



The Development of the
Interstate Highway System
in Texas

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CONTRIBUTING AUTHORS

Penny Beaumont
Rhonda Brinkmann
David Ellis
Chris Pourteau
Brandon V. Webb

GRAPHIC DESIGN

Vicky Nelson

COVER DESIGN

John Henry

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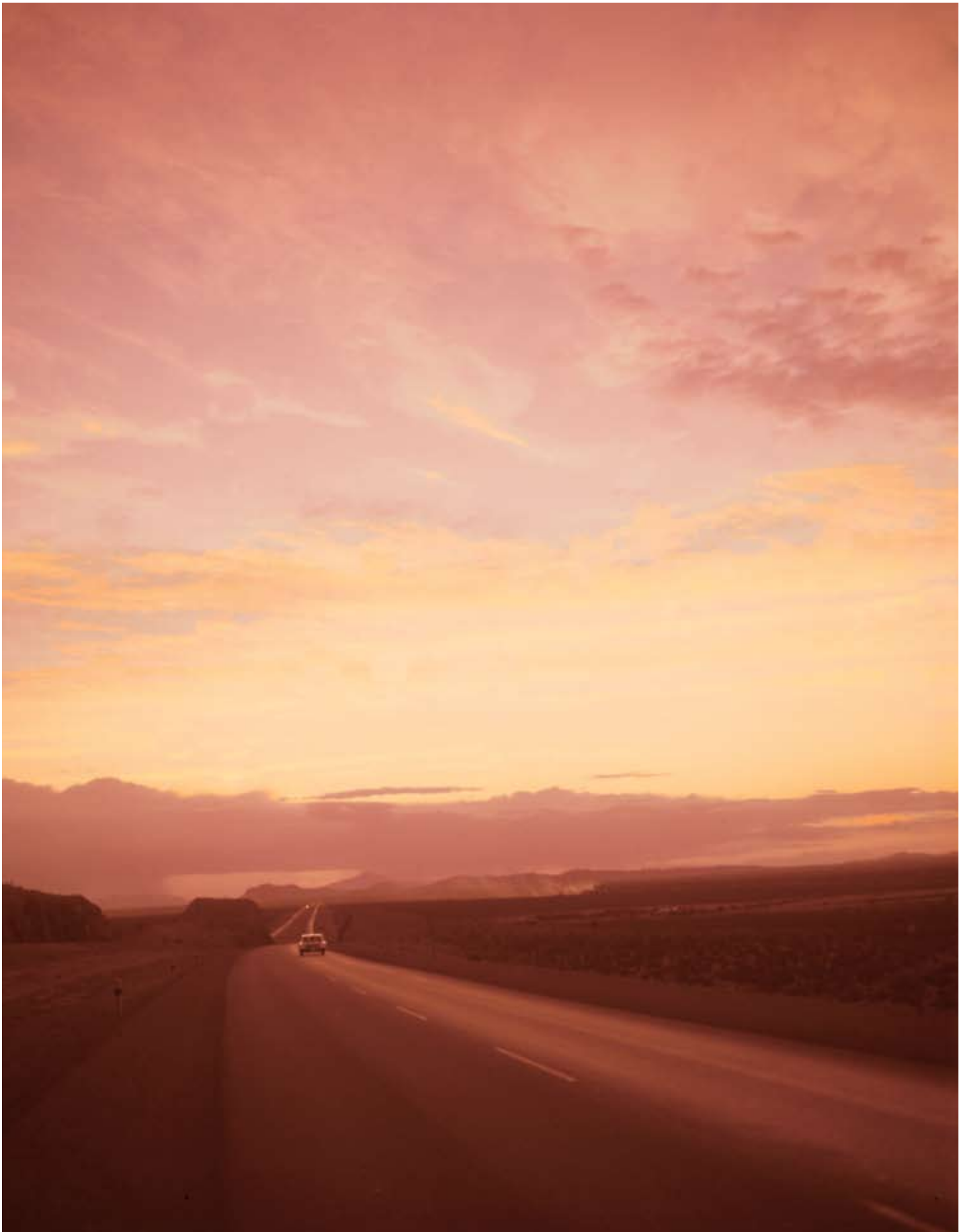


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From Anywhere to Everywhere: The Interstate Highway System in Texas

When the National Defense Highway Act was passed in 1956, no state had a greater stake in its success or could anticipate greater benefits from the new interstate highway system than Texas. As the largest state in the country, anything that improved travel times across vast distances was welcomed. The fact that these new roads were also going to be safer and smoother only increased their value and importance. With more than 2,905 miles of the system's total 40,000 miles initially scheduled to be built in Texas, interstate highways would significantly influence the population growth and the dramatic shifts in the state's economy that began in the mid-1950s. By that time, Texas had the advantage of an already excellent system of state highways and a state Highway Department composed of visionary, well-trained engineers ready to take on the challenge of merging the new interstate highways with the existing road system. Working cooperatively with engineering firms and contractors, as well as academic transportation researchers, these dedicated professionals built a federal and state highway system in Texas that is the backbone of the technologically sophisticated system of traffic management in place today. Texas's interstate highways did more than facilitate travel across the state's many miles. They also reshaped the appearance and improved the efficiency of transportation systems within Texas cities, affecting how and where cities grew as well as how they might flourish economically.

The success of the interstate system in Texas is a tribute to thousands of dedicated engineers, planners, and builders who worked together to create a highway system that would serve the people of Texas well. It's also a story of how public-private partnerships succeeded in calming troubled political waters, how politics sometimes affected route selection, and how elected officials and the Texas Highway Department dealt with opposition throughout the system's construction — environmental concerns, increase in urban "sprawl," and the sometimes devastating effect route decisions had on some small towns and urban neighborhoods. There are personal stories as well: dedicated professionals who worked long hours in all weather to meet deadlines; individuals who fought fiercely to protect their property or their community, while others generously gave up land or homes without a struggle, believing that their personal sacrifice was for the common good; politicians who juggled constituent concerns while working behind the scenes to affect the project. Above all, it's a story of how this massive federal public works project — the largest ever seen in the United States — affected a state, its people, and its economy.

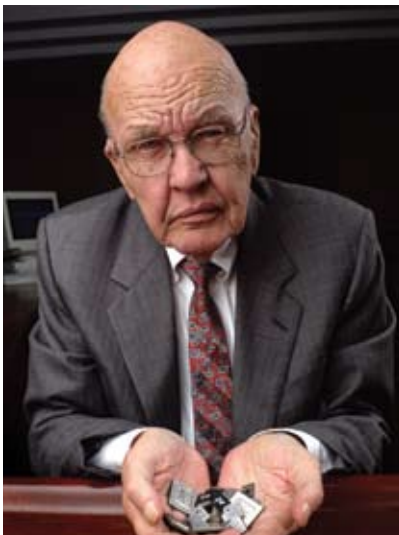
Land, Lots of Land...



Land has always been the most important resource to Texans, and the basis for nearly all of the state's economic growth. The early Texas fortunes came from what was grown and grazed on the land since agriculture — primarily cotton and cattle — drove the Texas economy. That economy required a road system that would enable farmers and ranchers to get their products to market. Today Texas is still one of the most important agricultural states in the country, leading the nation in producing cattle, cotton, and cottonseed, and deriving most of its farm income from cattle, cotton, dairy products and greenhouse products. The farm-to-market (FM) road system developed to meet the needs of the agriculture industry continues to be an important element of the state's transportation system today.

But it was what was under the land — enormous reserves of oil and natural gas — that created the great Texas fortunes in the 20th century and made the state an economic powerhouse. The discovery of oil at Spindletop, near Beaumont, in 1901 helped transform Texas into a more urban and industrial society, as the state moved from producing 900,000 barrels of oil a year in total, to over 3 million barrels of oil a year from just one well. As other even larger oil reserves were found in other areas of Texas, demands increased for more and better highways to transport products to

refineries and ultimately to users. Although most highway construction was halted during World War II, the petrochemical and natural gas industries became more important to the economy during those years, along with a growing aircraft industry and the establishment of military bases throughout Texas. Postwar years brought continued prosperity and industrial expansion, and the state was more than ready to rise to the challenge of creating a highway system that could serve this expanding economic base. The invention of the microchip in the late 1950s by Jack Kilby at Texas Instruments in Dallas and Robert Noyce at Fairchild Semiconductor Corporation started the electronics era and the development of the “Silicon Prairie” in North Texas, which evolved into a high-tech



Jack Kilby,
Photo courtesy Texas Instruments

corridor stretching all the way down I-35 to San Antonio. Texas added to its reputation as a high-tech center in the 1960s, with the creation of the Johnson Space Center south of Houston, where some of the most advanced scientific efforts the world had ever seen were underway. From the 1970s onward, that high-tech reputation helped lure service- and knowledge-based industries to the state, and they began to assume a more important role in the Texas economy. Today, Texas is a preferred location for many corporate headquarters, from airlines and retail chains to telecommunications and chemical companies. High-tech industries have boomed since the 1980s, especially in the Dallas–Fort Worth, Houston, and Austin areas, as the abundance of available space around Texas’s major cities and a rapidly growing system of urban loops linked to interstate highways enabled manufacturers to produce and deliver products easily and relatively cheaply.



These shifts in the Texas economy were not always smooth, and some, like the oil industry bust of the mid-1980s, caused considerable economic dislocation. But each decade saw transition and change in our economic history — changes that are still occurring today as Texas companies face the challenges of globalization. Through it all, there has been one constant: the essential need to be able to move goods and people from one place to another. Whether it was cotton or cattle, semiconductors or crude oil, we’ve always recognized the importance of the transportation system. It is what links us to each other and to the world beyond, allowing us to participate fully in the national and world economy. Texas has been blessed with both an abundance of natural resources and a citizenry of incredible creativity and energy. But the potential of all the resources we’ve found, all the things that we can make, and all the services we can provide would not be possible were it not for our ability to connect to the world through our transportation system, of which interstate highways are a critical element.

Land, Lots of Land...

The story of the design and construction of Texas's interstate highways is inextricably linked to the state's economic development and progress. The men — and for many years it was mostly men — who were most intimately involved in route selection, design, and construction of these new highways were aware of the impact these new roads would have on the state, local, and regional economies. They tried their best to be fair, following federal guidelines for route selection and working with elected officials at the local, state, and national levels to respond to public criticism and find compromises when possible. However, in their quest for economic highway locations, they were not always as sensitive to the individual concerns of rural landowners or homeowners in urban neighborhoods affected by the routes selected, and they were sometimes accused of building “white men's roads through black men's houses.” Still, most believed that the long-term value of this system would outweigh any individual objections and tried their best to find areas of compromise on route selection and, later, to address environmental concerns. Despite their best efforts at projecting future use, those early engineers could not have envisioned the tremendous population growth and economic changes that were to come. Their goal was to create Texas's part of this national highway system in a way that would ensure its long-term viability and utility to a diverse state with a large and growing population and a dynamic economy.

Early Interstate Champion: Thomas MacDonald

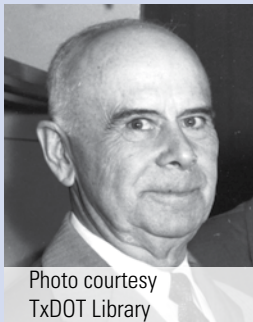


Photo courtesy
TxDOT Library

Although the interstate highways were a national project, from the very beginning, Texas had a special connection to the leaders who were spearheading the effort. Thomas MacDonald and Frank Turner, both of whom played crucial roles at the national level, had links to Texas — one at the beginning of his career, the other at the end of

his. Like thousands of other engineers, both men were able to attend college thanks to the Morrill Land Grant Act, which granted public lands in each state for the support of at least one college to teach agriculture and the “mechanic arts.”

MacDonald graduated from the Iowa State College of Agricultural and Mechanical Arts, where he came under the influence of the school's dean, Anson Marston, an early and important advocate of the “good roads” movement. At Marston's urging, MacDonald wrote his senior thesis on the highway needs of Iowa farmers, particularly the horsepower needed to pull heavy loads. After graduation in 1904, MacDonald was

hired as Iowa's chief engineer for a commission that was to study the state's roads. He and others believed that connecting the countryside to the city could help stem the tide of young men and women who were abandoning their family's farms, unable to tolerate the isolation of rural life. MacDonald not only wanted to get the farmers out of the quagmire of mud created when it rained; he envisioned a system of roads that would join the farms to the county seat, the state capital, and ultimately with other states. MacDonald's effectiveness in improving Iowa's roads by stabilizing soil, grading and spreading gravel and stone on some two thousand miles of roadway, paving nearly 500 miles, and overseeing the design and construction of new bridges and culverts earned him a national reputation.

In 1919, MacDonald was offered the position of chief of the Federal Bureau of Public Roads, which he accepted after holding out for an annual salary of \$6,000, \$1,500 more than his predecessor had earned. At the end of his distinguished career — and after an ignominious and controversial firing in 1953 by Secretary of Commerce Sinclair Weeks — MacDonald came to Texas A&M to help Texas A&M College and the Texas Highway Department develop a transportation research facility now known as the Texas Transportation Institute (TTI).



Photo Courtesy TTI Library

The earliest roads in Texas generally followed trails used by Indians or early Spanish explorers, but the first known roads developed as settlers traveled from Mexico to San Antonio, Goliad, and the East Texas missions. The Old San Antonio Road is perhaps the oldest known highway in the state, although the La Bahia Road and Trammel's Trace in East Texas were also well-traveled routes. Early Texas law called for the establishment of first-class roads between county seats, with a "first-class" road defined as a 40-foot-wide cleared path, with tree stumps less than eight inches in diameter cut off at the ground and larger stumps rounded off so that wagon wheels could more easily roll over them. Second-class roads were 30 feet wide, and third-class roads only 22 feet wide. With such limited requirements, these first Texas roads often were mere rocky trails or mud streams, and they zigzagged around hills, large trees, and boulders.

In 1883 the state government adopted a constitutional amendment that provided for a 15 cent county road tax for every dollar valuation of property. Each county commissioner's court had the power to choose routes and construct roads, although citizens could petition the county for a new road or for improvements to an existing one. All road work was done at the county level, with the commissioners appointing overseers to supervise workers. Overseers were often landowners (or their paid substitutes) on the route under construction.

As late as 1912, a Texas law required all able-bodied men aged 18 to 45 to volunteer several days a year for roadwork in lieu of local taxes. Even though the tremendous growth of the nation's rail network in the late 19th century helped merge Texas into the national economy, it did not give the state a complete transportation network. It was not economically feasible to site a railroad near every community, and rail transportation did not address how to get products from farms or ranches to markets, so inefficient and expensive transportation hampered both agriculture and industry in Texas.

Early Highway Development in Texas

Things did not improve rapidly in the first two decades of the 20th century: very few roads in the United States had any kind of hard surface, and Texas was no exception. Most roads were dirt — quickly transformed into nearly impassable muddy ruts during heavy rains — narrow, crooked, and inconvenient, and often routed around property lines due to right-of-way acquisition problems. Local governments had the responsibility for construction and maintenance, so roads were built generally to meet local needs. Even when paved roads were built, they often ended a few miles outside of a town, and often just the other side of a county line. However, as automobiles became more numerous, there was a dramatic shift in people's attitude toward highway development. Drivers began to recognize that road improvements were essential if they were to take full advantage of this new mode of transportation. The Texas Good Roads Association (TGRA) had been formed initially in 1903 to promote improved road construction and expansion of the road network. Their slogan "Get the farmers out of the mud" resonated with many in Texas. Like similar groups around the country, the TGRA organized auto tours and set aside special days to do volunteer roadwork, but the organization was seen as primarily benefiting automotive "sportsmen," who drove cars for a hobby. The TGRA did support bills to create a Texas Bureau of Public Highways, which like other proposed legislation establishing a state highway engineer (1907) and a commissioner of highways (1909) all failed. Undeterred, the TGRA reorganized in 1913 and again called for the creation of a Highway Department, believing that such an agency would minimize — if not eliminate — the corruption inherent in local control of road building, and would establish design and construction standards that would greatly improve road safety. The Federal-Aid Road Act of 1916 provided funds to construct rural public roads and justified federal financial support by proclaiming that the funds could be used for any road "over which the United States mails are or may hereafter be transported."¹ The legislation also required each state to have a state highway department and to maintain these new roads to "high standards."² Texas, like other states, finally accepted the fact that roads were more than a local concern, and that state and Federal involvement and funding were necessary to meet the growing transportation needs, and in 1917 the Texas Highway Department was created.

Early Interstate Champion: Frank Turner



Photo courtesy
TxDOT Library

Often called the "Father of the Interstate Highway System," Frank Turner studied engineering at what was then the Agricultural and Mechanical College of Texas — later Texas A&M University — graduating in 1929. He began his career with the Bureau of Public Roads in Arkansas, eventually joining the Washington, D.C. office in 1940. After wartime service in Alaska where he developed maintenance strategies to keep the new Alaska Highway open, Turner went to the Philippines where he oversaw all aspects of American efforts to rebuild and reconstruct the island nation, returning to Washington and MacDonald's service in time to contribute to the ongoing debates about the proposed

federal highway system, principally through his service as executive secretary to the President's Advisory Committee on the National Highway Program, chaired by General Lucius Clay. Turner also was the primary liaison between the Bureau of Public Roads and congressional committees during the deliberations and passage of the Federal Aid Highway Act of 1956, which established the interstate system.

From 1957 to 1969, as deputy commissioner, chief engineer, and then director of public roads, Turner was instrumental in helping to resolve many project disputes and keeping the interstate system's progress on track. In 1969, Turner's title changed to federal highway administrator, which he held until his retirement on June 30, 1972. He was the only Federal Highway Administration administrator to rise through the ranks and bring firsthand knowledge of the difficulties of highway construction to the post.

Historical Highlights of the U.S. Interstate Highway System

- The U.S. interstate highway system runs north and south, east and west, and past to present. While the interstate highway system we know today was officially implemented just 50 years ago, its roots run much deeper into our nation's past. Presidents George Washington and Thomas Jefferson both championed a national road, as did many others of their time and later.
- In 1806, Jefferson signed a congressional act establishing a national road. Construction on the first section began five years later, and by 1818, the National Road spanned the country from Baltimore, Maryland, to Wheeling, West Virginia. It whetted the population's appetite for even more navigable miles, and the Army Corps of Engineers took up construction west of Wheeling. At the same time, already-built sections were turned over to the respective states, which became responsible for upkeep. Most states charged a fee for road use within their borders, bringing toll roads to the national highway scene.³
- Through the turbulent years of the early 1900s, the national congress continued to pass bills intended to improve and connect the highway system. Each attempt faced inadequate funding or other obstacles that prevented it from being a comprehensive solution. President Woodrow Wilson signed the Federal-Aid Road Act in 1916, which funded the Bureau of Public Roads but ran into funding shortages during World War I.⁴ The Federal Highway Act of 1921 provided additional federal aid to the Bureau of Public Roads, headed at the time by the energetic Thomas Harris MacDonald. In 1930, President Herbert Hoover raised funding allocated by earlier acts.⁵ Throughout the 1930s, President Franklin Roosevelt's New Deal programs continued to fund road construction and employment during the decade of economic depression.
- The Defense Highway Act of 1941 and the Federal-Aid Highway Act of 1944 bolstered the nation's erratic highway development, but both faced the overwhelming impact of World War II. The first proposed map of interstate highways, then called interregional highways, was developed as part of the 1944 legislation. Although a second map created in 1947 included most of what is today the interstate highway system, it was not until the post-war years of the early 1950s that the interstate highway program finally took hold in its modern nationwide form.
- The partnership between states and the federal government had been in place since the days of the first national road, when the federal government built the road and then turned over maintenance to the states. Over the decades, the partnership had seesawed between boon and bane for both levels of government. In the 1950s, however, the partnership matured when President Dwight Eisenhower presented his coordinated plan for a system of interstate highways to the 1954 Governor's Conference. Despite anticipated prospects of a deadlocked defeat, the Federal-Aid Highway Act of 1956 passed overwhelmingly, and official construction on the national interstate highway system began soon after.⁶
- From the late 1950s through the 1970s, construction of the interstate highway system moved ahead full throttle. In 1957, the American Association of State Highway Officials (AASHO) selected the now-familiar red, white, and blue shield — designed by Texan Richard Oliver — to mark highways on the interstate system. Critical issues such as numbering, entrance and exit policy, limited versus unlimited access, and information dissemination were finalized, many refereed by Frank Turner, director of the Bureau of Public Roads (see sidebar for more information on Turner). The Federal-Aid Highway Act of 1962 encouraged coordinated, comprehensive highway planning. In 1967, the Bureau of Public Roads became a part of the larger Federal Highway Administration (FHWA). The 1970 and 1973 Federal-Aid Highway Acts addressed issues related to the social, economic, and environmental effects of the highway system.⁷ The completion of I-80 between Boston and Seattle was a significant milestone in the national system, which was declared complete in the 1990s, although some construction continued.
- In the decades that have followed completion of the initial system, highway officials have met emerging challenges and kept the nation's population moving. They have learned how to most effectively design freeways through urban areas. They have worked through complex environmental and cultural concerns. They have adopted and adapted changing technology to continually enhance and improve operations and materials.
- The future of our highways promises continuing opportunities for change and improvement. The purposes for which Americans want to use their highways — population growth and relocation, changing political climate, international relationships, economic concerns, emergent technologies, as well as more mundane purposes such as portal-to-portal transportation to and from the workplace, trips for shopping, vacations and other pleasure trips, and other issues — will influence the shape of our highways.

The Gilchrist and Greer Eras



Gibb Gilchrist, Photo courtesy
TxDOT Library



Dewitt Greer, Photo courtesy
TxDOT Library

The Texas State Highway Department was established in 1917 by act of the Thirty-fifth Legislature and was originally charged with granting financial aid to counties for highway construction and maintenance. The department assumed responsibility for maintaining state highways in 1924, but not until 1925 did the department have clear-cut authority for constructing the state highway system. During the late 1920s the legislature adopted the pay-as-you-go or debt-free concept, devised the first statewide marking system, and placed state and federal route signs including mileages and directions on designated highways in Texas. By the end of the 1920s, Texas had 18,728 miles of main highways, 9,271 miles of which were hard surfaced.

Throughout the Depression years of the 1930s, the department focused on improving highway safety, convenience, comfort, and aesthetics as road crews endeavored to shorten routes, smooth dangerous curves and deep culverts, and provide adequate drainage. They also cleared weeds and shrubbery to eliminate blind spots, and planted trees, flowers, and shrubbery to help prevent erosion of the road shoulders and beautify the landscape.

Better and more attractive highways were viewed as important to a growing Texas tourism industry, so in 1933, to prepare for a hoped-for influx of travelers for the 1936 Texas Centennial, the Texas Highway Department created the Office of Landscape Architect to direct a program that combined safety and aesthetics in highway landscapes. State Highway Engineer⁸ Gibb Gilchrist provided important leadership to this early beautification effort, encouraging districts to use the talents of newly hired landscape architect Jac Gubbels, and ordering road builders to spare as many trees as possible when building a road. When in doubt about whether or not to cut down a tree, Gilchrist said, “don’t do it,” and to emphasize the point, he included a copy of Joyce Kilmer’s famous poem “Trees” with his memorandum. He also encouraged citizen participation in highway beautification, encouraging local groups to donate time, labor, and supplies for roadside parks for which the department had no funds. In preparation for the Centennial, 13 tourist information stations were set up at major highway entrances to the state. The stations were staffed during the summer of 1936 by upperclassmen from Texas A&M, wearing their Corps of Cadets uniforms, an early indication of Gilchrist’s respect for the Texas A&M college and its transportation research program.⁹

“...the interstate’s impact on the American economy — the jobs it would produce in manufacturing and construction, the rural areas it would open up — was beyond calculation... more than any single action by the government since the end of the war, this one would change the face of America.”

*Dwight D.
Eisenhower,
34th president,
Eisenhower’s
1963 Memoir*

By 1936, there were 1,525,579 registered vehicles in Texas, and the state highway system was comprised of more than 21,000 miles of roads. As the Depression lifted, the onset of World War II curtailed road construction as both men and materials were needed for war work. In 1940, a new state highway engineer, Dewitt Greer, assumed responsibility for a network of 22,000 miles of Texas highways, not all of them paved. During the war years, Greer did his best to ensure that the department provided the highways in Texas needed for national defense while maintaining a holding pattern on most construction, and he looked ahead to what might be possible once the war was over. A leader in AASHTO and a respected voice on transportation issues, Greer was an early advocate of the interstate system. In 1944, he encouraged Congress to establish a program of construction of “interregional” highways, supporting the concept of “superhighways” described in federal legislation in 1939 and again in 1944. Greer’s reputation as a talented, ethical highway administrator earned him the respect of federal highway officials and the state’s congressional representatives, and he was thus able to work closely with them on issues affecting Texas as the interstate system was being developed.

Inventing the Future: Transportation Research and the Interstates

The Texas interstate system promised controlled access and high-quality design and construction, which leads to greater roadway safety.

One of the primary benefits promised by the interstate system was greater roadway safety. The new highways offered controlled access, and their design and construction would be of the highest quality, constantly evolving as new techniques and materials were developed. Here again, Texas had the advantage: a well-established Cooperative Research Program (CRP), which the Texas Highway Department had established in 1948 with Texas A&M University. The agreement was modified in 1964 to add The University of Texas at Austin.¹⁰ Even before the formal signing of the CRP, engineers at both universities had been working with the Texas Highway Department, providing vital research results and innovations that would transform Texas highways and save thousands of lives and billions of dollars. The fact that the research was “cooperative” between researchers and department staff meant that it was more applied than theoretical and thus more quickly implemented. Oftentimes, once the research results were implemented in Texas, they were then adopted by other states and countries.

From Expressways to Interstates: Early Freeways in Texas



Congested traffic conditions in Dallas in the early 1950s,
Photo courtesy Texas Good Roads Association

Traffic congestion is not a modern traffic problem, as this picture taken in Dallas in the early 1950s illustrates.

The 1944 Federal-Aid Highway Act provided \$1.7 billion for road construction, to be matched 50-50 by the states. The federal money could be used for three types of highways: an interstate highway network, a system of major arteries, and assistance in building land service roads — farm-to-market and ranch-to-market roads in Texas. This federal funding gave a boost to the Texas's fledgling FM system, the first stretch of which was built in 1936 — 5.8 miles between Mount Enterprise and Shiloh. As Texas cities grew exponentially during the 20th century, many FM roads became part of the urban traffic system, although only about 4 percent of the total FM mileage is within urban areas in Texas. There are now more than 40,000 miles of FM roads in Texas, now maintained by the state, and an important part of the overall highway system.¹¹

But it was the post-World War II boom that brought most of the new highways to Texas, including freeways and later the interstates. In 1946, the United States was beginning two decades of unparalleled economic growth, as technological advances and greater employment helped raise the overall standard of living. Government policies were geared toward meeting consumer demands, and highways were right at the top of the list as people eagerly bought the new cars first available in late 1946.

It is hard now to imagine what the availability of automobiles meant to Americans in the post-war years. People who owned cars during the war had coped with the inconveniences of gas rationing and a lack of new tires, but the great majority of Americans had relied on public transportation and longed for the independence car ownership could bring. As the supply of automobiles increased with the shift in industrial capacity away from a wartime footing, and the demand for cars became more prevalent with the economic boom of the post-World War II economy, people naturally demanded better roads, making American cities and the rapidly growing suburbs especially ripe for freeway development.

From Expressways to Interstates: Early Freeways in Texas

Like the rest of the nation, Texas was experiencing a post-war boom in traffic. Motor vehicle registrations increased from 1.7 million to 3.1 million between 1945 and 1950, drawing attention to the need for better highways. The 1946 “Good Roads Amendment” created a dedicated fund for highways, which helped to lessen the isolation of rural Texans by providing increased funding for more and better roads. In fact, by 1947, highway construction in Texas accounted for nearly one-quarter of all the highway work under contract in the United States. As a result, when the 1956 legislation was passed, Texas had many miles of roadway under construction that would eventually be designated as interstates. There were some 2,500 miles of roads already on the state highway system, many of which would be upgraded to meet interstate standards. In some cases frontage roads were added either as permanent enhancements or to serve traffic while the roadway was being improved.

The proposed federal financing was another important boon to the state. The fact that the federal government would pay 90 percent of the cost of interstate construction and the state only 10 percent was hugely important and represented a previously unprecedented leverage of state dollars. The cities paid almost nothing at all for urban interstates (their only cost was utility adjustments, which they would have had to do for any road), hence, the department had almost total control over the projects.

Houston, San Antonio, and Dallas–Fort Worth were the leaders in freeway development, having considered plans for urban transportation.

Several metropolitan areas in Texas — Houston, San Antonio, and Dallas–Fort Worth — were at the forefront of the new movement in freeway development, their civic leaders having already considered plans for urban freeway transportation. Equal credit for that progress goes to the forward thinking of Dewitt Greer. Because Greer had been able to save the department’s money during the war, Texas was able to begin building freeways before the passage of the 1956 highway act, particularly in those cities that were already seeing more and more cars on their streets. Traffic congestion was already becoming a problem in Texas’s larger cities. Even as early as the 1940s it could take 45 minutes to get across town in Houston, so “expressways” were a logical solution to this growing problem. In 1943, the Texas Highway Department received authority to enter the city limits to build and maintain roads. Recognizing that this area of transportation would require more specific expertise, in 1945 Greer created “expressway offices,” or Urban Project Offices, separate from the regular district offices, in San Antonio, Houston, Dallas, and Fort Worth, expanding the department’s urban presence and expertise. His wisdom in developing major arterial highways into high-volume limited-access facilities in the late 1940s made it possible for many Texas urban freeways to be incorporated into the interstate system with minimal changes.

Greer included rural Texas in his plans for the interstate system, quickly recognizing that there were several advantages to building the rural sections first. Not only was it easier to acquire right-of-way and to build highways in the vast open spaces, it also would create a constituency for highways among rural Texans — including legislators — whom Greer believed would be urban Texans at some point. He understood that those who had already benefited from the interstate system would be more likely to support urban construction (and even potential increases in highway taxes) whereas if the urban sections were done first there would not be money or support for the rural interstates.

From Expressways to Interstates: Early Freeways in Texas

Greer also saw this enormous construction project as an opportunity to expand the department's statewide network of contractors. Texas already had a well-developed program for letting and administering bids for highway projects, and the department was well served by a capable and flourishing highway construction industry. There was no shortage of contractors eager to bid on the interstate work, and there were several large firms in the state that could easily have handled much of the design and construction of the interstate system. By letting some of the jobs in the rural areas in smaller "packages" that could be handled by local or regional construction firms, Greer assured that these resources would be available for future highway work in the region. These firms hired local people and prospered, which enhanced local support for the project. More importantly, when the interstate project was completed, these firms were still around to maintain the new highways or do additional work for the department.¹²



Dallas frontage road, Photo courtesy TxDOT Library

The availability of frontage roads along our interstates helps to relieve congestion by offering motorists access to alternate routes.

Another Greer legacy to the Texas interstate system is its frontage road system. Texas interstates and freeways have many more access points than those in other states because Greer believed that these new roads should serve local and "interregional" traffic as well as long-haul through traffic. When Greer announced the new standards for the interstate highways in Texas, the right-of-way was to be 150 feet, plus another 100 feet for frontage roads, with the caveat that the specifications could be changed in locations where such width was impractical. In addition, since the Texas Highway Department was bound not to eliminate access to adjoining property on any existing road without paying property owners, those highways that were improved to meet federal standards kept their frontage roads. Thanks to Dewitt Greer, Texas now has 4,500 miles of frontage roads along its interstate highways and freeways.

From Expressways to Interstates: Early Freeways in Texas

Some have blamed frontage roads for urban “sprawl,” where a few businesses start up at a freeway interchange and on the associated frontage roads, and eventually a new suburban community arises. Others would argue that the growth along freeways is a positive rather than a negative force for economic development. Property once worth hundreds or thousands of dollars an acre suddenly becomes worth \$7 to \$10 a square foot, as new service and retail businesses spring up. That generates a need for housing, and eventually larger businesses locate in the region. Supporters also contend that development at the outer edges of a city actually reduces traffic congestion, as freeways and frontage roads make it possible for larger businesses to locate outside of the central city, thus reducing the need for employees to commute downtown.

Greer could not have foreseen the ultimate economic impact of his decision, which he based on the fact that it was cheaper to build frontage roads to enable access to adjacent property than to purchase access rights to that property. Nearly all of the state’s freeways were built under this policy.¹³ Although TxDOT officially designates these as “frontage” roads, each major city has its own nomenclature. In Houston they are called “feeder” roads; in Dallas–Fort Worth, “service” roads; in San Antonio, “access” roads; and in El Paso, “gateway” roads. Whatever they are called, the 4,500 miles of frontage roads are one of the features that make Texas interstate highways and freeways different from similar facilities in most other states.

Greer was somewhat less successful in his plans for rural interstates. He did not believe that strict access control was necessary in sparsely populated areas, feeling that at-grade crossings would be sufficient. He eventually had to bow to federal opinion on that issue and endured criticism for building “overpasses for jackrabbits” on rural stretches of interstate highways, especially in West Texas.¹⁴

Texas has over 4,500 miles of frontage roads along the interstate highway system. These roads, along with the many access points, make ideal locations for businesses such as hotels and restaurants for travelers.



Photo courtesy TxDOT Library

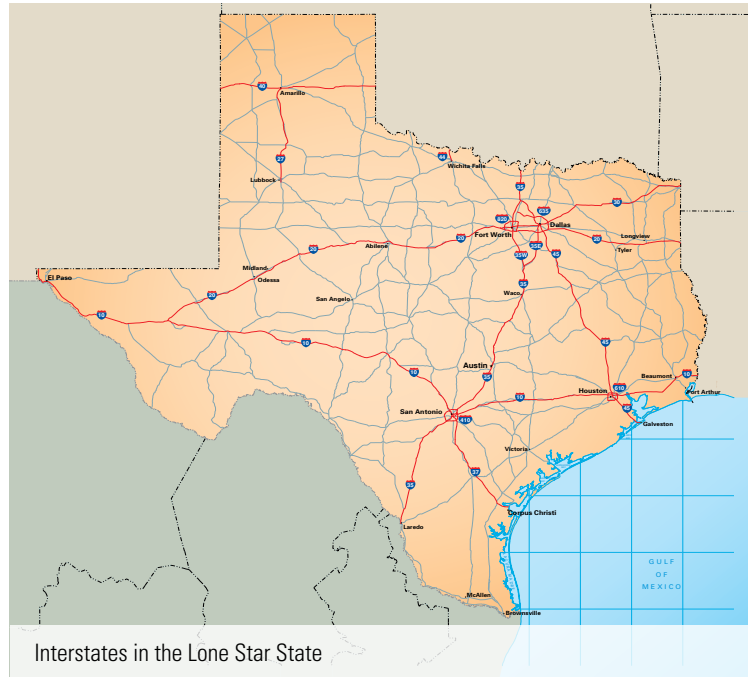
Route Selection – Not in My Backyard!

The primary interstate routes were based on recommendations from the states and had been laid out as early as 1944. Some followed lines that were drawn on maps as early as the 1920s. The final interstate map included in the 1956 legislation had been reviewed by the Department of Defense, but final route decisions, including where and whether or not to build frontage roads, were left to the state highway departments and their governing bodies—in Texas, the Highway Commission.

As the interstate program progressed, route selection naturally became a political issue at both the local and state level. The department's policy was to work closely with all levels of government as well as civic organizations and trade associations in selecting routes, holding public hearings and informal meetings before routes were finalized. Railroad officials also were consulted, as extensive negotiations on the need for and design of railroad grade separations were a key part of the planning process.

The 1956 act also set geometric and construction standards, and a guide developed by AASHO was used to implement those standards throughout the nation. Texas's active involvement and considerable influence in AASHO meant that the state had led the development of highway standards used prior to the interstate guidelines, and thus Texas was well prepared to accept the new federal standards on such topics as design and route connections, speed limits, construction sequencing, etc.

One important standard was the required 16.5 foot vertical clearances for an interstate overpass, some 2 feet higher than the clearance required on Texas highways. This was to enable movement of certain military hardware, particularly the “atomic cannon,” a huge piece of ordnance built by the United States in the mid-1950s to hurl nuclear shells far enough that they would not kill the people who fired them. The atomic cannon came into service in 1952, and although it had been deactivated by 1962, the vertical clearance standard was maintained. Any existing highways had to be upgraded to meet this standard in order to be included in the interstate system. If an overpass could not be improved, the standard could be met by providing exit and entry ramps that would enable easy on-and-off access of military equipment.



Construction in El Paso, Texas, Photo courtesy TxDOT Library

TTI Safety Innovations

Early transportation research focused on the roadway itself — materials, structures, and construction techniques — as well as highway economics. One of the first studies done in 1953 looked at the present and future transportation needs for 57 Texas industries, essential data for a state about to embark on a major highway construction program. As the road-building boom continued in the 1950s, researchers helped Texas Highway Department personnel by applying mass production principles to the making, storing, and utilization of bridge components, helping to reduce construction time and increasing the quality of bridge construction. In the '50s and '60s, thousands of miles

of Texas roads were upgraded from two lanes to four lanes, and TTI researchers developed standards for quality control in materials, specifications for equipment, and a basis for proper design. Researchers also helped the department find ways to prolong pavement life in order to handle the greater number of vehicles and larger amounts of congestion. More vehicles on the roads also generated a need for a more “forgiving” roadside, and researchers responded by designing, testing, and implementing life-saving safety structures such as breakaway signposts and light poles, innovative crash cushions, concrete barriers, and guardrails.

TTI pioneered the “breakaway” concept and specifications for improved safety of numerous roadside structures. Sign crash tests in the early 1960s led the way to implementation of these safer signs, light and utility poles, medians, mailboxes, and guardrails all across the nation’s interstates and Texas state highways.



ADIEM



ET 2000



Mailbox



Signposts

As freeways and interstate highways became an integral part of the urban transportation system, researchers began to focus on ways to better control and manage traffic flow. From the 1960s onward, TTI researchers were in the forefront of traffic management, beginning with a surveillance and control center in Houston to monitor the Gulf Freeway, and a computerized traffic control center in Dallas to help provide information on heavily traveled portions of the North Central Expressway. Institute researchers are national leaders in developing and adapting intelligent transportation systems (ITS) technologies to help improve urban mobility, conducting “bottleneck” studies, developing the roadway congestion index (RCI), and studying on high occupancy vehicle (HOV) facilities.

The 1970s saw a growing public environmental awareness, and transportation researchers responded by focusing on recycling waste materials, identifying lower cost alternatives

for road paving, and studying the ability of transit systems to both conserve energy and reduce congestion. Increased public consciousness and active participation in transportation policy decisions would continue throughout the last decades of the 20th century as issues such as mobility, highway location, land acquisition, and business access joined safety as key topics for public discussion, attention, and research.

New technologies and new processes are making research a necessary precondition to transportation strategies. The idea of sustainable transportation is one that looks at long- and short-term transportation issues and the role of transportation within a broader context such as the environment, the economy, and the public. It will be the cooperation of researchers and transportation professionals that develops the framework for transportation into the 21st century.

Route Selection — Not in My Backyard!

A Texan played the leading role in one of AASHO's most visible and permanent decisions — the design of the interstate highway signage. Richard Oliver, a senior traffic engineer in the Maintenance and Operations Division of the department, submitted the winning design, which was chosen from more than 100 submitted from all over the country. Thumbing through a dictionary looking for examples of other route markers, Oliver decided on the shield, seeing it as a symbol of federal authority and knowing that shape could easily be fitted into a square for manufacture. Although he wanted to use red, white and blue, Oliver submitted his original design in black and white, believing that color would not be authorized. The first prototype was created by a colleague, Clark Foster, and in 1957, Dewitt Greer notified Oliver that his design would be used nationwide, in the colors he had chosen.

The man behind the shield

Every highway department in the nation had the opportunity to submit designs for the new Interstate Highway route marker, but only Texas had the winner.

"In 1956, the route numbering committee asked for design entries. They received 76 designs and narrowed it to four finalists—Texas, Louisiana, New Hampshire and the AASHO (American Association of State Highway Officials) design," said Donna Tamburelli, current secretary of the route numbering committee for the American Association of State Highway and Transportation Officials.

The design that Texas entered was drawn by then-traffic engineer Richard Oliver of the Maintenance and Operations Division.

"It would've never occurred to me to enter a design," Oliver said. "But my boss said draw something and it won. I would've never thought of it."

In a letter commending Oliver, State Highway Engineer Dewitt Greer wrote, "I know that you will receive a great deal of personal satisfaction to know that your original design of the route marker for the Interstate Highway System has been adopted...and will be used throughout the United states...I just wanted you to know that we are all proud that Texas won this honor..."

Oliver said he submitted the basic design, but that it was black-and-white.



Oliver displays a modern Interstate shield, only slightly different from his original design, which appears on the front cover.

"I wanted to use red, white and blue, but I didn't think that we could authorize the color," Oliver said. "I presume that the Bureau of Public Roads—that's what the FHWA (Federal Highway Administration) was called back then—also felt that the shield should be red, white and blue."

Oliver said he got the idea for the shield while thumbing through the dictionary as he looked at examples of other route markers. He picked the shape of the shield because it indicates federal authority and because its shape fits in a square and could be easily manufactured.

Clark Foster, a Maintenance and Operations troubleshooter at the time, made the first sign, Oliver said.

"Right after they picked my entry for the new route marker, someone at my church found out about it," said Oliver. "Somehow the word got out and I got requests to design our denomination's newsletter."

Oliver didn't get the chance to design that newsletter because he moved to the Corpus Christi District. Thirty-six years later, Oliver admits the one design earned him extra points.

"It carried me quite a way. I was elected to sit on the board of my denomination's seminary and I was honored as a distinguished alumnus at the University of Toledo," he joked. ♣ Cheryl Converse

Interstate highway sign designer, Richard Oliver

Factors considered in route selection:

- Availability of right-of-way (including the purchase price of land)
- How many homes and businesses would be displaced by a particular route
- Anticipated economic impact of the completed highway on future land uses

“It was completely different back then — people wanted the highways, and were willing to sacrifice to get them built.”

*Luther DeBerry,
retired state
highway engineer*

The department was very careful about how it used the state’s limited interstate mileage allotment. For example, in order to get enough miles to build I-20 south of Dallas, the state repaid the federal government the small amount of money it contributed for I-30, thereby reclaiming the mileage for use on I-20.¹⁵ Improving traffic movement drove the location of urban interstate routes and was the primary “selling point” for the urban interstate system, while projected population growth and potential demand helped determine how many lanes would be built. However, construction and right-of-way costs, displacement of housing and commercial development, compatibility with community major street planning, the effect on parks and recreation areas, proximity of railroads, and drainage problems were also important elements to be considered. At least initially, ethnic or racial considerations were not key parts of the decision mix, but that changed as civil rights issues loomed larger in the public consciousness in the 1960s and ’70s.

The availability of right-of-way was the most important factor in route selection — including the purchase price of land — but planners and engineers also looked at how many homes and businesses would be displaced by a particular route as well as the anticipated economic impact of the completed highway on future land uses. While the most direct routes were preferred, sometimes routes could be shifted if doing so could ameliorate anticipated adverse environmental effects. The use of frontage roads also helped to reduce the economic impact on nearby businesses.¹⁶

The ruling by the Bureau of Public Roads that interchanges were to be spaced not less than 2 miles apart caused problems for both rural and urban interstates in Texas. The AASHO guidelines also stated that new frontage roads were to be constructed only where they represented an economical solution to providing access to “severed” property, or where they helped to restore continuity to the local road system. If the new interstate followed an existing highway, the old road could be left as a frontage road. Under the federal and AASHO guidelines, farms or ranches were sometimes literally cut in half by proposed routes, leaving owners without easy access to their property. The issue of how to handle routes near small towns was a difficult problem for department planners. If they put the interstate in the location most locals wanted — right in the middle of town — then the required amount of right-of-way for the highway would have wiped out most of the downtown area. Because that was not acceptable, the next thorny issue became how far outside of town to place the highway: too far out and the town loses the chance of attracting travelers; too close in and there was the danger that the town would expand right into the highway. In each case, the department did extensive studies on various options: one on any existing roadway and at least two others, always looking for the optimal solution.¹⁷

But the problems affected more than individual landowners. Like the coming of the railroads in the 19th century, the location of a highway route could mean life or death to small communities. County judges and mayors lobbied hard to make sure that their town would either be directly on the new interstate highway or have easy access to it. Some small towns withered and died as the lack of an interchange at the right location or the creation of new businesses along the interstates discouraged travelers from driving even a few miles to local businesses. Not surprisingly, those communities and landowners affected by these decisions looked to their elected officials for relief.

Route Selection – Not in My Backyard!



Photo courtesy TTI Library

Built in the 1920s, the first Phillips 66 service station in McLean, Texas, operated for more than 50 years, until the completion of I-40.

McLean, a small town in the Panhandle, is an example of what could happen when the interstate highway bypassed a community. McLean started in 1901 as a cattle loading site along the Rock Island Railroad with only a water well and a switching station. A few years later, an Englishman named Alfred Row, who had a ranch near the site, donated land for a town, naming it for W.P. McLean, a member of the Texas Legislature and later the Railroad Commission. The town grew quickly and by 1909 was a center for agriculture as well as railroad-related business in the area. During the golden age of Route 66, McLean was an economically strong community, with service stations, motels, cafes, six churches, 59 businesses, and a population of more than 1,500. However, with the growth of nearby Amarillo and Pampa, the town's population began to decline, and the decision that I-40 would bypass McLean was the final blow. Local business owners fought hard to stop or at least slow down the interstate construction, knowing that a bypass would draw away the tourist trade on which the many service stations, motels, and cafes thrived. Their efforts were to no avail. Construction of the bypass started in March of 1982 and was completed in the summer of 1984. The effect was exactly what civic leaders predicted: today, McLean is home to just over 800 citizens, and most of the businesses that thrived in the Route 66 era are long gone. The town still attempts to draw tourists by emphasizing its historic past and is the headquarters of the Texas Historic Route 66 Association.



Dewitt Geer and Representative Jim Wright,
Photo courtesy TxDOT Library

The opposition to specific interstate routes in Texas was similar to that seen in other states. While many Texans agreed to the division or purchase of their property for the new highways or frontage roads, others were less cooperative, and some objected to the federal highway program in its entirety. Despite the fact that the ultimate decision on routes would be made by

Route Selection – Not in My Backyard!

the state Highway Commission, Texans still looked to Washington, D.C., to resolve conflicts, and they wrote, called, and wired their congressional representatives seeking changes in the chosen routes. This reliance on Washington is not surprising given the strength of the Texas congressional delegation in those years. With Sam Rayburn as speaker of the house of Representatives from 1940 until 1961 (or minority leader in the two Republican Congresses of the period) and Lyndon Johnson as Senate minority or majority leader from 1953 until 1960, Texas had real clout in Washington's halls of power. Rayburn participated in the passage of nearly every significant piece of legislation during his 48 years in Congress, and he and Johnson worked together to ensure that Texas got its share of the federal dollars and programs being developed during that time. Texas also benefited from the consistent support for increased highway funding and gas taxes of former House Speaker Jim Wright and former Senator Lloyd Bentsen, two of the strongest advocates for highways who ever served in Congress. Both worked tirelessly throughout their careers to see that highways in Texas were adequately funded.

“There is a part of America which was here long before we arrived, and will be here, if we preserve it, long after we depart.”

*Lyndon Johnson,
36th President*

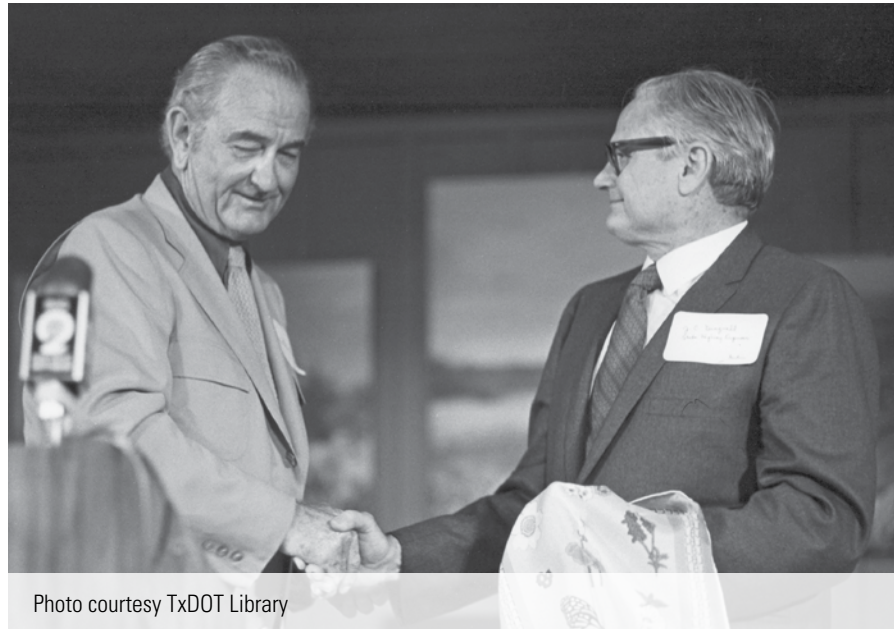


Photo courtesy TxDOT Library

Despite their considerable federal power, Rayburn and Johnson shared a dedication to serving their constituents, and responded to citizen inquiries and requests for assistance quickly and in a manner designed to help ensure future electoral support, no matter how fierce the criticism or outrageous the request. In 1960, Senator Lyndon Johnson received a letter from Mr. Walter Farrington of Tyler, who declared the entire highway program “...an outrage and a disgrace, not only because so many citizens cheat and deceive the government, but most of all I feel that this bungle and mess is more your responsibility than anyone else’s.”¹⁸

Route Selection — Not in My Backyard!

San Antonio had some of the fiercest opposition to freeways, if not the interstates per se. When her home was taken for a freeway right-of-way, Mrs. Maude Willcox launched a fierce and very public campaign, bombarding her local, state, and federal elected officials—including Johnson—with letters declaiming the new freeway and the methods used to acquire land. The use of eminent domain for acquiring right-of-way may be legal, she wrote, but it was, in her words, “...unconstitutional, unamerican [sic] and communistic...” She compared its effects to those of the Spanish Inquisition, the Salem witch trials, and the Holocaust, and even claimed that the city had used tear gas to evict an elderly couple who resisted the takeover of their home.¹⁹

The criticism and debate over routes did not diminish even when interstate construction in Texas began in earnest in the mid-1960s and citizens could begin to see the benefits. In 1964, President Johnson received a cordial but direct request from Mr. and Mrs. Guy Cox of Marshall requesting his help in getting the district engineer to reverse his decision to not locate a frontage road in a certain section of I-20. The frontage road would be “...for our benefit and...in case of war to clear the main highway for movement of troops and materiel.” In hopes of getting the president’s attention, Mr. Cox also invoked the name of Marshall native son and presidential staff member Bill Moyers. He further advised the president that he had a nephew working in the Pentagon and a cousin who was a congressman from Corpus Christi. He ended his letter by telling the President, “We are proud that our president married a Harrison County Girl.”²⁰ The fact that Mr. Cox had received less per acre for his land than had his neighbor undoubtedly had increased his dissatisfaction with the district engineer’s decision.

LBJ replied to Mr. Cox as he did to all such letters, explaining that while he understood their concerns, route decisions were made at the state level, and encouraging petitioners to take their concerns to the department. Requests for assistance on interstate routes from members of the Highway Commission, chambers of commerce, county judges, or other elected officials merited a review of the issue by the head of the Bureau of Public Roads, who would then draft a response for the senator’s signature. Johnson nearly always edited these responses and often added a handwritten personal note. However, there are recorded instances where Johnson did interject himself into ramp locations and access issues, such as that of the Stage Coach Inn in Salado, located on I-35.

The tone of the opposition did change with the times. By the 1960s and ’70s, opposition to urban interstate or freeway routes often was couched in terms of violating minority rights or damage to the environment. Nationally, the anti-freeway movement brought together neighborhood preservationists, environmentalists, and minorities. Battles now often centered on demolition of a park or disruption of a neighborhood, the severing of a campus, the bisecting of a zoo or a golf course, or the loss of a school or treasured trees. The accusation that the government was building “white men’s highways through black men’s homes” became the mantra of civil rights activists.

In the late ’60s, public concern over the proposed construction of US-281 through San Antonio parks and other real estate threatened to shut down the project. Thanks to legislation which allowed the roadway to proceed without federal dollars, this vital roadway opened to traffic in 1978.

“They won’t let anyone like us stop a multimillion dollar project...”

Mr. Oliver Shattio

Highway planners and engineers had always contended that right-of-way decisions were based primarily on finding the cheapest land possible to keep overall construction costs low, and that they had no intention to damage or divide minority neighborhoods. This argument was not always sufficient, but in most cases the Texas Highway Department got its way, and as in Florida and other states, minority communities in Texas were often divided or otherwise negatively affected by the routes selected for urban interstates.

As the disputes escalated, newspaper feature writers profiled affected neighborhoods and their residents, relating the trials of citizens whose houses were in the path of a new highway, and decrying the destruction of once viable neighborhoods and communities. “A Neighborhood Dies So Cars May Move,” written in 1970, described the last gasp of a 4 mile stretch of land being cleared for Houston’s South Freeway between the Gulf Freeway and the South Loop.²¹ After seven years of acquiring land and property and relocating residents, the end had come. “[Some] houses are up on blocks, ready to be moved, and the boarded businesses that mark a neighborhood in transition...[are] just memories of the people who once lived here and the people who make their living from what remains.”²¹ In 1973, residents of Houston’s Third Ward protested the expansion of the Gulf Freeway, complaining that the Texas Highway Department had not adequately considered their views about the expansion, “...not having enough concern for the ‘anxieties, emotions, fears and insecurities that relocation would cause residents.’ ” The group’s pro bono lawyer also claimed that too little attention had been paid to the environmental impacts of the project as well as the sociological effect on the community, citing a Texas Southern University study that said that the relocation of some 800 people “...would pose a potential threat to the stability of neighborhoods.”

Despite a relocation program in which the state paid all moving costs and a portion of the additional mortgage costs or higher rents, most of the residents living along the south side of the freeway where the expansion would take place were far from satisfied. Many felt that they did not receive adequate compensation for their homes and properties, in addition to the inconvenience of relocation. There was also a fatalistic attitude about the power of government. As Mr. Oliver Shattio bitterly put it: “They aren’t going to let anyone like us stop a multimillion dollar project because it would stop too much money from being in circulation among the rich.”²²

Route Selection – Not in My Backyard!



I-45 and Pierce elevated, Photo courtesy TxDOT Library

Similar bitter and hard-fought episodes occurred in other Texas cities. At a time when racial tensions in Dallas were simmering, the issue of exit and entrance ramps on the proposed I-45 route near Fair Park generated tremendous controversy in the poor, mostly black neighborhood. Residents wanted a highway that would connect them to the rest of Dallas, and they argued that without adequate ramps the new highway would not provide that essential link. They also felt that if the highway were elevated, it would be an even greater symbol of the minority community's separation from the rest of the city. The department on the other hand believed that an elevated highway would help preserve the existing street system. Under the leadership of the

Block Partnership Program of the Greater Dallas Council of Churches, residents lobbied successfully for the access ramps and for maintaining the highway at ground level through Fair Park. The neighborhood pressure and the attendant publicity forced the department to completely redo its plans (at considerable cost) despite the fact that the highway was just about to be constructed and the single, required public hearing was long past.²³ This trend for increasing community involvement in route decisions would continue throughout the decade, as engineers and planners struggled to find areas of compromise with citizens who placed environmental well-being or neighborhood considerations above any value that new highways could bring to a city or neighborhood.

As early as 1977, there was a push for rail rapid transit among the cities on the I-45 corridor in the Dallas area as a possible solution to the congestion problem on the Central Expressway. Across the nation, environmentalists also pressed for opening up the federal highway trust fund to other areas of transportation, most notably public transportation. That change was made in 1983 when Congress determined that a portion of the revenues obtained from highway users should be used to fund transit needs. It was the first time in 23 years that Congress had chosen to increase the federal tax on gasoline and diesel fuels. The gas tax more than doubled, from 4 cents to 9 cents a gallon (1 cent of which would go to transit) while the tax on diesel fuel jumped almost 400 percent, from 4 cents to 15 cents a gallon.

Paving, Progress, and the Environmental Price

Early roads, essential for wagon-wheeled commerce, consisted of little more than dust, clay, and—more often than not mud. A bona fide “expressway” of the early 1900s might be a loose patchwork of macadam, granite blocks, gravel, broken bricks, and wooden planks—hardly the stuff of today’s high-speed, engineering masterpieces. Such roads followed the natural spine of the land, picking and choosing their path in a Texas two-step between traveler and terrain.

By 1912 Congress would authorize funds to repair and upgrade routes for rural mail delivery, spending \$1.8 million to construct 425 miles of roads. That figure leaped to more than \$75 million over five years with the 1916 Federal Aid Road Act. Within the next five years highway improvement funding would grow to \$75 million per year. The race for roads was on. With increased funding for construction and maintenance, a national priority for safe, expansive roadways coast to coast, and a nation hungry for speed and cheap gas, the emphasis for highway construction was on cheaper and faster but, according to some, not necessarily on better.

Few transportation engineers in the 1950s focused on building roadways such as I-70 (completed in 1992) through Glenwood Canyon, Colorado, which former FHWA Head Thomas Larson called “a world-class piece of environmentally sensitive engineering...a scenic byway that is one of the wonders of the interstate system.”²⁴ Rather, in the 1950s and 1960s the engineering movement that pushed highway construction to link the country’s coasts and borders often bypassed those who were beginning to sound an environmental alarm.

“We were supposed to go through the least expensive land because land was a very high part of that cost,” says Frank Griggs, an engineer charged with building the first interstates through New York State in the 1950s. “If we were in an urban environment, we would go through the slums because that was the least expensive land.”²⁵



Earth moving machines on I-20, Photo courtesy TxDOT Library

Paving, Progress, and the Environmental Price

A Public Rumble

Hundreds of acres of parkland vanished in the 1950s when the Schuylkill Expressway was built to carry traffic into Philadelphia, while 5,000 homes met the blade of a bulldozer as IH-5 rolled through Seattle.

“The interstates gashed their way through existing rural landscape...communities, and small towns and in many cases just destroyed them,” says historian William Cronon, of the University of Wisconsin-Madison. “You drive down interstates passing through farms—which are old family farms...farm houses are on your left and half the fields are on your right...the farm family that now has their land split that way has to commute 2 or 3 miles with its tractor to...keep farming its land. That is a ripping asunder of old relationships that were present in the landscape.”²⁵

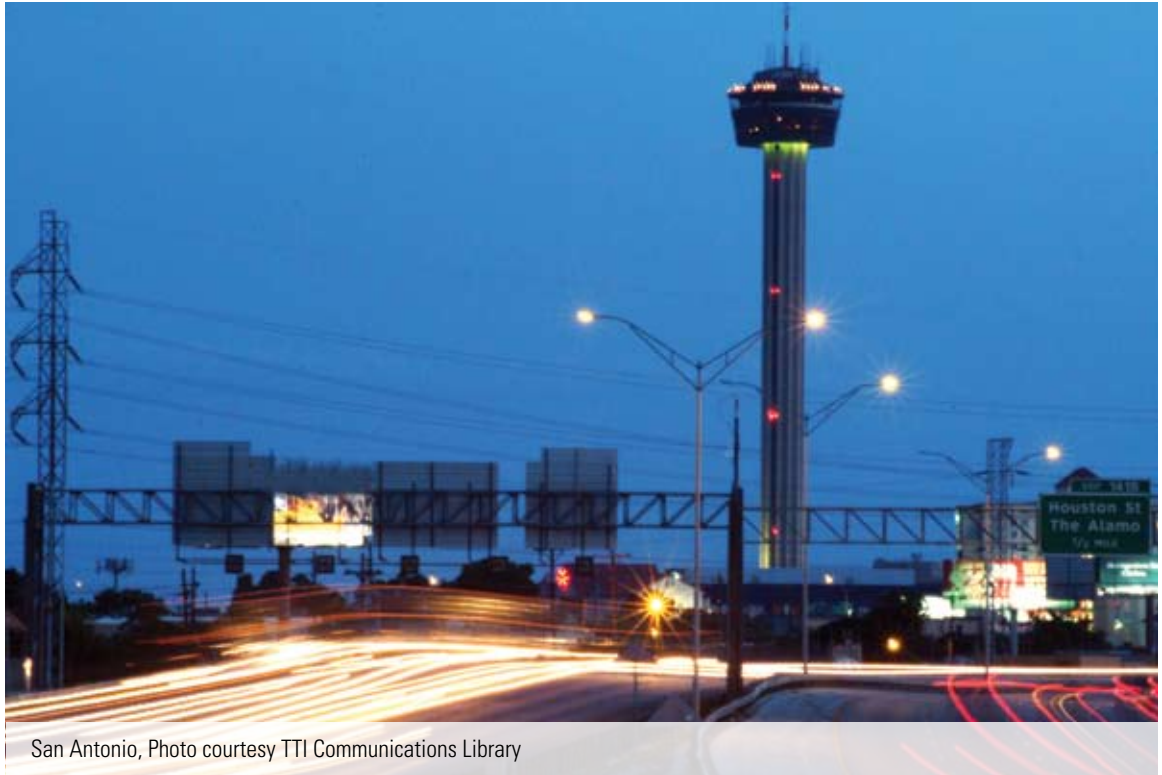
Such divisions of the land, combined with a lack of emphasis on protecting delicate havens for wildlife, drew public attention and increased scrutiny. By the 1960s, a disparate group of concerned citizens had organized into a full-scale environmental movement. The public demanded protection for parklands and wildlife refuges, and explicit protection for historic sites. They insisted that fragile ecological centers, air quality, and water quality were worthy of protection from roadway construction, or what many other citizens simply viewed as progress. Litigation over progress, process, and the impact of major roadways on the environment would rise as high as the Supreme Court.

Battle Lines in the Lone Star State

One of the most storied of such battles between the progress and the process of building major roadways began in a Texas city that knew war all too well—San Antonio. While the conflict did not involve an interstate highway, the struggle over US-281 exemplifies the kind of battle fought over interstate routes throughout the nation.

US-281 opened to traffic on February 7, 1978. It was named for Walter McAllister, an influential San Antonio mayor who was in office when the project was proposed.²⁶ The freeway is considered a backbone for the bustling north-central area of San Antonio, an area that includes Trinity University, the University of the Incarnate Word, Brackenridge Park, the San Antonio Zoo, Alamo Stadium, the San Antonio International Airport, and a number of suburbs. Though now considered vital to mobility through San Antonio, US-281 almost never saw the light of day.

City planners understood as early as the 1950s that a north-central freeway route, particularly one providing access to the airport, was essential for growth. San Pedro Avenue, McCullough Avenue, and Broadway were considered as possible routes but were all rejected due to right-of-way costs or limited airport access. Planners settled on a compromise route midway between Broadway and McCullough, designed to wind around Brackenridge Park, through the suburb of Olmos Park, and over the Olmos flood control basin. US-281 would consume part of a golf course and split park land and other real estate. While voters had approved a bond issue to replace the park land, those protesting the move took advantage of a notation in federal highway funding rules that disallows using parks for highway space.



San Antonio, Photo courtesy TTI Communications Library

In 1967 the San Antonio Conservation Society, a community preservation group, sued to halt the North Expressway, US-281, project.²⁷ Litigation surrounding the North Expressway eventually landed in the Supreme Court, where the court upheld a lower court's injunction against US-281. The project was resurrected in 1973 when Senators John Tower and Lloyd Bentsen co-sponsored legislation to allow the roadway to proceed without federal dollars.²⁶

While the most strident opposition to US-281 was led by the San Antonio Conservation Society, writer Helen Leavitt helped bring national exposure to the controversy with her book *Superhighway-Superhoax*. She wrote:

“As proposed, the expressway is to curve and wind its way across the Audubon bird sanctuary and Olmos Creek, a tributary in its natural state which would be converted into a concrete ditch, on and along a picnic ground and recreation area, wiping out a Girl Scout Day Camp and nature trail...sever a college campus (Trinity University), force an elementary school to close, pass through the zoo...follow the edge of the sunken gardens...taking homes...swiping off part of a municipal golf course, and limp home through a wooded portion of San Antonio's natural watercourse, one of the few remaining wilderness.

This is a classic example of highway planning...Clearly, the planners of San Antonio's North Expressway did not know where NOT to build.”²⁸

In December of 1970 FHWA sought to accomplish the rest of the US-281 project that San Antonio needed while minimizing the environmental impact. FHWA evaluated route options in the “San Antonio North Expressway Study.” The study ultimately recommended a different route from the final course US-281 takes through San Antonio.

Paving, Progress, and the Environmental Price

Building It Better

Two major developments resulted from the increased environmental awareness of the 1960s—FHWA revised its public hearings and location approval process to establish a two-hearing process for highway projects, and the National Environmental Policy Act (NEPA) of 1969 was made into law.²⁹

The two-hearing policy mandated that a “corridor public hearing” be held prior to setting route locations in stone. A “highway design public hearing” was mandated so the public could consider the potential social, economic, and environmental impacts of a project before it received federal aid. Subsequent modifications of the policy forced planning agencies to seek out public views before a project came to pass.

NEPA, later augmented in 1970 by the Environmental Quality Improvement Act and other legislation, created for the first time a “broad, national policy to prevent or eliminate damage to the environment; the act stated that it was national policy to encourage productive and enjoyable harmony between man and his environment.”²⁹

While some viewed the development of interstates in the 1950s and their improvement in the 1970s as a heavy-handed smudge on the landscape, others adopted the vision of a gleaming, safe, and efficient system placed where it could benefit the greatest number of people. The pendulum of opinion has swung throughout the debate and the decades since the 1950s, but a better picture is now appearing on the horizon as former opponents work together to link transportation progress and environmental preservation.

Preserving environmental assets, recycling crushed-up roadways, using cleaner-burning fuels, and implementing innovative roadway design and construction techniques have, according to the U.S. Environmental Protection Agency, improved the condition of the environment over the past 30 years.³⁰ Polluting vehicle exhaust emissions are down, and FHWA now creates 2 acres of wetlands for every acre lost. More than \$200 million is spent each year in wildflower programs, landscaping, and soil stabilization—essential to protect water quality. The transportation construction industry recycles 80 percent of pavement materials, much more than newspapers, aluminum cans, and glass bottles are recycled in the United States.³¹





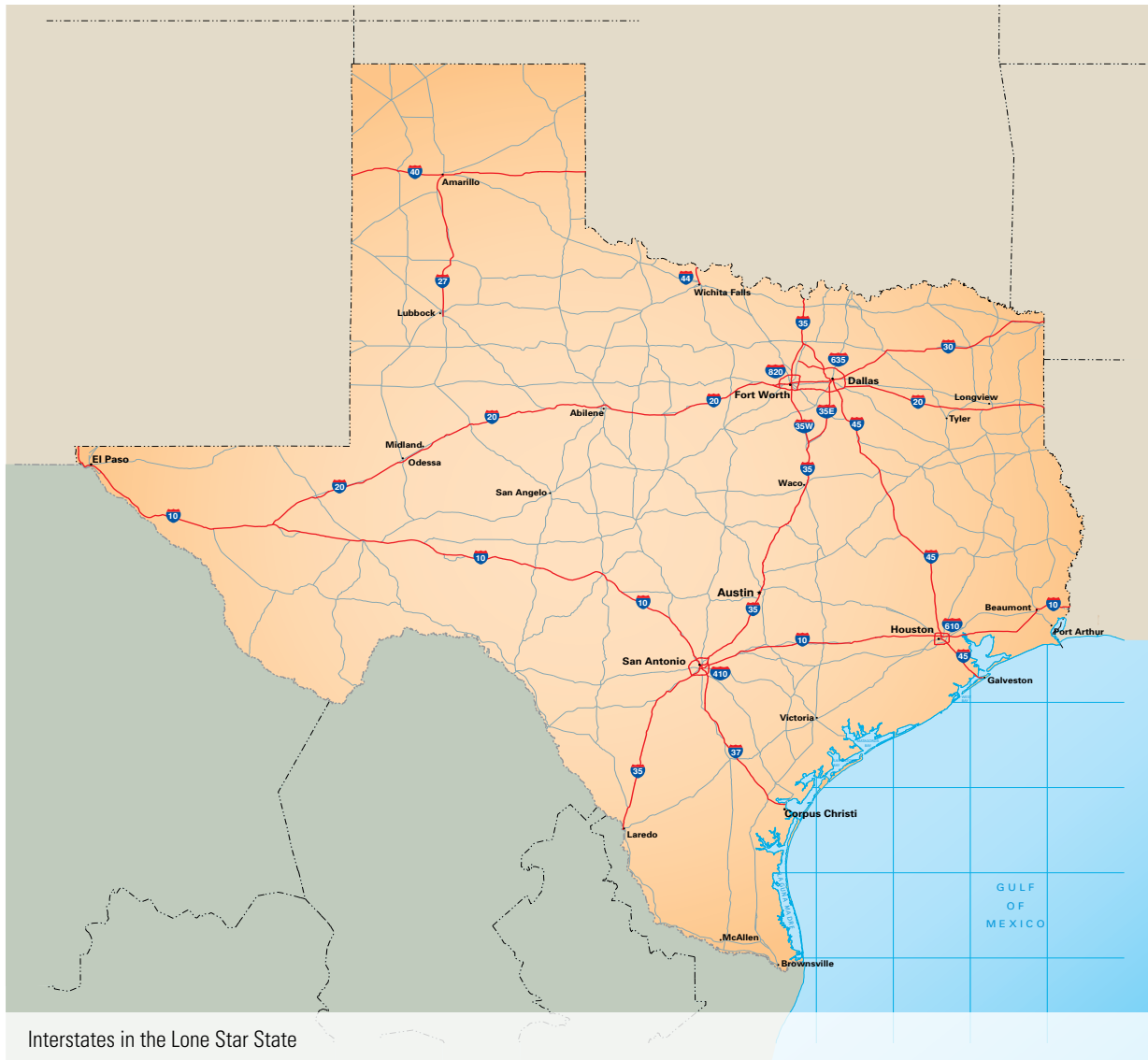
Photo courtesy TxDOT Library

And in 1998–1999, FHWA provided:

- \$608 million to build walkways, bike paths and recreational trails;
- \$378 million for landscaping and soil stabilization;
- \$6.2 million to plant wildflowers;
- \$100 million to build auto emissions testing facilities;
- \$148 million to restore historic buildings and sites;
- \$85 million for noise abatement;
- \$30 million to purchase land to protect scenic and historic sites; and
- \$25 million for wetlands replacement and mitigation.³²

The landscape, so to speak, of highway construction is changing in America. As vehicles are engineered to run more efficiently and more cleanly every year. As roads are more thoughtfully planned with an eye toward historic value of land, the sensitivity of nature, aesthetics, and public input; the transportation picture of tomorrow looks more environmentally benevolent and promising than the picture of 50 years ago.

The Interstate Waltz across Texas...



The interstate system was designed to be a “point-to-point” system, connecting all cities in the nation with a population of over 50,000. Most of Texas’s larger cities met this criteria — Dallas, Fort Worth, Austin, Houston, San Antonio, El Paso — while others would have the good fortune to be on a chosen interstate route.³³ Texas road maps of the late 1950s and very early 1960s are not clear about the state of the interstate system at the time. The interstate shield does not even show up on some highways until 1959 or 1960, and many of the maps of the time mistakenly used the same symbol for a four-lane divided highway as for a freeway, when in fact some were far from controlled access and had traffic lights, intersections, and crossovers.

The Interstate Waltz across Texas...

By 1962, the interstate system in Texas included the following highways, which were either open, under construction, or planned, with final routes to be determined by the Highway Commission:

Final interstate routes determined by the Highway Commission

879 miles	I-10 from the Louisiana border to the New Mexico border north of El Paso
634 miles	I-20 from the Texas border east of Marshall through Dallas–Fort Worth to a point southwest of Pecos, where it joined I-10
240 miles	I-30 from Texarkana to Dallas–Fort Worth where it joined I-20
492 miles	I-35 from the north Texas border to Laredo (both I-35E and I-35W)
142 miles	I-37 from San Antonio to Corpus Christi
182 miles	I-40 from the Texas–New Mexico state line to the Texas–Oklahoma state line
14 miles	I-44 from Wichita Falls to the Texas–Oklahoma state line
286 miles	I-45 from Dallas to Galveston, passing through Houston

Of the urban freeway loops, only Loop 610 in Houston had been approved by 1962, but others in Dallas, Fort Worth, San Antonio and El Paso were approved in the late '60s and early '70s. I-27 from Amarillo to Lubbock was approved in 1975.

Because Texas had nearly 2,500 miles of highways that could be upgraded to the new federal standards relatively easily, most interstates in Texas were developed along existing U.S. and state highways — I-45 replacing US-75 between Dallas and Houston, I-35 replacing US-81, and I-40 superseding the famed US-66 across the top part of Texas, on its way west to Amarillo, New Mexico, and the West Coast.

In fact, much of today's interstate system in Texas consists of existing roads for which frontage roads were built to serve traffic while the roadway was being improved. Although the 1956 act declared that the interstate system would be completed by 1972, like many other states Texas did not meet that deadline. In fact, it was 36 years before the Texas interstate system was complete. The first Texas interstate contract was let in 1956 for a segment of I-45 in Navarro County near Corsicana, and the last segment of I-27 between Lubbock and Amarillo was completed in 1992.

While transportation historians and aficionados may quibble about the details, the information in the following sections outline the basic history of most of the interstate routes in Texas.³⁴ Additional information on urban interstates and I-35 in particular will be found in a later section of this paper.

The Interstate Waltz across Texas...

I-10 — 881 Miles



I-10, Photo courtesy TxDOT Library

I-10 is the southernmost coast-to-coast interstate in the United States, and also the longest interstate in Texas, traveling from the deserts of El Paso to the bayous of the Louisiana border. I-10 enters Texas at the New Mexico border, follows along the Rio Grande, goes through downtown El Paso, and heads eastward. Once outside of El Paso, the freeway at one point narrows to two lanes as it passes through some of the most desolate interstate miles in the country, finally reaching San Antonio some 500 miles later. To maximize capacity in a tight right-of-way, I-10 is built on two decks in San Antonio, carrying both local and through traffic across the city.

Although the route was approved by the Bureau of Public Roads in 1959, the full route was not completed until well into the 1990s. From Houston, it proceeded westward via the West Loop 610, following the route of US-90, and by 1968 it was completed as far as Schulenberg. I-10 was completed through Houston — including both the East and West Loops of 610 — by 1968. The east and west construction crews met in 1972, enabling a non-stop trip from Louisiana to San Antonio. The short and final downtown section to be completed in Houston included a merge with I-45, which was completed in 1972.

The far west sections of I-10 between San Antonio and El Paso took much longer to build, with little construction taking place for many years. The wide open spaces, vast mileage to be covered, and lack of towns along the route made construction difficult, as did the variety in terrain. The first sections built were near Van Horn and El Paso, with the final segments being constructed in the 1970s and 1980s, and completed by the early 1990s. At Van Horn, most of the traffic transfers to I-20, which goes north toward Dallas and Fort Worth. Much of I-10 from Van Horn to San Antonio is in such desolate areas that for years some locations along the highway had at-grade crossings rather than full interchanges and some sections were only two divided lanes. The last section of I-10 to open in Texas was the bypass around Fort Stockton, the largest town between El Paso and San Antonio.

I-20 — 636 Miles

Beginning in the desert of West Texas, I-20 serves mid-sized communities such as Midland, Odessa, and Abilene, and is also the primary conduit between the West Coast and the Dallas–Fort Worth Metroplex. Once in the Metroplex, I-20 bypasses both cities to the south, overriding original alignments of I-820 and I-635, respectively. I-20 varies between six and eight lanes as it travels through cities such as Arlington, Grand Prairie, and Mesquite.

The route for I-20 was approved in 1971, running from a junction with I-10 southwest of Pecos in West Texas to the Louisiana border near Marshall, Texas, and Shreveport, Louisiana. The earliest parts of the highway to be built were near Abilene and from Dallas eastward to Louisiana. Later construction included the sections of I-20 between Dallas and Fort Worth. In all, I-20 runs some 636 miles in Texas, making it the state's second longest interstate, only 245 miles shorter than I-10.

The routing of I-20 in the 1950s in south Arlington got caught up in the politics of the Dallas–Fort Worth Turnpike construction, and also helped develop the city of Arlington. Civic leaders supported the route through the mostly rural southern edges of the city. When I-20 was completed several decades later, its location in the southern section of a growing community significantly enhanced Arlington's ability to develop a strong economy.

I-27 — 124 Miles

The next-to-last interstate approved and constructed in Texas was I-27 connecting Amarillo and Lubbock. The route follows US-87, some of which was upgraded to interstate quality from existing divided highway. The 1991 Intermodal Surface Transportation Efficiency Act City/State Rural Access Appropriations Section (Item 61) had authorized \$2.9 million to initiate “feasibility and route studies and preliminary engineering and design for a highway to connect Lubbock with Interstate 10 through Interstate 20.” This would imply that I-27, which currently ends just south of the Lubbock beltway, will be extended via US-87 to meet I-20 and then south to San Angelo and I-10.

A TxDOT study in the 1990s concluded that there was not enough current or projected traffic to warrant an extension of the interstate. Instead upgrades to U.S. and state highways in the area were recommended, including bypasses, intersection improvements, additional lanes on existing roads, and the implementation of some ITS measures to aid traffic movement. There are also some proposals to extend I-27 north of Amarillo. The future of I-27 may well lie within the development of the Ports-to-Plains Corridor, identified in the 1998 Transportation Equity Act-21 legislation as running “from the Mexican border via I-27 to Denver, Colorado.” Later legislation further defined possible Ports-to-Plains routes, which may include I-20 and I-10 as well as I-27 and several state highways.



Earth moving machines in District 10 on I-20,
Photo courtesy TxDOT Library

The Interstate Waltz across Texas...

I-30 — 223 Miles

It begins in Fort Worth at the junction with I-20 and heads to Texarkana and on into Arkansas. One of the earliest sections completed on this interstate was between Dallas and Greenville. Other sections up to Texarkana were completed in the 1970s.

The state's first toll road, the 32-mile highway built as the Dallas–Fort Worth Turnpike, was re-designated as I-30 in 1978, making I-30 the only interstate highway in Texas to have been tolled.³⁵ As would be the case with many interstates, compromises were an essential part of the planning for I-30. To sell the idea to the city of Arlington, an east-west connection to Grand Prairie was required, which was accomplished by constructing Texas 303, the Pioneer Parkway, completed in 1960.



I-30, Greenville; first interstate sign erected,
Photo courtesy TxDOT Library

I-37 — 143 Miles

I-37 runs from San Antonio to Corpus Christi, and was begun in the 1960s and completed in the 1980s, roughly paralleling US-181. It is the main freeway connection from I-35 to the Gulf of Mexico and the coastal zones, providing an important link from the north of Texas with US-77 and US-281 to Brownsville and McAllen. This corridor is also important as one of the only limited-access routes available during a hurricane evacuation, serving as the main escape route from the South Texas coastline.

If the proposed I-69 is constructed through south central Texas, I-37 will connect to the freeway near its current junction with US-59 and George West. Since a branch of I-69 will extend southwest toward Laredo and another south toward Brownsville via US-77, it is possible that the I-37 designation may be extended or rerouted to incorporate one of these branches.



I-37 leading into Corpus Christi, Photo courtesy TxDOT Library



Highway Construction, Photo courtesy TxDOT Library

“The biggest impact of the interstate is the connectivity across the state as far as the abilities of businesses in Texas to do commerce and to transport goods and services.”

*Arnold W. Oliver,
executive director
of the Texas
Department
of Transportation*

I-40 — 177 Miles

One of the major east-west interstate routes, I-40 goes across the Texas Panhandle and through the city of Amarillo, much of its route following the famous Route 66. I-40 was built in sections across the Panhandle, some of which were among the earliest interstates constructed in Texas. The Texas part of I-40 was completed years before it connected with the New Mexico portion. It was not until the mid-1970s that a section opened connecting Glenrio at the Texas border with Tucumcari in eastern New Mexico. Loops were added around small towns such as Vega and Shamrock much later. An interesting fact about I-40 west of Vega is that it has four or five crossovers for use by local ranchers. These were constructed because the exits are miles apart, and installing overpasses would have been prohibitively expensive. Technically, that should preclude I-40 from interstate designation since it does not have completely controlled access.

I-44 — 14 Miles

I-44 was one of the later interstates designated in Texas, approved in 1982. It is a diagonal east-west route and links Texas and Missouri via Oklahoma. Toll-free in Texas, a significant portion of I-44 follows the tolled turnpike system in Oklahoma. I-44 originally terminated at the junction of I-35 at the western end of the Turner Turnpike north of Oklahoma City, but it was extended to Wichita Falls in the 1980s where it joins US-281. There is a possibility that I-44 may be extended south of Wichita Falls to Abilene. Some advocate a freeway or tollway be constructed to Abilene and perhaps even farther south to provide an alternate route to I-10.

The Interstate Waltz across Texas...

I-45 — 285 Miles



I-45 North of Conroe under construction, Photo courtesy TxDOT Library

I-45 serves eastern Texas and is one of the busiest freeways in the state, carrying traffic between Houston and Dallas. It replaced US-75, a dangerous and winding two-lane road. The earliest part of I-45 was the US-75 Gulf Freeway, opened in 1948, which was re-designated as I-45 in 1971.

The Gulf Freeway from Houston to Galveston was a controlled-access freeway for a few miles, but it was actually a divided highway for most of the way. Over the years, it was upgraded to interstate standards and was extended to the Dallas–Fort Worth Metroplex. I-45’s northern terminus is at the southern terminus of I-345, the short section between I-45 and the Woodall Rogers Freeway. Unlike most interstates ending in “5,” I-45 is not a border-to-border highway. It is also the shortest interstate whose route number ends in “5.”

Early sections of I-45 included parts of the North Loop interchange in Houston up to Conroe and the section from north of Corsicana to south Dallas. During the 1960s, sections of I-45 from Conroe to Madisonville, a loop around Corsicana, and from Madisonville to Centerville were opened, while the highway between Centerville to Buffalo was opened in the early 1970s.

One of the last sections of I-45 to open was in Dallas connecting the Central Expressway and “hidden” I-345 downtown to the junction with I-20 (formerly I-635 but designated I-20 when it was completed to Fort Worth). The delay in completion was due in part to the need to construct a bridge over the Trinity River. I-45 was completed in the mid-1970s with the construction of the sections between Buffalo, Richland, and Fairfield.

Dewitt Greer deliberately planned that the rural interstate sections would be done first. He made the decision not only because it was easier to acquire right-of-way and to construct highways over the vast open spaces of Texas, but because he instinctively knew that the department would need the support of rural legislators when the (inevitable) increase in the state fuel tax was proposed. At that time, rural interests dominated the House and Senate, and rural members' support would be crucial on such a controversial issue. If rural legislators already had their new highways and could see the benefits from the new construction, any fuel tax increase was more likely to be approved.

The construction of interstates across the vastness of rural Texas brought economic and social changes to many communities, but it was in Texas's cities that the interstate highways had their greatest impact. As noted earlier, many existing urban freeways which met the new federal guidelines were simply re-signed as interstates. Texas had begun to build freeways in the 1940s, as civic leaders in the cities looked ahead to post-war economic development. Dallas's Central Expressway was carrying up to 15,000 cars and trucks a day in 1949, and the City Council had passed ordinances for safety and traffic control along the new expressway. Nearly all Texas's major urban areas had plans to improve traffic flow, and having seen how freeways had improved mobility and safety in Los Angeles (and closer to home, the Gulf Freeway in Houston), they made freeways a key element in their plans. The coming of the interstate era meant additional federal funds to speed urban freeway development, which meant that civic and political leaders were for the most part eager to see the construction started.

Lady Bird Johnson and Highway Beautification



Blanca rest area, 1965, Photo courtesy TxDOT Library

It was another Texan, Lady Bird Johnson, who helped increase environmental awareness with her program to make highways more attractive. Perhaps inspired by the early volunteer beautification efforts in Texas, Lady Bird used her position and influence to radically alter the landscape of the nation's highways. During her husband's long career in Congress, the Johnson family had driven many times from their home in Texas to Washington, D.C., and she became increasingly frustrated by the increasing number of junkyards and billboards along the way. As the interstate highways were constructed, the billboard industry took full advantage of the new open spaces, and before long, advertisements were literally cheek-by-jowl along the roadsides. In 1958, Congress had passed a highway bill that gave states an extra half percent in funding if they controlled billboards, but that did not keep highways from being blanketed with billboards. Lady Bird wanted the highways free of unsightly roadside advertising and replaced by open green spaces and wildflowers. Although in her own way Mrs. Johnson was as effective a lobbyist as her husband, LBJ did his part in 1965, encouraging a "new and substantial effort" to landscape highways and eliminate blight. Lady Bird continued to publicize the cause, reminding the billboard industry and others that

the public was behind this effort and that unless they took action, regulation was sure to follow. In the end, after a fierce battle with the powerful billboard lobby, the Highway Beautification Act was passed.³⁶ As with much legislation, the final bill was a compromise, stating that billboards would be banned "except in those areas of commercial and industrial use." Further pressure from the industry caused an additional amendment that required the government to provide "just compensation" to owners for losing their billboards.



Gulf Freeway, 1956, Photo courtesy TxDOT Library

It seems appropriate that Texas freeways would begin in Houston. From its earliest days, transportation was a key to the city's growth. The Allen brothers ran an advertisement in the *Telegraph* and *Texas Register* in 1836 for the town of Houston, claiming that because of its location, the town would become “the great interior commercial emporium of Texas,” that ships from New York and New Orleans could sail up Buffalo Bayou to its very front door, and that the “cool, healthy seabreeze” would ensure a comfortable climate. By 1863 Houston was the second largest railroad center west of the Mississippi, serving the cotton, sugar, and cattle plantations of the southwest.

Urban transportation in Houston began in 1868 with mule-drawn street cars on wood rails, supplanted in the 1890s by electric street cars on steel rails. Early events in the 20th century increased Houston's importance as a transportation center. The 1900 hurricane which destroyed Galveston, the Spindletop discovery in 1902, and the improvements made to the Houston Ship Channel by 1914 all contributed to Houston's development as a major oil-refining center. Automobiles began to show up around 1900, and their numbers grew exponentially. There were 900 cars in the city by 1910, 18,000 by 1920, and 80,000 by 1930. Gasoline-powered buses soon replaced the city's electric streetcars, and by 1940 Houston was an “automobile” city.

The first real freeway segment in Texas—Houston's Gulf Freeway, built by Brown and Root—was dedicated on a warm September evening in 1948. With a crowd of local and state dignitaries in attendance, Mayor Oscar Holcombe threw the switch that turned on the freeway lights, giving onlookers their first sight of this new kind of road. Motorists had lined up to drive the new freeway that evening, marveling at the design of this ribbon of concrete with no stoplights or stop signs.³⁷

Like civic leaders elsewhere in Texas, Houston's business and political luminaries had realized that the Allen brothers' 1836 grid system for the city had been surpassed and that growth was likely to be haphazard unless some plans for development and transportation were put in place. The electric streetcar system that had served the city and its suburbs so well in the '20s and '30s was replaced by a bus system by 1940, but after the war, it became clear that Houston's poorly planned network of streets could not cope with the rapidly increasing numbers of automobiles and trucks. Clearly a new road system that could move travelers quickly throughout the region was essential, and a plan produced in 1942 laid out the need for freeways and an urban loop system. While it did not designate specific routes, the plan did identify three major transportation corridors, two of which would later become the Gulf Freeway and the North Freeway, both ultimately segments of I-45.

Although the city's extensive freeway system includes only three interstates, each has played an important role in the development of the overall system. The city's "hub and spoke" freeway structure features multiple loops including I-610, the roughly "square" loop, with each section being individually named: the North, South, West, and East Loops.

The city's two interstates, I-45 and I-10, go north and south and east and west, respectively. As the largest city in the nation without zoning laws, Houston has seen a great deal of urban sprawl—much of it along the interstates—which has contributed to the city's continuing problem in maintaining its air quality.

Houston freeways are heavily traveled and are often being reconstructed to meet the demands of almost continual growth. TxDOT and Houston transportation officials have instituted several innovations to help reduce congestion and improve air quality, including the use of HOV lanes, timed freeway entrances, and improved traffic coordination and management. The opening of TranStar, a partnership of the four agencies responsible for the planning, design, and operation of transportation emergency managed in the city—Harris County, TxDOT, the city of Houston, and METRO—has also helped improve mobility along the city's freeways and interstates.

Prior to these developments, much of I-45 had already been built as US-75, the main highway between Houston and Dallas. A short section of that existing freeway, from downtown north to the present-day intersection with North Main Street, was among the first freeways approved by the Highway Commission in 1945. By 1952, the commission had designated all of US-75 between Dallas and Houston as a full freeway.

The North Freeway was built faster than any other Houston freeway, with the first 2.8-mile segment opening in December 1959 and the entire freeway to Spring completed by February 1963.³⁸ As the city expanded northward and new developments such as The Woodlands came on line, I-45 joined the growing ranks of congested urban freeways. In an effort to reduce congestion, in 1979, I-45 became the location for Houston's first contraflow lane, which evolved into dedicated, barrier-separated lanes for buses and HOVs.



Construction on I-45 in Houston, Texas, Photo courtesy TxDOT

Houston

Based on its success, HOV lanes became a staple on Houston's busiest freeways. HOV lanes are exemplified by the so-called "Texas T" ramps connecting the transitway to an adjacent transit center or a park-and-ride lot, usually crossing over the main freeway lanes and frontage roads. In the midst of an effort to rename several Houston freeways, it was proposed that I-45 be renamed the Dallas Freeway. That proposal, along with most of the others, was easily rejected by Houstonians, who saw no reason to advertise their economic competitor on their interstate highways.

I-10 West, also known as the Katy Freeway, was constructed in the 1960s, and has undergone expansion and rehabilitation since that time. The route was originally US-90, and was designated I-10 in 1959. With the city's rapid growth to the south and west and the increase in interstate truck traffic, the freeway had become seriously congested. The current expansion, expected to be completed in 2007, is one of the largest highway construction projects ever undertaken in the state, and when completed it will be the only interstate in Texas to include toll lanes. The expanded freeway will include four toll lanes, eight free-general purpose lanes, and six frontage lanes. The project has not been without its opponents who cite additional vehicle noise, carbon monoxide emissions, and aesthetic concerns over the expansion.

I-10 East, or the East Freeway (sometimes called the Baytown East Freeway), was also part of the early plans for an east–west freeway across Houston, ultimately absorbing parts of the routes of US-90 and SH-73 through and outside the existing city limits, both of which had been previously designated as freeways. The first freeway segment of I-10 opened in 1953, and the freeway was completed by 1966. Like all Houston freeways, some parts of I-10 East have been undergoing reconstruction or refurbishment since the 1960s.

The need for a bypass loop around Houston was evident as early as 1931 when Harris County officials proposed a bypass to divert traffic from downtown. The concept was formally proposed in 1941 by the city's Planning Commission as part of a report that dealt with the movement of military convoys through the city to the Ship Channel. After December 7, the presence of key war industries around the city added a sense of urgency for creating this "Defense Loop," and in 1942, the Highway Commission formally adopted the north section of the loop from what would later be I-10 West to SH-73 on the east side of town. The loop concept remained a part of the city's Major Thoroughfare Plan, but I-610 was slow in being fully completed.

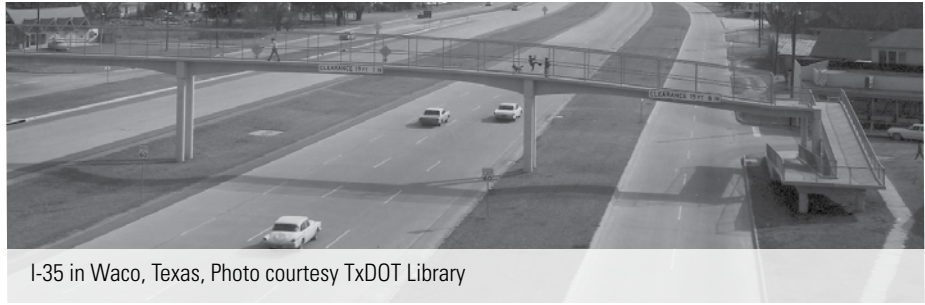
The earliest section near the Gulf Freeway was completed in 1952, and by 1954, the Highway Commission had officially designated three elements of the loop — West, North, and South—as freeways in the state highway system. These highways, previously approved as Loop 137, were adopted into the interstate system in 1956, but an eastern segment and the Ship Channel bridge were not.

The struggle over the limited number of interstate miles available to the state was fierce, and Dewitt Greer did not include these missing links in Houston and others in other Texas cities, assuming that the Bureau of Public Roads (BPR) would automatically add these sections since they were so obviously necessary to the overall system. Greer's plan backfired when the BPR assigned the state's additional interstate mileage to I-37 between San Antonio and Corpus Christi. In 1960, the Highway Commission adopted the proposed East Loop as part of the state's highway system, allowing Houston officials to obtain the necessary right-of-way to complete the loop, and in 1962 the BPR approved the East Loop as part of the interstate system. By 1975, the loop itself had been completed, although interchanges with other Houston freeways were being constructed throughout the 1980s and are being improved even today.



Construction on Houston ship channel bridge, Photo courtesy TxDOT Library

I-35: The First NAFTA Highway



I-35 in Waco, Texas, Photo courtesy TxDOT Library

While all the interstate highways in Texas have had economic impacts on the state, I-35 has arguably become the state's most important interstate route and has affected surface transportation in several of the state's largest cities. The highway that would become I-35 was built in 1941, one lane in each direction. Since that time, the highway has been expanded and improved almost continually as traffic volumes increased and the cities along its route grew.

Today, most trade between the United States and Mexico is transported on land, primarily by truck, and most of it goes through Texas via I-35. TxDOT reports that interstate traffic has increased every year since 1987. Between 1996 and 1999, passenger vehicle traffic statewide increased 12 percent while truck traffic increased 19 percent. Between 1999 and 2011, truck traffic is predicted to grow 50–70 percent. In fact, Texas has the highest volume of truck traffic in the nation, much of it due to the North American Free Trade Agreement (NAFTA), signed in 1993. NAFTA brought new trade and economic opportunities to Texas along with significantly greater truck traffic — especially along I-35, which rapidly became the primary interstate route in the nation.

Beginning at the international border in Laredo, I-35 follows the route of the old US-81 and provides a direct freeway connection between Mexico and Canada. The interstate's starting point in Laredo is one of the oldest border crossing points in the United States, and the nation's busiest inland port. In 2000, more than 85 percent of surface trade crossing into Texas from Mexico moved by truck, and most of that traffic came through Laredo and proceeded inland via I-35. The huge increase in commercial truck movements across the Texas border resulted in congestion and long delays at border crossings, as well as more stress on I-35. Local population growth in San Antonio, Austin, and Dallas has exacerbated the strain put on the highway by NAFTA traffic, and all these cities experience significant traffic congestion during peak travel times each day.

To help alleviate congestion, several improvements are underway along I-35, and many more are planned. Most of I-35 between San Antonio and Georgetown is now six lanes, and a bypass tollway, Texas 130, is planned. TxDOT is also participating in a \$1.5 million federal study of I-35 from Laredo to Duluth, Minnesota, which aims to provide comprehensive improvements to the corridor.

Texas has more miles of I-35 (505 miles, including 96 miles on I-35E) than any other state and has one of only two split routes (route numbers with a letter suffix indicating direction) remaining in the interstate system. Just north of Waco at Hillsboro, I-35 splits into 35E and 35W, taking travelers to Dallas or Fort Worth, respectively.³⁹

I-35: The First NAFTA Highway

The huge increase in traffic congestion along I-35 has resulted in nearly continuous work to expand its capacity, and while much of the freeway has been upgraded to a six-lane facility in recent years, there are still serious bottlenecks in New Braunfels and San Marcos, especially during holiday periods. The North American Super Corridor Coalition is among the many groups seeking additional funding for projects along I-35 (as well as for I-29 and I-94 in the Midwest and upper Midwest) to improve trade flows and transportation security, safety, and efficiency. I-35 was designated a high-priority corridor in 1995, making it eligible for additional federal funding.

As I-35 progressed northward, it inevitably affected, and continues to affect, the development of other urban freeways in San Antonio, Austin, and Dallas–Fort Worth.



I-35 and four-level interchange in Fort Worth, Photo courtesy TxDOT Library



Construction I-37 at Durango Boulevard in San Antonio, Photo courtesy TxDOT Library

Originally founded by Canary Islanders in 1731, San Antonio de Bexar was an early Spanish settlement and the site of the famous Battle of the Alamo during the war for Texas independence. After the Civil War, San Antonio prospered as a cattle, distribution, mercantile, and military center serving the border region and the Southwest, becoming the southern hub and supplier of the cattle trail drives. With the coming of the Galveston, Harrisburg and San Antonio Railway in 1877, San Antonio—formerly without a transportation system—entered a new era of economic growth, reaching a population of over 20,000 by 1880. In 1881 a second railroad, the International–Great Northern, reached the city from the northeast, and by 1900 five railroads had built lines into the city, as the city grew and modernized.

The city’s importance as a military center began when the First United States Volunteer Cavalry was organized in San Antonio during the Spanish–American War, and in both world wars the city was a key location for both the army and later the air force. That tradition continues as military bases, educational institutions, tourism, and a thriving medical research complex have been the foundation for the city’s growing economy.

Today San Antonio is a prime destination for some 20 million tourists and is home to five major military bases and such corporate giants as SBC Communications, USAA, and Clear Channel Communications.

San Antonio began to plan its freeway system during World War II, developing maps for future highways and expressways to be built after the war. Those maps proposed an “urban expressway” network, which included what are now the “Y” sections of I-10 and I-35 as well as the entire route of what is today I-35N. San Antonio had freeways well before 1956, opening a 3/4-mile section of what is now I-10W in 1949. By the mid-1950s, parts of I-35 and I-10 were operational, and other major segments of the current San Antonio freeway system were already planned. In 1958, the first section of I-410 was opened to traffic, and by 1961 substantial sections of the city’s freeways were completed. By 1964, federal interstate highway funding made extensive freeway construction possible, and virtually all of the freeways that had been proposed in 1957 were complete or nearing completion.

The approach of the 1968 World’s Fair drove San Antonio leaders to push even harder for freeway completion, and by the time Hemisfair opened, San Antonio was ready to welcome the influx of visitors to the city center. The many new restaurants and shops developed all along the gracious River Walk transformed downtown into a prime tourist and convention site. The urban revitalization of the late ’60s was followed by suburban success stories with the opening of Sea World and Fiesta Texas amusement parks, again made possible by the city’s extensive freeway system and interstate loops. Businesses relocating to San Antonio such as the new Toyota manufacturing facility also cite the city’s highway infrastructure as a positive factor.

Austin

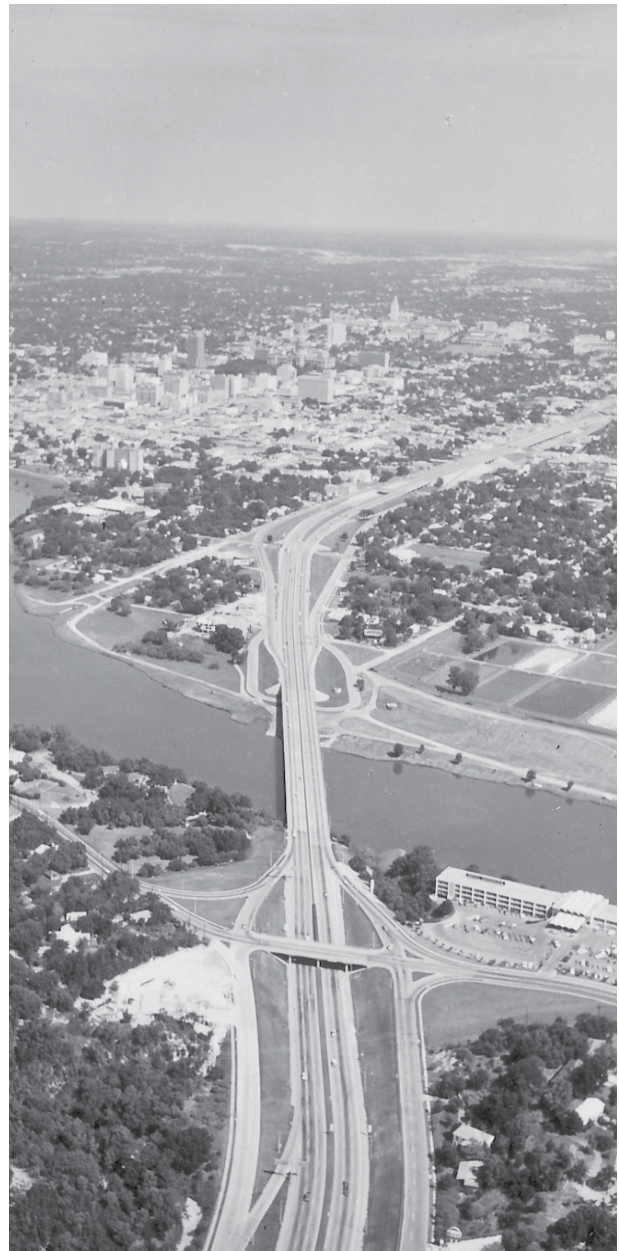
Austin was founded in 1835 and originally named Waterloo, but in 1838 Mirabeau B. Lamar renamed the city in honor of Stephen F. Austin, “the Father of Texas.” The city flourished as the Republic of Texas’s first capital but suffered a severe drop in population between 1842 and 1845, and deteriorated significantly. Once annexation to the United States was approved in 1845, Austin was reinvigorated as the state capital, and a new era of growth and development began. With the coming of the Houston and Texas Central Railway in 1871, Austin became the westernmost railroad terminus in Texas and the only railroad town for scores of miles in most directions, transforming the city into a major regional trading center. Although a second railroad, the International–Great Northern, reached Austin in 1876, the town’s fortunes turned downward after 1875 as new railroads traversed the region and diverted much of the city’s trade to other towns.

In the early 20th century Austin did not reap the benefits of the emerging oil industry like Houston and Dallas, but grew gradually over the years with government and education as primary economic drivers. By the 1970s, Austin’s growth was being propelled by its emergence as a high-tech center, fueled by an expanding research program at The University of Texas. IBM located in Austin in 1967, followed by Texas Instruments in 1969 and Motorola in 1974.

Two major research consortiums of high-tech companies followed during the 1980s, Microelectronics and Computer Technology Corporation and Sematech, and by the early 1990s, Austin and the surrounding counties boasted some 400 high-tech manufacturers. While high-tech industries located on Austin’s fringes, the central city itself was revived with the rapid rise of multistoried office buildings and hotels and a burgeoning music and film industry.

Despite being the state capital and home to the Texas Highway Department, Austin came relatively late to the business of building freeways. That may have been just the city’s famous “laid-back” atmosphere, or a failure to recognize how quickly the transportation infrastructure could, and would, be overwhelmed by a growing population.

The completion of I-35 in 1962 through the city showed civic leaders the value of freeways, and they laid out a plan for an extensive inner city freeway network, designed to complement the new interstate and help move east–west traffic. The proposed routes would have located freeways through the center of Austin, just north of the state capitol, alongside The University of Texas campus, along Town Lake, on Guadalupe Street, and through the center of downtown. While all of these proposed freeways might not have been appropriate for Austin, they did indicate that the planners somehow envisioned the gridlock that now constrains traffic in central Austin.



View north of I-35 along the Colorado River (Town Lake, Austin), Photo courtesy TxDOT Library

“It’s fair to say that without that infrastructure investment, and if we didn’t have a strong capable interstate highway system in the state, we probably wouldn’t be the company we are today. “

*Phil Ritter,
senior vice
president
of Texas
Instruments Inc.*

Although the plan survived on paper until 1969, most of it was never built. Other versions of a freeway master plan came and went as the political winds of the city blew for environmentalism and against “growth,” and with the exception of Loop 1 (also called MoPAC) none of the inner city freeways was ever constructed. The elevated lanes constructed on I-35 in the city center helped to move traffic in the early years, but the rapid increase in vehicle traffic has reduced their effectiveness.

In recent years, Austin has become part of the I-35 “high-tech corridor” between Dallas and San Antonio. The rapid proliferation of high-tech companies in the city — including Dell Computers, IBM, Freescale Semiconductor (spun off from Motorola), AMD, Intel, Cirrus Logic, and Apple Computer — have led the city and its suburbs to be renamed the “Silicon Hills.” It has also spurred rapid development to the north, south, and west, once again demanding an expansion of the city’s freeway system, a demand which could not be met fast enough to satisfy the leadership of Dell Computers. In 2000, Dell announced that it would build a new manufacturing plant in Tennessee rather than in Austin primarily because the transportation system — especially I-35 — in and around the city did not enable the company to move its products as quickly as needed to meet growing customer demand.

Dramatic growth in the counties just outside Austin has added to the congestion on I-35. Hays County grew by nearly 50 percent between 1993 and 2003, while Williamson County increased its population by 79 percent in the same time period.⁴⁰ The result is that traffic can often slow to a crawl in and around Austin. Traffic on I-35 from Austin to San Marcos has increased 754 percent since the mid-1960s and doubled over the last four years, making the drive from San Antonio to Austin sometimes more time-consuming than before the interstate was built. SH-130 has been proposed as a way to relieve traffic congestion in the area by creating a commuter and NAFTA corridor alternative to I-35. It will extend from north of Georgetown, head east of Austin, and end near the Austin Bergstrom Airport at US-183. The highway is one element of the Central Texas Turnpike System, which will also include 65 miles of new toll roads.

Opponents of SH-130 fear a repetition of the events surrounding the construction of I-35, i.e., damage to neighborhoods resulting from the “barrier” created by the interstate separating east from west. The area of Austin just east of I-35 has suffered economic decline, while the land on the other side of the interstate has grown in value. Preliminary plans to reconstruct and expand I-35 show a depressed freeway directly adjacent to the heart of downtown, and proposals also have been made to remove the visual and physical barrier created by the upper decks as a way to re-connect the city.

Dallas-Fort Worth

The division of I-35 into East and West before reaching Dallas and Fort Worth, respectively, is something of a metaphor for the differences in history and culture that make these two cities distinctly different. In fact, the question of whether I-35 should go through Dallas or Fort Worth was so contentious that the decision was made to have the interstate pass through both cities, reconnecting north of the Metroplex.⁴¹

In many ways, Dallas and Fort Worth are separated by more than just the 30 miles of I-30. Dallas is “Big D” — the epicenter of big business in Texas (a fact Houston would argue) — with the dynamic architecture, infrastructure, and self-confidence that comes from international recognition as the symbol of Texas pride and confidence. Fort Worth, on the other hand, with an equally proud business and cultural heritage, continues to promote its frontier cow town image, while at the same time emphasizing how the city has become a business and cultural center on the proceeds of the Texas oil boom.

Both cities were founded and prospered in large part because of transportation needs and improvements. Dallas was settled as a trading post in the 1840s, primarily because of its proximity to a natural ford on the Trinity River. John Neely Bryan, the city’s founder, was an entrepreneur who quickly expanded on the trading post idea and created the township of Dallas in 1856, having recognized that easy access to water transportation could be a key factor in developing a city. The arrival in 1872 of the railroads — freight as well as passenger trains — encouraged dramatic population growth as did the establishment of insurance and banking industries in the late 1800s.

The leaders of Dallas always understood the economic importance of transportation and acted accordingly. When the railroad construction was approaching the North Texas area, Dallas city officials paid one railroad to build its tracks through Dallas and tricked another one by having a state law passed that required the railroad to build its tracks through the city. The intersection of north-south and east-west rail routes in 1873 helped ensure Dallas’s importance as a center of transportation and commerce, and when Dallas was named one of 12 Federal Reserve Bank locations in 1914, the city was officially marked as a financial center, further encouraging growth.

From 1948 on, major U.S. corporations began to build their headquarters in Dallas, and by the late 1970s, well over 600 corporations called the city home, further increasing the need for freeways and other surface transportation to match the growing air transportation infrastructure. In the 1970s and 1980s, these corporations were part of the building boom, providing Dallas with its now-distinctive skyline. The city’s explosive growth also created a demand for a network of freeways and highways that could link the rapidly growing small communities outside the city proper. Over time, interstate loops and other roads were developed to serve this growth, giving Dallas a highway system that strives to meet the needs of its citizens as well as those of the surrounding communities.

The location of Fort Worth — founded in 1849 and abandoned by the military in 1853 — was also related to the transportation needs of the times. Within a few

Dallas skyline with Industrial Boulevard in the foreground, Photo courtesy TxDOT Library



decades of settlers taking over the old fort and establishing a town, Fort Worth became known as “Cowtown” because of its location as the last major stop before the Chisholm Trail. The city’s location along the Chisholm and several of the great cattle trails of Texas, combined with the arrival of the railroads, made the Fort Worth Stockyards a premier livestock shipyard, a position the city held until the 1960s.

But while cattle helped start Fort Worth, it was oil that nurtured its growth. As oil wells sprang up throughout West Texas in the early 1900s, the city became the place where many of the deals were made and, more importantly, where much of that West Texas oil money was spent. Today Fort Worth has its share of major corporations and is home to such industries as Alcon, the Bombay Company, Radio Shack, Bell Helicopter Textron, Lockheed Martin, Carter & Burgess, Pier One Imports, BNSF Railway, and Motorola.

The natural competition for regional predominance was sublimated to some extent in the region’s transportation development, with both cities gaining from the interstate program. Fort Worth had less need to develop urban freeways than its larger neighbor, as its smaller size and somewhat slower rate of growth precluded the kind of pressure put on Dallas freeways. Still, with five interstates, plus I-635 and I-820 in the area, Dallas–Fort Worth can stake a claim to being the transcontinental crossroads of Texas. I-20, I-30, I-35E, and I-45 all pass through Dallas, while I-30, I-20, and I-35W go through Fort Worth. I-635 loops around the northern and eastern fringes of Dallas, beginning at I-20 to the south, and leads to the Dallas–Fort Worth Airport. The initial segments of the President George Bush Turnpike, a toll road, were opened in 1999, further expanding the Dallas beltway system. I-820 is part of the Fort Worth beltway system, wrapping around the west, north, and east sides of the city, with I-20 comprising the southern portion. The original plan for I-820 was to be a full loop, but that was based on the assumption that I-20 would follow the route of the now-defunct Dallas–Fort Worth Turnpike. Once I-30 took the turnpike route, I-20 south of the city was included as part of the I-820 loop.

Traveling the interstate system in Dallas–Fort Worth can be confusing, as in Houston, with local names often superseding the official highway nomenclature. I-30 is known as the Tom Landry Highway, memorializing the long-time coach of the Dallas Cowboys. I-35 East is most often referred to as the Stemmons Freeway (southbound), honoring Dallas businessman Leslie Stemmons; and the R.L. Thornton Freeway (northbound), honoring a former mayor and civic leader. I-45 south of Dallas is less frequently referred to as the Julius Schepps Freeway, having been named for a long-time civic leader and philanthropist.

Two of the area’s interstate loops are named for famous Texas politicians — I-635 honors President Lyndon Johnson and is usually referred to as the LBJ Freeway, while I-820 was named the Jim Wright Freeway, in honor of the former speaker of the House. The short interstate (I-345) that connects I-35 to I-45 is commonly known as the Woodall Rogers Freeway.



Dallas Skyline, Photo courtesy TTI Library

Dallas-Fort Worth



Dallas High Five, Photo courtesy TTI Library

As with all major cities in Texas, highway construction in Dallas continues unabated in response to growing needs. In January 2002, ground was broken for what will be the largest freeway interchange in Texas, the Dallas High Five, a five-level connection between Central Expressway and I-635, the LBJ Freeway. Designed to serve the rapidly growing population in the immediate area, the High Five project is unique in its design and aesthetics. When completed the new interchange will improve mobility and safety, help maintain air quality, improve local access, and road capacity and provide flexibility to meet future traffic needs.

While the Texas economy has gained significantly from both Texas–Mexico and “through” traffic resulting from NAFTA, there have been economic and societal costs, especially in the I-35 corridor, primarily increased traffic congestion and the costs of maintaining and improving the state’s highways. NAFTA truck traffic comprises 16.5 percent of all Texas truck traffic, with 75 percent of this on rural interstate and other rural roads. Thirteen highway corridors, which make up 18.9 percent of Texas highway mileage, carry almost 90 percent of all NAFTA traffic in Texas, with IH-35 alone accounting for 31.6 percent of this total. The “social costs” of the increase in NAFTA traffic, including congestion, accidents, air and noise pollution, and related costs are estimated to be some \$560.8 million per year.⁴²

Whatever the impact the newest interstate, I-69, will have on trade and transportation in Texas, it is unlikely that I-35 will diminish in importance to the state’s economy. Designated a High Priority Corridor by Congress, I-35 remains a focus of state and federal transportation officials who envision the highway as a state-of-the-art international trade corridor by adding express lanes, better pavement, and ITS technologies such as tracking devices, electronic licensing, and even an international travel control center.⁴³

In addition to its significant economic and trade impacts, one could argue that I-35 — perhaps even more than other north–south interstates — has been one factor in the convergence of cultures that makes it as likely to find a Mexican restaurant in Duluth as in Laredo. While some may lament the homogeneity of the roadside businesses found along I-35 in all the states it traverses, for the foreseeable future it remains the primary route from Texas through and to the Upper Midwest.

The Impact of the Texas Interstate System on the State's Economy, Highway Safety, and the Environment

It's hard to imagine what Texas would be like without the interstate highway system. The most obvious difference the interstate system has provided is the reduction in intercity travel time — on average by 25 to 30 percent. But during its 50-year history, the system has meant more than just increased speeds and reduced travel times. Perhaps the three major areas where the interstate system has the biggest impact are the economy, highway safety, and the environment. Below are just a few quick facts that demonstrate the importance of the Texas interstate roadway network.

The Economy:

- The Texas portion of the interstate system represents 2 percent of all lane miles in Texas (15,004 of the state's 643,095 total lane miles) yet accounts for 22 percent of all miles driven annually (51 billion of 233 billion total miles driven).
- Federal studies have shown that Texas has the highest truck volume in the nation as a percentage of total vehicle miles traveled — over 45 percent of the state's tractor-trailer operations are on the interstate system.
- Over the first 200 years of the nation's development, inland trade corridors generally followed a traditional east–west development pattern, reflecting the nation's population centers and the importance of European trade. Two developments in the last 20 years significantly altered that trend — the General Agreement on Tariffs and Trade (GATT) in 1986 and the North American Free Trade Agreement in 1994. Those two agreements, particularly the latter, dramatically increased the importance of north–south trade corridors and, of particular importance to Texas, trade with Mexico.
- Texas exports have increased substantially over the years, nearly quadrupling since 1987. In 2002, Texas surpassed California to become America's top exporting state. Texas exports total almost \$100 billion annually and now account for over 13 percent of total U.S. exports. With the advent of NAFTA it is no coincidence that Texas's top export markets are Mexico and Canada. Access to those markets is serviced directly by the interstate system.
- Although there are more than 200 border crossings that move NAFTA trade among the United States, Mexico, and Canada, the top 10 ports, led by Detroit and Laredo, accounted for 73 percent of all North American land trade — trade that is directly related to the access, connectivity, and mobility provided by the interstate system.
- Agriculture accounts for nearly one-third of all freight transportation services provided in the U.S. Forty-five percent of all agricultural products move by truck. The interstate system carries almost half of all truck traffic in Texas. To take one example of how the efficiency of the interstate system becomes critical, production costs for a bushel of soybeans in the United States is more than a dollar higher than in South America. However, internal transport and marketing costs are almost a third less, leaving the total cost of U.S. soybeans in a competitive international position — which would not be the case without the efficiency of the interstate system.
- It is estimated that since its inception, the interstate system has contributed almost \$2.8 trillion (in 2004\$) to the state's economy. In 2005 alone, the interstate system's contribution to the economy is estimated to be \$104 billion. These contributions to the state's economy come in a number of forms. Key among them are increased productivity for business and lower costs, resulting in a better competitive position for Texas's products — both domestically and internationally.
- Absent the interstate's contribution to the economy, it is estimated Texas would have 1.6 million fewer non-farm jobs than is the case today and would have 4.2 million fewer people, representing a loss of over \$650 billion in personal income in 2005 alone.

The Impact of the Texas Interstate System on the State's Economy, Highway Safety, and the Environment

Highway Safety:

- The fatality rate for interstate highways is nearly 60 percent lower than that of the rest of the roadway system.
- Since its inception in Texas it is estimated that the interstate highway system has saved over 18,000 lives and prevented 1.1 million injuries, with an estimated reduction in economic loss of \$45 billion (\$16 billion in reduced economic loss as a result of fewer deaths, \$24 billion savings as a result of fewer injuries, and \$5 billion in property damage savings).
- For each mile of interstate highway constructed in Texas, more than 6 lives have been saved and more than 300 injuries have been avoided.

The interstate system in Texas has saved over 18,000 lives and prevented 1.1 million injuries.

The Environment:

- From an environmental perspective the primary benefits of the interstate system are the elimination of the "stop and go" traffic of arterials streets and higher operating speeds. Both serve to reduce emissions.
- Emission rates for nitrogen oxides show a decrease from 2.5 mph to 15 mph, relatively constant rates until 40 mph, and then a slow but steady increase. This observation holds true for both freeway and arterial roads.
- The emission rates for volatile organic compounds show a significant decrease from 2.5 mph to 10 mph on both freeways and arterials. Above 10 mph there is a steady slow decline in emission rate.
- In the major urban areas of Texas, delay in 2003 was 396 million hours at a cost of \$5.9 billion, with a Travel Time Index of 1.36. Without the interstate system, it is estimated that the number of hours of delay would be 743 million, at a cost of \$11.9 billion, with a Travel Time Index of 1.78. A Travel Time Index of 1.78 on arterials would be roughly equivalent to an average speed of 19 mph.



Texans always understood the importance of transportation to their economic success, whether it was building and maintaining roads, improving waterborne transportation, or developing an intrastate airline that proved to be a national and international model of low-cost, efficient transportation.

Given the entrepreneurial spirit and self-confidence for which Texans are known, it is entirely possible that a statewide freeway system would have been designed and built without the impetus provided by the interstate legislation of 1956. By that time, Texas had already begun planning and constructing controlled-access highways or freeways, and civic and state leaders were well aware of the growing need for safer, faster roads to accommodate the rapidly growing number of automobiles in the state.

However, the interstate program did provide Texas with additional funds from the increased federal gas tax passed as part of the federal legislation. While there might well have been sufficient political and public support for raising funds through the state gasoline tax to build a new statewide system of freeways, the federal funds and commitment to a national interstate system undoubtedly made the job easier.

The creation of the interstate system also solidified Texas's position as a leader in the emerging state–federal transportation partnership. Texas's transportation and political leaders fully supported the development of a national system, and despite attempts to bring politics to bear on transportation decisions, for the most part they concurred that decisions about highways (and the money to fund them) should be made on the basis of a broader national vision.

Conclusion – Where Do We Go from Here?

Regrettably, over the years, congressional earmarking of federal transportation funds has resulted in a diminution of that sense of a common purpose. What were originally titled “demonstration projects” (so called because they are supposed to “demonstrate” better ways to build highways) have now evolved into the “high priority projects,” many of which serve only specific regions or populations and are of limited value to the overall transportation system.

Former FHWA Administrator Ray Barnhart has noted that whereas the House Transportation Committee had inserted 52 “demonstration” projects in its version of the 1982 Surface Transportation Assistance Act, a total of only 12 such projects had been specified in the entire previous history of highway legislation. The House Committee again included 165 projects in the next legislation, at which time Barnhart warned that if the trend did not stop, there would soon be one project for every member of Congress. He subsequently noted that he was in error, for bills in following years included 667 projects and then 1,731 projects. The 2005 Reauthorization bill lists some 6,371 projects at a reputed cost in excess of \$20 billion.

The interstate system undoubtedly has played a major role in the growth of Texas’s economy, and these highways will remain an integral part of the urban transportation landscape. Interstate highways make “just-in-time” manufacturing possible, create more jobs, increase worker productivity, and raise property values. The interstate system has contributed some \$2.8 trillion to the Texas economy over its lifetime, more than \$104 billion in 2005 alone. Without the interstate system, Texas would have 1.6 million fewer non-farm jobs, and 4.2 million fewer people. At the same time, urban highways have brought traffic congestion and air quality issues to the forefront of public concern, as we struggle to maintain the balance between economic progress and an acceptable quality of life. The debate over the next interstate in Texas, I-69, symbolizes that conflict, with supporters citing economic statistics indicating the positive impacts, and opponents railing against the waste and poor use of land.

Whatever the outcome of that debate, the interstates in Texas continue to affect all our lives. Even with the increasing urbanization and “sprawl” so common in the state’s larger cities, much of Texas remains a land of wide open spaces, and there are still places where driving can be a solitary, even lonely journey.

The ribbons of concrete and asphalt that make up the Texas interstate system seem to stretch out endlessly across the hills, plains, and deserts of Texas, linking small towns with big cities, carrying the goods we manufacture and those we buy, and making it possible, as Frank Turner said, to go “from anywhere to everywhere.”



Endnotes

- ¹ Quoted in Hagan, *An Informal History of the Texas Department of Transportation*, p. 2.
- ² Many of the roads built under that program were called “Bankhead Highways” after the legislation’s sponsor, Senator John H. Bankhead. Bankhead Highways and Bankhead Avenues can be found in Texas communities even today.
- ³ Hagan, p. 26-27.
- ⁴ Lewis, Tom. 1997. *Divided Highways: Building the Interstate Highways, Transforming American Life*. Viking Penguin Books: New York, p. 11.
- ⁵ Lewis, p. 11.
- ⁶ Eisenhower’s interest in creating a national highway system had begun when he made a cross country trip in 1919, and was fueled by his experience with the German autobahn system during World War II.
- ⁷ Lewis, p. 241.
- ⁸ The title was changed to engineer-director in 1975, and to executive director in 1992.
- ⁹ Although not a Texas A&M graduate, in 1937, Gilchrist became dean of engineering at Texas A&M and later the first chancellor of The Texas A&M University System.
- ¹⁰ The Texas Transportation Institute at A&M was the first transportation research agency in Texas, having been established in 1917 by Thomas MacDonald, former head of the U.S. Bureau of Public Roads. The Center for Transportation Research at The University of Texas was founded in 1963. The Cooperative Research Program was opened to all public universities in Texas in the 1990s.
- ¹¹ In 1949, the Colson Briscoe Act formally created the state’s FM system.
- ¹² Interview with Tom Johnson, Associated General Contractors of Texas.
- ¹³ The policy change in 2001, which declared that all new freeway projects would be built without frontage roads unless absolutely necessary, met considerable opposition statewide, and the department has since backed away from the decision.
- ¹⁴ Hagan, p. 33.
- ¹⁵ I-30 was still able to be part of the interstate system because it met all federal design criteria.
- ¹⁶ Written interview with Bill Ward, retired head of TxDOT’s Houston Urban Projects Office.
- ¹⁷ Interview with Marke Goode, retired engineer-director of TxDOT.
- ¹⁸ LBJ archives.
- ¹⁹ LBJ archives.
- ²⁰ LBJ senatorial papers (H12/ST42).
- ²¹ *Houston Chronicle*, May 24, 1970.
- ²² “3rd Ward Group Protests Plan to Expand Freeway,” *Houston Chronicle*, February 22, 1973.
- ²³ Tony Hartzel, “I-45 Plan Took the High Road,” *Dallas Morning News*, March 3, 2003
- ²⁴ O’Neil, Robert. “Hitting the Roads.” 1999. http://americacityandcounty.com/mag/government_hitting_roads/.

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- ²⁵ Quoted in the PBS program “Divided Highways.” Tom Lewis, Larry Hott, and Diane Garey. 1997. Public Broadcasting Service.
- ²⁶ “Walter McAllister Freeway.” <http://home.att.net/~texhwyman/us281n.htm>.
- ²⁷ San Antonio Conservation Society. http://www.saconservation.org/about/milestones_3.htm.
- ²⁸ http://www.texasfreeway.com/SanAntonio/historic/281_1971_study/281_1971_study.shtml
- ²⁹ Urban Transportation Planning in the United States: An Historical Overview: Fifth Edition. Travel Model Improvement Program. Chapter 6. <http://tmip.fhwa.dot.gov/clearinghouse/docs/utp/ch6.stm>.
- ³⁰ “Indicators of the Environmental Impacts of Transportation,” U.S. Environmental Protection Agency. October 1999.
- ³¹ “Better Roads: For the Government/Contractor Project Team.” American Road & Transportation Builders Association (ARTBA). <http://www.betterroads.com/articles/broct00d.htm>.
- ³² Federal Highway Administration.
- ³³ They are: Amarillo, Austin, Beaumont, Corpus Christi, Dallas–Fort Worth, El Paso, Galveston, Houston, Laredo, Longview, Lubbock, Midland, Odessa, San Antonio, Temple, Texarkana, Waco, and Wichita Falls.
- ³⁴ www.geocities.com/BourbonStreet/8610/texas.html.
- ³⁵ Turnpike construction had begun in 1954 under the Texas Toll Road Authority, and the highway opened in 1957, at a cost of \$59 million.
- ³⁶ When it looked as though the bill might not pass, President Johnson told his cabinet and staff members, “You know I love that woman [Lady Bird] and she wants that Highway Beautification Act, He said, “and “by God, we’re going to get it for her. ”
- ³⁷ Although it was called a “freeway,” it was not fully a controlled-access road until the 1970s.
- ³⁸ Slotbloom, p. 218.
- ³⁹ The only other such split is another 35E and 35W near Minneapolis/St. Paul, Minnesota.
- ⁴⁰ *Transportline*, January 2003 (published by HDR, Inc.).
- ⁴¹ There was the same issue in Minnesota: I-35E goes through Dallas and St. Paul, and I-35W goes through Fort Worth and Minneapolis.
- ⁴² Texas Public Policy Foundation. Press Release, October 2001.
- ⁴³ North America SuperCorridor Coalition, NASCO News.

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of the Interstate Highway System in Texas,
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http://tti.tamu.edu/interstate_anniversary/



The Texas A&M University System
3135 TAMU
2929 Research Parkway
College Station, TX 77843-3135