Beth Long

The Railroad Resolution

Just about everyone recognizes the name Cornelius Vanderbilt; his name is plastered on everything from towns to a world-renowned university. His iconic railroad empire was the result of undeniably vicious business policies, but his progress was unprecedented in its speed, range, and influence. Regardless, it is impossible to deny the positive ramifications that came from him and his business, but more generally, the railroad industry as a whole. During the Industrial Revolution, the development of railroads had numerous immeasurable positive effects, including unprecedented growth by creating jobs and an entire profitable industry, allowing the people of the United States to expand and migrate to the previously mostly uninhabited western states, and allowing for the much faster transit of goods and services.[1] Railroads are unparalleled in the amount to which they helped usher the United States into the Industrial Revolution, and as they ushered the United States into a new era then, they can again in today's world.

The world is entering new eras in technology and energy, and American citizens are frequently at a disadvantage. Compared to just about every country in Europe and Asia, the United States public transportation system has lower ridership levels, longer waits, fewer service hours, and higher fees.[2] Furthermore, in an effort to combat climate change, many countries have been implementing renewable energy sources. In the past fifteen years, both Europe and the United States have cut their consumption of coal in half. However, where Europe replaced this power capacity entirely with power from renewable sources, resulting in a 43% drop in emissions, the United States replaced only 35% with energy from renewable sources, turning to natural gas for the rest.[3] High speed electric railway systems can solve both these problems, along with providing numerous other benefits the United States can reap.

High speed railway systems first began in Japan in 1961, soon after spreading to Europe in the 1980's. However, it was China who advanced the technology enough for it to take off in the 1990's due to generous funding from the Chinese government.[4] China specifically advanced exclusive high speed systems, or high speed railways that run on their own tracks and can reach speeds up to 210 mph.[5] While there are types of high speed rails that are just improvements made to current railways, the exclusive line high speed railways are favored because they reach double the speeds and actually increase the productivity of freight lines since passenger trains no longer travel on them.[6] Exclusive high speed railways also provide numerous other benefits, and right now the United States is missing out. In this brief, it will be discussed how implementing a high speed railway in the United States will help solve high travel prices and climate change, as well as discussing numerous other benefits like promoting tourism, creating jobs, and reducing traffic. Potential responses at the State and Federal level will then be discussed.

THE PROBLEM

As mentioned above, public transportation in the United States is horrendous compared to Europe and Asia. However, trains are especially bad, and for more reasons than the ones mentioned above. The locomotives are slow, they run on diesel, and there are limited miles and routes.[7] There is a reason for this. Amtrak is the largest passenger railway in the United States.[8] It was founded in 1970 by the Nixon administration when they passed the Rail Passenger Service Act, which was created in order to take pressure off of freight lines and take over the intercity passenger responsibilities of trains.[9] The passenger trains were never the ones that made money, so the creation of Amtrak under this bill was under-planned and underfunded due to the assumption that Amtrak would quickly be disbanded. They survived, and to this day Amtrak and other passenger lines have no reliable source of funding.[10] Implementing a high speed railway in

the United States would allow for a better planned and better funded restart while also helping to solve the mass transportation problem in the United States. Nonetheless, that's not the only problem solved by a high speed railway. The high cost of transportation and helping to combat climate change are more facets of the problem that high speed railways will help solve.

HIGH COST OF TRANSPORTATION

The cost of transportation in the United States is exorbitant. The average cost of transportation for a two person household in the United States is $9,826 per year, making it the second largest spending category for American households.[11] The average American household spends 33% more on transportation than food.[12] Studies show that only $236, or 2.7% of money spent on transportation, was used for public transportation.[13] The need for each household to have such a high transportation budget is due to a couple different factors.

To begin, gas prices recently have been outrageous, with gas prices increasing at the fastest rate ever recorded.[14] While gas prices rely on a multitude of factors, the main one causing this climb is Russia's invasion of Ukraine and the subsequent banning of Russian oil, one of the United States main sources.[15] In some states, gas prices are now above $5 per gallon, and this is causing many consumers to look towards fuel efficient and even electric options. However, many find themselves out of luck in this quadrant as well. High demand leads to higher prices, with the average price of a new vehicle rising to $46,805.[16] The price of used vehicles is also up 40%, giving no relief in that sector.[17] This has left many Americans struggling to find and afford consistent transportation.

CLIMATE CHANGE

Another, more pressing issue facing the world right now is climate change. According to experts, if we do not stop climate change now the damage done will be irreversible when the

average global temperature rises by 1.5ºC, and at the rate we are going currently that could happen as early as 2030, but at the latest 2050.[19] This increase in temperature is a big deal for a lot of reasons. Higher temperatures cause more irregular and extreme weather patterns, ice in Antarctica to fall off and melt, wildfire season to be longer with more fires, mosquitos to expand their territory and spread more disease, coral reefs to be bleached of color, the list of harmful consequences goes on.[20] Furthermore, it is a problem caused almost entirely by humans. Since the Industrial Revolution, society has been burning a copious amount of fossil fuels, producing greenhouse gasses which trap heat on earth's surface and cause temperatures to increase.[21] As not only inhabitants of earth but the root of climate change, it is our problem to deal with.

While installing a high speed electric railway in the United States will not immediately stop climate change in its tracks, it will help slow the increasing of the average global temperature in a few ways. First, trains account for 0.5% of the United States' global emissions.[22] That does not seem like a lot, but it is exponentially more than the rest of the world. Most developed countries have railways that are at least 60% electric, with South Korea being above 85%. The United States sits at a mere 5%.[23] Further, the average world wide energy intensity of a train is 100 KJ/passenger*km. The United States is 900 KJ/passenger*km.[24] This means American trains are producing more emissions and using more energy than trains in the rest of the world. Installing an electric high speed rail system will help the United States catch up to the rest of the world.

The second way installing a high speed electric railway will help slow climate change is by reducing aviation. In Europe and Asia, experts found the installation of a high speed electric railway reduced traffic on aviation routes by as much as 80%, with the average being around 50% reduction.[25] This is because over medium distances, for example Los Angeles to San

Francisco, a high speed railway would not only be half the price but also 2 hours faster. Aviation makes up 2% of the United States' emissions and is one of the single most polluting actions, so anything that can be done to reduce air travel will help significantly decrease emissions.[26] All considered, installing a high speed railway connecting the United States will help stop climate change by not only reducing emissions from trains, but by alleviating air travel.

POTENTIAL BENEFITS

While lowering the high cost of transportation and slowing climate change are urgent reasons why the United States should install a high speed railway, there are benefits to reap beyond that. If the United States were to install a high speed railway, Americans would benefit from less reliance on foreign oil, reduced traffic, faster travel times, creation of jobs, and how it would stimulate tourism across the country.

LESS RELIANCE ON FOREIGN OIL

The first benefit from installing a high speed railway in the United States would be decreasing American dependence on foreign oil. Despite only having 5% of the world's population, the United States consumes 25% of the world's oil supply, with close to 40% of the oil consumed coming from foreign sources.[27] Recently, with the conflict between Ukraine and Russia, American citizens are starting to feel the downsides of this dependence on importing oil, as with the sanctions against Russian oil gas prices in many states are now above five dollars, and increasing at an unprecedented rate.[28] Providing American citizens with green, cheap, and fast alternatives to driving will help decrease the United States dependence on foregin oil and help prevent crises across the globe from having such a direct economic impact on American families.

REDUCE TRAFFIC

Another benefit of a high speed railway in the United States would be a reduction of traffic. Congestion on roads and airport runways costs the United States $140 billion in lost time and productivity, and this problem is only expected to get worse the nation's population is predicted to grow by 100 million people in the next 40 years.[29] The United States cannot build and maintain enough highways to support the current American population, let alone one 100 million people bigger. The creation of a high speed railway is estimated get thousands of cars off the road each day, reducing the need for maintenance and reducing overall congestion.[30]

FASTER AND CHEAPER TRAVEL

A high speed railway connecting the United States would provide faster and cheaper travel. As discussed above, using the proposed line connecting San Francisco and Los Angeles as an example, plane tickets connecting these two cities cost on average $140.[31] While the price of the train ticket is still being set, experts working on the project say it will be between $50 and $86, 2-3 times cheaper.[32] Furthermore, taking a plane from Los Angeles to San Francisco takes 5.5 hours and driving takes 7.5 hours, where the high speed rail would take 3 hours.[33] These benefits are not limited just to California, as other cities and lines would see similar low prices and low travel times comparatively. Overall, a high speed railway would benefit American citizens by providing faster, cheaper travel domestically.

PROFITS AND STIMULATING TOURISM

High speed railways will also provide significant economic growth for the United States. A study by the American Public Transportation Association found that every $1 invested in high speed rail gives $4 in economic benefits.[34] Connecting America's economically vital regions keeps them mobile, productive, efficient and internationally competitive.[35] Furthermore, high speed rails in other countries have also been immensely profitable. China's high speed line

connecting Beijing to Shanghai, two main economic centers, has over $1 billion in operational profits each year.[36] Rail Europe, the system connecting 24 European countries with more than 20,000 stations, has over $400 million in profit each year.[37] Further, Rail Europe stimulates tourism across Europe by offering a discounted 1 month pass, where travelers can ride along their rails as many times as they want in a month.[38] This encourages tourism between European countries, and a similar ticket in the United States would do the same by allowing visitors to travel across the United States faster and cheaper.

CREATION OF JOBS

Some people will argue that the creation of a high speed railway will cost hardworking Americans in the highway and aviation industry their jobs. This is not true for a few reasons. First, our highway and aviation systems do not have the capacity to support the current American population. They are overwhelmed, and the creation of a high speed railway would take the pressure off these systems and allow them to operate at capacity instead of above it. Second, a study from the California High Speed Rail Authority found that construction of their line from San Francisco to Los Angeles will create 150,000 construction jobs and 450,000 permanent jobs.[39] This number would be significantly larger if a high speed railway were installed nationally, rather than just in California. All in all, a high speed railway will not just benefit current American transportation industries, but it will create hundreds of thousands of jobs.

EVIDENCE OF SUCCESS

High speed rails are not an untested technology. They have been installed in multiple countries in Europe and Asia, as well as New Zealand and Australia as well.[40] However, when looking for a prime example of what high speed rails can be, China is the prime example. Having installed 25,000 kilometers of high speed rail since 2008, China's high speed rail system is the

most extensive by far.[41] The World Bank, having financed portions of China's system, did extensive studies on it and found that the rate of return on their high speed railway was 8%, significantly higher than that of any other long term infrastructure investment.[42] China's high speed railway also consistently attracts more than 1.7 billion passengers a year, with passengers coming from all income groups because of the manageable prices.[43] Although China built their at about two thirds the price of what most other countries are able to accomplish, high speed railways are not money sinkholes in other countries either.[44] The California High Speed Rail Authority found that the French line paid back its construction costs in 10 years, with Japan's line following closely behind and paying off construction costs in 12.[45] The World Bank found that high speed railways did more than just sustain themselves, however. They found countries that installed high speed railways experienced benefits like shortened travel times, improved safety and facilitation of labor mobility, and increased tourism.[46] They found high-speed networks also reduce operating costs, accidents, highway congestion, and greenhouse gas emissions.[47] All things considered, high speed railways in other countries prove not just that it is a successful and sustainable business, but that high speed railways come with a myriad of other benefits that the United States is missing out on by not installing one.

WHAT NEEDS TO BE DONE

The United States should take the money they have set aside to update current railroads and use it to begin building a high speed railway. The United States federal government recently made a trillion plus dollar commitment to update American infrastructure, with $65 million of that set aside for railroads.[48] This update is long overdue, as much of our infrastructure was built 75 years ago with technology that is now obsolete.[49] However, this money promised to railroads is no guarantee of a high speed system anytime in the near future. Much of the money is

anticipated to go to Amtrak, who will use the money to fix the endless problems on the tracks they maintain but do not even own.[50] Some people suggest Amtrak will first focus on updating their existing trains and tracks and then move onto building a high speed system, but that is likely not the case. Amtrak has no reliable source of funding, so once their allocated money from this bill is used up updating current tracks the United States will be back where it started, with slow and unreliable passenger lines in need of updating to bring them to the modern era and little to no hope of a high speed railway in the future.[51]

Many policy makers argue this is good, as currently Amtrak makes most their money by taking advantage of subsidies given to companies that develop infrastructure.[52] Furthermore, about one third of Chinese high speed lines do not make enough money to cover their maintenance costs.[53] However, the United States current plan to just update existing passenger lines will just exasperate this problem. Studies done on the Chinese passenger lines found that their fastest lines, about 220 mph, had no trouble covering their costs and actually turning a profit.[54] Furthermore, the lines between 50 and 1000 miles in length were the most profitable.[55] The lines losing money were either significantly slower (similar to the current speeds of American trains), or too short of a distance to justify a high speed line. As stated above, the lines that were fast and the right length not only paid for themselves in just 10 years but turned a profit.[56] In short, it makes more sense for the United States to take the $65 million they are investing in current railroads and use it to build a high speed line, as it will make more money and last longer. While building a high speed railway will cost more than $65 million, it is not only a good start but a better investment long term. To put this in perspective, China's high speed rail costs about $17 million per mile.[57] That means, in total, a national high speed rail system spanning all regions of the United States would cost upwards of $1 trillion.[58]

It is undeniable that high speed rail is an expensive undertaking, and that Biden's $65 million does not even begin to cover it. However, based on Europe and Asia's experiences, it is undeniable the benefits outweigh the costs, especially in the long run, as discussed above. Expert Andy Kunz, CEO of the US High Speed Rail Association, agrees that the benefits outweigh the costs, saying, "this is a public service."[59] Furthermore, some opponents argue high speed rail systems will be obsolete by the time the United States constructs one. However, this is simply not the case. On the edge of technology are Magnetic Levitation trains, or maglev for short. Maglev trains are a type of high speed rail powered by magnets. According to experts, maglev can achieve higher speeds, have lower energy consumption and life cycle costs, attract more passengers, and produce less noise and vibration.[60] Research into maglev is ongoing, with China planning to build the first maglev line in the next few years.[61] The amount of money, time, and research pouring into maglev proves that high speed rail is the future, and is not going away any time soon.

CONCLUSION

The United States should invest in building a cross country, high speed railway. It will help the United States combat climate change and lower the high cost of public transportation. Furthermore, it will provide even more benefits to American citizens like less reliance on foreign oil, reduced traffic, faster travel times, creation of jobs, and how it would stimulate tourism across the country. The American railway system is out of date and due for updates, and it would cost less in the long term to build a high speed railway than to update the current passenger lines and continue to do so for the next fifty years. When Vanderbilt began building his railway system at the beginning of the Industrial Revolution, he never imagined it would reach the scope it did.

However, he would not have wanted his dream to stagnate like it has. It is time to update the American rail system and bring it up to the same level as the rest of the world.

Endnotes

1. Josef, “Railroads during the Industrial Revolution,” Worldwide Rails, October 28, 2019, https://worldwiderails.com/railroads-during-the-industrial-revolution/.
2. Joseph Stromberg, “The Real Reason American Public Transportation Is Such a Disaster,” Vox (Vox, August 10, 2015), https://www.vox.com/2015/8/10/9118199/public-transportation-subway-buses.
3. David Vetter, “U.S. Lagging Far behind Europe on Renewables, New Report Shows,” Forbes (Forbes Magazine, March 9, 2020), https://www.forbes.com/sites/davidrvetter/2020/03/09/us-lagging-far-behind-europe-on-renewables-new-report-shows/?sh=4d593a433f46.
4. Richard Nunno, “Fact Sheet: High Speed Rail Development Worldwide,” EESI, July 19, 2018, https://www.eesi.org/papers/view/fact-sheet-high-speed-rail-development-worldwide.
5. Dr. Jean-Paul Rodrigue, “B.4 – High Speed Rail Systems: The Geography of Transport Systems,” The Geography of Transport Systems | The spatial organization of transportation and mobility, November 14, 2021, https://transportgeography.org/contents/applications/high-speed-rail-systems/.
6. Ibid.
7. Geoffrey Morrison, “ARE US Trains Really That Bad? It's Complicated,” CNET, December 9, 2018, https://www.cnet.com/culture/are-us-trains-really-that-bad-its-complicated/.
8. Jakob Eckstein, “How Amtrak Makes Money,” Investopedia (Investopedia, January 7, 2022), https://www.investopedia.com/articles/investing/072115/how-amtrak-works-makes-money.asp.
9. Amtrak, “Historic Timeline,” Amtrak, accessed April 6, 2022, https://history.amtrak.com/amtraks-history/historic-timeline.
10. University Transportation Center for Mobility - Texas Transportation Institute State of Texas, “A Guide to Transportation Funding Options,” UTCM, accessed April 6, 2022, https://utcm.tti.tamu.edu/tfo/rail/#:~:text=Federal%20Rail%20Programs,to%20receive%20federal%20rail%20funding.
11. Michelle et al., “Transportation Costs in the U.S.: The 2nd Highest Expense Category,” 20somethingfinance.com, January 15, 2022, https://20somethingfinance.com/transportation-costs/.
12. Ibid.
13. Ibid.
14. Patrick George, “The Gas Price Spike and Chip Shortage Could Mean a Perfect Storm for Car Buyers,” The Drive (The Drive, March 9, 2022),

https://www.thedrive.com/news/44662/the-gas-price-spike-and-chip-shortage-could-mean-a-perfect-storm-for-car-buyers.
15. Csaba Csere, “Why Are Gas Prices Going up?,” Car and Driver, March 12, 2022, https://www.caranddriver.com/features/a15119896/why-are-gas-prices-going-up-when-demand-is-going-down-feature/.
16. Patrick George, “The Gas Price Spike and Chip Shortage Could Mean a Perfect Storm for Car Buyers.”
17. Ibid.
18. Marielle Mondon, “How Much Will It Cost to Ride California’s Bullet Train?,” Next City, May 12, 2018, https://nextcity.org/urbanist-news/fare-cost-ride-california-bullet-train.
19. Illissa Ocko, “This Is Why Fighting Climate Change Is so Urgent,” Environmental Defense Fund, accessed April 7, 2022, https://www.edf.org/climate/why-fighting-climate-change-so-urgent#:~:text=which%20grows%20cotton.-,Climate%20change%20is%20breeding%20storms%20with%20heavier%20rainfall%2C%20flooding%20farms,supply%20and%20more%20at%20risk.
20. Ibid.
21. Ibid.
22. “How 'Aggressive' Railway Expansion Could Cut Emissions in Eight Charts,” Carbon Brief, February 20, 2019, https://www.carbonbrief.org/eight-charts-show-how-aggressive-railway-expansion-could-cut-emissions.
23. Ibid.
24. Ibid.
25. Ibid.
26. Ibid.
27. Sam Hananel Director et al., “It's Easy Being Green: Rail Transport Picks up Speed,” Center for American Progress, May 12, 2008, https://www.americanprogress.org/article/its-easy-being-green-rail-transport-picks-up-speed/.
28. Csaba Csere, “Why Are Gas Prices Going up?”
29. “Benefits of High-Speed Rail for the United States,” American Public Transportation Association, March 17, 2021, https://www.apta.com/research-technical-resources/high-speed-passenger-rail/benefits-of-high-speed-rail-for-the-united-states/#:~:text=Reduces%20the%20Nation's%20Dependence%20on%20Foreign%20Oil%3A&text=According%20to%20the%20International%20Association,emissions%20and%20improve%20air%20quality.
30. Ibid.
31. Marielle Mondon, “How Much Will It Cost to Ride California’s Bullet Train?”
32. Ibid
33. Ibid
34. “Benefits of High-Speed Rail for the United States,” American Public Transportation Association.
35. Ibid

36. Richard Nunno, “Fact Sheet: High Speed Rail Development Worldwide.”
37. “Rail Europe Targets €500 Million Revenue,” LATTE Luxury News, October 18, 2019, https://latteluxurynews.com/2019/10/18/rail-europe-announces-e500-million-revenue-target/.
38. Ibid.
39. Sam Hananel Director et al., “It's Easy Being Green: Rail Transport Picks up Speed.”
40. Ibid.
41. World Bank Group, “China's Experience with High Speed Rail Offers Lessons for Other Countries,” World Bank (World Bank Group, July 9, 2019), https://www.worldbank.org/en/news/press-release/2019/07/08/chinas-experience-with-high-speed-rail-offers-lessons-for-other-countries.
42. Ibid.
43. Ibid.
44. Ibid.
45. “High-Speed Rail: An International Success Story - Hsr.ca.gov,” California High Speed Rail Authority , 2022, https://hsr.ca.gov/wp-content/uploads/2022/01/International_factsheet.pdf.
46. Ibid.
47. Ibid.
48. Steven Zeitchik, “All This Money Pouring into Infrastructure Should Be a Boon for High-Speed Rail, Right? Not so Fast.,” The Washington Post (WP Company, November 19, 2021), https://www.washingtonpost.com/technology/2021/11/18/infrastructure-bill-high-speed-rail/.
49. Aaron M. Renn, “Our Infrastructure Problem Is Mostly Just Old Age,” Governing (Governing, August 24, 2021), https://www.governing.com/community/our-infrastructure-problem-is-mostly-just-old-age.
50. Steven Zeitchik, “All This Money Pouring into Infrastructure Should Be a Boon for High-Speed Rail, Right? Not so Fast.”
51. University Transportation Center for Mobility - Texas Transportation Institute State of Texas, “A Guide to Transportation Funding Options.”
52. Jakob Eckstein, “How Amtrak Makes Money,”
53. Published by Statista Research Department and Mar 8, “China: Profitability of High-Speed Railway by Route,” Statista, March 8, 2022, https://www.statista.com/statistics/1218788/china-profitability-of-high-speed-railway-by-route/.
54. Ibid.
55. Ibid.
56. “High-Speed Rail: An International Success Story - Hsr.ca.gov,” California High Speed Rail Authority
57. Published by Statista Research Department and Mar 8, “China: Profitability of High-Speed Railway by Route.”
58. Adam A. Millsap, “Biden's High-Speed Rail to Nowhere,” Forbes (Forbes Magazine, April 15,

2021), https://www.forbes.com/sites/adammillsap/2021/04/15/bidens-high-speed-rail-to-nowhere/?sh=7fee6b5f108c.
59. Andy Kunz, “10 Reasons America Needs High-Speed Rail,” Global Railway Review, January 27, 2020, https://www.globalrailwayreview.com/article/69858/10-reasons-america-needs-high-speed-rail/.
60. Vukan Vuchic, “University of Pennsylvania Scholarlycommons,” UPENN, accessed April 15, 2022, https://repository.upenn.edu/cgi/viewcontent.cgi?article=1887&context=ese_papers.
61. Ibid.