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THE HIDDEN COST OF COVENIENCE

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## ABSTRACT

The research presented here investigates the impact of ever increasing service levels provided by some of the world's largest e-commerce players on the frontline workers who strive to fulfill them. One recent byproduct of the e-commerce revolution has been the demand for faster and more convenient delivery options when buying online. Thanks to what has been coined the "Amazon effect", e-commerce retailers large and small feel the pressure to preform to the standards set by Amazon's innovation. In the race to provide consumers with the best possible service, it is almost always the workers who face the harshest burdens in an effort to fill unrealistic quotas and meet exorbitant demand. Whether it's the pickers and stowers overexerting themselves in the distribution centers or the delivery drivers recklessly breaking speed limits, the pressure of operating an "instant" or "on-demand" delivery network can have severe repercussions both in terms of physical and mental wellbeing. The following pages document only a sliver of the effects of employment in and instant-delivery environment but overall serves to paint a comprehensive picture of the nature of the work. The second part of the paper analyzes the issues discovered in the course of research and presents a number of potential solutions to those issues. A range of solutions are presented that attempt to increase worker wellbeing while providing minimal costs in either monetary or efficiency terms. In a world where consumers profess to care about and make buying decisions based on a business's sustainability record, it's only a matter of time before knowledge of working conditions in instant-delivery environments begins to impact profitability. It will be up to consumers and businesses then to decide whether efficiency is worth the cost of worker wellbeing and vice versa.

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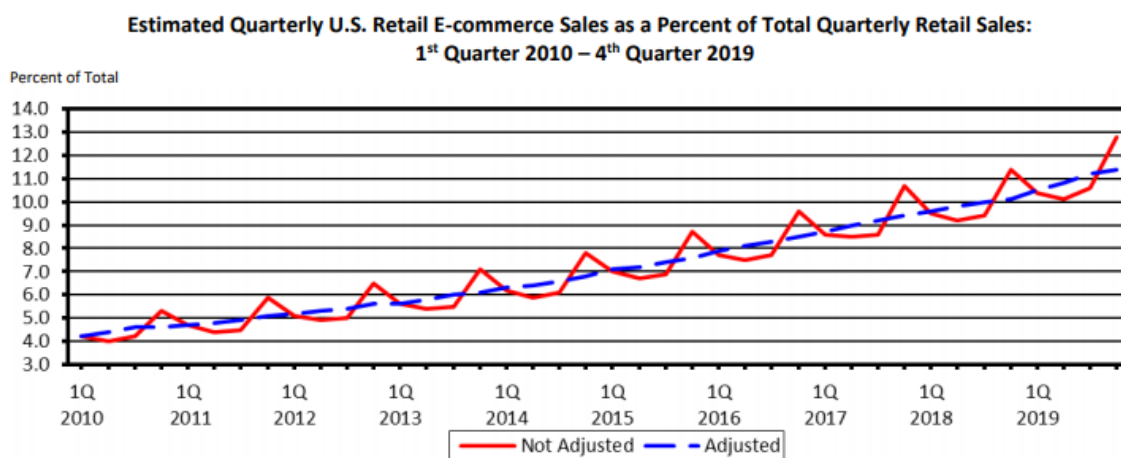
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## Chapter 1

### Introduction

Since around the turn of the century, the rise of personal computers, and the rapid adoption of the internet, has created a much different world. Industry sectors such as communication, education, entertainment, and much more have changed drastically in the past few decades thanks to the popularization of these new technologies. Perhaps one of the most visible paradigm shifts comes from the retail sector with the shift towards e-commerce and away from the more traditional “brick and mortar” buying. As recently as February 19, 2020 the U.S. Census Bureau released data on the increase in e-commerce retail sales as a proportion of overall retail sales since 2010. The information can be seen represented graphically below in Exhibit 1 and displays a steady rise in e-commerce sales over the past decade.



**Exhibit 1. US Census Bureau Retail Data**

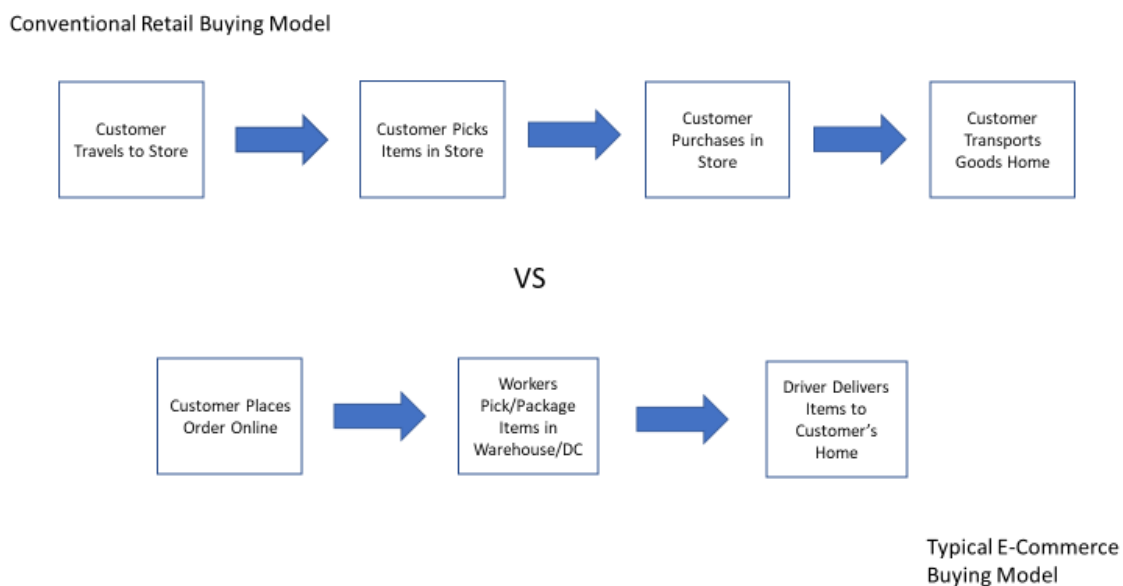
Cities and towns around America are increasingly littered with once thriving malls, now much more reminiscent of western ghost towns. Brick and mortar locations are increasingly being

liquidated and vacated as more and more consumers come to the realization that they can now find almost anything they need on-line, without having to spend their time or leaving the comfort of their homes.

One particularly fascinating evolution within e-commerce in recent years has been the advent of “On-Demand Delivery” or “Instant Delivery” by many of the major players within the e-commerce space. On-demand or instant delivery will be defined as the service of delivering a product within forty-eight hours of the time of purchase, i.e. two-day, next day, same day, half hour, etc. Amazon.com was the firm to really pave the way for on demand delivery, as they have tended to do with numerous other e-commerce innovations in the past, but many other players in the e-commerce space have since followed suit. Apple, Barnes and Noble, Target, Verizon, Costco, Home Depot, and Walmart, just to name a few, all offer shipping in two days or less on some portion of their inventory. It has reached a point where consumers in the United States are afforded the luxury of having almost any product delivered at little or no extra cost to themselves within forty-eight hours of purchasing.

This new trend is unlikely to decrease or reverse anytime soon. Rather, as often happens under a free market system, the countless online retail players will, in an effort to outdo their competitors, offer faster delivery times and increasingly convenient service to their consumers. Amazon already offers their Prime members living in select large cities the option of same day delivery and in some cases will even promise delivery times as low as two hours through the Prime Now service. It is easy to take for granted just how much these service level innovations have changed the day to day lives of millions of consumers around the world, all for seemingly no or nominal cost to said consumer. Many consumers, especially those of the younger generation who tend to be more willing to embrace change brought about by technology, now

find themselves with significantly more free time than previous generations as a result of no longer having to spend the time required to make purchases under a BISPIS (Buy in Store Pick up in Store) model. The models shown in exhibit 2 below provide a general visual guide to the difference between traditional brick and mortar purchasing and more modern e-commerce buying. The models are incredibly simplified and do not account for the innumerable variations that could be present in each model in reality.



**Exhibit 2. BOPIS vs BISPIS Model**

Things are never as simple as they look, however, and to cite one of the golden rules of economics, “there ain’t no such thing as a free lunch”. Everything has its cost, some can be determined by looking at simple financial metrics while others are hidden and more difficult to quantify. In the case of operating massive supply chain networks at such high service levels, the cost undoubtedly exceeds the sticker price of \$12.99 a month for Prime membership.

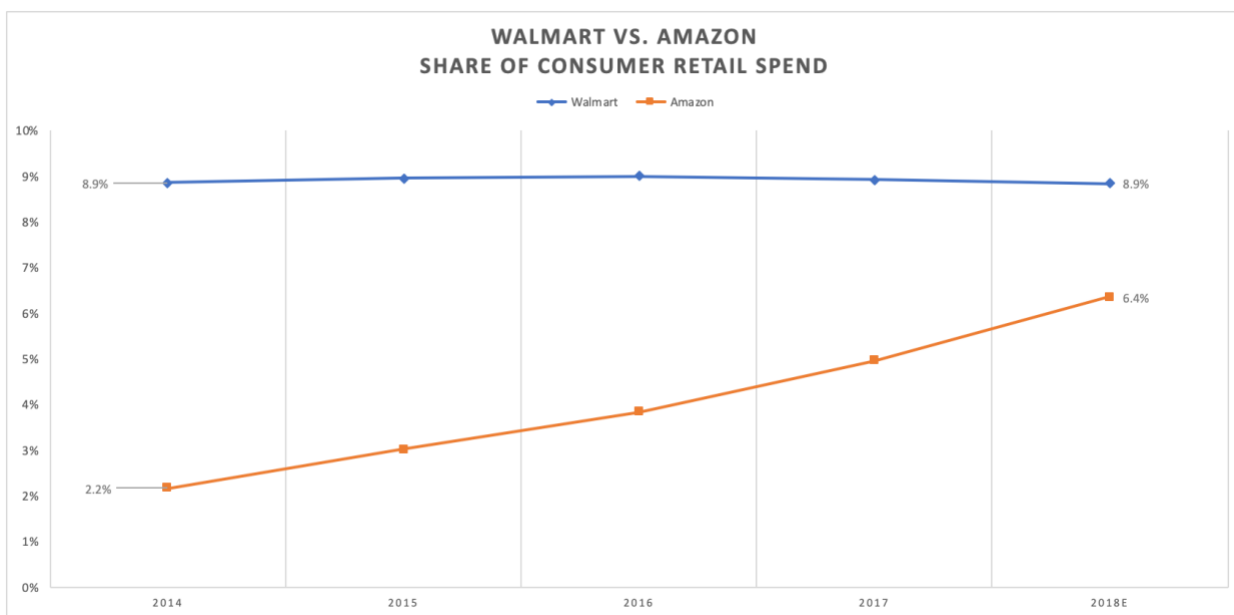


This research will attempt to develop a clearer picture of the “human cost” behind this recent phenomenon of on-demand delivery. Human cost will refer to those directly involved in the day to day process of running the operation through every step of order fulfillment from receipt up until final delivery, from the pickers in the warehouse to the drivers delivering the product to the customer’s front door. The purpose of this thesis is to gain a better understanding of what it takes to operate an effective and efficient “on demand” supply chain, and whether or not the practices in question can be considered sustainable.

It should be stated at the outset that purpose of this research is not to chastise Amazon and their business or management practices. A good deal of this research will revolve around Amazon simply due to the fact that the firm is the largest player in the e-commerce space and, consequently, the majority of the data exists as well as the information that has been published centers on them. Additionally, Amazon undeniably plays the role of “trend-setter” within the growing e-commerce sector. Both in an effort to compete as well as realize the unprecedented success that Amazon has seen in many recent years, a number of other companies have taken steps to mimic the firm’s practices and promises to customers, a phenomenon which has been dubbed the Amazon effect. As firms vie to outperform each other and capture greater portions of consumer spend, the purpose rather is to determine the consequences of these promises of ever higher service levels as felt by the employees who strive to deliver on them and whether or not such service levels can be provided in a sustainable manner.

One notable example of competitors following in the footsteps of Amazon was seen when Amazon made the decision to further decrease their Prime delivery times. Just a few weeks after Amazon announced that the firm would begin offering one-day delivery for all Prime members, Walmart responded by offering the same perk but without any sort of membership fee,

essentially offering the service completely “free”. Today Walmart arguably poses the biggest threat to Amazon’s e-commerce dominance while simultaneously, Amazon races to dethrone Walmart as America’s retail king overall. A report published by PYMNTS.com consumer insights in late 2018, which can be seen in Exhibit 3. shows the growth in both firms’ share of overall consumer retail spend in the United States since 2014.



**Exhibit 3. Walmart v Amazon Share of Consumer Spend**

While Walmart hasn’t seen any drastic decrease in their own market share over this five-year period, Amazon’s share of the market has increased substantially and looks to be on track to surpass Walmart’s in the coming years.

In response Walmart has attempted to mimic Amazon’s own practices as well as to develop their own innovations in order to better compete. One particularly interesting way that Walmart has begun testing is what the company refers to as “endless aisles”. Endless aisles take the form of touch screen kiosks at the end of aisles in Walmart’s brick and mortar locations which allow customers to access Walmart’s online inventory and place orders right there inside

the store. Endless aisles will attempt to solve the infuriating customer experience of making a trip to a store in search of a specific product only to find out that it is not stocked. While not the same as having the product in hand the same day, such a solution should offset frustration as consumers can be confident that the product is on its way and, in many cases, will be delivered as soon as next day. Another strategy Walmart has adopted in order to better leverage their preexisting brick and mortar infrastructure in their competition with Amazon is to offer online customers “discounts on thousands of products if they selected the option to collect their items in store”. In giving customers a positive incentive to make purchases under a BOPIS (buy on-line pick up in store) model, Walmart creates a win-win situation in which they themselves save on delivery cost and their customers save the time that would be required to physically pick their items in store.

Author Blake Morgan published an article in Forbes detailing the myriad of ways in which each company has competed with the other as well as how they have managed to edge each other out. While acknowledging that Walmart still holds the lead in terms of financial performance and “dominates” when it comes to brick-and-mortar presence, Morgan contends that Amazon wins on the grounds of innovation, customer focus, digital growth and supply chain/logistics practices. It is unlikely that anyone would seek to argue these characterizations, especially given that the latter largely comprise the driving forces that propelled Amazon into the position they now find themselves, competing with the long thought untouchable retail giant in Walmart. Morgan ends by grading the two firms on their sustainability track records, noting criticism of Amazon for not releasing their own carbon footprint records prior to 2019 while praising Walmart for their own carbon reduction efforts including “Project Gigaton”. In the end, Morgan gives this category to Walmart, writing “Both companies could improve in their

sustainability efforts, but Walmart is more transparent about its carbon footprint and is making progress around the world” (Morgan, 2019). The fact that Morgan chooses to focus so heavily on carbon emission as a metric to grade the firms’ sustainability records is interesting in that, while important, emissions and environmental impact only make up one portion of “sustainability”. Currently, the Pennsylvania State University defines sustainability as “the simultaneous pursuit of human health and happiness, environmental quality, and economic well-being for current and future generations” (The Sustainability Institute, 2020).

Considering this definition, it is clear that both of these large retail players contribute to economic well-being and have provided specific, measurable goals towards improving environmental impact. It is the third category, however, that of human health and happiness where not only Walmart and Amazon, but also countless other firms engaged in e-commerce come up short. As firms continue to compete for business in this relatively new age of retail, expanded product selection, shorter and shorter lead times, and a relentless pursuit of customer satisfaction puts a tremendous amount of strain on the supply chain, a strain which is often felt by the human element that works to keep it running.

## Chapter 2

### Background

One large organization whose name may not be immediately associated with e-commerce yet is active in the space, nonetheless, is Verizon Wireless. In late November of 2018, the New York Times released an installment of “The Daily” podcast, titled “The Human Toll of Instant Delivery”. The podcast, as the name implies, investigates the stresses placed on the employees charged with operating on-demand delivery networks, while also focusing on the story of a young woman named Tasha Murrell. Murrell was an employee at an XPO Logistics warehouse in Memphis Tennessee, involved in handling a range of products for Verizon Wireless. The episode opens with Murrell recalling an incident that occurred at the warehouse one morning in October 2017, Murrell says:

“October the 17<sup>th</sup>, 2017 was a horrible day for me. Come to work, started working and everything, and um all of a sudden, I started seeing coworkers running, screaming, crying. And I rushed to one of my coworkers, I’m like, ‘What’s wrong, what’s going on?’ and they were like ‘Miss Linda just fell, over there in big box, Miss Linda just fell’. They told me that Miss Linda was talking to the supervisor, telling him that she wasn’t feeling well, that day and she needed to go home. The supervisor stated to her, ‘you can go home with a point but I’m not gonna authorize for you to go home’. And two to three minutes later Miss Linda fell, as she fell she hit her head on the rail, when she hit her head on the rail she collapsed. She was just layin’ there on the floor and the other coworkers got down on their knees and wanted to give her CPR. The supervisor instructed them ‘no one better not touch her, leave her alone, let her be, do not touch her’. And they um did not touch her, and she died on that floor” (Barbaro, 2018).

*(The above quote has been recorded verbatim)*

Later in the episode, The Times business reporter Jessica Silver-Greenberg further discusses the death of Miss Linda Neal who had apparently asked supervisors at the XPO Verizon warehouse for a “break from heavy lifting” as she was feeling unwell and “short of breath, feeling nauseated”. Silver-Greenberg notes that “Around 11am, she collapses on the floor and dies of a heart attack” after which workers were allegedly instructed to continue with their work, avoiding Neal’s body (Barbaro, 2018).

In February of 2014, Tasha Murrell discovered that she was pregnant. Following a doctor’s visit, Murrell was informed that she should not be involved in any sort of lifting that exceeded five pounds, an order which was made known to and ignored by supervisors at the XPO Logistics warehouse. Aware of the potential risks, Murrell made the decision to go against the advice of her doctor and do the work that was asked of her, explaining that “I’m here at work, I need the money, so I’m not gonna go home, so I did what she told me to do” (Barbaro, 2018). One day after coming towards the end of a twelve-hour shift, which is not out of the ordinary at the XPO and many other warehouses, Murrell began to feel unwell complaining of stomach pain. When Murrell brought these complaints to the attention of her supervisor asking permission to go home for the day, she alleges that her request was subject to a profanity laden rejection. Understanding and accepting the potential consequences that could come from disobeying her supervisor, Murrell decided that she could not continue working in her current condition and left for the night. The pain that began at work continued into the night and when Murrell woke up the next morning she discovered that she had experienced a miscarriage which was later confirmed by emergency room doctors.

Tasha Murrell’s miscarriage was unfortunately not an isolated incident within the XPO Verizon warehouse. Murrell explains that four other coworkers, all working on the same shift at

the warehouse became pregnant around the same time; within the span of a few months in early 2014, each of them had experienced miscarriages. Murrell recalls, “January a coworker lost her baby, February a coworker lost her baby, I lost my baby”. Host Michael Barbaro, clearly taken aback then asks, “Wait, several of your coworkers, you all got pregnant around the same time? And how many of you miscarried?” to which Murrell replies “Five, in... not even months apart”. The Times reporter Jessica Silver-Greenberg when asked whether or not she believed this string of miscarriages could be a coincidence replies in the negative, explaining:

“I think that there was a pattern there, and the women would say there was a pattern of them being routinely pushed past their limits, of having their doctors notes ignored, denied even the slightest reprieve from heavy lifting, of being forced to hoist, against their doctors orders, boxes that could weigh up to forty-five pounds, of them working in conditions where the heat was unbearable and there were very few breaks. So no, I don’t think it was a coincidence” (Barbaro, 2018).

Given the conditions faced in the XPO Verizon warehouse, it begs the question why Murrell or any of her other coworkers would continue to work in such an environment. Murrell herself did not finally decide to stop working at the warehouse until March of 2018, almost half a year after the death of Linda Neal and nearly four years after the miscarriage of her own child. Responding to this question, Jessica Silver-Greenberg discusses the “broader macroeconomic picture” of warehouse work, explaining that “these are the dominant jobs that are springing up across the country, they’re often the only jobs ... if you’re someone without a college degree and you are dependent on a job for your livelihood, like most people are, you’re gonna accept the conditions of that job, whatever they are” (Barbaro, 2018). As the retail landscape continues to shift towards e-commerce, causing brick and mortar locations to close their doors, so shifts the

job opportunities available in communities across the country. Where once a worker without a college degree may have been able to secure employment in a department store, today it could be the case that the only opportunities present are in a distribution center, packaging the products once sold in that department store that are now being purchased by consumers on-line. Workers stuck in this position often have little choice but to accept the fact the strenuous work environment of a warehouse is the new reality when the position of sales associate in a retail store becomes extinct.

As service levels become higher, delivery times faster, and urgency in warehouses increase, so to do the physical dangers workers are subject to. In 2017, the Bureau of Labor Statistics recorded significant increases in the number of workplace injuries and illnesses resulting in days away from work (DAFW) within the warehousing industry. The BLS' annual Employer-Reported Workplace Injuries and Illnesses News Release reported an increase of 2,930 DAFW cases within the warehousing sector, bringing the total to 17,390 for 2017. Additionally, the report notes that the number of DAFW cases resulting from "overexertion and bodily reaction" increased by 1,350 cases for a total of 8,310 and that "transportation and material moving workers" accounted for 12,750 of the reported DAFW cases, increasing by 3,120 from 2016 numbers. In 2017 and subsequently 2018, the most recent year for which the BLS has reported injury and illness statistics, the warehousing and transportation industry recorded the greatest share of DAFW injuries and the second greatest share of injuries overall, coming behind only the agricultural, forestry, fishing and hunting industries by this metric.



Industry(1)	Total recordable cases (2)		Cases with days away from work(2),(3)	
	2017	2018	2017	2018
Private industry(4)	2.8	2.8	0.9	0.9
Agriculture, forestry, fishing and hunting(4)	5.0	5.3	1.7	1.7
Mining, quarrying, and oil and gas extraction(5)	1.5	1.4	0.7	0.6
Construction	3.1	3.0	1.2	1.2
Manufacturing	3.5	3.4	0.9	0.9
Wholesale trade	2.8	2.9	1.0	1.0
Retail trade	3.3	3.5	1.0	1.1
Transportation and warehousing(6)	4.6	4.5	2.0	2.1
Utilities	2.0	1.9	0.7	0.7
Information	1.3	1.3	0.6	0.6
Finance and insurance	0.5	0.5	0.1	0.1
Real estate and rental and leasing	2.4	2.3	1.0	0.8
Professional, scientific, and technical services	0.8	0.8	0.2	0.2
Management of companies and enterprises	0.9	0.8	0.2	0.2
Administrative and support and waste management and remediation services	2.2	2.3	0.9	0.9
Educational services	1.9	1.9	0.5	0.6
Health care and social assistance	4.1	3.9	1.1	1.1
Arts, entertainment, and recreation	4.2	4.1	1.2	1.1
Accommodation and food services	3.2	3.1	0.9	0.9
Other services (except public administration)	2.1	2.2	0.7	0.8

**Exhibit 4. BLS Workplace Injury Statistics 2017-2018**

Figures displayed in Exhibit 4 correspond to number of cases recorded per one-hundred workers, so for example, the real estate and rental and leasing industry would have reported one DAFW case per one-hundred workers in the industry in 2017 and so on. It is clear that where once mining, manufacturing, and construction were thought to be the most taxing and labor-intensive jobs, it turns out that today the greatest chance of a worker seriously injuring themselves comes when working in a warehousing environment.

In late 2019, the Atlantic and *Reveal* from the Center for Investigative Reporting published a story stemming from the results of an investigation into injury rates at Amazon fulfillment centers in the United States. Author Will Evans opens the story by detailing the experience of Candace Dixon, an ex-stower at Amazon's fulfillment center in Eastvale,

California. Dixon alleges that during the term of her employment at Amazon she would be required to “scan a new item every 11 seconds to hit her quota” and that “Amazon always knew when she didn’t”. Such a pace amounted to three hundred items an hour and thousands each day, a pace that fifty-four-year-old Dixon was able to keep up for about two months before she was forced to quit as “the lifting had destroyed her back”. Evans writes that “An Amazon-approved doctor said she had bulging discs and diagnosed her with a back sprain, joint inflammation, and chronic pain, determining that her injuries were 100 percent due to her job. She could no longer work at Amazon. Today, she can barely climb stairs” (Evans, 2019).

Dixon’s personal experience seems all too consistent with the reports of countless other workers employed in “instant delivery” environments: overwork in order to meet unrealistic expectations with the eventual result being serious health consequences. Dixon alleges that at one point during her employment with Amazon, she “had doctor orders not to pull or lift heavy objects and to alternate between sitting and standing, but she wasn’t given a chair and heavy boxes kept coming her way”. Such circumstances are reminiscent of Tasha Murrell’s experience working at XPO Logistics’ Verizon warehouse who had her own doctor’s orders ignored and was expected to continue engaging in heavy labor while pregnant. At the time of the story’s publishing, Dixon told Reveal that her workers compensation settlement had just about run out, she was struggling to find a new job and was worried about the possibility of losing her home.

Reveal’s investigation looked at internal injury records at nearly a quarter of Amazon’s fulfillment centers nationwide (twenty-three out of one hundred ten including the Eastvale, California location) and found that the rates of “serious injuries” at the locations investigated amounted to 9.6 for every one hundred full time workers, which was “more than double the national average for warehousing industry in 2018”. It should be mentioned, as the article points

out, that “a handful of centers were at or below the industry [injury] average” but at the same time, Reveal reports that a number of the locations investigated, including the Eastvale location, were “especially dangerous”. Evans writes that Eastvale reported a total of 422 DAFW injuries in 2018, which equates to over four times the industry average (Evans, 2019).

As mentioned previously, one of the major contributing factors behind why Amazon is today experiencing such unprecedented levels of success is thanks to their never-ending pursuit of continuous improvement and innovation. Within their warehouses, one of the major innovations comes in the form of automation and robots working alongside human employees. Evans writes that Amazon claims this development provides value twofold, both increasing productivity as well as making jobs easier and safer for the human employees. One of the ways these job improvements manifest themselves for pickers in automated warehouses is that rather than walk the oft reported “ten or more miles a day” pickers can now remain standing stationary while the robots come to them. While such an improvement is undeniably easier on many workers, especially those who experience issues walking great distances on a daily basis, it turns out that work in a co-bot environment may not be as utopian as it initially appears.

It turns out that when it comes to worker safety, simply increasing the levels of automation may actually have the opposite of the intended effect. As Evans reports, “Of the records Reveal obtained, most of the warehouses with the highest rates of injury deployed robots.” One facility in particular that employs a large degree of automation alongside its human workers is Amazon’s warehouse in Kent Washington. Evans reports that this facility recorded two hundred ninety-two serious injuries in 2018, which translates to an above average injury rate among Amazon warehouses surveyed at “a rate of about 13 serious injuries per 100 workers”. Another case study on the effects of increasing automation within Amazon warehouses can be

seen at the Tracy, California warehouse where Evans writes that, “After Amazon debuted the robots in Tracy, California, five years ago, the serious-injury rate there nearly quadrupled, going from 2.9 per 100 workers in 2015 to 11.3 in 2018, records show”. Once again 11.3 injuries in one hundred workers exceeds the already high average injury rate that Revel found among Amazon warehouses (Evans, 2019). As for the reason why, facilities making the switch to co-bot environments experience such drastic surges in injuries, Johnathon Meador, an employee at the Tracy warehouse describes an environment that had become so fast paced thanks to the addition of robots that the human worker could barely keep up. Meador is quoted as saying “‘Before robots, it was still tough, but it was manageable,’ he said. Afterward, ‘we were in a fight that we just can’t win’”. With the introduction of hyper efficient robots into instant delivery work environments, the humans in the system automatically become the bottleneck. Rather than operate at the pace of the human workers, however, they are now expected to increase their already demanding high productivity numbers in order to better match the pace that their robotic co-workers are setting. In practice, the result ends up being even less focus on proper injury prevention and lifting techniques in favor of speed which equates to even more injuries on the part of workers. Out of all of the locations that Revel surveyed over the course of their investigation, that with the highest rate of injury, a staggering rate of nearly twenty-six per one hundred employees came from Amazon’s Troutdale, Oregon warehouse which according to Evans employed robots from its opening in August of 2018.

According to testimony given by Amazon workers over the course of Revel’s investigation, Amazon’s professed culture of safety and care for their workers does not equate with conditions on the ground within the warehouses. Evans writes that employees “spoke with outrage about having been cast aside as damaged goods or sent back to jobs that injured them

further”. In terms of initial safety training, it has to be acknowledged that Amazon “does instruct workers on the safe way to move their bodies and handle equipment” but once again the “theory” of safety only provides so much benefit to workers when it does not translate into practice.

According to further testimony from former warehouse employees, Evans writes that,

“they had to break the safety rules to keep up. They would jump or stretch to reach a top rack instead of using a stepladder. They would twist and bend over to grab boxes instead of taking time to squat and lift with their legs. They would hoist extra-heavy items alone to avoid wasting time getting help. They had to, they said, or they would lose their jobs. So they took the risk.”

Returning to the idea of co-bot environments, one of the most interesting points within the Atlantic’s summary of Reveal’s investigation are the ramifications of Amazon’s proprietary “ADAPT” software system. ADAPT is the Big Brother like system that continuously tracks employee productivity, recording every time that targets are not met and using the data collected to determine potential disciplinary actions for employees. ADAPT epitomizes the pursuit of efficiency as is evident by the case of Parker Knight as recorded by the Atlantic. Author Will Evans Writes,

“The Amazon tenure of Parker Knight, a disabled veteran who worked at the Troutdale, Oregon, warehouse this year, shows the ruthless precision of Amazon’s system. Knight had been allowed to work shorter shifts after he sustained back and ankle injuries at the warehouse, but ADAPT didn’t spare him. Knight was written up three times in May for missing his quota. The expectations were precise. He had to pick 385 small items or 350 medium items each hour. One week, he was hitting 98.45 percent of his expected rate, but that wasn’t good enough. That

1.55 percent speed shortfall earned him his final written warning—the last one before termination.

“You are expected to meet 100 percent of the productivity performance expectation,” the warning reads” (Evans, 2019).

Documents obtained and published by the Verge in April 2019 further demonstrate the level of control that ADAPT is given over the workers within the facilities. The document in question takes the form of a signed letter written by an attorney representing Amazon. Providing insight into ADAPT’s autonomy, the letter states that “Amazon’s system tracks the rates of each individual associate’s productivity, and automatically generates any warnings or terminations regarding quality or productivity without input from supervisors.” Another metric recorded by the ADAPT system according to the letter is an employee’s “Time Off Task” or TOT, stating that “The system keeps track of gaps in scanning and generates reports based on those tasks”. These reports are provided daily to supervisors who then discuss with the employees in question the reasons behind time spent off task. The letter also reveals ADAPT’s full name to be “Associate Development and Performance Tracker”. While it seems that initially the ADAPT system operates with a significant degree of autonomy when it comes to generating warnings and terminations, Amazon makes it clear that “supervisors are able to override the process” ultimately meaning that ADAPT’s ruling is not always final. While clearly necessary, such a safeguard likely provides little comfort to workers transitioning to a co-bot environment in which the position of a traditional manager has been replaced by a faceless system delivering commands and reprimands while constantly tracking nearly every move they make (Verge, 2019).

In the “Human Toll of Instant Delivery” podcast, Jessica Silver-Greenberg, when discussing efforts to improve conditions in the XPO Verizon warehouse, makes the statement that the “cruel irony of all of this is that despite all that work, there is a very real chance that all of these jobs, no matter how good they are or how much better they get, will eventually be replaced by robots” going on to state that “that proportion of robots to flesh and blood workers is gonna change, and the robots, most economists think, will win out” (Barbaro, 2018). While this prediction may be true regarding the warehouse of tomorrow, such a future remains a long way off and in the interim the “flesh and blood” workers will find themselves working in increasingly co-bot environments. While the implementation of ADAPT or any similar such productivity management system provides a bot supervisor, many workers are finding themselves with bot co-workers thanks to increases in automation on the production side.

It does not appear that conditions in “instant delivery” providing warehouses are exclusive to the United States. James Bloodworth is a British journalist and author of the book, *“Hired: Six Months Undercover in Low Wage Britain”*. As the name implies, the book details Bloodworth’s experiences posing as a British “gig-economy” laborer in a variety of roles ranging from Uber driver to Amazon warehouse “associate”. The warehouse in question was the Rugby UK location, which Bloodworth wastes no time describing as having “the atmosphere of what I imagined a prison would feel like”. Conditions that help cultivate this atmosphere include security gates through which every employee must pass through and be subjected to pat downs whenever they want to leave the warehouse floor as well as the use of handheld devices that “tracked our every move as if we were convicts on house arrest”. Bloodworth describes how these devices, to be carried at all times by employees, took the place of a traditional “manager”, providing digital instructions to the employees such as where to report and what item to pick but

also delivering admonishments along the lines of “Your rates are down this hour, please speed up”. The ADAPT system is never mentioned by name throughout the course of Bloodworth’s account. Given the description given, it is likely that Rugley employees worked with a hybrid system characterized by a greater degree of human input than has been previously described.

When workers at Amazon facilities, such as that in Rugley, receive such productivity warnings it can be extremely worrying given the already perilous nature of their employment status. Bloodworth describes how while in the position of a temporary worker, he attempted on multiple occasions to obtain physical documentation of his employment contract until finally being informed by the agency he was hired through that no such contract actually existed because he was on a “zero-hours” contract. Furthermore, Bloodworth alleges that himself and fellow employees were informed that they should be “under no illusions that this is a temporary job”, a fact that would be drilled into their heads from the first day on the job onward.

According to Bloodworth, the most ‘outstanding’ workers could look forward to obtaining a permanent position with the organization after a nine-month incubation period, but the odds of this were slim and as put by Bloodworth’s hiring agency ‘we do keep on the best performing staff’ but ‘about seventy people are waiting for these jobs so don’t get your hopes up. This is the sort of pressure that these employees must deal with on a daily basis, knowing that their only options are to push themselves to meet often extreme performance goals or risk losing a job that they desperately need. For workers who may not be proficient in the local language, a situation that many of Bloodworth’s Eastern European coworkers found themselves in, the thought of a customer facing retail position was not possible and thus workers must face the reality of warehouse work.



Bloodworth describes the straightforward six strikes and you are out of the job system in place at the Rugley warehouse. These strikes, officially referred to as “points”, could be earned for a range of infractions, including “days off with illnesses, not hitting pick rates, or being late”. The Rugley’s points policy was strictly enforced and often no leeway was allowed based on the circumstances under which these infractions occur as is reported by a nineteen-year-old co-worker of Bloodworth’s referred to only as Claire. At the time of speaking with Bloodworth, Claire had garnered five points, one away from being released and had accepted the fact that this meant she likely would not be with the company for much longer. Bloodworth describes the circumstance under which Claire managed to accrue so many points within twelve months,

“The first point was for the car accident [described previously by Claire, a car accident around the beginning of her employment caused her to be late and consequently she was sent home for the day with her first point]; then she received a point for not hitting her productivity rates...; she picked up another when the bus laid on by Amazon was late again; she picked up a point when Amazon tried to force her to do overtime...; and she picked up another point when she was off with a migraine” (Bloodworth, 2018).

It appears that Amazon employees were faced with an impossible path towards permanent employment, even the hardest working and most dedicated of employee found themselves unable to hold out until the nine-month mark which rewarded the coveted “blue badge”. Claire recalls the experience of a friend of hers at the warehouse, who nearing nine months was set to be converted into a permanent employee. Claire estimates that the friend in question likely picked “what must have amounted to hundreds of thousands of items off the shelves for Amazon customers, from books to kitchen appliances” continuing on to note that “He had hit all his pick rates, had always turned up to work on time and, crucially, had somehow

managed to flout the innumerable petty rules which governed nearly every aspect of the job”. In the end however, none of this had mattered and the worker in question was let go with little regard to what previous value he may have provided. As to the reason for the eventual termination, Bloodworth writes that “Yet this brave new economy – the Darwinian world in which illness is an unpardonable sin – spat him out like a betel nut. His crime was having the temerity to get sick” (Bloodworth, 2018)

Such instances highlight both the precarious nature in which workers in these environments find employment status, but also prioritization of efficiency over all else and at any cost. The firing of such employees likely represents a shortsighted vision on the part of Amazon who in the long term may have received tremendous benefit. The fact remains however that there are countless others waiting to take such positions and given the incredible demand that Amazon must strive to fulfill, it's better to have a picker on the floor today than waiting to have a more qualified worker tomorrow.

The amount of walking required from the average picker within an Amazon warehouse is a topic that has been brought up a number of times when speaking with workers and is consistently reported to be at around ten to twelve miles a day. To try and put this number in perspective, some authors have compared the length to number of football or soccer fields you would need to reach ten miles. Bloodworth, when describing the amount of walking he personally engaged in on a day to day basis, paints a much more surprising picture for readers. Bloodworth writes,

“According to the pedometer I wore on my wrist, I was walking around ten miles a day. The greatest distance I traveled was fourteen miles and the shortest distance was seven. To give some concrete sense of what that entailed, setting off on my first day from the heart of London

and heading east, by the evening I would have arrived in Sidcup. By the end of day two I would be approaching Rochester. By the end of the week, the coast of Dover would be in sight, and at the end of the month, I would have walked to Antwerp in Belgium” (Bloodworth, 2018).

It is hardly surprising then that workers like Candace Dixon come to develop serious injuries in relatively short periods of time. It is difficult enough for a younger physically fit individual to be engaged for hours in such physically demanding work, but as Bloodworth puts it “If you were out of shape at all the work was torturous. The same was true if you were over a certain age” (Bloodworth 2018).

Over the span of sixty-five pages, Bloodworth spares no detail in his experience working undercover in an environment that could be described as nothing short of Orwellian. Physically demanding labor, minimal room for respite, constant surveillance and tracking and even invasion of privacy all add up to create an environment that few would willingly work in. It should come as little surprise that the results of a UK wide survey of Amazon staff by the GMB Union (A British workers’ union representing upwards of six hundred twenty thousand members) found that:

- ninety-one per cent would not recommend working for Amazon to a friend.
- seventy per cent of staff felt that they were given disciplinary points unfairly.
- eighty-nine per cent felt exploited.
- seventy-eight per cent felt that their breaks were too short.
- seventy-one per cent reported that they walked more than ten miles a day at work (Wolfe-Robinson, 2019).

Following this survey, the GMB union organized a series of protests by Amazon workers over what the Guardian describes as “horrific” working conditions. The Guardian’s Maya Wolfe-

Robinson reports that the GMP Union protests follow “international campaigns” spanning seven British warehouses as well as locations in seven cities in the United States staged coinciding with Amazon’s “Prime day” campaign. Unsurprisingly, Reveal found that injury rates in Amazon warehouses spike in the wake of Prime day, as well as during the Black Friday and Cyber Monday “peaks”. It should be noted that a spokesperson from Amazon told Reveal in response to these discoveries that injury rates only increase during these times because the company brings on additional temp workers to assist with the rush. No data was given to back up these claims notes Evans. The Prime day protests followed up 2018’s Black Friday protests during which Amazon workers in the UK picketed outside locations country wide over “inhumane” conditions within. Taken together, these protests served to shine a light on the conditions faced by the workers tasked with ensuring products are delivered in a timely manner. For the first time many consumers came to realize that there is more involved in ordering their books than they may have originally thought or wanted to think about.

Such events not only bring more eyes to the issue but also serve to demonstrate that the conditions described through Bloodworth’s own experience are not isolated to one poorly run site but rather pervades all of Amazon’s locations across the pond. The reality, however, remains that in many communities these jobs are the only ones available to many workers and when forced to choose between poor working conditions and being able to provide for loved ones, many will pick the former. Bloodworth describes the decline in manufacturing jobs UK wide writing that “manufacturing jobs have disappeared right across the Midlands over the last thirty years” going on to state that “One in five working people had a job manufacturing in Britain in the mid 1980’s. By 2013 that figure had fallen to just one in twelve”. Given this shift in the types of jobs available, excitement in the town of Rugley when Amazon arrived in 2011 was

“palpable” Bloodworth says. Locals recalled the arrival as a ‘massive thing for the community’ and local newspapers reported that the warehouse was ‘swamped’ with applicants. Fast forward a few years to Bloodworth’s own residency in Rugley by which point he writes, “the excitement when amazon first came to town had long since dissipated when I arrived”. It seems that the Rugley locals have come to understand the massive change in the way that business is being done globally creates change everywhere. This community that once manufactured goods that would go on to be sold locally, now works to package and distribute the goods being manufactured elsewhere around the globe (Bloodworth, 2018).

Transitioning back to the United States, recent labor disputes arising from a Target warehouse in New Jersey shine a spotlight on conditions faced by workers under the employ of yet another firm striving to provide their customers with instant-delivery service. Jennifer Smith of the Wall-Street Journal reports that, “A union representing warehouse workers in the state is trying to organize employees at a Perth Amboy distribution center” (Smith, 2020). The union in question is Service Employees International Union (SEIU) who claim that Target is mis-treating employees within the Perth Amboy distribution center. Target, on the other hand, argues that the company has created “a safe working environment of mutual trust” and stands opposed to SEIU’s attempts to unionize workers (Smith, 2020). According to a Business Insider article published in May of 2018, the Perth Amboy location was the first of Target’s distribution centers to implement and test the company’s new “flow center” approach. WSJ author Jennifer Smith more clearly defines the flow center approach as, “a strategy aimed at using smaller, more frequent shipments to restock nearby stores and at better integrating its distribution and online fulfillment” (Smith, 2018). Business Insider author Gregory Magana writes that “This test comes amid a variety of recent upgrades to the Target shopping experience” going on to state that

“Target continues to expand services, including curbside pickup, flat rate next-day delivery, and two-day shipping, to make shopping with it even more convenient” (Magana, 2018). Nearly two years later it has become apparent that one of the results of the test is alleged working conditions much like those that have been described by employees in instant delivery service facilities run by a variety of other firms.

Reporting on the working conditions he faced, Smith writes that, “Some workers in Perth Amboy have complained of difficult working conditions, the union said, including heavy production quotas, long shifts and unfair scheduling practices, such as the requirement that they keep some days open in case they get called in to work” (Smith, 2020). Nick Muscavage, described as a “local watchdog investigative reporter” for the site MyCentralJersey covered the protests by workers which took place February 20<sup>th</sup> 2020. Through the help of translators, Muscavage spoke with two former employees at the Perth Amboy distribution center regarding conditions they experienced during the duration of their employment. The first employee, a woman by the name of Esmeralda shared that, “Working here is very difficult, they don't have any consideration for the workers... They treat workers like robots”. According to Muscavage, Esmeralda relayed that “workers are timid to use the restroom afraid that it would interfere with their production quotas” and “Management, she said, requires employees to work mandatory overtime and has fired workers without reason”. The second woman with whom Muscavage spoke was named Anna who reported that while working at the distribution center, she felt as if she was “in a prison”. Anna went on to report that “The work is very hard... You come to work 10 hours a day” and over the course of that ten-hour workday Anna says “You are isolated” (Muscavage, 2020).

Given the testimonies previously recorded from a number of employees working within instant delivery facilities, the plight of workers within Target's Perth Amboy facility should come as little surprise. As the e-commerce landscape, both within the United States as well as globally continues to grow and develop, it is likely that more and more allegations of abuse will continue to emerge as on the ground workers struggle to meet the increasing consumer demand for instant access to their goods. The steps taken by Target follow the path laid out by Amazon when it comes to the road to e-commerce success, providing a clear example of the "Amazon Effect" in action. Target is not the first retailer to mimic Amazon and certainly will not be the last. Already, Home Depot, another name not immediately synonymous with instant delivery but engaged in the practice, nonetheless, is planning on opening a warehouse of its own in Perth Amboy, as Jennifer Smith reports (Smith, 2020). Only time will tell the effect that awareness of such conditions faced by employees has on consumer buying habits. In a day where more consumers than ever profess to care about a company's sustainability record, it will be interesting to see whether or not that compassion outweighs the benefits provided by the convenience of next day delivery.

As early as 2013, the BBC had conducted their own undercover investigation into an Amazon warehouse in Swansea (recall Bloodworth was positioned in Rugby). Reporter Adam Litter came on as a seasonal worker during the Christmas rush when the company reportedly hires fifteen thousand extra workers to assist with demand. Working as a picker in the Swansea location, Litter reported much of the same conditions described previously from those working in instant delivery facilities including miles of walking each shift and rigorous pick quantities and paces to be met. Litter recalls of his experience, 'We are machines, we are robots, we plug our scanner in, we're holding it, but we might as well be plugging ourselves in ... we don't think for

ourselves, maybe they don't trust us to think for ourselves as human beings, I don't know'. (BBC, 2013). Once again, the idea of the dehumanizing nature of work in these warehouses is becoming a trend. It is clear the physical toll that such work takes on the employees, but as Professor Sir Michael Marmot notes in relation to this story, it is important to consider the impact on mental health as well.

Sir Michael Marmot is currently a professor of Epidemiology and Public Health as well as the director of the Institute of Health Equity at University College of London. In addition, Prof. Marmot serves as an advisor to the World Health Organization. Discussing the nature of warehouse work, focusing on Litter's experience in particular after being shown video that he had secretly captured, Prof. Marmot says that such conditions encompass 'all the bad stuff at once' and that 'The characteristics of this type of job, the evidence shows increased risk of mental and physical illness' (BBC, 2013). While Prof. Marmot acknowledges that such jobs are necessary to meet the needs of our modern world, he stresses that 'it seems to me the demands of efficiency at the cost of individual's health and wellbeing – it's got to be balanced'. (BBC, 2013). Once again, this article was published in 2013, now at the turn of a new decade, more and more information has been obtained than ever before on the conditions faced within these on-demand delivery warehouses. It is evident from what has been documented that in the interim the balance has shifted even further towards the prioritization of efficiency overall.

In March of 2019, The Daily Beast reported that between October of 2013 (right around the time the BBC's investigation was published) and October of 2018, emergency services were called from Amazon warehouses in the U.S. at least one hundred eighty-nine times in response to "suicide attempts, suicidal thoughts, and other mental health episodes" (Zahn, 2019). This data comes from 911 call logs as well as ambulance and police reports reviewed by The Daily Beast



and covers forty-six locations across seventeen states. The story, titled '*Colony of Hell*': 911 *Calls From Inside Amazon Warehouses* records the transcripts of a number of the emergency calls, many of which are extremely disturbing to read and contain graphic descriptions of the suicide attempts made by employees while on the job and will not be recorded hear. The Daily Beast also spoke with a six current or former warehousing employees who had experienced some degree of suicidal thought and claimed that the nature of their work was a major contributing factor (Zahn, 2019).

One former employee that the Daily Beast spoke to was forty-one-year-old Nick Veasley who worked in Amazon's Etna, Ohio warehouse and whose job it was to "count the items in each one [bin] and check the tally against a computer screen to make sure it matched Amazon's inventory". Veasley began his employment at the Etna location in December of 2016, at which time he recalls being excited about the prospects of the job, saying 'The job was a big deal ... It was good money, good benefits. By February of 2017, however, things started taking a turn for the worse for Veasley who claims that all of the standing requisite in the position began to cause serious pain in his ankle and he went on medical leave to undergo surgery. Veasley returned to work August of 2017 and describes that resumption of work served to exacerbate suicidal thoughts that had been stemming from financial issues he was facing at the time. Veasley recalls how 'I had so much on my mind that the quietness of standing in one spot and doing my job, would just let my mind run'. After bringing his concerns to supervisors, Veasley reports that they seemed receptive and compassionate, allowing him to take an extra two months of leave with a reduction in pay. This second leave did little for Veasley's mental state however and on his second return to work Veasley describes a similar situation to the Daily Beast, "'The quota, the boringness, everything,' he said. Managers, he said, acted as enforcers. 'Do that, do this, do this,'

he said. ‘Crack the whip, crack the whip, crack the whip.’ Veasley’s situation came to a head when after expressing to a guard one day that he wished to “drive his car off a cliff” upon which, “police were called and Veasley was taken to nearby Licking Memorial Hospital and then psychiatric ward, where he spent three days, he said”. Summing up his experience employed at the Etna warehouse, Veasley says, ‘That place screwed me up so much it put me into a depression where I was actually on a 72-hour hold in a psych ward’. (Zahn, 2019).

It should be noted that Amazon disputes a number of claims in the story that Veasley provided and stated that,

‘As we would with any associate in need, we supported and attempted to help Nick get the treatment and support he needed and requested. We accommodated his requests, directly engaged with him to understand his needs, provided resources, including outside and emergent crisis intervention help to him’ (Zahn, 2019).

While Amazon challenged claims regarding the working environment in their Etna warehouse, an unnamed former employee who was also employed at the location provided the Daily Beast with his own account of mentally draining challenges faced as a worker. This employee’s story is recorded by the Daily Beast as follows:

“A former employee in Etna, Ohio, said that it was sometimes physically impossible to stay on pace. ‘Even if it isn’t your fault, they ignore any explanation that you could give.’

He was constantly fearful that he would receive citations for falling short. ‘Once you have enough write-ups, you’re out the door,’ he said. ‘There goes your livelihood.’

“There was a constant sense of, ‘did I screw that up, did I screw that up, did I screw that up?’” he said. ‘[It] stays with you and almost becomes a permanent anxiety.’ (Zahn, 2019).

Regardless of whether or not workers are directly concerned about work related issues, an environment such as has been clearly described to exist in on-demand delivery warehouses can still have an adverse effect on one's mental health. The Daily Beast spoke with a number of experts in the field and cites Naomi Swanson, "a lead researcher at the National Institute for Occupational Safety and Health" who asserts that "High levels of workplace stressors can be bad for pre-existing mental-health conditions and can exacerbate them" (Zahn, 2019). William Eaton, a Professor at Johns Hopkins' school of public health furthers this sentiment, stating "If you're doing something that is just too hard for you, you can't do it worried about your performance. That would be stressful, leading to mood disorders and anxiety disorders" (Zahn, 2019). Yet another Johns Hopkins' professor, Ron Goetzel, adds that the dimension of "working in social isolation" can play a role in harming mental health, stating that "They [workers] need to interact to feel human" (Zahn, 2019). Finally, Yeates Conwell, "a professor at the University of Rochester Center for Study and Prevention of Suicide" ties everything together saying that "You've got individuals who experience stress from a variety of sources ... The workplace may be one in which those things come together and get expressed as stress, mental illness, suicidal ideation behavior" (Zahn, 2019). Naomi Swanson notes that, as of yet, there is not much research that has been done on the link between working conditions and mental health in these high-pressure warehouses, after all the whole phenomenon of "instant delivery" is a relatively recent development (Zahn, 2019). While it is difficult to diagnose the cause of mental health issues, a task that should be left up to professional psychologists, it seems evident that those who may be experiencing preexisting mental health conditions can see such conditions exacerbated when working daily in the high-pressure environment of an on-demand delivery warehouse.

When researching conditions faced by workers supporting on-demand delivery operations, it is important to remember that those in warehousing locations only represent one aspect of the broader workforce. Another crucially important aspect of any distribution operation is transportation, more specifically for the purposes of this research the drivers responsible for delivering goods to the end consumers. According to the U.S. Census Bureau, the number of drivers has reached an “all-time high” at over three and a half million as of 2016. Exhibit 5, shown below, represents graphically the increase in U.S. truck driver employment over time.

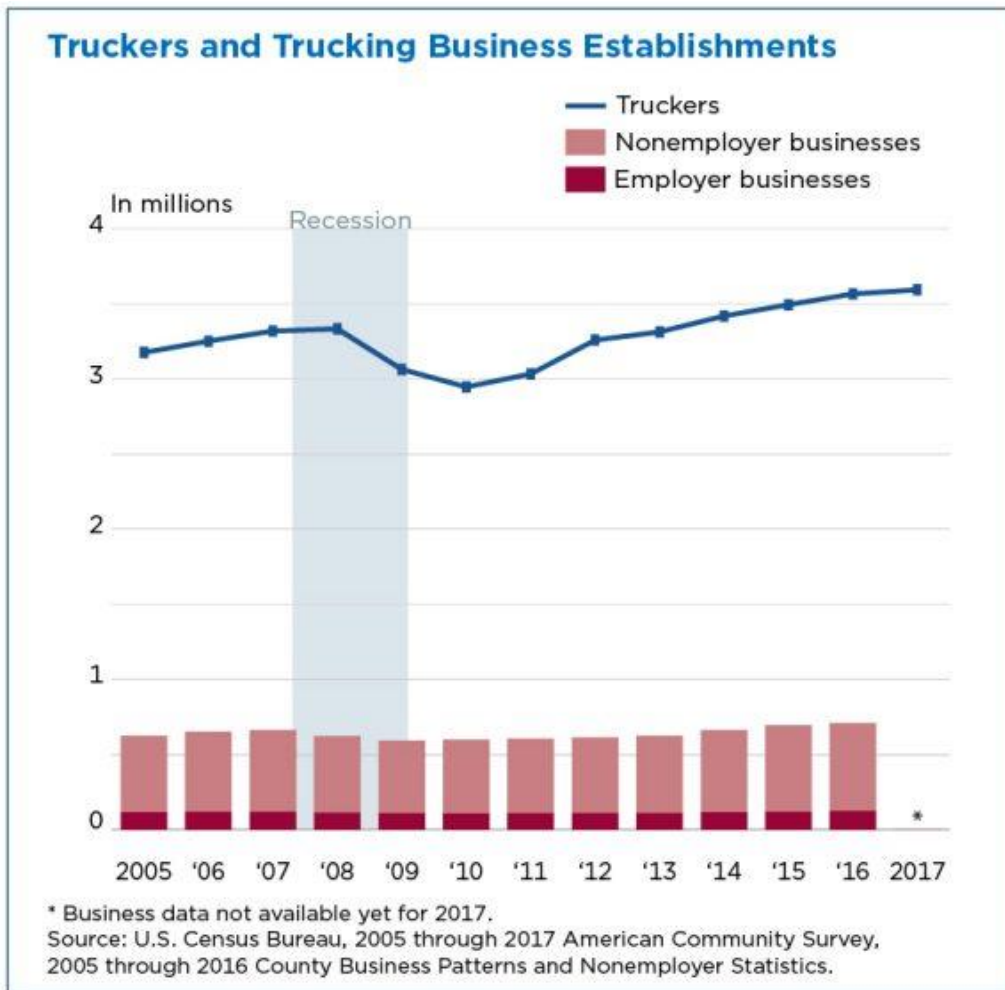


Exhibit 5. US Census Bureau Trucking Data

Mass public attention was first drawn to the conditions under which many truck drivers operate following the collision between a Walmart delivery truck and actor and comedian Tracy Morgan's limousine. The crash, which proved to be fatal for one of Morgan's friends and resulted in four other passengers, Morgan included, walking away with serious injuries. In the wake of the incident, the National Transportation Safety Board (NTSB) released their report following an investigation of the crash that found, "As he [the Walmart truck driver] approached the work zone in Cranbury [where the accident occurred], he had had only 4 hours of sleep opportunity in the preceding 33 hours. His fatigued condition diminished his awareness, and he failed to reduce his speed or respond appropriately to the slowed vehicles ahead of him, resulting in the crash" (NTSB, 2015). Both the accident itself and the reporting in the aftermath brought awareness to the lengths that many drivers would go in order to meet their deadlines, including, in this case, going twenty-eight hours without sleep. In terms of Walmart's own liability for their driver's actions, the firm settled a personal injury lawsuit with Morgan and another passenger. Details of this settlement were kept confidential, but the payout was estimated to be in excess of ninety million dollars. According to the NTSB's report, "Although Walmart Transportation LLC addressed fatigue as part of its driver training program, it did not have a structured fatigue management program in place that could have improved its ability to better monitor and educate its drivers about the risks of fatigue" (NTSB, 2015).

In June of 2017, USA Today published an investigative report on the conditions faced by short-haul drivers, titled: "Rigged: Forced into debt. Worked past exhaustion. Left with nothing". The report, a product of a year-long investigation into various southern California based trucking companies, details abusive practices on the part of the owners of the companies who deliver goods for retailers ranging from "Costco to Target to Home Depot" (the article mentions these

three companies in particular, all of which, as mentioned at the outset, offer instant-delivery service). Specifically, the truckers investigated are known as port truckers, who collect goods from LA's ports and deliver them not to retail locations, but rather "they drive them short distances to warehouses and rail yards" (Murphy, 2017). Author Brett Murphy describes the scheme in which trucking companies trap prospective drivers, who often do not know what they are getting themselves into and in many cases are "poor immigrants who speak little English". Murphy describes a truck-leasing system under which a number of these port trucking companies operate, whereby drivers "finance their own trucks by taking on debt they could not afford". After making the decision to finance their trucks, drivers find themselves in a financially vulnerable position which, as USA Today's investigation found, many trucking companies are more than willing to take advantage of (Murphy, 2017).

Murphy describes the ways in which drivers who opt into a truck lease end up finding themselves quite literally trapped, writing,

"If a driver quit, the company seized his truck and kept everything he had paid towards owning it. If drivers missed payments, or if they got sick or became too exhausted to go on, their companies fired them and kept everything. Then they turned around and leased the trucks to someone else. Drivers who manage to hang on to their jobs sometimes end up owing money to their employers – essentially working for free" (Murphy, 2017).

Murphy recounts the story of Samuel Talavera Jr. who worked as a short-haul driver until the truck that he had leased from his employers broke down and he could not afford to make the necessary repairs. Murphy writes that following this incident, "the company fired him and seized the truck -- along with \$78,000 he had paid towards owning it" (Murphy, 2017). Many drivers like Talavera end up with life altering money tied up in these jobs and consequently cannot

afford to walk away and look for other employment. As Murphy puts it, Talavera had essentially found himself in the position of “a modern-day indentured servant” (Murphy, 2017).

As if the aforementioned practices engaged in by these port trucking companies were not bad enough, USA Today’s investigation found a number of even more egregious methods by which owners forced drivers to work or risk a lease violation and lose everything. Murphy summarizes various additional findings of the investigation as follows:

“•Trucking companies force drivers to work against their will – up to 20 hours a day – by threatening to take their trucks and keep the money they paid toward buying them...

•To keep drivers working, managers at a few companies have physically barred them from going home. More than once, Marvin Figueroa returned from a full day’s work to find the gate to the parking lot locked and a manager ordering drivers back to work. “That was how they forced me to continue working,” he testified in a 2015 labor case. Truckers at two other companies have made similar claims.

•Drivers at many companies say they had no choice but to break federal safety laws that limit truckers to 11 hours on the road each day. Drivers at Pacific 9 Transportation testified that their managers dispatched truckers up to 20 hours a day, then wouldn’t pay them until drivers falsified inspection reports that track hours. Hundreds of California port truckers have gotten into accidents, leading to more than 20 fatalities from 2013 to 2015, according to the USA TODAY Network's analysis of federal crash and port trade data...” (Murphy, 2017).

Listed are just a few of the major findings that USA Today uncovered throughout the course of their investigation.

The results of this investigation are especially interesting because it provides insight into the less often considered world of short-haul trucking. Most people are aware of and can imagine

the conditions faced by long-haul truckers, such as nonstop driving over long distances, often little opportunity for breaks, lack of social interaction, all of which can eventually lead to fatigue and even exhaustion. The short-haul port truckers being investigated, on the other hand, face similar problems in the form of overwork and fatigue but also their own set of unique burdens. Based on the circumstances by which drivers entered into leases for their trucks, drivers may have either tied up significant amounts of personal wealth or taken on a large degree of debt. Either way, drivers are faced with the prospect of significant financial consequences should they violate their lease and lose their means of making a living. Faced with this choice, or lack thereof, many drivers will submit to the harsh demands of their employers as it represents their only viable option. It is working under these conditions that, as Murphy writes, “California’s port truckers make it possible for the Walmarts and Amazons of the world to function” (Murphy, 2017).

USA Today’s report was published in mid-2017, and in the years since, Amazon has been making strides to in-house more of its own transportation capabilities. According to Amazon’s own CFO Brian T. Olsavsky, a large contributing factor behind this decision is that, “What we like about our ability to participate in transportation is that a lot of times we can do it at the same costs or better and we like the cost profile of it, too” (Bowes, 2019). Such thinking is a large part of what landed Amazon in the position they are today, offering greater service than competitors and at a lower cost. Ruthie Bowles in SupplyChain247 outlines the effect that the decision to move towards in housing has had on Amazon’s transport fleet, writing that,

“Amazon’s current transportation fleet consists of:

- 40 Boeing 767 aircraft (with ten more coming in 2019 and 2020)
- Over 5,300 ocean freight containers moved in 2018



- More than 20,000 Mercedes-Benz sprinter vans (leased over time)
- 141,000,000 square feet of supply chain facilities
- 10,000 branded trailers
- 120 U.S. fulfillment centers
- 52 Prime Now hubs” (Bowes, 2019).

Clearly the amassing of such a massive fleet represents a further display of Amazon’s nontraditional modes of expansion, even more out of the box is the firm’s approach to increasing last mile delivery capacity through their “Delivery Service Partner” (DSP) program.

In June of 2018 in an effort to increase their last mile delivery capacity, Amazon introduced the Delivery Service Partner program. Through this program, Amazon will offer current employees up to ten thousand dollars (equivalent to about three months’ salary) in order to start their own business delivering Amazon packages. Employees will have the opportunity to run their own “local delivery networks” consisting of up to forty Amazon branded vans (Mercedes Sprinter vans mentioned above). Delivery partners will pick up packages from one of seventy-five Amazon delivery stations and complete the last mile of the delivery to the end customer. Amazon advertises that employees who opt into this new program have the potential to earn anywhere from seventy-five to three hundred thousand dollars annually when operating fleets with twenty to forty vans. Another alternative program that Amazon has introduced to deal with last mile deliveries is the “gig-work” Amazon Flex program. The Flex program could be described as the “Uber or Lyft” of package delivery in which drivers have a great degree of control in determining their own work schedules and can choose when they would like to be “on” and delivering packages. Amazon boasts that workers under this program can earn between

eighteen and twenty-five dollars an hour and that it provides the fulfillment that comes with “being your own boss” (Amazon, 2018).

While such delivery options may seem like a good alternative for those who cannot endure the strenuous nature of warehouse work, a joint investigation by BuzzFeed News and ProPublica reveals that such work have serious drawbacks of their own, finding that “in its relentless drive to get bigger while keeping costs low, Amazon’s logistics operation has repeatedly emphasized speed and cost over safety”. The investigation, titled “*Fast Mile*” focuses on the ethos of Amazon’s last mile delivery strategy as the company made the shift towards increased in-housing in that area. The investigation reports that “Inside Amazon, some employees have worried that the company loads up drivers with too many packages and expects them to complete deliveries at an inhuman pace.” One former Amazon manager describes the prioritization of offering high service levels to their customers saying, “The means to the end is something they don’t care about... If we are forcing these drivers to go like bats out of hell to get this stuff all over town, that’s OK, because we are making it great for our customers. The human cost of this is too much.” (Bensinger, 2019). As the article points out, such an idea is consistent with Amazon founder Jeff Bezos’ guiding belief that customer service should take precedence over all else when operating a business. The article quotes Bezos in a 1999 interview as saying that Amazon employees should “wake up every morning absolutely terrified, drenching in sweat” and that this fear should be not of the competitor but of the customer. Bezos continues, saying that “Our customers are loyal to us right up until the second that somebody else offers them a better service” (Bensinger, 2019). This philosophy has remained core to Bezos and Amazon’s competitive strategy and remains with them to this day, over twenty years later.

According to the BuzzFeed investigation, Amazon settled on the idea to employ third party contractors making use of their own fleets of small cargo vans when an experiment in San Francisco found that trucks similar to those in size of those that UPS employs “had difficulty navigating the city’s narrow, hilly streets”. As previously reported of the DSP program, the contractors would operate from Amazons “delivery stations” and deliver the company’s own packages, the investigation also reports that the drivers “followed the instructions of Amazon routing software, which dictated the number of packages loaded onto their vans and the order of the stops on their routes”. Additionally, it appears that the rigorous quality standards present within Amazon warehouses carry over to their delivery drives, as the article reports that the drivers, “were held to extremely high performance standards, including a requirement that 999 out of 1,000 packages be delivered on time” (Bensinger, 2019). Another important distinction between the use of small “sprinter-esque” vans is that unlike FedEx or UPS trucks, the contractor’s vans are below the weight limit for regulation by the U.S. Department of Transportation. In practice this means that “they didn’t have to adhere to safety mandates such as vehicle inspections by federal regulators or limits on the number of consecutive hours drivers could spend behind the wheel” (Bensinger, 2019). A final point on the relationship between Amazon and their last mile delivery contractors comes in the form of legal liability. On this point, the authors write,

“The contracts drafted by Amazon's lawyers for the delivery companies also shielded the e-commerce giant from just about every imaginable liability. The delivery companies were on the hook for anything that went wrong, from workers complaining they were mistreated or underpaid to pedestrians and drivers hurt in crashes. And when Amazon was sued in such cases, the delivery companies were even responsible for paying all of Amazon's legal bills” (Bensinger,

2019). This relationship would prove especially beneficial for Amazon when delivery drivers were involved in accidents with pedestrians. Of the sixty serious injury cases involving Amazon drivers that the investigation found, such language shields Amazon from liability even in cases where the incidents proved fatal.

BuzzFeed spoke with Will Gordon, a former employee at Amazon's Seattle headquarters, who headed a team with the goal to "improve route planning and maximize the efficiency of deliveries". According to Gordon, "There was a maniacal focus on increasing shipments per route... Everything was about getting more shipments per truck. It was the one metric that drove the organization". Gordon claims that at this point in the company's history, increasing the number of shipments per route was the number one priority taking precedence over any number of other considerations, safety included. The authors relayed an example given by Gordon regarding cities like Los Angeles where "Amazon underestimated the time it took to complete routes by failing to factor in rush hour traffic" continuing on to detail the effect of this lack of foresight writing, "This led harried drivers who felt pressured to race to complete their routes." (Bensinger, 2019). Another element of their delivery fleet that Amazon set out to optimize was the onboard navigation used by the contract drivers known as Rabbit. According to the article, Rabbit handled everything from scanning packages, to providing delivery instructions, to turn by turn directions to the end destination. BuzzFeed connected with Paula Wood, a member of the team tasked with improving the Rabbit app, who describes poor technology and a lack of commitment to the drivers on the part of Amazon. According to Woods, on a number of the routes set by Rabbit, "drivers didn't have enough time to go to the bathroom or eat, so they skipped meals and breaks and urinated in bottles". Woods also claims that the app was poorly made from the start, being paraphrased by the authors as follows, "Navigation directions were

terrible, she said. Drivers were, for example, directed to curbs that were no-stopping zones during rush hour. The Rabbit sent drivers on dangerous paths, back and forth across busy roads, she said, full of repeated U-turns and left turns” (Bensinger, 2019). Between poor planning and a need for speed when it came to increasing package delivery rates to match consumer demand, Amazon created an environment in which their drivers, similar to their warehouse workers, were forced to speed up in order to hit their quotas. While often these conditions “only” resulted in personal injury for warehouse workers, when introduced to the roads it creates a dangerous condition for the general public, which as has been shown, can result in fatal consequences.

This chapter will conclude with the account of a personal interview with Manuel Balbuena, a twenty-two-year-old biology student at the Pennsylvania State University, regarding his own experience working in an Amazon fulfillment center. Balbuena began working at Amazon’s Allentown location in October of 2017 as a “picker and packer”, a position which lasted about four weeks by which time he resigned. At the outset of the interview Balbuena asked whether it was a “formal” interview or if he could say whatever he wanted. On being informed that it was the latter he replied, “Word, cause *\*expletive\** that place”. This sentiment set the tone for what would be an unhappy remembrance that brief tenure Balbuena spent at Amazon’s Allentown warehouse. Prior to the interview, Balbuena was not given any indication as to the direction of this research aside from being told that it centered around working conditions within warehouses such as those operated by Amazon. Over the course of his time at Amazon’s Allentown warehouse, Balbuena worked the night shift which generally began at two a.m. and shifts ran from twelve to fifteen hours long. Balbuena worked in a four day on, four days off cycle consisting of four nights in a row of the above described shift followed by four

days of no work until the cycle repeats itself. Balbuena outlines the typical events of working a nightshift as follows:

“I’d get there in the morning, it’d be really dark obviously. Walk in there, we weren’t allowed to have any like cell phones or anything so like it was pretty miserable, cause like I would just have a whole shift without talking to anyone, I had no music, so like I was just, you know like, doing my work for hours and it was like mind numbing. But I’d walk in there and put all my stuff in the cubby and like walk in and they had metal detectors and all that. Walk in there, just meet in the center, like with the manager and he’d tell us what to do, whatever, and we’d just go off and like do our job for how many shifts and then we get two half an hour breaks. Pretty much they split up the time in thirds. So, like that really wasn’t enough, just two half hour breaks in fifteen hours overnight, like I really didn’t think that was the best ratio that they could’ve given. But like basically it’s just like do your work, break, do your work and then leave. It’s just very straightforward, not like no fluff, like not much you can do else”.

The account given by Balbuena is consistent with that of Bloodworth’s, as well as the number of other Amazon employees who have spoken on record regarding their own experiences at Amazon.

On inquiring what attracted Balbuena to a warehousing position as opposed to a more “traditional” job for a student working through college, he replied that the main reason was simply the fact that the company offered such a high hourly pay. Balbuena mentions that he knew he was a hard worker and figured that he could handle the demands of the job so he decided to give it a shot and see what it was like. As a follow up he was asked what it was that eventually caused him to leave and he immediately replies, “Oh the working conditions and the

hours” continuing to say “I didn’t like it, I couldn’t see anyone that would like doing that, so like I just, it wasn’t worth it, I could find a much better job elsewhere”.

Speaking on the personnel that he worked alongside during his time at Amazon, Balbuena says that from the interactions he had, his supervisors seemed nice enough and that he never had any problems working with them. When asked about his coworkers, Balbuena mentioned for the most part he has little recollection of any of his coworkers individually, save for one that he had met over the course of his two-day orientation. Balbuena recalls,

“I met this one guy that worked with me and like we talked there, but not really like outside because we had to, we weren’t really allowed cause we had to keep working, we couldn’t stop packing stuff. Like as soon as our bin was empty, like packing things in bins, we would have to grab another one and keep doing it, so we couldn’t really like socialize. So, like I didn’t really get to know people extensively”.

When asked about productivity numbers, Balbuena could not remember any exact rates or quotas that he was asked to meet but says that while he would not describe them as “unrealistic” he did say that they were “higher than they should’ve been”. Throughout the course of this interview it became clear that Balbuena has a strong work ethic, a fact that he carries with pride. Balbuena describes the how it came as such a shock when he was confronted by a manager regarding “low” productivity numbers,

“I know for a fact I worked hard, for everything I do I work hard, like I packed things nonstop, like and I’d get more in and I’d keep doing it, like I’d keep doing it. And like one day the dude came up to me, he was like ‘oh your um productivity’s not there’. I’m just like ‘how is that possible’, like I’m literally doing this all day, like I don’t speak to a soul for like the whole shift, I’m like it’s literally impossible, this is the only thing I’m doing and how is that possible.

So like right there I was like, maybe the numbers that they want to reach are just like stupid high. Cause you know, like they have a lot of people buying their stuff so, it's not like their fault, the manager's fault, but it's just like the company standards are just, maybe should be more relaxed also".

Finally, Balbuena was asked about the physical demands that came with the job.

Balbuena prefaced his response by saying "I work out every day anyways, so like it wasn't, the toll on me wasn't as bad as it would have been on someone that doesn't". Even considering Balbuena's above average level of physical fitness, however, he says "even me, I was beat after a shift, after like four days yo, I would sleep for like fifteen hours after a four-day run, like straight up I'd literally sleep hours, like fifteen hours cause I was just so tired. Cause like you're on your feet the whole shift, you're walking the whole shift, like over twelve hours straight walking".

For the final question of the interview, Balbuena was asked what if any advice he would give someone considering taking a position Amazon's Allentown warehouse. Before the question had finished being asked he answered succinctly and with a tone of finality, "Don't".



## Chapter 3

### Methodology

The remainder of this research will focus on determining potential solutions that providers of instant delivery services can implement in order to improve their employees' quality of life. These solutions will incorporate physical safety as well as mental health related improvements for workers within warehousing and distribution center environments. Additionally, quality of life improvements for both long haul and last mile truckers will be suggested in order to both improve driver working conditions as well as to increase safety for the general public on the roads. With each solution provided, a discussion of both the costs and benefits will follow in order to determine the potential pros and cons for firms should they choose to go ahead and implement the solutions proposed. Importantly, this analysis will look to determine what potential costs to efficiency may be incurred that could hamper the firm's ability to fulfill the promise of high service levels such as next day shipping. Conversely a heavy focus would also be placed not only on the benefit to worker wellbeing, but also the positive side effects that firms may experience as a result.

In devising solutions to the myriad of physical dangers that instant delivery warehouse workers find themselves exposed to, the works of experts in the field of injury prevention and personal fitness will be consulted. One such expert is Kelly Starrett, one of foremost figures in the world of recover and mobility, whose work is taken as gospel for many athletes training at the highest level of their sport, who day in and day out are subject to some of the most extreme physical demands imaginable. Not limited in scope to high level athletic performance, Starrett works to provide simple yet crucial advice to individuals in all walks of life regarding correct body movement when it comes to everyday activities such as how to properly

pick up a heavy object. Additionally, research will be conducted into best practices by other firms operating warehouses, whether or not they may be engaged in providing instant delivery. Any innovations that benefit worker health and safety and could translate over to an instant delivery environment will be duly considered when devising solutions.

Research into mental health solutions for workers will follow much the same pattern as laid out in regards to physical health, primarily taking the form of literature review. Given the relatively recent arrival of the type of work being studied within this thesis, there is little in the field of industrial and organizational psychology that has been published on the topic. The problems that we have seen described however, such as social isolation, monotonous tasks, and an overall lack of job satisfaction are not relegated to instant-delivery warehouse environments. Solutions therefore implemented in other environments such as offices could be applied to the warehouse setting, hopefully providing preliminary fixes to some of the problems discussed, until such a time that research specific to this space becomes a greater focus.

Finally, on the topic of driver safety, research will be conducted into safety practices implemented by major logistics providers and how such practices may be implemented across the board by those striving to provide instant delivery. A greater emphasis will be placed on investigating what can be done for the last mile drivers, as the previous research has demonstrated these workers seem to be those faced with the most pressure to perform and deliver under instant delivery supply chains. Within last mile, another aspect of transportation safety to investigate comes from “gig-work” providers such as Lyft and Uber. Lyft and Uber’s business models set the framework for Amazon’s “Flex” the major difference being that the former deliver passengers while the latter, packages. Both Uber and Lyft have faced criticism over their treatment of the contract work drivers that provide the backbone of their fleet, looking at how

these and other ride-hailing services have made changes to improve worker wellbeing can provide cues for firms like an Amazon to follow themselves.

The end goal of this analysis is to hopefully provide firms that recognize and admit to problems within their operations with a sort of starting point from which to make changes and further develop their own solutions. To once again quote Professor Michael Marmot, “it seems to me the demands of efficiency at the cost of individual’s health and wellbeing – it’s got to be balanced”. Historically, firms that have been seen to take advantage of their workers in order to shift the balance too far in favor of efficiency have faced significant consumer backlash and public outcry, such as was the case of Nike’s experience operating sweatshops in the 90s. As of yet this backlash has not materialized for many of the firms discussed thus far, allowing the opportunity to proactively avoid impending criticism by making changes. Hopefully the solutions presented in the following chapter can serve to inspire creative ways to shift the balance more towards workers’ favor than it exists today.

## Chapter 4

### Analysis

Dr. Kelly Starrett is an accredited doctor of physical therapy, CrossFit trainer, and author devoted to bringing modern recovery and mobility knowledge to the masses. Starrett boasts testimonials from countless athletes ranging from Georges St-Pierre, former two division UFC champion and considered by many to be the greatest mixed martial artist of all time, to comedian and podcast host Joe Rogan, to action film superstar Jason Statham. Starrett's book, *Becoming a Supple Leopard*, aside from achieving New York Times Bestseller status, has become gospel for many athletes seeking to improve performance, decrease recovery time, and maximize longevity in their chosen sport. A large part of what has made Starrett's methods so popular is his thesis that "the leopard doesn't stretch". Boiled down, this idea refers to the fact that a leopard in the wild does not need to stretch and warm up before hunting down its prey. Leopards can go from idle to max exertion in an instant in order to complete the task at hand. Starrett posits that humans possess the same ability to be supple like the leopard yet many of us cannot because of incorrect body mechanics and posture, learned and developed over time and thanks to the comforts of the modern world. Learning and applying correct body posture is so crucial according to Starrett that it can serve to prevent ninety-eight percent of all injuries that we as humans experience, the remaining two percent being due to pathology and catastrophic injury, such as might arise as the result of a car accident (Rogan, 2013). The principles and strategies espoused by Starrett are applicable not only at the highest level of athletics, when people must contend with some of the greatest physical stresses imaginable, but also activities performed in everyday life such as lifting a heavy box. Given simple instructions on correct body movement, specifically focused on the most common tasks performed during the workday, employees

working within instant delivery warehouses can be better prepared to safely perform their jobs and reduce the potential for injury.

One of the most important aspects of correct body posture and movement according to Starrett is “Spinal Mechanics”, which make up the very first topic addressed in *Becoming a Supple Leopard*. Central to correct spinal mechanics are the ideas of both the “Bracing Sequence” as well as the “Braced Neutral” spinal position, taken together these ideas provide the framework for a correct standing position. Exhibit 6 highlights the difference between two common spinal faults as a result of poor posture and a strong braced neutral spine.

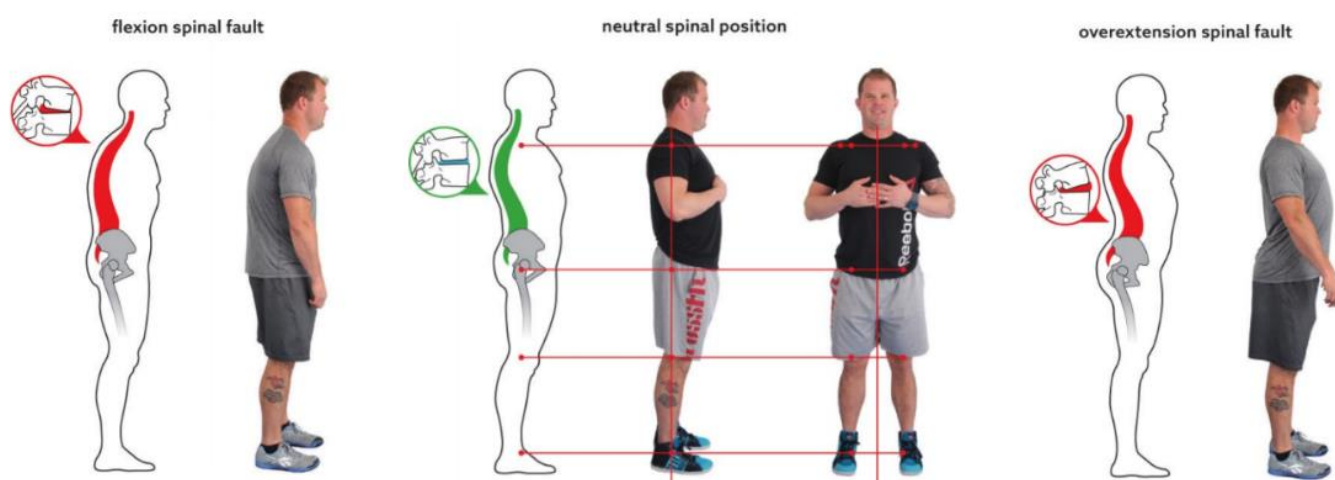


Exhibit 6. Dr. Starrett Demonstrates Correct vs. Compromised Spinal Positioning

[image courtesy of Fremont Chiropractic]

Starrett believes that “The braced neutral position is the optimal base position for most human movements” going on to say that “It is the most utilitarian position for the spine because it allows you to handle load safely and transmit force efficiently” (Starrett, 2015). The concept of a braced neutral spine is unfamiliar to many as the conditions of the modern world easily lend

themselves to the development of a hunched and slouching posture often resulting in a rounded spine. In order to simplify this method of posture correction, Starrett breaks down the five steps from compromised to braced natural spine in what he has coined the “bracing sequence”. The steps included in the bracing sequence can be seen below in Exhibit 7.

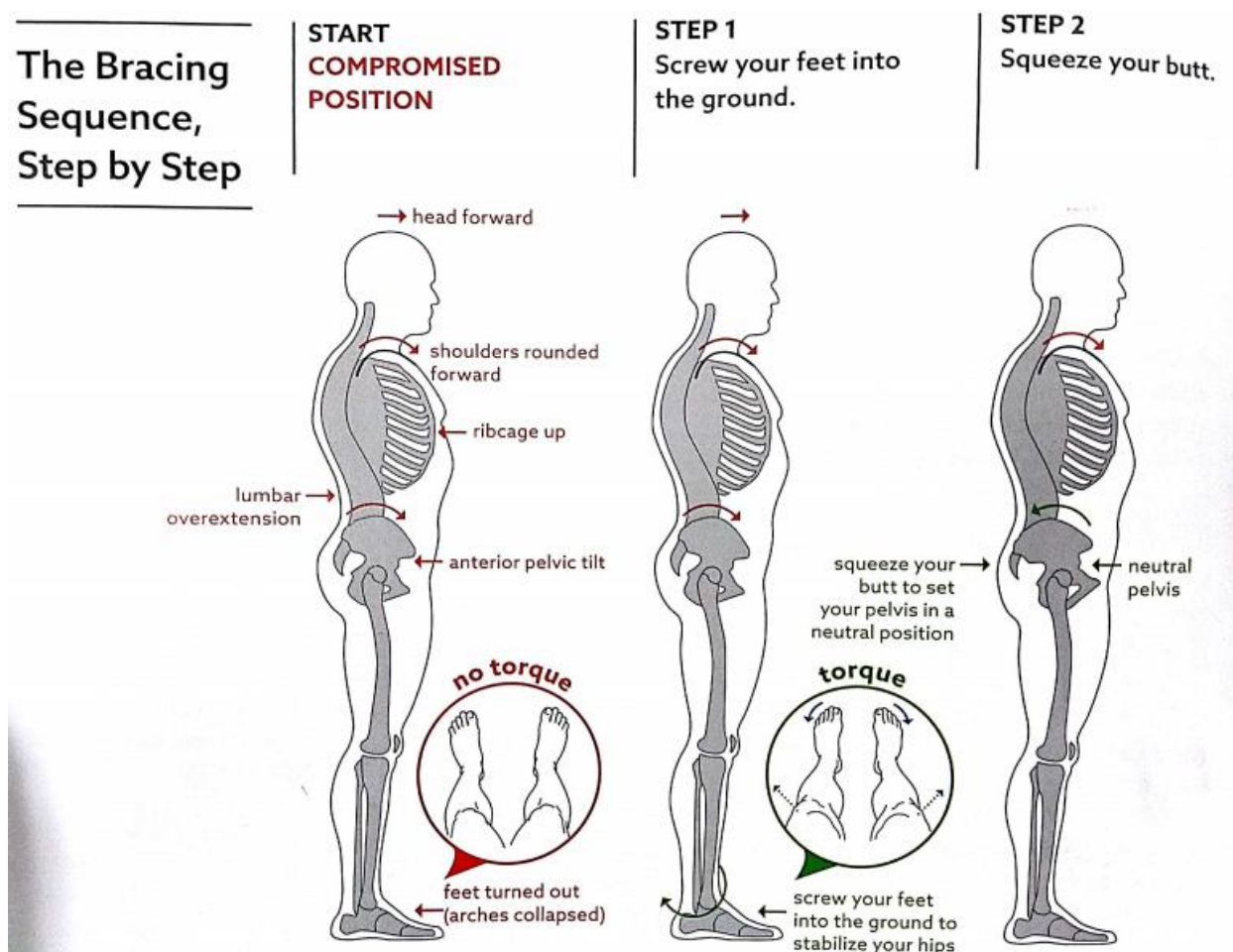
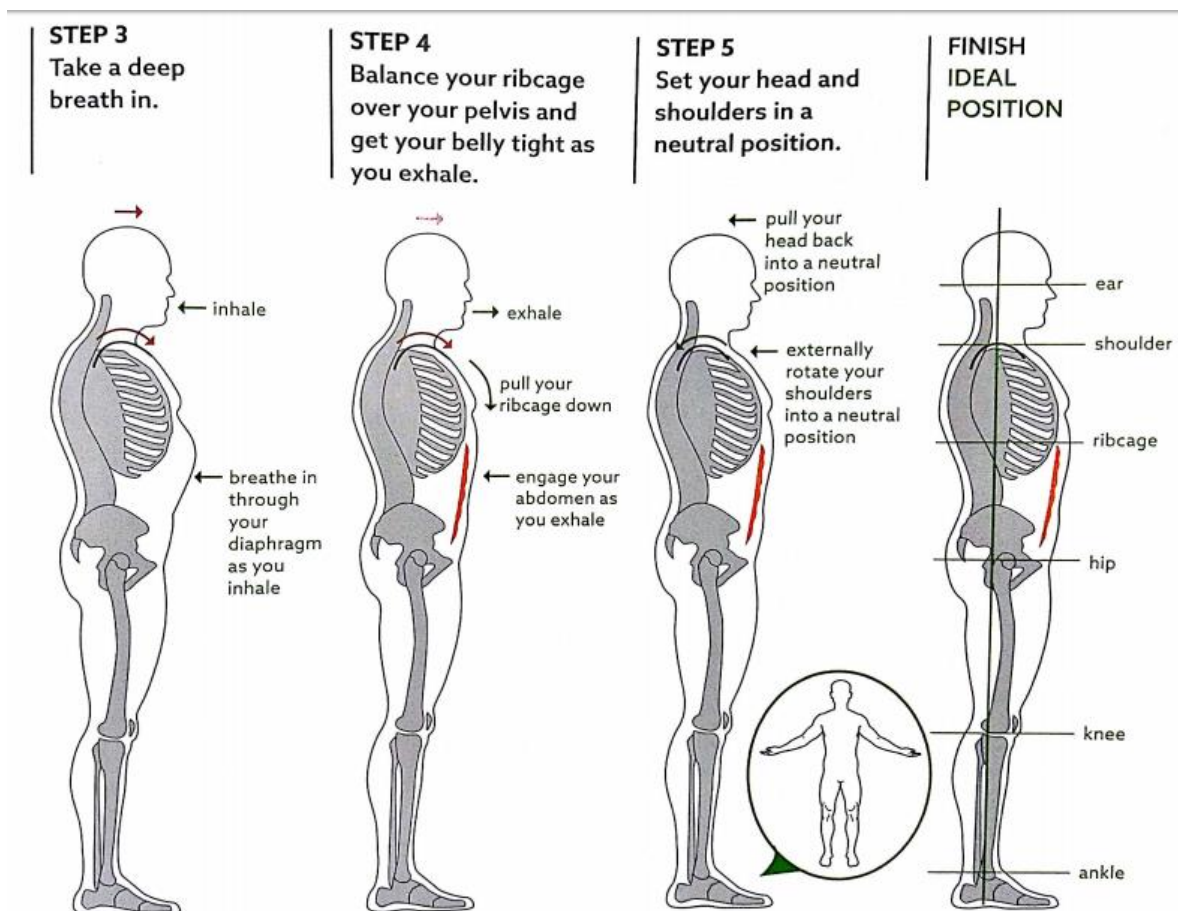


Exhibit 7. Steps of Dr. Starrett's Bracing Sequence

[image courtesy of PK Fitness]



(Exhibit 7 contd.)

While it may seem needlessly complex to go through a five step system simply to stand “correctly” in practice it only requires a few seconds of concerted thought to go through the movements which get easier as they become habitual. Given the amount of time that workers reportedly spend standing and moving around on their feet over the course of a single day in an on-demand delivery warehousing setting, it should be a crucial first step in injury prevention to ensure that workers are given education on correct posture.

Proper spinal mechanics lay the foundation for a number of other movements that one could conceivably perform in a warehouse setting, such as reaching to pick an item off an overhead rack to bending down to lift a heavy box from the floor. The latter movement, that of picking up an object off the floor is such a common sight in everyday work and life that many disregard proper form in practice. Consider how many times you have heard something along the lines of “Yeah I threw out my back the other day trying to lift xyz”. Lower back injuries have become such a common sight in the modern world simply because of a lack of education on proper form. The movements required to lift any sort of object are much the same as those required to perform the weight training exercise known as a deadlift. When performing a deadlift, athletes begin bent over, gripping a weight, often a weighted barbell. and with locked arms using primarily the legs and lower back, moves to a standing position with the weight in front of the hips. Starrett explains the benefits of proper form in such positions as follows:

“Each time you bend over to pick something up off the ground, you’re essentially executing a deadlift. Yet few people understand how to do it correctly. The fact that so many people round their back when they bend over to pick things up may explain why millions suffer from lower back pain. People who understand how to deadlift with good form – meaning that they know how to brace and create torque, and never sacrifice form for range of motion – typically have fewer back problems. They have a model for picking something up that is universally applicable: If you know how to set up for a deadlift, you know how to pick up something heavy off the ground without compromising your back.” (Starrett, 2015).

In order to position the body to properly perform a deadlift or any similar lifting motion, Starrett offers yet another bracing sequence similar to the sequence highlighted previously when discussing spinal alignment. The “Top – Down Setup” is a ten step sequence, more complex than



the bracing sequence to reflect the increased complexity of the movement being performed.

While all ten steps will not be listed here in the interest of brevity, some key concepts to highlight include the idea of “screwing” oneself into the ground through the feet which helps to generate torque and stabilize the joints (see step 1 of Exhibit 7) as well as creating tension within the trunk muscles. In the bracing sequence, it is the core abdominal muscles which should be engaged whereas when performing a deadlift, the complementary lower back muscles should be tensed along with the hips and hamstrings. Finally, potentially the most important step in performing the deadlifting motion correctly is maintenance of a flat spine throughout the movement. Rounding of the spine under such tension when lifting any sort of a heavy object is one of the quickest ways to open the door to injury.

Proper spinal alignment and deadlifting form are just two examples of education that could be provided to workers on how to better position their body in order to more efficiently complete their daily tasks and avoid potential injuries. It would require minimal costs to assemble such a training program which could either be implemented into orientation training, be performed on an ongoing basis, or some combination of the two. The benefits derived from such knowledge on the other hand could be immense in terms of increased employee retention, less paid time off for recovery, less medical expenses paid by the firm, increased employee performance, and the list goes on. The theoretical benefits of providing this education are countless but in practice the efficacy of increased knowledge of correct body positioning comes down to the ability to implement techniques learned when working. In Chapter 2 a common theme was that workers in instant delivery settings were often under such pressure to meet quotas that they were forced to forgo proper lifting techniques in order to maintain pace. Even if employees are given the knowledge they need to safely complete their tasks, with rigorous

demands to meet they may simply be unable to take the little bit of extra time to preform correct movements out of a fear of corrective action.

Correct body movement and knowledge about posture is a critical first step for those in any line of work in which strenuous manual labor is a part of the job. Looking beyond the foundations however, new technologies have been appearing in our ever-evolving world that have the potential to allow workers to increase their output while simultaneously protecting themselves more than ever. One such piece of technology that comes straight out of the realm of science fiction is the “exoskeleton”. Ekso Bionics is the firm currently paving the way for widespread exoskeleton use in industrial applications. Before developing the Ekso Works model of exoskeleton, Ekso Bionicks worked to provide suits that would enable those who have been paralyzed to walk again through the use of robotics. A short video by Wired titled “Exoskeletons Will Make Work Weightless” describes the suit as “less Tony Stark’s Iron Man armor and more the Power Loader from Aliens”. The original suit was entirely analogue and designed to help workers stabilize a heavy tool above their heads for long periods of time without growing tired. Fast forward to the present day and Ekso Bionics now manufactures a range of industrial exoskeletons categorized by which muscles require support: back, arms, legs, etc. One model of the Ekso Works vest in particular can provide up to fifteen pounds of support for each arm as reported by Bloomberg (Bloomberg, 2019) Currently, Ekso Works suits are being trialed primarily within construction and industrial settings with Ford being a notable test site. Additionally, organizations such as Boeing and BMW have been experimenting with different models of exoskeletons to aid their workers as Industry Week reports (Hitch, 2018).

Such technology could easily crossover and provide countless benefits for workers within instant delivery warehouse settings. While employees may not be engaged in

lifting as heavy as those in a construction or manufacturing setting, the constant movement and repetition of lifts can add up to result in severe fatigue and injury as we have seen. A suit such as the Ekso Works vest which provides lifting assistance to the arms could be an extremely useful tool to both increase worker efficiency and safety in everyday tasks. The tradeoff, however, is that outfitting workers with exoskeletons can pose a significant financial cost. According to Bloomberg, each unit of the arm assist Ekso Works vest will cost just under seven thousand dollars. (source) Applied to Amazon's North American distribution network for example, with over one hundred twenty-five thousand workers, it would cost in excess of eight hundred and seventy-five million dollars to outfit the workforce with these suits. Not a small cost to be sure but given that the company reported nearly eighty-seven and a half billion dollars in revenue in 2019, it is not beyond the realm of possibility either.

Truck driving is one of the oldest and most critically important professions in America. It is clear that increases in technology along with a more connected world than ever have meant drastic increases in the demands that come with trucking jobs. It is time then to look at new technologies for a solution to aid truck drivers operating in the on-demand delivery space.

In December of 2017, Tesla CEO, Elon Musk introduced "Semi", the company's first fully electric, long haul freight truck. Semi is described by the manufacturer as "the safest, most comfortable truck ever" (Tesla, 2020). Features that Semi offers in order to back up the claim of safest truck on the road include, "Enhanced Autopilot" which is featured in all Tesla vehicles and helps to supplement driver input and aids in accident avoidance, and a "low center of gravity" which should provide trucks with an extra measure of "rollover protection". Additionally, Semi features a "centered driver position" providing the operator with an almost cockpit like feel and providing increased visibility over a typical long-haul freight truck as shown in Exhibit 8.



**Exhibit 8. Tesla Semi Interior**

Tesla is quick to point out that Semi is not a fully autonomous vehicle and as such requires the constant attention of a driver who “is responsible for remaining alert and active when using Autopilot, and must be prepared to take action at any time” (Tesla, 2020). If in practice, Semi operates anything like the countless other Tesla models currently on the road. The vehicle will be continuously monitoring driver input and alertness and provide some sort of a tone or other stimulus should it sense that the driver is dozing off. Once these trucks start to hit the road, an additional potential safety feature could come in the form of vehicle data sharing with the employers. Such a feature could look something like the employer receiving a notification that a driver was given multiple “wake up” alerts in quick succession. The employer could then get in contact with that driver, instructing them to get off the road and guiding them to the nearest rest area. From there the truck’s motor could be shut off remotely until the driver has had an opportunity to gain adequate rest. Such a feature would have been incredibly useful had it

been available at the time of the Tracy Morgan/Walmart accident, which was determined to have been almost fully the result of driver fatigue. With such safeguards in place, businesses will have no excuse for not knowing the conditions that their drivers are operating under as the data will be plain to see.

Investment into these advanced trucks, be it the Tesla Semi or another brand to emerge in the coming years, will be primarily a financial decision rather than an efficiency concern. The up-front purchase price of a standard long-haul semi-truck could range from between eighty to one hundred and fifty thousand dollars. In comparison, Tesla's Semi begins at that high-end range of one hundred and fifty thousand for the three-hundred-mile range model and runs up to one hundred and eighty thousand for the five-hundred-mile range model. For a lower cost carrier this price could be a concern when looking to build a fleet, but for the larger organizations, those with the infrastructure to best support instant delivery, such a cost should be within scope. Once the up-front cost is paid, the Semi's become a long-term investment, one that could end up being profitable as Tesla predicts an excess of two hundred thousand dollars in fuel savings when compared to a standard semi. All this before even taking into account the benefits in terms of worker well-being as well as contribution towards organizational sustainability goals as emissions are significantly reduced as a result of electrifying any delivery fleet.

To once again call back to the words of Jessica Silver-Greenberg, "cruel irony of all of this is that despite all that work, there is a very real chance that all of these jobs ... will eventually be replaced by robots" (Barbaro, 2018). Fast forwards a little over two years from Musk's announcement of "semi" and today every Tesla sold comes standard with highly advanced autopilot features and by the end of this year Musk announced that Tesla plans to release its own fleet of fully driverless "robotaxis" to compete with the likes of Lyft and Uber.

This then begs the question: how long will it take until semi-trucks are the latest to become fully automated and driverless, especially when faced with demands beyond the scope of a human operator?

It is often heard and said by those working all across the supply chain field that “we’re facing a shortage of truck drivers”, as demand for goods has clearly outgrown the supply of those willing to deliver those goods. Given this dilemma, it is entirely possible that automated trucks could provide the perfect solution to the present shortage and may render human drivers entirely obsolete in the long run. Whatever the case the future of transportation may hold, the world we are living in today is not yet fully automated. The solutions detailed above could realistically provide safer roads for both truck drivers as well as the general public while not hampering efficiency required to meet the high demands of instant-delivery.

As the need for last mile delivery capacity continues to increase, delivery fleets start to look increasingly like rideshare fleets. From the “contractor” status of many of the drivers to the “work when you want, be your own boss” nature of the job, the fields significantly share similarities. When devising solutions to aid instant-delivery drivers then, it seems only logical to take a look at steps that organizations such as Uber and Lyft have taken in order to increase the well-being of their own workers.

One step that Uber takes is to provide drivers with a range of safety warning through the app which is always running while a ride is in progress. Two such warnings which the company’s website notes are speed warnings if it is detected that the vehicle is moving faster than the posted speed limit, as well as reminders to take breaks in order to ensure driver alertness behind the wheel. Going back to the idea of data sharing between vehicle and employer, these metrics could be more strictly enforced by delivery providers to further improve driver safety.

Very similar to the above semi-truck example, if the employer is notified that the driver has received too many alertness warnings, the driver could be asked to stop work for the day and return any undelivered packages. In terms of speed warnings, if the employer is notified that the driver exceeded local speed limits, say three times within one day, that driver could be subject to corrective actions. Both of these solutions would effectively slow down a delivery fleet, thus a reduction in efficiency would be the primary cost. It is up to businesses then to determine whether or not the increase in driver and public safety is justified by the cost of slowing delivery speeds.

One of the biggest concerns that both Lyft and Uber have faced in recent years is safety from physical violence, an issue which effects drivers and riders alike. In an attempt to address this issue, on step that Lyft will soon be taking is the introduction of predictive measures to help identify when a driver may need assistance. According to Lyft, this service will operate as follows: “if we notice your ride has stopped too soon or for an unusual amount of time, drivers and riders will hear from Lyft. We’ll ask if you need support, and if necessary, we’ll give you the option to request emergency assistance” (Lyft, 2020). While protection against physical violence is likely not something that delivery drivers need to be as worried about as those offering rides to strangers, such a feature could be adapted for accidents or other emergency situations. If an abnormal stoppage along a driver’s route is noticed, the employer could reach out to confirm their safety. If the driver does not respond, the employer could then immediately contact emergency services and be able to provide them with the exact location of the vehicle. Given that many businesses already use technology that constantly tracks drivers, implementing such a safety measure should be a relatively simple task while potentially providing enormous safety benefits.

Chapter 2 discusses the mental health of workers as a critical yet often overlooked component of overall wellbeing. As pointed out by Dr. Naomi Swanson, due to the relative infancy of instant-delivery warehouse work as an occupation, there is minimal research regarding the links between such working conditions and mental health. Therefore, in order to determine potential solutions, to the challenges faced by these workers, one must look to best practices from other industries and at a more abstract level in order to determine which can be applied to warehouse work.

Setting aside the physical tolls of the job, one of the most prominent complaints given by instant delivery warehouse workers is that they essentially feel as though they are being treated like robots. Day in and day out, workers in these environments set about the same task, often along the lines of “receive an order, pick an item, pack the item, repeat”. Given the prospect of facing the same monotonous work in perpetuity it is hardly any wonder why many of these employees are reportedly unsatisfied with their work.

The impact of performing “boring” tasks at the workplace on feelings of depression was studied in the Netherlands in 2016 by Madelon L.M. van Hooff and Edwin A.J. van Hooft. The researchers found that for employees with a high level of work centrality, essentially how important is work to the individual, boredom at work related positively to feelings of depression both after work as well as later in the evening. The researchers are careful to note that while monotony in terms of work routine has been shown to lead to feelings of boredom, repetitive tasks can also lead to positive outcomes such as creativity based on the task and the individual. Given the nature of warehouse work related tasks as previously described by employees, it seems safe to operate under the assumption that such monotony causes work-related boredom and thus



the results of this study would apply to a warehousing context. (Hooff, 2016). The researchers posit that,

“Employees who feel bored at work experience their work as unchallenging and meaningless (van Tilburg & Igou, 2011, 2012), and see no intrinsic value in their tasks (Fisher, 1993; Mikulas & Vodanovich, 1993; Pekrun et al., 2010). This implies that work-related boredom signals to employees that they are not progressing towards their work goals and the ultimate goal of growth and development. Based on control theory (Carver, 2004; Carver & Scheier, 1990), it may be assumed that this lack of goal process results in feelings of depression. Namely, this theory poses that people continuously monitor their pace of progress towards their desired goals. Goal-reaching progress taking place at a rate faster than expected will result in experiencing positive affect, whereas goal-reaching progress at a slower than expected pace will evoke feelings of negative affect”. (Hooff, 2016).

Consider the circumstances detailed by James Bloodworth, who wrote that employees were explicitly told that they should be “under no illusions that this is a temporary job”. (Bloodworth, 2018). People working in such an environment are incapable of striving towards any career or even life goals when they know that odds are sooner or later they will be out of their current job. The only solution then is to strive to pick the next item as quickly as possible, all while hoping that they had done enough to ensure they have held on to the job that puts food on the table for one more day. On the bright side, Hooff and Hooft may have found a silver lining that may provide solutions for warehouse workers dealing with feelings of job dissatisfaction. Their research found that those feelings of depression bought on by a day of monotonous routines in the workplace may be alleviated to some extent by “daily need satisfaction” following the workday. Essentially this means that if an employee is feeling

unsatisfied with their work but is able to somehow replace that goal-seeking satisfaction outside of the work, the effect of depression is mitigated and a level of fulfillment is achieved. (Hooff, 2016). Given these findings, the question becomes how to implement solutions both inside and outside the workplace for instant delivery employees in order to provide some measure of job satisfaction and improve mental wellbeing.

One possible solution is to provide as a standard employee benefit access to educational/skills training in an area that may be wholly unrelated to the job at hand. Precedent for such a benefit already exists in countless organizations globally that may offer a benefit somewhere along the lines of “if you work with us for two years, we will pay for you to go back to school and obtain a master’s degree”; oftentimes the area of education need not relate at all to the current job position. Generally, the “after x amount of years” stipulation exists so that firms do not lose out on talented workers who are simply looking to obtain a free education and then leave. However, for an organization like Amazon, that clearly is not worried high turnover, offering education as a benefit day one should not be an issue. The main barrier here then becomes financial cost, and given that Amazon already offers its warehouse workers extremely competitive salaries, such an investment in order to attract more labor does not seem to be unrealistic. Given that in 2019, Amazon had over seven hundred and fifty thousand employees and is only seeking to grow bigger, the firm could seek to reach a deal at scale with online educational providers for all of their employees. Envision a scenario then in which Jane Smith wants to be a computer programmer and John Smith a chef. Jane and John work at their local warehouse in order to pay their bills while learning the skills to pursue their true passions after working hours and on their days off. When their time at Amazon comes to an end, both are now equipped with new skills, allowing them to find employment elsewhere and continuing to make

progress towards their life and career goals. If the unsatisfying nature of the work cannot be changed, at least the overall effect on well-being can be mitigate by offering workers the opportunity to gain satisfaction elsewhere.

A second, yet equally important mental health concern leveled at instant delivery warehousing locations is the lack of socialization while at work. Given the nature of the work and the demand that must be fulfilled, time spent speaking with fellow workers while not on task results in decreases in productivity often considered unacceptable. This lack of socialization often leads to feelings of isolation and loneliness which, as has been described previously helps to cultivate an atmosphere that feels almost like a prison.

The American Psychiatric Association's Center for Workplace Mental Health published an article titled "Loneliness in the Workplace Can be a High Cost for Employees" which details a number of adverse effects that can come from a lack of socialization at work. The article's author, Emily A. Khul cites former US Surgeon General, Dr. Vivek Murthy who argues that lonely workers may become unhealthy. According to Dr. Murthy, social isolation can lead to serious health consequences which include "Greater risk of cardiovascular disease, compromised immunity, increased risk of depression, shortened lifespan". (Kuhl, 2018). It is clear that in addition to exacerbated mental health issues such as depression, impaired mental well-being through social isolation can be host to a wide range of physical health challenges as well.

Looking at the reverse, however, Dr. Murthy notes that by fostering strong social connections among employees, businesses can experience a range of benefits from reduced sick leave costs to higher employee retention, and perhaps most importantly in the context of instant delivery warehouse work, increased productivity. A few strategies which Murthy suggests organizations adopt in order to create social connections are to make strengthening such

connections an organization wide strategic priority and to create opportunities for employees to learn more about each other such as each other's varied interests and experiences (Kuhl, 2018). In a warehouse environment this could take the form of team building events once every few weeks that could give employees an opportunity to learn about their fellow coworkers on the same shift. Additionally, an obvious change could be increasing break times. Countless employees at Amazon in particular have complained that when they are allowed breaks, often they are on such a time crunch that they are unable to do much besides receive their food and eat as quickly as possible so as to avoid being reprimanded for starting work up again late. Increased break time would not only provide some much-needed relaxation from the demands of the job but also allow employees some time to socialize with each other. Clearly both solutions here would have the effect of an immediate reduction in productivity, one that many employers may not feel they can afford to take. In the long run however, the benefits in terms of increased employee well-being, morale, and productivity may more than make up for the lost time from breaks. James Bloodworth described how the environment within the warehouses led employees to find themselves "carrying out small rebellions against authority: a misplaced item you would once have picked up, you now left on the floor. You would snack in the warehouse and defile the floor with an empty wrapper, or deliver a satisfying boot to the spines of a row of tightly packed books or DVDs". Such behaviors extrapolated over years and hundreds of thousands of employee's likely result in significant costs, which could be entirely avoided by taking steps to improve employee job satisfaction and morale.

## **Chapter 5**

### **Conclusion**

At its inception, the purpose of this thesis was to develop a comprehensive picture of the costs associated with instant delivery, ranging from the human element to financial costs and even environmental impact. It soon became evident, however, that the issue of human cost within these instant delivery environments is much more far reaching and complex than originally anticipated. In the fall of 2018 when planning for this thesis was in the early stages, there was relatively little information to be found regarding the nature of instant delivery work and, in fact, much of the information cited in the preceding pages had yet to be published. Fast forward a little over a year to the spring of 2020 and it has reached a point where relevant stories, such as that of the New Jersey Target warehouse strike, are emerging in parallel with this research being conducted.

At the time of writing, the world is grappling with the threat of the COVID-19 outbreak. In the United States, many businesses have temporarily shut their doors while citizens are forced to stay home whenever possible and practice social distancing in an effort to slow the spread of the virus. In the midst of this pandemic, Amazon has once again gone against the mainstream, ramping up capacity to meet the significantly increased demand for online orders. CNBC reports that in March, Amazon created and filled one hundred thousand new positions and is planning on hiring an additional seventy-five thousand moving forward. Coinciding with the hiring increase, Amazon has also increased pay for all warehouse and delivery workers by two dollars an hour as well as doubling overtime pay for warehouse workers throughout the month of April (Palmer,

2020). Many of Amazon's employees, however, have been unsatisfied with the company's response and allege that not enough is being done to ensure the safety of workers. Employees at Amazon's Staten Island warehouse staged a walkout on March 30<sup>th</sup>, demanding that the facility be shut and thoroughly cleaned after employees at the location were tested positive for COVID-19. According to the Guardian, starting April 21, hundreds of Amazon employees from warehouses nationwide have planned to call in sick as a form of protest against a lack of promised safety measures such as temperature checks and personal protective equipment (Paul, 2020).

Once again, this information is emerging at the time of writing, given more time it would be interesting to examine this situation in-depth as it unfolds and study its impact on the workers at Amazon. As it stands, however, the organization's present situation represents a microcosm of what has been written here at length. There are no definitive answers regarding how an on-demand delivery network should be operated with regards to its workers, as with all things in supply chain it all comes down to tradeoffs. On the one hand, hiring one hundred and seventy-five thousand workers has the potential to make an already extremely contagious virus even more of a threat within fulfillment centers. By remaining operational under these conditions, there is the very real threat that Amazon employees could end up becoming exposed to the potentially fatal virus. On the other hand, however, the service that Amazon provides could prove extremely helpful to the most at risk members of society, such as the elderly by allowing them to obtain certain essential goods without having to leave the safety of their homes and risk contamination. On a larger scale, more people making orders online from Amazon will result in less traffic to stores, slowing the spread of the virus throughout society as a whole. Additionally, as a result of mandatory business closures and quarantine orders nationwide, the United States

has seen over twenty-two million citizens file for unemployment in just a few short weeks, wiping out “a decade of employment gains” as the Washington Post reports (Long, 2020). For those who lost their jobs during this time, employment at one of Amazon’s warehouses provides the ability to support themselves which to some may outweigh the potential risks involved.

Employee testimony continues to come to light at an increasing rate and seemingly on a daily basis now. In all likelihood it will soon reach a point where public knowledge surrounding the working conditions that exist which will allow us to obtain virtually anything quickly and conveniently becomes too significant to ignore. It will then be up to the organizations that run these delivery systems and the consumers that patronize them to make a judgement based on whether or not the cost of these systems is justified by their utility. Some may say that the toll on workers is too great and they must be better protected while others could argue that the benefit to society, especially now, is worth the burden that these workers face. This research does not set out to make that judgement, but rather to better investigate just one facet of the cost that exists in operating an instant delivery system and offering potential solutions with the aim of reducing that cost while maintaining a high level of efficiency in order to meet the demands of consumers in the modern world.

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ACADEMIC VITA  
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**SUPPLY CHAIN MANAGEMENT PROFESSIONAL**

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Supply Chain Management Professional who undertakes complex assignments, meets deadlines and delivers superior performance. Possesses practical knowledge in areas of procurement strategy as well as distribution operations. Combines strong research skills to advise management in practical decision making. Thrives in an environment that requires outside the box thinking and innovative ideas to find solutions to challenging logistical problems.

**EDUCATION**

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**The Pennsylvania State University Schreyer Honors College, Smeal College of Business**  
**University Park, PA**

Supply Chain Management Major, International Business Minor

*May 2016-Current*

**Graduation: May 2020**

**WORK EXPERIENCE**

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**Boeing Global Services**  
**Renton, WA**

*Procurement Agent*

*June 2019-August 2019*

- Conducted research into lack of data behind supplier "no bid" responses
- Worked closely with suppliers to determine mutually beneficial wants and needs
- Implemented changes to EOQ process estimated to result in 8 figure savings over the next 5 years
- Developed and released RFQ proposals to various suppliers
- Devised solutions to manage underperforming and delinquent suppliers

**Berkshire Hathaway Choice Properties**  
**Nazareth, PA**

*Licensed Real Estate Salesperson*

*August 2017 - June 2018*

- Engaged in marketing my own professional services
- Assisted fellow agents in conducting market research and locating properties that met the needs of both the agents and their clients
- Gained practical knowledge in areas of business law regarding contracts, warranties, negotiations, and liability

**MRR Development**  
**Bethlehem, PA**

*Landscaping Partner*

*January 2018-April 2018*

- Performed a variety of landscaping services for businesses in and around the Lehigh Valley
- Assisted in marketing services to potential customers via phone and email
- Corresponded with clients in regard to potential payment options for services

**RELATED EXPERIENCE**

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- Completed a project for Mondelez Int'l involving rearranging distribution center layouts with the goal of reducing damage and waste
- Completed strategic sourcing initiative for Capital One based on finding a superior market research tool
- Engaged in research on an undergraduate thesis centered around the topic of the cost of an "on-demand-delivery" model
  - Varying focuses ranging from loss of privacy, to monetary and sustainability costs
- Runner up in the 2018 PSU Boeing Case Competition

**ACCOMPLISHMENTS/SKILLS**

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- Recipient of The President's Freshman Award as well as The President Sparks Award
- Skilled writer, strong public speaker and great communicator/operator within multi-cultural teams
- Advanced skills in Microsoft Office programs including Word, Excel and PowerPoint
- Proficient in use of Tableau