



US HSR Investment

Sept/Oct 2022 Public Forum Topic

**Notes on Evidence**

* **Tags:** Cards are written with summaries (also called tags) to make understanding and presenting the material easier. However, many coaches and some high-quality briefs simply omit them, preferring to have students work more directly with the material to help with understanding and avoid power-tagging (ie, giving an inaccurate summary of the material).

Our tags often link to the topic, and therefore extrapolate from the material at hand. To avoid accusations of powertagging and increase your ability to actually use the cards, please read and understand each card before using it.

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* Thanks to **Armaan Christ** (achrist@utexas.edu) for help cutting these cards. Follow him on Twitter [@burdened](https://twitter.com/burdened).
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# **Background**

##### **High Speed Rail (HSR) Definition**

UIC 18 – [Union Internationale des Chemins de fer (UIC). UIC, the worldwide professional association representing the railway sector and promoting rail transport, UIC leads an innovative and dynamic sector, helping Members find continuing success and opportunities. Members are invited to take a proactive role in the UIC working groups and assemblies where the railways’ position on regional/worldwide issues is shaped. “HIGH SPEED RAIL : PRINCIPLES AND DEFINITION”. 11 June 2018. https://uic.org/IMG/pdf/uic\_high\_speed\_2018\_ph08\_web.pdf. pg. 5. Accessed 3 August 2022.] Debatetrack.

The definition of high speed rail HSR is still a grounded, guided and low grip transport system : it could be considered to be a railway subsystem. The most important change comes from the speed. As travel times had to be reduced for commercial purposes, speed emerged as the main factor. HSR means a jump in commercial speed and this is why UIC considers a commercial speed of 250 km/h to be the principal criterion for the definition of HSR.

However, a secondary criterion is admitted on average distances without air competition, where it may not be relevant to run at 250 km/h, since a lower speed of 230 or 220 km/h or at least above 200 km/h (since under this speed conventional trains can do) is enough to catch as many market shares as a collective mode of transport can do. This also applies in very long tunnels whose construction cost depends on the diameter linked to the square of the speed, at least.

For such speeds above 200 km/h, the infrastructure can be categorized in “High-Speed” if the system in operations, complies with :

track equipment, rolling stock (generalisation of trainsets), signalling systems (abandonment of trackside signals), operations (long-range control centres), the geographical or temporal separation of freight and passenger traffics, and more globaly with the standards for High Speed.

This definition is coherent with the definition of High Speed Rail given by 96/48/EC European directive

Chart, line chart

Description automatically generated

High speed rail requirements

Although increasing the speed has entailed many technical and operational changes, HSR still fulfils the same quantitative and qualitative requirements as classical rail :

Ability to accommodate various contexts and cultures Interoperability, Capacity, Reliability Safety and security Sustainability

This evolution has also made it possible to benefit from many other innovations beyond those simply enabling higher speeds, as there is no point improving one aspect of a journey chain (travel time) if the other links in the chain remain weak.

In addition, a thorough review of all the interfaces between the system components and of all the operating and maintenance procedures is necessary, as time gained for the passenger by the increased speed can be cancelled out by an unacceptably high ticket price.

##### **China’s Model of High Speed Rail**

Jones 22 – [Jones, Ben. Ben Jones has reported on various topics seen in: CNN Travel, The New York Times, Daily Mirror, MSN, MSN Canada, The Sun, Netflix, The Hollywood Reporter, VICE, British Journal of Sports Medicine and more. "Past, Present And Future: The Evolution Of China's Incredible High-Speed Rail Network ". CNN, 09 February 2022, https://www.cnn.com/travel/article/china-high-speed-rail-cmd/index.html. Accessed 10 Aug 2022.] Debatetrack.

(CNN) — At the beginning of the 21st century China had no high-speed railways.

Slow and often uncomfortable trains plodded across this vast country, with low average speeds making journeys such as Shanghai-Beijing a test of travel endurance.

Today, it's a completely different picture. The world's most populous nation has -- by some distance -- the world's largest network of high-speed railways.

No fewer than 37,900 kilometers (about 23,500 miles) of lines crisscross the country, linking all of its major mega-city clusters, and all have been completed since 2008.

Half of that total has been completed in the last five years alone, with a further 3,700 kilometers due to open in the coming months of 2021.

The network is expected to double in length again, to 70,000 kilometers, by 2035.

With maximum speeds of 350 kph (217 mph) on many lines, intercity travel has been transformed and the dominance of airlines has been broken on the busiest routes.

By 2020, 75% of Chinese cities with a population of 500,000 or more had a high-speed rail ink.

Spain, which has Europe's most extensive high-speed network and occupies second place in the global league table, is a minnow in comparison with just over 2,000 miles of dedicated lines built for operation at over 250 kph.

In contrast, the UK currently has just 107 kilometers while the United States has only one rail route that (just about) qualifies for high-speed status -- Amtrak's North East Corridor, where Acela trains currently top out at 240 kph on expensively rebuilt sections of existing line shared with commuter and freight trains.

A symbol of economic power

China's ambition is to make high-speed rail the mode of choice for domestic long-distance travel, but these new railways have a much greater significance.

Much like Japan's Shinkansen in the 1960s, they are a symbol of the country's economic power, rapid modernization, growing technological prowess and increasing prosperity.

For China's ruling Communist Party and its leader Xi Jinping, high-speed rail is also a powerful tool for social cohesion, political influence and the integration of disparate regions with distinct cultures into the mainstream.

"The building of these new railways forms part of Xi Jinping's grand plan of 'integrating the vast national market,'" says Dr. Olivia Cheung, research fellow at the China Institute of the University of London's School of Oriental and African Studies (SOAS). "It is also meant to be reflective of his 'new development philosophy,' of which 'coordinated development' is a key concept.

"His scheme is grand in that it extends beyond just simply connecting existing towns, but existing towns with new mega-towns that are being constructed from scratch. A famous example in which Xi takes a lot of pride is the Xiong'an New Area in Hebei province, around 60 miles southwest of Beijing."

In that sense, it could be argued that China is repeating railway history; many early railways in North America, Europe and the colonies of the European empires were built with similar goals.

The development of railway networks in Russia -- most notably the Trans-Siberian Railway -- Prussia, France, Italy and the British Empire, among others, were strongly influenced by political and military demands as well as economic development.

However, what took decades in the 19th and early 20th centuries is being achieved in just a few years by China.

"The Chinese have created an entire high-speed rail network on an unprecedented scale -- often faster and certainly more reliable than Chinese domestic flights," says rail travel expert Mark Smith, better known as "The Man in Seat 61."

"It's hard not to be impressed by the sheer size of some of the new stations, and by the efficiency with which the system moves vast numbers of people, all with a reserved seat and increasingly without the need for paper tickets, just a scan of an ID card or passport at the ticket gates."

China initially relied on high-speed technology imported from Europe and Japan to establish its network. Global rail engineering giants such as Bombardier, Alstom and Mitsubishi were understandably keen to co-operate, given the potential size of the new market and China's ambitious plans.

However, over the last decade, it is domestic companies that have developed into world leaders in high-speed train technology and engineering, thanks to the astonishing expansion of their home network.

Overcoming high-speed growing pains

The sheer size of China and its tremendous variations in terrain, geology and climate have presented the country's railway engineers with incredible challenges.

From sometimes frozen Harbin in the far north to the near-tropical humidity of the Pearl River Delta megalopolis, to the 1,776-km Lanzhou-Urumqi line traversing the Gobi Desert, China's engineers have quickly developed extensive expertise in driving railways over, under and through whatever terrain lies in their path.

That rapid growth has not been without its problems though; while centralized state funding, planning and approval allows China to avoid the endless legal wrangles that have bedeviled projects in Europe and the United States for decades, the flip side is that new lines pay little heed to existing communities along their route.

China's high-speed growing pains also contributed to the tragic Wenzhou collision in July 2011, when two trains collided on a viaduct and derailed, sending four coaches to the floor below, killing 40 passengers and injuring almost 200 others.

Public confidence in high-speed rail was severely shaken by the accident, resulting in a blanket speed reduction and the suspension of construction work on new lines pending an official investigation. However, no major incidents have been reported in the decade since and passenger numbers have risen exponentially as the network has expanded.

For anyone used to the scope of traditional railway projects, the statistics are often mind boggling.

Construction of the 815-kilometer, $13.5 billion Zhengzhou East-Wangzhou line was completed in less than five years.

When the new 180-kilometer Xuzhou-Lianyungang line opened in February, it completed a continuous 3,490-kilometer high-speed rail connection between Jiangsu province and Urumqi, in the Xinjiang Uighur Autonomous Region. Heading north from the capital, trains now complete the 1,700-kilometer Beijing-Harbin journey in just five hours -- requiring an average speed of 340 kph.

By late-2020, China National Railways was operating more than 9,600 high-speed trains per day, including the world's only high-speed overnight sleeper services on selected longer-distance routes.

On some routes, more than 80% of the track is elevated, soaring above densely packed cities and valuable agricultural land on endless concrete viaducts. More than 100 tunnels -- each over 10 kilometers -- have also been bored, along with spectacular long-span bridges thrown over natural obstacles such as the Yangtze River.

A high-tech demonstration in efficiency

Not satisfied with pushing the boundaries of speed, endurance and civil engineering, Chinese companies are among the first in the world to introduce new technology such as autonomous (driverless) train operation and advanced signaling and control technology.

The driverless "bullet trains" connecting Beijing and Zhangjiakou in northern Hebei province are capable of hitting speeds up to 350 kph, making them the world's fastest autonomous trains.

The new route, opened in December 2019 as part of preparations for the Beijing 2022 Winter Olympic and Paralympic Games, has reduced travel time for the 174-kilometer journey from three hours to less than 60 minutes. The fastest trains complete the trip in just 45 minutes.

Built in just four years, the line has 10 stations serving two of the major Winter Games venues, plus another at Badaling Changcheng providing faster access for tourists to the Great Wall of China. The latter is the world's deepest high-speed railway station, situated 102 meters (335 feet) underground.

Passenger saloons on the autonomous trains have expanded storage areas for winter sports equipment, seats with 5G touchscreen control panels, intelligent lighting, thousands of safety sensors and removable seats for passengers in wheelchairs. Facial-recognition technology and robots are used in stations to assist travelers with navigation, luggage and check-in.

Enormous new stations serving the major cities on the high-speed network are more reminiscent of airport terminals, with acres of spotless polished marble and glass, enormous information screens and lounges where passengers are held until their train is called. No loitering on cold and windy platforms here!

"While the UK argues about building High Speed 2, China has created a nationwide high-speed network," says rail expert Smith.

"China's high-speed lines are ruthlessly efficient -- once booked, a swipe of your ID card or passport at the ticket gates is all you need to travel."

Fares, he says, start from as little as $13.

The new Olympic line gives some clues as to the future direction of rail travel in China -- and beyond -- but technological boundaries are also being pushed in other areas.

In late-2020, China's state-owned rail engineering colossus CRRC previewed the prototype of a very high-speed electric train for international routes capable of operating at speeds as high as 400 kph.

Not only is it claimed to operate in temperatures ranging between -50C and +50C, it features newly developed gauge changing wheelsets that will allow it to run direct into Russia, Mongolia and Kazakhstan, which use a wider track gauge than China's standard 1,435 mm. More ambitiously, the ability to change gauges could also create the possibility for direct trains to India and Pakistan via Myanmar and Bangladesh.

What comes next?

Expansion into neighboring countries is already underway with the $5.3 billion Laos-China Railway due to open by the end of 2021. Although not a high-speed railway, the new 257-mile line is a significant extension of Chinese railway influence, providing improved links from southern China to the Laotian capital Vientiane.

Construction of a railway to Bangkok in Thailand and eventually south to Singapore is also in progress.

CRRC is already the world's largest supplier of railway vehicles and technology but as its home market matures, it has its eyes firmly on global exports worth billions of dollars every year.

As China seeks to expand its influence across Asia and into Europe and Africa via the ambitious "Belt and Road Initiative," rail is playing a fundamental part in creating the new "Silk Road" it desires.

"China's high-speed rail industry has become one of the nation's economic pillar industries and the high-speed network has brought greater mobility and prosperity to the public," said president of Bombardier Transportation China, Jianwei Zhang, in a 2020 statement.

Proposed new railways crossing the Himalayas to India and Pakistan, or reaching into Russia and the former Soviet states of the Central Asian republics will not only provide improved trade routes for Chinese exports, but will deliver enormous contracts (and challenges) for the country's rail and civil engineering conglomerates.

Backed by investment funds and loans, these projects also strengthen China's position as the regional superpower, further pulling developing nations into its gravitational field by increasing their economic dependence on Beijing.

"What remains to be seen -- and it will be very interesting indeed to know -- is how Beijing will systematically link up the domestic railway networks with the Belt and Road Initiative," says Cheung.

"BRI is an ambitious, comprehensive and sophisticated grand strategy, but suspicions about China's intentions are on the rise.

"The challenges to the BRI have not been talked about in public, including how a number of countries are scaling back, suspending or canceling their BRI contracts signed with China. They are worried of the possibility of losing control over strategic assets in the case of defaulting payment of Chinese loans."

Nevertheless, November 2020 saw the unveiling of a proposed $48 billion, 965-kilometer link between Chengdu, the provincial capital of Sichuan, and western Tibet close to the Indian border. An extension of the existing Lhasa-Xigaze railway, opened in 2014, is thought to be a precursor to a planned line to Kathmandu in Nepal and beyond.

These moves are viewed with suspicion in India, China's biggest regional and economic rival, adding to an already tense situation where their borders meet.

Although its trains are now among the fastest in the world, China is also spending billions of dollars on maglev (magnetic levitation) technology, which will allow it to operate passenger services at up to 620 kph -- well beyond the current limits of steel wheels on steel rails.

Two lines are currently under construction totaling around 170 miles, Shanghai-Hangzhou in Zhejiang province and a 110-kilometer underground route linking Guangzhou and Shenzhen, the two biggest cities in the densely populated Pearl River Delta region. It is expected that the latter will eventually extend to Kowloon in the former British territory of Hong Kong.

These projects build on experience gained with the German-backed Shanghai Airport maglev line, which opened in 2003, and is currently the only line of its kind in public operation.

Taking a typically pragmatic approach to raising the speed of land transport, China sees maglev as a better option than the much hyped, but unproven Hyperloop for bridging the gap between high-speed rail and air on long-distance routes.

##### **US High-speed Rail Strategic Plan**

US DoT 09 – US Department of Transportation. (2022). Retrieved 14 August 2022, from https://railroads.dot.gov/sites/fra.dot.gov/files/fra\_net/1468/hsrstrategicplan.pdf. Debatetrack.

After 60 years and more than $1.8 trillion of investment, the United States has developed the world’s most advanced highway and aviation systems. Yet these systems face mounting congestion and rising environmental costs. Moreover, the Nation’s current transportation system consumes 70% of our oil demand – much of it from overseas sources – and contributes 28% of greenhouse gas emissions.

The highway and aviation networks will always remain indispensable elements of the country’s transportation system, and significant investment is needed in those modes to rebuild essential infrastructure and modernize aging technologies. But it is also clear that the existing infrastructure is insufficient to handle the Nation’s future passenger and freight mobility demands. A new approach is needed – one that responds to today’s economic, energy, and environmental challenges.

Strategic Transportation Goals

Transportation investment strategy must address several strategic goals in the coming years:

• Ensure safe and efficient transportation choices. Promote the safest possible movement of goods and people, and optimize the use of existing and new transportation infrastructure.

• Build a foundation for economic competitiveness. Lay the groundwork for near-term and ongoing economic growth by facilitating efficient movement of people and goods, while renewing critical domestic manufacturing and supply industries.

• Promote energy efficiency and environmental quality. Reinforce efforts to foster energy independence and renewable energy, and reduce pollutants and greenhouse gas emissions.

• Support interconnected, livable communities. Improve quality of life in local communities by promoting affordable, convenient and sustainable housing, energy and transportation options.

As Figure 1 illustrates, each transportation mode plays a critical role in intercity passenger transportation, but the comparative advantage of each varies by market factor.

High-speed intercity passenger rail can play a critical role in certain travel markets, but the United States has historically failed to invest in this mode. The President proposes a long-term strategy intended to build an efficient, high-speed passenger rail network of 100- to 600-mile intercity corridors, as one element of a modernized transportation system.

In the near term, this proposal lays the foundation for that network by investing in intercity rail infrastructure, equipment and intermodal connections, beginning with an $8 billion down payment provided under ARRA, and continuing with a high-speed rail grant program of $1 billion per year (as called for in the President’s FY 2010 budget proposal).

The near-term investment strategy seeks to:

• Advance new express highspeed corridor services (operating speeds above 150 mph on primarily dedicated track) in select corridors of 200–600 miles.

• Develop emerging and regional high-speed corridor services (operating speeds up to 90–110 mph and 110–150 mph respectively, on shared and dedicated track) in corridors of 100–500 miles.

• Upgrade reliability and service on conventional intercity rail services (operating speeds up to 79–90 mph).

**Definitions: High-Speed Rail (HSR) and Intercity Passenger Rail (IPR)\***

**HSR – Express.** Frequent, express service between major population centers 200–600 miles apart, with few intermediate stops. Top speeds of at least 150 mph on completely grade-separated, dedicated rights-of-way (with the possible exception of some shared track in terminal areas). Intended to relieve air and highway capacity constraints.

**HSR – Regional.** Relatively frequent service between major and moderate population centers 100–500 miles apart, with some intermediate stops. Top speeds of 110–150 mph, grade-separated, with some dedicated and some shared track (using positive train control technology). Intended to relieve highway and, to some extent, air capacity constraints.

**Emerging HSR.** Developing corridors of 100–500 miles, with strong potential for future HSR Regional and/or Express service. Top speeds of up to 90–110 mph on primarily shared track (eventually using positive train control technology), with advanced grade crossing protection or separation. Intended to develop the passenger rail market, and provide some relief to other modes.

**Conventional Rail**. Traditional intercity passenger rail services of more than 100 miles with as little as one to as many as 7–12 daily frequencies; may or may not have strong potential for future highspeed rail service. Top speeds of up to 79 mph to as high as 90 mph generally on shared track. Intended to provide travel options and to develop the passenger rail market for further development in the future.

\* Corridor lengths are approximate; slightly shorter or longer intercity services may still help meet strategic goals in a costeffective manner.

##### **Biden Infrastructure Bill & HSR Investment**

Millsap 21 – [Millsap, Adam. "Biden’S High-Speed Rail To Nowhere". Forbes, 2022, https://www.forbes.com/sites/adammillsap/2021/04/15/bidens-high-speed-rail-to-nowhere/?sh=33068989108c. Accessed 28 July 2022.] Debatetrack.

President Joe Biden recently released plans for a $2.3 trillion dollar “infrastructure” bill that wants taxpayer dollars for all manner of things—regional innovation hubs, climate change research, workforce training programs, home care services for the elderly, and public housing. If you squint, you can see some money for what most people think of when they hear infrastructure—$115 billion to repair roads and bridges.

Yet despite the fact that over 75% of Americans drive alone to get to work, Biden wants to spend 43% more on public transit ($165 billion) than roads and bridges, including $80 billion alone on trains. This is the latest iteration of elaborate, top-down attempts to make passenger trains relevant in the United States even though they do not make sense.

High-speed rail (HSR) has been discussed as a transportation solution in America since the 1960s. HSR proponents typically claim that rail will increase productivity and make America’s economy more competitive, as in this presidential quote “…we need to ensure that we possess a [HSR] transportation system that boosts American productivity and international competitiveness.” But this is not President Biden talking, or even former President Obama. It is Bill Clinton back in 1992.

Rail was losing market share to cars prior to World War II and its market share fell throughout the 20th century. By the 1990s, the economics of HSR did not make sense and they make even less sense today. In 1994, Louis Thompson wrote a special feature in Japan Railway & Transport Review titled High-Speed Rail in the United States—Why Isn’t There More? In it, he points out all the things working against a U.S. HSR system—geography, relatively low population density, and greater competition from cars and planes than in other countries. These factors still present issues for HSR.

Some will argue that national population density is not the appropriate statistic to consider since HSR is designed to connect dense cities to one another. But U.S. cities are not very dense, either. New York is America’s densest big city at 27,000 people per square mile. San Francisco is second at just over 17,000 people per square mile. These cities are comparable to Beijing (almost 30,000 per square mile) or Tokyo (12,000 per square mile) but are well below Seoul (43,000 per square mile) Shanghai (35,000 per square mile) or Paris (53,000 per square mile).

##### **Texas HSR**

Tuggle 6/30 – [Tuggle, Donnie. Donnie Tuggle, an Atlanta, Georgia native, joined the KBTX team as a multimedia journalist in September 2020. “Supporters and opponents of proposed high-speed train await Texas Central’s next move” KBTX. 30 June 2022. <https://www.kbtx.com/2022/07/01/supporters-opponents-proposed-high-speed-train-await-texas-centrals-next-move/>. Accessed 10 August 2022.] Debatetrack.

BRYAN, Texas (KBTX) -What’s next? That’s the billion-dollar question supporters and opponents of Texas Central’s proposed 240 Mile high-speed train from Houston to Dallas are asking.

Texas Central’s recent victory in the Supreme Court of Texas has reignited the conversation about the project many considered to be dead as the company faces obstacles including reported funding challenges and a lack of upper management after the company’s CEO step down in June.

With Texas Central now having eminent domain authority many are wondering if new investors will emerge to get the project back on track.

Advocates like Rick Harnish with the high-speed rail alliance say the supreme court decision granting texas central eminent domain authority is a small step forward in connecting rural communities with metro cities.

“Were happy to see that the project can proceed according to this one piece of the puzzle,” said Harnish. “Texas uses eminent domain on a regular basis in order to expand highways and airports and utilities such as pipelines and electric utilities also use eminent domain in order to create our critical infrastructure.”

The Bryan-College Station Chamber of Commerce has supported Texas Central since its inception. Chamber President Glen Brewer says investment in transportation spurs both local and regional economies.

“Being able to be in Dallas and Ft. Worth or being able to be in Houston in a short amount of time without driving, without taking a car, relieving congestion on the highway without having to, you can work on your laptop while you’re going to your meeting. There are just a lot of efficiencies that come with traveling by rail that you’re not going to get by driving by car or having to go through the airport system,” said Brewer

“It does look like they’ve had some success on the legal front. There’s still some fundraising as I understand that they have to run through as far as investment goes that could slow things down,” said Brewer.

Brewer says while they support the project, they also hope that the railway purchases property on the free market instead of forcing people to sell.

“It really is a win-win for the business community, but we definitely understand the rights, the property rights and we’re hoping that doesn’t interfere with anyone’s private property rights.,” said Brewer.

KBTX reached out to Texas Central with the hopes of learning if and when new leadership could be in place and the next step in the project, but have yet to hear back.

##### **Florida HSR**

Rubio 07/22 – [Rubio, Paul. Paul Rubio is an award-winning travel journalist and photographer. His byline appears in AFAR, Conde Nast Traveler, Fodor’s, LUXURY, MSN, NerdWallet, Palm Beach Illustrated, Yahoo Lifestyle and more. He has visited 133 countries (and counting) over the past 20 years and won 27 national awards for his writing and photography. When he’s not plotting out his next trip, Paul loves to spend time at home watching reruns of Portlandia and Parks and Recreation with his husband and rescue dog, Camo. "Brightline Brings High-Speed Train Travel To America, Starting In Florida". AFAR Media, 2022, https://www.afar.com/magazine/brightline-trains-bring-high-speed-rail-to-florida. Accessed 10 Aug 2022.] Debatetrack.

By early 2023, the journey between Miami and Orlando should get a whole lot easier. Unbearable traffic, pricey refuels, road rage, and steep carbon footprints will be things of the past as Florida enters an age of high-speed train travel.

This welcomed change comes courtesy of Brightline, an ecofriendly, high-speed train company scheduled to commence service between Miami and Orlando early next year. It’s the latest plot point in a series of game-changing transportation improvements transforming the state.

Brightline has been changing how people live, work, and play in south Florida since it launched its first high-speed train service in 2018 between Fort Lauderdale and West Palm Beach. Soon after, it expanded to downtown Miami. Anchored by glass-encased futuristic stations (with fab work pods and watering holes), the privately funded, multi-billion-dollar rail service currently whisks passengers at 79 mph between these key cities on tricked-out trains (that run on clean biodiesel fuel), providing friendly, top-notch service all along the way (a rarity in travel these days).

Here, all you need to know about the state’s high-speed rail service—present and future—and why you’ll want to ditch the car on your next trip to Florida.

Current Brightline destinations

Brightline currently operates between three major metropolises—Miami, Fort Lauderdale, and West Palm Beach—with service almost hourly from early morning to late night. The trip clocks in under 30 minutes between Miami and Fort Lauderdale and another 35 between Fort Lauderdale and Palm Beach, less than half the typical travel time by car (during rush hour).

While the trains take passengers from one downtown to the next, Brightline also offers door-to-door service through Brightline+, a Brightline-branded fleet of electric cars. When booking a train, riders have the option of booking an electric vehicle to pick them up or drop them off anywhere within a five-mile radius of the station. (At press time, this service is complimentary–and is also working out some kinks.)

How much do Brightline tickets cost?

Before purchasing a ticket on the Brightline app or website, you’ll need to first choose between two classes of service: “Smart” and “Premium.” Both promise comfy seats, free Wi-Fi, and the greater Brightline train experience. However, Premium means seating in Coach 1, where complimentary snacks and beverages (including alcoholic) are provided along with slightly roomier seats. It also grants access to the predeparture lounges at train stations, where bites and tipples are also available.

Tickets in Smart begin at $10 for the journey between Miami and Fort Lauderdale, $27 in Premium. For Miami to West Palm Beach, fares start at $15 in Smart and $37 in Premium. Put in perspective, a rideshare typically costs $50–$75 from Miami to Fort Lauderdale and over $100 between Miami and West Palm Beach.

Note that Brightline also runs plenty of promos at any given time, most of which can be found on its website. For example, this South Florida–based writer is currently enjoying an unlimited monthly pass for $199 to commute between Fort Lauderdale and Miami.

The Brightline experience

The three Brightline stations currently in operation bear similar modern aesthetics, underscored by wide reception halls, cantilevered spaces above the tracks, geometric furnishings, and floor-to-ceiling windows. They’re solar-powered and rife with ecofriendly design elements like the highest tech Dyson hand dryers in the restrooms and water refill stations.

Riders are encouraged to arrive 15 minutes before scheduled departure, but boarding doesn’t close until 5 minutes prior. There are check-in counters upon entering for those who need to drop large suitcases, but most will skip this area and go directly upstairs to security screening. It typically takes a minute to self-scan your ticket from the app and get your smaller carry-on bags screened.

Once through, the predeparture area consists of stylish seating areas and work pods aplenty, with no shortage of plugs or USB chargers. There’s a sit-down bar in every train station, which serves breakfast, lunch, and dinner (and some pretty awesome cocktails) plus a grab-and-go market that’s fully autonomous (think: a minibar that automatically charges when you touch things but on a much larger scale). There’s also a predeparture lounge for those who splurge on Premium class.

Once boarding is announced and the train approaches the track, you’ll notice Brightline’s signature yellow exterior. Inside, the colors skew neutral and the cars spacious. Interior aisles measure an ample 32 inches, making it easy to maneuver rolling suitcases, strollers, and even wheelchairs. The train seats look and feel like premium economy airline seats; there’s plenty of legroom and elbow room plus an in-seat recline that slides forward instead of landing on the lap of the passenger behind. Each seat also features two USB ports and two outlets, so you can charge all your electronics at once.

On board, Brightline’s Wi-Fi exists at lightning-fast speed, strong enough for streaming and video calls. The network is the same across all stations and trains, avoiding connectivity interruptions.

During the journey in Smart class, attendants stroll through the aisles with food and beverage for purchase. In Premium, riders receive one snack and two drinks of their choice from the roving cart. When the cart does pass by, don’t be surprised if an attendant chats with you. Much like all the people working for Brightline that I’ve met, the on-board attendants are affable and customer-service oriented. This extends to the security screeners, baggage handlers, bar staff—you name it. Such an elevated hospitality-driven experience is refreshing, especially when service levels at hotels, restaurants, and on airlines seem to be hitting all-time lows.

The future of Brightline

Construction is underway for an Aventura station (between Miami and Fort Lauderdale) as well as a Boca Raton station (between Fort Lauderdale and West Palm Beach), both set to debut by December 2022. Additionally, tracks connecting West Palm Beach and Orlando are nearing completion. The station, which will be located at Orlando International Airport, should start welcoming passengers in early 2023. Once these three destinations are in service, Brightline will head to Tampa, Florida, soon after, while also embarking on a West Coast equivalent: an express train connecting Southern California and Las Vegas in just a three-hour ride. Construction is expected to begin in 2023.

For now, Brightline is actively transforming the way people live and vacation across south Florida. The high-speed, state-of-the-art trains are changing the face of local and regional travel, with the best yet to come.

##### **California HSR**

Ohnsman 7/16 – [Ohnsman, Alan. I track technology-driven changes that reshape how we get around from Los Angeles, America's sunny capital of congestion. "California Bullet Train Gets $4.2 Billion Green Light For First Phase While Bigger Challenges Loom". Forbes, 2022, https://www.forbes.com/sites/alanohnsman/2022/07/16/california-bullet-train-gets-42-billion-green-light-for-first-phase-while-bigger-challenges-loom/?sh=75ecec7725b1. Accessed 10 Aug 2022.] Debatetrack.

In a breakthrough for the country’s most expensive public infrastructure project, California’s bullet train finally appears to have the money and the legal approval to complete its first leg. What remains a challenge is how to link that initial 171-mile route through the state’s Central Valley agricultural heartland to population centers in Los Angeles, San Francisco and San Jose—and how its designers will overcome California’s mountainous terrain and seismic risks.

State legislators agreed last month to release $4.2 billion earmarked for the train’s first phase, between midsize cities Bakersfield, Fresno and Merced. The project may also benefit from more than $2 billion of federal Bipartisan Infrastructure Law funds set aside for passenger rail. Extending service to the San Francisco Bay Area and Los Angeles would boost the amount of track to 500 miles and the train’s total price tag to as much as $105 billion. That’s far above an initial estimate of about $40 billion when California voters approved a $10 billion bond measure to help build it in 2008.

“It’s not an easy task to build a system like this,” said Brian Kelly, CEO of the California High-Speed Rail Authority. “It’s a tough slog, but it’s one worth doing.”

Four years ago, the state tapped Kelly, a veteran transportation official, to get matters back on track after early management blunders threatened public support. Legal challenges and securing all the land needed to build even the first, relatively flat phase were also priorities. Today, 119 miles of concrete, bridgelike viaducts and other structures on which electric trains will someday run at over 200 mph are being built—bringing temporary headaches to downtown Fresno—with new work poised to begin on the remaining 52 miles that are now funded. Critically, Kelly and his team have also secured more than 90% of the land needed to keep construction on track.

The project “is alive and well and creating employment opportunities for thousands of workers who are engaged in the most innovative and transformative project our nation has seen in almost 75 years,” said Karen Philbrick, executive director of San Jose State University’s Mineta Transportation Institute. “The legislative support to advance an electrified HSR segment between Merced and Bakersfield is incredibly meaningful.”

Where Philbrick sees opportunity, critics see a boondoggle. “This is an enormous waste of money,” said Oakland-based attorney Stu Flashman, who sued to block funding for the train’s first phase, arguing it violated the state’s constitution. “My clients don’t feel it’s ever going to result in a viable high-speed rail line.”

It’s “the most transformative project our nation has seen in almost 75 years.”

California’s Court of Appeals ruled against Flashman late last year, allowing construction to continue. That victory and recent funding developments give the train a degree of stability for the time being.

It’s a big shift from a few years ago when then President Donald Trump withheld $929 million of federal funds awarded years earlier and threatened to claw back $2.5 billion doled out by the Obama Administration. Longtime train commuter President Joe Biden restored those funds in 2021 and wants more bullet-train projects, both for the jobs they’ll generate and to help cut climate-warming emissions from cars.

The California project, which estimates travel time between San Francisco and Los Angeles will be less than three hours, also receives about $1 billion annually from the state’s Cap and Trade program, a de facto carbon tax on major emitters of greenhouse gasses. While the Build Back Better infrastructure money was never approved, there’s a pool of other new federal money California can tap for future needs.

“We identified out of the infrastructure bill six different programs that we can compete in for different project elements,” Kelly told Forbes. “Those six different pots total about $70 billion over the next five years.”

Orders for the first trains could go out as soon as next year. Companies including Siemens, which has a passenger-train factory in Sacramento, and Alstom, which builds them at East Coast plants, both have Amtrak contracts and will likely compete for California’s business.

“There’s several other train manufacturers, from around Asia and the world, building high-speed trains,” Kelly said. “There’s no shortage of suppliers.”

Auto-obsessed America is a global laggard in high-speed rail, a service widely available across Europe, China, Taiwan, South Korea and Japan, which pioneered the technology six decades ago. While many of those trains run at speeds of up to 220 miles per hour, the fastest line in the U.S. is Amtrak’s Acela service between New York and Washington, topping out at 150 mph. Amtrak is upgrading the Acela fleet on its profitable Northeast Corridor between New York and Boston with new Alstom trains that will boost speeds to 160 mph. Future track improvements should increase that even further.

California has no monopoly on high-speed dreams. Florida-based Brightline, the only private passenger railroad in the U.S., is expanding its Miami to West Palm Beach service to Orlando next year, offering top speeds of 125 mph. The company, controlled by Milwaukee Bucks co-owner and Fortress Investment cofounder Wes Edens, also expects to announce new funding plans and a revised timetable for its delayed Brightline West, a train from Las Vegas to suburban Los Angeles that may move passengers at 200 mph when service begins late this decade. (Brightline has also said it may eventually connect to California’s bullet train at a future station in Palmdale.) Another private initiative, the Texas Central Railway, hopes to begin construction soon on a 240-mile high-speed line between Dallas and Houston. Planning has also begun for a Pacific Northwest line that would whisk passengers on high-speed trains from Portland, Oregon, to Seattle and Vancouver, British Columbia.

But all the programs share the same challenge the Golden State faces: finding billions of dollars to turn them into a reality.

Critics of the California project have long argued that it would have been faster and cheaper to design a system running along Interstate 5, the tedious backbone highway that connects Los Angeles to the Bay Area. But Fresno Mayor Jerry Dyer bristles at that idea because it would bypass the Central Valley cities.

“Those are the types of comments that led to the creation of I-5 many years ago, that caused Fresno and the Central Valley to be left out of the California economy,” he told Forbes. “This is an opportunity for Fresno and the Central Valley to be recognized as a part of California. Anyone who thinks that they can bypass Fresno and the Central Valley again doesn’t have a heart for people.”

Merced, the northern terminus of the first phase, will tie into an existing regional commuter train linking to Sacramento and the Bay Area, though a high-speed connection isn’t likely until the late 2030s. Including service to San Francisco, San Jose and Los Angeles, the California High-Speed Rail Authority estimates that 50 million riders will use the system annually, generating about $3.4 billion of fare revenue.

“Anyone who thinks that they can bypass Fresno and the Central Valley again doesn’t have a heart for people.”

Construction work in Fresno has clogged downtown streets and will be a headache for its nearly 530,000 residents for at least another year. While the Central Valley region is known mainly as the center of the state’s vast agriculture industry, Fresno’s population is rising in the wake of the Covid pandemic as its relatively affordable housing and cost of living draw Californians able to work remotely. High-speed rail, particularly if and when the system links to San Francisco and Los Angeles, will make it even more appealing, Dyer said.

“This has stimulated a lot of interest in terms of venture capitalists and others who have expressed an interest to come in and develop in Fresno,” he said. “But it’s important on our end that we not allow people to come in and buy buildings and land bank—to wait for the development to occur—but to develop now, in anticipation of high-speed rail.”

Ballooning costs and funding snafus aside, monumental engineering challenges also loom. These include tunneling through the San Gabriel and Tehachapi mountain ranges in the south and Pacheco Pass in the north. The system also has to be built to withstand the state’s infamous earthquakes.

California is tapping global expertise in those areas, such as Japanese engineers who’ve overcome similar geographic challenges. A technical advisory panel made up of international experts will review and provide input on California’s design criteria.

It’s likely that the next segment will be built to connect Merced to San Jose, Kelly said. “How and when we do the next segments beyond the (Central) Valley will come down to where funding is most available,” he said. “Our job is to get it ready to go and then when funding is there, we will be ready to move. It looks like the Bay Area would be first now, but we’ll have to see how it all shakes out.”

As far as transportation researcher Philbrick is concerned, the rail project has “turned a corner.” But in the absence of a clear source for the additional $80 billion needed to get the tracks to San Francisco and Los Angeles, detractors see only a white elephant.

“When they finish it, and it’s been running for a few years, maybe they’ll sell it at a loss,” Flashman said. “It will be a nice amusement ride for Disney.”

##### **In 2022, the California HSR project is moving ahead**

Rudick 22 – Clear Victory for High-Speed Rail as State Budget is Approved. (2022). Retrieved 12 August 2022, from https://cal.streetsblog.org/2022/06/30/clear-victory-for-high-speed-rail-as-state-budget-is-approved/ Debatetrack.

Lawmakers voted and [approved a $308 billion state budget on Wednesday that includes $4.2 billion](https://lbpost.com/news/california-lawmakers-ok-budget-most-taxpayers-to-get-refund) for completion of the Central Valley spine of the California high-speed rail project. The state can now move forward purchasing trains, building tracks, and fully electrifying over 100 miles of right of way.

“We’re thrilled that California’s political leaders are ratifying the will of the voters by advancing funding for the state’s high-speed rail project,” said Sean Jeans-Gail, Vice President of Government Affairs at the Rail Passengers Association in Washington D.C. “Now, we’re calling on those same leaders, in partnership with the California High-Speed Rail Authority, to accelerate construction on this corridor.”

‘This is America’s most important public infrastructure project that will redirect the nation into a clean, green 21st century,” said Andy Kunz of the U.S. High-speed Rail Association. “We commend California’s leaders for having the vision to boldly plan for a better future.”

Word came down early this week that a deal had been struck to finally release these funds, [locked in budget negotiations by Speaker Anthony Rendon](https://cal.streetsblog.org/2022/05/05/letter-to-speaker-rendon-stop-blocking-bullet-train/) and others for more than a year. TRANSDEF, one of many organizations engaged in lawsuits and other efforts to kill the project, conceded defeat in an email to its members. “I learned from the Speaker’s Office yesterday that a deal was struck that gave the Governor the $4.2 billion in HSR bonds that he wanted. That ends our hopes that HSR project can be killed,” wrote David Schonbrunn, the organization’s president.

“Unfortunately, we lost in the trial court. We appealed. We lost in the appellate court,” wrote the Community Coalition, a San Mateo based-group that helped launch one of many lawsuits against the project, in an email to its members. Their appeal to the California Supreme Court was rejected, meaning the main legal challenges to HSR are now dead.

Meanwhile, [efforts are underway to secure money from the federal infrastructure bill and other pending legislation in Washington to fully connect the Central Valley spine to San Jose, San Francisco and Los Angeles](https://cal.streetsblog.org/2021/11/08/feds-pass-downpayment-for-next-phase-of-california-high-speed-rail/).

“This is not the Notre Dame Cathedral, and it should not be a generational construction effort,” said Jeans-Gail. “The need to electrify the state’s transportation system to battle climate change is too urgent to let this project languish under a barrage of endless reviews and lawsuits.”

# **Pro**

## **Bucket List**

#### **High Speed Rails is crucial for supply chain improvements, climate change, job growth, and economic growth**

Waite 21 – [Waite, Marilyn. Marilyn Waite is a GreenBiz editor-at-large. Prior to this, she was a 1 Hotels Fellow at E2. She has worked across four continents in renewable and nuclear energy, tech startups and venture capital and investment. Author of "Sustainability at Work," Marilyn serves on the Board of Directors for The Biomimicry Institute and lectures sustainable business at UIBE in Beijing. Marilyn previously led the energy practice at Village Capital, modeled and forecasted energy solutions to climate change as a Senior Research Fellow at Project Drawdown, and managed clean energy research and development projects at AREVA. She holds a master’s degree with distinction in Engineering for Sustainable Development from the University of Cambridge and a bachelor’s degree in Civil and Environmental Engineering, magna cum laude, from Princeton University. "Why The US Needs To Get On Track With High-Speed Rail | Greenbiz". Greenbiz.Com, 2022, https://www.greenbiz.com/article/why-us-needs-get-track-high-speed-rail. Accessed 5 Aug 2022.] Debatetrack.

The barriers to high-speed rail (and rail at lower speeds) are numerous in the U.S. The obstacles include local NIMBY-ism, construction cost overruns of previous rail plans and laws that disadvantage the majority public interest and place small municipalities at the center of power of what are state or multi-state level infrastructure decisions. Amtrak, also known as the National Railroad Passenger Corporation, is the national rail operator that operates more than 300 daily trains in the U.S. and Canada. However, Amtrak operates most of its network, around 70 percent, on tracks owned by other railroads. China’s high-speed rail success was built on getting many things right that the U.S. has historically gotten wrong — including large public investment, exercising powerful right-of-way laws, rapid build-out, forecasted travel demand planning and low fares. The benefits of high-speed rail are plentiful and difficult to fully quantify. Historically, benefits have included shortened travel times and thus higher productivity, improved safety and facilitation of labor mobility, as well as increased economic activity associated with tourism, construction and other productive uses near new stations. High-speed rail networks also reduce operating costs, accidents, highway congestion and greenhouse gas emissions as some air and auto travelers switch to rail. As poverty rises in U.S. suburbs, high-speed rail could provide a means, especially when connected with local light rail systems, to access jobs and wealth. Studies indicate that high-speed rail connections have important spillover effects in supporting an extensive supply chain and manufacturing industry, which creates new companies. In addition, HSR helps reduce the negative impacts that extensive car use entails. According to engineer and historian Henry Petroski in "The Road Taken: The History and Future of America’s Infrastructure," the delays caused by traffic congestion alone cost the U.S. economy over $120 billion per year. In the era of COVID-19 and the corresponding re-working of many workplaces, high-speed rail provides an additional benefit: worker flexibility. In the era of COVID-19 and the corresponding re-working of many workplaces, high-speed rail provides an additional benefit: worker flexibility. With many companies deciding that a full remote working or twice-a-week in-the-office policy is not only feasible but better for a number of well-being and productivity outcomes, high-speed rail could offer more choice and options for workers, and more access to talent for employers. Imagine employers in California that can have equal access to Oakland and Los Angeles employees; likewise for Dallas-Austin-Houston; Atlanta-Nashville-Birmingham; Chicago-Detroit. Transportation represents the largest source of climate-harming greenhouse gas emissions in the U.S., and the climate benefits of high-speed rail are clear. According to Project Drawdown, high-speed rail reduces carbon emissions up to 90 percent compared to driving, flying or riding conventional rail, and is the fastest way to travel between two points that are a few hundred miles apart. High-speed rail also helps build in resiliency and needed redundancy to face the impacts of climate change, such as when planes are grounded due to severe weather. There are future plans to build high-speed rail in the U.S., and they have been plans for a long time. Without adequate public investment, better accounting of benefits and changes to the laws that impede progress, they will remain just plans, depriving the economy of the low-carbon infrastructure that’s needed to connect communities, create jobs and mitigate climate change.

## **Emissions**

#### **The US uses 25% of the world’s oil supply with only 5% of the population—we need to kick our dependence on cars, and HSR can help**

Center for American Progress 10—[It’s Easy Being Green: Rail Transport Picks Up Speed. (2010). Retrieved 11 August 2022, from https://www.americanprogress.org/article/its-easy-being-green-rail-transport-picks-up-speed/] Debatetrack.

The United States uses [25 percent](http://www.ushsr.com/benefits/energysecurity.html) of the entire world’s oil supply despite having only 5 percent of the world’s population, and sprawling communities force people to drive even short distances. We need alternate modes of transportation to kick this oil dependence, and one alternative is high-speed rail, which offers tantalizing environmental and economic benefits. President Barack Obama, Vice President Joseph Biden, and Transportation Secretary Ray LaHood [announced](http://www.fra.dot.gov/Downloads/RRdev/hsrpressrelease.pdf) a strategic plan for high-speed rail last year that includes $8 billion in the American Recovery and Reinvestment Act and $1 billion a year for five years in the federal budget. Their goal is to jumpstart a potential world-class rail system in the United States.

These economic incentives for a mass U.S. network of high-speed rail trains, or HSR, along existing transportation corridors could create much-needed jobs, decrease our dependence on foreign oil and fossil fuels, and significantly reduce greenhouse gas emissions.

The national implementation of HSR would create jobs in the planning, design, and construction of track and station infrastructure as well as the management, design, and manufacturing of high-speed trains. A study by the California High-Speed Rail Authority found that building their proposed HSR system—which would run from Los Angeles to San Francisco and voters OK’d in 2008—will create [150,000 construction jobs and 450,000 permanent jobs](http://www.csmonitor.com/Commentary/Opinion/2010/0201/US-high-speed-rail-to-the-rescue/(page)/2).

Critics worry that HSR will encourage sprawl and have a significant [impact](http://www.hsrlandimpacts.org/) on parks and wildlife refuges. Yet there have been [no links established](http://www.thetransportpolitic.com/2010/03/18/the-sprawling-effects-of-high-speed-rail/) between existing HSR stations in France and Spain, for example, and an epidemic of suburban growth. In fact, sprawl could be a thing of the past if we take [preventative measures](http://caivn.org/article/2010/03/23/while-high-speed-rail-languishes-us-it-booms-china-and-beyond) to encourage urban density, enact antisprawl regulations, and make it convenient to travel to outlying HSR stations with plenty of garage parking.

HSR systems would take advantage of existing transportation corridors to minimize intrusion onto protected nature reserves, decrease air pollution generated by internal combustion engines in cars, and reduce greenhouse gas emissions. The [California HSR](http://www.cahighspeedrail.ca.gov/faqs/environment.htm), for example, will remove 12 billion pounds of carbon dioxide per year by 2030 because it uses electricity generated from wind, solar, and other renewable resources. In addition, California’s HSR will save 12.7 million barrels of oil by 2030.

Further, the Center for Clean Air Policy and the Center for Neighborhood Technology concluded in 2006 that a national HSR system could reduce the number of annual car trips by 29 million and annual plane flights by 500,000, saving 6 billion pounds of carbon dioxide emissions equal to [removing 1 million cars from the road each year](http://www.ushsr.com/).

If the United States is going to have a world-class rail system, however, it needs to focus on the “speed” part of HSR. President Obama said on January 27, 2010, “there’s no reason why Europe or China should have the fastest trains.” Yet [plans](http://www.ushsr.com/hsrnetwork.html) for a network in the United States indicate that U.S. HSR trains will be slower than their European or Asian counterparts. European HSR trains operate in excess of speeds of 180 mph, but the U.S. HSR train speeds vary from express routes that serve major population centers traveling at least at 150 mph to regional routes at 110-150 mph to developing corridors topping out at 90-110 mph on tracks shared with regular rails.

#### **HSR eliminates a major source of emissions and pollution from automobiles – see table**

Lin et al. 21 – [Lin, Yatang; Yatang Lin is part of the Department of Economics, Division of Environment and Division of Social Science, HKUST, Clear Water Bay, Kowloon, Hong Kong; Qin, Yu; Yu Qin is part of the Department of Real Estate, NUS Business School, National University of Singapore; Wu, Jing; Jing Wu is part of the Hang Lung Center for Real Estate and Department of Construction Management, Tsinghua University, Beijing, China; Xu, Mandi; Mandi Xu is part of the Hang Lung Center for Real Estate and Department of Construction Management, Tsinghua University, Beijing, China; “Impact of High-Speed Rail on Road Traffic and Greenhouse Gas Emissions.” Nature climate change 11.11 (2021): 952–957. https://www.nature.com/articles/s41558-021-01190-8. Accessed 8 August 2022.] Debatetrack.

Impacts of HSR on road-traffic volume Following equation (1) (Methods), the main results (Table 1) show that traffic flows on highways significantly drop after a city pair is connected by HSR. The flows of passenger vehicles drop by approximately 20.5 log points with the most complete specification (column (2)). This finding is consistent with our conjecture that some passenger flows may shift from highways to HSRs, given that HSRs in China only serve passengers. Interestingly, we also find the flows of goods vehicles drop by approximately 15.7 log points (column (4)) after the HSR connection, which should not be driven by the shift of freight transportation from highways to HSRs, because HSRs are not used for freight transportation in China. One likely explanation is that the opening of HSRs helps relieve some of the capacity on conventional railway lines, which serve a mixture of both passenger and freight transportation. Given that HSRs draw passengers away from these conventional railway lines, the freight transportation capacity greatly increases in these lines, which may draw away some freight traffic from the highways. As declared in 2010 by Huawu He, the chief engineer of the Ministry of Railways of China, the opening of HSR has greatly released the freight capacity of the conventional railway; for example, the opening of the Wuhan– Guangzhou HSR line has increased the annual freight capacity of the parallel conventional railway by 87.6 million tons, and that of the Shanghai–Nanjing HSR line is 83.95 million tons (the sum of the two lines’ capacity increments reaches 171.55 million tons, which accounted for 5% of the national freight volume of 364,271 million tons in 2010)14. We provide additional support for this channel (Supplementary Table 1) by regressing annual province-to-province railway freight volumes on the intensity of province-to-province HSR connectivity and document significant positive responses. By contrast, we find an insignificantly positive effect of HSR on passenger traffic flows on ordinary national roads (columns (5) and (6)). This finding might be explained by the low substitutability between HSRs and ordinary national roads; ordinary national roads have no minimum speed limitation and no closed measures such as fences alongside, so vehicles have a much lower average speed on ordinary national roads than on highways. Possibly for the same reason, the HSR connections have no effect on the traffic flows of goods vehicles on ordinary national roads (columns (7) and (8)).

Table

Description automatically generated

#### **HSR has reduced emissions in China**

Nature Climate Change 21 – Environment: High-speed rail networks help reduce China’s carbon emissions | Nature Climate Change | Nature Portfolio. (2022). Retrieved 13 August 2022, from https://www.natureasia.com/en/research/highlight/13853] Debatetrack.

Expansion of the high-speed rail network in China between 2008 and 2016 led to a significant reduction in carbon emissions from its transport sector, according to a paper published in Nature Climate Change. The study suggests that this reduction comes mainly as a result of the transportation of goods shifting from highways to conventional rail because high-speed networks free up capacity on conventional railways.

High-speed rail (HSR) is an important form of long-distance public transport that is well-established across East Asia and Europe. Although HSR is believed to be more energy-efficient and environmentally-friendly than road and conventional rail, it is unclear to what extent new rail routes could reduce carbon emissions from the transport sector.

Using national traffic-monitoring data and statistical approaches, Yu Qin and colleagues provide evidence that the expansion of the Chinese HSR network between 2008 and 2016 has led to a reduction in annual greenhouse gas emissions equivalent to 14.76 million tons of carbon dioxide through reductions in both highway passenger and freight traffic in response to HSR. This substitution effect is the major contributor to the overall reduction of greenhouse gas emissions by HSR. This figure corresponds to 1.75% of the total greenhouse gas emissions in China’s transport sector. The authors suggest that this mitigation mainly comes from freight transport switching from road to conventional railways, which are indirectly freed up by passengers using HSR. The authors also project that greener electricity conditions could further increase the climate benefits of HSR.

In an associated News & Views, Armin Schmutzler notes the ‘very useful insights’ this paper presents in what ‘appears to be the first contribution identifying greenhouse-gas reduction effects of high-speed rail systems’.

## **Funding Gap**

#### **The US spends far less on rail than countries like the UK, France and Japan where rail ridership is far higher**

Freemark 21 – Congress’s Infrastructure Plan Could Be a Major Step toward Improved Intercity Rail—But Long-Term Commitment and Targeted Investments Are Necessary to Build Ridership. (2021). Retrieved 11 August 2022, from https://www.urban.org/urban-wire/congresss-infrastructure-plan-could-be-major-step-toward-improved-intercity-rail-long-term-commitment-and-targeted-investments-are-necessary-build-ridership

[Yonah Freemark is a senior research associate in the Metropolitan Housing and Communities Policy Center at the Urban Institute. He is the research director of the [Land Use Lab at Urban](https://www.urban.org/research-area/land-use#about). His research focuses on the intersection of land use, affordable housing, transportation, and governance. He has published peer-reviewed scholarship in numerous journals, including *Urban Affairs Review*, *Politics & Society*, *Housing Policy Debate*, and the *Journal of the American Planning Association*.] Debatetrack.

US intercity rail is underused. Though Canadians ride trains at a similar rate, compared with France, Germany, Italy, Japan, and the United Kingdom, the US stands out. Japanese residents, for example, travel an average of almost 1,300 miles on intercity rail annually, compared with just 24 miles for Americans.

One explanation for the difference is that the US has invested little in its rail system, routinely far less than in other nations. The United Kingdom spends about six times as much per capita on its railways. All investment combined, since 1995, the US has spent just 611 euros per resident—compared with more than 2,000 euros per resident for France, Italy, and the United Kingdom. The proposed bill, if passed, would fill part of the gap, but not all of it.

In previous years, the US has funded rail improvements, such as the [$2 billion spent](https://hsrail.org/midwest/chicago-st-louis-110-mph-project) increasing maximum travel speeds to 90 mph from [Chicago to St. Louis](https://www.chicagomag.com/city-life/february-2019/what-happened-to-high-speed-rail-in-illinois/) over 10 years. But such projects have failed to deliver significantly reduced travel times because [signal systems have not been adequately upgraded](https://hsrail.org/blog/chicago-st-louis-line-much-improved-not-done-yet) and passenger trains usually operate on tracks owned by freight companies, which [frequently delay](https://www.trains.com/trn/news-reviews/news-wire/maximum-speeds-increase-to-90-mph-on-amtraks-chicago-st-louis-corridor/) Amtrak trains.

Unlike France, Germany, Italy, Japan, and the UK, the US has barely invested in high-speed rail, or tracks that allow trains to operate at 150 mph or more. These services are attractive because they are [much faster than driving](https://www.eesi.org/papers/view/fact-sheet-high-speed-rail-development-worldwide) and often faster than flying. They also head right downtown.

Current services link Chicago and St. Louis in 5 hours and 30 minutes five times a day. It’s hardly a surprise more people drive when it’s faster and doesn’t require waiting. World-class rail service would connect the cities in [less than two hours](https://hsrail.org/220-mph-high-speed-rail-midwest), leaving every hour.

Compared with China, which has constructed [almost 25,000 miles](https://www.cnn.com/travel/article/china-high-speed-rail-cmd/index.html) of high-speed rail since 2000, the US has built [only 34 miles](https://www.cnbc.com/2019/05/07/why-is-there-no-high-speed-rail-in-the-us.html) of high-speed track in the entire country. This track, a section of the Northeast Corridor, is used by the Acela, which began operating [in 2000](https://history.amtrak.com/archives/acela-express-celebration-in-boston) after [decades of public investment](https://www.govinfo.gov/content/pkg/GAOREPORTS-RCED-95-151BR/html/GAOREPORTS-RCED-95-151BR.htm). Overall, though, Acela averages only 70 mph between Boston and Washington, DC. By comparison, the fastest trains in China [average 167 mph](https://www.beijingchina.net.cn/transportation/train/train-to-shanghai.html) on the 820-mile trip between Beijing and Shanghai.

The US does move more goods by rail than its peers. But high-speed rail lines built elsewhere have been on new corridors, freeing up space on existing tracks for freight. Improved passenger and freight services are not in opposition.

## **Housing Prices**

#### **HSR will allow access to more-affordable housing in places like San Francisco and Los Angeles, effectively bringing down housing prices**

Eaton 19— High-Speed Rail Helped Keep Housing Affordable in Japan. Could It Do the Same for California?. (2022). Retrieved 12 August 2022, from https://psmag.com/economics/high-speed-rail-means-low-cost-housing

[Joe Eaton is an assistant professor at the University of Montana, where he teaches investigative reporting and public affairs journalism.] Debatetrack.

CHSR has been touted as a [job creator](https://buildhsr.com/hsrinvestment/pdf/Economic_Impact_Infographic_DRAFT_011218_2017_UPDATE.pdf) and smog fighter, as well as a way to help [lower the state's carbon footprint](http://www.hsr.ca.gov/Programs/Green_Practices/environmental_benefits.html) by taking cars off the road and airplanes from the skies. Bullet-train boosters are hoping that another, less-examined impact of the project is due for attention: the possibility that the rail network could eventually help ease the housing affordability crisis in the cities at either end of the line.

That's the question that a recent University of California–Los Angeles [study](https://www.anderson.ucla.edu/Documents/sites/faculty/review%20publications/research/Nickelsburg_High-Speed_Rail_Economics__Urbanization_and_Housing_Affordability_2018.pdf) explores, through the lens of Japan's extensive high-speed rail system, the Shinkansen. The authors, led by UCLA management professor Jerry Nickelsburg, analyzed more than 50 years of prefecture-level economic and demographic data. The study follows up on a similar one from 2012, which used the Shinkansen to [take a critical look](http://articles.latimes.com/2012/jul/13/local/la-me-high-speed-study-20120713) at the expectation that high-speed rail would boost tax revenues in the towns and cities along the route. This time, the team charted the impact the Japanese trains had on housing affordability.

Their findings are no great surprise—Japan's rail network allowed lower-wage workers to access exurban areas where housing development is less expensive. While areas close to stations experienced price increases, in general prefectures linked by rail were more affordable than they would have been without rail. "What happens is you have effectively increased the size of the city," Nickelsburg says. "The size of the city expands, and you get urbanization moving out."

Nickelsburg developed the study with California in mind, and he expects to see the same socio-economic sorting if CHSR is completed. The study suggests that high-speed rail could be a boon specifically for workers in the Bay Area and Los Angeles metros that find themselves priced out of increasingly unaffordable central cities. Higher-income workers who can afford urban amenities and rents would be more likely to live in inner cities, Nickelsburg says. Speedier rail might liberate more lower-wage Bay Area workers, many of whom have already migrated to inland exurbs, from their [epic commutes](https://www.nytimes.com/2017/08/17/business/economy/san-francisco-commute.html). "We see that in cities everywhere," Nickelsburg says of the rush to the exurbs in search of affordable housing. "[High-speed rail] just facilitates that."

That, at least, has been the story in Japan, a nation whose development patterns have been shaped by their extensive high-speed rail network. In the post-war era, as the United States and many other countries invested heavily in air and auto infrastructure, Japan went all-in on trains: In 1959, the Japanese national railway company began construction on the Shinkansen, in part to relieve rail congestion between Tokyo and Osaka. The system [opened in 1964](https://www.nytimes.com/2014/08/29/upshot/fifty-years-ago-and-today-japan-blazes-trails-with-trains.html) and added on average one new line every four years until 2004.

## **International Travel**

#### **International travel via HSR from Mexico to the United States would promote trade**

Charur 14 – [Charur, Malena. Reporter for The Laredo Times. "U.S.-Mexico High-Speed Rail Benefits Discussed". Govtech, 2014, https://www.govtech.com/fs/us-mexico-high-speed-rail-benefits-discussed.html. Accessed 10 Aug 2022.] Debatetrack.

Jan. 17--The idea of a high-speed passenger and cargo rail service between Mexico and the United States has taken shape after high-ranking officials from both countries met Thursday. Secretary of Transportation Anthony Foxx, U.S. Congressman Henry Cuellar, representatives from the Texas Department of Transportation and members of the Mexican delegation met in Washington, D.C., to discuss progress and the economic benefits that would be created with the completion of the project, which would link San Antonio to Monterrey, Mexico. "It's a historic project that will connect San Antonio, Laredo and Monterrey and also help unite large economies, especially those of our areas," Cuellar said. The project, which will be presented to Vice President Joe Biden, should have the backing of the U.S. government as it has support on both sides of the border. "Transportation is important to any country," Cuellar said. "The fact that stakeholders are present is something that is taken into account for the authorization of this project." The project is in an advanced state on the Mexican side while it's in the study phase on the U.S. side. Mexican Congressman Marco Antonio Gonzalez Valdez, of Nuevo Leon, said the state government, like the federal government, has an interest in the project. "The hardest thing is to get the right of way. The easiest thing is to build infrastructure," Gonzalez Valdez said, adding that the original idea was for cargo service. Later the idea was expanded to include passenger service. Nuevo Leon already has the right of way and is ready to begin construction, as the project has already been approved. The interest in linking San Antonio to Monterrey was made by Manlio Fabio Beltrones, coordinator of the PRI parliamentary group in the Mexican Congress. He asked that the project be extended to other cities as far as Queretaro. Jorge Domene Zambrano, director of the executive office of the Nuevo Leon governor, said they have been working on the project for five years, keeping in mind that investment is coming from both countries as well as input from the public and private sectors. "We know that there are railroad tracks already in place in the United States, but the U.S. government has appropriated funds to conduct studies to determine the infrastructure to be used. The results will be ready later this year," he said. Domene Zambrano added that there is a possibility that both countries will need to discuss customs matters involving San Antonio and Monterrey in order for the trip to be non-stop between the cities. "I think Secretary Foxx looked favorably on this project. That it is something positive (and would become) a historic project as it will further unite the states and countries," Gonzalez Valdez said. He said the project would be added to President Barack Obama's agenda when he visits Mexico in February.

## **Jobs**

#### **HSR creates a substantial amount of new jobs for low-income workers – California proves**

Blancas 21 – [Blancas, Augie. Augie Blancas loves working in communications and public relations for organizations that I wholeheartedly believe in like the California High-Speed Rail Authority, Fresno Building Healthy Communities, and the Fresno Reel Pride LGBTQ Film Festival. "NEWS RELEASE: High-Speed Rail Celebrates 6,000 Construction Jobs While Helping Train For The Future - California High Speed Rail". California High Speed Rail, 2021, https://hsr.ca.gov/2021/09/02/news-release-high-speed-rail-celebrates-6000-construction-jobs-while-helping-train-for-the-future/. Accessed 8 Aug 2022.] Debatetrack.

FRESNO, Calif. – In celebration of Labor Day, the California High-Speed Rail Authority (Authority) today announced it has crossed another milestone with 6,000 construction jobs created to date across 119 miles of active construction in the Central Valley. “We wouldn’t be where we are today without all the dedicated women and men who are out in the field each and every day,” said Garth Fernandez, Central Valley Regional Director. “We’re proud to work with a skilled labor force that is bringing high-speed rail to life while working with statewide and local partners to help train the next generation of high-speed rail professionals.” Last month, the Authority welcomed students as part of ValleyBuild Partnership, a workforce training program that provides pre-apprenticeship training in the building and construction trades to put students on a path to the union construction apprenticeship of their choice. “These students come from up and down the Central Valley, particularly from disadvantaged communities. We prep them for the job opportunities that come about on high-speed rail and other transportation projects,” said Chuck Riojas, executive director of the Fresno, Madera, Tulare, Kings Building Trades Council. “Bringing them onto construction sites gives them real-world experience and purpose to stick it out and become the next generation of workers responsible for building for the future.” Each of the project’s design-builders is implementing the Targeted Worker Program, where 30 percent of all project work hours are performed by workers from disadvantaged communities where annual household incomes range from $32,000 to $40,000. Out of the more than 6,000 jobs created, 2,230 went to residents from Fresno County, 1,039 from Kern County, 217 from Kings County, 291 from Madera County, and 588 from Tulare County as of July 2021.

## **Quality of Life**

#### **HSR enables people to reap the economic benefits of large cities while living in less-crowded and more-affordable places**

Freuck 21 – All Aboard: Why high-speed rail is the future of transportation in the U.S., Wisconsin. (2022). Retrieved 11 August 2022, from https://badgerherald.com/news/2021/03/23/all-aboard-why-high-speed-rail-is-the-future-of-transportation-in-the-u-s-wisconsin/ Debatetrack.

The other benefit of high-speed rail is its ability to connect cities within regions, ultimately creating “megaregions” consisting of several metropolitan areas. One potential megaregion in the U.S. is the Minneapolis-Milwaukee-Chicago-Indianapolis [connection](https://twitter.com/nowthisnews/status/1371909885659643910).

Design innovation graduate student and Vice President of WiHST Utkarsh Maheshwari said while high-speed rail could be used to connect an entire country, it really needs to be focused on specific regions.

Maheshwari said by creating megaregions, high-speed rail reduces the time and cost of traveling while it increases passenger productivity. It also positively affects intermediate cities or stops — such as Madison — more than large cities like Chicago.

“A lot of people would rather move to be in smaller cities to have a better living experience with more affordable housing costs and a higher quality of life,” Maheshwari said. “With high-speed rail, you can live in these cities but still work in a larger city that’s just 30 or 40 minutes away by train rather than two or three hours away by car.”

Schlicting echoed this message, explaining your job opportunities would no longer be limited to the metro area you live in or live closest to. Instead, you could live in Madison or Milwaukee and commute to work in downtown Chicago every day.

On top of decreasing commute times, high-speed rail would also improve travel in general. Co-founding member of WiHST and former Operations Director for [Badgerloop](https://www.badgerloop.org/) — a University of Wisconsin student organization — Johnny Kohlbeck explained the concept of a “Goldilocks Zone” where high-speed rail would fit in between other forms of transportation.

#### **HSR improves urban livability**

Zhao et al. 22—Zhao, J., Yan, J., Ran, Q., Yang, X., Su, X., & Shen, J. (2022). Does the opening of high-speed railways improve urban livability? Evidence from a quasi-natural experiment in China. Socio-Economic Planning Sciences, 82, 101275. doi: 10.1016/j.seps.2022.101275. Debatetrack.

With the spread of “urban disease”, urban livability has aroused common concern in academic circles at home and abroad. High-speed railway opening is substantially affecting the development of cities. Based on the data of 271 cities in China from 2005 to 2018, this paper applies the entropy method to calculate urban livability level, and then the difference-in-differences (DID) model and mediatory effect model are constructed to test the impact and mechanism of high-speed railway (HSR) opening on urban livability. The findings show that: (1) Overall, HSR opening has significantly improved urban livability by 13.04%. After alleviating the endogenous problem and conducting a series of robustness tests, the conclusions are still valid. (2) Mechanism analysis indicates that HSR opening improves urban livability by promoting economic growth, talent agglomeration and industrial structure upgrading. Among them, the industrial structure upgrading effect is the strongest, followed by talent agglomeration and economic growth. (3) The heterogeneity analysis shows that the promotion effect of HSR opening on urban livability is more significant in the central and western regions and large-sized cities. Accordingly, the feasible path to improve urban livability through HSR opening is proposed. Finally, in the face of the impact of the COVID-19 pandemic on the world economy, more channels to enhance urban livability are expected to cope with the future “the global talent war”.

## **Safety**

#### **HSR is a safety-focused model – accidents are infrequent and heavily studied**

Berti 20 – [Berti, Adele. I am an Italian copywriter based in London. A graduate from City, University of London, I am currently a senior editorial writer at Wunderman Thompson. "Safety On High-Speed Rail: Preventing Disaster At Hundreds Of Miles Per Hour". Railway Technology, 2020, https://www.railway-technology.com/analysis/safety-on-high-speed-rail/. Accessed 8 Aug 2022.] Debatetrack.

Compared to traditional systems, the relatively recent introduction of high-speed rail has (so far) fared so well in protecting its passengers that when an accident does happen, it is even more noteworthy due to scarcity of precedents. Yet rarity doesn’t necessarily mean infallibility. “High-speed trains [could be] the equivalent of the commercial planes in rail, they are so safe that we just take them for granted,” explains KE Seetha Ram, senior consulting specialist for capacity building and training projects at the Asian Development Bank Institute (ADBI). “Because there are so few, we may not remember them for a long time.” But as the industry cruises towards a new age of digital integration and technological advancements, learning from past mistakes is paramount to decrease risk in all future operations. “That’s something we need to be aware of,” he says. “We need to learn from them and remember them and keep transferring the lessons because we don’t want them to happen ever.” A rail network can never be completely safe As Seetha Ram and his research associate Nikhil Bugalia explain, the first assumption should always be that a rail system can never be safe enough. Both of them recently contributed to the redaction of a paper called ‘Handbook on high-speed rail and quality of life’. “A railway organisation’s pursuit of safety should never stop,” the handbook reads. “For complex socio-technical systems such as railways, safety should be achieved through harmonised coordination between robust technology and qualified personnel.” “The accident in Italy is being analysed from the perspective of human-errors at the front of maintenance operators.” In this sense, Seetha Ram says, high-speed trains could be compared to computer systems, which are constantly updated based on bugs and other malfunctions. “But because the [number of] fatal accidents which resulted in a derailment or stopping of the train are [so rare] there are many other layers of avoidable or avoided and less tragic accidents which actually offer lessons and that is how the software gets updated.” While investigations in Italy were recently brought to a halt as a result of the coronavirus pandemic, early conclusions on the Frecciarossa accident seem to point that ‘human error’ (allegedly some technicians’ wrong display of tracks) could have caused the derailment. “The accident in Italy is being analysed from the perspective of human-errors at the front of maintenance operators,” says Bugalia, who recently completed a PhD dissertation on safety management practices among Japan’s high-speed rail (HSR) operators. “However, since the accidents in HSR systems are infrequent, they must be investigated thoroughly and comprehensively to get the most learning from a single unfortunate event. Thorough investigations may be expensive and time-consuming but these accidents are rare opportunities to learn, so the use of a bit of more resources could be warranted.”

#### **And car accidents are increasing consistently – HSR prevents future ones with unified travel infrastructure**

National Center for Statistics and Analysis 5/22 – [National Center for Statistics and Analysis. (2022, May). Early estimates of motor vehicle traffic fatalities and fatality rate by sub-categories in 2021 (Crash•Stats Brief Statistical Summary. Report No. DOT HS 813 298). National Highway Traffic Safety Administration. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813298. Accessed 8 Aug 2022.] Debatetrack.

NHTSA has released a companion report presenting early estimates of traffic fatalities and fatality rates in 2021 (Early Estimate of Motor Vehicle Traffic Fatalities in 2021, Report No. DOT HS 813 283). That report shows the increased trend in fatalities in 2020 has continued into 2021, and the increased trend in fatality rate per 100 million VMT in 2020 continued into the first quarter of 2021 but decreased during the second, third, and the fourth quarters of 2021. This NHTSA note is being issued after conducting a special analysis of the fatalities and the fatality rates per 100 million VMT by key sub-categories in 2021. The analysis is based on ratioadjusted estimates of 2021 fatal crash data coded thus far into NHTSA’s Fatality Analysis Reporting System (FARS), as described in the Data and Methodology section. For the whole of 2021, a statistical projection of traffic fatalities shows an increase of about 10.5 percent as compared to reported fatalities in 2020. Some categories showed large shifts in fatalities and fatality rates in a given month, compared to the corresponding month in 2020. For instance, the share of fatalities on urban roads went from 57 percent in March 2020 to 62 percent in March 2021, a 5-percentagepoint increase. Correspondingly, the total fatalities (fatality counts) on urban roads increased from 21,940 in 2020 to 25,411 in 2021, a 16-percent increase. In summary, the traffic fatalities (fatality counts) in the following categories showed relatively large increases in 2021 as compared to 2020: n on rural interstate roads (up 15%), urban arterial (up 15%), and urban collector/local (up 20%); n during daytime (up 11%); n during the weekend (up 11%); n during out-of-state travel (up 15%), reversing the trend seen in 2020; n in newer (vehicle age < 10 years) passenger vehicles (up 10%); n in multi-vehicle crashes (up 16%); n in on-road crashes (up 21%); n in speeding-related crashes (up 5%)  – still higher as compared to the pre-pandemic levels of 2019; n in the 25-to-34 age group (up 10%), the 35-to-44 age group (up 15%), the 45-to-54 age group (up 12%), and the 65-and-older age group (up 14%), reversing the declining trend in fatalities to those 65 and older seen in 2020; n females (up 12%); n unrestrained occupants of passenger vehicles (up 3%) – still higher as compared to the pre-pandemic levels of 2019; n in police-reported alcohol involvement crashes (up 5%) – still higher as compared to the pre-pandemic levels of 2019; n motorcyclist fatalities (up 9%), continuing the trend seen in 2020; n pedestrian fatalities (up 13%); n pedalcyclist fatalities (up 5%); and n in crashes involving at least one large truck (up 13%), reversing the trend seen in 2020. Additionally, the trend of the total fatality rate per 100 million VMT in 2021 was strongly driven by the trends in the fatality rates per 100 million VMT on the rural arterial, rural local/collector/street roadways, and urban arterial. Overall, the estimated fatality rate for 2021 was 1.33 fatalities per 100 million VMT, marginally down from the reported 1.34 fatalities per 100 million VMT in 2020.

#### **Various safe models and tools of HSR exist that not only encourages safety, but creates a reliable and robust railway network**

Watson et al. 17 – [Watson, I, Ali, A and Bayyati, A (2017). An Investigation of the Operational Reliability of High-Speed Railways and Possible Measures to Improve it. Railway Engineering Conference. Edinburgh, UK 21 - 23 Jun 2017. https://openresearch.lsbu.ac.uk/item/86yz5. Accessed 9 August 2022] Debatetrack.

The analysis of the performance of HSR systems worldwide allows some common conclusions to be drawn in terms of the reliability of these systems. It seems that the most punctual HSR is the one that has two-track dedicated line (Shinkansen, THSR). The entire length of the track is secured by fences and screens to prevent any access to the line whilst there are no level crossings. These measures prevent any outside disruption of traffic. Dedicated tracks need less maintenance as most of the dedicated HSR are built on slab track; this also improves the reliability as less maintenance means less disruption to train traffic. The mix of traffic, i.e. freight, regional, local and HSR brings some disadvantages as in the case of Germany. For example, if trains with different speeds are allowed to use the same line then that will decrease the traffic capacity, reduces safety levels and reduces the reliability. It is difficult to produce a timetable for mixed lines to satisfy both the passenger traffic and freight because of the significant speed differences. It is difficult to allocate time for maintenance as most of the daylight time was allocated to passenger trains, but during the night the line is used by freight trains whilst maintenance is more frequent and longer than for dedicated lines. If the speed differences are more than 50km/h then the capacity of the line reduces dramatically. High-speed lines that have many level-crossings and lines not fully secured by fences and screens can experience delays. Debris that occurs on high-speed lines quite often affects the punctuality of services and the safety of passengers using such train services. Another reason for low punctuality is an outdated signaling system. Signal failure and interlocking failure are the major reasons for a train delay. Implementing advanced signaling systems such as ERMTS improves the reliability and safety, reduces the maintenance cost, increases the capacity of the railways and overall improves the sustainability of HSR. ERMTS is the most advanced control system in the railway industry and it is used for high-speed railways in many countries.

Implementing the preventive maintenance regime on the HSR network will increase the punctuality of trains and will keep unexpected breakdowns to a minimum. The Dutch government in the nineties substantially reduced the subsidies on railway maintenance but in return the punctuality of their railway system fell a few years later. One of the ways to reduce disruption of railway traffic is to combine different maintenance activities at the same time on the same site of the railway network as much as possible. Austria, Germany, The Netherlands and France have already implemented computer models that make track maintenance decisions more efficiently. Using the modern rolling stock equipped with advanced technologies that have high performances and offer high level of comfort for passengers is another way to improve the reliability of travel. Japan decided to change their rolling stock every 15-20 years. New and modern HSR system that has well equipped rolling stock would be more efficient, safe, and comfortable to use. In the UK for example, rolling stock is built to be used for 35-40 years before it needs an upgrade. To reduce the delay time, there is a need to improve traffic management in the presence of delays and disruptions. Digitalising traffic management and the use of advanced software help maintaining more efficient control of the flow of trains across the railway network and reduces delays and disruptions. The system automatically reschedules trains if a disruption occurs and it helps to reduce the time to recover normal train flow. In order to improve the reliability of HSR services and reduce the number accidents it is important to implement a culture of continuous technical learning for staff with broad training that includes the study of possible failures. The analysis of performance of the HSR systems suggests that improving reliability of HSR can improve safety, increases demand and capacity of rail and overall improves the sustainability of HSR.

## **Savings**

#### **HSR saves time spent on freeways and billions of dollars pouring in oil**

Kurian 21 – [Kurian, Kevin. Kevin Kurian is a CAS junior studying Politics and Economics "America Needs High-Speed Rail". Washington Square News, 2021, https://nyunews.com/opinion/2021/03/25/high-speed-rail-necessary/. Accessed 10 Aug 2022.] Debatetrack.

The United States falls behind the rest of the developed world when it comes to high-speed rail. From the Czech Republic to China, governments across the world are innovating to create efficient and comfortable methods of transportation, while residents in the United States are consigned to airplanes and automobiles for long-distance travel. In a country and a city that so claims to be the best in the world, under no circumstances should we stand idly by while our economic and geopolitical competitors overtake us. High-speed rail will be monumental to New York and America’s environment and economy. The Biden administration and congressional Democrats indicated that their next legislative priority is a large infrastructure package slated to cost $2 trillion over the next four years. President Biden and his allies should make high-speed rail a central piece of this initiative. In 2020, the United States consumed a little over 18 million barrels of petroleum daily, 70% of which, or nearly 13 million barrels, is required for our existing transportation network. America is dependent on an energy source that requires us to destroy oceans and forests to reap the benefits. When fossil fuels are burned, carbon dioxide is released, eroding our ozone layer which heats up our atmosphere. Our reliance on oil caused us to engage in deep-sea drilling, which results in oil spills that stretch for miles. In contrast, high-speed rail is nine times more energy efficient than plane travel and four times more energy efficient than car travel, thereby reducing our dependence on fossil fuels. High-speed rail systems have found to be 29% more energy efficient than outdated railway systems like those offered by Amtrak. Energy efficiency will not only be of benefit to the environment, but also save the country money from spending on expensive oil. Instead of a family emptying their wallet to pick up their kid from NYU, they could pay for a train ticket, which would likely be cheaper due to the decreased cost of fuel. Through increased energy efficiency, HSR will save America billions of dollars by reducing the amount of oil that our nation consumes. Environment-friendly policies must be prioritized, especially in New York. New York, with its large size and density, has a higher concentration of pollution. Air pollution, in particular, is one of the most significant environmental threats to New Yorkers, contributing approximately 6% of deaths each year. It is no secret that car pollution disproportionately impacts Black and Latino communities, causing innumerable racial disparities between health outcomes. These disparities can be attributed to the historical practice of redlining. Redlining consigned racial minorities into certain neighborhoods that were disproportionately impacted by car exhaust. There is a higher incidence of asthma among Black Americans for this very reason. It is imperative to invest in new forms of transportation that will not increase the burden of pollution on minority communities. Not only would high-speed rail foster energy efficiency, it would also save Americans time. Alon Levy, a fellow at NYU’s Marron Institute of Urban Management, proposed a nationwide HSR system that would reduce the time of a train ride from Boston to New York City to an hour and 40 minutes, while a train ride from New York City to Washington would be an hour and 35 minutes. This travel time is comparable to that of an airplane trip, and significantly outpaces a car’s speed making these same trips. High-speed rail is a more efficient method of transportation, freeing up more time for Americans while keeping environmental costs low.

## **Solvency**

#### **Following proven strategies from other countries can ensure success of HSR buildup in the US; targeting specific corridors can ensure that HSR development leads to urban revitalization and long-term-sustainability**

Todorovich et al. 11 – High-Speed Rail. Lincoln Institute of Land Policy. (2022). Retrieved 12 August 2022, from https://www.lincolninst.edu/publications/policy-focus-reports/high-speed-rail

[Petra Todorovich is director of America 2050, a national urban planning initiative to develop an infrastructure plan and growth strategy for America in the 21st century. Dan Schned was Head of Project Development at the U.S. DOT, Build America Bureau of the U.S. Department of Transportation] Debatetrack.

High-speed rail has been adopted throughout the world, and is now being planned and developed in the United States. Over the past 50 years, U.S. transportation spending has favored the development of interstate highway and aviation systems. In the meantime, countries such as China, Japan, Spain, France, and Germany have been investing in modern high-speed rail systems to satisfy the travel demands of current and future generations. As the United States embarks on the High-Speed Intercity Passenger Rail Program launched in 2009, it can learn from the experiences of other countries in planning, constructing, and operating high-speed rail.

In 2009–2010, the U.S. Congress appropriated $10.1 billion for a new high-speed and intercity passenger rail program. Applications from 39 states requested nearly $75 billion, demonstrating broad interest in and support for this program. The available funds were awarded to dozens of conventional intercity passenger rail projects and a few dedicated high-speed rail projects in 32 states and the District of Columbia, and those projects are now moving forward. The U.S. Department of Transportation, which manages the passenger rail program, has adopted a tiered approach, which emphasizes investments appropriate to the different markets and geographies in the United States. It defines three categories of passenger rail service that are intended to work together as a network: Core Express refers to high-speed trains operating on dedicated tracks with frequent service; Regional service operates at moderately high speeds and high frequency on shared corridors; and Emerging/Feeder service is less frequent and connects smaller and emerging markets to major markets located along Regional and Core Express routes.

Decades of international experience with high-speed rail suggests that it could create similar transportation, economic, environmental, and safety benefits in American cities and regions. While it requires high upfront investment, high-speed rail promotes economic growth by improving market access, boosting productivity of knowledge workers, expanding labor markets, and attracting visitor spending. When planned thoughtfully with complementary investments in the public realm, high-speed rail can promote urban regeneration and attract commercial development, as shown in several European examples. High-speed rail has greater operating energy efficiency than competing modes and takes up less land than highways.

The initial investment of $10.1 billion in the U.S. High-Speed Intercity Passenger Rail Program, after years of minimal federal investment, required that the federal government and participating states quickly scale up to the challenge of laying the groundwork for a foundational program and implementing it at the same time. Those states that had the staff capacity, expertise, and experience in rail planning, such as Illinois, North Carolina, and Washington, were successful in securing high-speed rail grants. However, carrying the momentum of this initial investment forward has proven to be a struggle in a difficult fiscal environment, and California is currently the only federally funded Core Express high-speed rail project moving forward. In 2011, Congress voted to strip funding from the program. The expiration of the legislation authorizing the high-speed rail program in 2013 may provide an opportunity to consider policy changes.

This report describes several funding strategies that have proven to be successful in other countries, and makes specific policy recommendations to better position the federal high-speed rail program for success.

* Strengthen the federal policy and management framework by expanding the federal role in planning and prioritizing high-speed rail corridors and working with the states to secure rights-of-way.
* Prioritize corridors that meet investment criteria by clarifying the objectives and desired outcomes of the federal program and promoting investments in those corridors that exhibit the characteristics that are indicative of success.
* Establish new mechanisms for corridor management by developing legislation that enables the creation of public infrastructure corporations that can operate across state and national borders and attract private investment.
* Plan for maximum land development benefits by coupling high-speed rail station investments with policies that encourage land development around station areas. In general, well-connected stations in center-city locations offer the greatest potential for urban revitalization.
* Focus initially on the Northeast Corridor and California, which offer the best opportunities for Core Express high-speed rail service in the United States, by addressing the management and financing challenges each region faces.
* Secure adequate and reliable funding by drawing on a full complement of potential federal, state, and private sources. Such sources could include increasing existing transportation-related fees (such as a portion of the gas tax or ticket surcharges), creating an infrastructure bank, forging public-private partnerships, and expanding existing credit assistance programs.

This Policy Focus Report was a product of the Lincoln Institute of Land Policy, the Regional Plan Association and their joint venture, America 2050. The Lincoln Institute of Land Policy has been engaged in a series of projects with the Regional Plan Association for more than a decade. The partnership spawned the national initiative known as America 2050, which is aimed at meeting the infrastructure, economic development and environmental challenges of the nation, in preparation for a population increase of about 130 million by 2050. A major focus of America 2050 is the emergence of megaregions—large networks of metropolitan areas, where most of the population growth by mid-century will take place. Examples of megaregions are the Northeast Megaregion, from Boston to Washington, or Southern California, from Los Angeles to Tijuana, Mexico. High-speed rail is capable of linking employment centers and population hubs in corridors up to 600 miles in length in 11 U.S. megaregions.

#### **In addition to federal investment, private investment, commercializing HSR lines, and savvy analysis of key city pairs, borrowed from successes in Europe and Asia, will all make HSR feasible**

Allum et al. 21—From Ambition to Reality: What Could a Viable US High-Speed Rail Network Look Like? | L.E.K. Consulting. (2021). Retrieved 11 August 2022, from https://www.lek.com/insights/ar/US-high-speed-rail-network

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Given the current state of the US rail network, it seems likely that turning this ambition into reality will require significant private investment alongside that government funding — particularly if the Biden administration is to make significant progress towards a “national high-speed rail network from coast to coast.”

That is because developments in the United States’ road and air transport infrastructure — which are among the most sophisticated innovations in the world — have not extended to its rail networks, which now lag behind HSR services in Europe and Asia.

Indeed, at present, the US does not have any truly high-speed rail services. The Acela Express connecting Washington DC to Boston is the fastest train service in the US, but despite a maximum operating speed of 150 mph, average speeds over the journey are closer to 70 mph. Meanwhile, across the vast majority of existing US passenger rail networks, average speeds are just 40 mph.

To put that in context, true HSR routes connecting cities in Asia and Europe achieve maximum operating speeds in excess of 250 mph, while average speeds reach 125-150 mph.

Upgrading the United States’ creaking rail infrastructure to deliver a coast-to-coast, true high-speed rail network is, therefore, far from straightforward — a fact that is compounded by quite significant political opposition that sees investment in high-speed rail as wasteful and characterised by construction delays.

The key to overcoming those barriers and objections, and to maximising the impact of investment dollars, is in taking a commercial approach to HSR planning. It is not enough to simply focus on the big ‘coast to coast’ picture. As with any vision for fundamental change, delivering a viable reality is about tempering that vision with clear commercial thinking.

In turn, that means taking a more granular view, and identifying the right city pairs to connect — and here, a great deal can be learned from successful HSR connections in Europe and Asia.

As a consultancy with the ability to pair strategic thinking with commercial forecasting — and having already consulted on a 240-mile HSR project in Texas, as well as projects in other US states and around the world — L.E.K. Consulting is well positioned to provide that commercial-centric view that will enable investors to identify ‘sweet spots’ for successful HSR services across the US.

In our experience, those sweet spots share a number of key characteristics, as they:

* Connect large cities and have stations located close to population and economic centres
* Are the optimal distance apart to be competitive with road and air networks — far enough for substantial time savings over road travel, but also short enough to compete with air travel
* Deliver fast average speeds, thanks to fewer intermediate stops and clearer routes
* Have the commercial freedom to maximise profit rather than passenger volume

That insight is borne out by route length and travel time analysis of successful HSR city pairs around the world, as demonstrated by the chart below (see Figure 1), where the most competitive pairs lie within the yellow ellipse.

Clearly, individual HSR investment opportunities would require significant due diligence, with ridership revenue studies feeding into investment-grade forecasts. However, this kind of sweet spot analysis has to be the starting point — offering a clear direction in terms of where to focus that robust forecasting.

Quite simply, the sweet spot identifies routes where high-speed rail can win against road and air travel alternatives, based on a number of factors.

As noted above, route length is a key consideration — routes which are too short do not offer compelling enough time savings compared with driving. That is especially true when considering the full door-to-door journey, the approach and onward travel-associated rail travel. Similarly, routes which are too long allow the faster cruising speed of aircraft to make up for the additional processing time associated with air travel.

Combining route duration analysis with a focus on larger cities that generate a greater volume of travel by attracting both business and leisure travel has proven a successful model outside the US — and indeed, there is an abundance of examples worldwide of HSR routes that share these criteria for success.

They include routes connecting Tokyo and Osaka (in Japan), Paris and Lyon (in France), Madrid and Barcelona (in Spain), and more — all of which are explored in more detail in our *Executive Insights*, [New Routes to Profitability in High-Speed Rail](https://www.lek.com/insights/ei/high-speed-rail-profitability).

Now, using the same characteristics — journey distance and population — as base selection criteria, we have identified several potential city pairs in the US where high-speed rail might find fertile ground commercially (see Figure 2).

They include city pairs between 150 and 400 miles apart with a combined population of over 5 million and individual populations of over 1 million. Overall, these viable city pairs amount to an HSR network connecting more than 140 million people across 42 cities over a track network of more than 13,000 miles.

## **War Infrastructure**

#### **High speed rail is good for military transportation and missiles – China proves**

Economic Times 14 – ["High-Speed Rail Has 'Immense Strategic Military Value': China". The Economic Times, 6 February 2014, https://economictimes.indiatimes.com/news/international/world-news/high-speed-rail-has-immense-strategic-military-value-china/articleshow/29955944.cms. Accessed 5 Aug 2022.] Debatetrack.

China's high-speed train network could prove to be of "immense strategic military value" for rapid movement of forces , an official media report said. PTI BEIJING: China's rapidly developing high-speed train network spanning the length and breadth of the giant nation could prove to be of "immense strategic military value" for the rapid movement of forces and missiles, an official media report said. China's high-speed rail lines are becoming a major transport force for the People's Liberation Army (PLA), allowing the rapid movement of [military forces](https://economictimes.indiatimes.com/topic/military-forces) throughout the country, a recent state-run news report said. "While bringing convenience to the lives of the masses, high-speed rail also plays a military role that is growing more prominent by the day," the article states. "A lightly equipped division could be moved on the Wuhan-to-Guangzhou line about 600 miles (965 kms) in five hours, a fairly rapid mobilisation in military terms," the China Youth Daily said outlining military benefits of the country's six high-speed rail lines. The report says that China's high-speed rail network will provide "immense strategic military value". "And the Second Artillery (missile forces) could use the high-speed rail network to quickly deploy short-range missiles 'in a certain strategic direction', presumably from inland locations to coastal regions near Taiwan or Japan," the Washington Times quoted the Daily's report as saying. Other key rail lines include the Xian-Baoji and Xiamen-Shenzhen connections that are part of the network that has made China a world leader in high-speed rail. Since 2009, the PLA has reportedly been using high-speed trains to move troops in exercises. In 2011, the military conducted a rapid troop transfer on the Beijing-Shanghai line. The PLA's ability to move troops to the border due to a highly developed rail, road and air infrastructure, including in the rugged Tibetan region, has long raised concerns in the Indian Army prompting the Indian government to initiate its own rapid infrastructure development along the Chinese border. The January 14 report in the Daily said China will eventually set up a high-speed network of eight lines extending in all directions. A typical military train includes 16 high-speed rail cars that can carry 1,100 lightly armed soldiers. "With the daily improvement in China's high-speed rail network, transferring a 100,000-strong army might be possible within half a day in the future," the report said, adding that the military will use high-speed rail to project "mobile combat forces in various strategic directions". It said, "the use of high-speed trains as mobile missile launch platforms for strategic weapons is also a good idea". China is reportedly planning rail-mobile Intercontinental Ballistic Missiles (ICBMs) using a separate system that is not built for high-speed travel but for heavy transport. "The speed with which vehicles change direction is less than in road manoeuvring and is suited to testing work during manoeuvring to reduce the time required to prepare for firing. In addition, it is possible to manoeuvre and shift more than a thousand kilometres at once, making it easier to escape enemy tracking," the report said.

# **Pro Blocks**

## **AT: Car Dependency**

#### **Behavior of car dependency can be addressed through investment of HSR and used to address long-distance car travel – better than doing nothing**

Berg 21 – [Berg, Nate. Nate Berg is a journalist covering cities, architecture and urban planning. Nate's work has been published in a wide variety of publications, including The New York Times, National Public Radio, Wired, The Guardian, The Atlantic, Fast Company, Dwell, Architect, 99% Invisible and many others. He is a former staff writer at the website now known as CityLab and was previously an assistant editor at Planetizen. "Could High-Speed Rail Curb America’S Addiction To Cars?". Fast Company, 07 October 2021, https://www.fastcompany.com/90683832/could-high-speed-rail-could-curb-americas-addiction-to-cars. Accessed 10 Aug 2022.] Debatetrack.

The privately funded high-speed rail company Brightline understands that it has some convincing to do. Since the automobile turned once-dominant train travel into a transportation afterthought for most Americans, the idea of moving quickly and comfortably across the United States by rail has seemed more like a dream than a potential reality. The clunky, crash-prone and underinvested in Amtrak system has not helped shift that perspective. To try to persuade the average Joe Gas Tank that riding a train is a viable transportation alternative, Brightline is investing big in five new sets of train cars and locomotives that put the rider experience first. “We’re trying to get people to think differently about what riding a train is like,” says Mike Reininger, CEO of Brightline, and a longtime developer who’s built projects in Florida for Disney and led the redevelopment of Denver’s Union Station. “The real object here is to change people’s behavior,” he says. Inspired by scouting rides on train systems around the world and research on design approaches used in hotels and airplanes, Brightline’s new trains offer spacious seating, easily accessible aisles, touchless bathrooms, and on-board tech for fast internet and easy device charging. The new trains have just rolled off the assembly line of Siemens Mobility’s North American manufacturing headquarters in Sacramento. The full cost of the train set deal was not made public, but based on the cost of a similar train deal Siemens made with Amtrak, Brightline’s five new train sets likely cost hundreds of millions of dollars. They’ll soon be rolling on Brightline’s growing operations in south Florida. The first route is a 65-mile connection between Miami and West Palm Beach, which the company says has served more than 2 million riders since beginning operations in January 2018. Services were halted during the pandemic, but Brightline aims to resume operations in November. One of Fast Company’s most innovative transportation companies in 2020, Brightline is focused on reinventing high-speed rail in the U.S. by building routes between destinations that are about 300 miles apart: “too far to drive, too short to fly,” Reininger says. The company has invested more than $4 billion building out the first iteration of this system in Florida. A 170-mile service extension is now being built from West Palm Beach to the Orlando International Airport, bringing its total route up to 235 miles. Construction on the expansion is more than 60% finished, and the full route is expected to be complete by the end of 2022. The company also has plans to expand to the West Coast with a rail line linking Las Vegas with the Los Angeles metropolitan area.

## **AT: Climate Degradation**

#### **HSR can be built to withstand extreme weather—China proves**

Pike 19 – [Pike, Lili. Lili Pike is the executive producer of the Beijing Energy Network’s podcast and was formerly a researcher at China Dialogue. "How Green Is China’S High-Speed Rail?". China Dialogue, 2019, https://chinadialogue.net/en/energy/11174-how-green-is-china-s-high-speed-rail/. Accessed 10 Aug 2022.] Debatetrack.

The CR400AF-G train, which can operate at speeds of up to 350 kilometers per hour (217 mph) in temperatures as low as -40 degrees Celsius (-40 degrees Fahrenheit), is part of the Fuxing series of high-speed electric multiple-unit (EMU) trains developed and operated by the state-owned China State Railway Group.

The train, rolled out in Beijing on January 6, will run on a new high-speed line connecting the Chinese capital with northeastern destinations including cities Shenyang and Harbin -- the latter of which is famed for its [annual snow and ice festival](https://edition.cnn.com/travel/article/harbin-snow-ice-festival-events-canceled-intl-hnk/index.html).

Officials have yet to announce when the train will begin operations.

In a post on Chinese social media site WeChat, the China Railway Beijing Group -- part of the China State Railway Group Company -- ran through several of the train's optimized components that aid its ability to withstand cold temperatures.

These include: bolts made with chromium-molybdenum alloy -- a material that endures extremely low temperatures; silicone sealing strips, which prevent snow and ice from getting into the train body; temperature-resistant brake control devices; and stainless-steel pipes equipped with heating devices.

The train also features a streamlined low-resistance design, to help decrease energy consumption, and a lightweight aluminum alloy body.

In a report by state-owned newspaper [China Daily](http://global.chinadaily.com.cn/a/202101/11/WS5ffb9089a31024ad0baa19d7.html), Zhou Song, director of the China Railway Beijing Group's bullet train center, offered an analogy to explain the new train's brake system: "If the train stops in Harbin (one of China's coldest cities in northernmost Heilongjiang) for an hour, because of the extremely cold weather, the braking system can easily freeze if it stops moving for a while. The new system will enable the brakes to move from time to time even if the train stops, like a person who stamps his feet to keep warm in cold weather."

China isn't alone in having to adapt its bullet trains to extreme conditions.

In 2020, Japan launched its latest record-breaking bullet train and doesn't only run faster and smoother -- it's also able to transport passengers to safety in the event of an earthquake.

The N700S can run up to 360 kilometers per hour, however the operating speed is capped at 285 kilometers per hour.

The train has an upgraded automatic control and braking system that allows it to halt faster in case of an emergency and is fitted with a lithium-ion battery self-propulsion system -- the first of its kind in the world.

## **AT: Cost**

#### **Debt is underwhelming impact – any spending “triggers” more debt and means HSR should not be avoided since it’s worthwhile endeavor**

Lastrapes 19 – [Lastrapes, William D. Professor of Economics at University of Georgia. "Why The $22 Trillion National Debt Doesn't Matter – Here's What You Should Worry About Instead". The Conversation, 2019, https://theconversation.com/why-the-22-trillion-national-debt-doesnt-matter-heres-what-you-should-worry-about-instead-111805. Accessed 10 Aug 2022.] Debatetrack.

Default isn’t imminent First of all, it’s important to note current U.S. debt levels do not indicate any risk of imminent default. As long as the U.S. federal government remains an “ongoing concern” – fiscal institutions are strong and effective, taxing authority is maintained and the long-run productive capacity of the nation’s economy is secure – there is no economic reason to fear default on the nation’s debt. Political reasons, such as debt-ceiling mischief, are another matter. To remain solvent and ultimately pay what it owes, the U.S. Treasury – which sells notes and bonds to investors to raise money to finance the budget deficit – needs only to balance its books over the long run, rather than over an arbitrary unit of time like a year. Historically low interest rates on government debt suggest that bond market participants agree with this view and are not afraid of a sovereign debt default in the U.S. Indeed, with these low rates, sufficient economic growth can allow the government to borrow indefinitely. Why it’s irrelevant Although $22 trillion is a large number, it is essentially irrelevant to proper thinking about the economic role of the U.S. government or about responsible fiscal policy. Government debt simply reflects the timing of taxes. Higher spending levels today require more borrowing – and a larger debt – as long as the taxes needed to pay for those expenditures are pushed into the future. But regardless of when taxes are collected, what ultimately matters is the quantity of the economy’s scarce resources the federal government commands and controls, and how those resources are used, which essentially depend on the level and composition of government spending. To paraphrase Milton Friedman, spending is taxing. In short, government debt can be a bad indicator of the stance of fiscal policy or its burden on the private sector. The government can be wildly intrusive in the economy and thus a hindrance to growth and welfare even if its debt is low. For example, Venezuela’s sovereign debt was only 23 percent of its GDP in 2017, yet its economy has been in turmoil for several years. Or it can effectively manage spending to promote welfare even if its debt is high. In 1945, the U.S. debt-to-GDP ratio was 120 percent, immediately after the government mobilized the economy to win World War II. High debt should not prevent the government from spending on worthwhile public endeavors. And low debt does not prove that the level or composition of government spending is appropriate.

## **AT: Energy**

#### **Trains are extremely energy-efficient**

Pike 19 – [Pike, Lili. Lili Pike is the executive producer of the Beijing Energy Network’s podcast and was formerly a researcher at China Dialogue. "How Green Is China’S High-Speed Rail?". China Dialogue, 2019, https://chinadialogue.net/en/energy/11174-how-green-is-china-s-high-speed-rail/. Accessed 10 Aug 2022.] Debatetrack.

China’s economic planning department has recently approved a flurry of new rail projects at a scale that Green New Deal advocates in the United States would envy. A total of 800 billion yuan (US$120 billion) will be poured into rail construction in 2019 as part of a plan to stimulate the domestic economy. These investments are the latest in a decade-long building spree that has rapidly outfitted China with the world’s most extensive high-speed rail network – larger than all others combined. Trains are among the most energy-efficient modes of transport, so new lines could be a major asset to China’s decarbonisation. However, studies show that some of China’s high-speed lines have relatively large carbon footprints and are chronically underutilised. As China continues to pump money into an ever-expanding rail empire, these projects tell a cautionary tale. Infrastructure boom Little more than a decade ago, it took 12 hours to travel between Beijing and Shanghai by train. Now it takes four and a half. China’s 13th Five-Year Plan (2016-2020) seeks to replicate that feat, setting a target to build 30,000 kilometres of high-speed rail connecting 80% of the country’s major cities. The recently announced high-speed rail projects span China. They will connect the Guangxi gulf economic zone, historical Xi’an and Yan’an, and cities along the Yangtze River in Jiangsu province. In recent years, construction – particularly the production of steel and cement – has been driving the increase in China’s energy consumption. In February, the government reported that China’s coal consumption increased in 2018 for the second year in a row, with carbon dioxide emissions following suit. Zhang Baotong, the director of a Shaanxi economic research institute, acknowledged the thirst for materials of the projects recently invested in. Zhang said building subway systems not only meets public demand but can also absorb overcapacity in steel, cement and other industries, thereby boosting the economy. From a climate change mitigation perspective, the emissions intensity of these construction materials raises a key question. Are train trips energy efficient enough to offset emissions produced by crisscrossing the country with thousands of kilometres of new tracks? Does high-speed rail lower emissions? Globally, high-speed is recognised as a part of the transition to a low-carbon future. In a recent report, the Intergovernmental Panel on Climate Change called for its construction to help phase out flights. However, building a high-speed line does not guarantee significant emissions savings. The Future of Rail, a new study from the International Energy Agency (IEA), demonstrates why. A few factors determine a high-speed line’s carbon footprint. First, such lines typically flourish at distances between 300 and 1,000 kilometres, connecting cities where residents are relatively affluent and in the habit of intercity travel. In order to lower emissions, they must be efficient to construct. The trains they carry need to be powered by a green electricity grid, to run frequently and near capacity, attract people away from other higher-emissions modes of travel, like planes and cars, and not generate too much new demand for travel.

## **AT: Gentrification**

#### **Turn their gentrification argument – HSR development creates more affordable housing as stations to employment regions rely solely on HSR.**

Drew 19 – [Drew, James. James Drew covers the state Legislature and state government for McClatchy’s Washington papers: The News Tribune, The Olympian, The Bellingham Herald and The Tri-City Herald. “Would bullet trains spur affordable housing or gentrification along a Northwest line?”. The News Tribune. 20 August 2019. <https://www.thenewstribune.com/news/local/article233972782.html>. Accessed 9 August 2022.] Debatetrack.

THE HOUSING QUESTION The study uses Bellingham as an example of how high-speed rail would affect housing. An average resident of Bellingham pays more than half of their $53,415 income on housing and transportation. An average Seattle resident pays $495 more per month on housing, but a smaller share (46 percent) of a higher income ($70,475). The report says bullet trains would provide Bellingham residents with access to a much larger range of job opportunities, such as higher-paying jobs in Seattle. “Depending on the fare structure, a new service might reduce the percentage of income that workers in the smaller cities devote to housing and transportation,” the report says. Also, bullet trains would make smaller cities like Bellingham and Olympia more attractive for employers, bring them closer to lower-priced housing for workers that would be built around new stations, according to the study. High-speed rail would “provide the swift connection to sustain business operations, but much of the workforce might live in these new communities and might not need to rely on transit or motor vehicles to get to work.” Bellingham Mayor Kelli Linville said she supports the project, in part because it would fit into the city’s strategy to add more housing. “Housing is more affordable than Seattle, but it’s not affordable,” Linville said. “We’re looking at urban villages in high-density areas and that would fit in with the bullet train idea; areas around the transit stops and the train stop would be where we are looking to put more housing to. Anything that gets us off the freeway is a good thing. Anything that would bring better economic opportunities to our communities would be a great thing.”

# **Con**

## **Car Dependency**

#### **Car dependency will still remain the same and will result in the same amount of emissions – China proves**

Hunan University 19 – [Hunan University. The Hunan Official Web Portal is an international window providing information about the government, services, business, tourism, and Hunan generally. It is intended to be a comprehensive platform to promote exchanges and communication with international users and serve them better. "China Has 340 Mln Vehicles By Mid-2019-Hunan Government Website International-Enghunan.Gov.Cn ". Enghunan.Gov.Cn, 2022, http://www.enghunan.gov.cn/News/Text\_News/201907/t20190704\_5386366.html. Accessed 8 Aug 2022.] Debatetrack.

China had 340 million motor vehicles by the end of June this year, the Ministry of Public Security (MPS) announced Wednesday. A total of 250 million of them are cars, including 198 million private cars and 12.42 million registered over the last six months, down by 1.39 million year on year, according to data released by the traffic management bureau of the MPS. The number of new energy vehicles had reached 3.44 million by the end of June, accounting for about 1 percent of the total. China now has 422 million licensed motor vehicle drivers, with 14.08 million people obtaining their licenses in the first half of the year, according to the bureau. Also, there were 66 Chinese cities with over 1 million cars, while 11 cities including Beijing and Chengdu had more than 3 million by the end of June.

## **Climate Degradation**

#### **Climate change will wreak havoc on railway systems, as extreme temperatures and flooding damage infrastructure and make it unusable**

Campbell 22—**L**eah Campbell (2022). Climate Change Poses a Huge Threat to Railroads. Environmental Engineers Have Ideas for How to Combat That - Inside Climate News. Retrieved 10 August 2022, from <https://insideclimatenews.org/news/08042022/climate-change-railroads-adaptation/>

[Leah Campbell is a fellow at Inside Climate News based in Boston. She’s currently in MIT’s Graduate Program in Science Writing specializing in environmental and climate journalism. Previously, she worked as a research assistant at the University of North Carolina studying flood survivor advocacy, hazard mitigation planning and post-hurricane recovery. She also worked in the environmental nonprofit sector in California on citizen science projects and statewide policy around climate resilience and water quality. She’s all-but-dissertation in environmental planning and has a B.S. in Geology and Geophysics from Yale University.] Debatetrack.

Much of the world still relies heavily on railroads to move people and products. But railway infrastructure—from overhead wires to tracks—is at high risk from climate change and associated extreme weather.

Without efforts to adapt to future climate threats, the railway industry will face degrading infrastructure, safety hazards and skyrocketing operations costs, say experts in transportation planning and civil engineering.

Many point out that so-called nature-based solutions—projects that harness nature’s power to address social or environmental problems—could offer practical and cost-effective ways for railways to minimize the effects of extreme weather, while at the same time providing environmental benefits.

But so far, railways have done little to take advantage of such strategies.

A new[study](https://www.sciencedirect.com/science/article/pii/S2772411522000052) by researchers at the University of Glasgow is the first to review industry efforts to-date to use nature-based solutions to prevent climate change-related disruptions. The researchers identified several potential nature-based solutions railroads could apply, including  green corridors to shade tracks from heat and high winds, habitat restoration to buffer the effects of storms and wetlands to soak up water during heavy rain and hold it through drought.

Those kinds of strategies, said Lorraine Blackwood, a doctoral student in environmental sustainability at Glasgow and the lead author of the study, would also create habitat for wildlife, reduce noise and air pollution, improve water quality and provide privacy for track-side neighbors.

But, while Blackwood and her colleagues found several examples of nature-based solutions being successfully implemented by railways, their review suggests that the industry has a long way to go.

“It’s still very early days,” she said. “There’s still a long way to go to really trust and test these solutions in the railway environment.”

Climate-driven extreme weather, from hot to cold and wet to dry, poses serious challenges for railway infrastructure. Heat waves can cause tracks to buckle and expand, inviting train derailments, while freezes can damage overhead power lines. Flooding undercuts the embankments that line the tracks and can cause landslides that block trains, while droughts cause subsidence and dry out soils so tracks misalign.

When[Hurricane Ida](https://apnews.com/article/hurricane-ida-climate-change-business-new-york-city-floods-ccb72f9b4b838c8dd388de0ed6840266) hit the East Coast in 2021, the Amtrak Northeast corridor, from Boston to Washington, the nation’s busiest train route, was shut down for an entire day. About 75 million gallons—more than 100 Olympic sized swimming pools worth of water—had to be pumped out of the New York City subways after the storm.

With a changing climate, flooding is only expected to get worse in the future. A recent[study](https://www.sciencedirect.com/science/article/abs/pii/S1361920921002078) projected that Boston’s commuter train system could be operating at 40 percent less capacity within a decade because of increased flooding.

Extreme heat is another major engineering challenge for railroads. Steel tracks are only designed to operate within a narrow range of temperatures. If it gets too hot, rails will buckle and expand, which can cause a train to derail. To prevent that kind of catastrophe, most routes impose speed restrictions on trains when temperatures rise. But this strategy comes with its own setbacks. In a[2019 study](https://www.sciencedirect.com/science/article/pii/S0967070X16308198), researchers estimated that delays from temperature-related reductions in speed limits could cost the U.S. rail network up to $60 billion by 2100.

The risks for railroads go beyond the direct impact to a single line or the effect of a single storm. Climate change could shift the balance between different modes of transportation in ways that are challenging to predict. For example, experts suggest that changing water levels in the Great Lakes might result in more goods being transported by train, rather than by barge. A single major weather event can also cause cascading failures across an entire network, leading to major regional disruptions across industries and to people’s everyday lives.

In addition, thousands of miles of track in the United States are well over 100 years old. Those systems were designed with outdated construction standards, putting them at greater risk of failure and meaning that any repairs or retrofits could be prohibitively expensive.

To date, most railroad efforts to adapt to climate change have involved “hard” engineering solutions—so-called “grey” infrastructure—like elevating stations, installing sea walls and pumps and stabilizing the hillsides next to railway tracks. In Boston, for example, the city spent [almost $2 million](https://www.mbta.com/projects/aquarium-station-floodproofing) last year to install barriers at a station prone to flooding.

“It’s just not a particularly sustainable or attractive solution,” Blackwood said of hard engineering solutions. “Even from the mitigation point of view, with things like concrete and steel, the grey solutions themselves are very carbon intensive.”

## **Cost**

#### **HSR is very expensive – investments would need to reach toward a trillion dollars, current supply chain issues, diminishing returns, and stagflation hinders effective investment**

Yarow 9 – [Yarow, Jay. Jay Yarow is Senior Vice President and Executive Editor for CNBC Digital, responsible for setting the editorial direction for all CNBC Digital products and services. Yarow joined CNBC from Business Insider, where he was Executive Editor responsible for overseeing and implementing the editorial strategy. "The True Cost Of High Speed Rail For The U.S. Is More Than $500 Billion". Business Insider, 2022, https://www.businessinsider.com/the-true-cost-of-a-high-speed-rail-for-the-us-is-more-than-500-billion-2009-5. Accessed 9 Aug 2022.] Debatetrack.

Barack Obama's vision of a national high speed railway is going to cost over half a trillion dollars, according to an estimate by Randal O'Toole, a senior fellow at the Cato Institute. This is probably supposed to be a shocking number, but with the value of money losing all its meaning lately--a $750 billion TARP bill here, an $800 billion stimulus bill there--this really doesn't seem all that bad. Money well spent, we think, trains are pretty awesome. Not that the big number really matters since Obama's not talking about high speed trains. His plan is to improve the medium speed trains, which O'Toole says doesn't really benefit the environment all that much: According to the Department of Energy, the average Amtrak train uses about 2,700 British thermal units (BTUs) of energy per passenger mile. This is a little better than cars (about 3,400 BTUs per passenger mile) or airplanes (about 3,300 BTUs per passenger mile). But auto and airline fuel efficiencies are improving by 2 percent to 3 percent per year (for example, a Toyota Prius uses less than 1,700 BTUs per passenger mile). By contrast, Amtrak's fuel efficiency has increased by just one-tenth of 1 percent per year in the past 10 years. This means, over the lifetime of an investment in moderate-speed trains, the trains won't save any energy at all. In fact, to achieve higher speeds, moderate-speed trains will require even more energy than conventional trains and probably much more than the average car or airplane 10 or 20 years from now. California wants to build a true high-speed rail line between San Francisco and Los Angeles, capable of top speeds of 220 miles per hour and average speeds of 140 miles per hour. The environmental analysis report for the California high-speed rail projects costs of $33 billion for 400 miles, while the Midwest Rail Initiative projects costs of $7.7 billion for 3,150 miles of moderate-speed rail. That's $82 million per mile for true high-speed rail (partly because the California project goes through some mountains) and only $2.4 million for moderate-speed rail. All else being equal, high-speed rail will cost 10 to 12 times more than moderate-speed rail. A true, national high-speed rail network would cost more than half a trillion dollars.

#### **HSR may cost $100 million per mile, and unlike normal rail lines and highway investment, HSR can only be used for passengers and doesn’t benefit industry**

Wagen 21—Northeast University Political Review. Why High-Speed Rail Shouldn’t Be a Priority. (2021). Retrieved 11 August 2022, from https://www.nupoliticalreview.com/2021/12/16/why-high-speed-rail-shouldnt-be-a-priority/. Debatetrack.

The National Railroad Passenger Corporation, also known as Amtrak, is a quasi-public corporation that operates intercity rail routes in the US. Private rail companies [own](https://infrastructurereportcard.org/cat-item/rail/) approximately 70 percent of Amtrak’s 21,400-mile operating network, an arrangement that allows Amtrak to avoid many of the high costs associated with rail-line building. Unlike the rest of their network, Amtrak [largely owns](https://nec.amtrak.com/) the NEC between Washington, DC and Boston. Although this corridor is the busiest passenger railroad segment in the US and currently runs at capacity, Amtrak still struggles with its funding and maintenance. Most of Biden’s proposed non-HSR spending on rail focuses on resolving the NEC’s [$45.2 billion](https://infrastructurereportcard.org/cat-item/rail/) state-of-good-repair backlog and resulting delays.

HSR [requires](https://hsrail.org/high-speed-tracks) specialized and dedicated infrastructure, so Amtrak will have to build and maintain new lines to support any HSR initiatives. The Cato Institute [argues](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete) that cost projections of HSR are consistently overly optimistic. HSR projects have a history of exceeding budget limits in the [UK](https://www.thetimes.co.uk/article/hs2-running-a-decade-late-and-with-total-cost-unknown-r5z3f3n5n) and [Japan](https://journals.sagepub.com/doi/10.7227/TJTH.24.2.6). Further, HSR infrastructure will continue to require costly maintenance even after construction. California is currently building an HSR line connecting Los Angeles and San Francisco, costing [$100 million](https://www.latimes.com/local/california/la-me-bullet-train-costs-20190430-story.html) per mile. For comparison, the Interstate Highway System cost only $11 million per mile (adjusted) to build.

Cost estimates for California’s HSR project have continually increased since its inception, and its construction has been fraught with delays. California raised $9.9 billion through a bond measure in 2008 to support the project, but Governor Gavin Newsom has now [requested](https://www.sacbee.com/news/local/transportation/article254080888.html) an additional $4.2 billion to continue construction in 2022. The California High-Speed Rail Authority [projects](https://hsr.ca.gov/about/capital-costs-funding/) that the entire line will cost between $69 and $100 billion. Given Amtrak’s current inability to fund even the NEC corridor, these high costs bode poorly for its ability to maintain or fund any future high-cost HSR projects.

In addition to its high construction costs, the Institute of Transportation Studies (ITS) at UC Berkeley [predicts](https://escholarship.org/uc/item/8mm50358) that the total operating costs of the work-in-progress California line will be, at best, comparable to those of highways and much higher than those associated with air travel. The ITS finds that HSR’s only discernible operating benefits will be reduced noise, fewer accidents, and less pollution. However, even while ignoring the pollution resulting from electricity generation, the internal costs of HSR’s construction, operation, and maintenance outweigh these external benefits.

Further, HSR miles generate few positive externalities for other industries. Rail currently [provides](https://railroads.dot.gov/rail-network-development/freight-rail-overview) low-cost long-distance transportation for heavy freight, which HSR is unlikely to do given its higher costs and the [track damage](https://www.techrentals.com.au/wiki/case-studies/_physical-measurement/how-to-reduce-track-damage-and-derailment-risk) caused by heavy trains. HSR may compete with the domestic air cargo industry, though its [historically poor](https://www.iata.org/en/iata-repository/publications/economic-reports/profitability-and-the-air-transport-value-chain/) profitability suggests lackluster returns. There thus seems to be no possible arrangement for sharing any significant portion of HSR’s infrastructure costs. Highways, however, are used for both freight and passenger transportation; investment into the highway system benefits US firms’ logistics and freight operations as well as personal travel.

#### **In the US, bureaucracy and politics ensure cost overruns, extended timeframes and mediocre results**

Ditch 21—Ditch, David. (2021). Biden Embraces California’s Zombified Rail Boondoggle. Retrieved 12 August 2022, from https://www.heritage.org/transportation/commentary/biden-embraces-californias-zombified-rail-boondoggle

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California has a long history of churning out films about zombies, most of which are made on shoestring budgets.

Unfortunately, the Biden administration is throwing its weight behind a zombie with a big price tag: California’s slow-moving “high speed” rail line.

On Thursday, June 10, California Gov. Gavin Newsom announced that the Department of Transportation will restore $929 million in federal funding for the rail initiative. This reverses the Trump administration’s decision to pull federal funds from the wildly dysfunctional project.

Originally, California planned to build a high-speed rail line running from L.A. to San Francisco. After Congress approved federal funding for such projects in 2009, California received an initial $2.5 billion, with another $929 million earmarked for the second phase of the project.

The second phase never came, due to a series of delays and epic cost overruns.

This result was predicted by Heritage Foundation analysts in 2010 and 2012, since such projects have a long track record of over-promising and under-delivering.

In February 2019, Newsom had revealed that most of the project would be postponed, only completing a section connecting the small cities of Bakersfield and Merced due to astronomical construction costs eating up the original budget.

This prompted President Donald Trump’s decision to pull remaining federal funds. It was bad enough for taxpayers from the other 49 states to subsidize a California-only rail line, let alone one operating in a low-density part of the state.

But the rail project, like any other undead creature, has kept plodding along. California now intends to finish the rest of its plan in 2033, a full quarter-century after the 2008 ballot measure that birthed the debacle.

Its cost will exceed $80 billion, triple what was planned—and that’s only if it stays on budget for the next 12 years.

Both state and federal officials made many mistakes that contributed to the problem.

California officials misled voters about likely costs and funding prior to the 2008 vote. They assumed that once construction began, it would be impossible to stop.

Congress validated this dishonesty by handing California $929 million as “no year” money, meaning it would be available indefinitely, regardless of how poorly the project went.

Now, much like Hollywood’s habit of producing low-quality sequels to zombie flicks, Washington is considering whether to throw more taxpayer dollars at such ill-conceived projects.

The administration’s “infrastructure” plan doesn’t specifically earmark funds for high-speed rail. However, Biden often references the concept when discussing the plan, meaning he sees it as a goal.

Something that actively calls for high-speed rail is the Green New Deal, which ignores grade-school geography and imagines that Americans would rather spend days on a train to do a trip that takes hours in a plane. It also ignores the nonexistent environmental benefits that these pricey train lines would produce.

Similarly, the House is working on a transportation bill that would radically increase spending on intercity rail, with a floor vote likely to happen before July 4.

California Treasurer Fiona Ma, who championed the state’s rail project as a state legislator, has sent a letter to Congress warning them about the pitfalls of high-profile infrastructure projects:

“While the sky seems to be the limit in terms of the amount Congress is willing to spend, I fear failure remains a real possibility. Scores of billions may seem like a lot of money, but we know from our experience in California that actual construction ends up costing multitudes more than estimates anticipate.”

This is especially the case when the federal government gets involved. Washington’s bureaucracy increases costs, adds delays and reduces accountability.

State and local politicians don’t have to worry about pinching pennies when they get handouts from Uncle Sam, which leads to eye-popping costs for basics like employing bus drivers and building elevators.

California’s rail project is a perfect example of something designed to maximize political benefits rather than the public good.

They plan to ultimately have 27 stations, most in small cities that would have minimal demand. Marginal stations add to overall construction costs, while dramatically reducing how long the trains can spend at top speeds. That means taxpayers get mediocre average speeds, but have to pay a premium for the high-speed infrastructure.

Rather than creating more zombie projects through slush funds and subsidies, Congress should seek to reform federal infrastructure policy by reducing regulatory burdens, removing barriers to investment from the private sector and state governments, and cutting massive subsidies for modes of transportation that only account for a small percentage of nationwide travel.

Such changes would breathe new life into a stale policy area and would make it less likely that taxpayers unwittingly support brain-dead projects.

## **Ears**

#### **High Speed Rails damages passenger ears – research is only starting to emerge and increases risk of ear diseases**

Xie et al. 19 – [Xie P, Peng Y, Wang T, Zhang H. P.X. was the main investigator and contributed to the design and writing of the paper; T.W. was responsible for designing and conducting the moving-model tests and data collection; H.Z. contributed to the analysis of experiment data and provided insights into design of the paper; Y.P. critically reviewed the paper and contributed to its final edition. Risks of Ear Complaints of Passengers and Drivers While Trains Are Passing Through Tunnels at High Speed: A Numerical Simulation and Experimental Study. Int J Environ Res Public Health. 2019 Apr 10;16(7):1283. doi: 10.3390/ijerph16071283. PMID: 30974822; PMCID: PMC6480231. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6480231/ Accessed 8 August 2022.] Debatetrack.

Due to the interactions between air, rail and train, a wide variety of concerns have emerged relating to aerodynamic noise, resistance, environmental and public health issues [1,2]. However, the interactions intensify when high-speed trains pass through a tunnel. This simultaneously gives rise to pressure fluctuations inside the train, which cause aural discomfort in the passengers and crew members [3]. In China, a large number of tunnels have been constructed ranging from hundreds of meters to tens of kilometers in length. For train drivers with long years of service in areas with numerous tunnels, the risks of suffering ear diseases are increased significantly [4]. Similarly, passengers travelling by the train undergo aural discomfort when the trains enter the tunnel. The aural sensations present with various symptoms such as aural fulness, otalgia, dizziness, temporal hearing loss and tinnitus, etc. [5,6]. Hence, the train-tunnel effect poses hazards to riding comfort and otological health Many efforts have been made to mitigate the negative consequences of interior pressure fluctuations on the passengers and crew members when a train passes through a tunnel. For example, Muñoz-Paniagua implemented a genetic algorithm to minimize the pressure gradient through optimization of the shape of the train nose [7]; the addition of different hood patterns at the tunnel entrance also alleviates the amplitudes of pressure gradients [8,9]. Matsubayashi et al. proposed an active control technique to downsize the pressure wave by emitting a wave which was superposed on the incident wave in the tunnel [10]. Despite the fact these findings highlighted that decreasing the pressure gradient and amplitude produced positive effects, it was not clearly elucidated how human ears respond to the ambient pressure fluctuations. Ears, including the outer ear, the middle ear and the inner ear, are essential for humans to perceive ambient sounds and identify their direction. The middle ear is composed of the tympanic membrane (TM), the malleus, the incus, the stapes and the suspensory ligaments and tendons. It should be emphasized that the TM is responsible for converting the ambient pressure changes into mechanical vibrations and transmitting them to the inner ear by the ossicle chain path. The vibration transfers to the stapes footplate (SFP) until it is received by the inner ear. In healthy ears, large pressure fluctuations are certain to incur large vibration of both TM and SFP and in turn result in aural discomfort. It is obvious that the TM and the SFP play critical roles in whether and how much the pressure fluctuations are perceived by ears. Previous researches used human ear finite element models to investigate the middle ear functions as well as pathologies [11,12]. Kalb and Price have developed an auditory hazard assessment algorithm for humans (AHAAH) to predict the potential influences of impulsive noise on human ears [13,14]. However, frequency-independent pressure waves induced by train-tunnel effect are different from frequency-dependent noise or impulsive sounds and the hazards on ears caused by noise were generally judged by sound pressure level or the exposure duration [15,16]. Furthermore, the latent risks on human ears induced by the micro pressure waves generated by a high-speed train’s passing through tunnels has not been investigated until recently.

## **Energy**

#### **Energy consumption increases substantially with high-speed trains – overloads electricity grids in vulnerable areas and costs a whole lot more**

Swain 19 – [Swain, Frank. Frank Swain is communities editor of New Scientist and an occasional science writer for the BBC, Wired and others, covering technology, art, disability and trans-humanism. He lives in Barcelona. “The Dream of High‐​Speed Trains Is Already Coming off the Rails,” Wired, November 15, 2019. https://www.wired.co.uk/article/future-of-high-speed-rail-europe. Accessed 8 Aug 2022.] Debatetrack.

With air travel under increasing scrutiny as a dangerously indulgent mode of transport, rail is often touted as the greenest form of mass transit available. Across Europe and Asia, ultra-fast trains are racing to capture overland routes back from the air industry. Can high speed rail make long distance travel green again? “The big issue is power,” says Alan Vardy, emeritus professor of engineering at the University of Dundee. “The power required increases with the cube of the train speed.” That makes squeezing each additional boost in speed exponentially more difficult – and expensive. “You’ve got to have the electricity to provide that power, and the motors of the vehicle have to cope with that power,” he says. Typically, that power (around 15,000 to 25,000 volts worth) is supplied by catenaries, overhead wires that a train contacts to via a raised arm called a pantograph. These wires are not rigid, but draped between support pillars. “As the train goes under, it distorts the shape of wire, and the whole thing shifts,” says Vardy. The faster they go, the more the wire sways. “There is a fair amount of technology just keeping the pantograph in reasonable contact with the wire.” And as trains get faster, increasing that speed becomes even harder. Air resistance become a major factor with increased speeds. “Double the speed leads to four times as much loss to drag,” says Hugh Hunt, researcher in engineering at Cambridge. “So high speed trains have really sharp pointy noses.” The famously long noses of Japan’s Shinkansen ‘bullet’ trains are actually there for a different purpose, however: preventing sonic booms. As a train enters a tunnel, it acts like a piston, creating a shockwave that races ahead of the train. The aerodynamics of long, narrow tunnels can result in a cacophonous bang at the far end – to the irritation of those living within earshot. The problem is particularly acute in Japan, where tunnels were built before the effect was understood. Engineers designed trains with elongated nose cones to soften the sudden increase in air pressure. High-speed trains in Europe go just as fast as Japanese bullet trains – if not faster – but the phenomenon is rarer due to larger bore tunnels. Where it does occur, engineers usually tackle the problem by adding a long hood to the tunnel. “Just like the long nose makes is possible to operate in tunnels without any hood, the hood makes it possible to operate without a nose cone,” explains Vardy.

## **Environment**

#### **HSR will plow through irreplaceable natural habitats**

Cox 19 – [ “High-speed train could go through ‘irreplaceable’ land in Maryland” Bay Journal, March 2, 2021. https://www.bayjournal.com/news/growth\_conservation/high-speed-train-could-go-through-irreplaceable-land-in-maryland/article\_73ce9f30-7856-11eb-a581-ab45e0fb1552.html] Debatetrack.

During nearly 40 years as a federal wildlife biologist at the Patuxent Research Refuge, Sam Droege has tromped across nearly every one of its 12,800 acres.

And he doesn’t want to see any of them plowed under for a blazingly fast train. That is a growing possibility, though. With plans solidifying for a magnetic-levitation train between Baltimore and Washington, Droege and other conservation advocates are on alert for potential harm to the 85-year-old wildlife refuge.

“It’s hard to get across how special and rare this place is,” Droege said. “These places are irreplaceable. It’s not something that can be moved and remade elsewhere. It would be like going to the National Mall and removing one of the museums.”

The maglev train project took a key step forward in January when the Federal Railroad Administration and Maryland Department of Transportation published the preliminary findings of a federally mandated five-year, $28 million environmental and engineering study.

The draft environmental impact study outlines the project in detail: a sleek train floating on a cushion of air inside a U-shaped “guideway,” with all propulsion controlled by magnets. The guideway would run through tunnels bored as deep as 320 feet beneath the surface, and along elevated sections of the route looming 150 feet overhead. The maglev train can reach speeds topping 300 mph, slashing the time of the 36-mile trip between the cities to a mere 15 minutes.

But what has caught the attention of conservationists is the possibility of a largely above-ground section of the route slicing through federal lands just outside the DC Beltway.

Two routes are under consideration. Both mostly parallel the Baltimore-Washington Parkway. The main decision boils down to selecting a more densely populated route to the west of the parkway or an eastern route that crosses into federal lands, including the fringe of the Patuxent wildlife refuge.

The new analysis calculates that the eastern route could be constructed atop as much as 24 acres of the refuge’s property. A western route would leave it untouched. Both routes would bisect the Beltsville Agricultural Research Center, another federal oasis of open space, with as much as 187 acres being given over to the maglev and its supporting infrastructure.

Conservationists say that inside the refuge, the project would destroy wildlife habitat, upend wetlands and possibly require the re-routing of streams.

“I can’t find words strong enough to express what I feel,” said Marcia Watson, president of the Patuxent Bird Club. “It’s an environmental disaster in the making. I am outraged that a private company thinks it can waltz in here and take our land.”

Northeast Maglev, the company backing the project, says it will reduce travel times and ease congestion on the often-gridlocked roads connecting Washington and Baltimore. It will also be an economic boon, creating up to 195,000 jobs during construction and supporting up to 440 jobs while in operation, according to the draft study.

The environment will benefit from lower greenhouse gas emissions, a result of converting thousands of drivers into train passengers, said Wayne Rogers, the company’s CEO. The region can also look forward to improved water quality, he added.

“Traffic’s hurting everybody. The [Chesapeake] Bay is getting 85 million pounds of [nitrogen] pollution coming into it [from the air], and much of that is from transportation,” Rogers said.

It is not the first time that a maglev has been proposed between Baltimore and the nation’s capital. In the 2000s, the Federal Railroad Administration and Maryland Transit Administration got as far as finalizing an environmental impact study and selecting a transportation system based, at the time, on Germany’s Transrapid technology. Then came a budget crunch and a legislative blockade on state spending toward the effort.

#### **HSR projects will threaten air quality and endangered species**

#### Dawid 19 – High Speed Rail: Detriment or Benefit to the Environment?. (2022). Retrieved 14 August 2022, from https://www.planetizen.com/node/57184

[Irvin Dawid has a master's degree in urban & [regional planning](https://www.planetizen.com/definition/regional-planning) from San Jose State University As a long-time environmental activist, he formed the Sustainable [Land Use](https://www.planetizen.com/definition/land-use) committee for his local Sierra Club chapter and served six years on the Bay Area Air Quality Management District’s Advisory Council from 2002-2008. He maintains his interest in air quality by representing Sierra Club California on the [Clean Air Dialogue](http://cedlink.org/organization/clean-air-dialogue/), a working group of the Calif. Environmental Dialog representing business, regulatory and public health/environmental interests.] Debatetrack.

Ralph Vartabedian reports on the environmental challenges the high speed rail project faces that will affect the cost and the timeline for what "would be the largest infrastructure project in the nation".

Potential threats to endangered species, diesel emissions from construction equipment, and wetland impacts, are a few of the obstacles the High Speed Rail Authority must confront.

"A wide array of state and federal agencies is examining those effects and, over the next several months, will issue scientific findings that could affect the cost and schedule of construction. Beyond the regulators, environmental lawsuits brought by the powerful California agriculture industry are threatening to further delay work". And the [large environmental groups](http://www.planetizen.com/node/57014#comment-19361) have already voiced their opposition to streamlining the state's [environmental law](http://www.planetizen.com/node/57014).

Among the most difficult issues will be air quality, which is regulated across eight counties by the [San Joaquin Valley Air Pollution Control District](http://www.valleyair.org/Home.htm). The district worries that the construction project would exacerbate already problematic levels of nitrogen oxides, particulates and volatile compounds.

The district is taking the position that the rail construction should make no net increase in emissions. If the cleanest diesel equipment still adds to emissions, then the district wants "financial mitigation" so it can reduce pollution from other sources, a SJVAPCD spokesman said. Even the increased population that the rail project would generate would need to be mitigated, he said."

In addition to air quality are the impacts to wetlands and other bodies of water - regulated in part by the [Army Corps of Engineers](http://www.usace.army.mil/About.aspx).

"We anticipate there to be unavoidable impacts, given the sheer magnitude of the project," said Susan Meyer, a senior project manager at the Army Corps of Engineers. The law requires that any impacts be avoided or minimized. The Army could require "compensatory mitigation" under its permits, Meyer said.

Earlier, [The Fresno Bee](http://www.fresnobee.com/2012/05/26/2851875/high-speed-rail-secret-construction.html) reported on the delayed improvement the electric train will have on air quality. "But any reductions in air pollution won't start for at least a decade, when the trains would start carrying passengers between Merced and the Los Angeles Basin. Meanwhile, building the system in the San Joaquin Valley is expected to pump tons of dust, greenhouse gases and other pollutants into the air. International experts warn it could take years for the benefits of train ridership to make up for the harm caused during construction", wrote Tim Sheehan.

#### **Chinese HSR projects demonstrate extreme environmental harm**

Lin et al. 19 – [Lin, J., Cheng, S., Li, H., Yang, D., & Lin, T. (2019). Environmental Footprints of High-Speed Railway Construction in China: A Case Study of the Beijing–Tianjin Line. International Journal Of Environmental Research And Public Health, 17(1), 105. doi: 10.3390/ijerph17010105] Debatetrack.

The environmental footprints of China’s high-speed railway (HSR) have attracted much attention nationally and internationally. Although there is some research focusing on CO2 emissions, a comprehensive environmental impacts assessment of HSR construction is still lacking. In this study, the emissions of the Beijing–Tianjin intercity HSR line was calculated using a hybrid input–output life cycle assessment method to quantify the environmental impacts of HSR throughout its construction. The environmental footprints during the construction stage were analyzed in terms of different subsystems and sectors. The results showed that bridges contribute the largest environmental footprints at approximately 60%, followed by rail and electric multiple unit (EMU) systems. The top three sectors that contribute to pollutant emissions are the metal smelting and rolling industry, transport equipment manufacturing, and non-metallic mineral production. CO2 and NOx are the major pollutants directly emitted by site equipment operation. More chemical oxygen demand (COD), total phosphorus (TP), total nitrogen (TN), and petroleum are emitted in EMU production than in rail construction, while NH3-N is emitted more in rails instead. Cd, Pb, As, and Hg are the significant pollutants in the metal smelting and rolling industry, whereas Cr, Cu, and Zn are the main heavy metal emissions in the transport equipment manufacturing sector. Heavy metals are the main types of environmental footprints in bridges, stations, and electric systems. Water pollutants are the main environmental impacts for rail and EMU systems, and the emissions of air pollutants are significant in subgrades. The production efficiency of upstream materials, desulfurization and denitration in fossil combustion, and the length of the bridge construction should be considered for an HSR under construction, in order to become environmentally friendly and sustainable.

## **Freeways**

#### **Freeways are a better investment than HSR: they’re cheaper, generate more revenue, and would cut down on fuel use and deaths by getting cars off of urban roads**

O’Toole 21—Retrieved 11 August 2022, from https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete

[Randal O’Toole was a Cato Institute senior fellow specializing in land‐​use and transportation issues. He has written six books, including [*Reforming the Forest Service*](http://www.amazon.com/dp/0933280459/?tag=catoinstitute-20) and [*Romance of the Rails*](https://www.amazon.com/Romance-Rails-Passenger-Trains-Transportation/dp/1944424946), plus dozens of policy papers and numerous articles and op‐​eds about free‐​market approaches to transportation, housing, and other issues.] Debatetrack.

With growing recognition that China has become the United States’ main economic and political competitor, many people point to China’s high‐​speed rail system as evidence that the United States is “lagging behind.”[115](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref115) But the real transportation gap between China and the United States is not high‐​speed rail; it is freeways. China has about the same number of motor vehicles as the United States. But where the United States has about 67,000 miles of freeways and is adding fewer than 800 miles per year, China has 93,000 miles of freeways and is growing its system by more than 5,000 miles a year.[116](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref116)

China began building freeways before it began building high‐​speed rails, and it has built more miles each year and spent more money on new freeway construction (though less per mile) than on high‐​speed rail. Highway travel has grown faster than rail travel, and the highway system has become particularly important for freight, as it moves about 2.5 times as many ton‐​miles as rail lines.

**The Value of Freeways**

In 2007, an independent analysis calculated that the United States’ Interstate Highway System that was built between 1956 and 1992 generated $6 in economic productivity for every dollar that it cost, vastly increased personal mobility, and saved the lives of around 5,000 people per year by taking traffic away from more dangerous local roads. For these reasons, it has been called “the best investment the nation ever made.”[117](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref117) Unlike many urban transit projects, whose goal is to get people to use one mode of travel instead of another, the interstate highways did more than simply get people to travel by one road instead of another road: the system produced new travel that wasn’t taking place before the highways were built. Before the first interstates, Americans drove an average of about 4,000 miles per year. After the original system was substantially completed in 1980, Americans drove an average of 1,300 miles a year on the interstates plus 5,400 miles a year on other roads.[118](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref118) That new travel represents people accessing more affordable homes, better jobs, a broader range of consumer goods, and increased social and recreational activities.

Unfortunately, auto opponents have demonized those economic benefits, calling them “induced demand,” implying that new roads somehow force people to unwillingly drive on them.[119](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref119) Even as they insist that spending money on transit or intercity trains will produce the same $6 in benefits for every dollar spent, they object to new roads precisely because they produce such economic returns.

To be fair, since the United States already has 67,000 miles of freeways, there are probably diminishing returns to each additional mile. But even if those returns are only twice the cost of the roads, they are worth generating if the roads themselves can be financed by highway user fees. In contrast, no one expects transit projects or high‐​speed rail lines to pay for themselves, suggesting that they are not likely to return more economic benefits than their costs.

**China’s Expressways**

At 3.7 million square miles, China is about the same size as the United States, which is 3.8 million square miles.[120](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref120) As recently as 1997, China’s transportation network was largely undeveloped. Where the United States in 1900—before widespread auto ownership—already had 2.3 million miles of roads, China in 1997 had only 765,000 miles of road, 64,000 miles of which were unpaved. Fewer than 3,000 miles of the roads in China were freeways or expressways in 1997, both terms meaning limited access roads of four or more lanes.[121](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref121)

In a plan that was directly inspired by the economic success of America’s Interstate Highway System, China’s Ministry of Transport decided in 1995 to build 22,000 miles of expressways.[122](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref122) The first ones opened in 1998, and China achieved the 22,000-mile target in 2005. Convinced that highways were driving the country’s economic growth, China increased the goal.[123](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref123) By 2014, China’s freeway miles exceeded those in the United States, and China continues to build new ones.[124](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref124)

China will not stop building freeways anytime soon. The government’s latest plan calls for building 31,000 miles of new expressways by 2035.[125](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref125) Freeways aren’t the only roads China is building: by the end of 2019, the country had more than 3.1 million miles of roads of all types, a quadrupling since 1997.[126](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref126) This compares with 4.1 million miles of roads in the United States.[127](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref127)

The urban road network around Beijing surpasses that of any American urban area. China has built seven expressways radiating from the city center and supplemented them with seven ring roads around the city—no urban area in America has more than four. The outermost ring around Beijing is more than 600 miles long.[128](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref128) In contrast to American highway critics who say that new roads merely induce more traffic, the Chinese more accurately see that the new roads enable more economic activity.

China may have more miles of high‐​speed rail lines than the rest of the world combined, but it has more miles of expressways than the mileage of all the railroads in the country and four times as many miles of expressways as miles of high‐​speed rail.[129](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref129) China pays for road construction with tolls and new vehicle taxes, while it divides fuel taxes between road maintenance and non‐​transportation‐​related activities.[130](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref130) Meanwhile, it pays for its high‐speed rail lines out of deficit spending. By the end of 2019, China’s State Railway Group Company had debts of nearly $850 billion because of the cost of building and operating money‐​losing rail lines.[131](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref131) As a result, many argue that the country should slow or halt construction of new high‐​speed rail lines.[132](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref132)

**The United States’ Freeway Shortage**

The United States should not build more freeways simply because China has more. But there are several reasons why this country has a shortage of freeways. These include congestion, safety, and finance.

The Texas A&M Transportation Institute estimates that congestion in America’s 494 urban areas wasted 8.8 billion hours of travelers’ time and 3.3 billion gallons of fuel and cost $179 billion in 2017.[133](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref133) In the post‐​pandemic world, increased numbers of people working at home will reduce morning congestion. However, one study found that telecommuters drive more miles per day than people who drive to work.[134](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref134) Since they tend to do this driving in the afternoons, the number of hours of congestion in the afternoons may grow.

Safety is an issue because urban freeways are the safest of all roads to drive on, and rural freeways are the safest rural roads. Highway engineers classify roads as arterials, collectors, and local roads and streets. Freeways are arterials, but so are other major roads, generally including roads with speed limits of 45 mph or more.

In 2019, 4.5 people in the United States died in traffic accidents for every billion vehicle‐​miles traveled on urban freeways, while 7.9 people died per billion miles on rural freeways. Non‐​freeway arterials, however, are some of the most dangerous roads in the country: 14.4 people died per billion miles in urban areas and 19.8 people in rural areas in 2019. Converting 1,000 miles of urban non‐​freeway arterials to freeways would save about 70 lives per year, while converting 1,000 miles of rural non‐​freeway arterials to freeways would save about 30 lives per year.[135](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref135)

The financial reason to build new freeways is simple: new freeways, if located in the right places and priced properly, can pay for themselves. This is unlike high‐​speed rail or any passenger rail in the United States, which require both operating and capital subsidies. For the government to refuse to build new roads that can pay for themselves is to act as a monopolist with all the negative connotations that implies.

## **Interest Opposition**

#### **Groups like the Koch Brothers have substantial amounts of money to derail the investment**

Tabuchi 18 – [Tabuchi, Hiroko. Hiroko Tabuchi is a climate reporter for The New York Times, based in New York. She previously wrote for the paper on Japanese economics, business and technology from Tokyo. "How The Koch Brothers Are Killing Public Transit Projects Around The Country (Published 2018)". Nytimes.Com, 2018, https://www.nytimes.com/2018/06/19/climate/koch-brothers-public-transit.html. Accessed 8 Aug 2022.] Debatetrack.

In cities and counties across the country — including Little Rock, Ark.; Phoenix, Ariz.; southeast Michigan; central Utah; and here in Tennessee — the Koch brothers are fueling a fight against public transit, an offshoot of their longstanding national crusade for lower taxes and smaller government. At the heart of their effort is a network of activists who use a sophisticated data service built by the Kochs, called i360, that helps them identify and rally voters who are inclined to their worldview. It is a particularly powerful version of the technologies used by major political parties. In places like Nashville, Koch-financed activists are finding tremendous success. Early polling here had suggested that the $5.4 billion transit plan would easily pass. It was backed by the city’s popular mayor and a coalition of businesses. Its supporters had outspent the opposition, and Nashville was choking on cars. But the outcome of the May 1 ballot stunned the city: a landslide victory for the anti-transit camp, which attacked the plan as a colossal waste of taxpayers’ money. “This is why grass roots works,” said Tori Venable, Tennessee state director for Americans for Prosperity, which made almost 42,000 phone calls and knocked on more than 6,000 doors. Supporters of transit investments point to research that shows that they reduce traffic, spur economic development and fight global warming by reducing emissions. Americans for Prosperity counters that public transit plans waste taxpayer money on unpopular, outdated technology like trains and buses just as the world is moving toward cleaner, driverless vehicles. Most American cities do not have the population density to support mass transit, the group says. It also asserts that transit brings unwanted gentrification to some areas, while failing to reach others altogether. Public transit, Americans for Prosperity says, goes against the liberties that Americans hold dear. “If someone has the freedom to go where they want, do what they want,” Ms. Venable said, “they’re not going to choose public transit.” The Kochs’ opposition to transit spending stems from their longstanding free-market, libertarian philosophy. It also dovetails with their financial interests, which benefit from automobiles and highways.

## **Gentrification**

### **HSR Investment is a direct multiplier of gentrification and hurts local economics and low-income workers**

Lin and Xie 20– [Lin, Jen-Jia; Xie, Ze-Xing (2020). Jen-Jia Lin is part of the Department of Geography, National Taiwan University; No. 1, Sec. 4, Roosevelt Road, Taipei 10617, Taiwan. Ze-Xing Xie is part of the Graduate Institute of Building and Planning, National Taiwan University, Taiwan. The associations of newly launched high-speed rail stations with industrial gentrification. Journal of Transport Geography, 83(), 102662–. doi:10.1016/j.jtrangeo.2020.102662. https://www.sciencedirect.com/science/article/abs/pii/S0966692319302133] Debatetrack.

Feng et al. (2018) reviewed the literature on HSR impacts in East Asia and provided general information about socioeconomic changes associated with the station areas. Studies in Japan (Haynes, 1997a, 1997b), South Korea (Kim, 2000), and Taiwan (Lin et al., 2005) all supported the finding that HSR systems encourage population migration to the served areas because of the increased accessibility and development planning of station areas. The experiences in Japan (Haynes, 1997a, 1997b), South Korea (Korea Transport Institute and Eastern Asia Society of Transportation Studies, 2015), and Taiwan (Lin et al., 2005) suggest that HSR is positively related to the distribution of employment opportunities. Evidence from South Korea reveals that industry players near new station areas benefit from higher land price growths and better national averages than those near old station areas (Korea Transport Institute and Eastern Asia Society of Transportation Studies, 2015). Nakamura and Ueda (1989) found that the accessibility to Shinkansen in Japan increases land values in commercial areas by 67%. Evidence from Taiwan reveals that HSR impact on land prices varies with local real estate markets and station locations (Anderson et al., 2010). HSR services attract the migration of population and businesses to locations near station areas or those areas well-connected to stations. HSR services raise the land prices in these areas. Increased accessibility and land prices can result in the displacement of lower-rent-affordability activities by higher-rent-affordability activities, also known as “gentrification.”

Industrial displacement occurs when originally existing industries near HSR station areas are displaced by newly moving-in industries. Industrial gentrification is likely to occur when the displaced industries are the lower-skill or lower-wage types (“L industries,” i.e., usually with lower land-rent-affordability) and the moving-in industries are the higher-skill or higher-wage types (“H industries,” i.e., mostly with higher land-rent-affordability) (Yoon and Currid-Halkett, 2015). This industry-upgrading process is expected to raise economic growth but can also endanger local economic diversity and employment outcomes of unskilled and immigrant workers (Curran, 2007). However, the existing literature has not well clarified the occurrence of industrial displacement in localities near HSR station areas and its association with gentrification.

To resolve the aforementioned research gap in extant literature, this study aims to empirically determine the association of HSR with industrial displacement within localities near station areas and whether this industrial displacement is related to gentrification. The areas surrounding two HSR stations (i.e., Hangzhou Railway Station (HRS) in a developed urban area and HERS in a newly developing area in China), which launched HSR services earlier than the others (2010 and 2013, respectively), were selected as the empirical study areas. A total of 67,367 observations of business registration records for the HSR station area (test group) and non-HSR station area (comparison group) from 2010 to 2018 were collected as the study data. On the basis of the staff’ education and industry-related income levels, the study data (“observations”) were clustered into H and L industries. Then, the survival risks of businesses between H and L industries and between test and comparison groups were compared using survival analysis methods. The empirical results can provide novel evidence on the relationships between HSR stations and industrial gentrification that have not been mentioned in the literature and contribute knowledge on the relation of infrastructure investments to gentrification.

## **Political Corruption**

#### **Positions for HSR administration can be corrupted**

Shieber 11 – [Shieber, Jonathan. Jon Shieber is the editor at Footprint Coalition. He was an editor at Techcrunch and previously worked as a senior reporter for Dow Jones & Co., covering venture capital and private equity investment from New York and Shanghai. “New Revelations in China's Railway Corruption Scandal”. 23 March 2011. https://www.wsj.com/articles/BL-CJB-13529?reflink=desktopwebshare\_permalink. Accessed 8 August 2022.] Debatetrack.

As the Chinese government builds its case against disgraced former railways minister Liu Zhijun, new details are coming to light about the scope of the corruption bedeviling the country's world-beating high-speed rail build out. On Wednesday, the state-run Xinhua news agency said a government audit report shows embezzlers made off with 187 million yuan, or roughly $28.5 million, from just the Beijing-to-Shanghai portion of the high-speed railway project--a revelation that reinforces earlier doubts about implementation of the massive rail expansion. The latest numbers come from the same interim audit report, produced by the National Audit Office, that originally brought down Mr. Liu, who was made to step down in February. Xinhua now says that the audit could pave the way for other arrests for corruption and embezzlement. The steady drumbeat of revelations could spell a grim fate for Mr. Liu in China, which has a record of executing high-profile officials accused of corruption. Relative to the overall amount of money being funneled into the high-speed rail project, the amount that Xinhua said was embezzled on the Beijing-Shanghai line is small. The Beijing-Shanghai line involved total investment in the range of $33 billion, meaning embezzlers made off with less than a tenth of a percent. But if other Chinese infrastructure projects have seen larger chunks of their funding disappear into the pockets of corruption officials and contractors, few others have been as highly touted. China's national rail program, along with its burgeoning space program, has been a point of national pride for the country, with California even mulling the use of Chinese technology for its own high-speed rail project. Fed by tales of lurid backroom dealings reported in the Chinese press, the corruption scandal has dampened some of the crowing over the high-speed trains, which have also bit hit with concerns over the cost and safety of lines that already under construction. Reports from February, when the scandal first hit local media, acknowledged that the Ministry of Railways was under a heavy debt burden. Indeed, under Mr. Liu's tenure the ministry had racked up 1.3 trillion yuan in debt, with 854.8 billion yuan in short term debt and 448.6 billion yuan in long-term debt, in 2009 according to a report by the Global Times. At the time, the paper quoted a researcher from Beijing Jiaotong University, Zhao Jian, saying the debts had "grown too large for the government to afford." While ferreting out the people responsible for corruption may help restore some of the public's faith in the rail ministry, it doesn't address many of the other challenges facing China's high speed rail network, which is supposed to stretch 16,000 kilometers by 2020.

## **Population Density**

#### **Population density is the biggest single factor to why HSR is infeasible at worst and ineffective at best – images attached**

Davis 19 – [Davis, Jeff. Eno is an independent, non-partisan think-tank that shapes public debate on critical multimodal transportation issues and builds an innovative network of transportation professionals. "Population Density And High-Speed Rail". Enotrans.Org, 2022, https://www.enotrans.org/article/population-density-and-high-speed-rail/. Accessed 10 Aug 2022.] Debatetrack.

With the recent decision of the Governor of California to slow down (at a minimum) plans for construction of the state’s high-speed rail project outside the Merced-Bakersfield “Central Valley” segment, there has been a round of articles in the media along the lines of “why can’t the U.S. build high speed rail, when Europe/Japan/China are so good at it?” It’s a complicated question, but the biggest underlying factor – population density – is hard to describe in prose, and statistics are boring. And good visualizations were hard to find – until now. In researching this question, I ran across a wonderful Internet tool called World Population Density. It uses the resident population GIS dataset from the Global Human Settlement Layer (GHSL) produced by the European Commission JRC and the CIESIN Columbia University and puts all that information in a map format that can be navigated in a web browser similar to Google Maps (powered by CARTO). The site design is by Duncan Smith. The site allows easy visualization of comparative resident population density, per square kilometer, for any part of the globe, zooming in and zooming out to a variety of scales. One you find a scale you like for one area, you can then just rotate the earth around to another area to see the comparative population density of the other area at the same scale. At the widest shot possible, here is the population density of the entire planet, from about 60 degrees north latitude to about 15 degrees south latitude (where the bulk of the population is):

Davis continues:

Boston, MA to Washington, DC population density:

Map

Description automatically generated

San Francisco, CA to Los Angeles, CA population density:

Map

Description automatically generated

Davis concludes:

For fixed-guideway mass transportation (whether by railroad, or subway/elevated rail, or bus rapid transit), there’s just no substitute for population density as a measure of the need for, and likely success of, the system.

#### **Unlike Europe, Japan and China, the US is too large and too sparsely-populated for HSR to make sense—such a system would be a long-term burden on taxpayers**

Rodrigue 13—HS2: mixed success for high speed rail worldwide. (2013). Retrieved 11 August 2022, from https://theconversation.com/hs2-mixed-success-for-high-speed-rail-worldwide-20045

[Jean-Paul Rodrigue is Professor of Global Studies and Geography at Hofstra University. He does not work for, consult, own shares in or receive funding from any company or organization that would benefit from this article, and has disclosed no relevant affiliations beyond their academic appointment.] Debatetrack.

In North America, such is the vast size of the continent that, despite boasting some of the world’s largest cities, population density is low – commonly below 2,000 people per square kilometre. The only HSR service is Amtrak’s [Acela Express](http://www.amtrak.com/acela-express-train) that runs between Boston-New York-Philadelphia-Washington DC, but technical requirements limit the speed along several segments (the New York-Washington DC segment can be considered high speed).

Developing HSR corridors to link the regional cities of the US has been debated for more than 20 years, with many corridor projects clearly identified and advocated – for example San Francisco-San Diego, Quebec-Toronto, Miami-Orlando-Tampa or Vancouver-Seattle-Eugene. Yet the extent, prominence and relatively low cost of road and air transport have been played against the costs of building new rail.

The density of North American urban areas, including their city centres, is low enough to challenge the justification for large-scale HSR projects. Another barrier to HSR in North America is that private freight companies own and operate the majority of the rail network. This leads to right of way conflicts between existing freight trains and any potentially rising numbers of passenger trains in the vicinity of major metropolitan areas, which are also the sites of important cargo terminal facilities.

The problem is to reconcile this regional demand with high unrecoverable costs that are inevitably incurred building and operating HSR systems. So far HSR has not delivered financially sustainable systems. Only two individual lines are profitable: Paris-Lyon in France and Tokyo-Osaka in Japan – but [not the rest of the networks](http://reason.org/files/high_speed_rail_lessons.pdf) they are part of.

So the majority of HSR lines depend on large subsidies from both taxpayers and other cross-subsidies. An infrastructure project cannot be judged a failure if there is still an ongoing willingness by society to cover operational costs and finance expansion. What matters is to ensure this cost is acceptable, since once the commitment is made there are limited alternatives to developing an HSR network to its fullest possible extent.

## **Private Investment**

#### **Private Investment for HSR is more effective – bypasses political infighting, delays, and effectiveness of substantial return on investment**

Lindsay et al. 21 – [Lindsay, Morgan; Atkins, Raymond; Hynes, Terry. “High-speed rail in the United States: A golden opportunity”. Global Railway Review. 6 May 2021. https://www.globalrailwayreview.com/article/122442/high-speed-rail-united-states-opportunity/. Accessed 9 August 2022.] Debatetrack.

Is a government-run high-speed network the answer? One approach would be to expand and upgrade Amtrak’s existing service. Early indications are that this option – creating a government-run high-speed rail network – may be favoured by policymakers. While the Biden Administration’s massive infrastructure plan includes $80 billion for rail, the lion’s share of those funds are earmarked for Amtrak. But a high-speed rail strategy based solely on Amtrak’s government-operated train service is doomed to fail. The United States has an abysmal track record when it comes to government-run passenger rail service. Amtrak operates year after year at a loss, costing U.S. taxpayers nearly $100 billion since its inception. Despite massive subsidies, Amtrak trains (with the exception of its Acela service in the Northeast Corridor) rarely operate on time. Past federal spending to ‘upgrade’ Amtrak services has yielded only modest increases in train speeds, typically 10mph. Such marginal benefits hardly seem worth the price. Likewise, billions of dollars in federal funding for California’s 800-mile high-speed rail project have, after more than a decade, produced nothing more than partial construction of a small segment between Merced and Bakersfield – a “railroad to nowhere” that provides no transportation benefits for major cities like Los Angeles and San Francisco. In both cases, government control over rail construction projects has resulted in endless delays, massive cost overruns and minimal return on taxpayer investment. Moreover, Amtrak’s existing network is ill-suited to serve as the foundation for a state-of-the-art U.S. high-speed rail system. Most Amtrak trains operate over tracks that are shared with freight and/or commuter railroads. The physical characteristics of those tracks – including grade, curvature and weight of rail – were designed to move heavy freight cars at slower speeds. Conversely, the design characteristics of high-speed rail systems are incompatible with heavy-haul freight operations. Even if existing shared tracks could be upgraded to support high-speed trains, commingling slow-moving freight trains and passenger trains operating at speeds in excess of 150mph would be a recipe for disaster. That is why virtually all high-speed passenger trains operate on dedicated tracks that are not shared with other trains. The potential of private investment The success of America’s privately-owned freight railroads provides a model for creating a world-class high-speed passenger rail network in the United States. There is a better way. America’s freight railroads are the safest and most productive in the world. They were built by entrepreneurs who recognised the need for, and potential of, a privately-owned rail freight sector. Elimination of unnecessary government regulation enabled the freight railroads to recover from the travails of the post-war era and to innovate in ways that deliver fast and reliable service to the many industries that rely on rail freight to move their goods. The U.S. rail freight network is operated and maintained without government subsidies. While most new investment in rail freight infrastructure is privately financed, carriers have partnered with government to fund improvements where opportunities to benefit both the freight network and broader public objectives present themselves. The success of America’s privately-owned freight railroads provides a model for creating a world-class high-speed passenger rail network in the United States. Today, private investors are seeking to develop high-speed rail lines in California, Nevada, Texas, Florida and Maryland. These modern-day rail entrepreneurs have the ability to make prudent investment decisions that are free from the political compromises that delay – and, inevitably, increase the cost of – government-controlled projects. Once constructed, market forces will spur these privately-run passenger railroads to offer competitive rates, convenient schedules and a superior passenger experience.

## **Suburban Sprawl**

#### **HSR actually increases suburban sprawl through railway stops instead of urban growth**

Glaeser 09 – [Glaeser, Edward L. Edward Glaeser is a senior fellow at the Manhattan Institute, a contributing editor of City Journal, and the Fred and Eleanor Glimp Professor of Economics at Harvard University, where he has taught since 1992. He regularly teaches microeconomic theory and, occasionally, urban and public economics. "What Would High-Speed Rail Do To Suburban Sprawl? | Manhattan Institute". Manhattan Institute, 2015, https://www.manhattan-institute.org/html/what-would-high-speed-rail-do-suburban-sprawl-1895.html. Accessed 9 Aug 2022.] Debatetrack.

Any transportation investment can create large economic ripples only if it significantly increases the speed at which an area with cheap real-estate gains access to a booming place that doesn’t have any comparable, closer available land area. For example, in Spain, the city of Ciudad Real seems to have gotten a big lift thanks to high-speed rail because people can now live in Ciudad Real, where housing is cheaper, and commute into Madrid. This logic has led some to think that high-speed rail will do wonders transforming Buffalo into a back office for Manhattan. Buffalo is 376 miles from Manhattan, so a 150-mile-an-hour rail line will take two and a half hours, which is not going to be significantly faster than air. Moreover, vast amounts of low-cost space are closer to Manhattan than the shores of Lake Erie. Faster connections between Buffalo and Toronto might do more, but in that case speed is hampered by the burdens of border crossing. Philadelphia is the more natural beneficiary of high-speed rail access to Manhattan; there are already people who live in Philadelphia and commute to New York. Yet even in this most propitious setting, the coming of Acela seems to have had little impact on the population decline of Philadelphia or growth of Wilmington. Perhaps the absence of any trend break in population growth around 2000 just reflects the incremental nature of the Acela investment, but there is little here to bring confidence that rail lines revitalize cities. Moreover, I don’t see why is it in the national interest to disperse economic activity from Manhattan to Buffalo or Philadelphia. I have long argued that the economic case for directing economic aid to declining regions is weak. A third possible benefit of rail is environmental. Can high-speed rail bring people closer to city centers and thereby reduce carbon emissions? My work with Matthew Kahn on the greenness of cities suggests that each household that moves from Houston suburbs to the central city reduces carbon emissions and creates $164 of global-warming-related benefits each year. Each household that switches from suburb to city in Dallas creates $133 of benefits annually. Those benefits represent both reduced electricity usage (associated with smaller urban homes) and reduced driving. But there is little evidence documenting that rail has strong positive effects on land use. Unfortunately, all of the evidence on this question comes from intraurban, not interurban rail lines. Atlanta’s rail line had little impact on population or employment within the metropolitan area. BART, the Bay Area Rapid Transit system serving the San Francisco region, seems to have done more, but the effects are still modest. Nathaniel Baum-Snow and Matthew Kahn have done the most comprehensive look at new intraurban rail systems in 16 cities. I asked them to examine whether population levels rose close to new rail stations, and they found no evidence for that. Moreover, the story of Ciudad Real should make us question the presumption that rail will centralize. *If a Dallas-Houston line stops somewhere between the two cities,* and fosters the growth of a new exurb, *the result will be more, not less, sprawl*. Despite the lack of any positive evidence linking centralization to high-speed rail, I certainly accept that there is a great deal of uncertainty. To give rail the benefit of the doubt, I’ll assume that high-speed rail will cause 100,000 households to switch from suburb to city in both Dallas and Houston. This change would create extra, annual environmental benefits of $29.7 million. These benefits would be real, but they would still do little to offset the $524 million or $401 million net annual loss discussed above.

#### **The root cause is because of our infrastructure – suburb/exurb growth is real and cancels out any benefit to HSR land planning.**

Kambitsis 10 – [Kambitsis, Jason. City Planner and contributing editor for WIRED. "High-Speed Rail As A Conduit Of Sprawl". Wired, 16 March 2010, https://www.wired.com/2010/03/high-speed-rail-and-sprawl/. Accessed 9 Aug 2022.] Debatetrack.

Yes, it could, warn some urban planners. Despite the promise of creating more densely populated urban centers, high-speed rail could do quite the opposite by making it easier for people to live far from urban centers. Let's use California as an example, since high-speed rail has made the most progress there. The Golden State, long known as a trendsetter for transportation and environmental policy, has received more than $2.3 billion in stimulus funds toward a proposed linelinking San Francisco and Los Angeles by way of the Central Valley. The money is earmarked for construction, land acquisition and engineering and it follows the $9.95 billion allocated by a state ballot initiative. If and when the line is completed by 2030, riders will zip between the two cities in 2 hours and 38 minutes and pay less than half what it would cost to fly. But that convenience could increase emigration from California's urban centers to the exurbs and beyond. In other words, it could lead to more sprawl. An example of this can be seen in cities like Palmdale, which is 58 miles north of Los Angeles. By cutting the commute time between those two cities from 1 hour and 25 minutes, to 27 minutes, outward growth of the Los Angeles area will undoubtedly continue. It's easy to see why -- home prices in Palmdale are more than half of those in L.A., and high-speed rail could make getting downtown as quick and easy as living downtown. Pushing people further into the exurbs runs counter to a major goal of high-speed rail, namely cutting our carbon output while creating denser, more sustainable communities. Before this conversation goes any farther it should be said adopting high-speed rail is fundamental to the country's economic vitality because it provides cost-effective transportation options that link major commerce centers. It is in many ways more beneficial than the continued use of automobiles as the primary means of moving people around. The time is now and the technology is here. That said, there are some potential flaws regarding where stations are built and how the rail infrastructure is integrated with communities that could lead to sprawl. The goal for high-speed rail in the United States, as in Europe -- which, like Japan, is held as a model for HSR -- is linking large cities. But the big difference between the European and American approach is Europeans have made a large investment in rail and the accompanying infrastructure that links it with stations and communities. The United States, on the other hand, has invested heavily in a highway system. The result is our land use patterns are quite different. In addition to making rail a priority, Europe has long supported public transit and multi-modal transportation infrastructure that supports bicycling, walking and other ways of getting around. It has all but taken the car out of the equation and solved the so-called "last mile" problem -- addressing how people get from the transit stop to their final destination. Public transit options, along with dense, compact communities built around transit hubs (an approach called transit oriented development, or TOD) has created inherent convenience and in many cases eliminated dependence on cars. In the United States it is a completely different story. We rarely embrace TOD. This could be a problem with high-speed rail. Without a rapid transformation of our building patterns and a push to make existing communities denser, high-speed rail could be a conduit of sprawl, not a deterrent. If stations include vast parking lots, or they're built in remote areas away from urban cores instead of being made a part of the community, it will all but guarantee people drive to the stations and create a system that is only accessible by car. Drivers already comfortable with a commute of an hour or more could move further away from urban centers, drive to a station and ride to work and still enjoy a shorter overall commute time. "HIgh-speed rail will simply add another layer of access to the far-flung suburbs/exurbs and Central Valley, resulting in more mass-produced subdivisions," warns Robert Cervero, director of the University of California Transportation Center and author of Development Around Transit.

## **Regular Trains**

#### **The US has 140,000 miles of normal train tracks—improving these would be a lower-cost and lower-risk gamble at better train infrastructure—more appropriate to the US, which currently has minimal rail ridership, and in a country that “sucks” at large infrastructure projects**

Gordon 21— The U.S. Is Not Ready for High Speed Rail. (2021). Retrieved 12 August 2022, from https://www.vice.com/en/article/3aqz8y/the-us-is-not-ready-for-high-speed-rail. Aaron Gordon is a senior writer at Motherboard. Debatetrack.

One such question is about high speed rail (HSR), specifically whether the Biden plan should commit to building any and, if so, how much. Although there is no official definition, generally HSR means a passenger train capable of traveling 125 mph or faster, but it does not necessarily mean the entire route goes that fast.

There is no doubt that HSR is a fantastic technology that would make the U.S. much better in any measurable way. It is [a proven technology](https://www.thetransportpolitic.com/databook/world-high-speed-rail-kilometers-by-country/). It is also not a new technology, having first debuted in Japan in the 1960s (although like any technology it has of course improved over time). The fact that other countries like Germany, France, South Korea, Spain, and especially China have successfully built lots of HSR leads many hopeful Americans to believe we can too. It has spawned an entire meme subculture of [drawing prospective U.S. HSR maps](https://noahpinion.substack.com/p/i-dont-get-the-high-speed-rail-thing) that are aspirational and fun but little more than Microsoft Paint lines across state maps.

While I love the optimism HSR fuels in American transit nerds, we are not starting from where Japan was in the 1950s or France in the 1970s. We have no passenger rail culture to speak of outside of the northeast corridor and some tourist novelty routes. It would require an incredible building spree, the likes of which the U.S. hasn't seen for generations.

So, at the heart of this HSR question is not "would it be good?" but, rather, a more strategic issue. Do we take the lower risk, lower reward path to drastically improve the rail infrastructure we already have? Or do we go with the big swing and try to start all over with high speed rail? We have a passenger rail network. It sucks right now, but we can make it better a lot easier than we can build a new one.

One possible answer is "why not both?" This has obvious appeal. It's always preferable to not be forced into difficult choices. But given the several hundred billion dollars currently needed to [build just one U.S. HSR line](https://hsr.ca.gov/), "build it all" isn't likely to happen, especially in a country where one political party is opposed to publicly-funded HSR (although [that wasn't always the case](https://www.nytimes.com/2012/01/03/us/politics/for-high-speed-rail-support-in-the-past-from-gop-presidential-hopefuls.html)).

To be sure, reasonable people can disagree on what that choice should be. But I'd like to take a moment to advocate for the humble ol' choo-choo train that can still move tens of millions of people a year quickly, reliably, and comfortably, and in an environmentally friendly way.

HSR requires a lot more work than just buying faster trains. It needs new tracks and signals and often new routes entirely to both reduce the severity of curves and hills to enable faster speeds and to cut travel distances.

It is much easier to build HSR in countries with existing and widely used passenger rail. For example, countries like France and Germany [built sections of HSR](https://www.hsrail.org/high-speed-rail) to cut travel times along major corridors while still using existing tracks for the slower parts of the journey in developed areas. Then they added more HSR to gradually increase speeds and reduce travel times. Over decades, they got a true HSR network with transformative effects. Six hour-plus trips now take three or less. But it didn't happen overnight or in one big building spree. It would have been much harder to do without an existing, efficient, dependable passenger rail network.

In order to build a transportation system that works, it is important to be realistic. And, realistically, the U.S. sucks at building public transit for all kinds for deep, structural reasons (I wrote [a whole separate and frankly very long article](https://www.vice.com/en/article/884kvk/why-the-us-sucks-at-building-public-transit) about this a little over a year ago if you want to go into the weeds on *that* issue). More money can fix some of those problems, but it is not simply a question of more money. It is about fixing a public works mentality and legal structure that is fundamentally broken, requiring decades to even get such projects under construction after designing the project, acquiring the land, conducting all the legally required environmental reviews, and warding off the inevitable obstructionist lawsuits.

These would all be surmountable problems if we had unlimited time to do it. But we do not. Unfortunately, time is running out to build an HSR network that will meaningfully shift travel patterns away from more polluting means like airplanes and long drives. It takes a *long* time to build HSR even if you're good at it. According to [transportation researcher Yonah Freemark](https://www.thetransportpolitic.com/databook/world-high-speed-rail-kilometers-by-country/), in their first 20 years of HSR operations, Japan built 1,120 miles of HSR, France 896, and Germany 566; everyone else built even less.

Except, that is, for China, which is a global HSR outlier on steroids. China went from having zero miles of HSR in 2007 to 17,431 miles in 2020, or just 13 years, the kind of building spree many HSR advocates would love to see in the U.S. But, China is able to do this because it is not a democracy, national infrastructure priorities are not subject to debate, and people living where the trains go [are simply kicked out](https://www.nytimes.com/2013/09/24/business/global/high-speed-train-system-is-huge-success-for-china.html).

For the U.S., matching the building pace of other democratic nations would be too little too late. In 20 years, it will be 2041, a full decade *after* [the Intergovernmental Panel on Climate Change](https://www.ipcc.ch/sr15/) (IPCC) says emissions have to be reduced by 45 percent from 2010 levels to limit global warming to 1.5 degrees Celsius, and less than a decade before the planet has to be at net zero emissions. Even if the U.S. matched Japan's building pace in its first two decades of HSR, that wouldn't be enough time to build out three of the most obvious HSR routes: Chicago to New York, Boston to DC, and Los Angeles to San Francisco. Of course, the latter California route has been in various planning stages for several decades and [is nowhere close to done at several times the original cost estimate](https://www.latimes.com/local/california/la-me-california-high-speed-rail-consultants-20190426-story.html), so even matching the building pace Japan accomplished several generations ago feels so aspirational as to border on delusion.

## **Time**

#### **It will take decades to plan and build HSR lines, and a lot can change in that time**

O’Toole 21—Retrieved 11 August 2022, from https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete [Randal O’Toole was a Cato Institute senior fellow specializing in land‐​use and transportation issues. He has written six books, including [*Reforming the Forest Service*](http://www.amazon.com/dp/0933280459/?tag=catoinstitute-20) and [*Romance of the Rails*](https://www.amazon.com/Romance-Rails-Passenger-Trains-Transportation/dp/1944424946), plus dozens of policy papers and numerous articles and op‐​eds about free‐​market approaches to transportation, housing, and other issues.] Debatetrack.

The California legislature created a high‐​speed rail commission to study the possibility of a rail line in 1994. Construction didn’t begin until 2015. At that time, the authority projected it would be able to begin operating high‐​speed trains from Los Angeles to San Francisco by 2028. However, because of cost overruns and the pandemic, the authority now projects completion no earlier than 2033, nearly 40 years after planning began. Not all high‐​speed rail lines may take this long, but two decades seems a likely minimum.

A lot will happen in two or more decades that could completely nullify the claimed benefits of high‐​speed rail. The pandemic is likely to reduce people’s eagerness to use various forms of mass transportation even after most people are vaccinated. Driverless cars will reduce the cost of travel time because people will be able to work, socialize, or enjoy entertainment while they travel in personal vehicles. Electric aircraft could reduce the dollar and environmental cost of short‐​distance air travel. These and other uncertainties make big‐​budget, high‐​risk projects even less likely to succeed.

## **Solvency**

#### **The US system, which tries to balance between a small government with limited authority and big projects, can never build an HSR**

Mortimer 20—Mortimer, C. (2020). Why High-Speed Rail Has Failed. Retrieved 13 August 2022, from https://exponents.substack.com/p/why-high-speed-rail-has-failed [Colin Mortimer is Director of the Center for New Liberalism at the Progressive Policy Institute] Debatetrack.

So, *why has high-speed rail failed every time it has been tried in the United States?* It is not for a lack of effort or a lack of money. You’d think that after decades of head-banging that our public officials would find at least some progress past the obstacles that have stood in the way. *What gives?* It is a complex system of factors which can be grouped into two buckets: legal and structural.

The legal obstacles in opposition to high-speed rail may have had benevolent intentions when first passed, but are lethal to any aspiring high-speed rail project. Environmental reviews [make construction](https://www.latimes.com/local/california/la-me-high-speed-rail-delay-20171115-story.html) an expensive endeavor before shovels even start moving dirt. Sturdy property rights make the [acquisition of privately owned land](https://www.latimes.com/local/california/la-me-bullet-judge-201801120-story.html) expensive and lengthy: a problem that countries like China don’t face. A [culture of public input](https://www.hsr.ca.gov/communication/info_center/events.aspx) makes every inch of track an issue worthy of public hearings and comment. Contractors and their unions know all too well how to [extract money from public entities](https://www.nytimes.com/2017/12/28/nyregion/new-york-subway-construction-costs.html) who don’t know any better to turn the tap off. These are problems so large that they cannot be solved by any transit authority alone; they are deeply ingrained local, state and federal laws that breed a culture of that demands too many cooks in the kitchen. The result is the accumulation of cost overruns and delays that kill once-ambitious projects.

The problems are also structural, geographically and historically speaking. American advocates of high-speed rail don’t realize how little density America has compared to other countries with high-speed rail. For example, the route between San Francisco and Los Angeles would have been nearly 440 miles long, compared to the 238 miles between London and Paris. Tokyo to Osaka is 320 miles. Generally, high-speed rail with multiple stops is [only practical](http://www.fra.dot.gov/eLib/Details/L02833) under distances under 500 miles. California’s main route pushes this limit, with nothing to say on other ambitious proposals that call for a national high-speed rail network.

Then in a place like the Northeast Corridor, why haven’t we seen true high-speed rail? The distance from New York to Washington is about the same distance from London to Paris, right in the sweet spot. The answer here is one of space, and one that beckons to the legal concerns listed above: where are we going to put this track? Much of the existing rail in the Northeast corridor is abutted by industry, homes, and cities. Seventy years ago, building on greenfield would have made this a non-issue. But with suburban sprawl, acquiring all this property would be a monumental task, costing untold billions of dollars and disruption. When the systems of Europe and Japan were built, they did not nearly have this problem. They built high-speed rail, alongside a culture that valued it, well before infrastructure glut could get in the way. Status quo bias is a hell of a phenomenon.

So, the case against high-speed rail is not a case against high-speed rail itself. On its face, high-speed rail is a wonderful idea. It is a ([potentially](https://www.citylab.com/transportation/2011/11/how-green-high-speed-rail/492/)) green alternative to driving or flying and provides travelers with the opportunity to travel from downtown to downtown rather than to airports on the periphery. Instead, the case against high-speed rail it is a feasibility argument. It is an argument against the complex systems that prevent high-speed trains from taking to the tracks. If it were feasible to overhaul our burdensome environmental reviews, pump out corruption from our infrastructure contractors, reform the legal incentives that [encourage public resistance](https://pdfs.semanticscholar.org/1053/70f184185c07594f40b006251cc03d69b48c.pdf) to high-speed rail, demolish our current infrastructure without quality-of-life concerns and move our cities closer together all at once, then high-speed rail would be a no-brainer opportunity. Even reform in just a few of these areas might put high-speed rail over the edge.

But I’m not holding my breath for these structural concerns to be addressed. So, what are the solutions? For one, we can invest in our existing regional rail networks that connect suburbs to urban areas. Not only does this infrastructure already exist, but it is also far cheaper to build upon than to build high-speed rail networks from the ground up. Even urban metro systems, despite their cost, also have a clearer benefit than high-speed rail.

For long-distance trips, the U.S. can expand the Essential Air Program, coupled with carbon neutrality. The Essential Air Program subsidizes flights from small rural communities to large hubs so that people in those communities have access to the outside world. The program [costs $290 million per year](https://fas.org/sgp/crs/misc/R44176.pdf). For reference, the U.S government spent $450 million to upgrade 23 miles of signals in the Northeast corridor between Trenton and New Brunswick. This upgrade allowed trains to travel 25 miles per hour faster between the two cities.

And if we decide that we want high-speed rail in this country, we must be comfortable with rail authorities that have the power to build at their own whim. If on one end of the spectrum is the infrastructure paralysis that we are currently caught in, and on the other end is a figure like Robert Moses, then we need to carve out a middle ground between these two positions. The middle ground between these two positions is one where a powerful governmental authority can control costs and move dirt without requiring several environmental studies and public comment, but also cannot [steamroll minority communities](https://www.nytimes.com/2017/03/21/nyregion/robert-moses-andrew-cuomo-and-the-saga-of-a-bronx-expressway.html) and destroy the landscape with impunity.

The problem with high-speed rail is not high-speed rail itself. With a [desire to ride of 67%](https://www.prnewswire.com/news-releases/two-thirds-of-americans-are-likely-to-use-high-speed-rail-in-america-if-available-according-to-survey-300148591.html), Americans clearly desire a transportation alternative to our current offerings. It is a legal and structural problem. It is a problem that cannot be addressed by sheer will to simply lay down electrified track. It is a problem that requires shifting American culture away from feckless incrementalism and distrust of our political institutions to one that values change and visionary institutions that are willing to take risks to make the country a better place to live. Until then, the billions spent on high-speed rail are for a pipe dream best left to our counterparts in Europe, China, and Japan. That is for now, at least.

# **Con Blocks**

## **AT: Cars & Planes**

#### **HSR won’t reduce car or airline passengers—Europe, China and Japan all prove**

O’Toole 21—Retrieved 11 August 2022, from https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete

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The most heavily used high‐​speed rail lines in the world, including those in China, Europe, and Japan, gained their riders from conventional trains, not from autos or airplanes. The United States doesn’t have enough conventional train riders for high‐​speed rail lines to succeed.

When Japan opened its first high‐​speed rail line in 1964, nearly 70 percent of passenger travel was by rail and only 12 percent by automobile. Although Japan’s lines are considered highly successful, today only 25 percent of passenger travel is by rail and nearly 70 percent by auto.

The three European countries with the most high‐​speed rail lines are France, which opened its first high‐​speed rail line in 1981; Germany, which opened its first in 1991; and Spain, which opened its first in 1992. Since then, all three have built many lines, with Spain’s system extending the most miles. Yet, as shown in Figure 1, none have seen rail reduce automobile or airline travel. At most, money‐​losing high‐​speed rail lines reduced the market share of profitable bus lines.

Rail advocates sometimes claim that the opening of high‐​speed rail lines has led to a reduction of air service in those corridors, as if the replacement of profitable airlines with unprofitable trains is to be applauded. But the reality is that air travel in Europe has massively increased thanks to the introduction and expansion of low‐​cost air carriers. While data sources are inconsistent for earlier years, between 2010 and 2019, air travel grew 260 percent faster than rail travel in France, 63 percent faster in Germany, and 56 percent faster in Spain.

Information available about China is not as detailed as about Japan or Europe, but automobile ownership in China is growing much more rapidly than rail ridership. In 2005, China had 21.3 million passenger cars. By 2019, this had increased by more than 10 times to 340 million, a growth rate of 19.2 percent per year. By comparison, rail ridership has been growing at only a third of that rate, or 6.4 percent per year. While China still has fewer cars per capita than the United States, it has more total motor vehicles.[48](https://www.cato.org/policy-analysis/high-speed-money-sink-why-united-states-should-not-spend-trillions-obsolete#_ednref48) The rapid growth in auto ownership is likely mirrored by a similar growth in driving, showing that high‐​speed trains are not reducing auto driving. To enable these motor vehicles to travel around the country, China has built 40 percent more miles of freeways than the United States.

In both Asia and Europe, aggressive construction of new high‐​speed rail lines has failed to make a dent in driving or flying. At best, it has slowed the decline of the importance of rail travel in those regions. But if the goal is to save energy, reduce greenhouse gas emissions, or achieve other social goals, building cars that are more energy efficient would do more than building high‐​speed rail.

## **AT: Climate Change**

#### **HSRs won’t significantly change carbon emissions or impact climate change**

Joffe 17 – High Speed Rail Won’t Impact Climate Change. (2017). Retrieved 10 August 2022, from https://californiapolicycenter.org/high-speed-rail-wont-impact-climate-change/

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According to the high speed rail authority’s [website](http://www.hsr.ca.gov/Programs/Green_Practices/environmental_benefits.html), the bullet train is expected to reduce CO2 emissions by just over one million metric tons annually by 2040. This reduction is supposed to be achieved by replacing almost 10 million miles of motor vehicle travel each day, and eliminating between 93 and 171 daily flights. But these HSR projections have two fatal flaws: they are based on unrealistically high ridership estimates and they fail to take into account the transition to hybrid and plug-in electric cars. If HSR’s numbers are adjusted to take these factors into account, the project’s emission savings turn out to be much less. Further, they won’t have a meaningful impact on climate change.

HSR’s [Environmental Impact Report](http://www.hsr.ca.gov/docs/programs/merced-fresno-eir/final_EIR_MerFres3_3Air.pdf) used EMFAC2007 to estimate emission savings. EMFAC2007 is an emission model published by the California Air Resources Board ten years ago.  It has since been superseded by new versions released in 2011 and 2014. The EMFAC [web page](http://www.dot.ca.gov/hq/env/air/pages/emfac.htm) specifically states: “Do not use EMFAC 2007 for new studies.”. Back in 2007, no Teslas, Chevy Volts or Nissan Leafs had shipped, nor had California begun building its large network of vehicle charging stations. An emissions model created back in 2007 could not take into account what is now obvious: we are undergoing the initial phases of a transition away from gasoline-powered vehicles to hybrid and plug-in electric cars. In fact, the state’s [goal](http://insideevs.com/california-governor-wants-all-new-cars-to-be-zero-emissions-by-2050/) is for all new cars to be zero emission vehicles by 2050.

Since electric cars use the same power sources as high speed rail their respective contributions to greenhouse gas emissions will be proportional. If electricity is derived from coal, its use will be associated with large volumes of greenhouse gases. If, on the other hand, the electricity comes from wind, solar or nuclear, generating and using it won’t contribute to global warming. How much (or even whether) HSR reduces greenhouse gas emissions will then depend on how clean our electricity is, and (if it is not totally clean) how full the HSR trains are. A train carrying several hundred passengers will likely use less electricity than several hundred cars, but the energy savings won’t materialize if most seats on the train are not occupied.

And that brings us to the ridership issue. [CPC’s recent infrastructure study](https://californiapolicycenter.org/wp-content/uploads/sites/2/2016/11/Rebuilding-California-Infratructure-for-the-21st-Century.pdf) reviewed evidence suggesting that HSR’s ridership estimates are wildly optimistic. For example, we point out that HSR’s 2040 ridership projection of 33.2 million – 56.8 million passengers is far above current ridership of 11.7 million in Amtrak’s northeast corridor linking Boston, New York and Washington. The northeast corridor has more people, is more densely populated and is much more accustomed to rail travel than California – so its ridership levels would appear to provide a ceiling for California HSR utilization. If that’s the case, HSR is overstating ridership – and thus greenhouse gas emissions savings – by a factor of three or more.

Even in the extremely unlike event that HSR’s one million metric ton annual emission savings estimate were to be realized, it wouldn’t have a significant impact on global warming. According to EPA figures, global [CO2 emissions total 9449 metric tons in 2011](http://cdiac.ornl.gov/trends/emis/tre_glob_2011.html). Assuming this level remains constant and that HSR’s estimates are correct, the project would only reduce global emissions by about 0.01%. And, based on the evidence provided above, it is safe to assume that the real savings will be a small fraction of this figure.

A fair rejoinder is that even though nothing California does by itself will significantly move the dial on global emissions, the example we set for the result of the world is more important. If an affluent economy like ours’ can’t get emissions under control, how can we expect others to do so. But if we want to set an example, shouldn’t we do so in a cost-effective manner? Spending $64 billion to achieve minimal emission savings does not set a good example. Undoubtedly, there are ways to make steeper reductions in emissions at lower cost.

#### **Even if HSR was implemented – Climate Change is well on its way to slow-roast the earth and trigger the effects**

France-Presse 20 – [France-Presse, Agence. "There Is Nothing We Can Do To Stop The Oncoming Effects Of Climate Change Says A New Study- Technology News, Firstpost". Tech2, 2020, https://www.firstpost.com/tech/science/there-is-nothing-we-can-do-to-stop-the-oncoming-effects-of-climate-change-says-a-new-study-9011021.html. Accessed 9 Aug 2022.] Debatetrack.

Even if humanity stopped emitting greenhouse gases tomorrow, Earth will warm for centuries to come and oceans will rise by metres, according to a controversial modelling study published Thursday. Natural drivers of global warming — more heat-trapping clouds, thawing permafrost, and shrinking sea ice — already set in motion by carbon pollution will take on their own momentum, researchers from Norway reported in the Nature journal Scientific Reports. "According to our models, humanity is beyond the point-of-no-return when it comes to halting the melting of permafrost using greenhouse gas cuts as the single tool," lead author Jorgen Randers, a professor emeritus of climate strategy at the BI Norwegian Business School, told AFP. "If we want to stop this melting process we must do something in addition — for example, suck CO2 out of the atmosphere and store it underground, and make Earth's surface brighter." Using a stripped-down climate model, Randers and colleague Ulrich Goluke projected changes out to the year 2500 under two scenarios: the instant cessation of emissions, and the gradual reduction of planet-warming gases to zero by 2100. In an imaginary world where carbon pollution stops with a flip of the switch, the planet warms over the next 50 years to about 2.3 degrees Celsius above pre-industrial levels — roughly half-a-degree above the target set in the 2015 Paris Agreement — and cools slightly after that. Earth's surface today is 1.2C hotter than it was in the mid-19th century when temperatures began to rise. But starting in 2150, the model has the planet beginning to gradually warm again, with average temperatures climbing another degree over the following 350 years, and sea levels going up by at least three metres. Under the second scenario, Earth heats up to levels that would tear at the fabric of civilisation far more quickly but ends up at roughly the same point by 2500. Tipping points The core finding —- contested by leading climate scientists — is that several thresholds, or "tipping points", in Earth's climate system have already been crossed, triggering a self-perpetuating process of warming, as has happened millions of years in the past. One of these drivers is the rapid retreat of sea ice in the Arctic. Since the late 20th century, millions of square kilometres of snow and ice — which reflects about 80 percent of the Sun's radiative force back into space — have been replaced in summer by open ocean, which absorbs the same percentage instead. Another source is the thawing of permafrost, which holds twice as much carbon as there is in the atmosphere. The third is increasing amounts of water vapour, which also has a warming effect.

## **AT: Cost Savings**

#### **Savings from HSR are overhyped – travel by highway is still cheaper than HSR – prefer our robust methodology**

Levinson et al. 96 – [Levinson, D., Gillen, D., Kanafani, A., & Mathieu, J. (1996). The Full Cost Of Intercity Transportation - A Comparison Of High Speed Rail, Air And Highway Transportation In California. UC Berkeley: Institute of Transportation Studies at UC Berkeley. Retrieved from https://escholarship.org/uc/item/8mm50358. Accessed 9 August 2022.] Debatetrack.

Using the models from the previous chapters, we compare the full cost of the three modes in terms of the total cost of a trip in each of the major markets. These results are shown in Tables 7.2-7.4 for the air, highway, and rail modes respectively. The comparisons provide a quick assessment of the total full cost of a trip within the corridor by each of the modes. For example, for a trip between San Francisco and Los Angeles the total full cost would be $155.85 by highway, $82.02 by air, and $159.10 by high speed rail. The social costs imposed by a trip in each of these modes would be $21.08 by highway; $4.58 by air; and $1.35 by high speed rail. It is interesting to note that the recovery of these social costs might imply the addition of fare premiums in the air and rail systems equal to these amounts. But for highway transportation they would imply a premium of $1.50 per gallon of gasoline!

## **AT: Economic Growth**

#### **U.S. Economy is already in the gutter for recession as prices across the board increases – can’t be solved solely by HSR.**

Wiseman 7/22 – [Wiseman, Paul. I write about trade and international economics for the Associated Press. "US Economy Shrinks For A 2Nd Quarter, Raising Recession Fear". AP NEWS, 28 July 2022, https://apnews.com/article/us-economy-shrinks-4ffd93331422cb131a974223dad5825f. Accessed 9 Aug 2022.] Debatetrack.

WASHINGTON (AP) — The U.S. economy shrank from April through June for a second straight quarter, contracting at a 0.9% annual pace and raising fears that the nation may be approaching a recession. The decline that the Commerce Department reported Thursday in the gross domestic product — the broadest gauge of the economy — followed a 1.6% annual drop from January through March. Consecutive quarters of falling GDP constitute one informal, though not definitive, indicator of a recession. The GDP report for last quarter pointed to weakness across the economy. Consumer spending slowed as Americans bought fewer goods. Business investment fell. Inventories tumbled as businesses slowed their restocking of shelves, shaving 2 percentage points from GDP. Higher borrowing rates, a consequence of the Federal Reserve’s series of rate hikes, clobbered home construction, which shrank at a 14% annual rate. Government spending dropped, too. The report comes at a critical time. Consumers and businesses have been struggling under the weight of punishing inflation and higher loan costs. On Wednesday, the Fed raised its benchmark rate by a sizable three-quarters of a point for a second straight time in its push to conquer the worst inflation outbreak in four decades. The Fed is hoping to achieve a notoriously difficult “soft landing”: An economic slowdown that manages to rein in rocketing prices without triggering a recession.

#### **Infrastructure is particularly ill-suited to economic growth; instead, it only leads to more debt**

Rugy & Mitchel 17– Would More Infrastructure Spending Stimulate the Economy in 2017?. (2017). Retrieved 12 August 2022, from <https://www.mercatus.org/publications/government-spending/would-more-infrastructure-spending-stimulate-economy-2017>

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Matthew D. Mitchell is a Senior Research Fellow and Director of the Equal Liberty Initiative at the Mercatus Center at George Mason University. He is also an adjunct professor of economics at Mason. In his writing and research, he specializes in public choice economics and the economics of government favoritism.] Debatetrack.

President-elect Trump has made rebuilding America’s infrastructure an important part of his policy agenda. Specifically, Mr. Trump has called for a $1 trillion infrastructure spending package, which proponents claim will spur economic growth and create thousands of jobs. Yet historically, attempts at using infrastructure spending as economic stimulus have fallen far short of expectations.

In this updated Mercatus Center study, Senior Research Fellows Veronique de Rugy and Matthew D. Mitchell review the literature on infrastructure spending as a fiscal stimulus. The authors find significant reasons to doubt the effectiveness of fiscal stimulus, particularly at this time, and they note that infrastructure projects are particularly ill-suited for stimulus. The study concludes that, as a short-term measure, more deficit-financed federal infrastructure spending is unlikely to stimulate economic growth. Over the longer term, however, it is certain to leave the United States deeper in debt with little meaningful improvement in growth.

In an effort to boost employment and economic activity, fiscal stimulus aims to replace private spending with government spending during an economic crisis. There are significant limitations to this approach, however, especially given the current macroeconomic environment in the United States:

* The fiscal multiplier. The multiplier measures the effectiveness of government spending in expanding the economy. Many studies find a very small multiplier for stimulus spending, especially when macroeconomic conditions resemble those currently seen in the United States. In fact, some studies find this spending actually shrinks the economy.
* Lack of idle resources. Fiscal stimulus aims to put idle resources back to work. However, the potential benefits to the current US economy are small given that unemployment is low and interest rates are poised to climb.
* Permanence. Like most “temporary” spending, stimulus spending has been shown to remain in the budget, and add to the debt, long after the targeted crisis has passed.

## **AT: Emissions**

#### **Construction of HSR itself generates more emissions than can be offset by HSR – independently turns the argument**

Joffe 21 – [Joffe, Marc. Marc Joffe is a senior policy analyst at Reason Foundation. After a long career in the financial industry, including a senior director role at Moody's Analytics, Joffe's research focuses on municipal finances, alternative asset investments, transportation policy and federal, state and local fiscal policy. "High-Speed Rail Is Unlikely To Play A Major Role In Achieving Climate Goals - Reason Foundation". Reason Foundation, 23 March 2021, https://reason.org/commentary/high-speed-rail-is-unlikely-to-play-a-major-role-in-achieving-climate-goals/. Accessed 9 Aug 2022.] Debatetrack.

In a 2010 University of California—Berkeley study, professors Mikhail Chester and Arpad Horvath estimated that the entire California high-speed rail project would generate 9.7 million metric tons of carbon dioxide during construction. They also estimated that it would take high-speed rail 71 years of operation at medium occupancy to offset its own construction-related greenhouse-gas emissions.

Building high-speed rail systems require steel and concrete, the manufacturing of which typically generates greenhouse gases. Trucks, bulldozers, and other construction site equipment also consume energy. Thus, during their long construction phases, high-speed rail projects add greenhouse gases. Adding lanes to existing highways also generates greenhouse gases, but to the extent that recycled asphalt is used for road paving climate impacts can be somewhat reduced.

There are far quicker, more cost-effective ways to reduce greenhouse gas emissions than high-speed rail. By the time high-speed rail projects commence service, more cars will be fully electric, so future high-speed rail systems would be replacing fewer gasoline-powered automobile trips than they would’ve been replacing decades ago. California, for example, plans to terminate the sales of gasoline-powered cars by 2035. Similar bans are being implemented in Canada and the United Kingdom. Given the California rail project’s delays and carbon reductions being achieved by new technology, like electric vehicles, it is possible that, if built, the rail system will never pay back the carbon investment required to build it.

## **AT: Safety**

#### **The TSA has consistently ignored rail security and is vulnerable even with high-end safety**

Maurillo 12 – [Maurillo, Donna R. Donna R. Maurillo is Director of Communications and Technology Transfer at the Mineta Transportation Institute. Previously, she held executive and management positions with Silicon Valley technology companies and public relations agencies. For 20 years, she operated a successful corporate communications consulting business. High-Speed Rail in the US: Will It Be a More Attractive Terror Target than Inter-city Rail?. Diss. Master’s thesis, San Jose State University, 2012.] Debatetrack.

For all practical purposes, TSA has virtually ignored rail security, even with its mandate to protect all transportation modes. That must change. TSA must equally include high-speed rail – and all other rail modes – in its security planning and implementation. Otherwise, one can expect high-speed rail security strategies to follow the same secondclass path as that of inter-city rail. Perhaps the time is at hand for serious change to come about. As this nation has reached the confluence of a new rail system creation and the knowledge that rail transport is highly exposed, perhaps the US has at last reached the ideal time to review and reform its security strategy not only for inter-city and transit rail, but especially for high-speed rail. Certainly, some may argue that passenger safety and security are the responsibility of the operators. However, operators have typically included only those measures that are required by law. Higher authorities must mandate change before it will happen. Although high-speed rail will have unique safety and security features built into the system, this new mode also will have particular vulnerabilities, including speed, tilting, iconic status as a significant infrastructure investment, “high-value” passengers, and other attractive reasons to use it as a target. California, with its pioneering and completely new HSR system, is the ideal candidate to become the nation’s model for HS security. In fact, a comprehensive approach – and more important, a uniform approach – to HSR security would be a significant step toward building a strategy for rail and other surface modes. Because California is a center of innovation and a leader of change, it is the ideal place to develop a groundbreaking approach for national HSR security and, by influence, for other rail, as well. Geographies and other particular factors certainly will influence the details of security strategies for each corridor. But a comprehensive and standardized model can be created if it is based on well-researched threat analyses, workable plans to meld HSR security forces and local first responders, realistic expectations for performance, a reasonable funding plan, clear accountability, current technology, and other factors that can be applied across the board. Threat analyses must form the basis for a successful HSR security strategy. These analyses must examine not only general threats to the system, but also particular threats that could be unique to certain locations and situations. Once those threats are synthesized and prioritized, the plan must address them in order of priorities based on likelihood, potential body counts, proximity to other critical infrastructure such as bridges or power plants, environmental features such as adjacent high-rise office buildings versus open stretches of farmland, cost/benefit ratios, and other relevant factors.

## **AT: Supply Chain**

#### **Supply chain problems can’t be immediately resolved by HSR – manpower, quantity of items, and backlogs**

Yeung 8/22 – [Yeung, Ngai. Reporting on Los Angeles @business , political economy + journalism @USC "Entire US Supply Chain Needs 24/7 Operations, Not Just Ports, Official Says". Bloomberg.Com, 9 August 2022, https://www.bloomberg.com/news/articles/2022-08-09/entire-us-supply-chain-needs-24-7-not-just-ports-official-says. Accessed 9 Aug 2022.] Debatetrack.

All parts of the US supply chain -- not just its ports -- need to move to round-the-clock operations to alleviate snarl-ups and reduce overall costs, President Joe Biden’s supply-chain czar said. “If only you or only a terminal goes to 24/7, that’s interesting,” Stephen Lyons told Port of Long Beach Executive Mario Cordero in an interview Tuesday. “But if everybody -- including the warehousing community, all the other modes of transport -- moved to 24/7, or something more than today, that makes logical sense that you could move much more cargo in the same period of time.”

# **Source Blocks**

## **O’Toole**

#### **Randal O’Toole is funded by the Petroleum industry, known to oppose HSR for political-economic gains**

Light Rail Now 07 – ["Randal O'Toole's "Thoreau Institute": Oil, Asphalt, and Pipeline Money Feed an Extremist Attack on Urban Planning and Public Transit". LightRail, 9 August 2022, https://www.lightrailnow.org/facts/fa\_lrt\_2007-01a.htm] Debatetrack.

Randal O'Toole's self-styled "Thoreau Institute" lies at the core of his ferocious jihad against urban planning, Smart Growth, New Urbanism, public transport, and rail transit (a jihad that he also promotes through spinoffs and front groups such as his American Dream Coalition"). So, just what – and whom – does the Thoreau Institute represent?

[Media Transparency](http://www.mediatransparency.org/) – which exposes what amounts to "an interconnected web of conservative organizations" funded by far-right "philanthropies" (almost univerally opposed to public transport and rail transit) – provides some answers by revealing the primary funding sources of O'Toole's outfit.

According to Media Transparency's research, O'Toole's Thoreau Institute, based in Oak Grove, Oregon, received major grants totalling $ 321,100 between 1997-2005. Here's a tabulation of the organization's main funding sources in that period.

|  |  |  |
| --- | --- | --- |
| Date | Amount | Funder |
| 12/31/2005 | $50,000 | Sarah Scaife Foundation |
| 01/01/2002 | $50,000 | Sarah Scaife Foundation |
| 01/01/2002 | $10,000 | Charlotte and Walter Kohler Charitable Trust |
| 01/01/2001 | $50,000 | Sarah Scaife Foundation |
| 01/01/1999 | $50,000 | Sarah Scaife Foundation |
| 01/01/1999 | $10,000 | Charlotte and Walter Kohler Charitable Trust |
| 01/01/1998 | $50,000 | Charles G. Koch Charitable Foundation |
| 11/11/1997 | $22,550 | The Lynde and Harry Bradley Foundation, Inc. |
| 08/11/1997 | $22,550 | The Lynde and Harry Bradley Foundation, Inc. |
| 04/07/1997 | $3,000 | The Lynde and Harry Bradley Foundation, Inc. |
| 04/07/1997 | $3,000 | The Lynde and Harry Bradley Foundation, Inc. |

Who are these donors? Media Transparency has provided information on three out of the four (no information was available on the Kohler Charitable Trust). The Light Rail Now Project has supplemented with additional information, where appropriate.

Sarah Mellon Scaife Foundation – This is "a foundation financed by the Mellon industrial, oil and banking fortune", according to Media Transparency.

At one time, its largest single holding was stock in Gulf Oil Corporation. it was estimated some years ago to be a $200 million foundation. it became active in supporting conservative causes in 1973, when Richard Mellon Scaife became chairman. Since then, Scaife has been a leading financier of New Right causes.

Charles G. Koch Foundation – This foundation is deeply rooted in the petroleum and petrochemical industries. According to Media Transparency, David and Charles Koch, sons of the ultraconservative founder of Koch industries, Fred Koch, direct the three Koch family foundations: the Charles G. Koch Foundation, the David H. Koch Charitable Foundation, and the Claude R. Lambe Charitable Foundation. David and Charles control Koch industries, the second-largest privately owned company and the largest privately owned energy company in the nation; they have a combined net worth of approximately $4 billion, placing them among the top 50 wealthiest individuals in the country and among the top 100 wealthiest individuals in the world in 2003, according to *Forbes*.

Koch industries, Inc. has primarily been involved in petroleum and chemicals. its website boasts that...

Koch companies have been involved in the petroleum business since 1940, growing refining capacity more than 80-fold in six decades. Today, the Flint Hills Resources group of businesses, subsidiaries of Koch industries, are engaged in petroleum refining, chemicals and lube oil production, crude oil supply and trading, and wholesale marketing and trading of fuel oil, base oils, gasoline, petrochemicals, chemical intermediates, asphalt and other products. A subsidiary of Koch Supply & Trading also produces jet fuel, gas oil, naphtha and residual fuel in Europe.

[...]

As a result of Flint Hills Resources' various interests in production facilities in the petroleum chain, the company has expanded its marketing capability regularly to create value for customers. An example of that expansion is the 2003 entry into the base lube oil business following the purchase of a half-interest in Louisiana- based Excel Paralubes. The lube oil business is a natural extension of Flint Hills Resources, and has introduced it to a new customer base. The company's products are used in motor oil, agriculture oils and marine oils, among others.

in 2005, Flint Hills Resources began operating a system of strategically located asphalt terminals, formerly owned by Koch Materials Company, to market product from the Minnesota refinery. This refinery's production of asphalt sparked Koch companies' 1979 entry into asphalt marketing.

Koch further emphasizes its roots in the oil. gas, and chemical pipeline industry:

As part of a 1946 refining acquisition, Koch industries' predecessor company acquired a small crude oil pipeline system in southwestern Oklahoma. Over the years, Koch companies have bought or built and sold pipeline systems transporting crude oil and refined products, as well as natural gas, natural gas liquids and anhydrous ammonia. Today, Koch Pipeline Company, L.P. owns and operates pipelines carrying crude oil, refined products and natural gas liquids.

## **Reason Foundation**

#### **The Reason Foundation is funded by oil and airline companies who know that an HSR network will cut into their profits**

Christensen 11—Christensen, R. (2011). The great high-speed rail lie. Retrieved 11 August 2022, from https://www.sfgate.com/opinion/openforum/article/The-great-high-speed-rail-lie-2336677.php Debatetrack.

It's simple. Vranich makes stuff up. [Adrianne Moore](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22Adrianne+Moore%22), vice president of policy at the Reason Foundation, says the Europeans are abandoning rail in favor of driving and flying. Nonsense.

Transportation market share of European high-speed rail lines has grown steadily and many are near 80 percent. [Rick Geddes](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22Rick+Geddes%22), a professor at [Cornell University](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22Cornell+University%22) who is also on Reason's payroll, said on National Public Radio that the California system can't be powered by renewable energy - except that the Hoover Dam generates four times what the train needs.

The Reason Foundation is funded by Chevron, ExxonMobil, Shell Oil, the [American Petroleum Institute](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22American+Petroleum+Institute%22), Delta Airlines, the National [Air Transportation Association](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22Air+Transportation+Association%22) and, of course, the Koch Family Foundation. They know what will happen once Americans, furious about gas prices and the way airlines treat them, experience electrically powered 200-mph trains. But big oil and aviation can't attack high-speed rail directly - that would be an obvious attempt to abort competition. So they hire a "think tank."

Reason collaborates on research with [James Moore III](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22James+Moore+III%22), a transportation engineering professor at [University of Southern California](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22University+of+Southern+California%22). They parrot Reason's "train to nowhere" nonsense, a phrase they apply to all rail projects. It's especially absurd in this case, because interim services will have high-speed rail trains slow and reach the Bay Area on existing rail lines. Reason's minions claim there's no business plan or ridership figures. Except that anyone can go on the [California High-Speed Rail Authority](https://www.sfgate.com/search/?action=search&channel=opinion%2Fopenforum&inlineLink=1&searchindex=solr&query=%22California+High-Speed+Rail+Authority%22) website and download them.

Where does the corporate cash and propaganda end and the legitimate criticism begin? It was impossible to know in Florida, where high-speed rail was killed using the same techniques.

A modern 200-mile-per-hour rail link between Los Angeles and San Francisco will change America's transportation paradigm. Just like in Europe and Asia, California will develop a profitable system joining all its cities. Nearby states, such as Nevada and Arizona, will link into the network, just like European countries did after France established its network. Jet airplanes will be used for what they were intended: long-distance travel. Automobile use will be reduced. This will save millions of barrels of oil. And that's the real reason these lobbyists want it stopped.