

David HC Correll, PhD

Research Scientist and Lecturer

Massachusetts Institute of Technology Center for Transportation and Logistics

Committee on Transportation and Infrastructure

US House of Representatives

November 17 2021

Written Testimony of David HC Correll, PhD

Written Testimony for House Committee on Transportation and Infrastructure

November 17 2021

My name is Dr David Correll. I am a Research Scientist at the Massachusetts Institute of Technology Center for Transportation and Logistics (MIT CTL). MIT CTL is an entity at the Massachusetts Institute of Technology that is focused on delivering high-quality supply chain management education and applied and impactful research on questions of logistics, transportation, planning.

At MIT CTL, I co-direct a research group called the MIT FreightLab, which studies freight transportation, with a particular emphasis on American trucking. In our lab, I lead a project called the Driver Initiative, which looks to uncover new insights and identify specific opportunities to improve the effectiveness, efficiency, and quality of life of American over-the-road (OTR) truck drivers by analyzing data from their daily work logs (Electronic Logging Devices “ELDs”), as well as the systems that schedule and monitor their pickups and dropoffs (Transportation Management Systems “TMSs”).

So far, my student teams and I have analyzed the working hours and pickup and delivery experiences of approximately 4,000 OTR truck drivers employed by one mid-sized and one large national carrier in snapshots from 2016 to 2020. We have also analyzed thousands of freight pickup and delivery appointments using data provided to us by shipper and broker companies. We supplement this analytical work with frequent conversations with truck drivers, their management, as well as the shippers and receivers who hire these drivers' services.

This research program, along with ongoing conversations with logistics and transportation professionals, leads me to a few conclusions I am honored to share with your committee today.

### Chronic Under-Utilization of the American Driver

First, I believe that the American truck driver is chronically under-utilized, and has been since at least 2016 when our data begins. Based on our analysis of electronic working records, I estimate that American long-haul, full-truckload truck drivers spend, on average, 6.5 hours per working day driving their vehicles. Yet, according to federal law, they are allowed to work a maximum of 11 hours per day. This implies that 40% of America's trucking capacity is left on the table every day. [1] This result is especially troubling in times of perceived shortage and crisis like we find ourselves today.

To put my argument in the context of the 'driver shortage', the American Trucking Association estimates the national driver deficit at 80,000 drivers. By my calculation, this represents about 4.4% (conservatively) of the US Census Bureau's estimation of 1.8 million employee Class-8 freight truck drivers in the United States [2]. Adding 4.5% back to a long-haul truck drivers' working day of 6.5 hours would mean adding only 18 minutes. Seen this way, an 18-minute improvement to the daily average utilization of America's existing cadre of truck drivers could be equivalent in effect to recruiting new ones and then similarly squandering their time too. My research leads me to see the current situation not so much as a headcount shortage of drivers, but rather an endemic undervaluing of our American truck drivers' time.

### Detention's Daily Cycles

My analysis suggests that American truck drivers' daily driving time is reduced by the systems and infrastructure that they are subject to when they are loaded and unloaded. This same notion is frequently referred to in the industry as driver detention. I observe across many thousands of recorded pickup and delivery appointments from all over the country that detention of truck drivers varies in predictable cycles based on the time of day of their arrival. Drivers who arrive during typical first-shift appointments (5 or 6 am to 2 or 3pm) are processed much more quickly on average than drivers who arrive outside of these hours. This is true across data sets provided to our lab for analysis by trucking companies, shippers, and brokers, and covers all types of freight appointments ('live loads' and 'drop-and-hooks') and types of customers. [3,4,5,6] This leads me personally to believe that the detention problem is -- to use an analogy -- a software problem not a hardware problem. That is, the warehouses and distribution centers that we have show the capacity to get trucks loaded and unloaded quickly -- but they commit to staffing policies and plans that realize this potential for only one-third or less of every working day. I submit to this committee that America's current supply chain problems are too big to commit only one-third of our weekdays to our best efforts at unclogging them.

### Long-Haul Truck Drivers' Weekly Cycles

Another issue that I study is truck driver retention. That is, how can truck drivers' electronic logs predict if a driver will quit? This work is ongoing and preliminary but offers a few insights already that I think may be relevant to this committee's decision

making. Long-haul truck drivers who stay with their employers tend to do most of their driving on Tuesdays, Wednesdays, and Thursdays of every week. They drive on average, fewer hours on weekends. This is, in itself, not wholly surprising. However, I have compared these patterns in both soft (low price per mile for the driver) and tight (high price per mile for the driver) markets. This comparison test allows us to study what changes in pay actually incentivize America's truck drivers to do.

In my data, it turns out that when drivers are paid more, they drive more on weekends, but the same amount on weekdays. The drivers' average hours per day driving do not change on the money-making days Tuesdays, Wednesdays, Thursdays. On these days they reach the national average of 6.5 hours per day or slightly more. However, higher prices do seem to incent drivers to drive slightly, but significantly, more on Fridays, Saturdays, and Sundays [7]. Why is this the case? I interpret this result as evidence that there is no available extra truck driver capacity in the American system during the workweek, when facilities are open but operating under staffing policies that de facto limit drivers to only 6.5 hours daily driving. The only days that drivers show the ability to offer additional surge capacity are on the weekends. Unfortunately, I have also observed anecdotally that many warehouses and distribution centers do not offer weekend freight appointments, or if they do, it is in limited capacity.

## Conclusions

My research leads me to see the issue of America's truck drivers not as a crisis of head count, but rather of working hours. American supply chains do not make effective use of the drivers we have, and thereby reduces national competitiveness,

contributes to the industry's very high turnover rate, and makes doing a critical job at times very unpleasant and less lucrative than it could be. I don't think that we can afford to let any crisis go to waste, especially not this one. I encourage this committee to consider measures to get more out of our existing cadre of American truck drivers.

### Recommendations

Below are two programs I recommend as starting points for addressing the issues outlined in my testimony:

1. Governmental leadership in coordinating, analyzing, and distributing data on detention times at American shippers and receivers. This extant data is typically siloed and difficult for any one group to collect and to collate. Leadership from Washington could facilitate overcoming these data collection obstacles.
2. Governmental support for a standardized system of evaluation of American shippers and receivers that measures both (1) detention time, and (2) working conditions for visiting truck drivers. Standardizing such an evaluation would allow carriers to more accurately price services to underperforming shippers and receivers, and thereby unlock more market pressure to reduce national detention times.

## References

[1] "Is There a Truck Driver Shortage or a Utilization Crisis?" David HC Correll MIT CTL blog October 21 2019

<https://medium.com/mitsupplychain/is-there-a-truck-driver-shortage-or-a-capacity-crisis-73a7d7a5bcb>

[2] US Bureau of Labor Statistics May 2020 National Employment and Wage Estimates

[https://www.bls.gov/oes/current/oes\\_nat.htm](https://www.bls.gov/oes/current/oes_nat.htm)

[3] "Application of Linear Models, Random Forest, and Gradient Boosting Methods to Identify Key Factors and Predict Truck Dwell Time for a Global 3PL Company", By Sireethorn Benjatanont and Dylan Tantuico, supervised by David HC Correll and Christopher Mejia Argueta. MIT Working paper July 2020

[4] "Utilization of the American Truck Driver", Mei QingZhang and Adam. Buttgenbach, supervised by David HC Correll MIT Working paper July 2020

[5] "Diving Deep into the Determinants of Driver Dwell", Leora Reyhan Sauter, Michelle CatherineRoy, supervised by David HC Correll and Christopher Caplice MIT Working Paper June 2021

[6] "Optimizing Fleet Utilization by Adjusting Customer Delivery Appointment Times", , Colleen Copley and Charles Lu, supervised by David HC Correll MIT Working Paper July 2020

[7] "Two Quasi-Experiments Concerning Working Conditions of American Truck Drivers" by , David Correll, Christopher Caplice, and Bobby Martens MIT Working Paper March 2021