



Transport Workers Union of America, AFL-CIO

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"AMERICA'S FIGHTING DEMOCRATIC UNION"

August 1, 2022

Danyell Diggs
Office of Research, Demonstration, and Innovation
Federal Transit Administration
U.S Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590-0001

RE: Docket No. FTA- 2022-0012; Request for Information, Transit Bus Automation
Research and Demonstrations

Dear Ms. Diggs,

On behalf of the Transport Workers Union of America (TWU), I am pleased to submit these comments in response to the above-referenced Request for Information, Transit Bus Automation Research and Demonstration. TWU represents 155,000 frontline workers across our national transportation system. Our members include bus and subway operators, transit mechanics, station agents, cleaners, and many others who will be directly affected by the decisions the Federal Transit Administration (FTA) makes regarding new technology to research, develop, and demonstrate.

Our members know from decades of experience that the transit industry and our entire transportation system is constantly changing as technology evolves. Transit workers have evolved with those changes and have been on the frontlines of deploying innovations that have changed our system of mobility. As the existence of this RFI makes clear, technologies are not developed in a vacuum – the federal policies we enact and promulgate and the federal funds in research and development we direct are shaping the innovations that can improve transportation by creating good jobs and raising the level of safety in our system. Poor decision-making on these investments will have the opposite effect, degrading safety, fueling inequality, eliminating union jobs, and deskilling our most valuable asset: the transportation workforce.

The TWU believes that the FTA's research, development, and deployment programs should:

- Mirror the goals and beliefs of President Biden's Administration, as well as the Innovation Principles laid out by the Department of Transportation (DOT)
- Ensure that workers are empowered to participate in the creation and implementation of innovation policy and projects in order to allow them to benefit from new technologies
- Develop the existing workforce to build, operate, and maintain new technologies without eliminating jobs
- Exclusively pursue pro-worker, pro-safety innovations

The following comments highlight the path available to the FTA which follows these goals in order to encourage the creation of pro-worker, pro-safety technologies in our public transportation systems. Such an approach would preserve the integrity of our systems as public services rather than risk them becoming marketing tools for technology companies.

Biden-Harris Administration's Pro-Worker Agenda Should Guide the FTA's Research Programs

The historic pro-union and pro-worker policies and actions of President Biden and Vice President Harris should guide and inform how the FTA reforms and resets its research programs and investments. The Biden Administration has endorsed the most sweeping agenda in history to empower millions of workers to form and join unions. The President has repeatedly emphasized that unions built the middle class and that the best path to expand opportunity for working families is through strong and growing unions. These views have manifested themselves in a wide array of aggressive actions culminating in the release, in February, of the recommendations of the White House Task Force on Worker Organizing and Empowerment.¹ The President charged the task force as follows:

The Task Force and its members shall identify executive branch policies, practices, and programs that could be used, consistent with applicable law, to promote my Administration's policy of support for worker power, worker organizing, and collective bargaining.

Among the recommendations ultimately adopted in the Task Force's report are directives to the Department of Transportation (DOT) and its modal agencies to "incorporate[e] labor standards into discretionary grant criteria to help ensure DOT programs support good-paying jobs" and to "ensure labor's involvement in discussions on autonomous vehicles and automation in transit systems"². There is no question that these ideals apply to the research, development, and demonstration projects the FTA will fund in the coming years.

¹ Report to the President, White House Task Force on Worker Organizing and Empowerment <https://www.whitehouse.gov/wp-content/uploads/2022/02/White-House-Task-Force-on-Worker-Organizing-and-Empowerment-Report.pdf>

² Pages 34-35, Report to the President, White House Task Force on Worker Organizing and Empowerment <https://www.whitehouse.gov/wp-content/uploads/2022/02/White-House-Task-Force-on-Worker-Organizing-and-Empowerment-Report.pdf>

US DOT Innovation Principles Govern All of FTA's Research, Development, and Demonstration Projects

In January of this year, the Secretary of Transportation unveiled the agency's new approach to innovation policy: the US DOT's Innovation Principles.³ These principles reboot how our government develops and implements policy and invests technology research funds. The TWU greatly appreciates the Secretary's commitment to transform the DOT into a cabinet agency that not only cares about the safety and jobs of frontline employees, but also values their input, hands-on expertise and direct involvement in the agency's programs⁴. These principles are not rhetorical; they commit the department and its constituent agencies to funding and supporting pro-worker, pro-safety technologies to the exclusion of other projects.

Specifically, the principles adopted by the DOT obligate the research, development, and deployment projects that earn federal support to adhere to the following, among other planks:

- Serve the Administration's policy priorities (including those referenced above), as well as the goals of creating high-quality jobs, achieving racial equity, and tackling the climate crisis
- Support and empower workers by expanding access to skills and training, as well as ensuring that they have "a seat at the table in shaping innovation"
- Provide opportunities for the department to collaborate with stakeholder in order to "protect the interests of the public, workers, and communities" on "an outcomes-based approach that is technology neutral"

The innovation principles represent an important shift that lays to rest the misguided, hands-off approach of years past. A "technology neutral" approach that allows workers to shape innovation and built around "creating high quality jobs" bluntly rejects efforts to boost the AV industry (as opposed to scrutinize it). Past administrations have used public resources as marketing campaigns for these technologies – a practice which not only undermines workers, but inhibits innovation by putting government's thumb on the scale for one technological avenue. The very name and focus of the previous report ("Strategic Transit Automation Research Plan") is symptomatic of an outdated approach to innovation which is now precluded by the updated DOT principles.

FTA has an opportunity to exercise leadership and demonstrate how effective distribution of innovation research funds can, as the Secretary declared in unveiling the innovation principles,

³ <https://www.transportation.gov/priorities/transformation/us-dot-innovation-principles>

⁴ The TWU has strongly endorsed these principles saying "The DOT's Innovation Principles, in explicit terms, enshrine workers as an essential centerpiece to innovation in transportation. These principles, which also send a strong message that innovation programs must be about 'maintaining the highest standards of safety,' will guide our government's investments to ensure that federal money is used to create and sustain good, union jobs for the next generation of transportation workers."

Statement by TWU President John Samuelson in response to US DOT's Innovation Principles, January 2022
<https://www.twu.org/twu-president-samuelsen-dot-innovation-principles-will-ensure-transportation-workers-have-a-seat-at-the-table/>.

“support workers” and ensure frontline transit employees “have a seat at the table in shaping innovation.” To do so, the Administration must update its philosophy to align with these principles and apply them uniformly to all research, development, and deployment projects seeking federal support.

Transit Workers Must Have a Seat at the Table in Shaping Innovation

The most immediate action the FTA can take to implement the Innovation Principles is to ensure worker voices are incorporated into research grants. The Administration has already done this in several Notices of Funding Opportunity (NOFOs), including this year’s combined Low or No Emissions/Bus and Bus Facilities grant program.⁵ These NOFOs elevate projects endorsed by the effected workforce. They do so by prioritizing applications which include:

- a letter of support from a relevant union
- proof that the workforce has been consulted in the development of the project
- commitments to empower workers by ensuring they have a free and fair choice to join a union, create high-quality jobs, and consult with effected workers on an ongoing basis throughout the life of the project

These same incentives should be included in all research, development, and deployment projects facilitated by the FTA.

Additionally, the FTA must reject calls to fund projects which undermine workers, jobs, and labor rights. Too many bad actors solicit federal funds under the guise of “research and development” with the intention of replacing a unionized workforce or degrading their pay, benefits, and safety. For example, private mobility providers such as Uber, Lyft, and Via have marketed their services as alternatives to traditional transit. They partner with transit agencies to apply for demonstration projects which do not use these agencies’ existing workforces or which they actively market to other agencies as not requiring their existing workforces. Such schemes are altogether too common and should be publicly and forcefully rejected. Instead, using the criteria outlined above, the FTA could elevate projects like one in Columbus, OH which utilizes union workers dynamically directed to provide micro-transit and para-transit services.⁶ This shift in approach will help ensure that FTA’s significant power to spread practices between transit agencies is being used to create and sustain good jobs across the country.

Workforce Training and Development is Essential to Every Innovation Project

TWU is pleased that the DOT and FTA are deeply committed to addressing workforce issues around new technology including bus and other automation. Already the agency has demonstrated its commitment to frontline workers through its aggressive implementation of the Low or No Bus program as transit agencies transition to zero-emission buses. That program not

⁵ [FTA-2022-04621](#). See sections C(3), E(1)(C), E(2) – fleet-transition plans and workforce participation – E(1) – restrictions on autonomous vehicles – and E(2) – creating good-paying jobs with the free and fair choice to join a union.

⁶ <https://www.cota.com/services/cota-plus/>

only requires transit agencies to collaborate closely with their unions but it also sets aside significant resources to train and retrain mechanics who lack the necessary skills for this transition. This dedication should translate into the Administration's research programs.

Advanced bus technology will need to be operated by a driver with a different skill set (more below) and maintained by mechanics with a wider set of tools than required by traditional vehicles. No transit mechanic in the U.S., for instance, is trained to maintain a LIDAR system – a necessary technology in every automated driving system (ADS) we are aware of. Deployment projects which do not include training for the existing workforce on the new technologies being showcased only serve to exacerbate staffing issues at transit agencies. It does our transportation system no good to encourage agencies to purchase new equipment that they do not have the personnel to maintain or operate. Projects, in contrast, which elevate successful workforce development components will help ensure that good jobs can attract the next generation of workers into public transportation.

Carnegie Mellon University Researchers Identify Key Areas for FTA Bus Automation Research

Carnegie Mellon University (CMU) and its Traffic 21 Institute, have recently published an authoritative look at the vexing challenges around transit bus automation.⁷ The researchers, authorities on autonomous vehicles and human-automation teaming, reached powerful conclusions about the barriers and challenges associated with transit bus automation. Specifically, the report concludes that, even as the technology onboard buses advances, replacing a human operator with an autonomous system would degrade safety in public transportation.

The skills and judgement required of transit operators are very difficult to automate. Reacting in real-time to the complex operational and safety challenges that drivers encounter daily across our national transit network is a task machines are ill-suited to perform. As the report notes in its executive summary:

Due to both technical and operational challenges, transit vehicles including buses and vans will be highly likely to continue to require skilled human operators, even as automated vehicle capabilities are incorporated. The introduction of new technology will impact operator's duties and actions, as well as passenger safety and experience. Consideration of new federal policies will be important for the future of work for the 162,850 transit operators currently employed in the United States. To help maintain transit's high level of safety for passengers, it will be important to understand how automation stands to affect the roles and day-to-day tasks of trained operators.

The report highlights several avenues of research the FTA should pursue to better prepare the transit workforce for a more automated workstation:

⁷ Carnegie Mellon University and Traffic 21 Institute, How to Make Sense of Bus Automation, <https://www.cmu.edu/traffic21/research-and-policy-papers/traffic21-policy-brief-22.1---apr-14-002.pdf>.

- Added work tasks and potential new stresses placed on transit bus and van operators as autonomy prompts transitions from physical operation to supervision and emergency takeover control
- Active and passive systems that can improve a transit operator's ability to maintain safety on the road
- New oversight measures and requirements to ensure safety isn't degraded as transit systems might consider autonomous buses and vans that are marketed as capable of operating without a human operator on-board
- Hazard analysis of Level 3-5 automation in transit operations (including consultation with frontline employees and their unions)
- Infrastructure innovations to support data collection, sharing among agencies, and oversight of automated transit operations.

These are viable research questions that should be carefully evaluated and incorporated in the FTA's research portfolio. The CMU's findings should also give pause to the agency as it may receive research grant requests seeking to deploy experiments without a transit operator on-board who is able to intervene, respond to emergencies, and take control of a bus.

FTA Questions

What topics should be a priority for FTA's transit bus automation research and demonstrations over the next five years?

The effect of this technology on the workforce is paramount to every research topic. The FTA should ensure that each of its research streams includes specific engagement with stakeholders on this issue, especially with regard to maintenance and operation of new kinds of equipment.

What specific research questions should be addressed by FTA-supported foundational research within the next five years?

The CMU's list of research questions is very well-developed and can serve as the FTA's blueprint for work in this area. Additionally, demonstration projects which include strong workforce development components should be prioritized.

Are [the FTA's current] demonstration areas still needed? What additional or alternative demonstration areas are a priority? What are the biggest successes or challenges to deploying ADAS or ADS technology for transit?

The TWU believes that identifying coherent and functional driver assist technologies is an essential task for the next few years. While providers of these technologies continue to multiply, many of these companies continue to market unsafe and unhelpful features that should not be encouraged within our transit systems. At the same time, reliable features that alleviate burdens on operators such as lane-centering and curb-docking could have a major positive effect on our

systems. The FTA should elevate the best performing technologies in this area which come with a high amount of training.

Mobility-on-demand is ill-suited to automation in transit agencies and is better studied through the FTA's other existing research plans.⁸ These projects typically involve smaller, personal vehicles regulated by the National Highway Traffic Safety Administration (NHTSA). Until the FTA's companion modal agency acts to clarify the safety of automated systems on these vehicles, it would be inappropriate for the FTA to fund demonstrations of them. The other research programs at FTA are already studying the use of algorithmic assignments and dynamic route-planning (systems which have been implemented successfully using union workers in several cities) for mobility-on-demand and should continue to do so without duplicating that work here.

The TWU has a long list of safety concerns with automated shuttles and bus rapid transit projects. These concerns have been echoed by the National Transportation Safety Board (NTSB), the Federal Motor Carrier Safety Administration (FMCSA), and NHTSA as they are working to ensure the safety of these vehicles on our roadways. Unless and until this equipment can meet federal safety standards, it would be inappropriate for the FTA to utilize it in demonstration projects.

What ADAS/ADS technologies proven in other transportation applications would be useful and applicable to transit use cases?

While the TWU does not have examples to highlight for potential use in transit, we must flag that technologies in other sectors have been subject to a different set of safety, training, and oversight regimes. Aircraft automations, for instance, have been built into the Federal Aviation Administration's (FAA) larger safety management programs and require the constant oversight of two trained, physically present pilots, an aircraft dispatcher, and many air traffic controllers along any given route. Any consideration of technologies from other sectors must come with a full understanding of the circumstances in which that technology has succeeded – including and especially the human elements which guided its implementation and oversee its operation.

What activities have agencies undertaken to understand and prepare for the impacts of automation on their workforce?

The New York Metropolitan Transportation Authority's (NYMTA) transition from a token-based to card-based (and now card-optional) fare medium is illustrative of the high-road path available to transit agencies when preparing for new automated technologies. Prior to 2003, entrance into the system required a coin token, usually purchased from a person, inserted into a turnstile. Eliminating the token required transitioning thousands of workers away from their previous job duties, training the existing technician workforce to fix updated turnstiles and new card machines, and hiring thousands of the next generation of workers needed to maintain the new

⁸ Accelerating Innovative Mobility, Enhancing Mobility Innovation, Integrated Mobility Innovation, and Mobility on Demand Sandbox – just to name a few.

system, which is much more dependent on regular maintenance at the point of purchase. Through the whole process, not a single worker lost their job and the total employment in these fields increased at the NYMTA.

This success was not accidental. It was planned for in collaboration between the TWU and NYMTA management. Ticket takers and station agents were retrained for other customer-facing roles within the system. A joint group from the union and the employer developed new training materials for the technician workforce which was trained off the line on the new systems. And the workers proudly became the face of the NYMTA's hiring campaign to attract new technical workers into the jobs created. Workers from every category are still working at the NYMTA today as a result of this coordinated and effective planning.

Turnstiles and fare medium purchasing equipment are automations. While the technology may seem older, the philosophy behind this approach is perfectly applicable to newer automations the FTA is looking at today. Involving the workforce, committing to honor promises to workers, and investing in training early are the difference between a safe transition to new technology which creates high-quality jobs and one that destroys them.

What types of new skills, training, and resources may be required for transit workforce development and transition? What specific areas of workforce-related research should FTA consider? What types of resources could FTA provide to help agencies and their workers adopt transit bus automation?

As mentioned above, training for operators will need to be reconceptualized and significantly increased as the mental load of work will increase to oversee automated systems. Managing automated systems is a new skill set that bus drivers are not trained in today. The CMU research guidance is the definitive set of questions in this area as of today.

Maintenance workers will need equipment-specific training. Workforce development for these workers must be brought forward as a main pillar of any demonstration project moving forward.

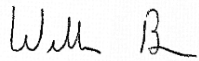
The FTA's role in helping workers "adopt transit bus automation" is dependent on which automations and the safety framework which surrounds them. The Administration should focus its energy on ensuring the highest degree of safety possible in our systems, training the workforce for the jobs necessary to achieve that level of safety (including the direct oversight of a human operator), and highlighting the agencies what are meeting these metrics. This is effectively the process for creating and disseminating best practices, which the FTA is adept at already.

TWU is committed to ensuring that the FTA's research programs are more worker-centric and reflect the historic pro-union values of this Administration. The Secretary has provided the FTA and all modal agencies a set of principles that should guide how they direct taxpayer-funded research dollars to advance new technology. The steps outlined above would not only bring the FTA in line with these governing documents, but would help set up our public transit agencies as

economic engines for our communities which offer high-quality jobs, as well as efficient, effective service to riders.

We look forward to working with you to advance these goals and to participating in the future research projects and initiatives funded by this agency. Thank you for giving us the opportunity to share our views.

Sincerely,

A handwritten signature in black ink, appearing to read "Willie B.", written in a cursive style.

Willie Brown

International Vice President

Director – Transit, Universities, Utilities and Services Division

WB:sg

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