

TEXAS TRANSPORTATION

Researcher

A Publication of the Texas Transportation Institute • Member of The Texas A&M University System • Vol. 39 • No. 2 • 2003

THE ROAD AHEAD

CHALLENGES FACING TRANSPORTATION

- ▶ Congestion
- ▶ Safety
- ▶ Planning



THE TRANSPORTATION WRECK

Will we avoid it?



MICHAEL STEVENS

Chairman
Transportation Task Force
Governor's Business Council

Chairman
Michael Stevens Interests, Inc.

What can pay for the entire \$58.7 billion annual operating budget for Texas for the next 7 years from savings, reduce statewide traffic congestion by 50 percent, add 120,000 permanent jobs and reduce emissions from hydrocarbon pollutants in the State by 775,000 tons, all at the same time?

The answer? According to the Governor's Business Council report entitled *Texas' Roadways—Texas' Future*, commit to spend \$78 billion over the next 25 years on the State's highway system in excess of what will be available under the current tax system.

The benefits stated above do not include those to the economy, business and our personal lives for becoming the easiest and safest state in the United States in which to get around. Nor do they take into account the equally profound costs of not spending the extra money.

Congestion will rise by 350 percent, making the State a less desirable place to live. Attracting and retaining businesses, employees, visitors and students will be more difficult. Moving goods and services throughout the State will take more time and be less reliable, increasing the cost of everything from housing and education to groceries. Getting to work, school and running errands will consume more of our available time causing further relocation of people and business to the outskirts of major cities or to states offering a less congested environment—or a solution to the problem. Ultimately, our resources will

be strained further as growth slows, stops or reverses, and our tax base deteriorates.

The importance of transportation to businesses, individuals and the economy is becoming more evident every time we take a poll or try to bring business to the State. While Texas still fares well by comparison to most other states, we are and have been growing at a significantly faster rate than others, placing greater strain on our transportation system. In the next 25 years, 90 percent of all population growth (8 out of 9 million new people) will occur in the urban areas where 15 million people currently live, where congestion is currently the worst and where the majority of jobs and gross domestic product are generated. Moving from point to point within the urban areas is and will be the major transportation problem facing Texas.

Two-thirds of all traffic volume in the State occurs on the State highway system, making it practically impossible for the urban areas to solve their congestion problems unless the State simultaneously reduces congestion on the urban highway system. Furthermore, public transit ridership only carries a 1.8 percent share of total state transportation volume, has been dropping nationally for 40 continuous years, and does not offer a realistic alternative to road construction or traffic management solutions.

The new people being added to the State's population will not start paying for their use of the transportation system until they are actually using it under the current tax system (primarily gasoline tax, vehicle registration fees and other user taxes). Unfortunately, it takes 10 years prior to that initial use to design and build the new roads they are going to be driving on. Any business would quickly realize that this mix of high population growth, user tax, pay-as-you-go highway construction and the 10-year lag from conception of construction to completion is a recipe for disaster. This is why planning in advance is so important in both business and transportation, and why the State's commitment to a fiscally unconstrained, long-term strategic plan for transportation is so critical. We do not have time to procrastinate nor to make the wrong decision. To avoid the wreck, we must act now. **R**

The **CO**\$T of **CONGE**\$TION

TTI leads effort for the Governor's Business Council

Good transportation is crucial to the future of the Texas economy and to our standard of living. The most serious transportation-related threat to the State's economy is the increasing delay in passenger and freight travel as a result of congested roads. To no one's surprise, the problem is most serious in the major metropolitan areas, and will increase to dramatic levels unless substantial solutions are implemented. Defining the magnitude of the problem is the easy part. Finding the solutions is the hard part.

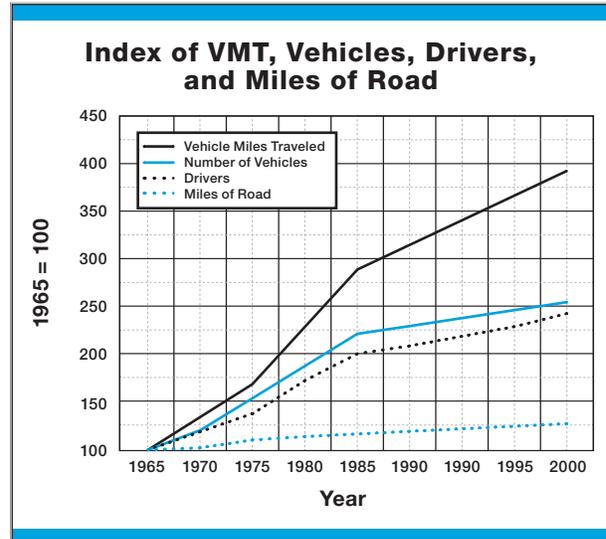
The Transportation Committee of the Governor's Business Council, an advisory committee appointed by Governor Rick Perry, sought the help of the Texas Transportation Institute (TTI) to answer some key questions about the future needs of the state's transportation system. TTI researchers Tim Lomax and David Ellis, along with consultants Alan Pisarski and Wendell Cox, recently completed a study entitled, *Texas' Roadways—Texas' Future: A Look at State Roadway Supply, Demand, Costs and Benefits*.

The study had two purposes: first, to establish a process whereby vision, needs and accountability drive the selection of transportation improvement options, rather than how much money is available to solve immediate problems; and second, to define minimum transportation system performance standards and identify the costs and benefits of achieving those standards.

The study developed projections of population, daily vehicle miles of travel (DVMT), fuel consumption and vehicles to determine traffic demand. Those projections were coupled with estimated state and federal funds available and construction costs for various types of roadway. The final product is a model that gives cost estimates of what it would take to achieve various levels of mobility across the State over the next 25 years.

Researchers found that in order to simply keep congestion from getting worse, the State will need to spend \$179 billion in constant year 2000 dollars over the next 25 years on new construction, reconstruction and maintenance. That is \$39 billion more than the \$140 billion that is expected to be available, given current tax rates and projected population and travel. To reduce congestion to levels where trips during peak hours take no more than 15 percent longer than trips during non-peak hours will require \$78 billion more than is expected to be available.

"The cost of implementing the needed additional improvements would be dwarfed by the benefits," says TTI Associate Research Scientist David Ellis. "In the



The chart above shows that the miles of roadways have not increased at the same rate as vehicle miles traveled and number of vehicles and drivers.

metropolitan areas we included in the study, the cost of congestion over the last 10 years alone represents a value to Texas and Texans of \$46 billion in increased travel time and wasted fuel. That's more than was spent by the State on our highways."

The research team reports that over the next 25 years, if current trends continue, the total cost of congestion will be over \$182 billion. However, the benefits of the improvements from less delay, fewer gallons of wasted fuel and increased efficiencies to business and commerce are estimated to total \$511 billion. In addition, almost 120,000 new jobs will likely be created, and hydrocarbon emissions will be reduced by 775,000 tons during that period.

Michael Stevens of Houston, Chairman of the Transportation Committee of the Governor's Business Council said, "I have found TTI to be an incredibly valuable and limitless resource for transportation information and research. They are a critical asset to the state during this time of growing congestion. The study we recently completed shows that it is critical we provide additional funding into our transportation system, and that to do so provides us with a \$433 billion profit. Excellent work!" **R**

MORE INFORMATION

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Research targets freeway congestion

Advance warning systems considered

You're on your way to work. The morning commute seems pretty routine. Then, you suddenly notice unexpected traffic congestion. Your

first response—slow down as fast as possible to avoid hitting vehicles in front of you, or move into an adjacent lane of traffic. Then, you look in your rearview mirror, hoping no one slams into your vehicle.

In addition to being a major safety issue, unexpected slow or stopped traffic is a costly and irritating problem on freeways in metropolitan areas of Texas. "I'm used to urban traffic, and I'm still frequently surprised by lines of stopped or slow freeway traffic," says Poonam Wiles, a research engineer with the Texas Transportation Institute (TTI). "We have observed these queues growing very rapidly—over 800 feet in just 10 seconds."

Wiles and co-researchers Scott Cooner, Carol Walters and Ed Pultorak, are working on a research project sponsored by the Texas Department of Transportation (TxDOT) to find devices and techniques that can warn drivers rapidly approaching stopped traffic.

"This research is a great example of how we listen and respond to the driving public," says Jay Nelson, TxDOT's Dallas District Engineer. "It was suggested by people stopped in traffic."

Specifically, the project is looking at congestion caused by not only freeway incidents, but also recurrent congestion at freeway exit ramps and connectors, as well as at work zones. About 50 locations exist in the Dallas-Fort Worth (DFW) Metroplex where the average speed of the morning drive suddenly dips below 30 miles per hour on freeways. About 40 locations slow down significantly during the evening commute. Many motorists have come to expect delays at specific locations. "But even if you are aware of the trouble spots, the nature of congestion fluctuates so much, you might not know exactly where to



expect backups and still be surprised," Wiles says. "And our study of the DFW freeways confirms that in some cases, the queue would grow so fast that drivers could have a hard time reacting to it."

Finding an effective and feasible early warning system for these areas is expected to increase the safety of those who must drive these routes every day. Previous research has concluded that with one second of additional warning time, about 90 percent of rear-end crashes could be avoided. And with half a second more warning time, 60 percent could be avoided.

The research team has evaluated a number of early warning devices, such as detectors, signs and message boards, found across the U.S. and as far away as Europe and New Zealand. They are now testing two of these devices on metroplex freeways. One of the devices being tested is shown in the center page illustration. Researchers will eventually make a final implementation recommendation based on results of the testing.

"We need to know how far in advance drivers should be warned of stopped or slow traffic," says Jay Nelson, TxDOT's Dallas District Engineer. "It serves not only the safety purpose of giving people warning that there's going to be slow or stopped traffic, but it also helps relieve congestion when people are informed of a closure far enough ahead that they can take a valid alternate route."

TTI's testing of the warning devices in the Dallas-Fort Worth area will conclude this fall. The results should be published in 2004. **R**

MORE INFORMATION

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RELATED PROJECT: *Advanced Warning of Stopped Traffic, Project 0-4413.*

TIMING IT

TTI researchers test new PASSER V software

RIGHT

Most drivers have experienced the frustration of sitting in their vehicles waiting for a traffic signal to turn green, then progressing through the intersection only to be stopped at the next light. Uncoordinated signal timing not only raises the collective blood pressure of drivers, it may result in poor traffic flow that causes long lines and delays and contributes to poor air quality. For example, when a car slows to a stop at a red light, idles and then accelerates when the signal turns green, it consumes excessive fuel and emits more pollutants than it would if it were continuously moving.

A number of computer programs are available to assist city and traffic engineers in arterial signal timing projects. Recently, researchers at the Texas Transportation Institute (TTI) examined three types of traffic signaling software: PASSER II, Synchro and TRANSYT 7F. The objective of the two-year project, sponsored by the Texas Department of Transportation (TxDOT), was to develop guidelines for selecting the proper program for use in signal timing projects.

“The computerization of the traffic signaling process makes it easier to program them, especially when you have to coordinate multiple signals,” says Nadeem Chaudhary, research engineer with TTI and lead researcher on the project. “It takes a great deal of expertise and planning to coordinate the traffic signals just by watching them, so that’s why software is used.”

The researchers compared the three programs by conducting a total of 1,300 simulation runs using CORSIM, a traffic simulation program. These results identified the two best programs, PASSER II and Synchro. Then, the research team performed an additional 400 optimization and simulation runs using these two programs to further analyze their performance. Their results showed that for optimal arterial operations, both Synchro and PASSER II outperformed TRANSYT 7F by producing better progression bands and timings with the least delay.

Another objective of the research was to develop an enhanced version of the PASSER II program, which was developed by TTI researchers a number of years ago in

another TxDOT-funded project. The result of the effort is the new PASSER V program, which provides advanced capabilities for a new Windows-based graphical user interface and improved optimization and analysis algorithms for arterials. In addition, PASSER V also provides



Uncoordinated traffic signals may result in congestion.

a capability similar to PASSER III for timing signalized diamond interchanges.

TTI is currently conducting training courses for TxDOT districts throughout the state on how to use the new PASSER V software.

“We’ve used the new PASSER V software program to coordinate traffic signals in Grapevine and Carrollton with very positive results and feedback from the traffic engineers,” says Rohit Parikh, assistant director of traffic operations at TxDOT and project director.

Poorly timed signals can lead to roads not being used to their full capacity. Roadway capacity is a perishable good—if a road is not at full capacity, that excess capacity is lost. By optimizing signal timings and coordinating signals along a roadway, traffic flow and roadway capacity improve, causing a decrease in travel time, gasoline consumption and vehicle emissions. **R**

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RELATED MATERIALS: **Report 4020-1, Software for Timing Signalized Arterials.**

Making Texas Roadways SAFE

According to the National Highway Traffic Safety Administration, in 2001, 2,248 drivers died on Texas roadways, placing the state first nationally.

Created by the Texas legislature in 2001, the Center for Transportation Safety (CTS) at the Texas Transportation Institute (TTI) is striving to lower this troubling statistic by reducing the toll taken by traffic crashes, injuries and deaths.

CTS is achieving this mission through a combination of research, education and outreach initiatives. CTS has strong research skills in the areas of statistical analysis of crash data and crash modeling, survey research, man-machine interactions (human factors) and policy review and analysis. Its educational and outreach initiatives include undergraduate and graduate student training, as well as workshops on public health and traffic safety and on the drunk driving problem in Texas.

STAFF AND SPONSORS

The Center has a staff of 27 full- and part-time researchers and policy analysts, plus 20 student technicians, and is currently conducting about \$2.5 million in research projects. In addition to TxDOT and the National Highway Traffic Safety Administration (NHTSA), other research clients include the Federal Highway Administration, Southwest Region University Transportation Center and the AAA Foundation for Traffic Safety.

STATE-OF-THE-ART DRIVING SIMULATOR

Among its other capabilities, CTS also possesses a state-of-the-art fixed-based driving simulator that can be used to conduct driving research, such as studies of alcohol-impaired driving and of the dangers posed by driver inattention and distraction that are too dangerous to conduct on the road.

SAFETY-RELATED POLICY REVIEWS

During its first 20 months, CTS has conducted a number of policy reviews, including studies for the Texas Department of Transportation on:

- ▶ pavement-related motorcycle crashes,
- ▶ safe routes to school for children,

- ▶ the pros and cons of different speed limits for cars and trucks in Houston,
- ▶ crash reduction factors, and
- ▶ crash countermeasures for two-lane rural roads.

CTS also initiated a major policy review of the red light running problem and appropriate countermeasures. In March 2002, it sponsored a national symposium on traffic crashes as a public health problem. And in November, it hosted a groundbreaking workshop on blood alcohol concentration (BAC) testing in Texas, which identified a number of reasons for the low-level of BAC testing of drivers involved in fatal crashes. For NHTSA, the Center evaluated the effectiveness of the highly successful *Click It or Ticket* safety belt use initiatives conducted in Texas over the 2002 Memorial Day and Thanksgiving weekends (see page 7). 



Safety center at TTI introduces new website and e-newsletter

CTS recently launched a new website aimed at providing the public with information on transportation safety. The website has links to crash statistics in Texas, press releases and information on CTS. Also featured is a safety e-newsletter, which can be sent via e-mail to those who subscribe. According to Center Director Dave Willis, the newsletter is intended to communicate information about important traffic safety issues and the work CTS and others are doing to address these issues proactively and effectively.

The URL for the website is <http://tti.tamu.edu/cts/>.

To subscribe to the e-newsletter, visit <http://tti.tamu.edu/cts/newsletter/subscribe.asp> or send an e-mail with your first name, last name, affiliation and e-mail address to SafetyNews@ttimail.tamu.edu.

TTI research shows more Texans



BUCKLE UP

Recent surveys administered by the Texas Transportation Institute (TTI) yielded some great news about Texas drivers: the *Click It or Ticket* seat belt enforcement campaign had a positive influence on the use of safety belts in the state.

The project, funded by the Texas Department of Transportation (TxDOT), found that 81 percent of Texas drivers buckled up, compared with the 2001 rate of 76 percent. This represents a 5 percentage point increase thanks to the *Click It or Ticket* outreach campaign.

The news is especially good when considering the following statistics:

- ▶ For every percentage point that safety belt use increases in Texas, on average 25 lives will be saved and 586 fewer people will be injured in traffic crashes.
- ▶ Increasing safety belt use from the current rate of 81 percent to 85 percent would produce annual economic savings of \$280 million.
- ▶ Research shows that when a driver is buckled, children are buckled 87 percent of the time.

Click It or Ticket is a joint venture between the Texas Department of Public Safety, TxDOT and hundreds of police and sheriffs' departments throughout Texas for the purpose of enforcing the state's occupant protection laws for adults and children. The program is supported by the National Highway Traffic Safety Administration (NHTSA), Federal Highway Administration and the National Safety Council/Air Bag and Seat Belt Safety Campaign, who also sponsored similar seat belt enforcement campaigns in 12 different states.

In 2002, the enforcement periods for the campaign occurred during the Memorial Day and Thanksgiving holiday weekends. In addition to statewide enforcement activities and media coverage, 10 urban areas received intense concentrations. TTI conducted observational surveys before, during and after the campaign in these areas to determine whether safety belt use increased as a result of public education and enforcement efforts.

"The 10 urban areas were of particular interest to TxDOT because they account for the majority of the population of the state," says Katie Womack, the TTI researcher who led the survey project. "So their thinking was that if



Carol Coker, of TTI's Survey Research Group, conducts an observational seatbelt survey.

safety belt use in those 10 areas could be increased, then safety belt use across the state overall would increase."

The campaign kicks off its second year this May with the goal to raise the safety belt use rate from 81 to 85 percent. This year the program will expand its community outreach and advertising to help reach the infrequent belt user that may not believe buckling up will save their life.

According to Chris Willrich, Occupant Protection Program Manager at TxDOT, "TTI and Ms. Womack's excellent work on the *Click It or Ticket* in-depth evaluation project, as well as the statewide observational surveys project, is a major contribution to Texas' success in this campaign to save the lives of the citizens of our great state." **R**

MORE INFORMATION

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RELATED PROJECT: *Evaluation of the Texas Click It or Ticket Campaign.*

TEEN DRIVING SAFETY

TxDOT, San Antonio high schools and TTI develop a unique teen driving safety campaign

Traffic crashes are the leading cause of death for teens 15 to 19 years old. Nationwide, more than 5,700 teens died in vehicle crashes during 2001—that is more lives lost than Pearl Harbor and September 11, 2001, combined, and it continues to happen

every year. In San Antonio, 10 teens were killed in car crashes in just a six-week period in 2001. Four of those students attended William H. Taft High School.

The Texas Department of Transportation (TxDOT)—San Antonio District is trying to break these trends. The District launched the state's first-ever driving safety campaign designed for teens by teens this spring. The campaign is the product of a six-month effort involving the students from Taft, with guidance from TxDOT and the Texas Transportation Institute (TTI).

Over a year ago, TTI and TxDOT approached Taft High School officials with an innovative plan to prevent teen driving tragedies: a peer-to-peer driving safety campaign. With the help of Taft High's principal, Harold Maldonado, the project was initiated. In order to measure effectiveness, the Clark High School student body was then recruited to act as the control group.

TTI researchers began by conducting more than 2,000 surveys at the schools to measure risk factor awareness of students and parents. Researchers, TxDOT staff and school officials found the results disturbing, indicating the need for an educational campaign. A team of some 25 students was recruited to help develop the campaign. The team created the name "Project YIELD"—Youth Informing Every Living Driver. The "Careless Driving Is Life Depriving" campaign is a result of their creative work. Students developed a logo that has helped to shape the identity of the project.

"We believe one critical element has been missing from other driving safety campaigns for young people," says Ximena Copa-Wiggins, public information officer for TxDOT—San Antonio District, which funded the project. "Previous campaigns have not involved the target audience from beginning to end—and that's what we've done with Project YIELD. Every part of this campaign has been inspired or influenced by the students on our team."

The campaign involved daily announcements during the week before Spring Break, posters, pamphlets, flyers and an interactive website. The centerpiece of the campaign was a three-minute video written by the students

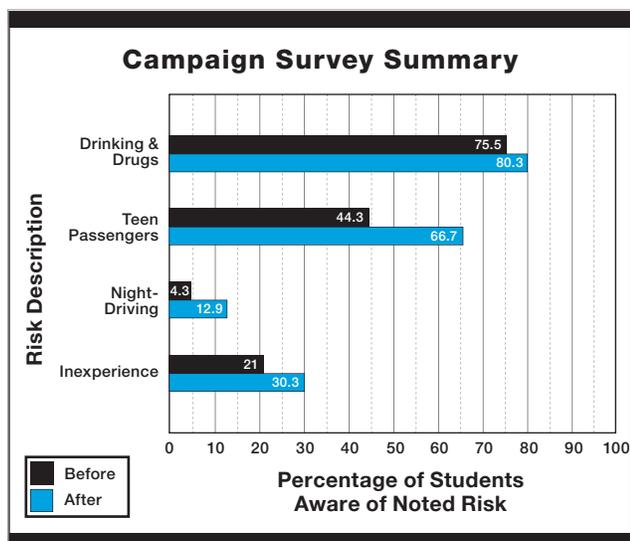


(who also acted in the video) and produced by TTI. The campaign was built around the five most common risk factors for teen drivers: nighttime driving, lack of driving experience, the presence of teen passengers, risky behavior (speeding and not wearing a safety belt) and alcohol and drug use.

Researchers found the post-campaign survey results for Taft to be quite remarkable with drastic increases in awareness of all the risk factors. In comparison, awareness at Clark High School (the control group) actually decreased.

“The results are certainly encouraging. Clearly, the campaign made a positive impact,” said Russell Henk of TTI’s San Antonio Office. “The scientific approach used to assess the project provides us many worthwhile insights. We’ve learned valuable lessons that will help us improve the program as we move forward.”

The strength and diversity of the team contributed to the success of the campaign. Key components of the project included strong support from TxDOT San Antonio’s Public Information Office, a core group of dedicated and creative students at Taft High School, along with strategic guidance and production support from TTI. The TTI team consisted of researchers from the Institute’s San Antonio Office and the Center for Transportation Safety, along with public affairs staff, video producers and graphic artists—all working together to make this project successful. The project team plans to expand the program to more schools in San Antonio and throughout Texas. **R**



PROJECT Y.I.E.L.D. RECOGNIZED BY TEXAS LEGISLATURE

In the wake of its launch, Project Y.I.E.L.D., the state’s first-ever teen-developed awareness campaign aimed at making the streets and highways safer, got an additional boost from the Texas Legislature. State Rep. Ken Mercer and State Rep. Jose Menendez, both of San Antonio, welcomed the students and sponsors to the floor of the House of Representatives on March 27, where House members passed a resolution introduced by Rep. Mercer to honor their efforts. Rep. Mercer also presented a recognition certificate to each team member. “This creative effort is distinguished by its unique peer-to-peer approach,” said Mercer.

The resolution read in part, “The House of Representatives of the 78th Texas Legislature hereby recognize the students of Project Y.I.E.L.D., along with their state agency partners for their innovation, dedication and important contribution.” Agency partners included the Texas Department of Transportation—San Antonio District Public Information Office and Texas Transportation Institute researchers and communications professionals. Later in the day, the team met with Governor Rick Perry to receive his congratulations and pose for group photos. The students were honored once again at a school assembly the following day.

David Martin, of TTI’s Information and Technology Exchange Center, teaches video editing techniques to students from Taft High School.



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STOP! Running that red light could be deadly!

Research to produce a handbook of engineering solutions

According to the Insurance Institute for Highway Safety, Texas has the fourth highest rate of red-light running deaths per 100,000 persons in the nation. Figures compiled from 78 cities nationwide between 1992 and 1998, show Dallas is ranked as the seventh deadliest city. Corpus Christi ranks 13th, Austin 16th, Houston 21st and El Paso 28th.

James Bonneson, Texas Transportation Institute (TTI) research engineer, is in the middle of a two-year research project sponsored by the Texas Department of Transportation (TxDOT) aimed at reducing red-light running.

At the busiest intersections in several Texas cities, TTI has documented violations occurring every six minutes, or about every third traffic signal cycle. At an average intersection, red-light violations happen about every 25 minutes or every 17th traffic signal cycle.

But a busy intersection does not necessarily mean a dangerous intersection. "I can show you a busy intersection with a high number of red-light runners. But it might be a relatively 'safe' intersection when you factor in traffic volume and look at the crash history. That's why this study is so important. We need to help engineers identify dangerous intersections and offer them a variety of solutions," Bonneson says.

At the end of the research project, TTI will publish a comprehensive technical handbook to help state and local traffic engineering departments identify, implement and evaluate engineering-based solutions. It is believed that the use of this handbook will reduce red-light violations and thereby the need for camera enforcement.

"Engineering solutions are a very important and useful aspect of controlling red-light running because they can be used full time, while law enforcement resources are limited," says Wade Odell, a Research Engineer in TxDOT's Research and Technology Implementation Office who is directing the research project.

Survey findings reported by Bonneson indicate that the three most commonly used engineering countermeasures include:

- ▶ improving visibility of signal heads,
- ▶ adding "Signal Ahead" signs for "hidden" intersections, and
- ▶ improving signal operation or coordination.

Another countermeasure often considered is to increase the yellow duration. Typical yellow durations range from 3 to 5 seconds, with larger values in the range being used for higher speeds. Small increases in the yellow duration, provided the resulting value is within this range and



A camera installed at an intersection captures a vehicle running a red light.

appropriate for the speed, are often effective at reducing the red-light violations that occur during the first few seconds of red.

Despite some concerns over privacy, more than a dozen states and 70 cities have passed laws approving the placement of intersection cameras that take a snapshot of red-light runners. Tickets are then sent in the mail. Cameras have been found to reduce violations by up to 40 percent at the treated intersection, and they can have a "halo" effect by reducing violations at nearby untreated intersections. In Texas, lawmakers have considered the use of cameras, but the legislation failed to pass.

"We can make a significant impact in red-light running using our resources as engineers," says Bonneson. A public awareness campaign to educate drivers on the hazards of red-light running and the periodic, city-wide implementation of an intersection traffic control enforcement program are options that deserve consideration as well.

The TTI research project will be complete in August 2004, and Bonneson hopes to have the red-light running handbook available to TxDOT traffic engineers by January 2005.

"We're anxious to complete this handbook because we believe it will be an effective tool in the reduction of red-light running," Odell says. "I believe local agencies will be receptive because there are no other guidelines containing a comprehensive list of engineering countermeasures." **R**

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RELATED PROJECT: *Safety Impact Red-Light Running in Texas: Where is Enforcement Really Needed, Project 0-4196.*

YOUNGER OLDER & DRIVERS

Where are the greatest crash risks?

Research shows that there is a higher probability that older and younger drivers may be involved in a fatal crash compared to drivers in other age groups (see line chart). But what's the difference between crashes that involve these demographic groups and those that involve other drivers?

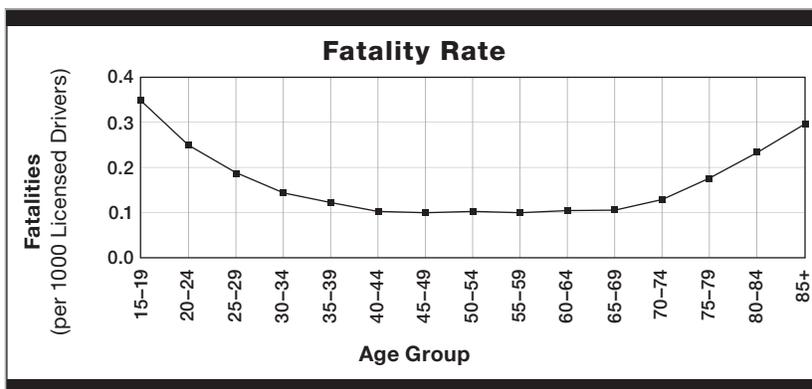
This question prompted the Texas Department of Transportation (TxDOT) to sponsor research conducted by the Texas Transportation Institute (TTI) to compile and review five years of fatal crash data in Texas. The goal of the project was to develop a database detailing the locations and the types of crashes involving younger and older drivers in the state from 1995–1999.

“Problems encountered by many younger and older drivers are well documented. Some of these difficulties arise from inexperience on the part of young drivers and from the realities of the aging process among older drivers,” says Val Pezoldt, research scientist with TTI who led the project. “We wanted to examine the extent to which the known differences among drivers of different age groups are reflected in the circumstances of fatal crashes.”

The database was developed using information from TTI's crash record system, which is based on the accident files developed and maintained by the Texas Department of Public Safety and roadway information from TxDOT. The researchers then assigned each crash to one of three groups based on the driver's age at the time of the crash: 14–20 years old, 21–64 years old, and 65 years old and older.

The project pooled five years of data to increase the sample size available for examining crash variables and to lessen the influence of conditions that may be specific only to a particular year, such as weather conditions or the introduction of new enforcement efforts.

In addition to segregating the crashes by age group, TTI researchers used 24 variables including environmental and road conditions and a wide range of contributing factors to analyze the data. For each variable, three measures of crash involvement—magnitude, proportion



and relative likelihood—were summarized as a function of driver age.

Researchers found that younger drivers with at least two other persons in the vehicle with them were significantly more likely to have died in crashes—almost exactly twice as likely as among 21–64 year-olds. Drivers under the age of 21 were also nearly three times more likely to have been unlicensed at the time of the crash than 21–64 year-olds.

The researchers found even more differences in the characteristics of drivers 65 and older relative to 21–64 year-olds. Older drivers were:

- ▶ nearly two and a half times more likely to have disregarded a stop sign/light or signal,
- ▶ almost six times more likely to have failed to yield right of way, and
- ▶ about three times as likely to have died in crashes in which two vehicles were approaching at an angle.

“Young and older drivers statistically appear to have a higher fatality rate per capita than other drivers,” says Bill Strawn, TxDOT traffic planner who directed the project. “We need more information to help determine appropriate methods to decrease the involvement of older and younger drivers in traffic crashes.” **R**

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RELATED PROJECT: *Older and Younger Driver Crash Risk Scenarios in Texas.*

SMART GROWTH in TEXAS

TTI researchers examine strategies and potential benefits

Imagine waking on a Sat-

urday morning to the aroma of baking bread. Minutes by foot from your front door are your favorite bakery and coffee shop, newspaper stand and a beautifully landscaped little park. Your dry cleaning awaits just two doors down. If you lived in a “smart growth” neighborhood, you’d be at home.

Smart growth neighborhoods, sometimes called “livable communities,” are defined by their planned use of space, emphasizing attractive, landscaped neighborhoods, conservation of open space, a complementary mix of residential and commercial properties and an open, comfortable design that promotes walking, bicycling and transit use.

“Smart growth does not and should not mean the absence of growth,” says Brian Bochner, a senior research engineer for the Texas Transportation Institute (TTI). “Rather, it is a basis for planning where, when, and what type of growth should occur to maximize the long-term vitality of the community. Transportation is a key element of smart growth.”

TTI researchers examined the potential benefits of smart growth planning in Texas in a study sponsored by the Texas Department of Transportation (TxDOT). The research project, directed by Jenny Peterman, transportation planner for TxDOT, resulted in the development of a research report named *Introducing Smart Growth in Texas*, a primer on smart growth, a workshop presenter’s guide and participants’ workbook and a PowerPoint presentation to support the workshop.

“Cities could experience some general cost savings by implementing these strategies, because smart growth helps preserve resources,” Peterman says. “But I think the greatest benefit will be in health, due to reduced vehicle miles traveled and improved air quality.”

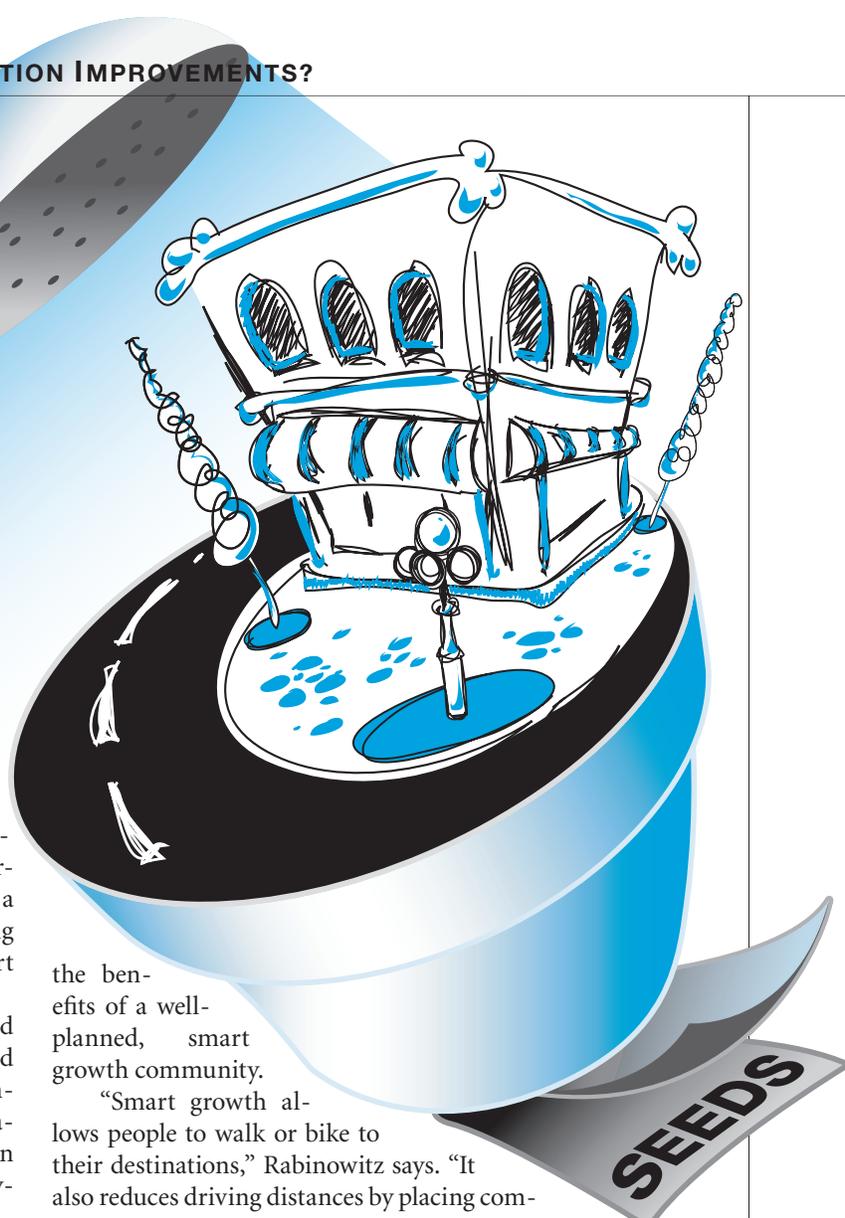
According to Robin Rabinowitz, an assistant transportation researcher at TTI, improved air quality is one of

the benefits of a well-planned, smart growth community.

“Smart growth allows people to walk or bike to their destinations,” Rabinowitz says. “It also reduces driving distances by placing complementary land uses near each other and providing more compact communities.”

Whereas conventional street patterns sometimes make it difficult for pedestrians, a smart growth plan allows for wide sidewalks, safe crosswalks and other treatments that promote convenience, safety and aesthetic appeal. A comfortable, safer walking environment encour-

Apartments above offices and retail merchants, known as live-work units, in The Kentland subdivision in Gaithersburg, Maryland.



ages people to leave their vehicle at the curb and instead grab their bike or walking shoes. Using these and other smart growth street and development patterns can reduce the need for additional, costly infrastructure projects.

Planning compact, mixed-use communities that encourage walking and transit and offer a sense of neighborhood isn't easy. Transportation professionals, policy makers, metropolitan planning organizations (MPOs), architects, lenders and many other professionals are often involved in planning a smart growth community. Multi-agency involvement and citizen participation in the planning process helps ensure that these well-planned communities accomplish transportation and city objectives while providing a comfortable environment for living and working.

The next step to implementing this research is to further introduce smart growth strategies in Texas through a series of workshops. TTI researchers will conduct the workshops for TxDOT, MPO employees, other civic and transportation professionals and community members.

"It takes a lot of coordination and commitment to make smart growth happen," says Bochner. "And although it takes time to implement and achieve the bene-



A multimodal DART transit station in Plano, Texas, that successfully integrates bike, bus, light-rail and pedestrian traffic.

fits of smart growth, some residents in communities are saying they would rather do it right than do it fast." **R**

MORE INFORMATION

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RELATED MATERIALS: Report 4238-1, *Introducing Smart Growth to Texas: Research Report*, and Project Summary Report 4238-S, *Introducing Smart Growth to Texas*.

Planning strategies in practice

THE PROBLEM

In the decade between 1990 and 2000 the City of Austin's population swelled from 465,000 to more than 650,000. Austin's population is expected to grow by 19,000 people per year to more than 800,000 by 2010. The soaring population brings increased traffic congestion and declining air quality to a city already stretched to deal with these challenges. Smart growth planning strategies are at the forefront of efforts to accommodate this level of growth and reverse the trend of busier streets and smoggier skies.

THE PLAN

Planners are using smart growth techniques to determine how and where the city grows. Classic, smart growth strategies such as compactness of multi-use space, landscaping, and an emphasis on transit, walking and biking, are being implemented. Austin planners have created Desired Development Zones (DDZ) to define areas within the city targeted for development or redevelopment. Planners use a Smart Growth Matrix to determine how well the development fits into the city's overall smart growth plan, based on key qualities such as:

- ▶ location/proximity to transit,
- ▶ pedestrian facilities and design characteristics,
- ▶ compatibility with nearby neighborhood plans, and
- ▶ potential to increase tax base and others.



Desired Development Zone (DDZ) in downtown Austin, Texas.

Developers with plans that rate highly in these characteristics are often offered incentives, such as fee waivers, expedited plan review and transportation improvements. These incentives create an economic draw for employers and a positive political buzz for all concerned.

THE RESULTS

Austin is enjoying the many benefits of smart growth. Infill and redevelopment is taking place within the DDZ on the south and west sides of the downtown business district. Proper planning enables employees to live within walking or biking distance of the office, and the amount of housing in the downtown area is on the rise. Some residents have given up their vehicles altogether, which decreases congestion and contributes to better air quality. **R**

FOR MORE INFORMATION: <http://www.ci.austin.tx.us/smartgrowth/incentives.htm>; and Bochner, Brian S., et al., Report 4238-1, *Smart Growth Texas Style*, pages 41-42.

The Future of Freeways

Research identifies strategies for developing managed lanes

Rising construction costs, land consumption, neighborhood impact and environmental issues are all factors that must be considered when examining transportation alternatives, particularly on our freeway systems. There is a growing realization that simply adding more general-purpose lanes to freeways is not always the answer to increasing mobility and travel efficiency. A viable and increasingly popular method for meeting urban mobility needs is the concept of “managed” lanes.

Managed lanes maintain free-flow travel speeds on the designated lanes by allowing only eligible user groups on those lanes through management strategies such as setting vehicle-occupancy levels, pricing and vehicle types. These eligible user groups can vary by time of day or other factors, depending on available capacity of the facility, as well as the mobility needs of the community.

Some regional transportation agencies have made a public policy decision to proceed with multiple managed lanes projects, and managed lanes are options in major investment studies underway in Texas and across the country. Because the managed lanes concept is so new, and the experience base is so small, the Texas Department of Transportation (TxDOT) began a major research project in September 2000 to examine planning, designing and operating successful managed lanes. As the project nears the end of its third year, Texas Transportation Institute (TTI) researchers have already completed a number of tasks providing direction to the Department and others interested in managed lanes.

“There are so many things to consider at all stages of a managed lanes project, but getting started can be particularly challenging,” says Beverly Kuhn, one of the TTI research supervisors of the effort. “With so many agencies and stakeholders involved, and with all of the ideas and strategies that are possible, the groundwork has to be in place before a successful project can become a reality.”

TTI research results in three areas key to laying that groundwork are now being implemented:

- ▶ **Passing legislation to ensure legal authority to develop projects.** Some of the results of the legislative research (See TTI Research Report 4160-8) are currently being implemented in various forms in the 2003 legislative session in Texas to ensure that TxDOT has the authority to implement any potential managed lane strategy.
- ▶ **Educating to gain support from the public and policy makers.** TxDOT is using the education brochures developed for the media and policymakers to communicate the objectives and advantages of managed lanes (See TTI Research Reports 4160-7, 4160-5-P1, and 4160-6-P2).
- ▶ **Funding and financing to overcome barriers to implementation.** New financing options for TxDOT are being considered in the current legislative session in Texas (See TTI Research Report 4160-9).



Managed lanes provide travelers with more choices than driving alone on a congested freeway.

“The research results from this project have come at the perfect time,” says Carlos Lopez, TxDOT Traffic Operations Division director and project director. “Their timely implementation will go a long way towards helping TxDOT plan and design managed lanes to serve the mobility of Texans in the future.” **R**

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With any project, using the right tool can make all the difference in the world.

Transportation projects are among the most complicated, expensive undertakings in society, and the right decision-making tool can be a transportation professional's best friend. A powerful, new version of Transportation Decision Analysis Software (TransDec 2.0) promises to give transportation planners the ability to solve the proverbial problem of comparing apples to oranges.

One of the most difficult tasks in planning for transportation projects is weighing, ordering and comparing the increasingly disparate options and considerations one may face in a road, rail, air or waterway project. How valuable is air quality as compared to an aesthetic landscape, lives saved or a quick commute to work?

TransDec 2.0, updated to perform on modern and future Windows® operating systems, is able to harness elements such as these and allows planners to analyze a wide range of potential projects with all the varying considerations that occur in the real world. According to Steve Roop, director of the Texas Transportation Institute's (TTI) Multimodal Freight Transportation Program, this updated version of TransDec is sponsored by TTI and will be distributed free to anyone who has the original version.

TTI and Ken Opiela, formerly of the Transportation Research Board, developed TransDec 1.0. Opiela, now with the Federal Highway Administration, helped create the original software project for the National Cooperative Highway Research Program.

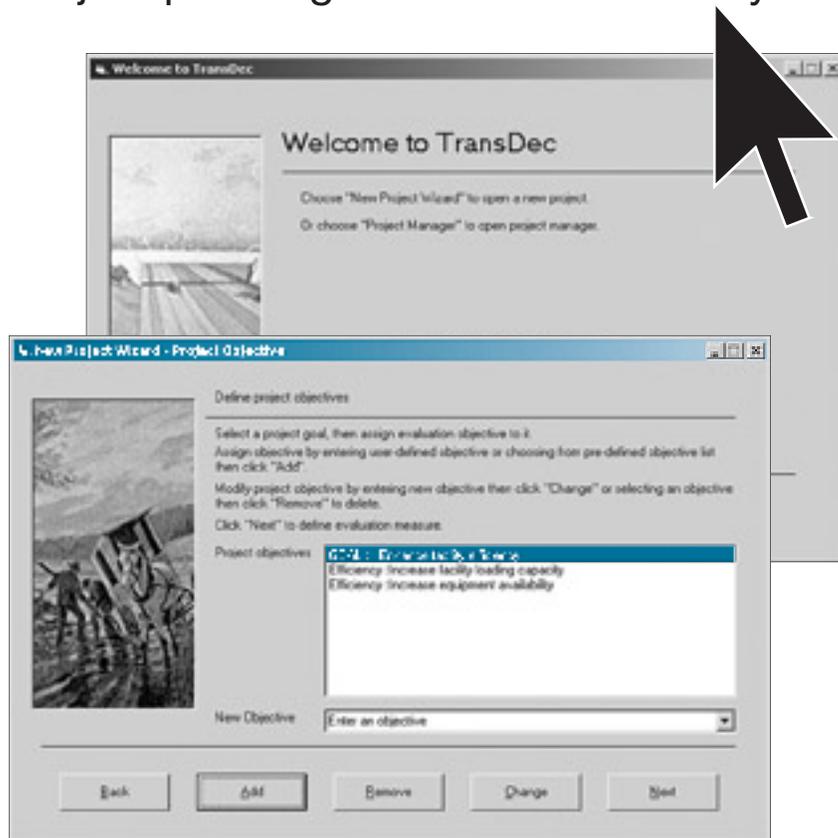
"TransDec 2.0 is a consensus building tool," says Roop. "The software is designed so that the stakeholders on a project can agree what factors should be considered, what measurement scales you should use and what the relative weighting of each factor should be. It's very open, visible and public."

TransDec allows anyone making transportation decisions and comparing alternative projects or approaches to arrive at a decision based on sometimes unrelated criteria. Thus, budgets can be allocated more effectively across projects.

On the horizon of TransDec software development is version 3.0, which incorporates an artificial intelligence (AI) aspect that may prove useful to transportation decision makers.

TransDec 2.0

Project planning decisions made easy



The TransDec 2.0 interface allows users to define their project objectives.

"It's an experimental foray into decision-making," says Roop. "The AI approach in 3.0 is an attempt to mirror human decision-making processes that are often-times not overt and observable."

Whereas the multi-criteria approach in 2.0 is designed to be a consensus-building tool, the AI approach would use complex mathematical algorithms, called fuzzy logic, to approximate the "gray area" that humans sometimes encounter when making decisions.

Roop says TransDec 2.0 will be available in the summer of 2003. **R**

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TEXAS TRANSPORTATION HALL OF HONOR

Four distinguished Texans honored for contributions to state's transportation system

Four men who represent the political, administrative, research and construction professions that produced the state's modern transportation system were recognized on Monday, April 14, 2003, when they were inducted into the Texas Transportation Hall of Honor.

Honorees include:

- ▶ The Honorable Dolph Briscoe Jr., former governor of Texas,
- ▶ B.L. DeBerry, former engineer-director of the State Department of Highways and Public Transportation (now the Texas Department of Transportation),
- ▶ The late Charley V. Wootan, director emeritus of the Texas Transportation Institute, and
- ▶ The late H.B. Zachry, founder of the H.B. Zachry Company.

Briscoe and DeBerry accepted their honors during a ceremony in Austin on Monday, Wootan's honor was accepted by his wife, Doxie, and Zachry's honor was accepted by his son, H.B. Zachry, Jr.

The Texas Transportation Hall of Honor, established in 2000, recognizes those visionary leaders who have

helped to provide Texas with an outstanding transportation system.

"The Hall of Honor is intended to recognize that small group of people whose exceptional leadership

and vision made possible the outstanding transportation system we enjoy today in Texas," TTI Deputy Director Dennis Christiansen said in announcing the inductees. "We are proud and thankful to recognize these four great leaders for what they have given to the people of Texas and the nation."

Other transportation leaders joining Christiansen in the recognition ceremony included: John W. Johnson, Commissioner of Transportation for the State of Texas, Tom Johnson, executive vice president of the Associated General Contractors of Texas; Mark Goode, retired TxDOT engineer-director; Doug Pitcock, chairman of Williams

Brothers Construction; and Marcus Yancey, retired deputy engineer-director of TxDOT. ■



TTI Deputy Director Dennis Christiansen announces the Hall of Honor inductees.



(L-R): H.B. Zachry, Jr.; Doxie Wootan; B.L. DeBerry; Dolph Briscoe, Jr.

HALL OF HONOR

2003 INDUCTEES



DOLPH BRISCOE JR.

During his long and distinguished political career, Dolph Briscoe (UT '43) served in the Texas Legislature from 1949 to 1957 and was governor from 1973 to 1979. As an elected leader, he pursued a goal of building and funding an extensive highway system.

In 1949, Representative Briscoe was co-sponsor of the Colson-Briscoe Act. Funded by a special appropriation, this act provided for the construction of a network of paved roads in rural areas to get the "farmer out of the mud." The farm-to-market system now makes up over half of the TxDOT system, and it helped to conquer the vastness and deep isolation of rural Texas.

As governor, in 1975 he signed legislation merging the Texas Mass Transportation Commission into the Texas Highway Department, creating the State Department of Highways and Public Transportation. To cope with the impacts of inflation and inadequate highway funds, in 1977 the governor developed and led a proposal, which was enacted by the Legislature, addressing these concerns.

A distinguished alumnus of The University of Texas, Governor Briscoe has been inducted into both the Texas Business Hall of Fame and the Texas Good Roads and Transportation Association's Hall of Honor. ■



B.L. DEBERRY

Luther DeBerry (UT '37) began work for the Texas Highway Department following his graduation. He became District Engineer in Lufkin and Dallas and was named Assistant State Highway Engineer in 1968. He became the head of the department in 1973 and retired as Engineer-Director in 1980.

Mr. DeBerry guided the department through a challenging period of significant change. During his tenure, an Arab oil embargo and budget cuts led to drastic employee reductions and reorganization, and the Texas Mass Transportation Commission was merged into the department to create the State Department of Highways and Public Transportation.

His leadership and administrative skills guided the department through this difficult period. He was an early advocate of promoting all modes of transportation, saying: "We are not in the highway business. We are in the transportation business." Mr. DeBerry was widely recognized as a man who represented both change and excellence through instituting unified planning and fostering a multimodal transportation program.

He received AASHTO's highest award and was named as a distinguished engineering graduate of The University of Texas. In 1980, TxDOT established the Luther DeBerry Award to honor individuals in transportation organizations who make the greatest contributions to Texas. ■



CHARLEY V. WOOTAN

Charley Wootan (A&M '50) joined the Texas Transportation Institute in 1956, and his career with TTI continued until his death in 2001. He became TTI's director in 1976, serving in that capacity for 17 years. Upon his retirement in 1993, Dr. Wootan was named Director Emeritus by The Texas A&M University System Board of Regents.

Dr. Wootan was very instrumental in growing the TxDOT cooperative research program from a brilliant concept to a nationally recognized program of excellence, and he became a respected national spokesperson for the value of transportation research. One of the founders of the Council of University Transportation Centers, Dr. Wootan became CUTC's first president in 1979. Dr. Wootan was actively involved with the Transportation Research Board for over 40 years and was TRB chair in 1983. Dr. Wootan was the recipient of numerous awards given by state and national organizations to recognize his contributions to both transportation and research.

Under Dr. Wootan's leadership, TTI became the largest and one of the most highly regarded university-affiliated transportation research organizations in this country. In recognition of his contributions to both transportation and the agency, TTI chose to name its most significant employee recognition in honor of Dr. Charley Wootan. ■



H.B. ZACHRY

H.B. "Pat" Zachry (A&M '22) founded the H.B. Zachry Company in Laredo in 1924. He would lead this construction company for six decades, serving as president (1924-1945), chairman and CEO (1945-1965) and chairman of the board from 1965 until his death in 1984.

Mr. Zachry's vision and leadership made a lasting impact on Texas transportation. In addition to undertaking some of the largest transportation projects in Texas, the Zachry Company built highways, bridges, airstrips, dams, power plants and pipelines around the world.

Mr. Zachry served as president of the Associated General Contractors of America. His many honors included being named a distinguished alumnus of Texas A&M University, where he also chaired the Board of Regents. The university further recognized Zachry's contributions by naming its Engineering Center for him in 1972. Mr. Zachry was inducted posthumously into the Texas Business Hall of Fame in 2000.

H.B. Zachry's legacy is more than an impressive catalog of projects; he was known as a man of honesty, integrity and generosity. In the words of former Governor Briscoe: "Mr. Zachry was truly one of the greatest Texans of all time... No one has made a greater contribution to his fellow man." ■

TTI Student Employees Receive Honors

TY THOMPSON, a graduate research assistant with the Operations and Design Division and **JONATHAN TYDLACKA**, a graduate research assistant with the System Management Division, were awarded Kimley-Horn Scholarships for 2002–2003. Thompson and Tydlacka are currently pursuing Master of Science degrees from Texas A&M University in Civil Engineering under the supervision of Dr. M. Burriss and Dr. L. Rilett, respectively. Kimley-Horn and Associates, Inc. is a national engineering consulting firm with over 40 offices nationwide.

JACQUELINE JENKINS, a graduate research assistant with the Human Factors Group at TTI, has been selected for a 2003 ENO Fellowship. As part of the fellowship, in May she attended the 2003 Leadership Development Conference in Washington D.C. Held annually, this week-long program brings 20 top students from colleges and universities around the country to Washington D.C. for a first-hand look at how national transportation policy is decided and implemented. Ms. Jenkins is pursuing a Ph.D. degree in the Department of Civil Engineering at Texas A&M University under the supervision of Dr. L. Rilett. She is planning on completing her studies in August 2003.

ANNA GRIFFEN was awarded the 2002 William R. "Dick" McCasland '55 Fellowship based on her excellent

academic record and her involvement in the ITE student chapter. She received her Masters of Engineering degree in the Department of Civil Engineering this past December and is currently working in Austin, Texas, for the City of Austin.

GRANT SCHULTZ, **LELITHA VANAJAKSHI** and **TERESA QU**, have received invitations to participate in the Integrative Graduate Education and Research Traineeship (IGERT) "What will move you?" Student Research Conference, June 26–27, 2003, at the University of California, Davis. All three are pursuing Ph.D. degrees in the Department of Civil Engineering at Texas A&M University under the supervision of Dr. L. Rilett. IGERT is a National Science Foundation - funded endeavor that was initiated in 1997 to showcase the research of graduate students involved in advanced transportation technologies. The students will receive a stipend that will cover their travel, room and board. All three are employed as Research Assistants with the Texas Transportation Institute. The titles of their papers are:

- ▶ Estimating the Impact of Freeway Speed Limits on Automobile Emissions (Teresa Qu);
- ▶ The Use of ITS Technologies to Develop Distributions for Commercial Motor Vehicles (Grant Schultz); and
- ▶ Loop Detector Data Screening and Diagnostics Based on Conservation of Vehicles (Lelitha Vanajakshi). ■

Drive Clean Across Texas Takes Two Tellys Awards recognize significant creative achievement

Drive Clean Across Texas (DCAT), the nation's first statewide air quality awareness campaign has just joined the prestigious list of Telly Award winners. Founded in 1980, the Telly Awards showcase and recognize outstanding non-network and cable commercials, films and video productions.

The DCAT campaign, sponsored by the Federal Highway Administration, the Texas Department of Transportation and the Texas Commission on Environmental Quality, was named a winner and presented a silver statue for its "Butterfly Valves" television commercial, which educates viewers about the importance of maintaining an automobile to reduce air pollution. "Singer," a campaign ad featuring country music performer Rick Trevino sitting near a busy highway and coughing his way through, "Home on the Range," was named a Telly finalist and was awarded a bronze statue.

The "Singer" and "Butterfly Valves" public service announcements were directed and produced by Sherry Matthews Advocacy Marketing for the DCAT outreach and awareness campaign. Brian Bochner, Director of the Texas Transportation Institute's (TTI) Center for Air Quality Studies, heads TTI's involvement in the campaign along with



Stills from Telly award-winning *Drive Clean Across Texas* campaign television commercials.

creative support from the Institute's Information and Technology Exchange Center and Public Affairs Office.

To view the award-winning television pieces, please visit: www.drivecleanacrosstexas.org, click on "campaign materials" and then click "TV and radio spots." ■

Christiansen testifies in support of transportation programs

In March, federal and private sector transportation officials testified before the U.S. House Subcommittee on Highways, Transit and Pipelines Subcommittee, outlining the need for increased funding for future transportation research, development and education programs during this year's reauthorization of the Transportation Equity Act for the 21st Century (TEA 21). Dennis L. Christiansen, the Deputy Director of the Texas Transportation Institute at Texas A&M University, was among those who gave testimony.



"As transportation-related problems intensify and budgets are constrained, the need to innovate and become more productive is critical. A well-trained and educated workforce of sufficient size is needed to assure that programs can move forward and that money is effectively utilized. Federal leadership and funding, through a range of different research programs, are essential to help realize these benefits. As research and education programs are considered and debated, attention needs to be given to the role of universities. The universities have much to offer and desire to be a key part of the solutions through effective research and education efforts," Christiansen said.

For the six-year TEA 21 authorization period from 1998 through 2003, \$2.9 billion was provided for research. The research efforts included programs for highway safety, surface transportation research, technology deployment, intelligent transportation systems, training and education and university transportation research.

"Surface transportation research, technology and education programs conducted at the federal, state and university level are critical components in the successful development, construction and operation of a national transportation system," said U.S. Rep. Tom Petri (R-WI), the Chairman of the Subcommittee. "The research funded within these programs is quite simply the cornerstone of virtually every aspect of the system. From pavement and cement research to safer buses, research funded through these programs has produced the innovations we drive on every day.

Also testifying before the subcommittee were Dr. Tony Kane of the American Association of State Highway and Transportation Officials, Richard Capka, Deputy Administrator for the Federal Highway Administration, and Ellen G. Engleman, Administrator of the Research and Special Programs Administration in the DOT. ■

Bligh, Buth and Ross honored by The Texas A&M System Technology Licensing Office

The Technology Licensing Office (TLO) of The Texas A&M University System hosted "A Celebration of Innovation in the Research Valley" May 14. The celebration commemorated the 2000th invention disclosure filed by A&M System faculty and researchers. Chancellor Howard D. Graves gave the keynote address for the celebration that honored 10 inventors with "Spirit of Innovation" awards for their contributions to the A&M System and to society.

Receiving the Spirit of Innovation Award for "Public Benefit" were Dr. Roger Bligh, associate research engineer and manager of the Roadside Safety Program at Texas Transportation Institute (TTI); Dr. Carl Eugene "Gene" Buth, head of TTI's Safety and Structural Systems Division; and Dr. Hayes Ross, research engineer for the Roadside Safety Program at TTI and Professor Emeritus of Civil Engineering. Bligh, Buth and Ross developed the life saving guardrail end treatments ET-2000 and SRT. With more than 150,000 installations, these devices have saved hundreds of lives and have reduced medical expenses by millions of dollars.

The TLO, which serves the entire A&M System, seeks to commercialize innovations developed by A&M System faculty and researchers for public benefit and economic development. ■



(L-R): Texas A&M Chancellor Howard Graves; Roger Bligh; Hayes Ross; Gene Buth.

Brazos Bravo Awards

The Information and Technology Exchange Center (ITEC) and Public Affairs office at TTI were recently honored at the 2003 Brazos Bravo awards ceremony. The groups were awarded six Brazos Bravo awards, five excellence awards and 13 achievement awards in categories such as communication campaigns, printed communications and design illustrations.

The Brazos Valley chapter of the International Association of Business Communicators (IABC) sponsored the awards presentation. IABC is the premier international knowledge network for professionals engaged in strategic business communication management. ■

THE BACK ROAD



The TTI Advisory Council is comprised of leaders in the public and private sectors of the transportation industry. These distinguished men and women play an important role in our research program by keeping us aware of the most critical issues facing the Texas transportation system. At this year's meeting, Council members identified three ma-

major areas of concern: controlling the growing traffic congestion problem; improving roadway safety; and how best to identify needs and develop future transportation improvements.

Following their lead, this issue of the *Researcher* describes 'big picture' research done for the Transportation Committee of the Governor's Business Council on future transportation planning, as well as the success of research on managed lanes and the effects of red-light running. You'll also learn about an innovative driving safety campaign designed by teens for teens at William H. Taft High School in San Antonio. The campaign was so successful in educating teens about the greatest risks—night-time driving, lack of driving experience, the presence of teen passengers, risky behavior (speeding and not wearing a safety belt) and alcohol and drug use—that there are plans to expand the program to other schools in San Antonio and throughout Texas.

With increased numbers of drivers on our highways in the summer, traffic congestion can be dangerous as well as frustrating. TTI researchers are studying how soon drivers should be warned of slowdowns or roadway lane closures through testing of early warning techniques such as those found in Europe, and as far away as New Zealand, on freeways in the Dallas-Fort Worth area. Researchers will eventually recommend devices, such as detectors and signs, that provide earlier warnings of congestion.

There's much more in this issue, including profiles of this year's Transportation Hall of Honor inductees. These four gentlemen each made significant contributions to transportation in Texas and are most deserving of this honor.

I hope you'll have a good summer, and that you'll travel safely to some of the exciting and interesting destinations in our great state of Texas.

Thanks for your continued interest in TTI research.

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Texas Transportation Researcher is published by the Texas Transportation Institute to inform readers about its research, professional and service activities. Opinions expressed in this publication by the editors/writers or the mention of brand names do not necessarily imply endorsement by the Texas Transportation Institute or The Texas A&M University System Board of Regents.

Texas Transportation Researcher (ISSN 00404748) is a quarterly publication of the Information & Technology Exchange Center, Texas Transportation Institute, The Texas A&M University System, 3135 TAMU, College Station, Texas 77843-3135. For more information or to be added to the mailing list, contact this address, call (979) 458-8834, or e-mail Nancy Pippin at n-pippin@ttimail.tamu.edu. Periodicals postage paid at College Station.

POSTMASTER SEND ADDRESS CHANGES TO:

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