



Factors Affecting Recruitment Retention and Safety of Commercial Drivers from Diverse Backgrounds: Supervisory Styles, Safety Culture and Long Work Hours

CTIPS-004 – Full Project Description

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Research Needs

Commercial truck drivers are an essential component of the national and international supply chain. Truck drivers are the backbone of the supply chain ensuring the timely and safe delivery of goods to manufacturers and retail outlets. However, this essential and critical component of the supply chain is vulnerable and in need of replenishment. A recent report cited the alarming increase in driver turnover post pandemic.¹ According to the Journal of Commerce, “The annualized turnover rate for truckload drivers at large motor carriers remained constant quarter to

¹ <https://www.trucking.org/news-insights/truth-about-trucking-turnover>

quarter at 92 percent in the fourth quarter of 2020.”² Moreover, “Large truckload fleets, for example, saw an annual turnover rate of around 94% from 1995 to 2017.”³ The problem extends beyond the USA, according to the International Road Transport Union (IRU), European driver shortages increase by 42% from 2020 to 2021. In Mexico, shortages rose 30%. Additionally, Driver shortages are forecast to double in 5 years. Only 12% of drivers are below 25, just 6% are women.⁴

Summarizing the IRU report it is noted that trucking industry's revenue accounts for 3% of global GDP, trucking's versatility and cost effectiveness make it suitable for most distances, and is the first and last leg of almost every journey, and lastly it indispensable to intermodality. The trucking industry is a significant source of employment to both urban and rural.⁵

Women face particular barriers and obstacles to recruitment and retention due to gender bias and work life balance issues. According to recent reports women comprised only 4.8% of truck drivers in 2021 due to issues having to do with long hours, lifestyle obstacles to raising a family and gender bias.⁶ A more recent study estimated that “9.0% of all professional truck drivers are women, while 91% are men.”⁷ To increase the presence of women in trucking Congress established the Women of Trucking Advisory Board (WOTAB) of the U.S. Department of Transportation's (DOT) Federal Motor Carrier Safety Administration (FMCSA) 2022. WOTAB was tasked with reporting on policies that “provide education, training, mentorship, or outreach to women in the trucking industry and recruit, retain, or advance women in the trucking industry.”⁸

The ethnic diversity of truck drivers professional truck drivers is White (57.2%), followed by Hispanic or Latino (20.0%), Black or African American (13.7%) and Unknown (4.7%).⁹ A study by the Federal Motor Carriers Association (FMCA) reported that 84.75% of those holding commercial driver's licenses were not Hispanic or Latino concluding that women, Asian and multiracial drivers, and Hispanic/Latino drivers were underrepresented.¹⁰ Native Americans are represent only 0.8% of the drivers in the trucking industry.¹¹

Of growing concern are the data and projects for the impact of driver shortages in the near term. A report by the American Trucking Association (ATA) estimating that more drivers are needed to meet the country's demands for freight services. ATA Chief Economist Bob Costello said “The combination of a surging freight economy and carriers' need for qualified drivers could severely disrupt the supply chain. The increase in the driver shortage should be a warning to

² https://www.joc.com/article/us-truckload-driver-turnover-flattens-wages-demand-rise-ata_20210330.html

³ <https://www.freightwaves.com/news/why-trucking-embraces-alarming-turnover-rates>

⁴ <https://www.iru.org/news-resources/newsroom/global-truck-driver-shortage-double-2028-says-new-iru-report>

⁵ <https://www.iru.org/resources/iru-library/driver-shortage-report-2023-freight-global-executive-summary>

⁶ <https://www.nytimes.com/2023/10/05/business/economy/women-truck-drivers.html>

⁷ <https://www.zippia.com/commercial-truck-driver-jobs/demographics/>

⁸ <https://www.fmcsa.dot.gov/wotab>

⁹ <https://www.zippia.com/professional-truck-driver-jobs/demographics/>

¹⁰ https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2023-08/Demographics%20of%20CMV%20Workforce%20_WOTAB%208.14.23.pdf

¹¹ <https://www.zippia.com/professional-truck-driver-jobs/demographics/>

carriers, shippers and policymakers because if conditions don't change substantively, our industry could be short just over 100,000 drivers in five years and 160,000 drivers in 2028."¹²

Understanding the factors that affect driver turnover and retention are key to developing programs, policies, and plans for remedying the situation. A number of factors have been hypothesized to contribute to driver turnover. A recent study by the Univ of Iowa interviewed 33, drivers, supervisors, students and instructors. The results showed that health conditions, differences in job expectations, and work demands were associated with drivers choosing to leaving the industry. Workplace policies and culture, such as lack of supervisor support, long hours away from home, company size, and lack of benefits, also contributed to drivers leaving a company.¹³ Michael Belzer, a Wayne State University economist who has studied the industry for 30 years. "None of them will work for these wages," he added. Studies even show that their pay, when adjusted for inflation, has declined markedly since the 1970s."¹⁴ Also, "long work hours which contribute to fatigue which leads truckers to be unsafe and to fall asleep at the wheel or lose focus — is a direct result of low wages that encourage drivers to spend too much time on the road."¹⁵

Factors that affect truck driver retention have also been explored. Several reports mention driver burnout, competitive compensation, enhanced technological safety measures, improved physical environment of equipment and rest areas, a strong culture that supports safety as well as diversity and inclusion, and attention to Work-Life Balance.¹⁶ Driver fatigue is also thought to contribute to driver burnout, which is in turn related to job satisfaction.¹⁷

Less frequently documented are corporate policies that promoted a corporate culture that prioritizes productivity over safety, worker quality of life and well-being. Understanding the relationship between the conditions of work and well-being could facilitate a more comprehensive approach to managing retention health, safety, and well-being of long-haul truck drivers. Health conditions, differences in job expectations, and work demands were associated with leaving the industry. Workplace policies and organizational culture including supervisor support, work schedules and benefits have been associated with drivers' intention to leave an organization.¹⁸

¹² <https://www.trucking.org/news-insights/ata-releases-updated-driver-shortage-report-and-forecast>

¹³ <https://www.public-health.uiowa.edu/news-items/researchers-identify-factors-that-affect-job-turnover-in-trucking-industry/>

¹⁴ <https://www.nytimes.com/2022/03/15/opinion/truckers-surveillance.html>

¹⁵ <https://www.nytimes.com/2022/03/15/opinion/truckers-surveillance.html>

¹⁶ <https://drivewyze.com/blog/truck-drivers/truck-driver-retention-stats-and-strategies-you-need-to-know/#proven-truck-driver-retention>

¹⁷ Sherry, P. Driver Safety attitudes and safety during COVID. (Unpublished Study).

¹⁸ Aryal A, Janssen B, Casteel C, et al. Applying the Worker Well-Being Framework to Identify Factors that Impact Turnover Among Long-Haul Truck Drivers. *Workplace Health & Safety*. 2023;71(9):419-428. doi:10.1177/21650799231178636

Sherry also found that supervisor support was also strongly related to intention to turnover¹⁹ which is similar to results from other findings with nurses, mental health workers, as well.²⁰ Supervisors play a critical role in contributing to employee turnover and retention. Research repeatedly shows that employee turnover intention across industries, including construction, is inversely correlated with supervisor support (Zhang *et al.*, 2018). A study by Yeosock (2020), perceived supervisor support was negatively correlated with turnover intention through job engagement, mediating the link between perceptions of supervisor support and turnover intention.^{21,22} Work engagement has been hypothesized to be the mechanism through which supervisor support decreases intention to turnover or quit.²³

Long work hours contribute to a perception of low supervisor support and so may lead to greater feelings of needing to quit the job. Long work hours can disrupt family life, lead to increased fatigue and unsafe working conditions and also may increase vulnerability to job stress. Sherry determined that long work hours and increased number of miles driver was significantly related to truck drivers' perceptions of low supervisors' support.²⁴ Consequently, long work hours and fatigue were considered factors that could contribute to intention to turnover.

Lastly, on board technology was also thought to related to factors affecting turnover. Having the latest safety features and improved technology and equipment was thought to be related to factors affecting job satisfaction and supervisor support. These factors could offset the feelings of frustration and lead to a sense of increased commitment to the company.

The purpose of this study then is to identify factors that contribute to truck driver turnover and retention in a diverse population of drivers. Drivers' attitudes and beliefs and perceptions related to these factors will be surveyed to identify important information related to an understanding of these factors.

Research Objectives

The objectives of this project are as follows:

1. Conduct a review of current literature on retention and turnover in the trucking industry.
2. Develop a survey measuring instrument to gather data from employees of the commercial trucking and transportation industry that gathers data on Native American, women and Hispanic/Latino members.
3. Conduct statistical analyses to determine the relative contribution of factors related to turnover.

¹⁹ Sherry, P. Driver attitudes and safety during COVID. (Unpublished Study).

²⁰ Fukui S, Wu W, Salyers MP. Impact of Supervisory Support on Turnover Intention: The Mediating Role of Burnout and Job Satisfaction in a Longitudinal Study. *Adm Policy Ment Health*. 2019 Jul;46(4):488-497. doi: 10.1007/s10488-019-00927-0. PMID: 30810850.

²¹ Kissi, Ernest et al. "Mediating Role of Work Engagement in the Relationship between Supervisor Support and Turnover Intention among Construction Workers." *Engineering, construction, and architectural management* 31.13 (2023): 102–120. Web.

²² Yeosock, Addison. "The Mediating Role of Work Engagement on the Relationship between Perceived Supervisor Support and Turnover Intention." ProQuest Dissertations Publishing, 2020. Print.

²³ Ibid.

²⁴ Sherry.

4. Conduct statistical analyses to determine the relative contribution of ethnic and gender factors related to intent to remain with the company.
5. Conduct statistical analyses to determine the relative contribution of ethnic and gender factors related to intent to turnover.
6. Conduct statistical analyses to determine the relative contribution of job characteristics factors related to turnover.
7. Writing of report & development of recommendations.
8. Conduct presentations at key conferences to disseminate results.
9. Post final report on website.

Research Methods

Procedure

Data will be collected on a sample of healthy truck drivers in a large metropolitan area in the Western United states.

Measures & Data Collection

A number of psychological measures will be contained in a SurveyMonkey questionnaire administered online to Truck drivers who agree to participate in the study. The study has been granted IRB approval.

Turnover Intention: The single item scale from Spector, Dwyer, & Jex 1988, “How often have you seriously considered quitting your current job?” and the 3-item intention scale from the Michigan Organizational Assessment Questionnaire (MOAQ) by Lawler et al. (1975) Also, I have had success using the following scale: “I often think about quitting this organization.” And “ I intend to search for a position with another employer in the next year.” (Bentein, et. al., 2005).²⁵

Loneliness: The Three Item Loneliness Scale (TILS) was described in a study by Hughes et. al. (2004), with an alpha coefficient of reliability $\alpha=.72$. In addition, persons who scored high on loneliness were more likely to experience depressive symptoms, as indexed by a short form of the Center for Epidemiologic Studies–Depression Scale (CES-D; Turvey, Wallace, and Herzog 1999), and, on average, score higher on the Perceived Stress Scale (Cacioppo et al. 2010). The correlation between R-UCLA Loneliness scale and TILS was found to be $r=.82$ and $r=.48$ with the CESD which was also significant.

Stanford Sleepiness Questionnaire (SSQ): The SSQ is a standard Likert response scale used to assess the study participant’s self-assessment of their sleepiness (Hoddes , et. al., 1973; Herscovitch & Broughton (1981). The SSQ is administered using a 9-point scale. Responses provide an assessment of the level of sleepiness experienced by the participant.

Sleepiness: The Karolinska Sleepiness Scale (KSS) has been used to demonstrate the effects of shift-work on fatigue. Ganesan, et. al. (2019) found KSS and PVT mean reaction times were higher at the end of the first and subsequent night shift compared to day shift, with KSS highest at the end of the first night. In a study of registered nurses working 12-hr shifts (Geiger-

²⁵ Bentein, K., Vandenberg, R., Vandenberghe, C., & Stinglhamber, F. (2005). The role of change in the relationship between commitment and turnover: A latent growth modeling approach. *Journal of Applied Psychology*, 90, 468-482.

Brown, et al. 2014) vigilant attention, as measured by PVT lapses and anticipation responses, showed no significant association with KSS scores; however, mean reaction times were slower (566 ms) for a KSS score of 9 (extreme sleepiness and fighting sleep) compared to reaction time means ranging from 275 to 326 ms for KSS scores of 1–8 in nurses who reported their highest level of sleepiness during the shift ($t = 2.37$; $p = 0.05$). Thus, partial support for the validity of administering the KSS was shown.

Fatigue: A single item visual analog (VAS) measure of fatigue was used in the form of a slider graphic. Respondents moved the slider button to either the 0 – Not fatigued or the 100 – severe fatigue. Two studies reported promising psychometrics for single-item fatigue measures. A single-item fatigue measure (“How fatigued do you currently feel?”; 1–10 scale) showed high convergent validity in staff at a Dutch university ($r = 0.80$ with the POMS-B fatigue subscale; Van Hooff et al., 2007). Another single-item measure (“I get tired for no reason”; 4-point Likert scale) showed good validity in cancer patients ($r = .70$ with the Functional Assessment of Cancer Therapy-Anemia; Kirsh et al., 2001). Single-item fatigue measures offer a valid way to assess daily fatigue. Additional items gathering information on number of hours worked daily and weekly, miles driven daily, and weekly and overall fatigue level will also be administered.

Burnout: The single-item burnout measure was based on a single question validated by Rohland, et. al. (2004). Burnout has been shown to be an important measure related to workload, fatigue, and job satisfaction. Similar results were obtained by Dolan et al (2015).

Depression: The VAS scale is strongly correlated with the PHQ-9 total score (0.61) and its 9 individual items (ranging from 0.19 to 0.67). ROC analysis shows that the VAS scale has high accuracy for detecting the presence and different levels (mild to severe) of depression corresponding to PHQ-9 cutoffs. The VAS depression scale represents a simple, easily implementable instrument that is suitable for mental health research in common settings and larger population-based studies. A study by van Rijsbergen (2014) found the VAMS had an AUC value of .94 and the highest positive predictive value (PPV) without any false negatives at score 55 (PPV¼0.53; NPV¼1.0) and was the best predictor of current relapse status (variance explained for VAMS: 60%; for HAM-D17: 49%; for IDS-SR: 34%). Assessing depression mood with a single-item mood scale appears to be a reasonable method in a sort internet-based assessment tool.

Number of Accidents, Tickets, and Crashes: The study participants were asked to report the number accidents, tickets or citations, and crashes that they had been involved in over the last year.

Supervisory Attitudes and Safety Culture: Participants in the study will be administered items related to the perception of supervisory practices and attitudes. These items will assess the extent to which supervisors are perceived to be engaged in promoting training education and develop of safety and safe work practices. In addition, the safety culture will also be assessed through the administration of items from the Safety Culture Assessment Survey (Sherry, 2018) which are related to the safety attitudes of the entire organizations.

Work Characteristics: Items will be developed which will assess respondent’s work history, perceptions of work load, salary, benefits, and other factors thought to contribute to work life balance.

Relevance to Strategic Goals

This project will contribute to the three of the USDOT Strategic Goals, namely safety, economic competitiveness, and equity. The primary goal of the project will be to enhance and increase economic competitiveness and efficiency, by contributing to the development of a work force that is interested in working in transportation for long periods of time. Contributing to the recruitment and retention of employees who will work safely and consistently over time will decrease the economic costs of high turnover rates and driver shortages.

A secondary goal will be to improve the safety of the employees and the public due to the identification of drivers with a high probability of being safe drivers. Finally, the tertiary goal will be to improve the equity and diversity of the transportation workforce by identifying factors that increase the likelihood of the recruitment and retention of drivers from diverse backgrounds.

Educational Benefits

Several graduate students will assist with the project thereby contributing to the development and education of graduate students who will later be employed in the industry. These students will gain experience in the data collection techniques commonly used in the transportation industry. In addition, they will gain an understanding of the theory and best practices associated with safety and workforce development.

Outputs through Technology Transfer

In order to facilitate the technology transfer obtained in the present investigation three separate events will be undertaken.

1. Educational briefing for stakeholders in the immediate project held on the site or the premises of the research sites.
2. A workshop on the DU Campus with invitees from local DOT and other community agencies to review and discuss key findings.
3. The development of a video and webinar on the findings to be posted on National Center for Intermodal Transportation website.

Expected Outcomes and Impacts

The proposed study will contribute to the workforce development needs and shortage of drivers in the trucking industry. The study will examine the attitudes and characteristics related to entering and remaining in the trucking industry as a driver in a national sample of drivers operating long haul trucks. In addition, the study will examine driver behavior, mood and personality characteristics in relation to driver safety and self-reported frequency of traffic citations, accidents and crashes. Finally, the study will explore the presence driver fatigue, burnout, and job satisfaction which may be related to driver selection and retention. It is expected that the results of the project will be able to be converted to a standard selection and screening tool for on-line use that can be readily deployed in the operational environment to determine characteristics of drivers that will be likely to enter the trucking industry and remain for many years. The technology will hopefully lead to a reduction in turnover and an increase in driver retention. A secondary gain will be increased driver safety and an improvement in economic competitiveness.

Work Plan

Achieving the overarching goal of this project requires the completion of several different tasks. Since the project will be built upon the contributions of various organizations, we anticipate that the results will be a significant contribution to the existing literature. Permission from participating organizations will be needed to gather data from participants.

Task 1 – Literature Review

Review relevant literature relative to recruitment retention and turnover to determine relationship between existing measures.

Task 2 – Data Collection

Organizations will be asked to distribute online surveys to drivers.

Task 3 – Data Analysis

Data will be analyzed to assess the relationship between the survey measures (i.e., hours worked, supervisor style, etc.) and intention to turnover and job tenure.

Task 4 – Reporting Writing

Draft report will be discussed with stakeholders at national and regional meetings describing the results of the research and identification of hypothesized linkages.

Task 5 – Stakeholder Feedback

Following the completion of the draft report stakeholders’ relevant feedback will be integrated into the report.

Task 6 – Tech Transfer Meetings

The draft report will be shared with stakeholders in presentations at regional and national meetings and relevant findings will be disseminated.

Task	Months							
	1 - 3		4 - 6		7 - 9		10 - 12	
1	■	■						
2		■	■					
3			■	■	■			
4					■	■	■	■
5							■	■
6							■	■

Project Cost

Total Project Costs: \$196,392
MPC Funds Requested: \$ 98,196
Matching Funds: \$ 98,196
Source of Matching Funds: Truck Load Carrier Association

References

- Anitha J., Begum F. N. (2016). "Role of Organisational Culture and Employee Commitment in Employee Retention." *ASBM Journal of Management*, 9(1):17-28.
- Aryal A, Janssen B, Casteel C, et al. Applying the Worker Well-Being Framework to Identify Factors that Impact Turnover Among Long-Haul Truck Drivers. *Workplace Health & Safety*. 2023;71(9):419-428. doi: 10.1177/21650799231178636
- Bentein, K., Vandenberg, R., Vandenberghe, C., & Stinglhamber, F. (2005). The role of change in the relationship between commitment and turnover: A latent growth modeling approach. *Journal of Applied Psychology*, 90, 468-482.
- Bureau of Labor Statistics. (2018). Heavy and Tractor-trailer Drivers. <https://www.bls.gov/ooh/transportation-and-material-moving/heavy-and-tractor-trailer-truck-drivers.htm>
- Cacioppo JT, Hawkley LC, Thisted RA. Perceived social isolation makes me sad: 5-year cross-lagged analyses of loneliness and depressive symptomatology in the Chicago Health, Aging, and Social Relations Study. *Psychol Aging*. 2010 Jun;25(2):453-63. doi: 10.1037/a0017216. PMID: 20545429; PMCID: PMC2922929.
- Chen G. X., Sieber W. K., Lincoln J. E., Birdsey J., Hitchcock E. M., Nakata A., Sweeney M. H. "NIOSH National Survey of Long-Haul Truck Drivers: Injury and Safety." *Accident Analysis & Prevention*, 2015 Dec;85:66–72. doi: 10.1016/j.aap.2015.09.001.
- Costello, B., & Suarez, R. (2015). Truck driver shortage analysis 2015. *Arlington, VA: The American Trucking Associations*. <https://www.trucking.org/sites/default/files/2020-01/ATAs%20Driver%20Shortage%20Report%202019%20with%20cover.pdf>
- Dolan ED, Mohr D, Lempa M, Joos S, Fihn SD, Nelson KM, Helfrich CD. Using a single item to measure burnout in primary care staff: a psychometric evaluation. *J Gen Intern Med*. 2015 May;30(5):582-7. doi: 10.1007/s11606-014-3112-6. Epub 2014 Dec 2. PMID: 25451989; PMCID: PMC4395610.
- Federal Motor Carrier Safety Administration. (2018). Summary of Hours of Service Regulations. <https://www.fmcsa.dot.gov/regulations/hours-service/summary-hours-service-regulations>
- Federal Motor Carrier Safety Administration. (2015). Interstate Truck Driver's Guide to Hours of Service. https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/Drivers%20Guide%20to%20HOS%202015_508.pdf
- Fukui S, Wu W, Salyers MP. Impact of Supervisory Support on Turnover Intention: The Mediating Role of Burnout and Job Satisfaction in a Longitudinal Study. *Adm Policy Ment Health*. 2019 Jul;46(4):488-497. doi: 10.1007/s10488-019-00927-0. PMID: 30810850.
- Ganesan S, Magee M, Stone JE, Mulhall MD, Collins A, Howard ME, Lockley SW, Rajaratnam SMW, Sletten TL. The Impact of Shift Work on Sleep, Alertness and Performance in Healthcare Workers. *Sci Rep*. 2019 Mar;9(1):4635. doi: 10.1038/s41598-019-40914-x. PMID: 30874565; PMCID: PMC6420632.

- Geiger Brown J, Wieroney M, Blair L, Zhu S, Warren J, Scharf SM, Hinds PS. Measuring subjective sleepiness at work in hospital nurses: validation of a modified delivery format of the Karolinska Sleepiness Scale. *Sleep Breath*. 2014 Dec;18(4):731-9. doi: 10.1007/s11325-013-0935-z.
- Herscovitch J, Broughton R. "Sensitivity of the Stanford Sleepiness Scale to the Effects of Cumulative Partial Sleep Deprivation and Recovery Oversleeping." *Sleep*. 1981;4(1):83-91. doi: 10.1093/sleep/4.1.83. PMID: 7232973.
- Hoddes E, Zarcone V, Smythe H, Phillips R, Dement WC. "Quantification of Sleepiness: A New Approach." *Psychophysiology*. 1973 July;10(4):431-6. doi: 10.1111/j.1469-8986.1973.tb00801.x. PMID: 4719486.
- Hughes ME, Waite LJ, Hawkley LC, Cacioppo JT. A Short Scale for Measuring Loneliness in Large Surveys: Results From Two Population-Based Studies. *Res Aging*. 2004;26(6):655-672. doi: 10.1177/0164027504268574. PMID: 18504506; PMCID: PMC2394670.
- Kirsh KL, Passik S, Holtsclaw E, Donaghy K, Theobald D. I get tired for no reason: a single item screening for cancer-related fatigue. *J Pain Symptom Manage*. 2001 Nov;22(5):931-7. doi: 10.1016/s0885-3924(01)00350-5. PMID: 11728796.
- Kissi, Ernest et al. "Mediating Role of Work Engagement in the Relationship between Supervisor Support and Turnover Intention among Construction Workers." *Engineering, Construction, and Architectural Management*. 2023 Dec;31(13):102-120. doi: 10.1108/ECAM-06-2023-0556.
- Lawler, E., Cammann, C., Nadler, D., & Jenkins, D. (1975). *Michigan Organizational Assessment Questionnaire (MOAQ)*. APA PsycTests. doi: 10.1037/t01581-000.
- Miller, Jason W., Yemisi Bolumole, and William A. Muir. "Exploring Longitudinal Industry-Level Large Truckload Driver Turnover." *Journal of business logistics* 42.4 (2021): 428–450.
- Prockl G., Teller C., Kotzab H., Angell R. (2017). Antecedents of Truck Drivers' job satisfaction and retention proneness. *Journal of Business Logistics*, 38(3), 184–196.
- Rohland BM, Kruse GR, Rohrer JE. Validation of a single-item measure of burnout against the Maslach Burnout inventory among physicians. *Stress Health*. 2004;20(2):75–79. doi: 10.1002/smi.1002.
- Ryder. <https://www.ryder.com/en-us/insights/blogs/transportation/recruiting-retaining-truck-drivers>
- Ryder. <https://www.ryder.com/en-us/insights/white-papers/transportation/infographic-driver-shortage>
- Sherry, P. "Further Validation of Safety Culture Measurement Tool for Improving Safety in Commuter Rail Operations." Mountain-Plains Consortium, United States Department of Transportation, University Transportation Centers, October 2018. <https://rosap.ntl.bts.gov/view/dot/42627>
- Sherry, P. Driver Safety attitudes and safety during COVID. (Unpublished Study).
- Sieber, W. K., Robinson, C. F., Birdsey, J., Chen, G. X., Hitchcock, E. M., Lincoln, J. E., & Sweeney, M. H. (2014). Obesity and other risk factors: the national survey of US long-haul truck driver health and injury. *American journal of industrial medicine*, 57(6), 615-626.
- Spector PE, Dwyer DJ, Jex SM. "Relation of Job Stressors to Affective, Health, and Performance Outcomes: A Comparison of Multiple Data Sources." *J Appl Psychol*. 1988 Feb;73(1):11-9. doi: 10.1037/0021-9010.73.1.11. PMID: 3350784.
- Stay Metrics. <https://www.staymetrics.com/press/new-stay-metrics-research-top-5-reasons-drivers-leave-90-days/>
- Thomas, S.P., Liao-Troth, S. and Williams, D.F. "Inefficacy: The Tipping Point of Driver Burnout." *International Journal of Physical Distribution & Logistics Management*, 2020 May;50(4):483-501. doi: 10.1108/IJPDLM-07-2019-0223.

- Turvey CL, Wallace RB, Herzog R. "A Revised CES-D Measure of Depressive Symptoms and a DSM-Based Measure of Major Depressive Episodes in the Elderly." *Int Psychogeriatr*. 1999 Jun;11(2):139-48. doi: 10.1017/s1041610299005694. PMID: 11475428.
- University of Iowa. <https://www.public-health.uiowa.edu/news-items/researchers-identify-factors-that-affect-job-turnover-in-trucking-industry/>
- van Hooff ML, Geurts SA, Kompier MA, Taris TW. "How Fatigued Do You Currently Feel? Convergent and Discriminant Validity of a Single-Item Fatigue Measure." *Journal of Occupational Health*. 2007 May;49(3):224-34. doi: 10.1539/joh.49.224. PMID: 17575403.
- van Rijsbergen GD, Burger H, Hollon SD, Elgersma HJ, Kok GD, Dekker J, de Jong PJ, Bockting CL. "How do you feel? Detection of recurrent Major Depressive Disorder using a single-item screening tool." *Psychiatry Res*. 2014 Dec;220(1-2):287-93. doi: 10.1016/j.psychres.2014.06.052. Epub 2014 Jul 10. PMID: 25070177.
- Viscelli, Steve. *The Big Rig: Trucking and the Decline of the American Dream*. Berkeley, CA: University of California Press, 2016. Web.
- Yeosock, Addison. "The Mediating Role of Work Engagement on the Relationship between Perceived Supervisor Support and Turnover Intention." ProQuest Dissertations Publishing, 2020.