Transportation Automation and Employment in the United States

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William Holincheck

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

Signed: _____

Approved: _____ Date _____
Peter Norton, Department of Engineering and Society

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Labor automation in the United States is causing workers and companies to adapt. According McKinsey Global Institute, about one quarter of all U.S. work is subject to automation by 2030, and up to 160 million workers will need to change their field of work (Manyika, et al., 2017). In response, some workers learn new skills, while others lobby legislators to guarantee their place in the system. In transportation, Uber and Lyft are developing self-driving vehicles and human drivers' place in the system. In the U.S. state and local governments draw in autonomous companies through lax regulation. Large employers in the transport sector present automation as inevitable technological progress, while its critics characterize it as a way to subordinate human workers even without benefit to consumers.

Review of Research

Bessen, et al. (2019) and Benzell et al. (2015) analyzed automation and employment mathematically, considering economic trends and the forces behind them. Acemoglu and Restrepo (2018) include a history of automation and labor. Gasper and Carney (2019) found that when drivers had their vehicles turn on partial automation, they spent more time looking away from the road. Boy (2005) discusses how the interface between human and autonomous system should appeal to human instinct towards safety. *Harvard Business Review* (2019) concluded that trucking as a profession will maintain a core labor force as many trips stay local and the task of loading and unloading the freight is difficult to automate.

According to De Freitas et al. (2019), the trolley problem is non-representative of circumstances autonomous vehicles find themselves in. Situations will not be so binary, and such life-threatening situations are not reliably interpreted.

Cohen & Sundararajan (2015) discuss self-regulating organizations as a concept and through the ride-hailing companies Uber and Lyft, among others. They propose four types of self-regulated organizations: voluntary with no government intervention, coerced under threat of government regulation, sanctioned where government approves industry guidelines, and mandated where government requires industry to self-regulate. The Institute of Nuclear Power Operations is used as an example for self-regulated organizations, earned trust through professionally handling problems that arise. The paper claims that self-regulating organizations rely on an image of trustworthiness and reputation to have negotiation power as well as strong sales.

Technology allows unskilled workers to replace skilled workers

Near the start of the Industrial Revolution skilled textile workers would go through apprenticeships for years to earn the right to work in the industry. The introduction of new machines like a wide stocking frame and gig mill allowed unskilled workers to outpace production of the skilled workers (Randall, 1997).

A taxi driver must pay for an expensive taxi medallion, while driving for Uber or Lyft requires no such payment. A taxi driver a decade ago would have still been using their personal memory of the city's road network to plot the rider's course, while drivers for ride-hailing companies simply follow what the GPS tell them. Taxi drivers express their discomfort through lobbying to restrict the functions of ride-hailing companies. In New York City, the Taxi Workers

Alliance rallied support for legislature that would place a cap on the number of ride-sharing vehicles as well as requiring Uber and Lyft to pay better wages. This bill applies pressure to the ride-hailing companies while allowing taxi drivers to continue with life as usual (Salazar, 2019).

A trucker named Finn Murphy writes about how he knows he will soon be replaced by autonomous trucks coming from any of the companies running tests on them now. He calls the autonomous trucks his power loom, an advancement in technology that will displace skilled workers in the field. Finn points out the millions of truckers that will be displaced in some way by autonomous trucks and how there doesn't seem to be a safety net of any kind to handle them. Finn questions why the pursuit of innovation seems to be outpacing any consideration of how it will affect society as a whole (Murphy, 2017).

Workers deeply displaced by automation are likely to seek education and training for entirely new fields. Markle's Labor Task Force program acknowledges "the nearly 70%" of Americans "who do not have a college degree" (Markle, 2018). This task force identifies the need for skills as opposed to specific degrees and continual training of workers while in the work force. Aspen Institute's Future of Work claims it seeks to **"**enable workers to access skills training, good jobs, and new economic opportunities" (Aspen, n.d.). Groups like these say that a diverse skill set is a worker's insurance against job displacement from automation.

Ride-hailing companies automate to diminish commitments to drivers

Uber and Lyft are developing of autonomous vehicles. In its IPO filing, Uber states that they "believe that autonomous vehicles will be an important part of [their] offerings over the long term" and they "incurred $457 million of research and development expenses" (Uber,

2019). In 2018, the CEO of Uber, Travis Kalanick said “If you’re running a tech company and you’re not making new innovation, you become part of the past” (CNBC, 2018). In Lyft’s IPO filing they explain “research and development expenses increased $164.2 million … in the year 2018” to over $300 million, driven by “efforts to launch new innovations, including our autonomous technology efforts” (Lyft, 2019)

Uber and Lyft have both resisted their workers’ interests in benefits. In their IPO filing, Uber acknowledges “business would be adversely affected if Drivers were classified as employees instead of independent contractors” (Uber, 2019).

Worker groups like Gig Workers Rising pursue employee status for drivers. It strives for a driver’s union and for the benefits of employee status (Gig Workers Rising, n.d.). In California, Assembly Bill 5 built upon the Dynamex court ruling to expand the definition of employee to include Uber and Lyft drivers. The California Labor Foundation supports AB5 when saying they’re “not about to allow greedy corporations to flout the law or delay its implementation” (California Labor Foundation, 2019). California Assemblywoman Lorena Gonzalez says “the one clear thing we know about Uber is they will do anything to try to exempt themselves from state regulations that make us all safer and their driver employees self-sufficient” (NBC News, 2019)

Uber, Lyft, and some of their drivers campaign against employee status. The coalition Protect App-Based Drivers and Services, which states it has major funding from Uber and Lyft, has the support of thousands of drivers that prioritize the flexibility offered under independent contractor status (Protect App-Based Drivers and Services, 2019). This coalition also supports measures to overturn Assembly Bill 5 arguing that it forces drivers into strict schedules and mandatory hours. The California Trucking Association pursued a lawsuit for exemption from

Assembly Bill 5 and succeeded. The ruling detailed how the long-standing system in place for truckers would be disrupted by changing employee status (CTA, 2020). This ruling fuels the Uber and Lyft suit, adding there is no rational basis to differ between the industries.

In New York City, Uber helped organize the Independent Drivers Guild. This labor group was comprised of Uber drivers and allowed to hold a collective voice to Uber. However, this also comes with the stipulation that guild members can't unionize or claim employee status for five years. As in California, some drivers prefer independent contractor status while others really need the benefits that come with being an employee (Fingas, 2016). The Machinists Union, which helped create the IDG, has in the past worked with black car drivers to earn them employee status and benefits. Their experience in the field makes them believe they can work for similar rights in Uber drivers.

Zeljko Jeftic, a leader in the World Road Transportation Organization, proposes multiple ways that human truck drivers could interface with autonomous vehicles. In a single truck delivery, the most difficult parts to automate are the start and the end. When the first wave of autonomous trucks is deployed, they will need human guidance on the ends. Jeftic says this could either be from a driver in the cabin or remotely controlled. The truck cabin might look more like an aircraft cockpit in a truck fitted for autonomous long hauls. Jeftic does admit that fully autonomous vehicles will not be feasibly ready to hit the road in the next 10 years (Rajamanickam, 2019).

Industry self-regulates to avert public regulation

Private groups like automation companies, research groups, and trade associations propose guidelines for autonomous vehicles. The Society of Automotive Engineers devised a

classification of six levels of automation in vehicles, which they then use to define how research should be conducted at each level (Society of Automotive Engineers, 2019). Additionally, the SAE holds seminars to help industry professionals learn about the systems that go into autonomous vehicles. The International Transport Forum suggests the expansion of insurance will organically regulate autonomous vehicles. The ITF further discusses the merits of industry regulation and how market forces will drive companies to good practices.

Some governments are rejecting the current levels of self-regulation ride-hailing companies have imposed. Austin, Texas held a vote on Proposition 1, which would allow Uber and Lyft to self-regulate their drivers in the city. Uber and Lyft spent over eight million dollars to urge people to vote in favor of Proposition 1, but the voters chose to oppose the bill. Ride-hailing companies were left with the need to comply with taxi driver regulations like fingerprinting. Uber and Lyft stopped all operation in the city after the proposition failed (Jervis, 2016).

Unions and trade associations favor regulation

Groups like the Transportation Trades Department lobby directly to Congress to ensure the human driver has a spot in an autonomous system. In 2019 the TTD came to Congress with eight core policies. These policies look to maintain the collective bargaining unions hold currently, require human drivers in all autonomous vehicles, and have companies provide training for the new systems. Additionally, the TTD argues for stricter federal guidelines about what vehicles are allowed to be autonomous as well as a method of evaluating how the autonomous vehicles are interacting with transit, jobs, and budget. The Transport Workers Union of America is fighting against removing bus operators, claiming an empty seat “can’t assist in an

emergency, help senior citizens get on board, call 911" among other things (Transport Workers Union, 2019).

The group Human Driving Association works to make sure humans always have the possibility to drive through their platform. In their website's manifesto they believe every car should be made with a steering wheel, are in support of traffic neutrality, and believe all connected programs should be opt-in. They also say they are pro-technology but only as a means, in favor of using Advanced Driver Assistance Systems to help keep vehicles safe, and support increasing driver license standards (Human Driving Association, n.d.).

Bus unions in the U.S. threaten strikes in protest to cities pushing autonomous buses. In regards to bringing autonomous buses to Columbus, Ohio the president of Transportation Workers Union of America said "for the sake of our own members, we will take strike action in Columbus, Ohio before we come off these buses." The bus drivers don't believe that a computer will be able to make effective decisions under rare circumstances. The drivers refer to the actions they took during the attacks on September 11, 2001, claiming that an autonomous bus could not get passengers to safety. The drivers also say that caring about the members of the community is an important part of the job that a computer would not be able to do (Aubry, 2018).

In 2018 Rideshare Drivers United was formed to protect the interests of drivers. The group believes tech companies can exploit their drivers more and more because they don't interact with each other. Their core belief is that interaction between the drivers and creating real connections allows them to hold a collective voice to the tech companies. The members are mostly located in California, a hub for ride-hailing companies, but want to spread to other chapters across the country (Drivers United, n.d.). The group also coordinated a massive strike in May 2019 ahead of the company's IPO. The strike spanned 10 cities and on the list of drivers'

demands was a 10% cap on commissions taken by the ride-hailing firms, public breakdown of where customer money goes, and a living wage.

U.S. regulatory systems lead to a competition between states

The United States Department of Transportation explains its role in the future of autonomous vehicles. The DOT can run its own research into the safety of a particular autonomous vehicle. Among their guidelines are "establish performance-oriented, consensus-based, and voluntary standards," and "identify and remove regulatory barriers to the safe integration of automated vehicles" (U.S. Department of Transportation, 2018)

The ITF also discusses how states like Michigan that allow autonomous vehicles to be used only for testing actually drive away potential companies looking to test there. Michigan clearly allows autonomous vehicles in some use cases while many states have no regulation banning or allowing autonomous vehicles. ITF states companies might have testing procedures

that don't qualify under Michigan's system and would rather go to another state (International Transport Forum, 2015).

Arizona and California have been easing regulations in an attempt to woo automation companies to their state. In 2016, California DMV revoked the registrations for Uber's test fleet stating that the vehicles were not registered as autonomous test vehicles (Schneider, 2016). Uber sent their test fleet to Arizona shortly after. Arizona Governor Doug Ducey said "California may not want you, but we do." Arizona's registration treats autonomous vehicles the same as human driven, providing a lower barrier than California (Randazzo, 2016). In 2018 California made the first move to allow driverless cars on the road (Hawkins, 2018) and Arizona soon followed

(Randazzo, 2018). Many companies like Uber are located in California, but the state's requirement on autonomous registration causes companies to look elsewhere.

Pittsburgh has also been a hub of autonomous vehicle testing with their relatively lax regulation. By not requiring a specific autonomous test license Pittsburgh drew Uber to test in the city. Pittsburgh's regulations are effectively requiring companies to submit their plans to test ahead of time, as well as reporting on data they collect (Associated Press, 2019).

Entities champion autonomous vehicles without fully considering the drawbacks

Arizona Governor Doug Ducey has very publicly stated his affection towards autonomous vehicles, drawing companies like Uber, Waymo, and Intel to test in Arizona. Ducey issued an executive order allowing testing to occur on public streets, and in his announcement brought up how many deaths are caused by human operated vehicles and how autonomous vehicles will reduce them. Operating under little government oversight, a crash involving an Uber test vehicle killed Elaine Herzberg. Ducey suspended Uber's testing operations in Arizona within a week (Randazzo, 2019). Similarly, Pittsburgh regulations were updated to require companies to report crashes that result in injuries of any kind as well as require two human backup drivers in every test vehicle.

Groups like Axios analyze data that points out how most of the current crashes aren't caused by a failure of the autonomous vehicle. They do note that while an autonomous vehicle might not be at fault, a better system would be able to avoid more of these crashes altogether (Kokalitcheva, 2018).

Automation in transportation will likely have different effects on different racial demographics. Andrew Jordan, president of an Ohio bus driver union says that autonomous

buses “would be devastating in the African American community as predominantly the bus drivers are African American” (Madrigal, 2018).

Automation will ultimately reduce the total number of jobs

While the introduction of new technology creates new jobs that can’t always be anticipated, at some point in the future automation will replace jobs faster than new ones are created. As global population increases as well, societies need to account for a large unemployed population that was forced out by automation.

Former presidential candidate Andrew Yang centered his campaign around the concept of Universal Basic Income (Yang, n.d.). The base idea is that the government sends every citizen a monthly stimulus, enabling individuals who don’t work to survive. Yang also warned the country of the upcoming impact of automation on the labor force, and suggests the UBI is a perfect solution. Trials of UBI programs like Stockton, CA illustrate growing support for the idea. Stockton’s results showed over 80% of participants spending their money on groceries, bills, and other necessities (Tubbs & Martin, 2019). Critics like Oren Cass argue against a UBI saying that it will reduce an already record low labor participation rate (Vagle, 2020).

Bill Gates has proposed what is called a robot tax. When a human works a job, they pay income tax on the payment they receive for the work. If that job is simply replaced by a robot then the total taxable income goes down and that individual is out of a job. If the owner of that robot would be required to pay the same taxable income, the government could put that money towards funding another job for the human to work. This would move a lot of the labor force into industries not easily automated, like school teaching and care taking (Delaney, 2017).

Conclusion

As automation is worked into transportation industries many jobs will still require human intervention. Tech companies look to autonomous vehicles and other innovation as a necessity while the voices of workers and unions try remind them that the tech is a means to an end. State and local legislatures have engaged in an anti-arms race of regulation on autonomous vehicles to entice companies to bring their fleet, which could lead to more cases like Elaine Herzberg. While four years ago it would seem that tech companies and legislatures were shaping the field of autonomous vehicles alone, labor groups are forming and are lobbying hard to earn a spot at the table.

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