Testimony of

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When Unlimited Potential Meets Limited Resources:
The Benefits and Challenges of High-Speed Rail and Emerging Rail Technologies

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Introduction

Good morning, Chairman Payne, Ranking Member Crawford, and Members of this Subcommittee. Thank you for inviting me to testify at this hearing on behalf of Amtrak. My name is William Flynn, and I am Amtrak's Chief Executive Officer.

I am particularly honored to be representing Amtrak at this hearing. It takes place six days after President Biden traveled to Philadelphia to join us in celebrating Amtrak's fiftieth anniversary. The American Jobs Plan he has proposed, which would provide $80 billion for Amtrak and high-speed and intercity passenger rail, is an important first step in developing an improved passenger rail system that would enhance mobility by serving more communities; provide more frequent and more equitable service; generate significant economic benefits; and reduce greenhouse gas emissions.

Amtrak has accomplished a great deal since we began service on May 1, 1971 with a mandate to transform unprofitable intercity passenger rail services operated by private railroads into "a modern, efficient intercity railroad passenger service"[1] – with an initial appropriation of only $40 million. In thinking about where Amtrak, and high-speed rail service in North America have come over the past half century, the title of today's hearing – "When Unlimited Potential Meets Limited Resources" – seems particularly apt.

The potential high-speed rail offered to revolutionize intercity travel was one of the major reasons Congress created Amtrak. The *Metroliner*, the United States' first high-speed train, had begun service between New York City and Washington in 1969, the year before the enactment of the Rail Passenger Service Act (RPSA) that established Amtrak. Many members of Congress who had experienced the *Metroliner* recognized the potential high-speed rail service had to, in the words of the RPSA, "provide fast and comfortable transportation between crowded urban areas[2]" throughout the United States.

What Is High-Speed Rail?

When most Americans hear the words "high-speed rail," what comes to mind are sleek bullet trains racing along newly-constructed rail lines on elevated viaducts. People who live in countries that have extensive high-speed rail networks would consider that definition of high-speed rail too narrow. In fact, "high-speed rail" encompasses several different types of services arranged

[1] Rail Passenger Service Act of 1970, Pub. L. No. 91-518, Sec. 101.

[2] Ibid.

along a continuum with generally fuzzy boundaries – and we need all of them in the United States if we are to realize high speed rail's potential.

On one end of the continuum are the high-speed bullet trains, such as Japan's Shinkansen or the extensive network of high-speed services China has developed over the past 15 years that operate on dedicated, custom built electrified rail lines at speeds that approach or exceed 200 mph. Their costs – both monetary and from the environmental impacts associated with their construction – can be justified in corridors with high travel volumes that are anchored by large cities; where existing rail lines are at capacity; where the distances are too long for anything other than very high speed service to be trip time competitive with flying; and/or where topographical characteristics such as mountains or other factors make it infeasible to significantly increase speeds on conventional rail lines. Los Angeles to Northern California is the perfect example of this, which is why we need to build California High Speed Rail.

Next are high-speed corridors like Amtrak's Boston-to-Washington Northeast Corridor (NEC) or Great Britain's West Coast Main Line connecting London and Glasgow, where frequent high-speed trains operating at maximum speeds of 125 to 160 mph share electrified tracks with conventional intercity, commuter and freight trains. Both the NEC and the West Coast Main Line have high train densities and passenger volumes that have reached the point where development of dedicated high-speed rail lines over portions of their routes is necessary to accommodate growing demand, and also to make rail more competitive with air travel for trips between their endpoint cities, which are approximately 400 miles apart. In the U.K., this has taken the form of the roughly $135 billion HS2 program, a series of newly-built, dedicated 225 mph lines that will interface with existing high-speed and conventional lines now under construction to connect London, the Midlands and Northern Britain.

The German system – Europe's largest in terms of annual passengers - perhaps best represents the strategy of incremental development of high-speed rail. Starting with an extensive conventional network and a significant freight rail sector in place, Germany has strategically developed 186 mph or higher high-speed segments to speed up certain city pair and international routes, while investing in conventional routes to bring them up to 100 to 155 mph standards, to achieve overall trip times which are competitive with driving and flying. Thus, out of Deutsche Bahn's roughly 21,000-mile network, only approximately 1,300 miles operate at speeds above 155 mph as of 2018, yet the network serves as the primary mode of intercity travel for many. To put this in perspective, Germany is roughly half the size of Texas but has a total network of equal size to Amtrak's that provided 151 million intercity trips in 2019.

While some definitions of high-speed rail use a higher threshold, the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) defines "high-speed rail" as "intercity passenger rail service that is reasonably expected to reach speeds of 110 mph."[3] Corridors with maximum speeds of 110 mph, four of which Amtrak operates, can offer faster trip times than driving and be very competitive with flying. Importantly, they can be developed at a much lower cost than faster corridors in markets where passenger demand would not justify the major capital investments, such as electrification and elimination of grade crossings, that are generally required to operate trains at higher speeds.

In nearly every nation, conventional rail service is the foundation for the development of successful high-speed rail service. Improvement or initiation of conventional rail service can occur much more quickly than construction of new high-speed rail lines, and can set the stage for high-speed rail service by building a ready market and existing passenger ridership that high-speed rail can tap when it arrives. Conventional rail service also feeds high-speed rail, providing connecting passengers and allowing high-speed services to be extended over conventional speed lines to extend the reach of high-speed trunk lines.

The Path Ahead

Instead of asking how we can develop high-speed rail *lines*, what we should be asking is how – to paraphrase Amtrak's initial and current statutory goals - we can develop a modern, efficient, trip time competitive *intercity* passenger rail *network* throughout the United States that *includes* high-speed rail. If we focus myopically on the development of dedicated high-speed rail lines, or on new technologies that share most of their characteristics, we will not tap intercity passenger rail's potential in the many locations around the nation where it can play a meaningful role. And we will continue to make little progress in addressing climate change on a national scale, as we will leave most of the country waiting at the station for the decades it typically takes to develop even one new high-speed line. For example, the UK's HS2, for which planning began in earnest in 2012, is not set to begin operation on its initial segment until as late as 2030, with the full project not expected to be complete until 2040. We also cannot ignore the fact that we already have a high-speed railroad in the United States - the NEC between Washington and Boston - on which relatively modest investments could yield large improvements in trip times, ridership, economic impacts and reduced greenhouse gas emissions.

Much of the NEC's success is due to factors that do not exist at similar levels anywhere else in the United States, particularly its very high population density along a linear corridor anchored by the country's largest city and extensive network of conventional rail, commuter and transit services that predates the development of high-speed rail. However, that does not mean that the

[3] 49 U.S.C. 26106(b)(4).

NEC is the only U.S. corridor well suited for high-speed rail service. Rather, it helps to illustrate, as a prototype, the sorts of conditions that corridors in the U.S. will likely need to be successful – robust public transit connectivity, high-density land-use, significant populations, high driving and parking costs, significant congestion on other modes, economic agglomeration, and so forth.

So, while Amtrak strongly supports development of new high-speed corridors, we can't focus only on the dream of funding and constructing a large number of them from scratch, which is not going to happen soon enough to meet the near term need for more passenger rail service, or take a chance that new technologies will eventually prove viable. The urgent economic and mobility needs of the nation require a more holistic approach that focuses on quickly improving and expanding our conventional network to serve more people and places with reliable service, completing the two high speed corridors already under development – the NEC and California High-Speed Rail – and launching select additional corridors with the right attributes for high-speed development.

Such an approach, which focuses on creating reasonable alternatives to high-carbon transportation modes in the near term, is essential to addressing climate change. As the Committee knows, the transportation sector accounts for the largest share – nearly 30% -- of greenhouse gas emissions in the United States. The ambitious environmental goals the Biden Administration has proposed – particularly the 50% reduction in greenhouse gases by 2030 – cannot be realized if the only options for most intercity trips continue to be driving or flying. With new high-speed lines taking, on average, 16 years to progress from the start of construction to operation in Europe according to a 2018 report by the European Union's European Court of Auditors,[4] the United States simply does not have the time to wait on high-speed rail alone to increase intercity passenger rail use in America.

<u>High Speed Rail in the Northeast Corridor</u>

Turning the Boston-to-Washington NEC into North America's only high-speed railroad is perhaps Amtrak's biggest accomplishment. When we acquired the NEC on April 1, 1976, it was literally falling apart. *Metroliners* bounced over bumpy tracks at reduced speeds; commuter rail service was in a downward spiral; and extensive slow orders due to lack of maintenance by the NEC's owner, the bankrupt Penn Central, could have curtailed rail service were it not for an emergency appropriation in 1975 that kept trains running until Amtrak took over.

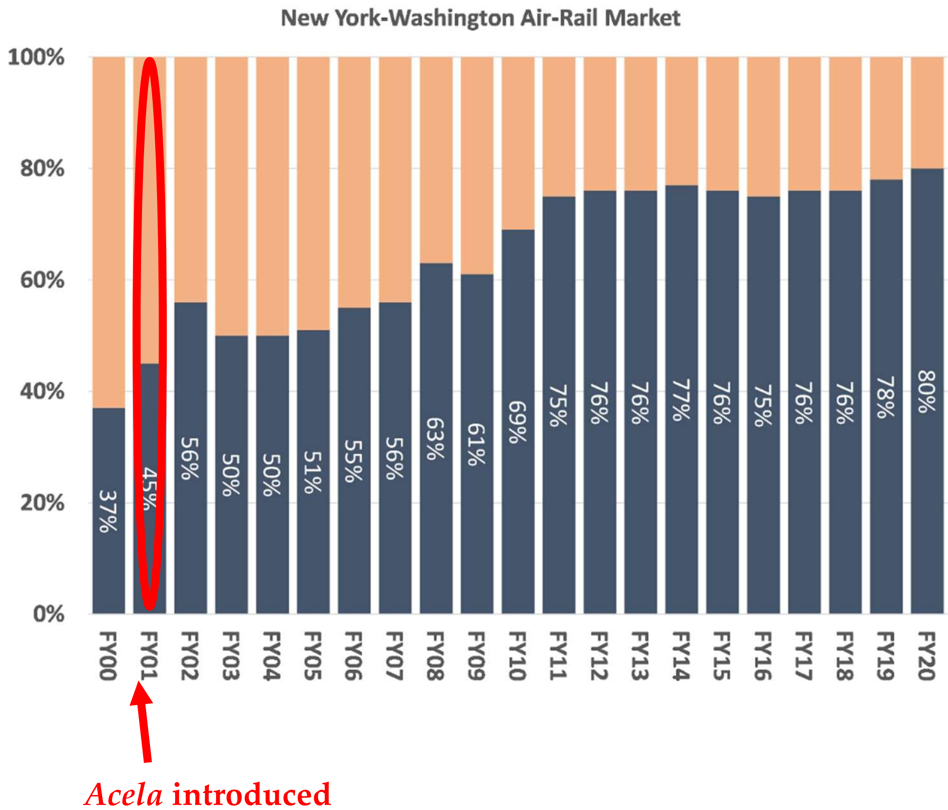
Over the next five years, Amtrak rebuilt the NEC with funds provided by the Northeast Corridor Improvement Program (NECIP), reducing trip times, and ultimately increasing maximum speeds

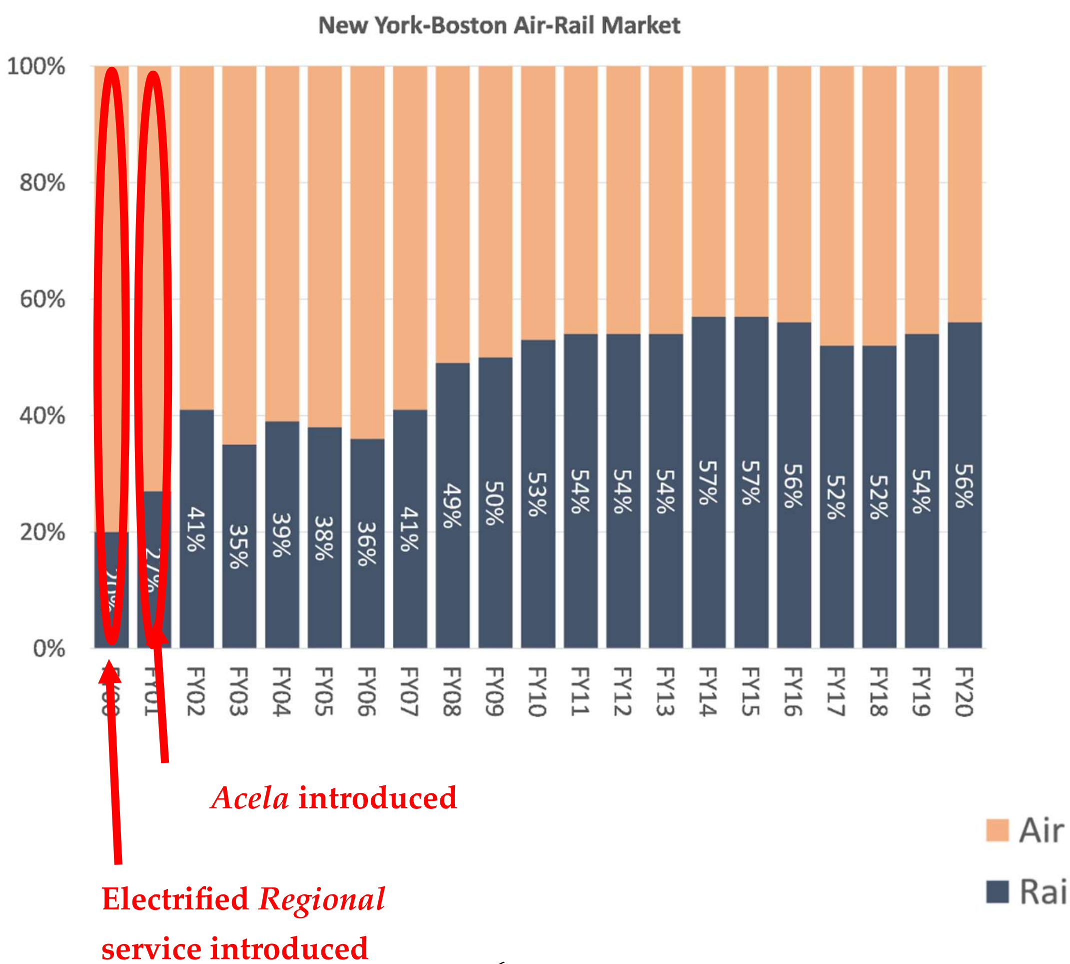
[4] https://op.europa.eu/webpub/eca/special-reports/high-speed-rail-19-2018/en/

to 125 mph. In 2000, funding appropriated for the Northeast High-Speed Rail Improvement Project (NHRIP) allowed us to extend electrification from New Haven to Boston and increase maximum speeds to 150 mph on that segment. Shortly thereafter, we introduced the high-speed *Acela* trainsets that have been the flagship of our NEC services for the ensuing two decades. Their popularity has led to widespread usage of the term "*Acela* Corridor" to describe the megaregion they serve: a densely populated corridor that accounts for 17% of the U.S. population and 20% of the gross domestic product on which the NEC is the artery that provides mobility and drives the economy.

As a result of these investments, the NEC is a very different rail line today than it was in 1976. It is the busiest railroad corridor in the Western Hemisphere, hosting (pre-COVID) 2,000 passenger trains carrying approximately 820,000 commuter and Amtrak passengers each weekday, along with approximately 60 freight trains a day. Amtrak passengers made 17.1 million trips on the NEC in FY 2019, accounting for over half of our total ridership. Today, the high speeds between Washington and New York City are 135 miles per hour and will soon rise to 160 miles per hour, as will maximum speeds between New Haven and Boston. High-speed crossovers and bidirectional signals allow trains to weave efficient paths across the railroad, Positive Train Control protects operations, and trains achieve high levels of on-time performance far surpassing those on the rest of the Amtrak system.

Improved and higher speed service in the NEC has had a dramatic effect on Amtrak's competitiveness with airlines. As shown below, from 2000 to 2019 Amtrak's share of the air-rail market between New York City and Washington increased from 37% to 78%. Amtrak's market share between New York City and Boston nearly tripled, increasing from 20% to 54%. Amtrak's NEC ridership has, of course, decreased markedly during the pandemic: March ridership was down 76% from FY 2019 levels. However, our share of the air-rail market has actually increased since the pandemic began. That trend is likely to continue if, as many observers expect, airline service in short-distance markets is not restored to pre-COVID-19 levels.


New York-Washington Air-Rail Market
Acela introduced


New York-Boston Air-Rail Market
Acela introduced
Electrified Regional service introduced
Air
Rail

Despite COVID-19, we are continuing to make major improvements in our NEC high-speed rail services.

- The opening of the Moynihan Train Hall at New York City's Penn Station at the end of last year has transformed our station facility in that city, which contributes nearly half of our nationwide ticket revenues, from a crowded subterranean chamber of daily commuter horrors into a spacious, modern, world-class station that is at last worthy of the great city it serves. Moynihan Train Hall gives new meaning to the phrase from last to first.
- The 28 next generation *Acela* trainsets that will soon begin entering revenue service will expand the *Acela* fleet by 40% and increase the number of seats per train by 25%. They will operate at higher speeds – a maximum of 160 mph – while offering improved ride quality, increased reliability, and modern contactless features. The new *Acela* trainsets have already provided large benefits to our nation's economy because they were bought in America: 95% of their components were produced in the United States by 250 suppliers in 27 states.
- We have just selected a preferred bidder to produce 83 Intercity Trainsets: dual mode trains capable of operating at 125 mph under electric power and continuing under diesel power to destinations beyond the NEC without the need for time consuming engine changes. They will replace the 45-year-old Amfleet I cars operated on our *Northeast Regional* trains and will also operate on many of our state-supported corridor routes.
- Completion of the New Jersey High-Speed Rail Improvement Program, which is replacing the electric traction infrastructure and overhead catenary wires installed in the 1930s, and upgrading track and signals, on a 24-mile stretch of the NEC between Trenton and New Brunswick, New Jersey, will allow the new *Acela* trainsets to operate over that segment at a maximum speed of 160 mph.

Because the NEC is a shared use facility, capital investments in the NEC have also provided major benefits to the commuter rail riders who account for over 90% of NEC rail travelers. The near doubling in the number of commuter trains operating over the NEC from 1976 when Amtrak acquired it to 2019, particularly the enormous expansion of New Jersey Transit service and the increase in trains between Washington and Baltimore on the MARC Penn Line from two to 31 round trips each weekday, would not have been possible without the investments the federal government has made to provide expanded capacity, increased reliability and higher speeds.

The Green Way to Travel

The history of Amtrak's ownership of the NEC demonstrates that, when Congress has provided funding to improve high-speed rail service, we have used it well on transformative projects that have produced enormous benefits. Importantly, those investments have led millions of passengers who would otherwise have driven or flown to take the train, making a major contribution to our environment.

Passenger rail service is the green way to travel, particularly on electrified rail lines like the NEC. We hear a lot of talk about other transportation modes adopting stretch goals to reduce their emissions, such as producing only electric cars by 2035. On Amtrak's NEC, we are already there. Since we completed electrification to Boston in the early 2000s, all Amtrak trains operating between Washington and Boston have utilized electric power. As a result, traveling on an Amtrak NEC train produces 83% fewer emissions than driving, and 73% fewer emissions than flying. About a third of the NEC's electric traction power is hydroelectric power generated in Safe Harbor, Pennsylvania along the Susquehanna River.

High-Speed Rail on Amtrak's National Network

The *Acela* trains account for only part of Amtrak's high-speed operations. *Northeast Regional* trains, *Keystone Service* trains and other state-supported trains operate over the NEC at a maximum speed of 125 mph. Passengers riding those trains between the NEC and destinations on state-supported routes travel at that speed for a portion of their trips, reducing their trip time. Long distance trains destined for Chicago, New Orleans, Georgia, and Florida travel over the NEC at a maximum speed of 110 mph.

On four of the corridors on our National Network, all of which are operated, maintained, and owned in whole or part by Amtrak, we operate state-supported services which reach the 110 miles-per hour threshold for high-speed rail under the PRIIA definition. All these corridors benefited from improvements funded under the American Recovery and Reinvestment Act of 2009 and/or the 2009 and 2010 Transportation Appropriations Acts that provided over $10 billion in funding for high-speed and intercity passenger rail development.

- On the Amtrak-owned Keystone Corridor between Philadelphia and Harrisburg, the initial phase of the Keystone Corridor Improvement Project (KCIP), a partnership between Amtrak and the Commonwealth of Pennsylvania completed in 2006, restored electrified service, increased maximum speeds to 110 mph, increased service frequency and extended most trains from Philadelphia to New York City. The result: 91% ridership growth from 2006 to 2019. The KCIP project's success, made possible because of Amtrak's ownership of the corridor and its ability to mobilize its workforce to complete the project in a relatively short time, has been cited in studies published in the Harvard Business Review and the Mineta Institute as a model for cost-efficient improvements in existing intercity passenger rail services. With additional investments, maximum speeds on the Keystone

Corridor, the only electrified Amtrak route other than the NEC, could be increased to 125 mph.

- On the 96-mile Amtrak-owned portion of the Michigan Line between Porter, Indiana and Kalamazoo, Michigan that forms part of the *Wolverine* route between Chicago and Detroit/Pontiac, speeds were increased to 110 mph in 2012 following the installation of the Interoperable Electronic Train Management System (I-ETMS), one of the first successful positive train control systems outside of the NEC. When, following completion of improvements constructed by Amtrak, speeds are increased on the 135-mile segment of the Michigan Line between Kalamazoo and the Detroit area that Michigan acquired in 2013, trains will be able to operate at 110 mph on approximately 160 of the 231 miles of the Michigan Line owned by Amtrak and Michigan.
- Track and signal improvements on the 61-mile Amtrak-owned Springfield Line between New Haven and Springfield, Massachusetts allowed speeds to be increased to 110 mph in 2018, and provided additional capacity that enabled Amtrak service to increase from six to nine weekday round trips and the initiation of CTrail commuter rail service.
- Trains also operate at a maximum speed of 110 miles per hour on the 79-mile portion of the Amtrak-leased, and partly Amtrak-owned, New York City-Albany/Schenectady Empire Corridor between Poughkeepsie and Schenectady.

When you add up all the trains described above, over half of Amtrak's trains operate at a maximum speed of 100 mph or more over at least a portion of their route.

Amtrak is also working with Union Pacific Railroad, the Illinois Department of Transportation, and the Federal Railroad Administration (FRA) to increase maximum speeds between Joliet and East St. Louis, Illinois on the Chicago to St. Louis *Lincoln Service* route. We are seeking FRA approval of recently completed testing for 90 mph operations, which we hope to implement within the next few months. Thereafter, additional testing will be conducted to obtain FRA approval for 110 mph operations, which could commence within a year.

Why Doesn't the U.S. Have More or Faster High-Speed Trains?

One of the questions Amtrak is often asked is why the United States does not have faster or more high-speed trains like most European countries in corridors where that would make sense. The answer is simple: money. Unlike these countries, the United States has chosen to primarily invest in highways and aviation rather than rail.

From the mid-1930s, when lightweight streamlined trains were introduced, until 1959, the United States had the fastest trains in the world. Passenger trains serving corridors like Chicago to Minneapolis, some pulled by steam locomotives, operated at speeds of 90-100 mph. They offered frequent service, with trip times that would be competitive even with today's driving times, on rail lines shared with freight trains.

In the 1950s that began to change. As European countries and Japan started investing in improved and higher speed passenger rail service, the United States opted instead to build interstate highways and airports. The federal government's decision to invest in cars and planes rather than passenger rail contributed significantly to the precipitous decline in intercity passenger rail service that resulted in the creation of Amtrak.

Today, the 150 miles per hour maximum speed on *Acela* trains places the United States 18th in the world when countries are ranked based on their fastest trains. You get what you pay for – and in the United States the vast majority of federal transportation funding has gone to highways.

In recent years, an increasing share of highway funding has come directly from taxpayers rather than from highway users. As everyone familiar with federal transportation funding knows, failure to raise the federal gas tax since 1994 caused the Highway Trust Fund to become insolvent in 2008. Since then, the federal government has appropriated over $157 billion to bail it out: nearly three times as much money, in just over a decade, as Amtrak has received over its entire 50-year existence.

By contrast, since 2010, the only federal funding available for developing or improving intercity and high-speed passenger rail, other than Amtrak's annual appropriation, has been small grants under several competitive matching grant programs such as the Consolidated Rail Infrastructure and Safety Improvements Program (CRISI) and the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) program (formerly known as BUILD and TIGER). The *total* funding appropriated for competitive grant programs for which passenger rail is eligible would not make a dent in the cost of constructing even a single high-speed rail line. Most of those programs are not limited to intercity passenger rail, and over the last four years highway projects have received the majority of the funding from programs for which they are eligible.

If highways were funded in the same way we fund passenger rail, we'd still be driving on dirt roads. If we are going to have improved intercity and high-speed rail in the United States, Congress must provide adequate, consistent, and reliable funding as it does through trust funds earmarked for other transportation modes.

What Do Successful High-Speed Rail Systems Around the World Have in Common?

While international high-speed rail systems differ in many respects, an examination of the way successful systems have been developed reveals five nearly universal commonalities.

First, the national governments in all these countries have provided significant, consistent, and predictable funding for the development and construction of high-speed rail lines over an extended period.

Second, nearly all these countries have followed an incremental approach to expanding high-speed rail service. They began by upgrading existing conventional speed rail lines for higher speeds; progressed to building dedicated high-speed rail segments along portions of routes; and over time extended their dedicated high-speed rail network along lengthy corridors on heavily traveled routes. The major exception is Japan, whose narrow-gauge rail lines through mountainous regions could not be upgraded for higher speeds. Even today, most European high-speed trains continue to share tracks with conventional rail services over at least portions of their routes, particularly in terminal areas in major cities.

Third, high-speed rail service in these countries does not exist in a vacuum. Rather, it is integrated with conventional speed intercity passenger rail service, often operating over the same tracks or as extensions of high-speed rail services, and seamlessly connected to regional rail, commuter rail and rail transit services, as well as airports.

Fourth, countries that have rapidly developed high-speed rail systems – most notably China – do not have environmental laws like those in the United States, or the same protections for private property owners' rights. That allows high-speed rail lines to be built more quickly and at lesser expense. Six years of ultimately unsuccessful environmental litigation delayed construction of Brightline's yet-to-be-completed line Miami to Orlando Airport line, which was originally projected to begin operations in 2015. Environmental requirements, and the challenges of purchasing or condemning thousands of properties to create a new right-of-way, are major reasons the initial segment of California High Speed Rail is now projected to begin service more than two decades after voters approved funding for it. No one would suggest getting rid of our environmental and property rights laws, but any realistic projection of the time required to build high-speed lines if funding suddenly became available must take those laws into account.

Finally, in nearly all the countries that have built successful high-speed rail systems, a national passenger rail operator has played a leading, and in most cases the lead, role in planning and developing high-speed rail service. Examples include SNCF in France, Deutsche Bahn in Germany, Renfe in Spain, and JNR in Japan. In order to build a high-speed railroad, you need people with experience in planning, constructing, maintaining and operating high-speed rail lines, and you want to leverage this capacity so that you can support several projects efficiently, learning valuable lessons as development progresses. In most countries (including the United States), most of those people work for the national passenger railroad, and this core capacity is utilized to drive network development.

<u>What Can We Do to Transform High-Speed Rail on the NEC?</u>

The biggest challenge we face in improving existing high-speed rail service on the NEC is, of course, the age, condition, and capacity of key infrastructure assets, such as bridges, tunnels, and electric traction systems. The good news is that most of those assets were built to last 100 years. The bad news is that many of them are now more than 100 years old. They must be replaced or rebuilt just to maintain existing service levels. Historical federal funding levels have been insufficient to address the NEC's State of Good Repair backlog, let alone make the investments required to increase speeds and track capacity for improved high-speed rail service.

The most important factor in achieving higher speeds on a rail route is not the maximum speed at which trains are able to operate, but rather minimizing places where trains must go slow. In many places along the NEC, all trains must operate at very slow speeds on infrastructure not capable of accommodating faster operations. The most prominent example is the curving, water-laden, 150-year-old Baltimore & Potomac (B&P) Tunnel just south of Amtrak's Baltimore station, through which trains crawl at 30 mph. The longest slow stretch is the 57-mile Metro-North Railroad segment of the NEC between New Rochelle, New York and New Haven, on which the maximum speed is only 80 mph. Slow speeds on the Metro-North segment are the major reason that *Acela* trip time between New York City and Boston is 51 minutes longer than between New York City and Washington, even though the distances are nearly identical and the *maximum* speed between New York City and Boston (150 mph) is faster than the 135 mph maximum between New York City and Washington.

It also does no good to have an *Acela* train race up the Northeast Corridor from Washington at a maximum speed of 135, or soon 160, miles per hour, only to come to a dead halt four miles from its New York City destination because trains in both directions are sharing the one single-track tunnel under the Hudson River while the other undergoes stopgap repairs. The additional time that must be added to schedules to account for the likelihood of infrastructure-related delays affects on-time performance and necessitates longer scheduled trip times.

Fortunately, we have an opportunity to address this problem. With realistically achievable levels of federal funding for essential state-of-good repair investments and additional investments to increase speeds, we can significantly reduce trip times and improve existing NEC high-speed-rail service.

Amtrak has identified investments, collectively projected to cost approximately $50 billion, that would enable *Acela* trains to operate at 160 mph on approximately 333 of the 457 miles between Washington and Boston and increase maximum speeds on the Metro-North segment to 125 mph. This would reduce trip times on express *Acela* trains to approximately two hours between New York City and Washington and two hours and 30 minutes between New York City and Boston.

Travel time between Washington and Boston would decrease by a full two hours, making Amtrak service much more competitive with flying. These investments would also provide additional capacity that, in addition to enabling Amtrak to increase *Acela* service frequency to every half hour, would also benefit other Amtrak and commuter rail services.

The key infrastructure investments to increase speeds and capacity that could be accomplished if this level of funding were made available include:

- Realigning curves, upgrading tracks and signals, and installing constant-tension catenary where it is not presently in place;
- Minor bridge replacements, platform reconstruction and interlocking reconfigurations where required for higher speeds or to facilitate increases in service frequency;
- Installation of additional track to provide a continuous four-to-six-track railroad along the Metro-North segment and a minimum of three tracks on the state-owned/Amtrak-operated portion of the NEC in Massachusetts;
- Construction of a new dedicated high-speed segment between Newport and Edgemoor, Delaware (Delaware New Segment); and
- Construction of a new high-speed segment on new right-of-way between New Haven and Providence (Connecticut New Segment).

The projected costs of these improvements, and the trip time reductions they would produce, are shown in the table below.

SECTION ->	WAS-NYP		NYP-BOS			NEC	
Phase	HSR Trip Times	Cost ($B)	HSR Trip Times	Cost ($B)		HSR Trip Times*	Total Cost ($B)
Current NEC	2:49		3:40			6:29	
NEC HSR Program	2:00	**$12.0**	2:28	**$36.3**		4:28	**$48.3**

*Full Corridor Trip Times exclude New York City station dwell

The Connecticut New Segment accounts for $29.5 billion of the $36.3 billion projected cost of the New York City to Boston improvements. Amtrak's plan assumes it would run primarily within the Interstate 95 right-of-way and include a new station in New London. While the projected trip time improvements attributable to construction of the new segment assumed its maximum speed would be 160 miles-per-hour, approximately 38 miles could support up to 186 mph operations, which could produce additional trip time reductions.

The projected $12 billion cost of the Washington to New York City improvements does not include the cost of four not yet funded State of Good Repair projects: replacement of the B&P Tunnel and of the Susquehanna, Gunpowder and Bush River Bridges in Maryland. While some of these projects, particularly the B&P Tunnel replacement, would increase speeds and contribute to the projected trip time reductions, replacement of these assets is necessary for reasons unrelated to speed limitations.

What is most significant about these investments is the not the higher maximum speeds they would allow on hundreds of miles of track, but rather that they would increase *average* speeds to 113 mph between New York and Washington and 94 mph between New York and Boston, both in the same range as many European high-speed rail services. These investments could be constructed incrementally as funding and track time for construction became available, providing immediate benefits before completion of the entire project.

Going Further: Investments to Achieve Below Two-Hour New York to Washington Trip Times

When President Biden spoke at our 50th anniversary celebration last Friday, he said that Amtrak's vision shouldn't be limited to reducing trip time from New York to Washington to two hours. Instead, he believes that our goal should be to operate 220 miles per hour trains with a trip time of 90 minutes.

Additional funding beyond the $50 billion scope described above would advance this goal by allowing Amtrak to begin constructing dedicated high-speed rail tracks on new alignments. The Selected Alternative in the NEC Future Plan discussed below includes the construction of five new segments, in addition to the Delaware New Segment included in Amtrak's proposed investments, between Washington and New York City. They are:

- Bayview (Baltimore) to Newark, Delaware
- Philadelphia International Airport
- Baldwin, Pennsylvania to Philadelphia
- Philadelphia to Bridesburg, Pennsylvania
- North Brunswick to Secaucus, New Jersey

The new segments would be designed for 220 mph operation. While they would be connected to the existing NEC tracks at endpoints, the new segments would be located almost entirely outside of the existing NEC right-of-way. This means that their construction would have little impact on current NEC operations, allowing it to proceed in tandem with upgrading of existing NEC tracks that requires track outages that must be limited in order to avoid severe disruptions and delays to train operations.

Trains could begin utilizing each new segment as it was completed. Once a significant portion of the new segment mileage has been constructed, additional high-speed trainsets capable of higher speed operation could be acquired and the maximum speed on the new segments increased to 220 mph, equivalent to the fastest high-speed lines around the world.

Amtrak's Proposed Investments and the NEC Future Plan

In 2017, the Federal Railroad Administration (FRA) completed a more than five-year, comprehensive planning and Tier I assessment of environmental impacts known as NEC Future that defined, evaluated, and prioritized future investments in the NEC. All the investments Amtrak has identified above are included within the Selected Alternative the FRA chose in the Record of Decision. (The Selected Alternative includes additional capacity between New Haven and Providence but does not specify how it will be provided pending further study.)

In addition to establishing a prioritized plan for future investments, NEC Future's Record of Decision also provides programmatic level (Tier 1) environmental clearances. This will enable projects included in the Selected Alternative to proceed directly to site-specific, project-level environmental reviews, greatly shortening the environmental review process compared to corridors for which corridor-wide programmatic environmental analyses have not yet taken place.

Amtrak is aware of proposals to discard the Selective Alternative that FRA has chosen for the route of New York City to Boston service, which is along the existing NEC right-of-way except for the New Haven-to-Providence segment, in favor of an alternative route across Long Island (the Long Island Alignment) that FRA considered and rejected because of its significant negative environmental and community impacts. The rejected Long Island Alignment would, among other things, require the construction of new tunnels under the East River; building a new high-speed rail line from Long Island City to Ronkonkoma, New York through densely populated urban communities; the construction of a long, deep tunnel under the environmentally fragile Long Island Sound; and construction of a new high-speed rail line through communities between Hartford and Boston. Needless to say, the environmental and impacts and enormous costs of this alternative make it highly unlikely that it would ever be constructed even if it had been selected. Giving it further consideration would serve no purpose other than to delay commencement of urgently improvements on the Metro-North segment between New Rochelle, New York and New Haven, the slowest portion of the NEC.

What Is Amtrak's Role in Advancing High-Speed Rail Outside of the NEC?

When Congress created Amtrak in 1970 to revitalize passenger rail service, a major component of its vision was that Amtrak would develop expanded and higher speed passenger rail service. A half century later, only a small part of that vision has been realized. The main reason, as I noted above, is money. However, a lack of national direction and stable leadership in developing and advancing a plan for a national network of connected intercity and high-speed rail routes has also played a role.

It is time to return to Congress's original vision of having Amtrak play a lead role in the development of expanded intercity and high-speed rail service – and this time provide the funding to enable that to happen. Amtrak brings a great deal of value to the table. Amtrak is the operator of the only high-speed rail service in the United States today, and the only U.S. company that has maintained and constructed operational high-speed rail lines. We have more than 45 years of experience in complying with the unique U.S. safety regulations for high-speed rail track and equipment. The majority of our approximately 17,000 employees are involved, directly or indirectly, in the operation of high-speed rail services, including most of our train and engine employees (conductors and engineers). Many of these employees have unique skills not possessed by other U.S. workers in areas such as construction and maintenance of electric traction infrastructure and planning high-speed rail operations and equipment acquisition. We are also the only U.S. company with high-speed rail training programs.

Amtrak also possesses unique access rights, administered by the Surface Transportation Board (STB), over all other freight and passenger rail carriers' rail lines and other facilities. While very high-speed rail services may require dedicated tracks, frequent, higher-speed passenger rail services are compatible with freight operations and are an essential component of any high-speed rail development effort to avoid the extraordinary costs and environmental impacts of building new, dedicated high-speed rail lines where they are not necessary. Amtrak trains on the NEC operate up to 150, soon to be 160 miles per hour on tracks shared with freight trains, and freight trains operate over nearly all of the Amtrak rail lines elsewhere on which the maximum passenger train speed is 110 mph.

Given the high expense of high-speed rail infrastructure, which on average was found to cost $30 million per kilometer (excluding more expensive tunneling projects) with more recent projects exceeding $48 million per kilometer in Europe by the 2018 European Union audit, maximizing the utility of the conventional network and focusing new alignment, high-speed segment construction on the highest impact, most-critical segments is imperative to properly conserve financial resources.

There are many different ways for Amtrak to participate in and bring value to proposed high-speed rail services like those whose representatives are also appearing before you today.

- Amtrak was part of one of the international teams that bid to be the Early Train Operator for California High-Speed Rail.
- We have consulting and joint ticketing agreements with Texas Central. The joint ticketing agreement will allow passengers to make reservations through Amtrak's website, app and other distribution channels for trips involving travel on both Amtrak trains and Texas Central's planned high-speed rail line between Dallas and Houston, and provide seamless connections between the Amtrak and Texas Central stations.

- We have also recently entered into an agreement with the Commonwealth of Virginia under which we will contribute capital funding to Virginia's planned upgrades along the fast-growing Washington-to-Richmond segment of the Southeast High-Speed Rail Corridor This will allow significant increases in Amtrak service frequency and set the stage for extension of Amtrak service over a newly constructed, dedicated high-speed rail line between Petersburg, Virginia and Raleigh.

We would welcome the opportunity to develop a joint-ticketing agreement with Brightline, whose proposed extension from the Orlando Airport to Disney World would operate along the same rail corridor as Amtrak's New York-to-Miami *Silver Service* long-distance trains, with which it could connect. However, existing federal law creates a major impediment to establishing connections between Amtrak trains and railroads like Brightline that the STB deems to be "intrastate." Those railroads are not subject to the STB's jurisdiction, and therefore do not have to pay Railroad Retirement or Railroad Unemployment Taxes for their employees, as long as they do *not* connect with Amtrak.

Discouraging connections between other passenger railroads and Amtrak's National Network makes no sense. Nor does treating some passenger railroads that operate over the interstate rail network, seek federal grants, and utilize federal tax advantaged financing differently from the rest of the railroad industry makes no sense. Congress should eliminate this loophole to encourage connectivity and create a level playing field for all passenger rail operators. Likewise, federal laws should be amended to ensure that foreign rail operators, most of which are government-owned, that wish to operate high-speed rail or other passenger rail services in the United States are allowed to do so only if their countries extend the same right, on equal terms, to American railroads.

Finally, if the federal government is going to invest in private developers of high-speed rail systems, Amtrak, as the federally-owned intercity rail operator, should be the vehicle for this investment. Amtrak, with five decades of marketing and sales experience, is ready to help validate high-speed rail development schemes and ridership and revenue estimates, assist with planning and design for infrastructure and operations, invest in projects and form joint ventures, provide experienced union labor, and ensure that new lines or segments are properly integrated into Amtrak's National Network so that these investments create value far beyond the project limits.

<u>Amtrak Connects US Provides a Blueprint for Near Term Expansion</u>

The Amtrak Connects US proposal that Amtrak has recently unveiled[5] sets the stage for improvement of intercity passenger rail service *throughout* the United States – not just along a few isolated corridors. The product of nearly three years of planning and consultation with stakeholders, Amtrak Connects US embodies a carefully considered vision for expanded and improved intercity passenger rail service. By adding up to 30 plus new routes and increasing service on up to 20 plus existing routes over the next 15 years, it would attract 20 million more riders annually

Amtrak Connects US would bring new or additional passenger rail service to 47 of the 50 largest urban areas. It would provide Amtrak services with multiple daily frequencies to 15 states that lack such service today, including many of the largest, fastest growing and most diverse states such as Florida, Texas, and Georgia. The only Amtrak service these 15 states currently receive is provided by trains that run just once a day, and in many cases pass through the state in the middle of the night.

Amtrak Connects US presents numerous opportunities for additional federal investments, and for partnering with states, cities and proposed non-Amtrak high-speed rail services that do advance. It is a realistic, achievable, and scalable plan that can be developed incrementally, and incorporate high-/higher-speed service where demand warrants and funding permits. Many of the routes it identifies for new or expanded service, including Portland to Vancouver, British Columbia; Miami to Tampa; Chicago to Indianapolis; Petersburg, Virginia to Raleigh; New York City to Scranton; and Los Angeles to Phoenix have segments that would be good candidates for near term 110 mile-per-hour service.

The importance of having a plan shaped by vision but not fantasy is underscored by the history of the federally-designated High-Speed Rail Network. In 1991, Congress directed the U.S. Department of Transportation (USDOT) to designate corridors on which trains were reasonably expected to reach speeds of 90 mph or more that would be eligible for authorized federal high-speed rail funding. Since then, Congress and USDOT have designated 9,200 miles of high-speed rail corridors in addition to the NEC. However, the funding required to develop high-speed rail on these corridors has never been appropriated. Thirty years later, trains operate at 90 mph or higher on only 277 of those 9,200 miles. More than a third – 3,413 miles – of the federally-designated high-speed network is served only by Long Distance trains, and 1,500 miles have no intercity passenger rail service at all.

[5] https://www.amtrakconnectsus.com/vision/

New Technologies Are Not a Substitute for High-Speed and Conventional Passenger Rail

While new technologies like Maglev and Hyperloop may capture the public imagination, they are not a substitute for high-speed and intercity passenger rail. They would serve only a small niche of the intercity travel market at a much higher cost – both financially and environmentally.

Maglev is not really a new technology. The first high-speed Maglev carrying revenue passengers opened in Germany in 1984, and a 19-mile Maglev line serving Shanghai's airport has operated in China since 2003. However, countries that have considered building a Maglev system – China, Japan and Germany – have opted to build high-speed rail lines instead in every case where that was a viable alternative because constructing a Maglev line is much more expensive than building a new high-speed rail line, and vastly more costly than upgrading an existing rail line for higher speeds.

Construction of a Maglev line through heavily populated areas would also be much more environmentally disruptive than developing or improving high-speed rail along an existing rail corridor. Maglevs are also not as energy efficient as Amtrak trains. The energy consumption of the proposed Washington-to-Baltimore Maglev that FRA has calculated is twice as high per passenger mile as the energy consumed by an Amtrak NEC train. FRA has concluded that building that Maglev line would *increase* energy consumption by 3.0 trillion BTUs annually.

In addition, the huge public expenditures required to construct a Maglev line would benefit only a small number of affluent travelers. Unlike passenger rail, Maglev is a point-to-point system that serves few or no intermediate stops and cannot share tracks with or easily connect with other services. Very few Amtrak NEC or MARC commuter rail passengers would be able to use, and even fewer could afford to use, the proposed Washington-Baltimore Maglev.

Less than 3% of Amtrak's NEC passengers travel between the three places – Washington, Baltimore and BWI Airport – the proposed Washington-to-Baltimore Maglev would serve. Even for them, using Maglev would save only a few minutes of travel time. Maglev's projected trip time from Washington to Baltimore would be only 15 minutes faster than an *Acela* train today, and just six minutes faster than the projected *Acela* trip time following replacement of the B&P Tunnel and completion of the other investments discussed above. Based on Maglev's average fares, a daily commute from Washington to Baltimore that costs $16 on MARC would cost $120 on Maglev. For less than half the projected cost of constructing a Washington-Baltimore Maglev, the parallel NEC could be transformed into a modern four-track railroad, providing significantly improved capacity, reliability and speeds for both MARC and Amtrak passengers from all economic strata.

Unlike Maglev, Hyperloop is a new unproven technology. No one has traveled in a Hyperloop, let alone at high speeds, other than company employees on short test tracks. If Hyperloops prove to be technologically feasible and safe, and are able to gain public acceptance, they would have the same limitations as Maglevs.

Conclusion

President Biden's American Jobs Plan is an important first step in developing a high-speed and conventional passenger rail system in the United States that would enhance mobility, generate significant economic benefits, and reduce greenhouse gas emissions. The potential for high-speed rail in the right markets in the United States is indeed unlimited – and largely untapped.

We urge Congress to support the President's proposal; to provide the levels of funding Amtrak has requested in its Legislative & Grant Request; and to enact Amtrak's proposals for reauthorization. Most importantly, we urge Congress to provide adequate, assured and long-term funding for intercity passenger rail service, such as the trust funds it established decades ago for other transportation modes, and that has been the key to the development of high-speed rail services in every other nation.

I thank you for your time today and for your support for Amtrak. I invite you to join with President Biden, Amtrak's employees and stakeholders, and me in celebrating what we have accomplished during our first half century, and in realizing in the years ahead Congress's 1970 vision that Amtrak provide "fast and comfortable transportation" in every region of the United States.