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TEXAS HIGH SPEED RAIL REQUIRES CAUTION: AN UPDATED ANALYSIS

by Baruch Feigenbaum
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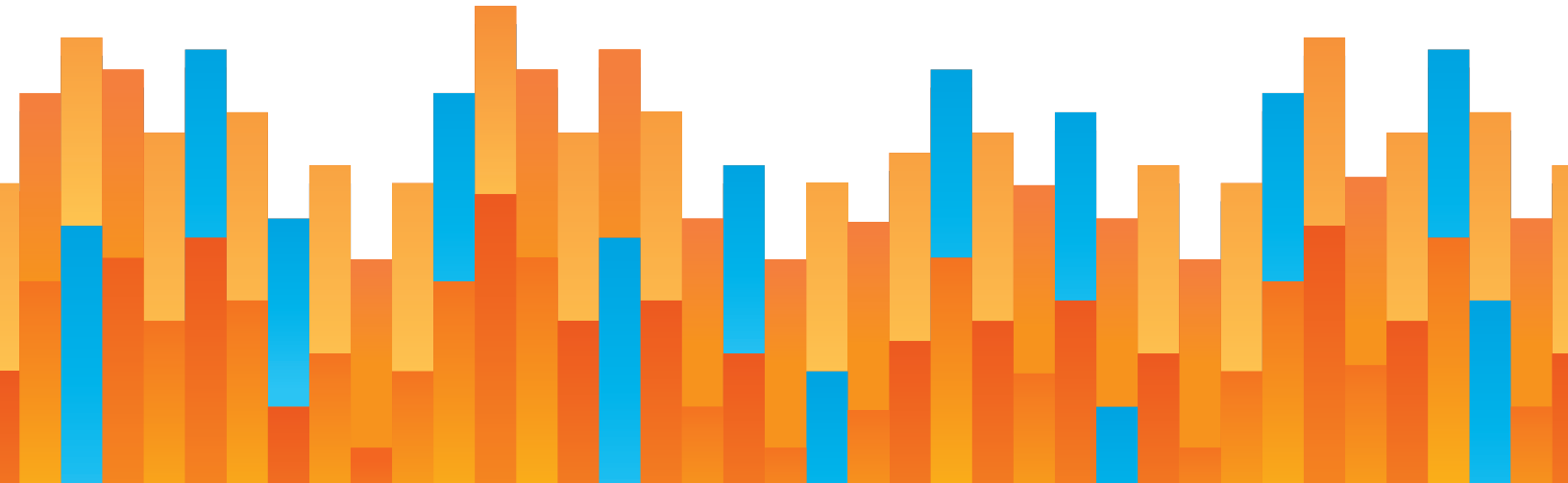

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PART 1

OVERVIEW

In 2017, I wrote the study "High Speed Rail in Texas: Caution Ahead," which detailed concerns about Texas Central's proposed Dallas-to-Houston privately financed high-speed rail line in Texas.[1] While I noted the potential advantages of private high-speed rail service, including project innovation, less susceptibility to political interests, and increased customer-oriented service, I also raised several cautions and concerns regarding Texas Central's project. The dialogue I hoped for with Texas Central did not occur.

Over the past two years, Texas Central has continued work on the project, including commissioning an outside feasibility study. As a result, it is time to revisit the case for and against this proposed high-speed rail project.

This follow-up brief clarifies parts of the previous Reason report, analyzes new information regarding Texas Central's ridership and cost numbers, and raises additional concerns regarding the project.

[1] Feigenbaum, Baruch. *Texas High Speed Rail: Caution Ahead*. Reason Foundation, 2017. Web. https://reason.org/wp-content/uploads/files/texas_high_speed_rail.pdf, 28, January 2019.

PART 2

TEXAS CENTRAL'S CRITIQUES OF OTHER HIGH-SPEED RAIL REPORTS

In addition to my report, there were five other peer-reviewed studies by transportation researchers analyzing the prospect of high-speed rail in Texas. In two of those studies—conducted by the Texas A&M Transportation Institute and the University of Texas—the researchers projected that high-speed rail between Dallas and Houston could require taxpayer subsidies of up to $15 billion.[2]

Texas Central has stated that all of these studies (including mine) were out-of-date and did not include the private-sector innovations that Texas Central plans to use. While some of the studies were several years old and others focused on public-sector high-speed rail operations only, the studies raised legitimate concerns about ridership and cost that Texas

[2] Roco, Craig and Leslie Olson. "Policy and Financing Analysis of High Speed Rail Ventures in the State of Texas." Texas A&M Transportation Institute, September 2004. Web. https://static.tti.tamu.edu/swutc.tamu.edu/publications/technicalreports/167150-1.pdf, 28, January 2019; "A Review of the Economic Feasibility of a Privately Financed High Speed Passenger, Rail System in Texas." University of Texas at Austin, 1992. 20-28. Print.

Central has failed to address. And, regardless of when the studies were conducted, some aspects of the project have not changed over time. For example, the project will always have to cover the approximately 240 miles between Dallas and Houston. And, the urban spatial structure characteristics of the two metro areas, including employment and population density and transit use, change very slowly.

After Texas Central released the results of its new study on ridership and cost projections (more details in Part 3), other researchers expressed concern. Matthew Glans of the Heartland Institute pointed out that successful high-speed rail requires cities with much denser population and employment than Dallas and Houston.[3] Randal O'Toole of the Cato Institute wrote, "(H)igh speed rail proposals are high cost, high-risk megaprojects that promise little congestion relief, energy savings, or other environmental benefits."[4] Wendell Cox, who has written several studies on high-speed rail, noted that there have been large cost overruns in other countries that have implemented high-speed rail.[5] Finally, Travis Korson, a researcher at Frontiers for Freedom, questioned the company's financial projections. Korson pointed out that the combination of escalating construction costs and optimistic ridership estimates raises considerable doubt as to the long-term viability of the project.[6] These researchers work for free-market think tanks, and are pre-disposed to support a privately funded high-speed rail line. Yet, they cast doubts on Texas Central's ridership projections and cost estimates.

Transportation researchers are not the only experts expressing concern. Alain LeRay of SNCF America (the U.S division of the French high-speed rail operator). said, "The whole thing is just a dream." He added, "That is not going to happen on private financing."[7] Texas

[3] Glans, Matthew. "High Speed Rail Won't Work in Texas." The Heartland Institute, 17 July, 2018. Web. https://www.heartland.org/publications-resources/publications/research--commentary-high-speed-rail-wont-work-in-texas, 18 January 2019.

[4] O'Toole, Randal. "High Speed Rail The Wrong Road for America." Cato Institute, 31 October 2008, Web. https://object.cato.org/pubs/pas/pa-625.pdf, 18 January 2019.

[5] Cox, Wendell. "EU Auditor High Speed Rail Criticisms: Lessons for North America and Australia. NewGeograpy, newgeography.com, 19, July 2018, http://www.newgeography.com/content/006033-eu-auditor-high-speed-rail-criticisms-lessons-north-america-and-australia, 18 January 2019.

[6] Korson, Travis. "America's First Bullet Train is Already a Failure and It Hasn't Even Been Built." *The Hill*. 4 December 2017, thehill.com. Web. https://thehill.com/opinion/technology/363141-americas-first-bullet-train-is-already-a-failure-and-it-hasnt-even-been, 18 January 2019.

[7] Leszcynski, Ray. "Rival Blasts Texas Bullet Train Firm's Private Funding Plan Saying it's Just a Dream." *The Dallas Morning News*, 18 September 2018, *dallasnews.com*. Web. https://www.dallasnews.com/news/transportation/2018/09/18/rival-texas-bullet-train-company-blasts-japanese-investment-says-high-speed-rails-private-funding-plan-just-dream, 18 January 2019.

Central responded to SNCF's skepticism with claims that SNCF is trying to build a parallel system in Texas and that a "French monopoly" does not understand how free-market capitalism works.

SNCF has some valid points. Of all the high-speed rail lines around the world, only two are profitable: Tokyo to Osaka and Paris to Lyon. All other high-speed rail lines received significant government subsidies for construction, and most also receive operating subsidies.[8] Experts think that a high-speed rail line serving the densely populated, transit-friendly northeast corridor cities of Boston, New York City and Washington could cover its operating costs without government subsidies. A direct line between Los Angeles and San Francisco might also be able to cover its operating costs. But neither could possibly cover its capital costs from its own revenues.

As a result, virtually all high-speed rail experts are-skeptical that a high-speed rail line connecting the low-density, car-friendly metro areas of Dallas and Houston could be profitable without substantial public subsidies for capital and operations. SNCF also raises legitimate concerns regarding Texas Central's sources of and ability to obtain funding.

Transportation writers for local magazines and newspapers have also expressed concerns. Ray Leszcynski from the *Dallas Morning News* has suggested that Texas Central's plans may not be financially viable.[9] The *Houston Chronicle* has detailed how rural Texas lifestyles are being disrupted for a project that will only serve urban Texas residents.[10] The *Dallas Observer* has pointed out issues related to Texas Central's reliance on Railroad and Rehabilitation Improvement Financing (RRIF) loans (discussed in Part 4).[11] In addition to these major outlets, local newspapers have also questioned the project's viability.

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8 Peterman, David, John Fritelli and William Mallett. "The Development of High Speed Rail in the United States: Issues and Recent Events." Congressional Research Service. *fas.org*. 20 December 2013. Web. https://fas.org/sgp/crs/misc/R42584.pdf, 18 January 2019.

9 Leszcynski, Ray. "Here is What is Ahead for the Proposed Houston-to-Dallas High-Speed-Rail Including Potentially Traumatized Butterflies." *The Dallas Morning News*. 31 August 2018, dallasnews.com, Web. https://www.dallasnews.com/news/transportation/2018/08/31/ahead-proposed-houston-dallas-high-speed-rail-including-potentially-traumatized-butterflies, 18 January 2019.

10 Begley, Dug. "Bullet Train Opponents List Fears Over Houston-Dallas Line." *Houston Chronicle*. 30 January 2018, houstonchronicle.com. Web. https://www.houstonchronicle.com/news/transportation/article/Bullet-train-opponents-show-in-force-to-list-12538407.php, 18 January 2019.

11 Nicholson, Eric and Diana Wray. "Will a Dallas-to-Houston Bullet Train Revolutionize Texas?" *Dallas Observer*, 18 August 2015, dallasobserver.com. Web, https://www.dallasobserver.com/news/on-the-line-will-a-dallas-to-houston-bullet-train-revolutionize-texas-7501328, 18 January 2019.

PART 3

TEXAS CENTRAL'S CLAIMS ARE NOT WELL SUPPORTED

Texas Central has not been shy about criticizing studies from other transportation researchers. Yet its own study, written by an anonymous author at a global management consulting firm, L.E.K., has a number of its own problems. (Texas Central has not released the entire study but has made public the cost and ridership numbers.)

According to the L.E.K. study, 90% of the 16 million people living in the Dallas-Houston high-speed rail service area would save at least one hour on their journey times, as compared to air or automobile.[12] Also, the L.E.K. study claims 71% of frequent travelers and 49% of non-travelers would probably or definitely use its high-speed rail on their next trip between metro Dallas and metro Houston. (Texas Central does not define a non-traveler, but it appears to be a person who does not currently travel between the two cities, but decides to make the trip because of the train.) Based on these and a number of other assumptions, L.E.K. estimates that its project will attract five million annual trips by 2025

[12] "Transforming Travel in Texas." *texascentral.com.* Texas Central, 2016. Web. http://www.texascentral.com/wp-content/uploads/2016/11/Ridership-Brochure.pdf, 30 January 2019.

and 10 million annual trips by 2050, which would comprise 30% of the total trips between the metro areas.

Let's start with the study's methodology: L.E.K. did not release any information on planned ticket prices. And Texas Central does not provide any details either. On its website, Texas Central states that "on the high end, tickets will be competitive with the cost of flying, and on the low end, they will be competitive with the cost of driving." It is impossible to accurately project ridership without estimating ticket price. For instance, if L.E.K.'s study estimates a ticket price of $50, when the actual price proves to be around $200, the ridership projections will be severely inflated.

Second, L.E.K. used "stated preference" surveys to sample residents. Stated preference is the weakest analytical method in predicting traveler's patterns. Most researchers do not use it. Because people are not the best judge of their future transportation choices, transportation engineers conduct detailed modeling before construction of a roadway or transit line. The modeling uses past behavior to predict how people will travel in the future. The modeling also takes into account other factors such as improvements in highway capacity, airport capacity, and technology, which impact people's travel habits.

There's another problem with stated preference surveys: even when people know their travel patterns, they are not always honest in surveys. Studies of carpooling (two or more people sharing a ride from home to work) show that commuters routinely overstate the amount that they carpool, because it is considered a societal good (carpooling reduces congestion and greenhouse gas emissions).

The best and most accurate method of determining ridership is through quantitative modeling. This modeling includes the use of travel diaries or smartphone applications to monitor which modes commuters use. The activity pattern data are then analyzed via a travel-choice simulation model. Quantitative models also examine planned and future improvements in transportation networks. Because experience shows that the largest share of high-speed rail passengers switch from air travel or conventional rail, analyzing changes to these transportation modes is crucial in accurately estimating potential ridership.

A less ideal approach (although better than stated preference) is a strengths/weaknesses/opportunities/threat (SWOT) analysis. Although SWOT lacks a quantitative metric, it can identify potential ridership levels. By comparing tradeoffs, a

SWOT analysis examines the effect of additional airport gate capacity on ridership, or how train station proximity within a quarter-mile of a rail line increases ridership.

Another option—revealed preference—is better than stated preference because the technique draws statistical inferences from known behavior to generate more-accurate responses. Revealed preference can be used to inform a four-step travel demand model, although the results can be inaccurate.

Accurate modeling is essential to building and implementing a successful project. From what little is revealed of L.E.K.'s actual methodology, it is difficult to judge how L.E.K.'s cost and ridership numbers were actually estimated.

In the L.E.K. study, Texas Central makes two other claims that are difficult to take seriously. First is the claim that 90% of passengers in the service area will save an hour on their trip, as compared to flying or driving. Some passengers traveling from *downtown* Dallas to *downtown* Houston may save around an hour, but not most travelers. As Part 5 details, downtown Dallas and Houston have a small percentage of the region's residences and jobs. Travelers in the Dallas and Houston suburbs would have to travel up to an hour by car or transit to get to and then from the train station, reducing or altogether eliminating any time savings.

The relevant trip times must be measured door-to-door, not station to station. Texas Central's claimed travel time savings also depends upon a lack of security screening. However, any high-speed rail service will obviously need some type of security screening, thus further reducing the travel time savings. Even the privately financed higher-speed rail service in Florida—Brightline—has security screening in its stations. Finally, Texas Central assumes there will be no increase in highway or airport capacity between Dallas and Houston over the next 30 years. It is essential to compare all modes in the future, rather than comparing, for example, today's air travel to high-speed rail in 2050.

Second, by forecasting five million riders in 2025 and 10 million by 2050, Texas Central is both overstating initial ridership and assuming an unusually high passenger growth rate. Given Texas Central's challenges in acquiring land, obtaining funding and the necessary governmental approvals, not to mention the time needed to construct the project, service will not likely begin until 2025. Rail ridership tends to build gradually from year to year. Assuming rail service begins in 2025, Texas Central's projection of five million passengers in that year is 4.5 times our forecast of 1.1 million passengers. Also, Texas Central assumes

a 4% passenger growth rate per year, which is on the high end, especially given the mature, low-cost aviation market between Dallas and Houston. A 2.5% growth rate is more realistic. Assuming a 2.5% growth rate, Texas Central's 2050 projection of 10 million passengers is five times our forecast of two million passengers.

PART 4

THE FINANCING RISK

Texas Central continues to say that it will privately finance the construction of its high-speed rail line. Granted, financing mega-projects—those costing over $500 million—is the most realistic way to pay for them. Similar to taking out a mortgage loan to buy a house, using revenue bonds to pay for a mega-project over the long term is a sensible way to pay for such a major project.

But if Texas Central plans to finance the project with loans from the government, taxpayers will need protections in place in case the company defaults. Texas Central is planning to seek a loan from the federal government's Railroad Rehabilitation and Improvement Financing (RRIF) program. But, as explained below, RRIF loans lack the needed taxpayer safeguards.

Created under the Transportation Equity Act for the 21st Century (TEA-21), the RRIF program can support up to $35 billion in loans and loan guarantees.[13] Yet, unlike the Transportation Infrastructure Finance and Innovation Act (TIFIA) loan program, there are limited taxpayer protections for RRIF loans other than the requirement that recipients pay a credit risk premium.

[13] "Railroad Rehabilitation and Improvement Financing." United States Department of Transportation Build America Bureau. *transportation.gov*, 2019. Web. https://www.transportation.gov/buildamerica/programs-services/rrif, 24 January 2019.

In 2015, Reason Foundation recommended four changes to the RRIF program to give it taxpayer protections comparable to TIFIA:

1) restrict loans to 33% of the project's budget;
2) require that the project's senior debt carry an investment grade rating;
3) require that the loan recipient document the existence of a revenue stream dedicated to retiring the RRIF and other loans; and
4) require that, in bankruptcy, the RRIF loan moves to equal status with the primary debt (the "springing lien" provision).

Unfortunately, none of these provisions were adopted.

The problem with the RRIF program is that it encourages loan applications from risky, speculative projects. With respect to Texas Central's project, there is concern that an RRIF loan could serve as the primary or sole source of funding, unlike a TIFIA loan that provides supplemental gap-closure financing. In fact, a similarly speculative rail project, XpressWest, applied for a $5.5 billion RRIF loan, which was between 80% and 100% of the project's estimated budget.[14] The FRA rejected XpressWest's application, but only after lobbying by members of Congress.

Since the RRIF program does not have sufficient taxpayer protections, there is a significant risk that Texas Central would default on a RRIF loan. The default on such a large loan would be a real burden on taxpayers.

[14] Cox, Wendell. "The Xpress High Speed Rail Line from Victorville to Las Vegas: A Taxpayer Risk Analysis." Reason Foundation, 2012. Web. http://demographia.com/xpresswestreport.pdf., 4 February 2019.

PART 5

THE PROJECT ASSUMPTIONS

As discussed in my initial report, Texas Central's revenue projections are based on questionable assumptions, several of which are detailed below:

#1 Switch from Car to Rail: Texas Central assumes that between 60% and 99% of travelers driving between Dallas and Houston will switch to high-speed rail. The highest previous percentage anywhere in the world is 18% (on a Spanish high speed rail line).[15] Texas Central predicts that more than 14,600 cars will be removed from I-45. My earlier report calculated that the occupants of 14,769 cars could make the trip via train. As a result Texas Central is forecasting a diversion rate of 99%.[16] Air or high-speed rail travelers are generally high-income people who choose these modes because of their speed. Automobile travelers are typically middle-income people who choose to travel by car because they want to make a stop along the way, take a more individualized route, have several people in the car (each of whom would need a rail ticket), or are headed to a destination in the suburbs or outside the metro area where they would continue to need transportation. Similar to bus travelers, car

15 Feigenbaum, Baruch. "High Speed Rail in Europe and Asia: Lessons for the United States." Reason Foundation, 2013. Web. https://reason.org/policy-study/high-speed-rail-in-europe-and-asia/, 4 February 2019.

16 Feigenbaum, Baruch. *Texas High Speed Rail: Caution Ahead*. Reason Foundation, 2017. Web. https://reason.org/wp-content/uploads/files/texas_high_speed_rail.pdf, 28, January 2019.

travelers are unlikely to switch to high-speed rail. For all other high-speed rail lines, either the majority of travelers have switched from conventional rail or air travel, or are new, induced riders. Very few switched from driving to high-speed rail. Even though the Dallas-to-Houston corridor lacks conventional rail, Texas Central's ridership projection is three to four times higher than what we would consider to be an optimistic ridership projection.

#2 Low-Cost Air Service: The two most financially successful high-speed rail lines in the world, Tokyo-Osaka and Paris-Lyon, had limited airline competition. Tokyo-Osaka had limited air service because there was no airport near Osaka. As for the Paris-Lyon line, the high-cost government-owned mainline carrier, Air France, provided air service at the time, and it was looking to cut back service in the corridor to focus on international destinations.

In Texas, the aviation market is very different. Both Dallas and Houston have lower-cost air travel options through Southwest Airlines and airports that are easily accessible for business travel (Dallas Love Field and Houston Hobby). These cities also have flights to and from suburban Houston Intercontinental and Dallas-Fort Worth International airports. While Southwest is not as low-cost as Allegiant, Frontier or Spirit, it prioritizes the Dallas-to-Houston corridor, offering daily flights every 30 minutes, starting at less than $100 for advance purchase, and $200 for purchase less than one week in advance.[17] The low-cost and frequency of air travel in Dallas and Houston greatly reduces the number of passengers who will switch to rail.

#3 Employment and Population Densities: Successful high-speed rail lines rely on high population and employment densities near rail stations. Most high-speed rail passengers take transit or rideshare services (Uber/Lyft) to rail. Very few drive to rail stations. Neither Dallas nor Houston has high employment or population density; in fact, they are two of the least densely populated major urban areas in the world.

In contrast, the Northeast Corridor, with New York City at its center, is the best-suited high-speed rail corridor in the country. Approximately 35% of jobs (1.7 million) in New York are within two miles of downtown.[18] Houston and Dallas, in comparison, have only 140,000 and 130,000 jobs within two miles of downtown, respectively. And population densities are even weaker, with 70,000 people living within two miles of downtown Houston and 40,000

[17] Prices found by using Southwest Airlines' website for travel two months in advance and less than one week in advance. The website address is www.southwest.com

[18] Todorovich, Petra and Yoav Hagle. "High Speed Rail in America." America 2050, 2011. Web. www.america2050.org/pdf/HSR-in-America-Complete.pdf, 4, February 2018.

living within two miles of downtown Dallas. These paltry figures, which rank 36th and 143rd in the nation, respectively, are dwarfed by New York City, with 520,000 people within two miles of downtown. In general, U.S. population densities are very low by international standards. No U.S. city has a population density per mile close to London (14,600) or Tokyo (11,400). But New York's population density at 4,500 people per mile is still significantly higher than Dallas and Houston both at 2,800.

#4 Extent of Local Transit Usage: Transit, and particularly rail usage, is one of the most accurate indicators of high-speed rail success. Most high-speed rail lines rely on a network of heavy (high-capacity) rail to funnel passengers to stations. Dallas and Houston have limited (low-capacity) light-rail that cannot funnel passengers as effectively. Many destinations in Dallas and Houston require a rental car, taxi or rideshare (Uber/Lyft) to reach the destination. Sixty percent of commuters use transit in Tokyo and 25% use it in Paris.[19] In both Dallas and Houston, it is less than 5%.

#5 Conventional Rail Network: The largest source of high-speed rail passengers is conventional rail service between the cities in question. European and Asian countries with successful high-speed rail built these lines to relieve congestion on convention rail. In contrast, there is no conventional rail service between Dallas and Houston. No country in the world has built a high-speed rail line between a city-pair (similar to Dallas to Houston) lacking conventional rail. Both Japan and France have far fewer people per rail km (more overall rail service) than the U.S. (33.5).[20] Travelers are far more likely to use rail in these countries than they are in Texas.

#6 Automobile Culture: U.S. automobile ownership is considerably higher and less costly than in both Europe and Japan. When the Japanese and French high-speed rail lines were built, automobile ownership was below 25% in Japan and approximately 40% in France.[21] Today, both France and Japan have a per capita car ownership rate of around 50%. Dallas and Houston have car ownership rates of 90%. Car ownership is important, because regions with higher car ownership rates tend to be more suburban, making it more convenient to fly than take the high-speed rail. Finally, residents less familiar with transit are far less likely to take high-speed rail.

19 Feigenbaum. "High Speed Rail in Europe and Asia."

20 Ibid.

21 Ibid.

PART 6

CONCLUSION

Texas Central has not addressed the primary concerns raised in the peer-reviewed studies with credible data. While Texas Central is free to pursue a truly privately funded high-speed rail project, there are significant concerns regarding the project's feasibility that must not be overlooked, since taxpayer funds may be put at risk (through RRIF loans). The primary areas of concern are the following:

- Texas Central's lack of transparency regarding its project's details;
- Texas Central's challenges in acquiring right-of-way and limited funding/financing, both of which appear to be the cause of mounting delays in the project's timetable;
- Texas Central's use of a management consulting firm—L.E.K.—to estimate ridership for a transportation mega-project, rather than a company with expertise in traffic and revenue studies;
- Texas Central's suggestion that 60% to 99% of Dallas-Houston travelers will switch from car to high-speed rail, when the highest diversion rate anywhere else in the world is 18%;
- Texas Central's potential pursuit of RRIF loans, which could provide funding for more than 50% of the project's estimated $20 billion capital cost, despite the RRIF program's lack of taxpayer safeguards; and
- Texas Central's failure to account for numerous factors indicating that the project could fail financially, including the presence of low-cost airline flights between

Dallas and Houston, lack of conventional rail travel between those cities, low employment and population densities.

We continue to encourage Texas policymakers and stakeholders to closely monitor this project. There is a significant probability that if this project is built and put into operation, Texas Central will default on its loans, require a taxpayer bailout, or both. This would be a devastating outcome for Texas, its residents, taxpayers, and proponents of private high-speed rail in the United States.

ABOUT THE AUTHOR

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