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Jobs and Automation in the Freight and Warehousing Sector

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POLICY BRIEF

Issue

Today there are companies experimenting with autonomous mobile vehicle and equipment technologies. These technologies come in various forms, from small delivery robots to large automated heavy-duty trucks and cargo movers. Some of these have been part of the labor force in factories, warehouses, and distribution centers worldwide for some industries, and their expansion is likely. A recent white paper from UC Davis assesses the landscape for freight automation and its potential labor impacts in the freight and warehousing sector.

The paper concludes that the extent and timing of adopting these technologies will vary across settings. For example, mass adoption of driverless heavy-duty trucks may be some years away, except for in controlled environments such as ports, large factories, or logistics centers where many are already in testing and early deployment. The white paper aimed to address questions about whether and how various autonomous technologies will affect individuals in the labor market. While there are still more

questions than answers, it is known that as the technology matures, the future for workers will depend on policymaker and industry actions. While these actions can have potentially negative effects for some workers (e.g., job loss or reduced job quality), they can have positive effects for others (e.g., improved safety, security, job quality, and new high-quality jobs).

Key Research Findings

Short-term job loss is not anticipated in long-haul or warehousing sectors. Uncertainty remains about the timeline and scope of job losses associated with automated technologies. Different segments of the truck driver population are likely to be impacted differently. In the short-term (0-10 years), attrition is expected among freight truck drivers, 25% of whom are over the age of 55. This reflects an older driver workforce than nationwide workforce averages. The warehouse sector is anticipated to see short-term job growth, accompanied by large-scale expansion of robots and other automated technologies inside facilities. For warehousing, short-term concerns remain regarding changes in the quality of the available jobs.

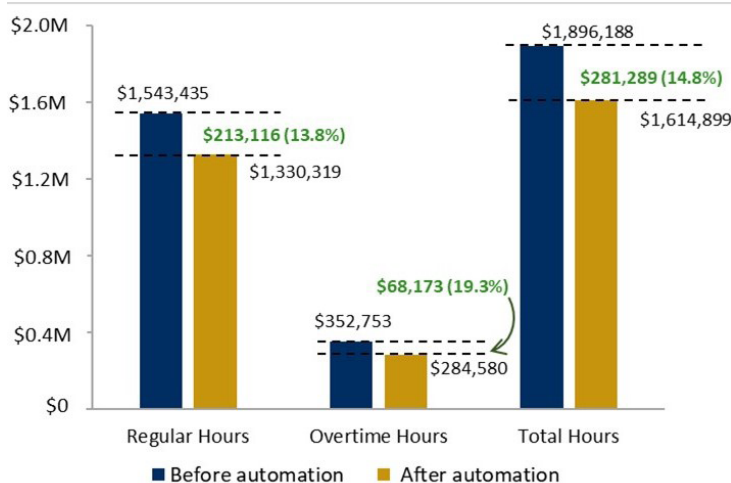


Figure 1. Salary expenditure for drivers of power industrial vehicles at USPS's Pennwood Place sorting center before and after addition of autonomous mobile robots, period 2016-2017. (Adapted from USPS report ¹)

Efficiency gains offer opportunities for new jobs. The introduction of automated technologies in freight and logistics has correlated with increases in efficiency and, for some companies, gains in profit and growth in hiring. Retailers and logistics companies have continued to expand their workforce but have also invested in automated technologies to increase efficiency, thereby reducing the human labor required for every dollar worth of product sold (in some cases by more than 90%). For example, the US Postal Service deployed automated technologies, with a demonstration in 2017 resulting in a 14.8% reduction in salary costs. (Figure 1).

Automation can yield some benefits for workers but concerns about worker pay and job quality remain. Automated equipment can remove physical burdens from warehousing workers and make workers less susceptible to injury. Similarly, partial vehicle automation (such as level 1–2 automation [as defined by the Society of Automotive Engineers](#)) offers safety benefits that protect drivers from preventable accidents, e.g., by monitoring fatigue and providing emergency braking. While automation can improve safety and working conditions, the efficiency of automated systems, especially for repetitive simple tasks, could lead companies to lay off workers whose duties can be automated or increasingly monitor and manage workers through targeted efficiency rates. And as automation can reduce costs, wages would be affected. How the market responds to these efficiency gains and their impact on wages for existing and new types of jobs is still uncertain.

There are only limited federal worker-retraining programs. The US Department of Labor provides some relief to a narrow set of workers facing layoffs. Programs like the Workforce Innovation and Opportunity Act (WIOA) Dislocated Worker Program are insufficient to meet the needs of all types of freight workers.

Policy Implications

Overall, there are positives and negatives associated with the use of automated technologies in the freight industry, with varying effects on workers. Looking ahead, it is important to consider strategies, such as the following, to support the development of policies and take action to aid workers impacted by automation.

Bring everyone to the table. Bringing stakeholders from labor, industry, advocacy, and government together to discuss labor issues is not a new strategy. But recent noteworthy initiatives include the High Road Transition Collaborative, under the Community Economic Resilience Fund and the High Road Training Partnerships, which focus on fostering solutions that can leverage technological advancements that will result in shared economic prosperity and social good.

Expand job training efforts. In the rapidly changing freight industry, a direct connection between training opportunities and the jobs that individuals may perform is vital. More transparency and thorough documentation of technological progress may lead to better anticipation and development of training programs. Training for transitioning workers, within or outside the current industry, will help mitigate the direct impacts on workers, allow many to develop the skills necessary for new positions, or provide safety nets for displaced workers.

Expand efforts for automation technologies that can improve worker safety. It's possible that some workers will benefit from the technological benefits and others will not. Regulators and other policy makers are in a position to serve as arbiters, weigh tradeoffs, and listen to perspectives to encourage adoption of technologies that benefit workers and do not only reduce costs.

Expand and target existing workforce social safety nets. Expanding the scope of federal aid may be necessary to help the many workers in smaller firms, independent contractors, or part-time workers. Effective aid programs may need to also consider displaced workers who may not seek placements within the freight industry, despite the availability of training programs.

More Information

This policy brief is drawn from “Jobs and Automated Freight Transportation: How Automation Affects the Freight Industry and What to Do About It,” a white paper from the National Center for Sustainable Transportation, authored by Miguel Jaller, Carlos Otero-Palencia, and Mollie C. D’Agostino of the University of California, Davis. The full report can be found on the NCST website at <https://ncst.ucdavis.edu/research-product/jobs-and-automated-freight-transportation-how-automation-affects-freight-industry>

For more information about the findings presented in this brief, contact Mollie D’Agostino at mdagostino@ucdavis.edu.

¹USPS, Office of General Inspector. (2018). *Autonomous Mobile Robots and the Postal Service*. <https://www.uspsaig.gov/sites/default/files/document-library-files/2019/RARC-WP-18-006.pdf>

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