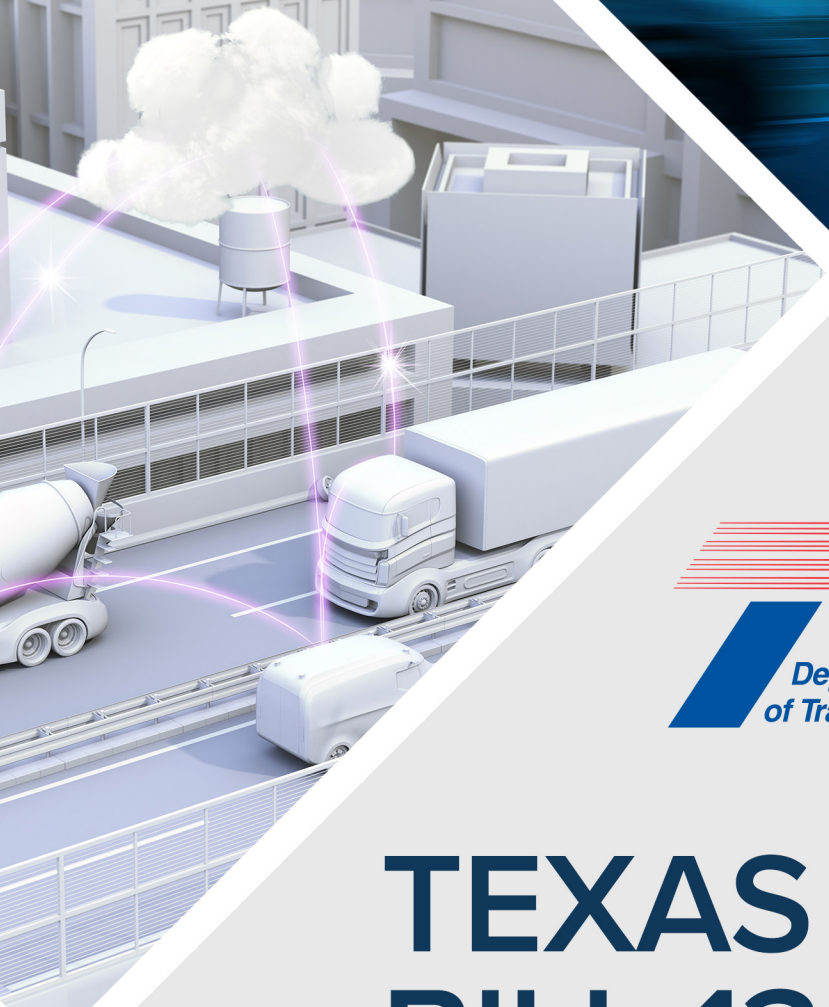


Texas Department of Transportation

TEXAS SENATE BILL 1308 STUDY

EXECUTIVE SUMMARY

DECEMBER 2022

Senate Bill 1308 Study Purpose and Need

Texas' success as a transportation and economic leader in North America and beyond is driven by the willingness to explore new solutions to ongoing challenges. In 2021, the Texas Legislature passed Senate Bill (S.B.) 1308 requiring a study to explore the potential benefits and impacts of automated and connected driving systems technologies to help mitigate the key challenges facing the state related to border congestion, public and driver safety, and the transportation workforce. This study has recognized:

Trade across the United States-Mexico border has strengthened the competitiveness of both the United States and Mexico. As such, the Texas-Mexico border is a vital economic gateway between the thriving economies of Texas and Mexico. In 2019, the value of Texas-Mexico trade grew to $213 billion.[1] **This trade drives a fundamental need to move goods and people safely and efficiently across Texas' multimodal transportation system and across the Texas-Mexico border.**

The Texas transportation system supports the movement of people and goods by providing connections for commerce, convenience, and daily life. **Driver and public safety are essential to the Texas transportation system for all roadway users, including personal vehicles, commercial motor vehicles, pedestrians, and bicyclists.**

Finally, **a growing economy requires a growing workforce.** The Texas economy is supported by an engaged and growing transportation industry workforce that represents about **8% of all jobs in Texas.** There are significant **opportunities for continued economic growth and development associated with the exciting transportation innovations** that are already shaping Texas as a leader.

[1] Texas Department of Transportation (TxDOT). Texas-Mexico Border Transportation Master Plan 2021, March 2021. Accessed at: https://www.txdot.gov/Government/partnerships/trade-border/btmp.html.

Advancements in Technology

Over the last two decades, **automated and connected vehicle technologies have made significant advancements on the transportation systems in Texas,** the United States, and throughout the world. These types of emerging technologies in vehicles have the potential to increase fuel efficiency, reduce traffic congestion, improve mobility, access, and public safety, in large part by reducing driver error while delivering advanced information exchange, improved connectivity, and integration within and between vehicular operating systems. Automated and connected driving systems are **two of the most potentially transformative technologies being developed, tested, and deployed today.**

Robust stakeholder engagement helped shape the study's findings.

Stakeholder Informed

The study engaged a diverse group of stakeholders led by the Texas Department of Transportation, the Texas Department of Public Safety, and the Texas Transportation Institute to inform the potential applications and impacts of automated and connected driving systems. The **S.B. 1308 Working Group was formed to guide the study** and provide input throughout the analyses on border crossings, safety, and workforce.

Overall, the study engaged **622 unique participants representing 269 agencies or private sector companies for a total of 1,267 total stakeholder interactions.**[2]

Technical Approach

The S.B. 1308 study's technical approach centered around **detailed analysis based on state of the practice research, a range of possible use cases, and stakeholder engagement and input.**

Adoption, or usage of automated and connected driving systems in Texas is the most critical driver of change.

STAKEHOLDER INFORMED

- Summarize State of the Practice
- Identify Potential Impacts of automated and connected driving systems
- Establish Technology Use Cases
- Estimate Impacts

[2] Interactions are defined as unique touch points such as a meeting and/or interview.

Border Congestion

Texas's border infrastructure is an asset to both the United States and Mexican economies

Mexico has been the United State's top trading partner since 1994, representing 14.8% of total imports and exports in 2019. **Cross-border trade generates millions of jobs in the U.S. and Mexico** and trade has continued to grow over the last few decades.

According to a 2019 study from the Waco-based Perryman Group, **WAIT TIMES AT TEXAS PORTS OF ENTRY COST THE STATE MORE THAN**

$32 BILLION

in just over three years.

Congestion at border crossings has a direct impact on freight transportation costs and limits economic growth.

Movement of goods across the Texas-Mexico border generated

1.6 MILLION JOBS

in the United States and

5.3 MILLION JOBS

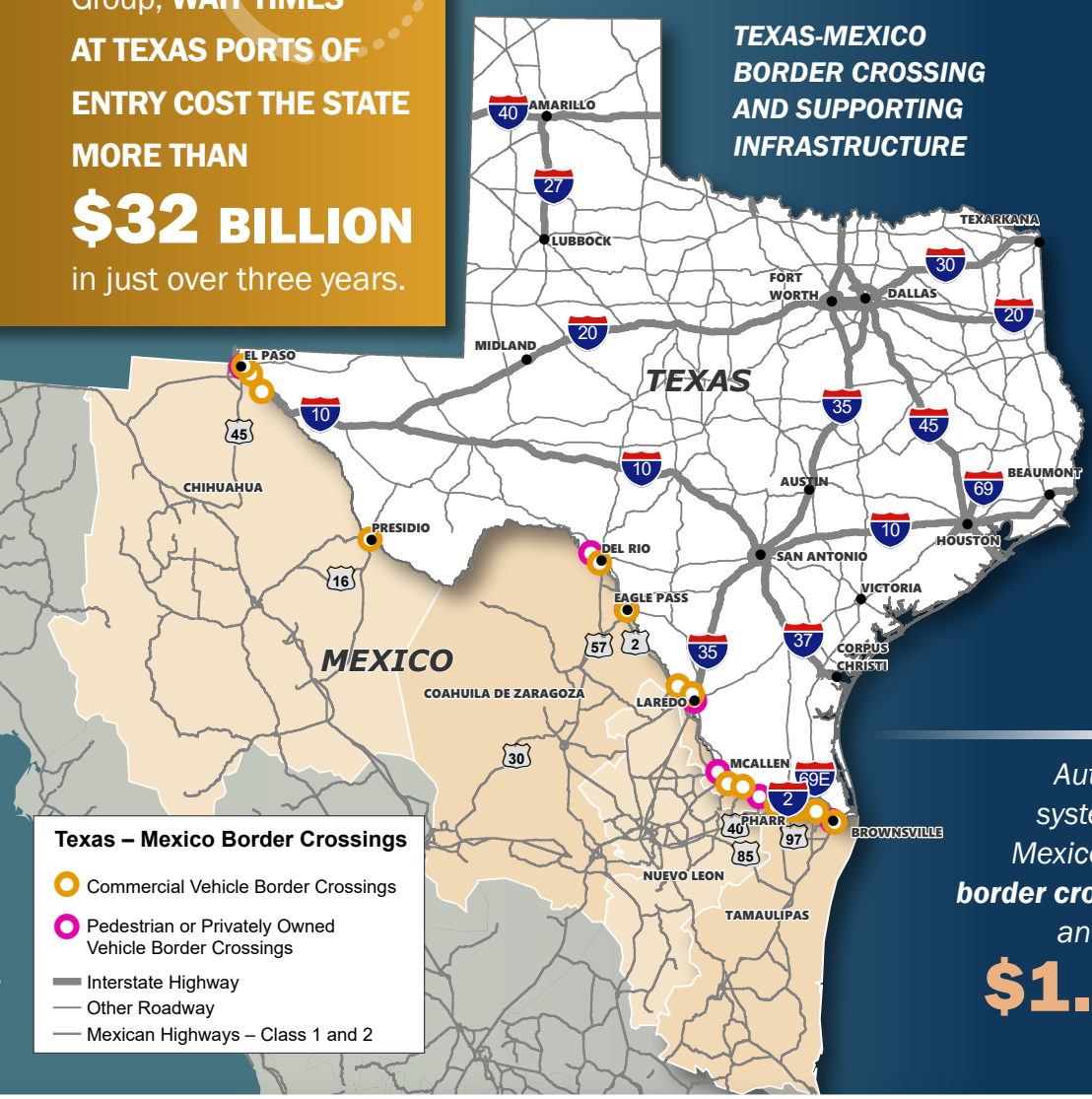
in Mexico in 2019.

Trade crossing the Texas/Mexico border **quadrupled** from

$111 BILLION

to **$451 BILLION**

between 1994 and 2019 and is forecasted to continue growing through 2050.



FINDINGS

- Automated and connected driving systems are developing technologies but have a strong likelihood for adoption by Ports of Entry users.
- Automated and connected driving systems applications at the Texas-Mexico border can directly target congestion.
- Texas has an opportunity to be a frontrunner in automated and connected driving systems border applications.

Automated and connected driving systems implemented at the Texas-Mexico border ***could reduce average border crossing times by 38% for trucks*** *and* ***27% for cars*** ***STIMULATING***

$1.8 TO $3 BILLION

IN ECONOMIC GROWTH.

Driver and Public Safety

Driver and public safety are essential to the Texas transportation system and its ability to support economic vitality and an improved quality of life

The overwhelming majority of crashes are preventable. Roadway or lane departure and intersection crashes, coupled with human errors and behavior such as **distracted driving, aggressive driving, impaired driving, and speeding, are the primary cause of 95% OF CRASHES.**[3]

TEXAS CRASHES FROM 2015 TO 2020

38%	27%	19%	6%	5%
Roadway or lane departure	Intersection	Distracted Driving	Speeding	Impaired

1 PERSON
DIED every
1 hour **57** minutes

1 PERSON
was **INJURED** every
2 minutes **12** seconds

1
REPORTABLE CRASH
OCCURRED every
57 seconds

In 2020,
NEARLY 4,000 DEATHS
FROM CRASHES on public roadways in Texas resulted in
OVER $44 BILLION
IN TOTAL COST—including medical costs and cost estimates for lost quality of life and lives lost.

Texas Motor Vehicle Crash Statistics 2020

FINDINGS

- Automated and connected driving systems may lead to reduced fatalities, injuries, and crashes in Texas.
- The primary impact of automated driving systems is to reduce driver errors.
- Automated driving systems can also reduce risky driver behaviors.

Automated and connected driving systems implemented throughout Texas ***could reduce crashes saving over 1,500 LIVES ANNUALLY by 2050***
RESULTING in $29 BILLION
IN SOCIETAL COST SAVINGS,
including wage and productivity losses, medical expenses, and motor-vehicle damage.

[3] National Highway Traffic Safety Administration (NHTSA) (2008) National Motor Vehicle Crash Causation Survey. U.S. Department of Transportation, Report DOT HS 811 059. Retrieved from: http://www-nrd.nhtsa.dot.gov/Pubs/811059.PDF (October 15, 2014).

Transportation Industry Workforce

The future of the Texas economy depends on a growing workforce

Traditionally, technological advancements have had complex effects on the workforce. While some sectors are vulnerable to automation—consider the toll booth operator—the current shortage of labor to fill some positions, especially long-haul trucking, coupled with the increase in research, development, and manufacturing sectors over the past decade gives weight to the idea that **the net impact to the Texas economy and workforce will be positive.**

The workforce may see a shift in responsibilities from operation to specialized tasks.

While freight movement may not displace many jobs, taxi and ride-hailing services will likely not keep an onboard attendant—reducing jobs in this area substantially.

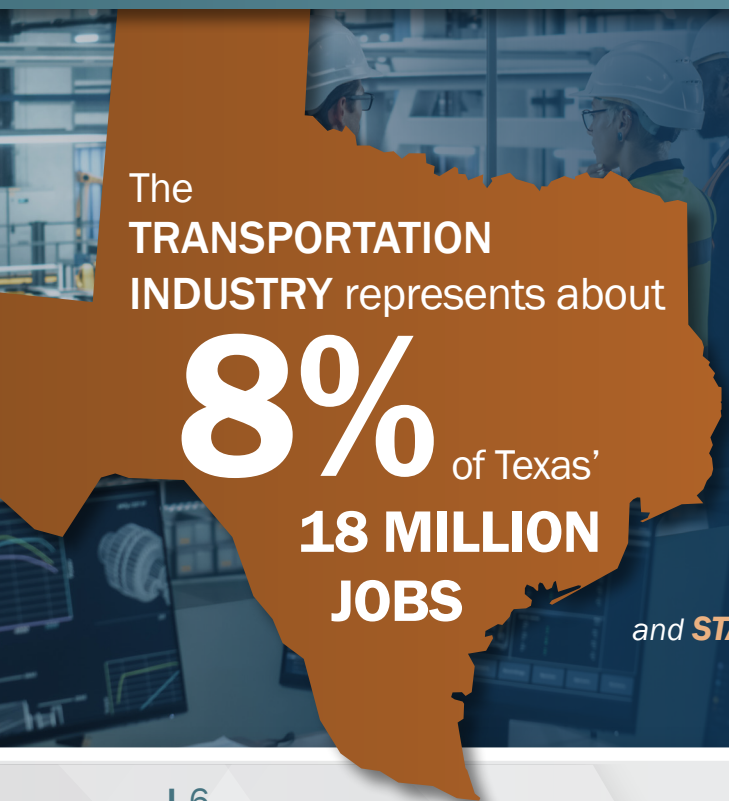
New facilities for manufacturing, assembling, and maintaining these systems represent a clear increase in the need for a skilled labor force.

Each new job created in the transportation industry results in as many as four jobs in related industries.

WHAT WE LEARNED FROM STAKEHOLDERS

As technology evolves, new job opportunities will be created. Technology will not replace workers, just change what workers do, requiring new skills.

Changes in workforce will be gradual and will complement the truck driver shortage in the near to medium term. For examples, drivers may do local deliveries while automated vehicles handle long-haul movements.



The **TRANSPORTATION INDUSTRY** represents about **8%** of Texas' **18 MILLION JOBS**

FINDINGS

- Autonomous vehicles should not result in a net loss of jobs over time.
- Automated and connected vehicles represent an opportunity.
- There is a great deal of uncertainty on sector-specific effects of automated and connected driving systems.
- Texas needs a workforce prepared for the future.

*Automated and connected driving systems implemented throughout Texas **could increase the** **NUMBER OF JOBS IN TEXAS BY** **1.1%** and **STATEWIDE GROSS DOMESTIC PRODUCT BY** **1.6%** **by 2050** over and above anticipated increases in jobs and economic growth.*

Considerations for the Future

Texas can consider key steps to pursue the benefits of automated and connected driving systems

Many of these considerations complement or expand established state programs in place today.

DEVELOPING A COORDINATED TECHNOLOGY PROGRAM. TxDOT is actively engaged in several technology-driven initiatives today that informed this study and will continue as a partner to prepare the state for a more automated future.

MONITORING AND ENGAGING WITH PRIVATE INDUSTRY. Through the conduct of this study, the S.B. 1308 Working Group sought extensive stakeholder engagement to capture input from numerous private sector technology firms, including several directly involved in the development, testing, and deployment of automated and connected driving systems.

ASSESSING COMPATIBILITY OF BORDER IMPROVEMENTS WITH FUTURE TECHNOLOGY INVESTMENTS. Numerous projects to address capacity and operational needs at the Texas-Mexico border are planned or underway.

CONDUCTING DEMONSTRATIONS THAT ADVANCE THE INTEGRATION OF AUTOMATED DRIVING SYSTEMS-EQUIPPED VEHICLES WITH BORDER CROSSING SAFETY AND SECURITY SCREENING PROCEDURES. Numerous demonstration efforts are taking place in Texas and elsewhere that test and develop automated driving systems-equipped vehicle interactions with law enforcement.

CONTINUING TO INCORPORATE TECHNOLOGY INTO THE STATE'S SAFETY PROGRAM. As technology advances from advanced driver assistance systems to automated driving systems, the Strategic Highway Safety Plan and specific safety projects should continue to incorporate technology considerations and/or technology compatible components.

PROMOTING WORKFORCE TRAINING. Many stakeholders identified the availability of a qualified workforce as a key constraint.

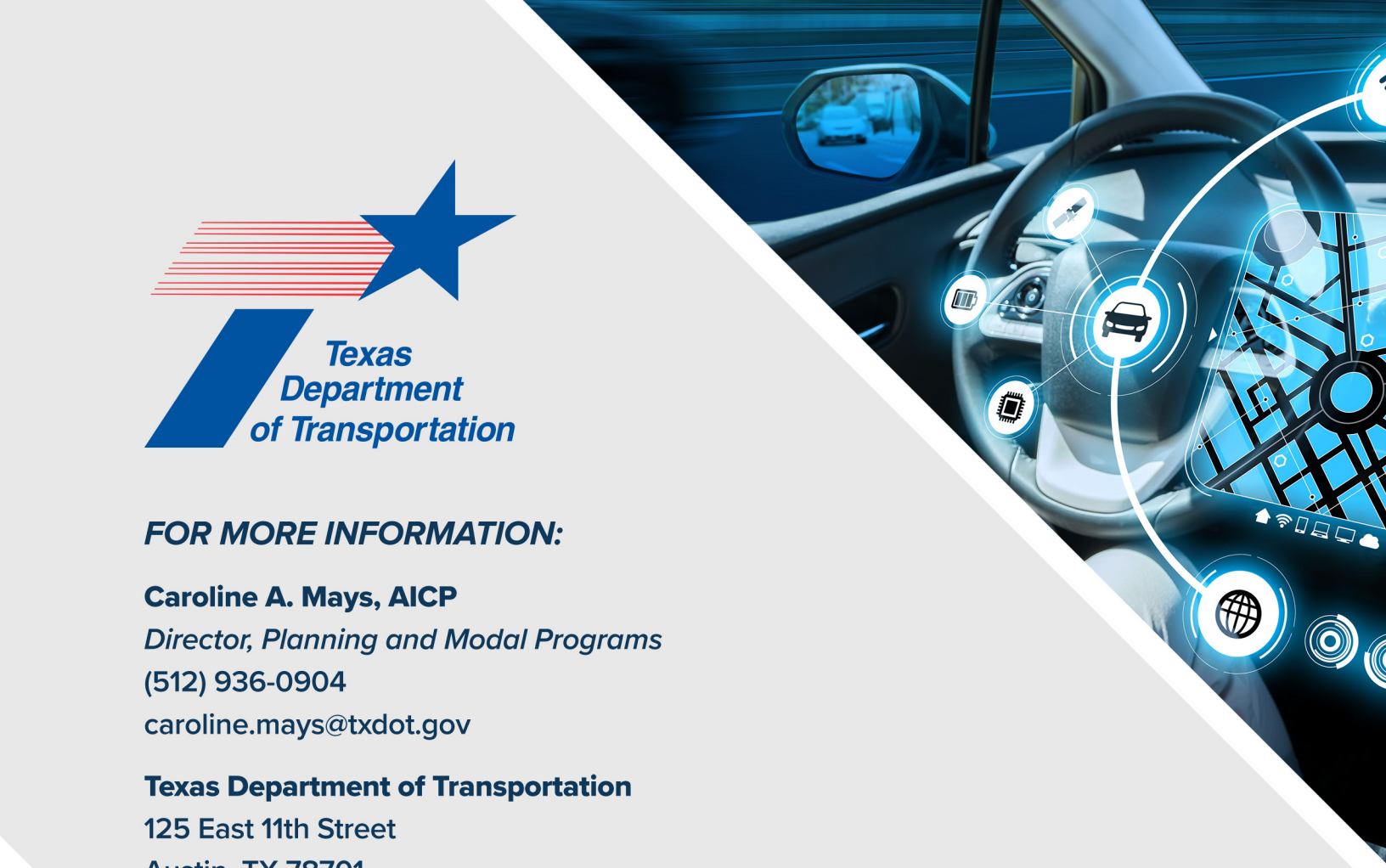
ADVANCING SYSTEM INTEGRATION AND SHARED DATA. The success of many technology deployments will depend on the ability to share data between systems and operations.

SUPPORTING EDUCATION AND PROMOTION. One finding from this study is that many stakeholders are not aware of today's advancements in automated and connected driving systems.

RETAINING LEGISLATIVE AND REGULATORY AUTHORITY. Texas has been lauded by industry, confirmed by this study's stakeholders, as a progressive state for the advancement of automated and connected driving systems.

SUPPORTING TESTING AND DEPLOYMENT. The state can partner with local and regional partners and the private sector to help demonstrate the capabilities of automated and connected driving systems.

These considerations could help ensure **Texas remains a leader in automated and connected driving systems and stays well positioned to generate the benefits described in this S.B. 1308 study.**



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