



# Trucking in the Era of COVID-19 | BTR Conference

Danielle Sperry, Amy Schuster, Shelia Cotten, Shubham Agrawal, Elizabeth Mack, Noah Britt and Jessica Liberman

# WEAVE (Preparing the Future **W**orkforce for the **E**ra of **A**utomated **V**ehicles)



**WEAVE**  
Preparing the Future **W**orkforce  
for the **E**ra of **A**utomated **V**ehicles

- WEAVE Goal:
  - Determine impacts that autonomous vehicles will have on employment in the trucking, taxi, and ride-hailing industries, with the goal of preparing workers for this transition
  - COVID-19 emerged as prominent theme as we began conducting our research
- Team members at Michigan State University and Clemson University
- Funded by National Science Foundation



# COVID-19 Impacts



**26,000,000**

number of U.S. Americans that filed for unemployment



**49,000**

truck drivers lost their jobs during the first two quarters of 2020



**30%**

growth in e-commerce sales during COVID-19

# Trucking and COVID-19

- Trucking industry - nexus of economic and health concerns
- Business closures and manufacturing shutdowns led to reduced demand
  - Certain sectors experienced declines while other sectors succeeded with e-commerce
- Governmental impacts created complications for drivers
  - Truck drivers may be a more vulnerable population
- Uncharted territory for an industry with existing issues
  - Impacts of COVID-19?

# Research Objectives

- ▶ To gain a better understanding of the impacts experienced in the trucking industry during the pandemic
- ▶ To examine public perceptions of the trucking industry before and during COVID-19



# Methods

# Data Collection



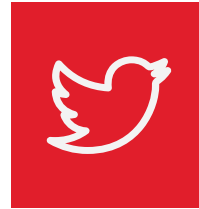
## Focus Groups

- ▷ 21 focus groups (N= 42 participants)
- ▷ Questions about the impact of COVID on the trucking industry



## Pre-Survey

- ▷ N=42 participants
- ▷ Demographic questions
- ▷ Questions related to COVID-19 and the trucking industry



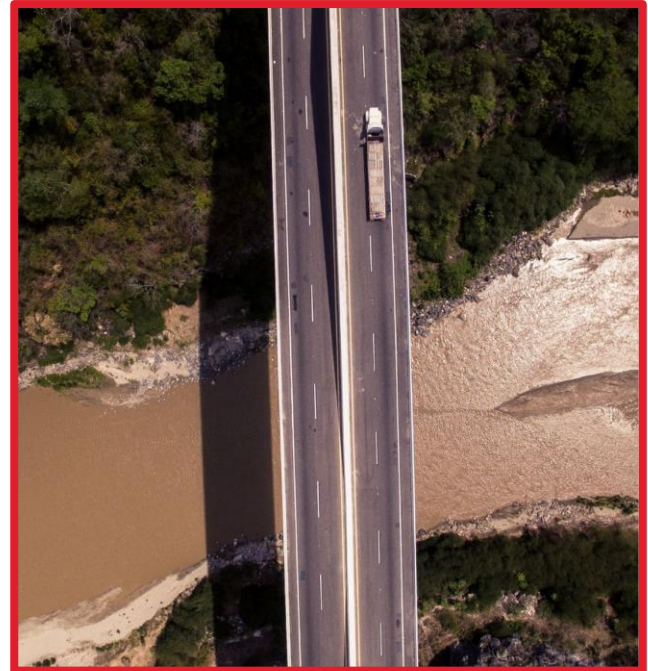
## Twitter posts (tweets)

- ▷ N=~190,000 Twitter posts
- ▷ Investigate sentiment of public discourse around trucking on social media pre- and during-COVID



# Survey & Focus Group Data Analysis

- ▶ Survey data
  - Descriptive analysis
- ▶ Focus Group Data
  - Thematic Analysis :
    - Review data
    - Develop initial codes
    - Search for themes
    - Review & define themes
    - Inter-Coder Reliability
      - Cohen's kappa > 0.80



# Twitter Data

- ▶ Tweets from Feb 28, 2020 to Mar 27, 2020
  - Mar 13, 2020 - declaration of COVID-19 as a national emergency in the U.S.
    - Two-week time window before and after the declaration
    - Tweets from Salesforce Marketing Cloud's Radian6
- ▶ Data filters
  - U.S.-based tweets only
  - Contains keywords: "trucker", "truckers", and "trucking"
  - Excluded keywords: "cap", "hat", and "mother trucker"
- ▶ Determined underlying sentiment of tweets using Salesforce Social Studio's proprietary Sentiment Model
  - Classified tweets as either positive, neutral, or negative

# Results

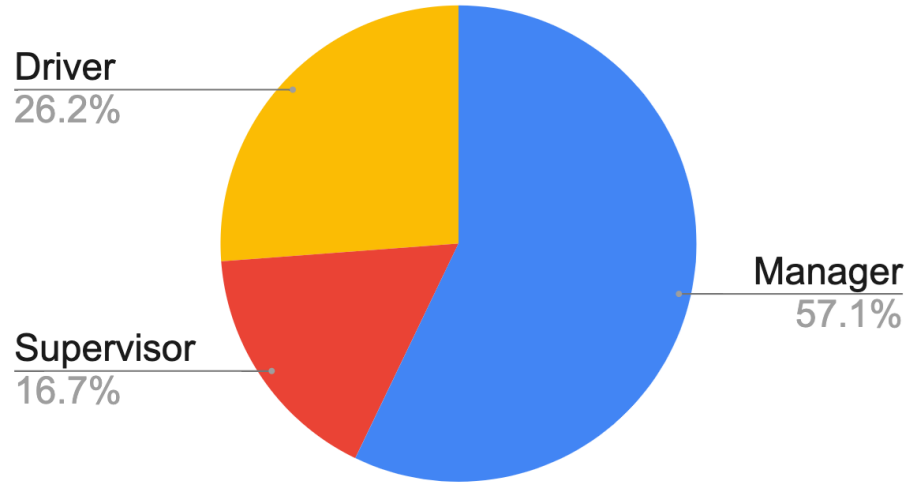
# Demographic Information

## Sample Characteristics

<b>Age*</b>	
Upper-level Management	Avg. 52 years
Supervisor	Avg. 36 years
Driver	Avg. 47 years
<b>Gender</b>	
Female	4 (9.5%)
Male	38 (90.5%)
<b>Length of Time at Job*</b>	
Upper-level Management	Avg. 257.7 months
Supervisor	Avg. 91.7 months
Driver	Avg. 129.4 months

Participants' age and gender consistent with industry averages.

Participant Employee Type



\* Data from pre-survey (N = 40). Missing responses for 1 driver and 1 upper-level manager.

## COVID-19 Effects on Work

N (%)

<b>Yes</b>	<b>32 (80)</b>
No	8 (20)
<b>Of those that said yes:</b>	
<b>Increased the stress associated with my work</b>	<b>29 (91)</b>
<b>Increased the health risks associated with my work</b>	<b>20 (63)</b>
Increased the amount of hours/time spent working	18 (56)
<b>Decreased the amount of pay I receive</b>	<b>8 (25)</b>
<b>Decreased the amount of hours/time spent working</b>	<b>5 (16)</b>
Increased the amount of pay I receive	3 (9)
<b>I was laid off from work</b>	<b>2 (6)</b>

# COVID-19 Effects on Work

- Main takeaways:
  - Increased stress
  - Increased health risk
  - Limited negative personal economic impacts

\* Data from pre-survey (N = 40). Missing responses for 1 driver and 1 manager.

# Four Major Themes

- ▷ Industry Changes
- ▷ Company Adaptability
- ▷ Company response
- ▷ Impacts on drivers



# Theme 1: Industry Changes



*In the US, buying habits have changed a lot since COVID. People aren't spending as much on experiences, like travel and entertainment, and restaurants...**they're spending more on durable goods for their home...so all that stuff has to be shipped.***

- Manager

# Industry changes

- ▷ Shifts in consumer buying trends
- ▷ COVID-19 changed the daily operations in the trucking industry due to supply chain disruptions
  - Vendor work shortages
  - Inability to ship due to mandatory shutdowns
- ▷ Shift from just-in-time freight

***“Our priority is in buying and rushing stuff right now.” - Manager***



# Theme 2: Company adaptability



*"When COVID first said it was only essential goods, which is not office furniture and not hot water heaters. So, they [dispatch and backhaul employees] quickly, quickly, it was impressive, **switched over to brokered freight... like getting into other competitors' markets.**" - Driver*

# Company adaptability

- ▶ Variability in freight volume
  - Initial decrease
  - Rebounded or increased after time
- ▶ Pivoted business models
  - Different markets
- ▶ Temporary fixes
  - Unemployment
  - Reserves
  - Adjusting policies

*"The business probably slowed down a little bit initially, but in the last few months **we're actually busier than we have been in probably the last year.**" -  
Manager*

# Theme 3: Company response



*"When the governor, **when we got the shutdown, we stayed open as an office, but we locked ourselves out. Our dispatchers, load planners, and everybody else, we came in.** Our billing and up-front workers, they did split shifts here. **But we did lock the drivers from ... because they're traveling all over the country.**" - Supervisor*

# Company response

- ▶ Varying responses from employees
  - Scared vs. skeptical of severity
- ▶ Employee-focused companies
- ▶ New business protocols
  - Isolated, divided work environments
  - Separate standards for drivers

*"We've got guys who don't think it's a real thing, we've got guys who's overly serious about it. So right now, the climate that **we're in is just trying to manage all of these new things.**" - Supervisor*

# Theme 4: Impacts on drivers



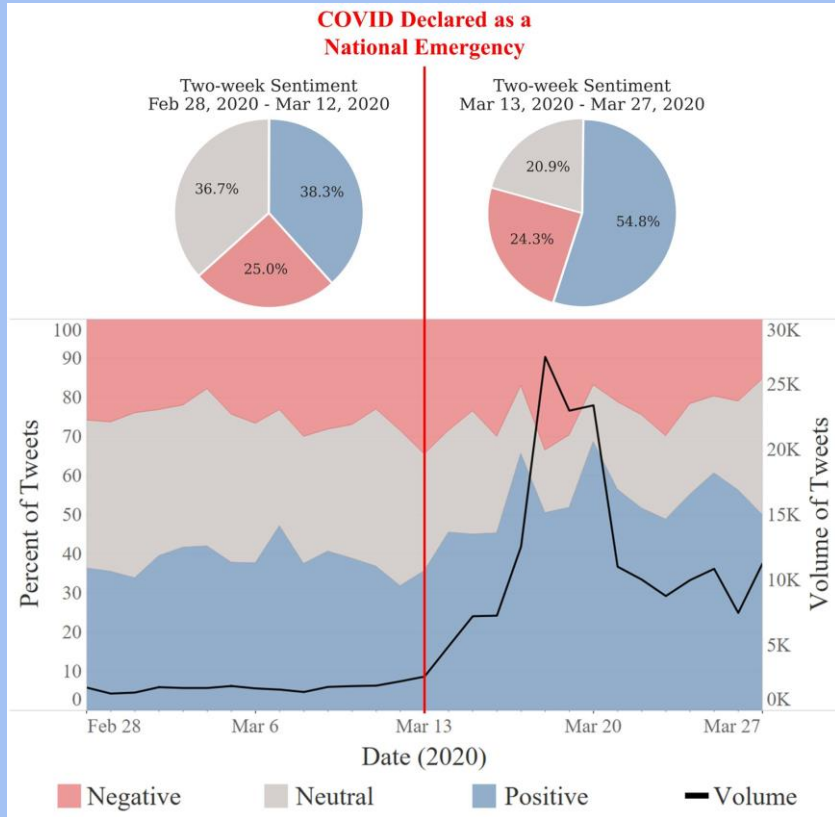
***“Truck drivers were America’s heroes as this pandemic started because we deliver toilet paper to the stores. I’m serious. People were going to grocery stores and panicking because the shelves were empty, and truck drivers were heroes. I said, ‘Well, we need to enjoy it while it lasts because it won’t take long... our reputation will get tarnished again, just by the mere fact that there’s a bad perception.’” - Manager***

# Impacts on drivers

- ▶ Changes in quality of life
  - U.S. closures of rest areas and businesses
  - Threats to personal safety
- ▶ Vendor protocols
  - Restricted social interactions
  - Need for contactless delivery
- ▶ Changes in public perceptions

*“You were talking about the COVID-19, even with the vaccines, **I heard nothing mentioned about truck drivers getting the vaccine. I’m like, wow, we’re front line, front and center. If it wasn’t for us, you wouldn’t even have the vaccine.**” - Driver*

# Public Perception on Twitter



- ▷ **Sharp increase in the volume of tweets following the declaration**
  - Increase in public attention towards truckers and the overall trucking industry
- ▷ **Higher positive sentiment of tweets during-COVID compared to pre-COVID**
  - More positive during COVID-19
  - Support findings from the focus groups

# DISCUSSION AND CONCLUSION



# Discussion



**Impact 1:** Fluctuation in revenue depending on sector.



**Impact 2:** Job security was not a main concern during COVID-19



**Impact 3:** Pivoting to new markets as key to success



**Impact 4:** Truck driving jobs were less vulnerable to negative, personal economic impacts



**Impact 5:** Decreases in driver morale and heightened stress



**Impact 6:** Improved public perception of truck drivers

# Future Research



Examine a national sample from the trucking industry with proportionate organizational representation of employee types and genders

Further study the impacts of COVID-19 on:

- Need for technology
- Business operations
- Public perception of drivers
- Driver retention and shortages

Will employees reenter the trucking workforce, or transition to new careers outside of the transportation industry?

# Conclusion

- ▷ Unclear what the aftermath of COVID-19 will hold for the trucking industry and the country
- ▷ Positive vs. negative changes
  - E-commerce
  - Supply chain disruptions
- ▷ Trucking industry kept America running during an unprecedented time in history
  - **Through pivoting, adapting, and the country's support, the trucking industry was able to survive COVID-19**
  - Will the general public remember the efforts of truck drivers?

# Thanks!

## Questions and Discussion

Danielle Sperry | [dmsperr@g.clemson.edu](mailto:dmsperr@g.clemson.edu)  
Clemson University  
[www.weavensf.com](http://www.weavensf.com)



This project is funded by the National Science Foundation [award number 2041215: Preparing the Future Workforce for the Era of Automated Vehicles]. These results are completely ours and do not reflect the views of NSF.

# References

- ▶ Agrawal, S., De Smet, A., Lacroix, S., & Reich, A., 2020. To emerge stronger from the COVID-19 crisis, companies should start reskilling their workforces now. McKinsey and Company. McKinsey Insights.
- ▶ American Transportation Research Institute (ATRI), & Owner-Operator Independent Driver Association Foundation (OIDAF), 2020. COVID-19 Impacts on the trucking industry. American Transportation Research Institute.
- ▶ American Transportation Research Institute (ATRI), 2020. Critical issues in the trucking industry—2020. Retrieved from <https://truckingresearch.org/wp-content/uploads/2020/10/ATRI-Top-Industry-Issues-2020.pdf>
- ▶ Barua, S. (2020). Understanding coronanomics: The economic implications of the coronavirus (COVID-19) Pandemic. SSRN Electronic Journal, April, 1–44. <https://doi.org/10.2139/ssrn.3566477>
- ▶ Bureau of Labor Statistics (BLS), 2021. Labor force statistics from the current population survey. Retrieved on January 22, 2021, from <https://www.bls.gov/cps/cpsaat11b.htm>
- ▶ Bureau of Transportation Statistics (BTS), 2018. Truck tonnage. Retrieved February 1, 2021, from <https://www.bts.dot.gov/learn-about-bts-and-our-work/statistical-methods-and-policies/truck-tonnage>
- ▶ Blau, F. D., Koebe, J., & Meyerhofer, P., 2020. Who are the essential and frontline workers? (No. w27791). National Bureau of Economic Research. <https://doi.org/10.3386/w27791>
- ▶ Burstein, P., 2003. The impact of public opinion on public policy: A review and an agenda. *Political Research Quarterly*, 56(1), 29–40. <https://doi.org/10.1177/106591290305600103>
- ▶ Costello, B., & Karickhoff, A., 2019. Truck driver shortage analysis 2019 (Issue July). American Trucking Association.
- ▶ Centers for Disease Control and Prevention (CDC) January 10 2021. COVID data Tracker. Retrieved on January 11, 2021, from [https://covid.cdc.gov/covid-data-tracker/#cases\\_casesper100klast7days](https://covid.cdc.gov/covid-data-tracker/#cases_casesper100klast7days)
- ▶ Chebly, J., Schiano, A., & Mehra, D., 2020. The value of work: Rethinking labor productivity in times of COVID-19 and automation. *American Journal of Economics and Sociology*, 79(4), 1345-1365.
- ▶ Drus, Z., & Khalid, H., 2019. Sentiment analysis in social media and its application: Systematic literature review. *Procedia Computer Science*, 161, 707–714. <https://doi.org/10.1016/j.procs.2019.11.174>
- ▶ Fairlie R., 2020. The impact of COVID-19 on small business owners: Evidence from the first 3 months after widespread social-distancing restrictions. *Journal of Economics & Management Strategy*, 29(4), 727- 740. <https://doi.org/10.1111/jems.12400>
- ▶ Federal Reserve Bank of St. Louis (FRED), 2020. *Truck tonnage index, monthly, seasonally adjusted, January 2000- December 2020* [Data set]. FRED Economic Data. <https://fred.stlouisfed.org/tags/series?t=tonnage%3Btrucks>
- ▶ Ghilarducci, T., & Farmand, A., 2020. Older workers on the COVID-19-frontlines without paid sick leave. *Journal of Aging & Social Policy*, 1-6.

# References Cont.

- ▶ Gray, R. S., 2020. Agriculture, transportation, and the COVID-19 crisis. *Canadian Journal of Agricultural Economics*, 68(2), 239-243.
- ▶ International Monetary Fund (IMF), 2020. "The IMF's response to COVID." Questions and Answers June 29. Washington, DC and Paris: International Monetary Fund. <https://www.imf.org/en/About/FAQ/imf-response-tocovid-19>
- ▶ Lemke, M. K., Apostolopoulos, Y., & Sönmez, S., 2020. Syndemic frameworks to understand the effects of COVID-19 on commercial driver stress, health, and safety. *Journal of Transport & Health*, 100877. <https://doi.org/10.1016/j.jth.2020.100877>
- ▶ Lund, S., Ellingrud, K., Hancock, B., & Manyika, J., 2020. COVID-19 and jobs: Monitoring the US impact on people and places. McKinsey Global Institute.
- ▶ Mulero, E., October 6 2020a. Public views trucking industry favorably in pandemic era, newhouse says. *Transport Topics*. <https://www.ttnews.com/articles/public-views-trucking-industry-favorably-pandemic-era-newhouse-says>
- ▶ Mulero, E., April 16 2020b. Trump praises trucking industry's pandemic response at white house event. *Transport Topics*. <https://www.ttnews.com/articles/trump-thanks-truckers-white-house>
- ▶ Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J., 2017. Thematic analysis: Striving to meet the trustworthiness criteria. *International Journal of Qualitative Methods*, 16(1), 1609406917733847.
- ▶ Palmer, A., 2020, August 18. Coronavirus pandemic turbocharges online sales, which were up more than 31% in just three months. Retrieved from <https://www.cnbc.com/2020/08/18/e-commerce-sales-grew-more-than-30percent-between-q1-and-q2.html>
- ▶ Papanikolaou, D., & Schmidt, L. D., 2020. Working remotely and the supply-side impact of Covid-19 (No. w27330). National Bureau of Economic Research.
- ▶ Salesforce, 2021. Retrieved on February 19, 2021, from <https://www.salesforce.com/>
- ▶ Thorbecke, W., 2020. The Impact of the COVID-19 Pandemic on the US economy: Evidence from the stock market. *Journal of Risk and Financial Management*, 13(10), 233.
- ▶ The White House, 2020. Proclamation on Declaring a National Emergency Concerning the Novel Coronavirus Disease (COVID-19) Outbreak. In *White House Proclamations (Vol. 85, Issue 53)*. <https://www.whitehouse.gov/presidential-actions/proclamation-declaring-national-emergency-concerning-novel-coronavirus-disease-covid-19-outbreak/>
- ▶ Turnbull, E. C., 2017. Hours of service of drivers: Harnessing autonomous technology for safer operations. *Jurimetrics: The Journal of Law, Science & Technology*, 58(1), 105-125. Retrieved on March 10, 2021, from <http://www.jstor.org/stable/26426452>
- ▶ Verizon Connect, 2019. Collision course: Commercial vehicle driving safety - A perception analysis of commercial driver road safety in America. Retrieved on March 5, 2021, from [https://static.verizonconnect.com/verizonconnect/digital/resources/Report\\_Commercial\\_driving\\_patterns\\_VZC\\_Wakefield.pdf](https://static.verizonconnect.com/verizonconnect/digital/resources/Report_Commercial_driving_patterns_VZC_Wakefield.pdf)