

Comments from American Maglev Technology Inc. to the
United States Department of Transportation, Office of the Secretary

Docket No. DOT-OST-2019-0165

Request for Comments on

Non-Traditional and Emerging Transportation Technology (NETT) Council

January 10, 2019

Just over 25 years ago, American Maglev Technology (AMT) was founded in Volusia County, Florida, with a mission to solve an age-old question that continues to haunt our generation:

How do we deploy and maintain safe, efficient, environmentally friendly mass transportation systems that are sustainable — i.e., affordable to build and operate?

For it was no secret that as the country’s megaregions were rapidly taking shape, the “state-of-the-art” for mass transit at the time — 19th century steel wheels on steel tracks, rubber wheels on concrete, oxymoronic “rapid bus” systems, or the like — was clearly not the answer to the escalating mobility crisis. The required infrastructure was far too expensive for the public sector to possibly keep up with the accelerating demand, creating a decades-long backlog of high-traffic, shovel-ready projects across the country. The handful of projects that did manage to get built (through political favor, luck, or otherwise unprecedented patience) saw huge expenditures to foreign companies for rolling stock (as there were no U.S. manufacturers) and required massive public subsidies, as fare boxes could neither finance such bulky, inefficient capital, nor cover the costs of energy and manpower required to support ongoing operations and maintenance.

There simply had to be a better way. So in 1994, on a wing and a prayer, our small team set out to design a simple, American-made solution to a complicated transportation problem. Over the next 25 years and change, we would go on to hire some of the world’s leading engineers, scientists, and consultants to help develop, refine, and optimize a lower-cost, lightweight version of magnetic levitation (maglev) technology for passenger and freight systems. We would go on to raise more than \$20 million in funding (some public, most private) to build three generations of full-scale maglev technology at three separate sites on U.S. soil, spending the interim years completing thousands of testing cycles covering a wide range of operational and safety parameters. We would go on to host hundreds of wide-eyed, highly interested customers, lobbyists, politicians and government officials from around the world who would marvel at the ability to move a 50,000-pound levitating train with the simple push of a hand. We would go on to respond to countless RFIs, RFQs, and RFPs from public and private entities desperately seeking transportation solutions. We did a lot of things right, and, naturally, we made lots of mistakes — such is the nature of birthing and innovating new, disruptive technology.

But despite all the efforts, stubbornness and perseverance, a quarter-century later, there are still no commercial maglev systems operating in the United States. Most of the mass-transit projects that were on the “backlog list” in 1994 still remain on the horizon, waiting patiently for the federal

process to begin (while other projects have been scrapped altogether). Perhaps most disappointing of all, what was widely considered the state-of-the-art of transportation technology of 25 years ago remains the state-of-the-art of today in the United States.

This begs a handful of questions. Why are there operating maglev systems in China, Japan, and South Korea — but not in the United States? Why are there no active U.S. manufacturers of mass transportation systems? And when are we going to get to work building out all these projects that were considered commercially viable and ready to go a quarter-century ago?

The answers to these questions are synergistic with the objectives of the DOT's Request for Comments on the NETT Council.

First, the regulatory process for the deployment of next-generation transportation technologies must be clarified and streamlined. We are often asked whether maglev technology falls under the umbrella of the Federal Railroad Administration (FRA) or Federal Transit Administration (FTA), and our response is rarely sufficient or clear. Yes, there are FRA rules for "high-speed maglev," like the Transrapid system operating in Shanghai. High-speed rail is intended to operate on the rail system of the United States, so perhaps this makes some sense. Over the years, we have asked the various FRA administrators and staff about how to achieve compliance in projects employing new technology. The FRA seems to be accustomed to a standard process: seeking appropriations to do new development work, followed by years of study at Volpe National Laboratory, followed by a rulemaking published in the Federal Register. With all due respect to the FRA and everything it does, we believe this is no way to run a railroad, much less a next-generation transportation system.

On the other hand, the FTA regulates people movers of all description, whether rail or rubber tires or maglev, using the Automated People Mover (APM) Standards (ANSI/ASCE/T&DI-21). The American Society of Civil Engineers (ASCE) has done a terrific job with the development of these standards for state and local governments to provide safety and security planning and ongoing reviews for mass transit systems. Compliance with the APM standards requires that all relevant state, regional, and local codes (such as local building and fire codes as adopted by the local governments, mainly for stations development). The APM standards also have a procedure for dealing with conflicts between codes and getting waivers when certain specific codes are impossible, including a standing committee of APM/ASCE representatives to issue rulings and advisories. It is also our understanding that the APM standards are internationally recognized, with international companion codes such as IEC 62267, whose safety assessment and risk mitigation approach are highly relevant to any transportation technology.

This position reflects our unique experience in working with the FRA and FTA. While the style has been different from Clinton to Bush to Obama, the bottom line is that the absence of clear and well understood rules all but prevent actual deployment of new technologies. This lack of clarity also stymies the implementation of high-speed rail systems intended to operate at speeds in excess of 79 mph.

Over our history, we at AMT have made concerted efforts to cope with, and in some cases, attempt to circumvent this "lack of clarity," with little end success to date. We offer three anecdotes as evidence, and more information on each of these projects is available upon request.

- Acting under a wholly-owned subsidiary, AMT submitted an unsolicited proposal to the Florida Department of Transportation (FDOT) in 2012 to build, operate and maintain a transport connection between the Orlando International Airport and the Orange County Convention Center — long considered the “Holy Grail” of mass transit projects due to the unwavering passenger demand. After undergoing its due diligence process (including opening up the bid to other proposers and completing a comprehensive technical review of AMT’s test track), FDOT awarded a 100-year lease to AMT in 2014 for existing rights-of-way along FDOT-controlled roadways. But despite receiving virtually unanimous support from local government entities, the project quickly became bogged down due to turf battles involving a myriad of issues, including toll-road bonds, airport fees, unilateral changes to the terms of our proposal, and perhaps most frustrating, ongoing concerns about the newness of our technology (despite FDOT’s comprehensive assessment and subsequent execution of our lease). The project, albeit currently stalled, remains shovel-ready and highly anticipated by the many local stakeholders. However, while FDOT was instrumental in considering, vetting, and ultimately approving the deployment of new technology, there was no subsequent regulatory framework or leadership to facilitate this development.
- Also in 2012, AMT responded to Colorado DOT’s Request for Statements of Interest (RFSOI) to build a transit system along the I-70 Mountain Corridor between Denver and Vail. Following an extended, intensive process that included many global leaders in transportation development, Colorado DOT found AMT’s concept to be overall “most responsive” to the RFSOI. This project is particularly significant, because it considers using the system for passengers during regular hours, and then using the system to restock the resorts and remove the trash from those treacherous mountain highways during off-hours. This unique approach to intermodal transportation has resonated with the resort operators, and it seems to be acceptable with CDOT as well as the traveling public. Again, though, no further action has been taken to date, likely due to a lack of institutional framework or path to deployment for new technologies.
- At the Ports of Los Angeles and Long Beach, where more than 50% of U.S imports and exports originate and/or depart, we have worked for more than a decade in conjunction with the Southern California Association of Governments (SCAG) and other local officials to develop a containers-only system that would run along the I-710 freeway to remove trucks from the corridor, clean up the hotbed of “cancer clusters” and polluted air in the region, and act as a viable alternative to the \$12 billion freeway upgrade at a fraction of the cost. We submitted an unsolicited proposal to the Port of Long Beach in 2018 to build out a pilot system using private financing, which would also demonstrate solutions to other 21st century challenges like transloading and establishing inland ports and warehousing facilities. Despite the added benefit that such implementation would eliminate more than 1 million tons of carbon emissions from mobile sources by the 2028 Olympic Games, the Port has yet to take action, and this project has yet to move forward.

In each of these cases, the lack of clarity and clear rules is the prime risk factor that has prevented serious consideration of new transportation technology, and we realize our story is not unique. The prevailing response to this trend has been to do what is safe — building more roads and paving over the megaregions. For Congress has still not seen fit to fund the U.S. DOT to address these new problems, which present new and much more complicated issues than we have faced in our

society under the guise of promoting the general welfare and securing the blessings that we and our posterity are endowed with as Americans.

So, what actually can be done to reverse this quarter-century curse?

The NETT Council could begin to show leadership by adopting ASCE 21-13 as the “rules of the road” for new transportation technology. This would be the beginning of the story, and definitely not the end, but it would give great engineers something to work with. In the best case, it could interface with the public and private sectors in order to foster a better and more equal life for people throughout the country’s megaregions by beginning to connect them over trips ranging from 500 to 1,000 miles. In the long run, it could facilitate the development of a new U.S.-based manufacturing giant like Boeing or General Motors to lead a global high-tech industry and create new, green jobs.

However, this process should be established with care, caution, and consultation with all the appropriate stakeholders along the way. This is not to say that prompt action is not imperative, but should such “leadership” include a litany of studies or outreach or even boosting a singular candidate technology, it could easily exacerbate or further complicate the current conundrum. In this hyper-partisan environment where an “all-of-the-above” transportation policy can be misinterpreted as something of an intentional affront to car drivers, a sop to poor folks, immigrants, and persons of color, or a personal attack on the way of life of a significant segment of the population, optics are arguably just as important as the actual policy itself.

The role of the public sector really has to be about safety and clear rules. If the public sector can clarify the scope and process to meet minimum suitable safety requirements, this may be the best first step. Getting the regulatory rules clearly presented and understood will do much to de-risk these projects. Without proper governmental oversight, we risk creating another Boeing 737-MAX situation, where a private company was enabled to set its own rules and ended up selling thousands of planes that no one will likely ever feel completely comfortable flying. And to make the situation worse, the boosterism of the Export-Import Bank (referred to by many as “Boeing’s bank”) placed unprecedented pressures on the company’s production schedules, making the once-great American aircraft builder look shortsighted to the point of being foolish.

Clearly, when the government enters the business of preemptively picking winners and urging or pressure state and local governments to accelerate deployments and complete its regulatory work on a system of trust, this creates a dangerous situation. Without a clear strategy, the will of Congress, and mostly importantly, the resources to do actual work, the NETT Council could be set up for failure.

If a more aggressive posture were envisioned for the NETT Council, it could be empowered to tap Railroad Rehabilitation and Improvement Financing (RRIF) grants or loan guarantees, which would show commitment and leverage loans, grants, and other capital from state and local government resources. Pension funds globally are looking for double-digit returns on equity, which means that only a few select toll road projects currently meet this tough requirement. If RRIF guarantees were available for 25 to 30 percent of the total project cost, when combined with Private Activity Bonds (PABs) or other tax-exempt or tax-favored bond programs, then financing

would be plentiful, and projects could be initiated to meet many large and small needs within and among the megaregions.

We have found that Wall Street has an avaricious appetite for these bonds. A recent passenger rail project that shall remain nameless sold upwards of \$2 billion in bonds. This project will never break even, much less pay back the PABs, and the bonds were reportedly oversubscribed by four times. This example is provided only to show that once projects are “de-risked,” they can be financed with zero equity.

While the concept of zero equity sounds crazy for a new-technology transportation system, this is the nature of projects, of finance, and of risk and reward. The federal government can be relieved of the insurmountable obligation to write a check for every major transportation infrastructure project, but only with the appropriate leadership established on the front end to minimize risk and foster an environment that embraces viable, American-made transit technology.

As far as AMT is concerned, we would be willing to engage with the NETT Council to help further define these leadership components; clarify the approach to establishing system certification, safety and security plans, and operating rules; and pave the way for any viable as-yet-undeployed technology to solve a transportation problem, whether it is maglev, Hyperloop, or an entirely different concept. For there is not one end-all solution to the mobility predicament we have become entrenched in. It will take a spirit of close collaboration between the public and private sectors to ensure that the best suited technology is implemented in each case. The federal government is in the advantageous position of looking no further than its own borders to tackle the impending mobility crisis and subsequently create a new, green export industry that will be the marvel of the rest of the world. We just have to get started.

As AMT continues to participate in ongoing public procurement processes like New Jersey Transit’s “Innovation Challenge” to connect The Meadowlands with Secaucus Junction, and Miami-Dade County’s procurement for a transit link between Miami and Miami Beach, we are constantly confronted with apprehension about new technologies. This is despite the fact that these projects specifically solicit a cost-effective, environmentally friendly, driverless, automated, grade-separated solution — parameters that simply cannot be met using today’s established “state of the art.” With all due respect to these agencies as they attempt to balance the advantages (hundreds of millions of dollars in lifecycle cost savings, environmental mitigation, failsafe automation, and so on) with the risks of “non-traditional technology,” the lack of guidance from the federal government appears to tip the scale in favor of Bombardier, Alstom, and other higher-cost, lower-risk foreign solutions from centuries past.

These comments are respectfully offered from the perspective of the company and not from the point of view of any public entity. We look forward to the opportunity to further discuss what has the potential to actually move projects forward toward groundbreaking and passenger revenue service, regardless of the flavor of technology.

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