

Congress of the United States
House of Representatives
Washington, DC 20515-3313

January 19, 2018

The Hon. Elaine Chao
Secretary
U.S. Department of Transportation
1200 New Jersey Avenue SE
Washington, DC 20590

Dear Secretary Chao:

I am writing to request that the Department of Transportation consider reclaiming US leadership in hydrail—hydrogen fuel cell railway technology. Hydrail appears to be a strong option for the administration's job creation and infrastructure modernization policies.

Toward the end of the George W. Bush Administration, the United States developed hydrail as a mining technology with DOE support. Congress later funded the Department of Defense's proof-of-concept hydrail locomotive, HH 1205, built by BNSF Railways and the Army Corps of Engineers. It was a success and operated in the Port of Los Angeles and various military bases before being shelved

In this same timeframe, three of our constituents conceived the passenger rail potential of this important technology and set out to bring its economic and environmental benefits to a wide variety of stakeholders, in particular the United States and the state of North Carolina.

Circa 2005, Research Analyst Jason W. Hoyle at Appalachian State University joined with Mooresville Mayor Bill Thunberg and Stan Thompson of the Transportation Committee at the Mooresville NC Chamber of Commerce to form the *Mooresville Hydrail Initiative*.

At first the *Initiative's* objective was to pioneer hydrail commuter transit service between Mooresville and Charlotte. But in the process of identifying relevant supporting expertise around the world, their purpose became an international collaboration of universities, governments and industrial entities to build support and expertise for the increased deployment and uptake of hydrail technology.

The shared international objective was to expedite hydrail development and deployment as rapidly as possible in order to (1) avoid sinking further public capital into outmoded technologies, (2) to harmonize railways, globally, with the historic trend away from exhaustible carbon fuels and toward renewable and nuclear energy, and (3) to reduce the

health hazard posed by diesel fine particulate emissions, especially in the poorest countries.

At the global scale, the *Mooresville Hydrail Initiative* has been a success. Beginning in 2005, they have convened twelve *international Hydrail Conferences* in the USA, Austria, Canada, Denmark, Germany, Spain, Turkey and the United Kingdom. The new hydrail tram and train plants in Qingdao and Tangshan, China, and Salzgitter, Germany, today stemmed in part from the *Initiative's* efforts. Ontario's Metrolinx plan to interconnect the Province using heavy hydrail self-powered double-decker "HMU" railcars also grew in part out of associations formed at the *International Hydrail Conferences*—especially the 2013 event in Toronto.

Today three of the largest railway manufactures in the world—CRRC, Siemens and Alstom—are building, or have announced, hydrail rolling-stock. Many of the most industrially-advanced countries in Europe and Asia are manufacturing and/or deploying hydrogen trains.

Our Mooresville and Appalachian State constituents have been hard at work advancing hydrail for nearly fifteen years. For the last eight years they've helped maintain America's involvement and visibility in this rapidly growing technology area.

If the nation does not act, our locomotive manufacturers—including GE and Electro-Motive Diesel—may be left with no market offerings as hydrail locomotives from offshore sell switch engines for environmentally challenged cities. As in China and Germany, hydrail manufacturing jobs will continue to be created offshore only and US employers will face an increasingly entrenched market. Having helped create what may be the single most climate-friendly technology ever, the US may miss out on capitalizing on the benefits of the technology as it sees increasing international commercial deployment.

Therefore, I am writing to ask that the US DOT consider these strategic options:

- Advocate publicly for the deployment and utilization of hydrail technology.
- Produce a regulatory framework that will allow for the deployment of hydrail rolling stock and related systems domestically.
- Prioritize hydrail as a high technology transportation initiative.
- Engage closely with international partners, particularly in Canada, who have led the way on hydrail technology.
- Facilitate the use of existing renewable energy grant funding to transit authorities for hydrail.

- Consider hydrail as part of trade negotiations to ensure that American purchasers can acquire the equipment that they need for this important technology.
- Open discussions with manufacturers with American footprints in order to explore options for using existing capacity to build hydrail equipment.
- Establish formal inter-agency collaboration with DOE and the EPA to optimize hydrail introduction location sequencing, based on transportation demand; renewable electricity proximity (especially intermittent sources, since hydrogen intrinsically stores energy); and air quality remediation needs.
- Direct US DOT funding and policy support to the nascent hydrail planning and engineering programs at the Appalachian State and Charlotte Campuses of the University of North Carolina. Since 2012, Mooresville has fostered collaboration among UNC, the Birmingham (UK) Centre for Railway Research and Education and China's Southwest Jiaotong University (of railway engineering).
- Hydrail and other disruptive railway innovations require the education of experts by universities and, a little later, by community technical colleges. When established, the availability of such education could draw international students, funding—perhaps entirely—the creation of curricula and faculty. Mooresville has positioned the University of North Carolina well with offshore railway universities to benefit from this innovation but Federal seed money could significantly accelerate the process.

Madam Secretary, until 2009 our constituents worked closely with the Volpe Center and other DOT offices. Mooresville's Stan Thompson—a planner and futurist retired from AT&T—named "hydrail" technology back in 2004; co-founded the *International Hydrail Conferences* in 2005; and has spoken on hydrail at universities and elsewhere in Belgium, Canada, China, Denmark, France, Germany, Italy, Spain, Turkey and the UK.

To get DOT started quickly, Stan would be pleased to connect whomever you wish with the appropriate international expertise. He would also be pleased to give you a personal assessment of hydrail's development over the last fifteen years and its present global status.

Sincerely,



Ted Budd
Member of Congress



U.S. Department
of Transportation

**Federal Railroad
Administration**

Administrator

1200 New Jersey Avenue, SE
Washington, DC 20590

The Honorable Ted Budd
U.S. House of Representatives
Washington, DC 20515

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Dear Congressman Budd:

Thank you for your letter regarding the role of the U.S. Department of Transportation in the development of hydrogen fuel cell railway technology, known as hydrail.

The Federal Railroad Administration (FRA) is aware that BNSF Railway (BNSF) and Vehicle Projects, LLC, developed a hydrogen fuel cell switcher locomotive and publicly demonstrated it for the first time in June 2009 in Topeka, Kansas. The project was led and funded by BNSF, the U.S. Department of Energy, and the U.S. Army Corps of Engineers. The system was built on a proton exchange membrane (PEM) fuel cell that required 99.9 percent pure hydrogen, which was not achievable at that time. Without this purity level, unwanted grime and very small particles of debris accumulated, and the PEM degraded rapidly.

The FRA's understanding is that BNSF met with parties interested in hydrail, but those meetings led to the conclusion that the railroads were not interested in making this investment. However, it may be a viable option for local passenger rail.

We are willing to explore these issues with our stakeholders, including railroads interested in using hydrail.

Again, thank you for the letter. I appreciate your commitment to the Administration's job creation and infrastructure modernization policies. If you have further questions, please do not hesitate to contact me or Christopher Hess, Director of Government Affairs, at 202-366-~~8688~~ or at christopher.hess@dot.gov.

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Sincerely,



Ronald L. Batory
Administrator