Statement of Josh Giegel, Chief Executive Officer
Virgin Hyperloop
before the
Subcommittee on Railroads, Pipelines, and Hazardous Materials,
Committee on Transportation and Infrastructure,
United States House of Representatives
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Chairman DeFazio, Chairman Payne, Ranking Member Graves, Ranking Member Crawford, and distinguished Members of the Subcommittee:

Thank you for the opportunity to testify today about the exciting work we are doing at Virgin Hyperloop to bring the transportation network into the 21st Century. My name is Josh Giegel, and I serve as CEO of Virgin Hyperloop. In 2014, I co-founded the company when hyperloop was just an idea on a whiteboard in a garage. Today, we have approximately 300 employees and are the leading hyperloop company in the world. Last year we added to that leadership when we became the first hyperloop system to safely carry human passengers, conducting that test on our full-scale operational prototype facilities.

The Innovative Hyperloop Technology

First, let me briefly explain hyperloop technology. The term "hyperloop" is shorthand for a high-speed surface transportation system utilizing magnetic levitation to move vehicles, or "PODs" as we have named them, within a low-pressure enclosure, while the POD is pressurized to normal atmospheric conditions – much like a commercial aircraft. The low-pressure environment all but eliminates aerodynamic drag on the vehicle, which allows a comfortable passenger experience at very high speeds while maintaining those speeds with significantly less energy than other modes of transportation. Transportation is on demand and direct to destination, which combined with the system's high speed, means dramatically reduced travel times.

Benefits of Hyperloop

Hyperloop transportation could fundamentally improve the way people and freight move and the way communities connect -- in urban and rural areas alike. It is in our national interest to support the continued advancement of this exciting industry to bring these benefits to reality sooner rather than later.

Hyperloop offers the promise of many benefits: improved mobility of people and freight, enhanced safety, the creation of new jobs and supply chains, establishing U.S. international leadership in an emerging technology, and, very important in these times, environmental and energy efficiency benefits.

Enhanced Mobility: Our hyperloop system is designed to be incredibly high-speed and high-capacity, capable of moving people and goods at up to 670 miles per hour and 50,000 passengers per hour per direction. Trips that take hours today could take minutes, providing businesses access to more extensive labor and consumer markets, and providing individuals and families with a wider range of opportunities for employment, housing, healthcare, and other services. Hyperloop service is designed to be on-demand and direct to destination, minimizing

wait times common in other modes of transportation. Practically speaking, this would mean no long waits at a portal (station) for a POD's arrival or departure; no waiting at intermediate stops for other passengers to board or depart; and no departure delays due to other PODs' simultaneous use of the same portal. A hyperloop route could serve not just the largest cities but also smaller metro areas. This system is intended to combine many positive attributes from other systems -- the speed of a plane, on-demand convenience, and the energy efficiency of an electric car -- all while being affordable, comfortable, and safe.

Safety Advantages: Safety is our top priority at Virgin Hyperloop. Our system is safe by its very nature. Because the PODs travel in an enclosed tube, hyperloop would avoid some of the greatest safety risks affecting rail or bus travel, including at-grade crossings and weather. The enclosed tube would prevent tragic pedestrian and trespasser deaths and injuries, as well as collisions with wildlife. Not only is hyperloop expected to be safer as a system, Virgin Hyperloop is committed to safety through multiple reviews of our technology and processes, not only by our world-class engineering team but also by independent safety experts and certifiers.

Economic Growth and High-Tech Jobs in the U.S.: The birth of a new mode of transportation holds the promise of boosting economic growth by spurring the development of a new high-technology industry. The ecosystem that will develop around the hyperloop industry will help the U.S. build back much better through the creation of advanced and high-tech jobs in the manufacturing, construction, and engineering industries, among others.

U.S. Leadership Internationally: Hyperloop also presents the United States with the opportunity to achieve international leadership in an emerging industry. We are a U.S.-based company creating American jobs, all while retaining the know-how and intellectual property within this country. The jobs we are creating here in the U.S. will allow our technology to be deployed around the world, solidifying the United States as the leader in and exporter of hyperloop technology.

Superior Environmental Performance: Lastly, hyperloop can be an important part of the solution as we tackle the climate crisis. Our system is designed to be 100% electric with zero direct emissions, and our proprietary magnetic levitation system is energy efficient, driving down any indirect emissions. We believe that hyperloop will be roughly 10 times more energy efficient than an airplane and use significantly less energy than other maglev systems, making it less expensive to operate. We are also designing our system to be energy agnostic, meaning we can use any type of clean energy to power our system, like solar, wind, or hydrogen power. Due to its high speed and capacity, hyperloop could also reduce roadway congestion and air pollution, for example, by reducing demand for auto travel. In addition, a hyperloop tube is anticipated to have a narrower profile than the right-of-way for a conventional rail track or a new highway lane, with portals significantly smaller than high-speed rail of equivalent throughput, using less land and reducing costs as well as environmental impact.

Virgin Hyperloop's Rapid Progress

By late 2016, only two years after I was working out of a garage, we began construction on our first full-system test site, "DevLoop", which is 30 miles north of Las Vegas. In six months, we completed construction and began testing. To date, we have completed over 500 tests of our system and its components. Several Members of this committee have visited our DevLoop test track on CODELS, including Chairman DeFazio and Ranking Member Sam Graves, in addition

to senior DOT Officials. In November 2020, through our "Pegasus" demonstration, we became the first hyperloop system to safely carry human passengers. As one of those human passengers, I can attest to the safety of the system and the exciting potential this carries to transform the way people travel.

We are at a watershed moment in our development. Our team is passionate about hyperloop's potential to revolutionize transportation for the future by enhancing mobility, increasing economic opportunities and bringing communities and regions together -- safely and in an environmentally responsible way.

As we rapidly developed and began our engagement with the Federal government, we realized that hyperloop was perceived as not fitting clearly into an existing modal administration at the Department of Transportation. Some components of our system are similar to rail, but other aspects of the system, like cabin pressurization, face aircraft-like issues. All of the various components created the need for a one-stop-shop for companies like ours to engage with the Department.

That's why we worked with the Department of Transportation and several Congressional Committees of jurisdiction on the establishment of the Non-Traditional and Emerging Transportation Technology, or NETT Council, in 2019. This internal DOT body improves agency coordination on innovative technology with multi-modal applications and has been critical to helping move hyperloop forward in the United States. We commend this Committee for including codification of the NETT Council in the surface transportation bill it developed last year. That remains a sound provision.

Our work with this Committee, coupled with the NETT Council, led to the release of the "Pathways to the Future of Transportation" guidance document by DOT in July 2020. That guidance provided a clearer regulatory framework for hyperloop.

Furthering Continued Rapid Progress for Hyperloop Would Serve the National Interest

We have a real opportunity at this moment to Build Back Better when it comes to our nation's transportation system, and we can do this in part through a U.S.-based hyperloop company creating American jobs. Federal funding supporting hyperloop would be a down payment on a faster, cleaner, more efficient transportation system connecting communities in ways not possible with existing modes.

For all these reasons, we believe funding for hyperloop is a sound investment. We believe our narrow right-of-way profile, ability to climb steeper gradients, and tighter turning radius will allow us to reduce or avoid issues that can be costly for other systems, including right-of-way and tunneling costs. We also expect that our portals will be significantly smaller than high-speed rail stations while achieving the same passenger throughput, further reducing infrastructure costs. As with all cutting-edge technologies, we expect further cost efficiencies to emerge as technology scales and matures. So, while project costs will always vary based on length, terrain, and other variables, we are always working to drive down costs in a manner consistent with safety.

Further, our very high-speed capabilities and optimized fleet management design mean dramatically increased throughput on a route. This would reduce per mile costs per passenger

or POD. Beyond immediate cost savings, greater route capacity would reduce the need to build additional infrastructure in the future as populations and ridership grow.

As Virgin Hyperloop continues to advance in its technology development toward commercial operation, the Federal government can demonstrate support for this U.S.-based technology by ensuring this type of advanced technology has a chance to access Federal funding. This could include ensuring the eligibility of applicants to seek and receive funding for pilot projects that would demonstrate the technology, as well as commercial projects.

Because of the U.S. DOT's guidance that hyperloop is subject to FRA safety jurisdiction, it is appropriate that legislation makes clear that hyperloop is eligible for any funding program for which rail is eligible, provided the application meets other requirements. This would be for routes of all lengths, for demonstrating the ability to provide passenger and/or other service, and for commercial service.

Further, the Federal government should provide additional funding opportunities for such a cutting-edge means of transportation as hyperloop. Legislation could set aside funds for emerging technology developed in the United States. As the conversation continues on funding programs for transportation, it is important to support emerging and cutting-edge transportation to bring our transportation system into the 21st-century – as well as to increase national competitiveness in an increasingly interconnected and competitive world. The opportunity exists to provide funding for this type of transformational transportation as part of larger legislation without sacrificing other modes. We must continue to invest in our future and our children's future, even as we bring other systems up to a state of good repair.

Conclusion -- The Bright Future

We can have -- in the near future -- hyperloop, a new, more efficient, faster, and sustainable component of our national transportation system that brings communities together and opens up opportunities for all. We aim to create a mass-mobility experience that is available to the broad public. We pride ourselves on our engagement with local communities, working with on-the-ground partners in, alphabetically, Missouri, Ohio, Texas, and West Virginia, to conduct feasibility studies and explore future possible routes and projects.

I have seen this company grow and our technology develop and am confident in hyperloop's ability to transform transportation in this country for the better. America has moved forward as we've moved faster – hyperloop is the giant leap.

I appreciate the opportunity to testify today before you -- policymakers who can position the U.S. to lead the 21st-century transportation revolution. It's time to build back much better, smarter, safer, and cleaner. We are proud of the bipartisan interest and support we have garnered, and we look forward to continuing to work with this Committee, Congress, and the Department of Transportation as we bring our vision to reality.

Thank you for the opportunity to appear today.

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