Fast Track: Societal Drives Behind Bullet Train Technological Advancements

An STS Research Paper
presented to the faculty of the
School of Engineering and Applied Science
University of Virginia

by

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March 14, 2024

On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Fast Track: The Competition for the Future of High-Speed Rail in the United States

Since the early 2000s, high-speed rail (HSR) proposals have been controversial in the United States. In 2008 California voters approved Proposition 1A, initiating a major HSR project (Spur, 2008). Meanwhile China, through its vast new HSR network, had already set an example for the world. In the US, however, HSR proposals have been thwarted by influential interest groups that oppose them. Opponents criticize HSR's high cost, stress its environmental impact, and question its necessity.

Since 2008, interest groups have vied to either promote or impede HSR in the US. Five key participant groups include the US High Speed Rail Association, the American Public Transportation Association, Texas Railway Advocates, Texans Against High Speed Rails, and the Show-Me-Institute. Participant groups on both sides of the high-speed rail debate strategically appeal to key values such as economic viability, environmental impact, and financial practicality. They engage in lobbying, publicity, social media campaigns, and strategic partnerships to advance their respective agendas.

Review of Research

Two main areas of research are pivotal to the high-speed rail debate in the United States: the comprehensive impacts of HSR projects, including environmental, economic, and social effects; and the analysis of participant groups in the debate, examining their motivations, arguments, and tactics for advocacy or opposition.

Research on HSR highlights significant environmental, socio-economic, and mobility-related impacts. Damián and Zamorano highlighted the significant environmental toll of HSR construction, where materials like concrete, diesel, and steel account for about 70% of the

environmental impacts, especially as geological conditions worsen. The environmental toll escalates with decreasing Rock Mass Rating, indicating a direct correlation between construction challenges and environmental emissions (Damián & Zamorano, 2022). Studies by Dobruszkes shed light on the socio-economic implications of HSRs, revealing that its primary users are typically from higher income, education, and occupational brackets, painting a picture of social exclusivity (Dobruszkes, 2021). Moreover, Albalate underscored the transformative mobility dynamics introduced by HSRs, exemplified by the Paris-Lyon route, where rail traffic significantly increased at the expense of air traffic. However, while HSR enhances city accessibility, it also has unintended economic repercussions, such as the "tunnel effect," which could lead to territorial polarization and challenges in achieving interterritorial cohesion, highlighting a potential economic drawback of HSR (Albalate, 2012).

Exploring the advocacy strategies and challenges faced by participant groups in both high-speed rail and related sectors like Electric Vehicles (EVs) offers valuable insights into the dynamics of promoting sustainable transportation solutions. Roger Rudick critiqued claims by the “ExxonMobil and Koch-funded Reason Foundation,” which argued that California's high-speed rail would mostly replace electric vehicle trips, thus not significantly reducing greenhouse gas emissions. Rudick countered this claim, highlighting that even if California's electric vehicle goals are met by 2030, the majority of cars will still not be electric, affirming the high-speed rail's potential to significantly reduce CO2 emissions (Rudick, 2019). In the EV sector, research furthermore highlights the environmental benefits of lithium-ion batteries used in EVs, especially when they are effectively recycled, with a provision that effective recycling remains a complex and energy-intensive process, tempering the optimism about their environmental impact (Gaines & Dunn, 2014).

However, the environmental narrative around EVs isn't entirely positive. Research into the environmental impact of lithium-ion batteries has highlighted significant concerns regarding electronic waste (e-waste). A key issue is the improper disposal of these batteries, which contributes to escalating e-waste problems. This waste, often ending up in commercial waste or landfills, can lead to hazardous situations, such as uncontrollable fires in waste facilities, stemming from short-circuited batteries mixed with combustible materials (UL Research Institutes, 2019). Further compounding these concerns, the cobalt mining industry in the DRC, a key supplier for EV battery production, is notoriously rife with human rights abuses, including widespread child labor and extremely unsafe working conditions, casting a profound ethical shadow over the supply chain of these 'green' technologies (Nature Publishing Group, 2021).

The surge in demand for crucial minerals accentuates the challenges faced by interest groups, underscoring the need to navigate a complex balance of fulfilling environmental promises while addressing practical and ethical considerations. The World Bank predicts a nearly 500% increase in demand for minerals like lithium and cobalt by 2050 (World Bank, 2021). This is in part due to the increasing number of major automotive companies publicizing their ambitious plans to significantly increase the production of electric vehicles over the upcoming decades (White, 2023). Graham Evans, an analyst for S&P Global, provides a critical perspective on how interest groups are addressing the socio-economic challenges associated with EV production, focusing on the strategies these groups are adopting to mitigate the ethical supply issues related to critical battery materials. Highlighting efforts such as securing stable supply chain relationships, diversifying geographical sources, and developing flexible battery technologies, Evans predicts that “reliance on the DRC will decrease from 56% to 17% in terms of total tonnage” (Evans, 2021). His insights are significant as they demonstrate the proactive

measures taken by EV interest groups to justify their cause, mirroring the strategies of high-speed rail advocacy groups in promoting or impeding sustainable transportation while navigating complex socio-economic landscapes.

Pro HSR Interest Groups

US High Speed Rail Association

Formed in 2009, the US High Speed Rail Association (USHSR) emerged in response to increased interest and federal funding for high-speed rail during President Obama's administration. In 2010, an $8 billion investment was announced to develop new high-speed rail programs and improve existing ones, notably in Florida and California, which was a key factor in USHSR's establishment (Lahood, 2010).

The USHSR underlines high-speed rail's substantial economic and environmental advantages. Economically, it emphasizes HSR’s potential to generate $19 billion yearly and create 150,000 jobs, contrasting with current road expansion costs (USHSR, 2023). Additionally, USHSR references a study by Georgetown University, projecting that a $1 trillion investment in infrastructure, including high-speed rail, could create 11 million American jobs over ten years (Carnevale, 2017). Environmentally, USHSR emphasizes HSR's significantly lower carbon emissions compared to other transport modes, with a CO2 emission per passenger per kilometer ratio as low as 6:283 (DBEIS, 2019). This positions HSR as a sustainable and economically advantageous solution for decarbonization. With strong data support, USHSR advocates for high-speed rail as a transformative force in the US transportation sector.

The USHSR employs a diverse strategy to promote high-speed rail, combining legislative efforts, partnerships, events, and media outreach. Their 5-point legislative plan, in line with the

Biden administration, involves forming a high-speed rail authority, prioritizing major projects, and merging HSR into community and economic plans (USHSR, 2020). This strategy gained federal attention, evidenced by an $8.2 billion funding announcement for passenger rail projects, showing its influence on policy (The White House, 2023). USHSR collaborates with key industry players such as FS Italian Railways and Deutsche Bahn. These alliances bring in global expertise and reinforce the technical and operational aspects of HSR projects ((FS Group, 2019). Additionally, legal advice from firms like Sidley Austin emphasizes USHSR's focus on complex rail regulations and environmental concerns (Sidley Austin LLP, 2022).

USHSR organizes events and conferences that bring together politicians, experts, and advocates to discuss topics like climate solutions and oil trade deficits. Speakers such as Congressman Seth Moulton and Brian Kelly participate, promoting knowledge exchange and reinforcing HSR support among stakeholders (HSR2024, 2024). Moreover, USHSR counters HSR misconceptions through a 'fact vs. fiction' segment on their website and confronts false claims from opponents, including calling out the Koch Brothers, to clarify HSR benefits (Tabuchi, 2018). This tactic not only counters opposition narratives but also educates the public on the factual merits of high-speed rail. Their social media strategy further extends to promoting popular cultural references like the 2022 film 'Bullet Train' starring Brad Pitt, using it as a tool to normalize and advocate for high-speed rail in the American context (USHSR, n.d.).

American Public Transportation Association

Established in 1882, the American Public Transportation Association (APTA), a nonprofit, advocates for diverse public transport modes in the U.S., including buses, light rail, commuter rail, subways, and high-speed rail. Evolving from its initial focus on horse-drawn

transit, APTA now champions increased federal funding for these transportation methods (APTA, n.d.a).

APTA uses data-driven arguments to highlight its economic benefits. APTA focuses on the broad reach and job creation potential of HSR, noting that within 25 years, 80% of Americans could have access to the network, with significant interest stemming from anticipated fast trip times and lower costs (APTA, 2013). Highlighting the annual $130 billion loss due to congestion, APTA advocates HSR as an effective economic remedy, especially with growing populations. They also mention significant economic gains lost without HSR in regions like California and the Midwest, estimated in billions of foregone benefits over 40 years (Peterson, Eric, 2012).

Environmentally, APTA underscores HSR's energy efficiency and its role in reducing greenhouse emissions. They point out that “the impact of aircraft emissions on the environment will continue to be quite significant… over the next 10 to 15 years" (APTA, 2018). This analysis supports HSR's operational advantages over air travel, emphasizing its promise for a more sustainable future. However, APTA focuses mainly on the operational advantages of HSR, painting a promising future impact, but less on the energy and resources needed for initial development. This perspective highlights HSR's potential environmental benefits while minimally addressing the costs of establishing a broad network.

APTA effectively promotes HSR and public transport using varied interactive methods. On their website, visitors are immediately invited to register for a legislative conference, underscoring APTA’s role as a primary advocate in Washington D.C. for the public transportation industry. This online platform aggregates essential advocacy resources, including congressional testimonies, legislative updates, and research, making them readily accessible to the public

(APTA, n.d.b). Through newsletters and articles, APTA keeps its audience informed about HSR developments and trends worldwide. Biannual newsletters, known as the "SPEEDLINES Newsletter" provide insights into global HSR projects and the associated economic and social benefits (APTA, 2023). A key focus is on the "Opportunity Cost of Inaction," which discusses the significant economic benefits that could be missed, stressing the urgency and importance of acting now to embrace high-speed rail (Peterson, 2012).

Using citizen surveys, APTA assesses public opinion on HSR, finding that 63% of Americans are likely to use HSR if available, increasing to 67% when aware of the cost and time savings, offering a grounded expression of the potential widespread appeal of HSR (APTA, 2015 Additionally, they organize events like the 2019 High-Speed Rail Policy Forum, facilitating discussions on how high-speed rail promotes economic growth and connects mega-regions, reflecting their commitment to facilitating industry-wide dialogues (APTA 2021). Partnerships with groups like the High-Speed Ground Transportation Association and the American Association of State Highway and Transportation Officials showcase APTA's extensive network and collaborative efforts in HSR advocacy (APTA 2022).

Texas Railway Advocates

Texas Rail Advocates (TRA), a non-profit, dedicates itself to promoting the advantages of freight and passenger rail, including high-speed rail, in Texas. They aim to improve the state's transportation infrastructure and foster economic growth, actively promoting rail-based transportation through events, publications, and advocacy (TRA, n.d.).

TRA underscores the Dallas-Houston HSR project's economic role, set to bring over $36 billion in benefits across Texas. This projection encompasses not just the direct economic

impact, but also broader benefits such as increased employment and tax revenues. Texas Central, managing the project, will likely add nearly $2.5 billion in tax revenue by 2040. Anticipated to create 10,000 construction jobs and 1,000 operational jobs, with a significant annual payroll of $80 million, this venture is a major economic catalyst. Over $1 billion is planned for investment in Grimes County for development (TRA 2019). Strong public and stakeholder support against bills aiming to derail the project is evident, with TRA noting an 'outpouring of public support' against these measures (Melhado 2022). This project, crucial for linking North Texas and Greater Houston, is seen as vital for Texas' economic progress and infrastructure development.

TRA utilizes a strategic blend of legislative monitoring, informative content, and event organization to advocate for HSR in Texas. They focus on key bills like HB 366, which involves filing a bond by private HSR operators with the Texas Department of Transportation, and HB 3870, concerning the disposition of real property acquired for HSR projects (Bell 2023). TRA also ensures easy access to data on Federal and State rail agencies and legislative committees, keeping their audience informed about regulatory aspects (Harris, 2023a). Their diligent tracking of Texas Legislature bills affecting the rail sector demonstrates a commitment to shaping legislative outcomes (TRA 2023a).

TRA connects with its audience through informative articles, reporting on HSR-related events and studies, like opponent rallies and transport evaluations between Dallas and Fort Worth, offering a thorough perspective of Texas' high-speed rail situation (TRA 2023b, TRA 2021). Coverage of national figures' stances on rail projects, like President Biden's, helps contextualize the rail debate in broader terms (Hatsumi 2020). Furthermore, TRA’s organization of events like the Southwestern Rail Conference demonstrates their commitment to fostering dialogue and collaboration among industry stakeholders. The 2024 conference, featuring

Amtrak's Executive VP of high-speed rail development programs, Andy Byford, serves as a platform for discussing advancements and challenges in the sector, thereby enhancing the visibility and support for high-speed rail initiatives (TRA 2024).

Anti HSR Interest Groups

Texans Against High Speed Rails

Established in 2015, Texas Against High Speed Rail (TAHSR) is a group opposing high-speed rail projects in Texas, notably the Dallas-Houston bullet train. Their mission is to protect property rights, values, and the quality of life of Texas residents, focusing on the negative impacts of high-speed rail, including environmental concerns and financial implications. They aim to prevent the use of taxpayer dollars for these projects, positioning themselves as a counterpoint to Texas Rail Advocates' pro-rail stance (Ura, 2021).

TAHSR articulates their opposition to the Dallas-Houston HSR project by focusing on environmental technicalities and the economic impact on Texan landowners. Environmentally, their objections do not directly argue that HSR is bad for the environment; instead, they challenge the project's environmental planning, particularly its failure to thoroughly consider increased rainfall and potential flooding (Formby 2017, Roberts 2021). This approach appears more as a strategic attempt to delay the project through legal and technical challenges rather than presenting substantial environmental concerns. Economically, TAHSR resonates with Texan values of land ownership and agriculture. They raise concerns for over 1,700 landowners affected by the project, potentially losing about 9,000 acres of land, impacting farmland and altering rural lifestyles (McRell 2024). TAHSR underlines issues such as water runoff, erosion,

and noise stress on livestock, viewing HSR as a threat to traditional Texan land rights and farming practices.

TAHSR utilizes a strategic mix of legislative lobbying and partnerships to oppose high-speed rail projects in Texas. Their legislative efforts are concentrated on influencing bills that align with their objectives to protect property rights and challenge the high-speed rail project. TAHSR's reaction to the Supreme Court ruling, which granted eminent domain to Texas Central, reflects their concern over setting a dangerous precedent for landowners (Melhado 2022). They actively share their viewpoints on social media platforms like Facebook, highlighting risks such as potential land condemnation by financially unstable companies (TAHSR, 2022).

TAHSR's advocacy extends to lobbying lawmakers directly at the state house, emphasizing their stance against the proposed high-speed train project. They advocate for specific bills, including HB 366, which would require high-speed rail operators to provide a bond for property restoration, and HB 2357, mandating transparency in funding and financing methods (Tuggle 2023, Cecil, 2023). Other proposed bills, like HB 3870 and HB 2391, focus on granting property repurchase rights to original owners and limiting eminent domain powers, respectively, showcasing TAHSR's comprehensive legislative strategy to address various aspects of property rights concerns (Harris, 2023b, Texas Legislature, 2023a).

In terms of partnerships, TAHSR partners very closely with the Southwestern Cattle Raisers Association, uniting with stakeholders who share similar concerns about eminent domain and its impact on landowners and agricultural practices. This collaboration enhances their advocacy strength, as seen in the case of Jim and Barbara Miles, who articulate the potential destruction of agricultural land and disruption to wildlife habitats (Cattle Raisers Association,

2021). Their concerns extend to issues such as water runoff, noise pollution, and restrictions on animal movement, further exemplifying TAHSR's focus on rallying support from those directly affected by the high-speed rail projects (Kirton, 2024).

Show-Me-Institute

Founded in 2005 and based in St. Louis, Missouri, the Show-Me Institute is a think tank that champions free-market principles, focusing on economic efficiency and individual freedom. Dedicated to improving life in Missouri, it provides researched solutions to local policy issues, emphasizing economic and governance concerns. However, the Institute's partnership with the Koch Brothers, known for their significant contributions to pollution and for promoting a right-wing agenda, raises questions about the Institute's motives. The Koch Brothers, prominent polluters following ExxonMobil and American Electric Power, have interests in petroleum and gasoline industries, which could potentially conflict with the environmental benefits touted by high-speed rail (Dickinson, 2014, Greenpeace, n.d.). Additionally, Rex Sinquefield, the co-founder, is noted for his opposition to union rights and taxes, further complicating the group's public stance on policy issues (Greenblatt, 2015).

The Show-Me-Institute (SMI) approaches the high-speed rail (HSR) debate in Missouri with a critical stance, focusing on economic burdens and questioning the environmental benefits. Economically, SMI argues that building HSR would commit Missouri to subsidize long-term operating and maintenance costs, potentially straining state finances (Stokes, 2011a). They scrutinize HSR supporters' claims, pointing out inconsistencies in travel time estimates and challenging the rationale behind spending billions to marginally reduce travel times on current routes (Stokes, 2011b). Additionally, SMI raises concerns about the disproportionate distribution

of federal funds for HSR, noting that states like California and Florida receive significantly more than Missouri (Harbin, 2010). SMI's environmental arguments are largely skeptical, contending that HSR may do more harm than good. They argue that automobiles are already as energy-efficient as Amtrak, and that the energy efficiencies of both autos and airliners are outpacing trains. Furthermore, they suggest that the energy cost of constructing new HSR lines would offset any operational savings, although this claim lacks specific citations or evidence (O'Toole, 2009). Another criticism revolves around technological progress in transportation, with SMI suggesting that advancements in autos and airlines may surpass those in rail, rendering HSR less environmentally friendly than anticipated (Sivasailam, 2009). They also question the viability of HSR in achieving its environmental goals, citing a UK study to support their argument but noting that construction pollution is often omitted from operational emission figures.

The Show-Me Institute engages in a variety of methods to disseminate its anti-high-speed rail stance, primarily through partnerships and media outreach. One of their most notable partnerships is with the Koch brothers, who are known for pushing a right-wing agenda and policies that favor their business interests, particularly in petroleum, gasoline, and fuels (Dickinson, 2014). This partnership aligns with the Institute's criticism of high-speed rail, which threatens to shift the market away from fossil fuels (The Labor Tribune, 2013, Reiff, 2022). The involvement of Rex Sinquefield, co-founder of the Show-Me Institute, further colors their advocacy with his known anti-union, anti-tax, and anti-public education views, suggesting an alignment with broader political agendas rather than purely transportation-focused concerns (Fischer & Graves, 2014).

In media, the Show-Me Institute is active in criticizing high-speed rail through various articles with titles such as “Why Missouri Taxpayers Should Not Build High-Speed Rail” and “The High Cost of High-Speed Rail.” These articles underscore their argument that high-speed rail is a financially and environmentally imprudent venture for Missouri. Additionally, their presence in other media outlets like MissouriNet, where their studies and viewpoints are featured, extends their reach and influence in public discourse (Missourinet, 2009). The Institute also leverages social media platforms like Facebook to update their followers on the high-speed rail situation. With approximately 32 thousand followers, their posts include photos and videos that aim to sway public opinion against high-speed rail projects, underlining their efforts to engage with a broader audience and influence public perception (show-me-institute, n.d.).

Conclusion

This study of high-speed rail (HSR) advocacy in the United States sheds light on how power and financial interests drive the narratives of key interest groups. It highlights the necessity of scrutinizing the underlying motives of these groups, which often extend beyond stated economic and environmental concerns. This analysis underscores the crucial role of money and power in shaping public infrastructure debates, reminding us to remain vigilant about the agendas behind both pro- and anti-HSR advocacies. An important realization is that the groups studied here represent just a portion of the many voices in the HSR discussion. Their perspectives and strategies offer insights but also pose questions about the contributions and impacts of less prominent entities in the HSR debate.

The findings suggest that policy and future research should adopt more inclusive and transparent methods in infrastructure decision-making, urging policymakers to balance progress

with ethical considerations and engage a broader array of stakeholders. Further research is needed to explore the wider socio-economic and environmental effects of HSR to provide a comprehensive understanding of its impacts. The study highlights the intricate interdependencies in infrastructure policy debates, applicable to high-speed rail and other major public projects.

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