



# TRANSFORMING TRAVEL IN TEXAS

Assessing passenger demand for high-speed train  
service between North Texas, the Brazos Valley  
and Greater Houston



**TEXAS CENTRAL**  
AMERICA'S BULLET TRAIN



## ABOUT THE PROJECT

The design, construction, finance and operation of a new high-speed passenger train line connecting Houston and North Texas has been under development for five years. The project expects to begin construction in 2018, and will enable passengers to travel between Houston and North Texas in 90 minutes, including a stop in the Brazos Valley. This transformational project will provide a safe, productive, fast and reliable choice for travelers between Texas' two largest economic hubs, using proven, world-class technology. The increased mobility between two of the fastest growing metropolitan areas in the US made possible by the Texas Bullet Train will deliver substantial and long-lasting benefits to both the state and local economies.

Texans will have a safe, productive and reliable choice for travel between Houston, the Brazos Valley and North Texas.

## ABOUT THE STUDY

In January 2016, Texas Central appointed L.E.K. Consulting to conduct a study exploring the opportunity for a high-speed train service in Texas and the benefits it could bring to Texans.

L.E.K. has developed a commercially-driven, technology-enabled forecast for passenger demand including:

- Estimating the market size and growth rate for travel between the two metropolitan areas;
- Undertaking primary market research with input from more than 2,000 Texans to understand local travel habits and determine the Texas Bullet Train's potential share of the travel market; and
- Building a robust and highly granular forecasting model to predict future passenger demand under a range of assumptions and different scenarios.

This study is the most comprehensive work conducted to date for this specific region and is unprecedented in its depth, innovative approach and use of both new, private research and publicly available data.

L.E.K. has worked closely with Texas state and regional governments, macro-economic forecasters, and cell phone data providers to obtain robust and highly granular third party data and forecasts.

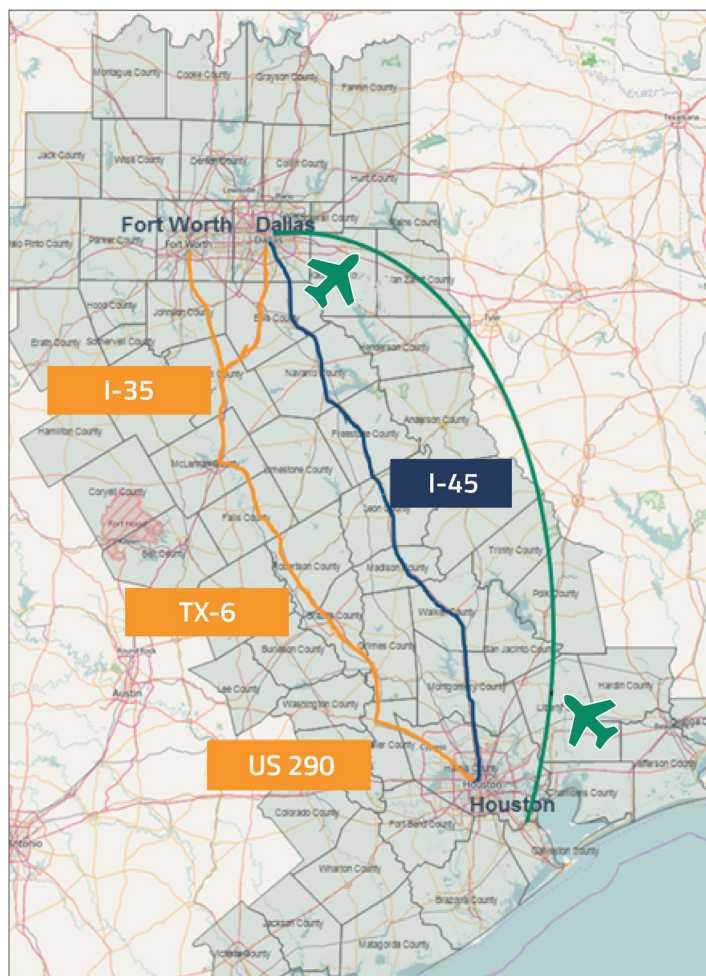
L.E.K. has combined all the data using modeling techniques which either meet or exceed the best practices outlined by the United States Department of Transportation, deploying standard transport economics, statistical analysis and big data approaches to produce a robust and detailed forecast.

# 1. TRAVEL MARKET OVERVIEW

## TEXANS LIKE TO TRAVEL ACROSS TEXAS...

Each year, roughly 14 million journeys<sup>1</sup> are made between Greater Houston and North Texas. Calculated using a variety of data sources, including traffic count data from TxDOT, Bluetooth data from TTI and cell-phone data, this estimate includes all flights, bus journeys, and non-commercial/non-freight road traffic.

Research indicates most journeys are made for personal reasons, nearly half of which are to visit friends and family. Other reasons for travel across the region include taking a vacation/weekend trip, going to a game or shopping. Trips for business are common, representing nearly 20% of all journeys, while students also represent a significant portion of the travel market between Houston and North Texas.



## ... BUT TRAVEL OPTIONS ARE LIMITED AND JOURNEY TIMES ARE LONG AND UNPREDICTABLE

More than 90% of journeys between Houston and North Texas are made by road, typically using Interstate-45 or the Western alternative route, which consists of a series of interstates, state highways and farm to market roads. Drive times can range from 3.5 to 5.5 hours during busy times, and - once congestion is factored in - may be significantly longer than anticipated and difficult to predict. Moreover, congestion will only get worse, both in and around the metropolitan areas, and along I-45 where vehicle counts have increased at a rate of nearly 10% per year since 2012.

Approximately 1 million journeys are made by air each year, with the connection between Dallas Love Field (DAL) and Houston Hobby (HOU) airports the most popular. Although in theory scheduled flight times range between 60 – 75 minutes, in reality flight times are typically longer, once delays are factored in.

In fact, when all stages of the trip are taken into consideration (check-in, baggage drop, choke-point security, and lining up single-file to board in a cramped aisle) travel by air is not much faster than by road. As a result, air travel inadequately serves the most time sensitive travelers on this route, and has been in decline, with travelers choosing to drive instead of flying.

<sup>1</sup>Defined as one-way travel between the North Texas and Houston regions made by one single passenger



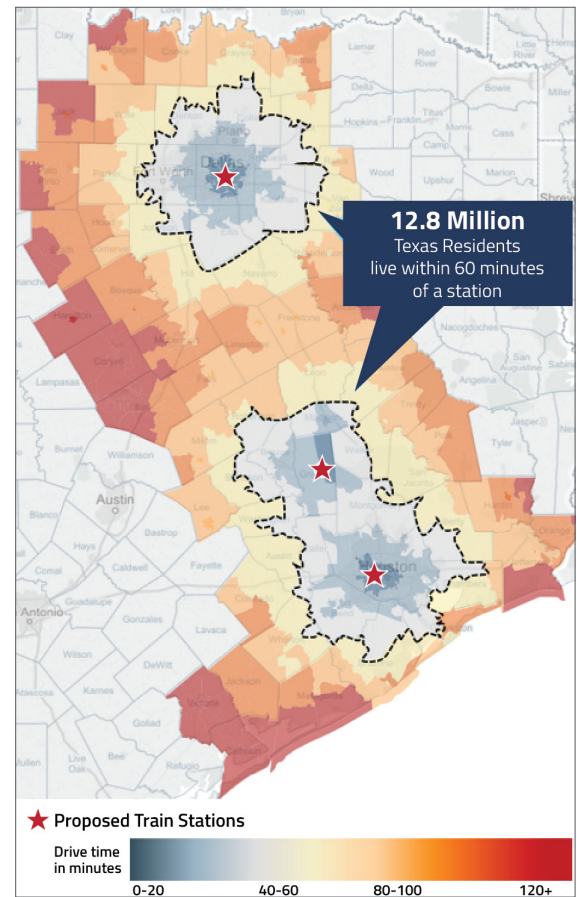
## TEXANS DESERVE THE BEST

The Bullet Train will fundamentally transform the journey between North Texas and Greater Houston, providing travelers with a safer, more productive, more reliable and faster alternative to driving or flying. At speeds approaching 200 miles per hour, the Bullet Train will take less than 90 minutes from station-to-station, including one stop in the Brazos Valley.

The Bullet Train system is based on the Tokaido Shinkansen Technology, which has operated for more than 50 years in Japan with **a perfect track record of no crashes and zero passenger fatalities or injuries** due to train accidents.

Three stations will be conveniently located to serve the people of the Houston-North Texas corridor:

- In Dallas serving North Texas;
- In Grimes County serving the Brazos Valley, and
- In Houston serving the Greater Houston region.



## OF THE 16 MILLION TEXANS LIVING IN THE LOCAL AREA, OVER 90% WILL BE ABLE TO SAVE AT LEAST 1 HOUR OF THEIR JOURNEY TIME BY TAKING THE BULLET TRAIN

Stations will be within 60 minutes' drive for more than 80% of local residents and will provide easy access to each region's excellent highways, thoroughfares and expansive public transit networks. Passengers will navigate easily through each of the three new stations, designed with the customer in mind, with frequent departures to help minimize waiting time.

## SYSTEM SECURITY

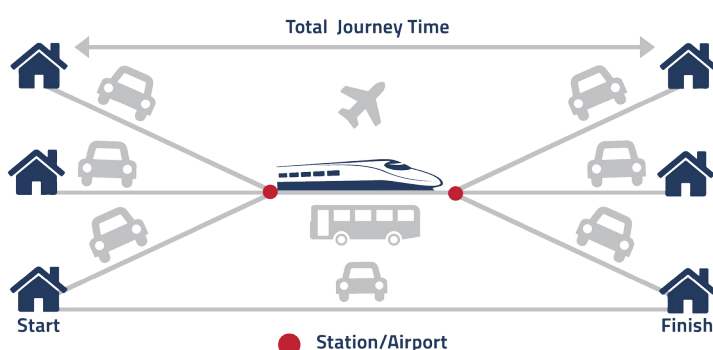
Passenger safety and system security is a top priority for government agencies, law enforcement, the project's private sector workforce and investors. The Department of Homeland Security (including the TSA), Federal Railroad Administration and other oversight agencies will review and approve the passenger security and emergency preparedness plans. Detailed planning is ongoing and of necessity isn't appropriate for full public disclosure. However, we can say that the Texas Bullet Train will adhere to many practices used by the highly successful Japanese Shinkansen train systems (tailored to the unique Texas operational environment)

including a "total system" approach that seamlessly integrates all major train safety system functions. As a privately developed project, there will be an unwavering focus on safety and deploying world-class technologies and practices while ensuring safe operations without imposing the intrusive, time-consuming procedures airline passengers must endure while flying. As threat assessments evolve, the project will continue to adopt security technologies and safety protocols that effectively protect passengers and provide customers peace of mind while traveling.

## TEXAS BULLET TRAIN WILL REDUCE JOURNEY TIMES BY 60 MINUTES ON AVERAGE

A comprehensive analysis of every component of a trip between North Texas and Greater Houston via the Bullet Train—including getting to and from the station, check-in, security and boarding—indicates an average total journey time of under 3 hours 30 minutes.

To determine how this compares to current journey times across the region by car or by air, it is necessary to consider the total journey time from start (e.g., home) to finish (e.g., work).



## JOURNEYS USING THE TEXAS BULLET TRAIN ARE AROUND 70 MINUTES FASTER THAN TRAVELING BY CAR

When traveling by car, journeys starting from Houston city center and finishing in Dallas city center (or vice versa) take approximately 4 hours 40 minutes at busy times. This includes time spent driving on local roads and the freeway, as well as rest stops.



## JOURNEYS USING THE TEXAS BULLET TRAIN ARE AROUND 50 MINUTES FASTER THAN TRAVELING BY PLANE

When traveling by air, journeys starting from Houston city center and finishing in Dallas city center (or vice versa) take approximately 4 hours 20 minutes at busy times. This includes driving to and from the airport, total flight time, as well as time spent at the airport before departure (i.e., for check-in, clearing security, boarding) and upon arrival (i.e., for disembarkation and bag-collection).

## **SIGNIFICANT TIME SAVINGS WILL DRAW PASSENGERS TO HIGH-SPEED TRAINS**

The Texas Bullet Train is therefore an attractive choice of travel for local residents, many of whom would save 60 minutes or more on their total journey time between Greater Houston and North Texas. For instance, people traveling from McKinney to Houston city center would arrive 90 minutes earlier if they took the Bullet Train instead of driving. Likewise, people traveling from Galveston to Denton would save 80 minutes versus an equivalent journey by car, or save 70 minutes versus an equivalent journey by air.

Overall, more than 90% of residents in the area around or between Houston, North Texas and Brazos Valley will make significant time savings over car and air by using the Bullet Train to travel between Greater Houston and North Texas. The Texas Bullet Train should therefore become the preferred mode of travel for millions of travelers. Moreover, to the degree the Bullet Train helps relieve any congestion on busy roadways and at crowded airports, the system will benefit every Texan, even if they choose to continue to drive or fly.

## 2. MARKET RESEARCH

Extensive, technology-enabled research was undertaken to determine how attractive the Texas Bullet Train would be for local travelers. One part of this inquiry involved conducting a rigorous, independent survey of 2,000 Texas residents to better understand local travel habits and measure perceptions of high-speed train service.



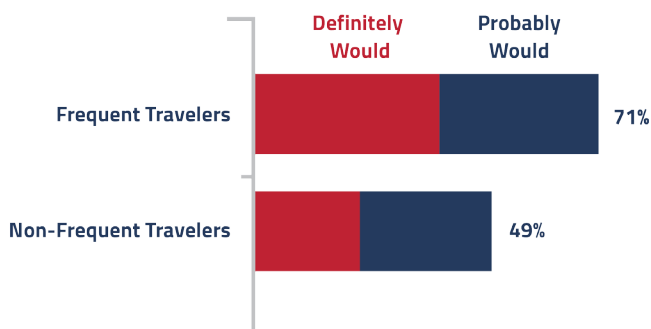
### TEXANS ARE EXCITED BY THE TEXAS BULLET TRAIN

General attitudes towards the Texas Bullet Train are highly positive. When asked to write up to three statements or words that describe their reaction to a picture and description of the Bullet Train, the majority of survey respondents reacted positively, with "fast" and "convenient" most commonly expressed.

### OVER 80% OF TEXANS WOULD CONSIDER USING THE TEXAS BULLET TRAIN

Everyone knows Texans love their cars and trucks—we do too! Nevertheless, an overwhelming majority of Texans (more than 80%) said they would use the Bullet Train in the right circumstances, with only 15% of survey respondents stating they would not consider any alternative but their personal vehicle.

How likely are you to travel by the Texas Bullet Train on your next journey, if the option existed?



### MORE THAN TWO THIRDS OF FREQUENT TRAVELERS EITHER "DEFINITELY" OR "PROBABLY WOULD" USE THE TEXAS BULLET TRAIN ON THEIR NEXT JOURNEY

The survey also tested Texans' likely intention to use the Bullet Train, were it available today. Among survey respondents who had traveled between Greater Houston and North Texas over the last 12 months for personal or business reasons, more than two thirds said that they either "definitely" or "probably would" travel by the Bullet Train on their next journey.





## TEXANS ARE NOT SATISFIED WITH THEIR CURRENT CHOICES FOR TRAVEL BETWEEN NORTH TEXAS AND HOUSTON

Encouragingly, almost half of survey respondents who had not traveled between Houston and North Texas in the last 12 months also indicated they “definitely” or “probably would” travel between the two metropolitan areas in the next 12 months, if the Bullet Train existed.

This important finding demonstrates that Texans are not satisfied with their current choices for travel between North Texas and Houston. By providing an alternative that eliminates many of the things that keep people from making the trip in the first place, such as long journey times that make single day trips impractical, high-speed trains have the potential to inspire exciting new journey opportunities.

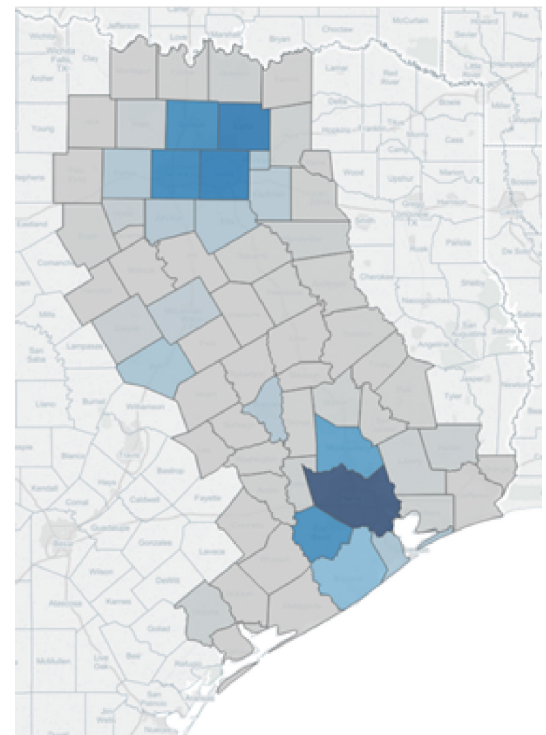
In summary, the research shows not only that Texans are excited by the prospect of the Texas Bullet Train, but also that they have a strong intention to use it for future journeys.

## 3. FUTURE MARKET DEVELOPMENT

The Texas Bullet Train is expected to launch in the early 2020s. As such, the forecast level of demand for high-speed trains must be based on the total number of long distance journeys we expect to be made between Greater Houston and North Texas for decades to come. To determine the expected size of the underlying travel market, three fundamental drivers of growth were analyzed: (i) population, (ii) economic activity, and (iii) journey costs.

### POPULATION TRENDS WILL FAVOR TRAVEL MARKET GROWTH IN TEXAS

Simply put, more people living in the region means more journeys between the Greater Houston and North Texas. Forecasts estimate the population in the 66 relevant counties of the Houston-North Texas corridor to grow at 1.5% per year to 2050, almost twice the US national average. This will add an additional 11 million residents to the area by 2050, of which 9 million will reside in the urbanized areas of Greater Houston and North Texas. This will underpin significant growth to the underlying travel market.



Population increase 2015-50F (thousands)

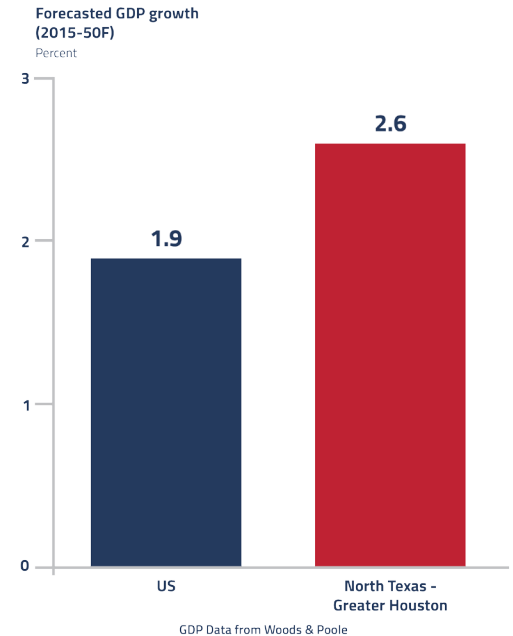
0 3,000



## A STRONG TEXAS ECONOMY STIMULATES GROWTH IN THE TRAVEL MARKET

Changes in levels of economic activity will have a direct impact on travel across the region. Rising incomes are an important influence on demand for travel, not only because people with higher incomes tend to make more trips, but also because income levels influence decisions about which modes of travel to use.

Texas State GDP has been growing considerably faster than the US national average since 1997. Strong growth in levels of economic activity is expected to continue in the Greater Houston-North Texas region, with growth rates of 2.6% per year over the forecast period to 2050 (compared to 1.9% per year for the rest of the United States). This increase in wealth will support significant growth in the underlying travel market.

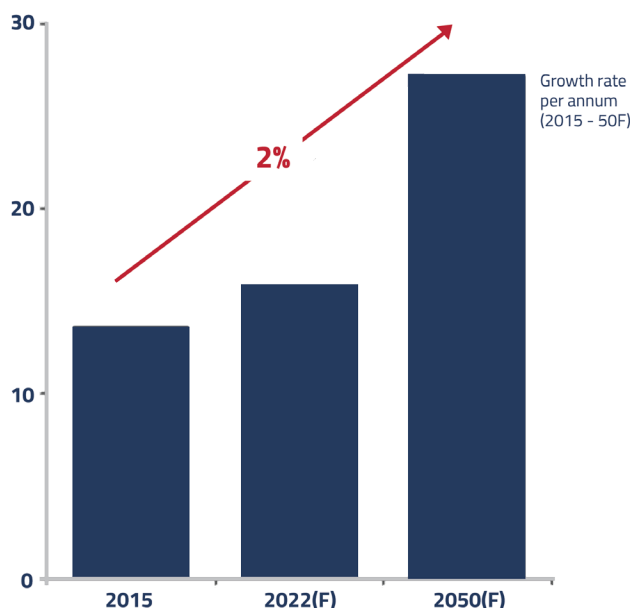


## STEADY FUEL COSTS SUPPORT STEADY GROWTH OF THE TEXAS TRAVEL MARKET

Changes in journey costs will also have an impact on the travel market between Greater Houston and North Texas. Journey costs change with fuel prices and vehicle fuel efficiency. Underlying trends in the oil market suggest a steady increase in fuel prices in real terms throughout the forecast period, while improving technology and environmental regulations will drive significant improvements in vehicle fuel efficiency out to 2050. In combination, the changes in price and efficiency factors suggests fuel cost per mile is likely to remain relatively stable between 2015 and 2050 in real terms.

Forecasted growth of the travel market (2015-50F)

Millions of journeys



## MORE THAN 27 MILLION JOURNEYS WILL BE MADE BETWEEN NORTH TEXAS AND GREATER HOUSTON IN 2050

As a result of the underlying trends in population, economic activity and journey costs, the size of the travel market between Greater Houston and North Texas is expected to grow at 2% per year over the forecast period, resulting in a total of just under 16 million journeys in 2022 and just over 27 million journeys in 2050.

## 4. PASSENGER DEMAND FOR THE TEXAS BULLET TRAIN

The Texas Bullet Train will drive growth in the travel market beyond trends in population, economic activity and journey costs, as it transforms transportation in Texas.

### THE TEXAS BULLET TRAIN WILL STIMULATE NEW JOURNEYS ACROSS TEXAS

Research findings indicate many new journeys will take place, as the existence of the Bullet Train stimulates additional travel demand. Below are just a few representative examples of Texans describing how the Bullet Train could impact their lives:



This additional demand from new journey opportunities will increase the total size of the Texas travel market. Our estimates suggest that with the introduction of the Texas Bullet Train, the total number of journeys in the region, across all modes of travel, will rise from 13.7 million in 2015 to 31 million by 2050.

### NEARLY 5 MILLION PASSENGERS ARE FORECAST TO USE THE BULLET TRAIN BY 2026 AND 10 MILLION PASSENGERS BY 2050

Bringing together end-to-end journey time analysis, primary market research on perceptions of high-speed trains, and long distance travel market size estimates, it is possible to develop estimates for future levels of demand for the Texas Bullet Train.

We forecast that following a ramp-up period in the mid-2020s, the number of journeys on the Texas Bullet Train will reach nearly 5 million, representing almost 25% of the total number of long distance journeys between Houston and North Texas. By 2050, the Texas Bullet Train's share of the total travel market is forecast to reach almost 30%, or over 10 million journeys.

## TEXAS CENTRAL WILL DELIVER A SAFER, MORE PRODUCTIVE, FASTER AND MORE RELIABLE TRAVEL OPTION FOR TEXANS – AND HELP DRIVE THE TEXAS ECONOMY



CEO Tim Keith - Texas Central

Texas Central is a privately funded company. With a group of primarily Texan investors, Texas Central is poised to bring high-speed train service to the state with Lone Star entrepreneurial values in mind. This project is not backed by government grants and will not require taxpayer operating subsidies.

Taking a private-sector approach to financing this project changes everything, bringing real-world fiscal discipline to all decisions and careful scrutiny of economic models and timelines. Private projects have to demonstrate that

there is a viable market before a project is built. The market identified and described by this latest study demonstrates strong, pent-up demand for better travel options in Texas and demonstrates how the Bullet Train will make a significant impact on the Texas travel market. **Further, the number of riders forecast to use the Bullet Train will provide the basis for the long-term commercial success of this private venture.**

The project's financial and technical experts are developing the Bullet Train to maximize ridership and capital efficiency. Without the political constraints of a public endeavor, this project has much greater freedom with which to deliver these commercial objectives, compared with other lines around the world that have arbitrary political hurdles to overcome. In addition, management of the Texas Bullet Train will have far greater scope to adjust schedule, service and ticketing to improve the value delivered to customers which will drive commercial success.

By deploying world-class, proven technologies and cutting edge commercial strategies, we can expect the Texas Bullet Train to deliver more passengers over and above equivalent state-run ventures.



## THE TEXAS BULLET TRAIN WILL TRANSFORM TRAVEL FOR TEXANS

The Texas Bullet Train will provide Texans with a faster, safer, more convenient and reliable alternative to driving or flying. Our research has illustrated that the Texas Bullet Train will not only save travelers time on their journeys, but Texans are already excited by the prospect of high-speed trains, and say they will make more journeys because of it. For all of these reasons, the Texas Bullet Train is set to transform travel in Texas and bring a new high-tech industry to the Lone Star State.



*The majority of the Bullet Train line will be elevated on concrete viaducts which ensures the easy movement of people, wildlife, vehicles and equipment.*



**TEXAS CENTRAL**  
AMERICA'S BULLET TRAIN

## **ABOUT TEXAS CENTRAL**

Texas Central Partners, LLC (Texas Central) is a private company bringing a transformational project to Texas that advances the economy, respects Texan values and keeps our state on track for future growth.

It is a Texas-based private company, employing a market-led approach to transportation infrastructure in Texas. Unlike other high-speed train projects, Texas Central is backed by private investors, not public grants or operating subsidies.

For more information, go to [www.texascentral.com](http://www.texascentral.com)



## **ABOUT L.E.K. CONSULTING**

L.E.K. Consulting is a global management consulting firm that uses deep industry expertise and rigorous analysis to help business leaders achieve practical results with real impact. L.E.K. helps clients make consistently better decisions, improve business performance and create greater shareholder returns.

Founded more than 30 years ago, L.E.K. has extensive experience in advising commercial railways, high speed train operators and governments across the Americas, Asia-Pacific, and Europe.

THE INFORMATION PROVIDED HEREIN IS PROVIDED WITHOUT ANY WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL WARRANTIES ARE EXPRESSLY DISCLAIMED. NOTHING HEREIN SHOULD BE CONSTRUED AS ADVICE TO TAKE ANY POSITION WITH REGARD TO THE SUBJECT MATTER HEREIN, AND PARTIES SHOULD CONDUCT THEIR OWN ANALYSIS AND DILIGENCE. IN NO EVENT SHALL L.E.K. CONSULTING BE LIABLE FOR ANY PARTY'S USE OF THIS INFORMATION.