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Researcher
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SPECIAL ISSUE:

Celebrating Five Decades

of Safety, Mobility and Growth

Photo courtesy TxDOT Library

The Greatest Stake

The nation's largest public works project

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 lower forty-eight, anything that improved travel times across vast distances was welcomed, and the fact that these new roads were also going to be safer and smoother only increased their value and importance.

"What we required of every state as one of the elements of becoming eligible to receive federal assistance on a construction project was the development of the integrated, interconnected system of highway pieces that were all joined together so that you could get from anywhere to everywhere, that's a massive concept alright."

Frank Turner
Texas A&M University, class of 1929

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, which is the backbone of the technologically sophisticated system of traffic management in place today. Texas' 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 they grew as well as their economic future.

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 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 working long hours in all weather to meet deadlines; individuals who fought to protect their property or their community, while others gave up land or homes, 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.

Backbone of a Boom

How the interstate system transformed Texas' economy

The newly established TTI began research for the Texas Highway Department as the construction of the interstate highway system began. Some of the earliest economic studies at TTI focused on estimating future needs of trucking, air, and water and on the future interstate highway system

At the turn of the twentieth century, Texas probably seemed like a vast, lonely state with few roads to connect towns or small farming communities. What a difference a century makes, as Texans are now connected with a safe, modern interstate highway system that has contributed nearly $2.8 trillion to the state's economy. In 2005 alone, the interstate system's contribution to the economy is estimated to be $104 billion. The following sections help explain some of the impacts the interstates have had on the Texas economy.

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

(Bottom Right): 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.

(Bottom): TxDOT engineers look over a model and blueprint of the I-35 and U.S. Hwy. 290 interchange in Austin.

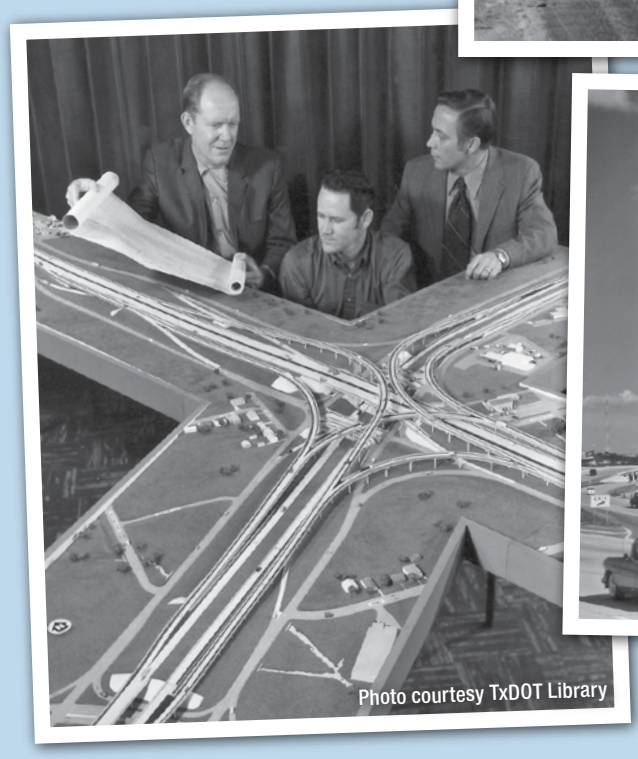


Photo courtesy TxDOT Library

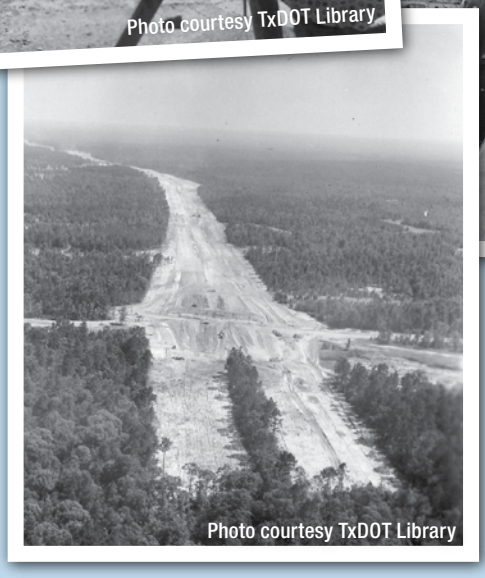
Photo courtesy TxDOT Library

Feeders, service, access and gateways

Texas interstates and freeways have many more access points than those in other states because state highway engineer Dewitt 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. Although TxDOT officially designates these as "frontage" roads, each major city has its own nomenclature. In Houston they're called "feeder" roads; in Dallas-Fort Worth, "service" roads; in San Antonio, "access" roads; and in El Paso, "gateway" roads. Whatever they're 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. R

"…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
Eisenhower's 1963 Memoir



(Top): Construction workers survey land during an earth moving project on I-45 near Madisonville.

I-45 serves as a major economic corridor between Dallas and Houston. (Bottom) Early construction of I-45 north of Conroe, Texas. (Right) Construction of the Pierce Elevated roadway (I-45) through downtown Houston.

Economic IMPACTS

The interstate system in Texas represents 2 percent of all lane miles in Texas (15,004 of the state's 643,095 total lane-miles), yet serves 22 percent of all miles driven annually (51 billion of 233 billion total miles driven).

★ ★ ★

Over 45 percent of the state's tractor-trailer businesses operate on the interstate system.

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Texas exports total almost $100 billion annually and now account for over 13 percent of total U.S. exports.

The efficiency of the interstate system enables competitive international trade thanks to savings in transport and marketing costs.

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Without the interstate system, 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.

★ ★ ★

In the triangle formed by Dallas, Houston and San Antonio, interstate highways save travelers an estimated 60 million hours per year, resulting in an annual savings of approximately $2 billion.

Cities under Construction

Interstate highways through Texas cities open the path to commerce

A) I-35 west weaving through Fort Worth. State Highway 183 crosses the interstate at the bottom of the photo.

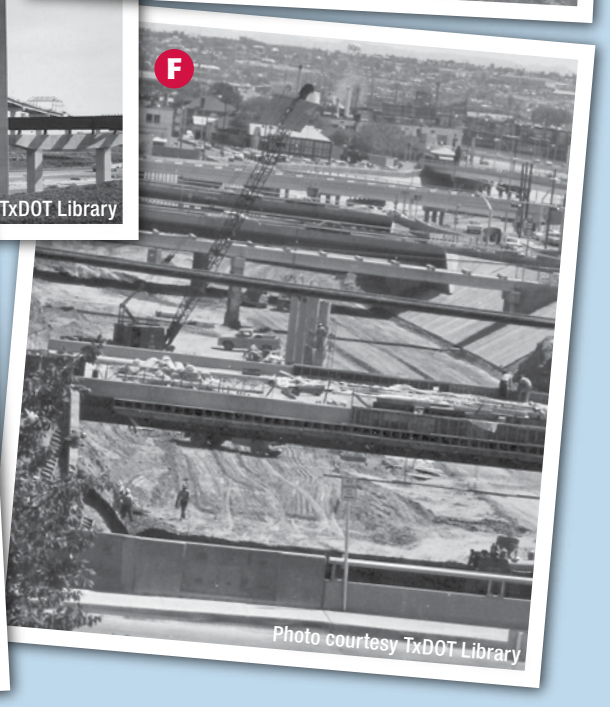
B) Workers build a frame during construction of I-45 in Houston in 1961.

C) Construction of the I-35 and I-635 interchange in Dallas. The major cities in Texas built loops, such as I-635, around the central core of the city as a practical way of navigation and congestion relief.

D) A roadcrew lays an asphaltic base on I-35 south of San Antonio.

E) Construction of the upper deck of I-35 in Austin in 1972. The unique double deck construction of this stretch of roadway allowed lanes to be built in this tight stretch of Austin.

F) I-10 in El Paso in 1961. The magnitude of the interstate highway construction through a major metropolitan area is depicted well in this photo, as six streets are shown crossing the depressed area of the constructed roadway.



Turn up the volume!

Texas sets the pace for interstate construction and urban growth

Photo courtesy TGR/TA

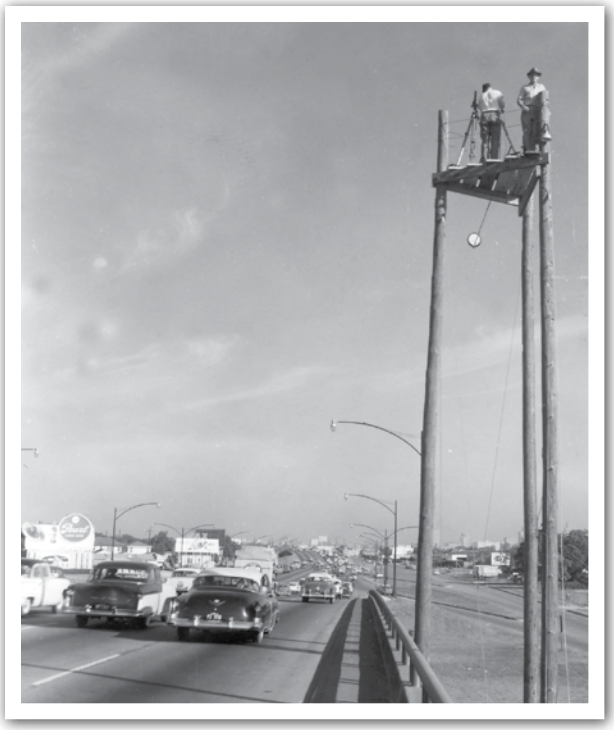
Post-World War II America enjoyed a prosperous and robust economy. Americans, after enduring years of rationing and uncertainty, were eager to take to the roads in their new automobiles, and Texans were no different. Vehicle registration in Texas exploded from 1.6 million cars in 1945 to 4.5 million in 1960. This time period also ushered in an era of congestion, as our urban area streets were not equipped to deal with the increase in traffic.

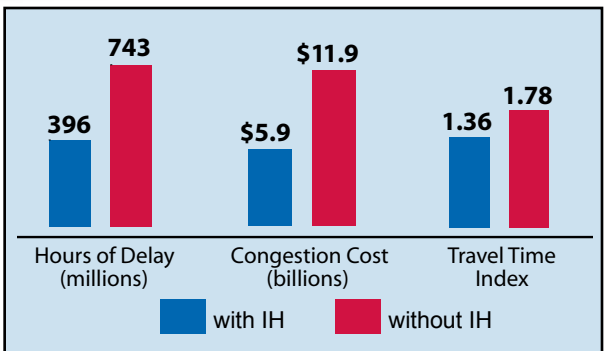

Photo courtesy Texas Highway Department

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

(Left): Central Expressway, Dallas at the peak of traffic in 1958. The estimated hourly traffic load per inside lane was better than 2,000 vehicles per lane, per hour.

(Bottom): TTI used towers and motion picture cameras to assist in the design, construction, operation and improvement of urban interstates. Shown here is I-45 (the Gulf Freeway) in Houston.





Urban Mobility in Major Urban Areas in Texas, with and Without Interstate Highway, 2003

Urban mobility IMPACTS

With the interstate highway system, our urban areas have:

- ★ Lowered the annual hours of delay from 743 to 396 million,
- ★ Saved the taxpayers $6 billion annually in congestion costs

Jump on construction

During the war, DeWitt Greer set aside funds for highway construction, which gave Texas a head start on highway construction. Combined with federal funds issued in 1944, construction began on Texas highways at an astounding rate. By 1947, highway construction work in Texas accounted for a quarter of all highway construction projects in the United States.

From 1945 to 1963, the miles of state highways in Texas more than doubled, from 24.6 to 53.3 thousand. When the landmark 1956 federal legislation was passed establishing the interstate highway system, Texas had many miles of roadway under construction that would eventually be designated as interstates. Many Texas highways would simply need to be upgraded to meet interstate standards. In 2003, Texas by far led the rest of the nation with the most miles of interstate highways at 3,233.

Unclogging our urban areas

Nowhere was the impact of the modern interstate system felt more than in our urban areas of Texas.

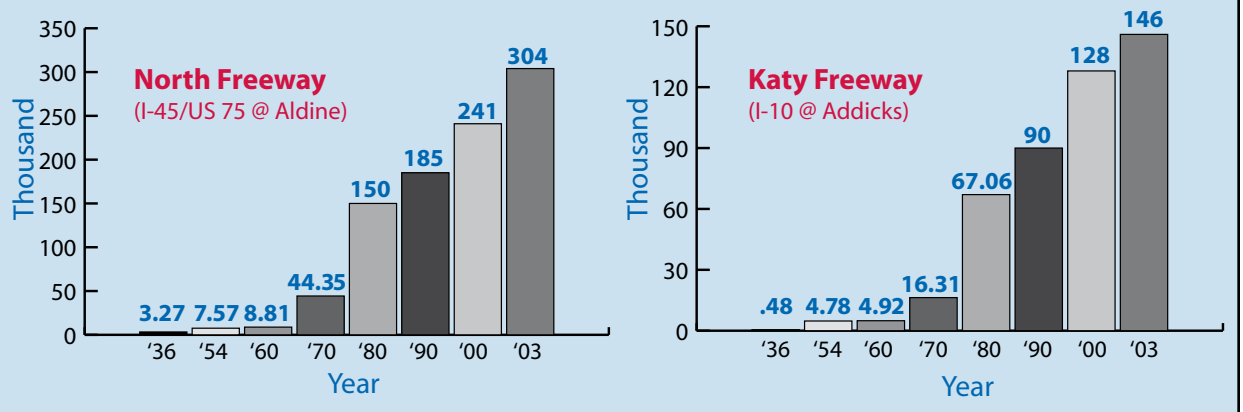
"When I moved here in 1941, the population of Houston was 263,000 people," said Doug Pitcock, president/owner of Williams Brothers Construction Company. "Houston was a horrible town to get around in. If you went from one side of town to another, you were looking at least from 45 minutes to an hour."

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,

> **"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

Texas Transportation Institute researchers, working with the Texas Highway Department and the Federal Highway Administration, 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, the development of the roadway congestion index (RCI) and studies on High-Occupancy Vehicle (HOV) facilities.

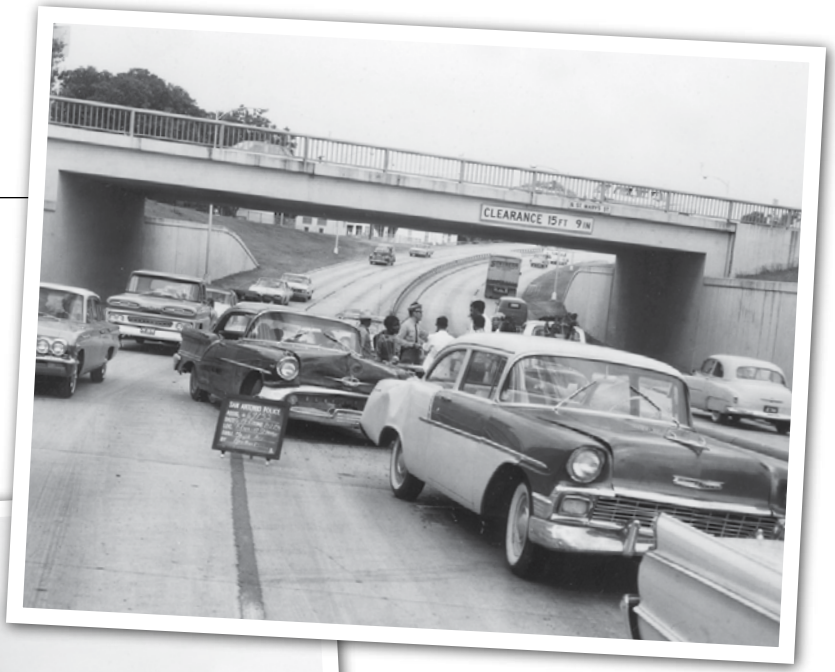
Although urban congestion remains a major transportation issue, the interstate highway system has saved commuters hours of delay and saved billions in congestion costs. If not for our multi-laned modern urban interstate system, inner city travel would be hopelessly gridlocked. R

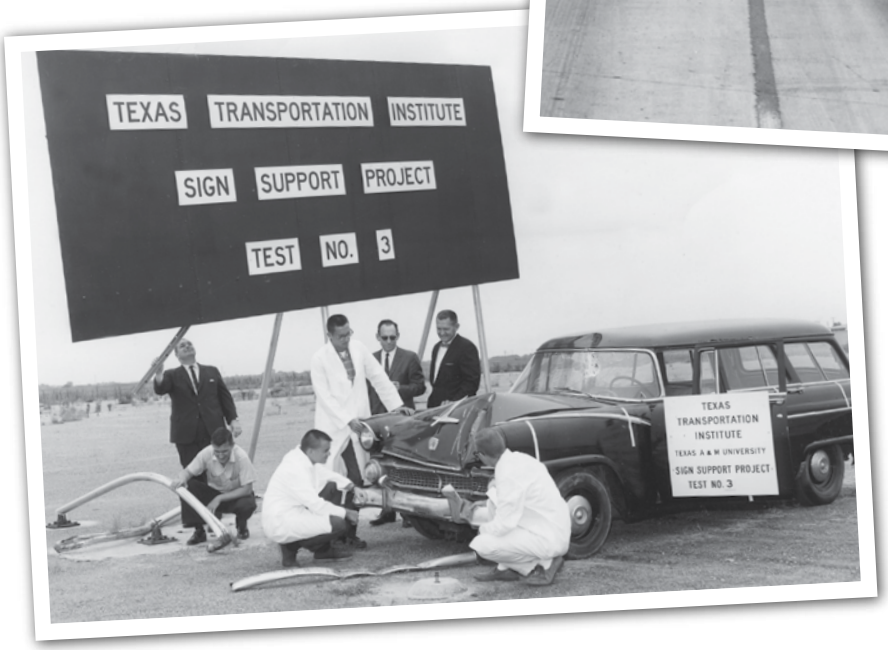


Average daily traffic volumes on selected Houston interstates by year Today, actual volumes per lane more than twice those originally planned for are common. Typical volumes in 2003 at these Houston locations are 70 times larger than they were in 1936, and 10 to 30 times greater than they were in 1960.

A "Forgiving" Roadside

Texas leads the way in highway safety innovations along the interstate





(Top): The number of auto accidents and deaths on urban and rural highways was a major reason for the creation of the interstate highway system.

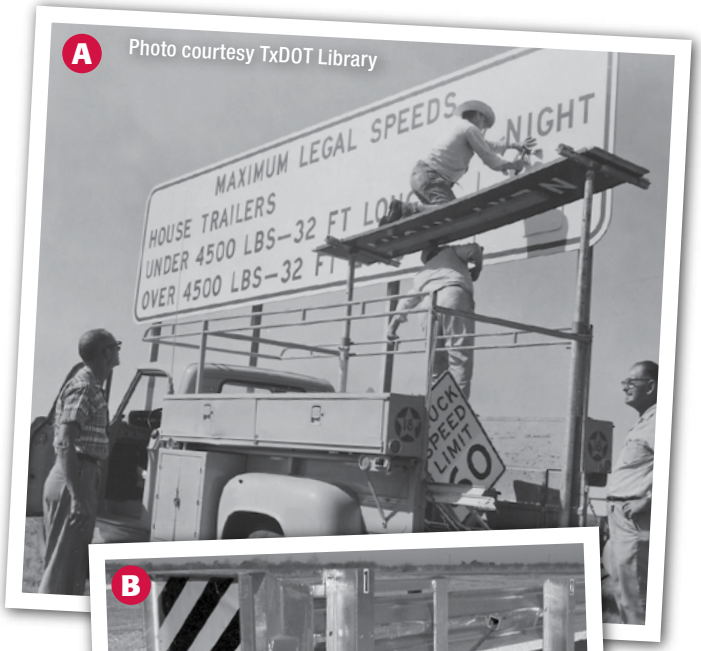
(Left): The Institute working with the Texas Highway Department pioneered the "breakaway" concept and specifications for improved safety of numerous roadside structures. Sign crash tests in the early 1960s led the way to implementation of these safer signs, light and utility poles, medians, mailboxes and guardrails all across the nation.

Americans, and especially Texans, built the interstate at a phenomenally rapid pace through the 50s and 60s. As the sophisticated network of highways developed, so did roadside devices such as signs, guardrails, utility poles, median barriers and culverts with concrete headwalls. These devices had the potential to become hazardous to vehicles leaving the roadway due to driver error or wet roads.

But both Texas and the nation rose to the occasion and responded to the need for a more "forgiving" roadside. The passage of the National Traffic and Motor Vehicle Safety Act of 1966 and the Highway Safety Act of 1966 provided federal funds on a 50-50 matching basis for expansion and improvements of state and local highway safety programs. It is in this area that Texas has had the most notable contributions to transportation. Through its partnership with the Texas Highway Department and participation in the Cooperative Research Program, Texas Transportation Institute (TTI) researchers utilized the funding by designing, testing and implementing several life-saving safety structures such as breakaway signposts and light poles, innovative crash cushions, concrete barriers and guardrails. Many of these innovations are implemented today across the nation's highways. R

"The people at TTI get a big plus for everything they've done in safety. The good thing about it is that everything they have come up with, the Department (TxDOT) has utilized—it wasn't just a study that was put on a shelf, it's been something that was put into use."

Mark G. Goode, retired engineer director, Texas Department of Transportation



A) Safer roadside devices allowed the Department to raise speed limits.

B) The ET2000 is a guardrail treatment that improves the chances of drivers surviving a run-off-the-road-crash.

C) The breakaway sign support is designed to slip from its base at impact allowing the vehicle to pass safely underneath.

D) Cost effective and easy to install, the ADIEM is a soft concrete crash cushion end treatment for concrete barriers.

Interstate Highway Safety IMPACTS

The fatality rate for interstate highways is nearly 60 percent lower than that of the rest of the roadway system.

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Since its inception in Texas it is estimated that the interstate highway system has saved over 18,000 lives and 1.1 million injuries.

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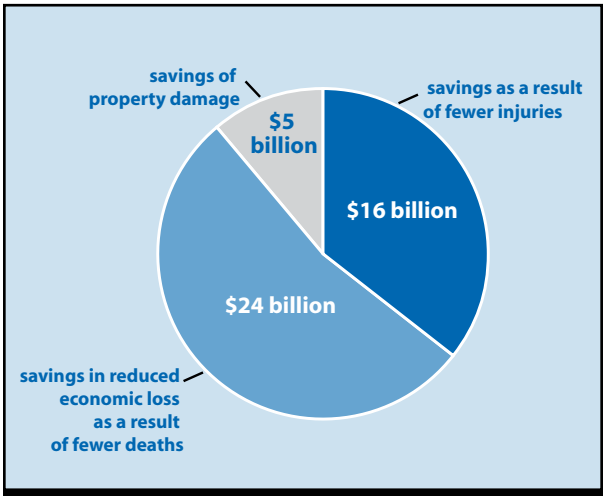
For each mile of interstate highway constructed in Texas, 6 lives have been saved, and more than 300 injuries have been avoided.



The safety benefits of the interstates have produced an estimated reduction in economic loss of $45 billion.

Planning the path

Route selection for interstates sometimes pitted people versus paving and progress

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.

Selecting the routes for the nation's interstates—the massive ribbons of miles that connect communities all across the country—was not without social impacts. Naturally, there was opposition to specific routes. 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. Thus began a trend toward increasing community involvement in route decisions and transportation planning—one that would continue to grow and evolve throughout the twentieth century.

Battle lines in the Lone Star State

One of the most storied battles involving progress and the process of building major roadways began in a Texas city that knew war all too well—San Antonio. Although not an interstate, US-281 faced the had same type of obstacles major roadways encounter when they are in the planning stage. US-281 opened to traffic on February 7, 1978. 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 that would provide access to the airport was essential for growth. San Pedro Ave., McCullough Ave., 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—one that would consume part of a golf course and split park land and other real

(Right): Former TTI Director Charley Wootan and highway department engineers examine plans for an early 1960s project to evaluate the consequences of constructing new highways. TTI researchers examined land use and values along freeways and rural stretches of highway.

(Bottom): 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.

estate. In 1967 the San Antonio Conservation Society, a community preservation group, sued to halt the North Expressway, US-281, project, taking advantage of a notation in federal highway funding rules that disallows using parks for highway space. 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, thus propelling the project to completion in 1978.

A Panhandle casualty of progress

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 off of the interstate to local businesses.

McLean, a small town on Route 66 in the Panhandle, is an example of what did happen when the interstate highway bypassed a community. 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. Their efforts were to no avail.

"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
Texas Instruments Inc.

When construction of the bypass 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. R

Route Selection IMPACTS

Selection decisions, such as where to place ramps and interchanges, could either be an economic boon or a devastating blow to communities.

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Litigation over route selection rose as high as the U.S. Supreme Court.

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Public involvement in transportation planning was born.

The waltz across Texas…

3,233 miles of interstate highways—more than any other state in the nation

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—Dallas, Fort Worth, Austin, Houston, San Antonio, El Paso—met this criteria; others would have the good fortune to be on a chosen interstate route.

While basic maps for the interstate system were in place by the 1940s, many issues that would affect the final system, such as how to pay for it and what the relationship between the federal government and the states would be, were not resolved. By 1962, however, the interstate system in Texas included the highways shown on this map, which were either open, under construction or planned, with final routes to be determined by the Highway Commission.

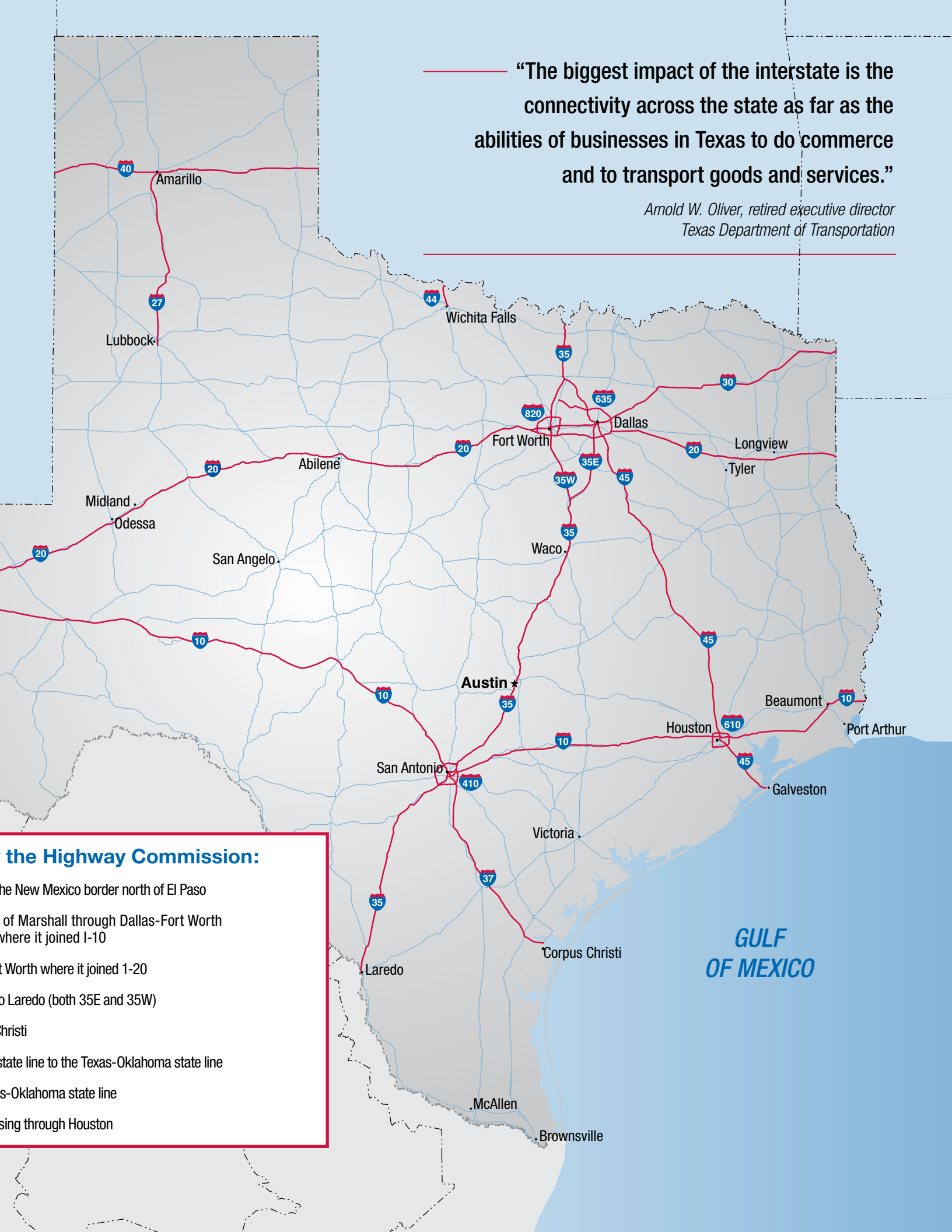
Of the urban freeway loops, only Loop 610 in Houston had been approved by 1962, but others in Dallas, Fort Worth, San Antonio and El Paso were approved in the late '60s and early '70s. I-27 from Amarillo to Lubbock was approved in 1975.

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 US 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. Out of a system that includes over 47,000 miles of roadway, Texas comes in with 3,233—more miles than any other state.

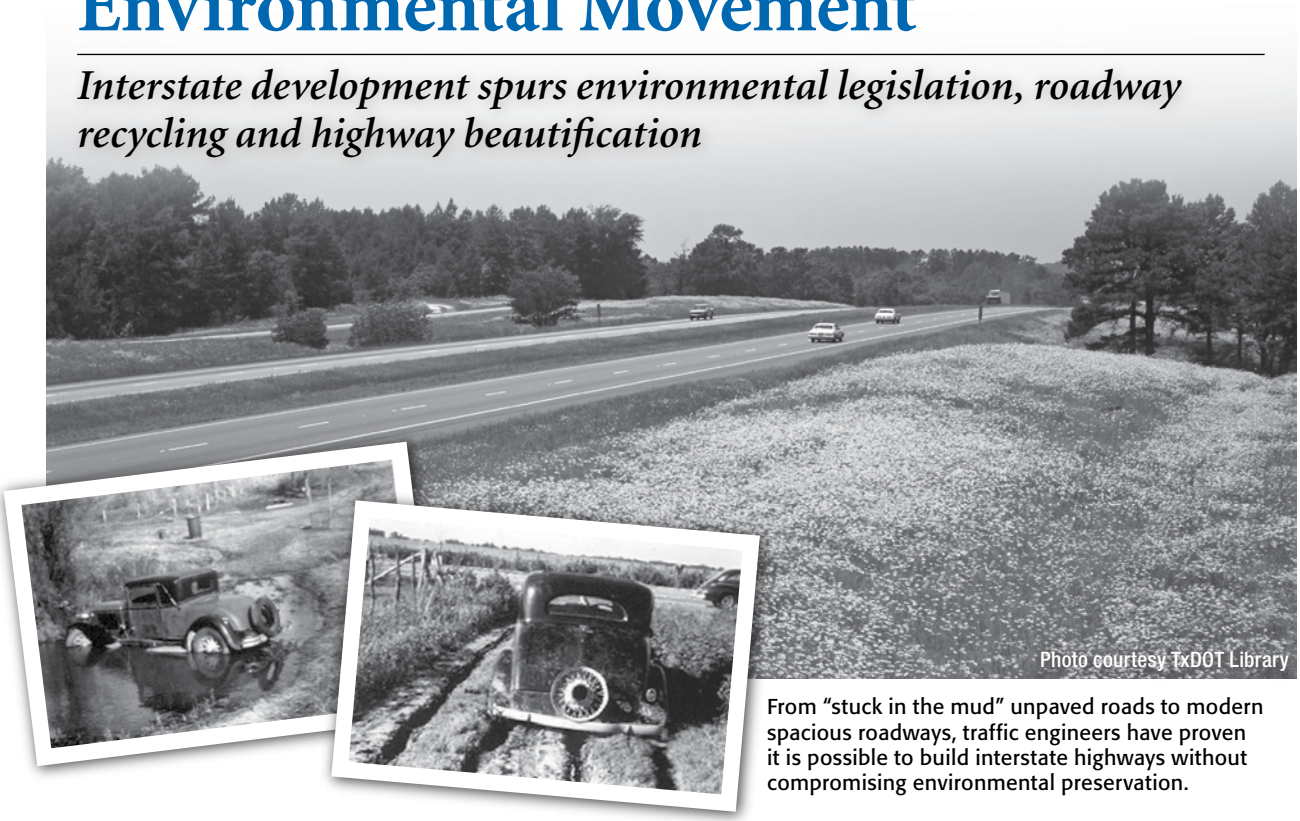
Final routes determined by

879 miles	I-10 from the Louisiana border to t
634 miles	I-20 from the Texas border east to a point southwest of Pecos, v
240 miles	I-30 from Texarkana to Dallas-Fort
492 miles	I-35 from the north Texas border t
142 miles	I-37 from San Antonio to Corpus C
182 miles	I-40 from the Texas-New Mexico s
14 miles	I-44 from Wichita Falls to the Texa
286 miles	I-45 from Dallas to Galveston, pas


"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, retired executive director
Texas Department of Transportation
Amarillo
Lubbock
Wichita Falls
Abilene
Midland
Odessa
San Angelo
Fort Worth
Dallas
Longview
Tyler
Waco
Austin
San Antonio
Houston
Beaumont
Port Arthur
Galveston
Victoria
Corpus Christi
Laredo
McAllen
Brownsville
GULF OF MEXICO
the Highway Commission:
he New Mexico border north of El Paso
of Marshall through Dallas-Fort Worth
where it joined I-10
t Worth where it joined 1-20
o Laredo (both 35E and 35W)
hristi
state line to the Texas-Oklahoma state line
s-Oklahoma state line
sing through Houston

Mobility and the Environmental Movement

Interstate development spurs environmental legislation, roadway recycling and highway beautification



From "stuck in the mud" unpaved roads to modern spacious roadways, traffic engineers have proven it is possible to build interstate highways without compromising environmental preservation.

Early roads, essential for wagon-wheeled commerce, consisted of little more than dust, clay, and more often than not, mud. Such roads followed the natural spine of the land, picking and choosing their path in a Texas two-step between traveler and terrain.

"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 of the United States

Getting it built

By 1912, in response to the call to "get the farmers out of the mud," Congress had authorized funds to repair and upgrade routes for rural mail delivery and spend $1.8 million constructing 425 miles of roads. Funding soon grew to $75 million per year. The race for paved roads was on.

With increased funding for construction and maintenance, a national priority for safe, expansive roadways coast-to-coast, and a hunger for speed, the emphasis for highway construction was on cheaper and faster. But, according to some, this massive effort of laying millions of tons of concrete and asphalt needed more careful consideration for the people, the land, and the animals effected. By the 1960s, a disparate group of concerned citizens had organized into a full-scale environmental movement. The public demanded protection for parklands, wildlife refuges, and explicit protection for historic sites. From an environmental perspective, however, two of the primary benefits of the interstate system are the elimination of the "stop and go" traffic of arterials streets and the allowance of higher operating speeds. Both conditions do in fact help reduce emissions from automobiles.

TTI's research on vegetation and erosion control in the 1960s saved Texans millions of tax dollars in highway maintenance costs through the discovery of effective ways to control Bermuda grass and the development of planting guides for the 10 geographical regions of the state.

Building it Better

Two major transportation policy 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 passed into law. The two-hearing policy mandated that both a "corridor public hearing" and a "highway design public hearing" be held prior to setting route locations in stone so the public could consider the potential social, economic and environmental impacts of a project before it received federal aid. 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."

Positive Preservation Today

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. Vehicle exhaust emissions are down. Federal regulations now require wetland mitigation programs, including establishing new wetlands for those lost due to freeway construction. More than $200 million is spent each year in wildflower programs, landscaping and soil stabilization—essential to protect water quality. And the transportation construction industry recycles a staggering 80 percent of pavement materials, a much higher percentage than newspapers, aluminum cans and glass bottles that are recycled in the United States. R

Environmental IMPACTS

FHWA revises its public hearing process to allow for multiple public hearings.

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The National Environmental Policy Act (NEPA) is established to help prevent environmental damage.

★ ★ ★

More than 80 percent of roadway materials are recycled.

★ ★ ★

$200 million each year now goes to water quality preservation programs.

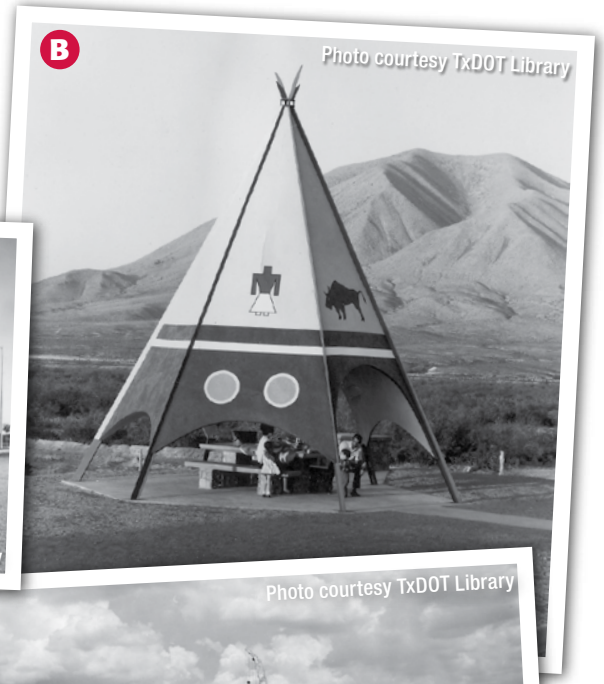
The Pathways of Texas

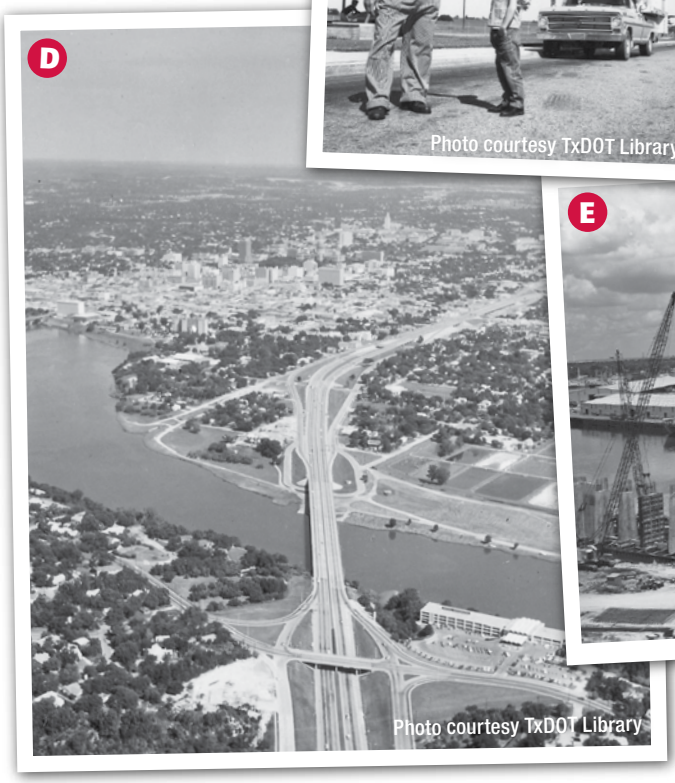
A modern interstate system offers families safe passage for city to city travel

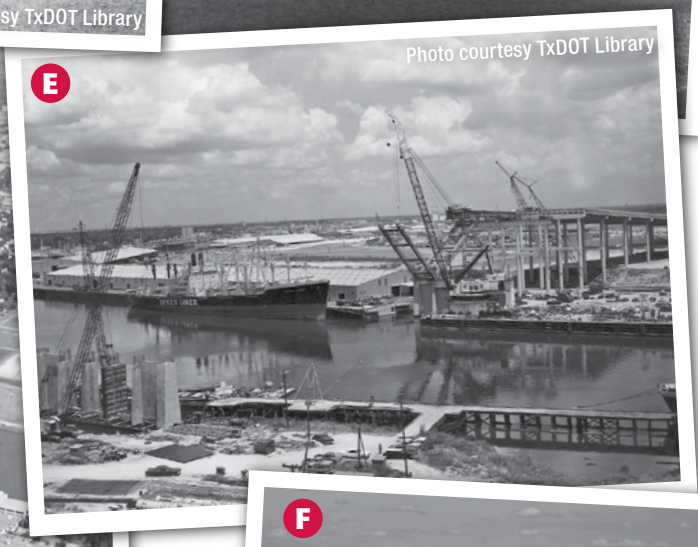
A) Safe rest areas are a signature of Texas interstates. These clean facilities offer a respite for weary travelers to stretch their legs.

B) The teepee arbor rest area was located on I-10 in West Texas.

C) In this shot, probably taken in the early 1970s, a Texas Department of Transportation rest area caretaker offers some friendly advice to a young traveler.







D) An aerial view of I-35 crossing Town Lake in Austin. The construction of safe and modern bridges across the many Texas waterways was a major feat of the interstate construction effort.

E) The I-610 ship channel bridge was constructed in 1971. This enormous structure allows ships to safely navigate one of the world's biggest ports.

F) Wide lanes, numerous overpasses and shoulders make it safe for families to traverse Texas interstates with travel trailers in tow.

Where Do We Go From Here?

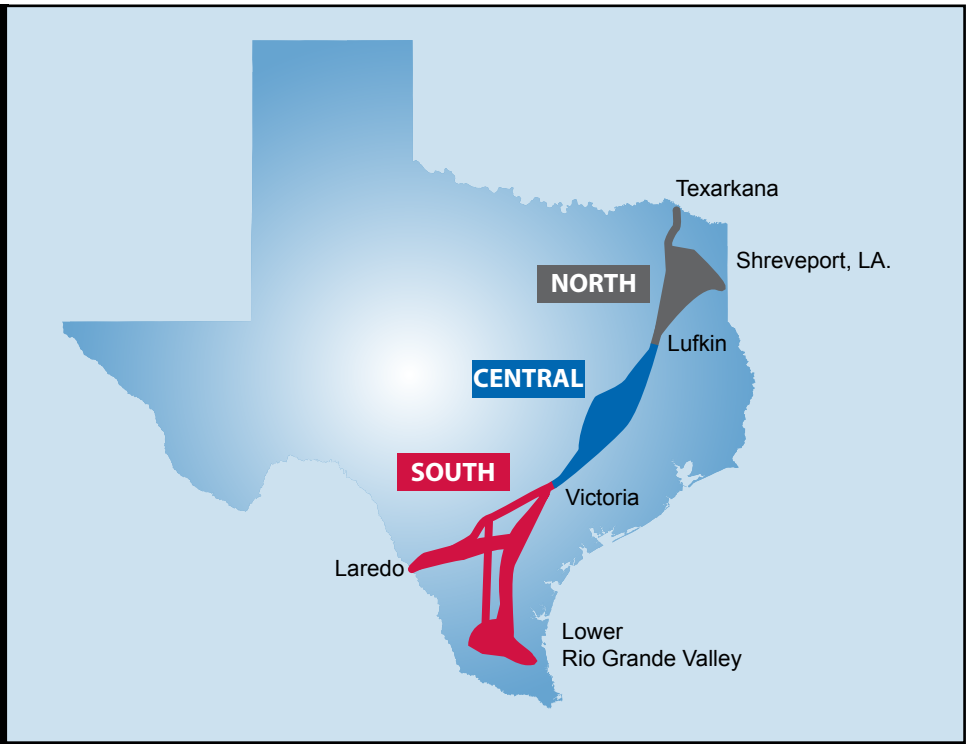
From anywhere to everywhere…

The interstate system undoubtedly has contributed to the growth of Texas's economy, and these highways remain an integral part of the urban transportation landscape. Interstate highways make "just-in-time" delivery possible, allow massive truck volumes to transport NAFTA trade over Texas highways, create more jobs, increase worker productivity and raise property values.

The interstate system has contributed some $2.8 trillion dollars 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 what might be the next interstate in Texas, I-69, symbolizes that conflict, with supporters citing economic statistics indicating the positive impacts, and opponents speaking out 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 Texan Frank Turner, A&M class of 1929 and one of the interstate's pioneers, said, to go "from anywhere to everywhere."

The map on the right shows the proposed route of I-69. This corridor is expected to be a major NAFTA trade corridor between the United States, Mexico and Canada. I-69's border-crossing ports in Texas from Laredo to Brownsville will handle over 49 percent of all U.S. truck-borne trade with Mexico. By connecting North American economic centers, I-69 will support economic development in a wide geographic area of the United States, from urban centers to rural communities bypassed, until now, by major highways of commerce.



Ties to Texas

Texans made lasting contributions to the interstate highway system

Whether they were born here, they finished their distinguished career in Texas or they simply possessed a vision of transportation as sweeping and bold as the Lone Star state itself, these "Texans" made contributions to the National Interstate Highway System that will last forever.

Former President Bush (below) signed legislation renaming the Interstate and Defense Highway System after former President Dwight D. Eisenhower (right) in 1990.

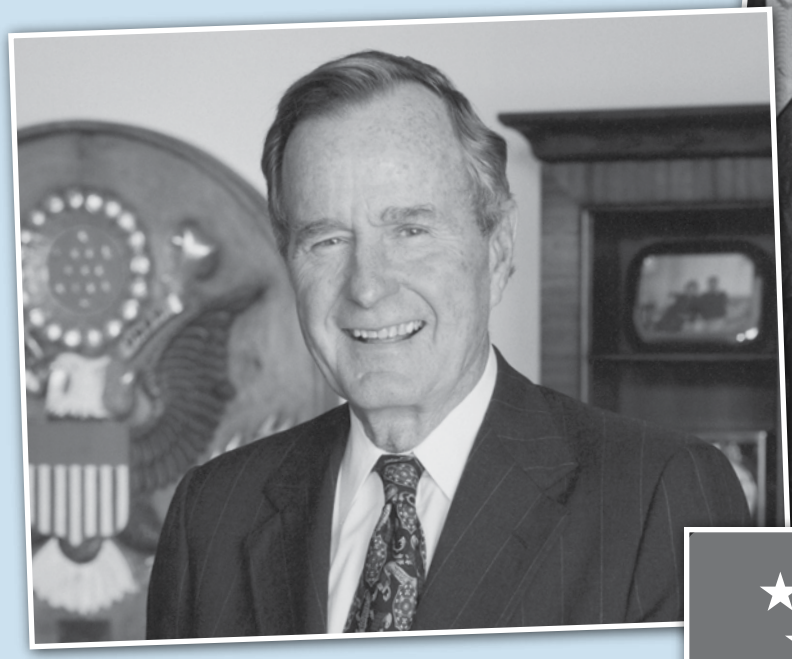


Photo courtesy NATO website

EISENHOWER INTERSTATE SYSTEM

Ray Barnhart

As Federal Highway Administrator from 1981-87, Barnhart insisted that transportation policy be based upon engineering and economic principles, established the Federal/State Technology Transfer Center Program, fought to preserve the sanctity of the highway trust fund, insisted on returning decision power to the states and initiated a nationwide effort to stop the theft of fuel taxes.

Lloyd Bentsen

As a Congressman from 1948 until 1955, and Texas' Senator from 1970 until 1993, Bentsen was one of the strongest supporters of highways ever to serve in Congress, supporting both increased highway funding and gas taxes. Two hundred and seventy miles of US Highway 59 between I-45 and I-35 have been designated the Senator Lloyd Bentsen Highway.

G.H.W. Bush

As the 41st President of the United States and son of Senator Prescott Bush, who supported the 1956 interstate legislation. He signed the 1990 bill that changed the name of the interstate highway system to the Dwight D. Eisenhower System of Interstate and Defense Highways.

Dwight David Eisenhower

As the 34th President of the United States, Eisenhower was the driving force behind the passage of the Federal Aid Highway Act in 1956, which created the interstate system and launched the biggest peacetime construction program in the nation's history.

(Left): Richard Oliver
(Right): Dewitt Greer and Jim Wright
(Bottom Left): Frank Turner
(Bottom Right): Lady Bird Johnson

Dewitt Greer

Called "King of the Highway Builders," Greer served as Texas State Highway Engineer for 27 years. Under his leadership, the highway system in Texas expanded from 22,207 to 72,945 miles. Greer was a national leader in AASHO whose integrity and passion for safer highways were hallmarks of his contributions to the development of the interstate system.

Lady Bird Johnson

With a passion for preserving the nation's natural beauty, Lady Bird Johnson worked tirelessly prior to and during her tenure as First Lady to secure passage of the Highway Beautification Act of 1965, which removed billboards, junkyards and other eyesores from the nation's highways.

Lyndon Johnson

As the 36th President of the United States and one of Texas' most powerful politicians, Johnson used his considerable influence to ensure that the state got its fair share of interstate mileage allotments and funding. He also affected some individual route/access decisions as the system was being developed.

Thomas MacDonald

As Chief of the Bureau of Public Roads from 1919 until 1953, MacDonald oversaw the early years of national highway construction, which ultimately led to the interstate highway system. MacDonald ended his distinguished transportation career in Texas by helping to establish the Texas Transportation Institute.

Richard Oliver

A senior traffic engineer in the Maintenance and Operations Division of the Texas Highway Department, Oliver designed the now-familiar red, white and blue interstate shield. The design was chosen from more than 100 submitted in a 1957 nationwide competition.

Sam Rayburn

Rayburn served as a Congressman during eight presidencies. He was elected Speaker of the House in 1941 and served until his death in 1961, longer than any other individual in U.S. history. Devoted to his home state, Rayburn made sure that Texas received its fair share of any new federal projects, including the interstate highways.

Frank Turner

Renowned as the "Father of the Interstate Highway System," Turner was a native Texan and graduate of Texas A&M University. In his 43 years with the Bureau of Public Roads (later the Federal Highway Administration), Turner was the chief architect of the interstate highway system.

Jim Wright

Wright represented Texas' 12th Congressional District in the House of Representatives from 1955 to 1989, serving as Speaker from 1987 to 1989, after having served as majority leader for 10 years. He was a consistent advocate for increased transportation funding. R

TEXAS TRANSPORTATION INSTITUTE COUNCIL

The Texas Transportation Institute (TTI) wishes to recognize members of the TTI Council by featuring profiles in each issue of the *Texas Transportation Researcher*. The TTI Council meets once a year to hear updates on research projects and program initiatives, discuss critical transportation issues facing Texas and provide guidance on potential future research efforts.

BOB JONES, Texas A&M Class of 1969, is president, CEO and founding partner of Jones & Carter, Inc., a 270-person, general civil engineering company headquartered in Houston, Texas. His background is in broad civil engineering activities with discreet emphasis on transportation and general mobility planning.

Over the past five years, Jones has personally worked with the Texas Department of Transportation, Union Pacific Railroad (UPRR), Texas Industries and the City of Stafford to develop a transportation corridor through Stafford, Texas. At Jones' recommendation, the UPRR that parallels US 90A will be relocated approximately 100 feet north of its present location to provide the transportation corridor that will allow TxDOT to widen US 90A and to construct underpasses for Stafford Road and FM 1092—enhancing traffic safety and improving traffic mobility.

Jones is a member of the Texas A&M Dwight Look College of Engineering Advisory Council and is an emeritus member of the Civil Engineering Department Advisory Council. He has been honored with the Dwight Look College of Engineering Outstanding Alumni Honor Award and the Department of Civil Engineering Distinguished Graduate Award.

Jones is the son of Truman R. Jones, Jr., Class of 1943, who was a professor of civil engineering at Texas A&M and was one of the original researchers for the Texas Transportation Institute from the early 1950s to 1963.

Recently, Bob and Jones & Carter received the "Patriotic Employer" award for exceptional support of employees actively serving in the military. The award was presented by the National Committee for Employer Support of the Guard and Reserve (ESGR). ■

DAVID LANEY is a partner in the Business Transactions section of Jackson Walker. His expertise includes transportation planning, construction and finance, and he is actively involved in the representation of clients in connection with state legislative matters. His practice has also included litigation management and planning, mediation, and strategic and organizational planning. He has served on the boards of state and federal agencies, as well as educational institutions and civic organizations.

Laney is a member of the American, Texas and Dallas Bar Associations and the Texas and Dallas Bar Foundations.

Laney is chairman of the board of the National Railroad Passenger Corporation (AMTRAK). He serves on the Executive Board of the Dedman School of Law at SMU (2001-present) and is trustee for the Southwestern Medical Foundation (2001-present). He is a member of the Dallas Assembly and the Dallas Committee on Foreign Relations.

Laney is a past chairman of the Texas Transportation Commission (1995-2001), and past member of the Texas Turnpike Authority (1998-1999), the Coastal Coordination Council (1995-1997), the North Texas Turnpike Authority (1995-1997) and the Finance Commission of Texas (1989-1995). He has served on the Board of Trustees for the following: Stanford University (1998-2003), The Hockaday School (1993-1995), St. Mark's School of Texas (1983-1993) and Callier Center and Communication Disorders (1985-1990).

Laney was named a "Texas Super Lawyer" in the November 2003 and October 2004 issues of *Texas Monthly* magazine. ■

TxDOT Short Course

The 79th Annual Transportation Short Course was held on the Texas A&M University campus in October. The conference, sponsored by the Texas Department of Transportation (TxDOT) and the Texas Transportation Institute (TTI), offers engineers, researchers and industry professionals opportunities to learn about the latest developments in transportation tools, techniques, technologies, policies and programs.

One of the central themes of this year's opening session was the response of TxDOT employees in the aftermath of hurricanes Katrina and Rita.

"More than 2.5 million people evacuated the Gulf Coast region," said TxDOT Executive Director Michael Behrens. "Contra-flow (a one-way vehicle evacuation using northbound and southbound roads) was implemented in this area for the first time, and overall it was a success. We had TxDOT employees providing gas out of portable containers on evacuation routes. I am very proud of the way TxDOT responded."

TTI Director Herb Richardson spoke of the importance of a healthy transportation system during times of distress.

TxDOT Executive Director Mike Behrens speaks during the opening session of the 79th Transportation Short Course.

"The past few weeks have vividly demonstrated how important our transportation infrastructure is to our well being as we watched our citizens along the Gulf Coast evacuate."

Other highlights of the opening session were speeches from the four Texas Transportation Commissioners: Ted Houghton, Jr., Hope Andrade, John Johnson and Commission Chairman Ric Williamson. More than 2,500 attended Short Course this year. ■

2005 TxDOT award winners

Dewitt C. Greer Award
Joe S. Graff
Maintenance Division

Gibb Gilchrist Award
Douglas W. Eichorst, II
Odessa District

Luther DeBerry Award
Clifford W. Halvorsen
Houston District

Russell H. Perry Award
H. Thomas Kornegay
Executive Director,
Port of Houston Authority

Raymond E. Stotzer Award
Robert W. Jackson
Office of General Counsel

Awards


Dudek


Bochner


Carlson


Holick

Connie Dudek received the Transportation Education Council Best Innovation in Education Award from the Institute of Transportation Engineers (ITE). Dudek was recognized for his mentoring program called "Mentoring Activity Integrated into a Graduate Course."

■

Brian Bochner received the 2005 ITE Coordinating Council Special Award. Bochner was recognized for his significant and sustained volunteer contributions to Institute of Transportation Engineers technical activities. He serves on various ITE technical committees and has authored several books, including Smart Growth Transportation Guidelines: An ITE Proposed Recommended Practice. The ITE Coordinating Council Special Award recognizes outstanding contributions to the ITE Coordinating Council Program. Selection for this special award is based primarily on the significance of the contributions made to the transportation engineering profession.

■

Paul Carlson and Andrew Holick will be presented with the Transportation Research Board's (TRB) Fred Burggraf Award during the 85th TRB Annual Meeting in January 2006. The TRB Fred Burggraf Award recognizes excellence in transportation research by researchers 35 years of age or younger. The paper that was nominated and selected for the award was titled, "Maximizing Unlit Freeway Guide Sign Legibility Using Clearview Font and Combinations of Retroreflective Sheeting Materials." ■

Russell Henk named to Governor's Task Force


Henk

TTI Research Engineer Russell Henk has been named to the Governor's Task Force on Evacuation Transportation and Logistics, joining 13 other prominent business and professional leaders from across Texas to tackle one of the most urgent needs facing the state in recent memory. When Hurricane Rita threatened Texas soon after Katrina hit New Orleans, Houstonians fled the city en masse. Every route out of the city was backed up as millions of people tried to leave at the same time. In response to these and other challenges, Governor Rick Perry announced his task force, along with Houston Mayor Bill White and Harris County Judge Robert Eckels. It is chaired by Jack Little, the former CEO and president of Shell Oil Co.

"Being added to the Governor's Task Force is a very pleasant surprise and privilege," Henk says. "I'm really looking forward to being part of such a distinguished group of minds and talent, and contributing solutions for addressing this important issue for our state." Henk, head of the Research and Implementation Division in TTI's Traffic Operations Group, has extensive experience in traffic management and is responsible for the first hurricane contraflow evacuation plan adopted in TxDOT's Corpus Christi District over 5 years ago.

The task force has already conducted public hearings and will report its findings to the Governor in February. ■

TTI consolidates and expands

Funding has recently been approved for the construction of a four to five-story research building adjacent to the Gilchrist Building in College Station. Planning, approvals and actual construction will take at least three years. Upon completion, the building will provide new research space and will house all TTI administrative and support functions including the Director's Office, Business Office, Human Resources, Research Development Office and Facilities and Support Services.

As part of the agreement with A&M, TTI will vacate 13,500 square feet in the CE/TTI Tower to assist the University and College of Engineering with space for new faculty as part of the Faculty Reinvestment Plan.

"This is an exciting opportunity for the Institute, and one that I and the Management Team have been working hard to achieve," says TTI Director Herb Richardson. ■

Dal*Trans* breaks ground

Staff members at the Texas Transportation Institute's (TTI) urban office in Dallas reached a milestone of service in October when a groundbreaking ceremony was held for the future location of the Dal*Trans* traffic management center.

TTI has operated an office in Dallas to serve that rapidly growing area of the state since 1968, when the Federal Highway Administration selected TTI to develop one of the first integrated freeway and surface street control and management systems in the United States. After years of expansion and improvement, that system has become Dal*Trans*, which now includes nearly 130 closed-circuit TV cameras, 32 dynamic message signs, a county-wide vehicle detection system, high-speed fiber-optic communications and roving courtesy patrols. Once finished, the new home for Dal*Trans* on the grounds of the TxDOT Dallas District Office will house traffic management equipment that could help reduce travel delay and crashes by as much as 15 to 40 percent, based on TTI's experience with other systems deployed around the country.


(l-r): Mo Moabed, TxDOT; William Hale, TxDOT; Terri Hodge, State Representative for District 100; Gary Thomas, Dallas Area Rapid Transit; Al Kosik, TxDOT; and James Carvell, TTI; particpate in the groundbreaking ceremony for the Dal*Trans* Transportation Management Center.

TTI Senior Research Engineer Jim Carvell was TTI's on-site project engineer during the implementation of the first Dallas freeway management system in the early 1970s. Joining Carvell at the microphone that day were Mo Moabed, TxDOT Dallas director of transportation operations; Al Kosik director of TxDOT's traffic management section; Bill Hale, Dallas District engineer, and Gary Thomas, president and executive director of Dallas Area Rapid Transit. ■

Rail conference held in Austin

The 2005 National Highway-Rail Grade Crossing Safety Training Conference was held November 6-9 at the Hyatt Regency in Austin, Texas. The conference, sponsored by the Texas Transportation Institute (TTI), was an opportunity for industry researchers, consultants and state and federal agencies to discuss technological innovations that are being researched and implemented to make rail crossings safer.

Rail crossings are a serious safety issue in the United States. About every 120 minutes, an incident occurs between a vehicle and a train at a highway rail crossing. In the past, Texas has led the nation in the number of rail crossing incidents.

The conference kicked off with opening remarks from Steve Simmons, deputy executive director for the Texas Department of Transportation; Jo Strang, Federal Railroad Administration deputy administrator for safety; and Dan Reagan, Federal Highway Administration regional director. Among the major issues discussed at the conference were pedestrian trespass and safety issues, low-cost warning systems and several changes to the Manual on Uniform Traffic Control Devices.

Cliff Shoemaker (left) and TTI Assistant Agency Director Steve Roop (right) present Richard Mather with the first annual Career Achievement award.

In an evening ceremony, retired Oregon Department of Transportation (ODOT) employee Richard "Dick" Mather was presented the first Career Achievement award. Mather began his career as a cook on a railcar before working his way up through the ranks at ODOT. Mather also served on numerous technical committees for the Transportation Research Board, often paying for the travel expenses out of his own pocket and using his own vacation time to attend these meetings.

"The overall comments that I have received indicate that the conference was a great success," said TTI's Jessica Franklin, who coordinated the conference. "The program had timely issues and the speakers were very knowledgeable in their areas."

(l-r): EPA Administrator Stephen Johnson; Congressmen Chet Edwards; TCEQ Commissioner Ralph Marquez; TTI Director Herb Richardson; TxDOT Commissioner Ted Houghton, FHWA Texas Division Administrator Dan Reagan; Texas A&M University Vice President and Provost David Prior; and Texas A&M University System Chancellor Robert McTeer.

TTI awarded $3 million in truck emission reduction program

The Administrator of the Environmental Protection Agency (EPA) recently announced a $3 million grant to the Texas Transportation Institute (TTI). The grant is part of the effort to reduce emissions and fuel consumption from idling truck engines. TTI will use the funding to implement locations to deploy engine idle reduction technology.

The grant is the largest ever awarded by the EPA's SmartWay Transport Partnership and is the largest of the total $5 million grant package earmarked by Congress. TTI researchers estimate idling trucks at the nation's 3,500 truck stops produce 250 tons of oxides of nitrogen emissions and 7 tons of particulate matter emissions every day.

EPA Administrator Stephen Johnson celebrated the important benefits of the grant, stating, "This award by EPA's SmartWay Transport Partnership is an important element of our nation's efforts to conserve fuel, achieve energy independence and reduce emissions from the United States trucking industry."

The grants are expected to increase the development and commercialization of idle-reduction technology resulting in further fuel conservation and reduced emissions as the use becomes more widespread.

Learn more about engine idle reduction technology by visiting TTI's website at http://tti.tamu.edu/cfaqs/projects/truck_idling_reduction/ or the EPA website at http://www.epa.gov/.

Trinity Industries comes to TTI, TAMU

Continuing a long-standing relationship with the Texas Transportation Institute (TTI), executives with Dallas-based Trinity Industries spent October 26 touring TTI's facilities and visiting with staff from both TTI and Texas A&M University. The Trinity officials, including nine presidents of various departments, described the company's different product lines and outlined issues that would benefit from further research.

Several roadside safety devices developed by TTI are licensed and manufactured by Trinity. The company has supported the TTI Employee Awards Program for a number of years and recently made a $50,000 per-year commitment to sponsor the annual Research Champion Award Program.

In addition to meeting with researchers, the visit included a crash test at the Riverside Campus and dinner in the Board of Regents dining room. ■

TTI/MARAD collaboration announced


Kruse

The Center for Ports & Waterways (CPW) at the Texas Transportation Institute will soon begin a study for the U.S. Maritime Administration (MARAD) to update a comparison of freight transportation methods. The collaboration will provide an up-to-date analysis of the environmental impacts of barge transportation compared to other modes, such as highway or rail transportation. TTI will focus on at least five issues: cargo capacity, air emissions, congestion, social and safety impacts and energy efficiency.

Statistics being used today are drawn from comparisons completed at least 10-15 years ago. A lot has changed since then according to Jim Kruse, director of the CPW. "Engine standards are different, safety and security practices have changed and severe congestion in major corridors and in urban areas has become a major transportation issue." TTI's study will collect updated information as well as analyze the differences in the various transportation methods in today's operating environment.

To begin the project, CPW is reaching out to the private sector in two ways: hearing suggestions of alternative ways of structuring the comparison across modes, and collecting information already available. All interested parties are invited to participate. "We don't want to leave any stone unturned," says Kruse. "We highly value both private and public sector input." ■

Mark Stiles receives Friend of TTI award

Senior Vice President of Trinity Industries and TTI Council Member Mark Stiles is this year's recipient of the Friend of TTI award, presented October 26. The award was presented to Stiles at a ceremony at the Texas A&M University Board of Regents' offices on October 26.

Stiles served eight terms in the Texas House of Representatives. During his years in the House, Stiles served as a member of all of the major House committees at one time or another. He served an unprecedented three terms as chairman of the critical Committee on Calendars. Recognized by many for his work, Stiles was instrumental in major legislative reforms in property tax, insurance, education and criminal justice.

Over the years, a large number of people have provided significant support to TTI. In 1999, the Institute began giving formal recognition to one individual annually who has provided an exceptional level of support to TTI for many years.


TTI Director Herb Richardson (right) presents Mark Stiles with the Friend of TTI award during a ceremony on October 26.

Stiles joins six other Friend of TTI award winners: Vice President for Service Design and Performance of the Burlington Northern Santa Fe Railway Company Rollin Bredenberg (2004), Chairman of the Amtrak Board of Directors David Laney (2003), Former Executive Director of TxDOT Arnold Oliver (2002), Chancellor Emeritus of The Texas A&M University System Barry Thompson (2001), Former Mayor of Houston Bob Lanier (2000) and Former General Manager of the Metropolitan Transit Authority of Harris County Bob MacLennan (1999). ■

Behrens foursome takes top spot

It was a perfect day for golf as 36 teams took to the links at Briarcrest Country Club in Bryan, Texas, in October for the 38th Annual Gallaway Invitational. The event is named after Professor Bob Gallaway, a pioneer in the field of transportation research.

The team of TxDOT Executive Director Mike Behrens, Wayne Ramert, TxDOT Deputy Executive Director Steve Simmons and Dennis Warren shot the lowest net score of 46.75. Scott Marr, Hiten Parshottambhai, Kevin Schmuhl and Mike Taylor took top honors for lowest gross score with a 55.

The tournament organizers wish to extend thanks to all the sponsors who helped provide a generous sample of gifts, door prizes, and lunch and dinner for all golfers.

(Left-right) Steve Simmons, Wayne Ramert, tournament host Bob Gallaway, Dennis Warren, and Mike Behrens. This foursome took top honors with a net score of 46.75.

TTI opens El Paso urban office

The Texas Transportation Institute (TTI) is in the process of branching out to West Texas with the establishment of an urban office in El Paso.

TTI's newest urban presence in Texas is the result of years of effort from a wide range of individuals including: State Senator Eliot Shapleigh of El Paso, TTI Associate Director Bill Stockton and Assistant Vice Chancellor Cathy Reiley.

Initially, TTI's work will focus on three areas: border crossings, air quality and traffic management initiatives. Research Engineer Russell Henk, head of TTI's Research and Implementation Division in the Traffic Operations Group, will be responsible for overall leadership of the El Paso office.

TTI Director Herb Richardson noted recently that the Legislature's vote to fund the office was based on the growing needs of the El Paso region, along with TTI's long-standing reputation for quality service. Henk says it's that same reputation for service that's certain to help turn a two-year Legislative appropriation into a years-long history of excellence and benefit to the people of West Texas.

1st Annual
TEXAS TRANSPORTATION FORUM

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Sponsored by: Texas Department of Transportation

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THE BACK ROAD

Despite the fact that the system has been in place for less than 50 years, interstate highways have become one of the defining elements of American life. It's difficult now to remember what our state was like before I-35 divided West Texas from East Texas, I-10 crossed the vast expanse from San Antonio to El Paso, and when Route 66, not I-40, sped travelers across the Panhandle. In fact, the reduction in intercity travel time—on average by 25 to 30 percent—is one of the most important benefits of the interstate system, but it's not the only one.

During its 50-year history, the interstate system has meant more than just increased speeds and reduced travel times for Texans. It's also been a key to our economic development as well as our improved mobility. In this issue of the Researcher we'll review the economic, environmental and social effects of these largest of all public works projects in our state. You'll meet some of the men who helped design and build the Texas portion of the system, and learn how their ingenuity and dedication brought Texas one of the best highway systems in the nation.

The upcoming 50th anniversary in June 2006 of the passage of the federal legislation prompted us to compile this information, and we're very proud of our part in this important national endeavor. Almost from the day the bill was passed, TTI researchers were engaged in studies and developments that would help make the interstate system an even better value for America. From the roadside safety devices that have saved thousands of lives to the creation of new traffic management strategies and technologies to make urban interstates and loops more efficient, TTI research has been an integral part of this national highway system. It's a fascinating story, and I hope you'll come away with a greater appreciation of the creativity, dedication and just plain hard work it took to make this magnificent system of highways a reality.

As always, we appreciate your interest and support for the Institute. We wish you and your family the best of holidays and a happy and prosperous new year.

Herb Richardson

TEXAS TRANSPORTATION Researcher

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PUBLISHER/DIRECTOR, TTI	Dr. Herbert H. Richardson
EDITOR	Kelly West
MANAGING EDITOR	Chris Sasser
WRITERS	Penny Beaumont Chris Sasser Brandon Webb Kelly West
DESIGNER	Stacy Schnettler
PHOTOGRAPHER	Dennis Christiansen James Lyle
ART DIRECTOR	John Henry
PROOFREADER	Beverly Gracia

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