Committee on Transportation and Infrastructure
U.S. House of Representatives
Washington DC 20515

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May 3, 2021

SUMMARY OF SUBJECT MATTER

TO: Members, Subcommittee on Railroads, Pipelines, and Hazardous Materials
FROM: Staff, Subcommittee on Railroads, Pipelines, and Hazardous Materials
RE: Subcommittee Hearing on "When Unlimited Potential Meets Limited Resources: The Benefits and Challenges of High-Speed Rail and Emerging Rail Technologies"

PURPOSE

The Subcommittee on Railroads, Pipelines, and Hazardous Materials will meet on Thursday, May 6, 2021, at 11:00 a.m. EDT in 2167 Rayburn House Office Building and via Zoom to hold a hearing titled "*When Unlimited Potential Meets Limited Resources: The Benefits and Challenges of High-Speed Rail and Emerging Rail Technologies*." The hearing will explore the opportunities and limitations associated with high-speed rail and emerging technologies, including regulatory oversight, technology readiness, project cost, and available federal resources.

The Subcommittee will hear testimony from two different panels, focused respectively on the federal policy of high-speed rail and proposed projects. The first panel will include witnesses from former leadership of the United States Department of Transportation (DOT), the Seattle Metropolitan Chamber of Commerce, the Los Angeles County Metropolitan Transportation Authority, the International Brotherhood of Electrical Workers, an elected judge from Waller County, Texas, and the U.S. High Speed Rail Association. The second panel will include witnesses from Texas Central High-Speed Rail, Amtrak, Virgin Hyperloop, Hyperloop Transportation Technologies, Brightline Trains, and the Northeast Maglev.

BACKGROUND

While current global health events have reduced highway, rail, and air travel, future projections show that intercity travel will both rebound and increase from pre-pandemic levels, but

mobility will be constrained by existing transportation capacity limitations. DOT estimates that by 2045, increased congestion will be experienced on intercity highways.[1] The costs of congestion have already increased almost 50 percent from the previous decade.[2] In 2017, traffic congestion cost $179 billion in our nation's urban areas, including 8.8 billion hours of delay and 3.3 billion gallons of wasted fuel.[3] Further estimates forecast that national congestion costs will grow from $179 billion in 2017 to $237 billion in 2025, a 32 percent increase.[4]

According to the 2019 United States Department of Energy *Data Book*, Amtrak is 47 percent more energy efficient than traveling by car and 33 percent more energy efficient than domestic air travel on a per-passenger-mile basis. Traveling on the electrified Northeast Corridor system emits 83 percent less greenhouse gas emissions than driving and up to 73 percent less than flying.[5] Brightline Florida is aiming to be carbon neutral with the use of biofuels, solar power at stations, and electric vehicle plug-in charging in its parking lots.[6]

One difference between our national transportation system and other leading industrial nations is the limited high-speed passenger rail service in the United States. Moreover, the United States invests only a fraction of what European and Asian countries have invested in the development of high-speed rail operations.

Federal Funding for High-Speed Rail and Emerging Technologies

There is a discrepancy in historical federal investment between highways, aviation, and intercity passenger rail. In terms of federal investment in transportation modes, between 1949 and 2017, more than $2 trillion in federal funds have been invested in our nation's highways and over $777 billion in aviation.[7] Federal investment in passenger rail began in 1971 with the creation of the National Railroad Passenger Corporation (Amtrak).[8] In contrast to highways and aviation, between 1971 and 2020, $96 billion in federal funds have been invested in Amtrak.[9]

The establishment of a national high-speed rail system in the U.S. poses opportunities as well as challenges. Congress has recognized that the development of a comprehensive high-speed rail network requires long-term planning and investment. However, to this end, legislation has

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[1] "Beyond Traffic 2045." The U.S. Department of Transportation. Accessible at https://www.transportation.gov/sites/dot.gov/files/docs/BeyondTraffic_tagged_508_final.pdf
[2] "Urban Mobility Report 2019." Texas A&M Transportation Institute, August 2019. Accessible at https://static.tti.tamu.edu/tti.tamu.edu/documents/mobility-report-2019.pdf
[3] Ibid.
[4] Ibid.
[5] "Amtrak Sustainability Report FY2019," *Amtrak*. Available at https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/environmental1/Amtrak-Sustainability-Report-FY19.pdf.
[6] Brightline. www.gobrightline.com
[7] Committee staff calculations of annual appropriations bills, inflated to 2009 dollars.
[8] Rail Passenger Service Act of 1970, P.L. 91-518.
[9] Committee staff calculations of annual appropriations bills, inflated to 2009 dollars.

historically provided sparse funding for high-speed rail. One such example is the High-Speed Intercity Passenger Rail (HSIPR) grant program.[10]

The foundation for the HSIPR grant program originates from the Swift Rail Development Act of 1994, which created the high-speed rail program (P.L. 104-440), the Passenger Rail Investment and Improvement Act of 2008 (PRIIA, P.L. 110-432) and the American Recovery and Reinvestment Act of 2009 (ARRA, P.L. 111-5). PRIIA, passed in October 2008, established three new competitive grant programs for high-speed and intercity passenger rail capital improvements. In February 2009, President Obama signed ARRA into law, appropriating $8 billion for the PRIIA-authorized high-speed and intercity passenger rail grant programs. Then, in December 2009, Congress appropriated an additional $2.5 billion for the HSIPR grant program in the Fiscal Year (FY) 2010 Department of Transportation Appropriations Act. These funds were invested in new project planning and engineering, as well as large-scale service development programs, and it supplemented projects already funded under ARRA.

The majority of federal funding for high-speed and intercity passenger rail has focused on improving existing lines in five corridors: Seattle-Portland; Chicago-St. Louis; Chicago-Detroit; the Northeast Corridor (NEC); and Charlotte-Washington, DC.[11] Most of the remaining funds have been allocated to a largely new system dedicated to passenger trains between San Francisco and Los Angeles, the California High Speed Rail (CAHSR) project. The proposed line was originally estimated to cost roughly $33 billion and begin operating in 2020.[12] This project recently announced an $80 billion total cost to complete Phase I with a service start date of 2029.[13]

Cost estimates for constructing high-speed rail vary according to train speed, the topography of the corridor, the cost of right-of-way, and other factors. According to the Congressional Research Service (CRS), "few, if any, high-speed rail lines anywhere in the world have earned enough revenue to cover both their construction and operating costs, even where population density is far greater than anywhere in the United States."[14] Much like the federal investments made by the U.S. government in highways, aviation, and transit, foreign governments have generally contributed to the cost of construction and in many cases the operating costs of high-speed rail as well.[15]

Current federal funding for all passenger rail is insufficient to meaningfully invest in high-speed rail projects. In FY 2021, the amount of federal funds available for all rail projects was approximately $2.5 billion, little of which was eligible for high-speed rail.[16]

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[10] "High-Speed Intercity Passenger Rail Program (HSIPR)." U.S. Department of Transportation, Federal Railroad Administration. Accessible at https://railroads.dot.gov/competitive-discretionary-grant-programs/high-speed-intercity-passenger-rail-program-hsipr/high

[11] "The Development of High Speed Rail in the United States: Issues and Recent Events." *Congressional Research Service,* December 2013. R42584.

[12] Ralph Vartabedian, *A 'low-cost' plan for California bullet train brings $800 million in overruns, big delays*, LOS ANGELES TIMES (Feb. 22, 2021), *available at* https://www.latimes.com/california/story/2021-02-22/california-bullet-train-dragados-design-changes.

[13] "2020 Business Plan, Recovery and Transformation." California High Speed Rail Authority. Accessible at https://hsr.ca.gov/about/high-speed-rail-business-plans/2020-business-plan/

[14] "The Development of High Speed Rail in the United States: Issues and Recent Events." *Congressional Research Service,* December 2013. R42584.

[15] Ibid.

[16] Public Law No: 116-260.

On July 1, 2020, the U.S. House of Representatives passed with a bipartisan vote of 233-188 the Majority's H.R. 2, the *Moving Forward* Act, which proposed authorizing $60 billion over five years, with $19.2 billion over five years for the Passenger Rail Improvement, Modernization, and Expansion (PRIME) grant program. This grant program would fund intercity passenger rail projects, including high-speed rail projects.

In March of 2021, the Biden Administration released the *American Jobs Plan*, which proposed $80 billion over five years above baseline spending for rail projects. This request included $20 billion for the PRIME grant program.[17]

High-Speed Rail and Emerging Technologies Today

Today, the world's high-speed rail systems fall into two categories— steel wheel-on-steel rail systems and magnetic levitation (maglev) systems. There is no operational hyperloop system moving passengers today.

The only magnetic levitation systems in current revenue operation are located in China, South Korea, and Japan, and these systems account for a small percentage of these countries' high-speed rail networks. China is the only country with high-speed maglev in operation for approximately 18 miles between the Shanghai airport and a terminus outside of downtown. Japan has plans to develop a high-speed maglev route between Tokyo and Nagoya.[18]

Steel wheel-on-steel rail high-speed rail systems are vastly more common and typically operate on exclusive, electrified rights-of-way.[19] These high-speed systems can attain performance well above what is capable of today's conventional American passenger rail service. High-speed rail can either be built by improving existing tracks and signaling to allow trains to reach high speeds, typically on track shared with slower-moving freight trains, or by building new tracks dedicated exclusively to high-speed service. The potential costs and benefits are relatively lower with the former approach and higher with the latter approach.[20]

In 1964, Japan became the first nation to develop a high-speed rail operation. First introduced with the Shinkansen, or so-called "bullet train," Japan began operating at speeds faster than 150 miles per hour.[21] In FY 2019, speeds reached over 310 miles per hour and ridership reached over 174 million people.[22] In 1981, France inaugurated a 255-mile high-speed rail line between Paris and Lyon, cutting rail travel time from four hours to two hours and creating a

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[17] "FACT SHEET: The American Jobs Plan," The White House. March 31, 2021. Accessible at https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/31/fact-sheet-the-american-jobs-plan/
[18] Makichuk, Dave. "China's 'floating' maglev train in testing stage," Asia Times. June 23, 2020. Accessible at https://asiatimes.com/2020/06/chinas-floating-maglev-train-in-testing-stage/
[19] "The Development of High Speed Rail in the United States: Issues and Recent Events." *Congressional Research Service,* December 2013. R42584.
[20] Ibid.
[21] "Annual Report 2019." Central Japan Railway Company. Accessible at https://global.jr-central.co.jp/en/company/ir/annualreport/_pdf/annualreport2019.pdf
[22] Ibid.

network that now spans 1,700 miles with trains reaching speeds of 320 miles per hour.[23] In FY 2019, ridership reached 5 million passengers per day.[24] In 1991, Germany unveiled a 203-mile high-speed rail service between Hanover and Wurzburg and a 62-mile line between Mannheim and Stuttgart. Since then, numerous other countries have created additional high-speed rail lines. In 1992, Spain and Italy launched their own high-speed rail systems. In 1998, Sweden upgraded its rail lines to accommodate high-speed rail, and in 2000, the Netherlands started service between Amsterdam and Brussels. In 2020, China announced plans to more than double its approximately 21,000 miles of high-speed rail by 2035, to 43,000 miles.[25]

The U.S. has one high-speed rail corridor and multiple rail lines that operate with high-speed trainsets. Amtrak's Acela service is capable of traveling up to 150 miles per hour— between Washington, D.C. and Boston, MA—but it operates at slower speeds due to century-old deteriorated infrastructure, poor alignments, and capacity constraints that prevent the corridor from dramatically increasing speeds. Acela 2.0 is expected to operate up to 160 miles per hour.[26] Brightline Florida operates at 79 miles per hour but has plans to operate up to 125 miles per hour.

The focus of this hearing will center on six different projects or technologies; the Amtrak Acela, Texas Central High-Speed Rail, Brightline, Northeast Maglev, Virgin Hyperloop, and Hyperloop Transportation Technologies. Texas Central High-Speed Rail aims to build and operate high-speed rail service between Dallas and Houston using technology that is owned by the Central Japan Railway Company (JRC). Brightline currently offers high-speed service in southern Florida and is proposing to connect Las Vegas, NV, and Victorville, CA. Both Texas Central and Brightline are steel wheel-on-steel rail technologies. Northeast Maglev plans to develop along the Northeast Corridor, and its magnetic levitation technology is similarly owned and developed by JRC. Virgin Hyperloop has testing sites in California and Nevada, and it completed the first successful test run in history in November 2020. Hyperloop Transportation Technologies (HyperloopTT) is currently focused on the Great Lakes region, and aims to connect Chicago, Cleveland, and Pittsburgh. Virgin Hyperloop, HyperloopTT, and Northeast Maglev are licensing companies, and seek to sell the technology to a separate entity for construction and operation. Each of the project witnesses have been asked to provide total project costs and any requests for federal support in their testimony.

In 2019, DOT launched the Non-Traditional and Emerging Transportation Technology (NETT) Council, created to identify and resolve jurisdictional and regulatory gaps in the development of new transportation technologies.[27] As part of that work, in July 2020, the NETT Council released the Pathways to the Future of Transportation policy document, intending to serve as a clear roadmap for developers of cross-modal technologies.[28] The Pathways document

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[23] "SNCF Group 2019 Annual Results". SNCF. Accessible at https://medias.sncf.com/sncfcom/finances/Publications_Groupe/SNCF_Group_Annual_Results_2019_Press_conf.pdf

[24] Ibid.

[25] Chen, Frank. "China sets railway building spree in high-speed motion." *Asia Times.* Accessible at https://asiatimes.com/2020/08/china-sets-railway-building-spree-in-high-speed-motion/

[26] "Next Generation High-Speed Trains," Amtrak: The Northeast Corridor. Accessible at https://nec.amtrak.com/project/next-generation-high-speed-trains/

[27] "Overview of the NETT Council," United States Department of Transportation. Accessible at https://www.transportation.gov/nettcouncil

[28] "Pathways to the Future of Transportation: A Non-Traditional and Emerging Technology (NETT) Council Guidance Document." Office of the Secretary of Transportation, Department of Transportation. July 2020. Accessible at: https://www.transportation.gov/sites/dot.gov/files/2020-07/NETT_Pathways_jul20_final_3.pdf

determined the Federal Railroad Administration (FRA) has the necessary tools and authorities to regulate and manage the safety of emerging technologies like hyperloop and maglev technology systems.[29]

A Level Playing Field: Buy America and Labor Protections

Investment in high-speed rail provides opportunities not just for greater connectivity, but also for creating U.S. railroad and manufacturing jobs. Current statute authorizes several discretionary grant programs that are administered by the FRA to invest in passenger and freight railroad infrastructure. These grants include conditions; for example, a "Buy America" condition requires that 100 percent of the steel, iron, and manufactured goods used in a project funded by a FRA grant be made in the United States.[30] Such requirements help ensure that federal investments benefit U.S. manufacturers and their employees, rather than manufacturers overseas. FRA grant conditions also ensure workers are paid prevailing wages when a project funded by a FRA grant uses a railroad right-of-way.[31]

Statutes governing FRA grant programs also require that those conducting rail operations over rail infrastructure constructed or improved with funding provided in whole or in part by a FRA grant be considered a "rail carrier" for purposes of Title 49 of United States Code and certain railroad-specific statutes.[32] Among others, these statutes include the Railway Labor Act, which governs the relationship between rail carriers and their employees; the Railroad Retirement Act, which provides retirement benefits that are in lieu of Social Security benefits; and the Railroad Unemployment Insurance Act, which provides unemployment benefits in lieu of state-administered unemployment benefits, as well as sickness benefits. FRA grants are also conditioned on other requirements, some of which relate to conditions established decades ago.[33]

WITNESS LIST – PANEL I

The Honorable John Porcari
Former Deputy Secretary
Department of Transportation

Ms. Rachel Smith
President and Chief Executive Officer
Seattle Metropolitan Chamber of Commerce

Mr. Phillip Washington
Chief Executive Officer

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[29] Ibid.
[30] 49 USC 29905(a)
[31] 49 USC 22905(c)(2)(A)
[32] 49 USC 22905(b)
[33] Other conditions are provided in 49 USC 22905, including 22905(c)(2)(B) which relates to the conditions in Section 504 of the Railroad Revitalization and Regulatory Reform Act of 1976, 45 USC 836.

Los Angeles County Metropolitan Transportation Authority

Ms. Danielle Eckert
International Representative
International Brotherhood of Electrical Workers

The Honorable Carbett "Trey" Duhon III
Judge
Waller County, Texas

Mr. Andy Kunz
President and Chief Executive Officer
U.S. High Speed Rail Association

WITNESS LIST – PANEL II

Mr. Carlos Aguilar
President and Chief Executive Officer
Texas Central High Speed Rail

Mr. William Flynn
Chief Executive Officer
Amtrak

Mr. Josh Giegel
Chief Executive Officer and Co-Founder
Virgin Hyperloop

Mr. Andres de Leon
Chief Executive Officer
Hyperloop Transportation Technologies

Mr. Michael Reininger
Chief Executive Officer
Brightline Trains

Mr. Wayne Rogers
Chairman and Chief Executive Officer
Northeast Maglev