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Washington CDL Requirements Evaluation

Final Report

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EXECUTIVE SUMMARY

This report was written to fulfill a requirement by the Washington State Legislature – laid out in Section 208, Subsection 14 of Engrossed Substitute Senate Bill 5689 (ESSB 5689) – directing the Washington State Department of Licensing (DOL) to evaluate current commercial driver’s license (CDL) requirements and their effects on commercial driver supply in Washington State. Prepared by the Division of Governmental Studies and Services (DGSS) at Washington State University (WSU), this report examines state requirements for CDLs that include training hours, testing requirements, and whether alterations to any of these standards or existing licensing requirements would alleviate the demand for commercial drivers.

A mixed-methods approach was used to answer these questions. The report begins with an examination of existing literature to determine the extent of a commercial driver shortage in the United States and its primary causes, which include licensing requirements across the country as well as other potential causes like working conditions, policy barriers, and challenges with the workforce. This is followed by a quantitative analysis of available secondary data in Washington to assess the supply of commercial drivers in the state, labor environment for drivers, and how CDL licensing requirements are linked to driver safety in Washington. Lastly, this report includes qualitative findings from stakeholder interviews and focus groups to compliment the quantitative data and provide greater depth and insight to our analysis.

This report concluded that licensing and testing barriers are important issues to stakeholders and there is overwhelming agreement among stakeholders that these barriers need to be reduced. In terms of commercial driver supply, recruitment and retention are the primary factors impacting the supply of commercial drivers in the state. Factors impacting driver recruitment and retention include wages, demanding hours, difficulties hiring younger drivers, which is exacerbated by federal age limitations on interstate drivers, federally mandated drug tests in a state where recreational cannabis is legal, the attractiveness of the occupation relative to other career options, and challenges recruiting women and drivers of color.

Ultimately, this report makes six overall recommendations:

- **Recommendation One:** Washington State should substantially increase the number of CDL testers to meet demand, thereby relieving immediate driver supply concerns and addressing testing backlogs.
- **Recommendation Two:** The DOL should implement the new AAMVA testing modernization as soon as possible to help alleviate concerns of inequitable testing practices. After implementation, future research is necessary to ensure concerns over testing are addressed.
- **Recommendation Three:** Reducing Washington’s 160-hour requirement for Class A licenses is not recommended at this time until further research can be conducted on potential impacts on traffic safety
- **Recommendation Four:** Streamline retraining requirements when drivers leave the profession and return more than a year later by simply retesting drivers, making their return to the occupation more efficient.
- **Recommendation Five:** Expand existing recruitment programs and establish a recruitment program for young drivers.
- **Recommendation Six:** Review policies around testing backlogs and licensing requirements for military personnel and determine whether revisions could address issues currently experienced.

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INTRODUCTION

Supply of Commercial Drivers

For several years, concerns have grown in the United States around a shortage of drivers in the commercial trucking industry, which has worsened with time and was exacerbated by the COVID-19 pandemic. The American Trucking Association (ATA), which has been warning about potential shortages since the 1980s, comprehensively examined the shortage and its causes in 2005, indicating that while the supply of long-haul drivers would increase on average by 1.6% annually, the demand for these drivers would increase by 2.2% annually (Global Insight, 2005). ATA's projections were looking ahead 10 years, and they identified an aging workforce and subsequent retirements as the primary cause of this shortage, with working conditions and inadequate compensation in the wake of the onset of recession in 2000 as contributing factors (Global Insight, 2005). In 2019, ATA issued another report on the driver shortage, noting that the industry struggled to address the issue since the 2005 report, even though the Great Recession temporarily erased the shortage from about 2008 to 2011 (Costello & Karickhoff, 2019). The economic recovery during the 2010s restored the shortage, and by 2019, ATA reiterated its concerns that an aging workforce, along with a lack of diversity in the industry, continued to be the primary impetus for the ongoing shortage (Costello & Karickhoff, 2019).

The most recent ATA report on the driver shortage, published in 2021, further emphasized the ongoing shortage, noting that 2021 would mark a historic high in the deficit of driver supply (ATA, 2021). ATA identified in this report no less than eight primary reasons for the shortage. An aging workforce was still identified as the primary factor, but diversity problems, quality of life for drivers, concerns about federal policies on minimum driving age and marijuana use, and exacerbations by the COVID-19 pandemic, which compelled many drivers to exit the industry, were all reported causes of the shortage (ATA, 2021). Moreover, ATA projected that the commercial trucking industry could be short up to 160,000 drivers by 2030 (ATA, 2021).

Since the commercial trucking industry is responsible for 72.5% of all domestic freight tonnage in the United States and takes in almost \$800 billion in revenue each year, it is a pivotal component of the US economy and a core reason why the driver shortage is so concerning (ATA, 2022). The impacts of this shortage have combined with the disruption of the COVID-19 pandemic, resulting in severe supply chain issues that could continue for some time. Without enough drivers, the ability for freight to be delivered from ports or railways to distributors is hampered, and this deficit ripples across the American economy, dragging down growth, increasing prices and further inflaming inflation (Ngo & Swanson, 2021). While the driver shortage (including its causes and effects) is a national phenomenon, the problem is also palpable in Washington state, where 80% of communities in the state rely on trucking for the delivery of goods (Wohlfeil, 2021). Additionally, since the Port of Seattle and the Port of Tacoma together rank as the third largest container complex in North America, and with Washington ports handling 7% of exports and 6% of imports in the United States, the driver shortage is particularly acute in Washington and has wide-ranging effects (Washington Public Ports Association, n.d.).

Authorizing Legislation

In 2022, the Washington State Legislature passed ESSB 5689. In Section 208, Subsection 14, the Washington State Department of Licensing (DOL) was required to lead an evaluation of current licensing requirements in Washington State, including required training hours and testing requirements, their potential impacts on commercial driver shortages, and potential changes to current requirements to

address commercial driver shortages [Sec 14, lines 13-17]. The legislation also requires the DOL to consult with several groups, including “the workforce training board, state board for community and technical colleges, federal motor carrier safety officials, and organizations that represent veterans, commercial drivers, and business/commercial entities that rely on commercial drivers” [Sec 14, lines 17-25].

Involvement of the Division of Governmental Studies and Services

The Department of Licensing contacted Washington State University’s Division of Governmental Studies and Services (DGSS) in 2022, to assist in the evaluation required in ESSB 5689. DGSS is a social science research and outreach unit with over 55 years of experience in evaluation research. DGSS worked with representatives of the Washington Department of Licensing to identify research questions to guide analysis and began to develop an evaluation plan in the Summer of 2022 to meet the requirements of the legislation. The final evaluation plan included extensive review of related studies, semi-structured and open-ended interviews and focus groups, and quantitative analyses using both state and federal data. Each of these methods informed the development of recommendations and potential strategies to address commercial driving supply concerns in the state of Washington, as well as recommendations for further research to assess potential options and strategies more fully for strengthening local supply chains in the long-term.

RESEARCH OVERVIEW

This effort uses a mixed methods approach to examine factors that impact commercial driver supply and evaluate the impact of licensing and testing on commercial driver supply in Washington State specifically. In collaboration with the Department of Licensing, the research team developed a series of research questions to address in the evaluation (See Table 1 below). In the report which follows, each of the methods and analysis that is used to address these research questions, derive conclusions, and make recommendations is presented.

Table 1: Research Questions

RQ1	A.	Is there a shortage of commercial drivers in Washington State?
	B.	What factors impact a potential shortage of commercial drivers in Washington State?
	C.	What barriers impact entering/re-entering commercial driving profession in Washington State?
RQ2	A.	What is the impact of licensing requirements on commercial truck driver supply in Washington State (training hours/testing)?
	B.	How do current Washington State CDL licensing factors impact commercial driver diversity and inclusion?
	C.	Do increased training hours/licensing requirements (above federal requirements) increase driver proficiency?
RQ3	A.	Are there other issues that impact potential driver shortage in Washington State (testing backlogs/delays) and how can these issues be addressed?

Systematic Review

A systematic review of scholarly, industry, and government research was conducted to examine the factors that impact the supply of commercial drivers in Washington State; the barriers to entering or re-entering the commercial driving profession in Washington State; and whether increased training hours/licensing requirements increase driver proficiency. Where relevant, a review of research of

related occupations, or occupations with higher entry-level licensing requirements that may impact entry into the profession is included.

Quantitative Analysis

Driver Supply

CDL-License Holders, Truck Drivers, and the Civilian Workforce

The total number of CDL license holders in the state from 2005 to 2021, provided by the Washington Department of Licensing, are analyzed. Additionally, state level estimates from U.S. Bureau of Labor Statistics' Occupational Employment and Wage Statistics (OEWS) are used to estimate truck drivers in Washington state relative to the civil labor force from 2001 to 2021.² Truck drivers are identified as Driver/Sales Workers, Heavy and Tractor-Trailer Truck Drivers and Light Truck Drivers from Standard Occupational Classification (SOC) system on OEWS.

Assessing Labor Market for Truck Drivers

The labor market for truck drivers over time in Washington State is examined following the procedures outlined by Burk and Monaco (2019) published by the Bureau of Labor Statistics. This assessment uses data from the OES Survey to examine employment and earnings between truck drivers and blue-collar occupations to analyze stability, demand, and tightness of the labor market for truck drivers in the state of Washington. Additionally, Washington State data from the Current Population Survey (CPS) public-use microdata files and the Outgoing Rotation Groups (ORGs) files obtained from the Center for Economic and Policy Research (CEPR) was used to create mini-panels of individuals who were surveyed twice, twelve months apart (See Burk and Monaco, 2019). From these mini panels, occupation retention among truck drivers from the first observation to the second observation twelve months later are examined.

Traffic Safety

Collisions and CDL Tests

To potentially assess the impact of Washington state CDL training on traffic safety, three analyses are conducted. First, Washington collision data involving individuals who hold a CDL license was provided by the DOL. Data on 61,832 CDL holders involved in collisions that occurred from 2015 to 2020 was provided. This file included all collisions for individuals with a CDL regardless of the vehicle involved in the collision. To better isolate potential long-haul drivers and training impact, all cases where the driver did not have a Class A CDL (which requires 160 hours if receive training from a registered school) were removed. In addition, drivers involved in collisions while driving a vehicle that requires a Class A CDL are removed using vehicle type and vehicle classification code.^{3 4} This results in a file with 7,555 CDL holders involved in a collision. State where vehicle is registered (Washington/Non-Washington) is used as a proxy for state of CDL training and used to compare collision contributing factors and severity.

² Truck drivers are identified as Driver/Sales Workers, Heavy and Tractor-Trailer Truck Drivers and Light Truck Drivers from Standard Occupational Classification (SOC) system.

³ First, vehicle type was used to remove vehicles not requiring Class A CDL. This included the following vehicle types: not stated; passenger car; pickup, panel truck or Vanette under 10,000 pounds; truck (flatbed, Van, etc.); farm tractor and/or farm equipment; taxi; bus or motor state; school bus; motorcycle; scooter bike; other; moped; railway vehicle; and golf cart.

⁴ After removing vehicle type, vehicle classification code is used to remove vehicles where CDL is not required (Commercial vehicle transporting 16 passengers or less - No CDL endorsement required).

Second, collision data for all Washington CDL holders (all CDL classes) are examined since each has a different hour requirement. For this analysis, drivers involved in collisions while driving a vehicle that does not require any CDL using vehicle type and vehicle classification code, and drivers in registered vehicles from outside Washington State are removed.⁵ This results in a file with 15,521 Washington State CDL holders involved in a collision.

Third, the DOL provided all test results for CDL tests from 2009 to 2022. The file contained 165,897 scheduled tests with several schedule reasons, such as initial CDL, previous failure, emergency, among others. Each test that comprises the CDL is a single row; therefore, an individual who passes the CDL the first time will have three separate rows in the data file. Based on advice of interview participants, the performance on the Road Test (one of the three tests that comprises the CDL test) and whether the individual was trained in a state registered CDL program or a private employer program are compared. Registered schools must meet the 160-hour requirement while private employers do not; thus, comparison between these schools and their performance on the road test, which focuses on traffic safety, could potentially indicate whether increased hours are leading to better driver proficiency and safety.

Qualitative Analysis

Interviews and Focus Groups

A series of semi-structured and unstructured interviews were conducted with representatives of stakeholder groups identified in the legislation (workforce training board, state board for community and technical colleges, federal motor carrier safety officials and organizations that represent veterans, commercial drivers and business/commercial entities that rely on commercial drivers). At least one representative from each group was consulted by the research team (and multiple individuals for several stakeholder groups). To identify additional participants, interviewees were asked if they were aware of anyone else who should be interviewed (snowball sampling). Through this process, additional stakeholders in business and education were interviewed. Each interview lasted approximately 45 to 60 minutes and data from the interviews was analyzed thematically.

Additionally, one organization arranged a focus group with its members. This focus group lasted 60 minutes. A total 25 individuals participated in interviews or the focus group.

LITERATURE REVIEW

Causes of the National Driver shortage

As previously noted, ATA has identified eight primary causes of the driver shortage: an aging and retiring workforce, a lack of female drivers, difficulty getting drivers to pass drug tests (especially in states where cannabis is legal), a federally mandated minimum driving age of 21 for interstate drivers, the COVID-19 pandemic compelling drivers to leave the industry, quality of life issues associated with the occupation, problems with infrastructure that back up the supply chain, and barriers to entry that include difficulties meeting hiring standards for some carriers (ATA, 2021). These primary causes can be further sorted into three general categories, which include workforce challenges, policy barriers, and working conditions.

⁵ Vehicle types removed: not stated; passenger car; pickup, panel truck or Vanette under 10,000 pounds; truck (flatbed, Van, etc.); farm tractor and/or farm equipment; taxi; motorcycle; scooter bike; other; moped; railway vehicle; and golf cart.

While not exhaustive, these three categories generally encompass the primary factors impacting commercial driver supply and resolving any one of these specific issues would likely go a long way toward solving the problem. This section explores each of these categories and the associated literature, providing clear evidence for each.

Workforce challenges appear to be the most important factors contributing to the national driver shortage. The primary concern is the gradually aging workforce, which results in retirements exceeding new hires. ATA estimates that among the almost one million new drivers needed by 2030, nearly half of these new hires are required to replace retiring drivers over the same period (ATA, 2021). Other academic research has come to similar conclusions. Johnson et al. (2010) noted that while drivers themselves identified several concerns with the occupation that may be leading to a driver shortage, the retirement of the Baby Boomer generation still loomed as the most significant immediate threat to a driver shortage. Costello and Karickhoff (2019) state that the average age of over-the-road, or long haul, drivers is 46, while in other trucking sectors, the average age can be even higher, pushing the average age of the industry well beyond the overall workforce. Age and retirement are further confirmed as leading factors of the shortage by multiple academic and news media sources (ATBS, 2020; Mittal et al., 2018; Raphelson, 2018).

While an aging workforce may be behind most of the current shortage and its expected persistence over the next decade, another workforce problem contributes to both the general shortage and the challenge the industry has in replacing retired workers: recruitment. ATA (2021) claims that women make up only 7% of drivers in the country, which is far below their representation in the overall workforce. Some sources find this number to be even smaller, with Scott and Davis-Sramek (2021) asserting that women make up only 3.2% of drivers. The reasons for this disparity are numerous. Scott and Davis-Sramek (2021) provide ample detail on why women either choose not to enter the trucking industry or are kept out by working conditions. They point out that long periods of time away from home, the inherent reputation of trucking as a male-dominated occupation, equipment not designed with women in mind, isolation, and harassment all contribute to women either avoiding the trucking industry or leaving it shortly after joining (Scott & Davis-Sramek, 2021). A survey by Women in Trucking (2021) also confirmed that women are very likely to encounter gender bias and harassment, which may be a major barrier to their entry into the occupation. In addition to difficulties recruiting women into the occupation, the trucking industry has also encountered difficulties recruiting younger drivers. The federal government has mandated a minimum age of 21 for interstate drivers, which shrinks the potential employment pool, but younger workers who wish to enter a blue-collar occupation can choose from several other career paths that do not require long, isolated periods away from home – a lifestyle many young workers may not find attractive (Trick, Peoples, & Ross, 2021).

The commercial trucking industry itself can make efforts to try to increase the recruitment of women and younger drivers, as the challenges detailed here are not insurmountable. However, workforce challenges are intimately linked to the second category of factors causing the driver shortage: policy barriers. As mentioned, the federal government has long held the minimum age for interstate commercial trucking drivers at 21 years old. However, the Federal Motor Carrier Safety Administration (FMCSA) proposed a pilot program in 2020 to experiment with allowing drivers as young as 18 to cross state lines, and in 2022, this pilot program began (FMCSA, 2022). ATA identified the 21-year-old minimum age as a major policy barrier to recruitment of new drivers, so if the pilot program is successful, the commercial trucking industry may soon have a significant means of addressing the

shortage. However, the FMCSA has found that younger drivers are much more likely to be involved in crashes and moving violations, due to less experience (FMCSA, 2020). This may imply that recruiting younger drivers to replace retiring ones will lead to more safety issues, at least initially.

The other major policy barrier identified by ATA is related to the policy differences between state governments and the federal government concerning the use of cannabis. ATA asserts that because the federal government still bans the consumption of cannabis, the trucking industry has encountered challenges with some drivers not being able to successfully pass drug tests, which makes them ineligible to drive (ATA, 2021). The Department of Transportation (DOT) regulates CDLs, and part of that regulation requires drivers to pass drug tests upon hiring or after any accident (Pedini & Crockett-Verba, 2022). In states where cannabis use is legal, whether recreationally or medically, many drivers or would-be drivers who may consume cannabis legally in their states of residence find out that this use bars them from getting hired or might compel their departure from the commercial trucking industry. Because of confusion around this policy or simply because of the testing requirement itself, the pool of potential CDL holders is made smaller, and this contributes to the driver shortage. Carriers who may not want to test their drivers are still required to by the DOT, so there is also no ability for employers to change their own policies around cannabis for CDL holders, making this a clear policy barrier that only the federal government can resolve (Pedini & Crockett-Verba, 2022). The effect of the federal ban is significant; since 2020, almost 90,000 drivers have been sidelined due to positive tests for cannabis use, and most of these drivers never return to the roads, leaving the commercial trucking industry altogether (Daugherty & Zhang, 2022). While both the House of Representative and the U.S. Senate have introduced bills to federally legalize the use of cannabis, which would lift this policy barrier for the trucking industry, passage is uncertain and not imminent, so the federal ban on cannabis will continue to be a barrier for the foreseeable future (Fertig, 2022).

The third category of issues related to the driver shortage concerns working conditions. As noted by ATA (2021), these concerns can range from infrastructure issues related to available truck parking and traffic issues that exacerbate supply chain problems to concerns among drivers, current or prospective, about compensation and working culture, the isolating nature of the work itself, and changes brought on by the COVID-19 pandemic. In a short survey in 2011, researchers found that 60% of truck drivers interviewed stated that they would not recommend their occupation to their children, citing long periods away from home, inadequate compensation, and social stigma around the occupation (Johnson et al., 2011). A survey by the National Institute of Occupational Safety and Health (NIOSH) in 2015 found similar concerns among drivers about working conditions. Of the over 1,200 drivers surveyed at truck stops, 73% felt their delivery schedules were too tight, 24% reported driving despite bad weather, fatigue, or traffic due to delivery pressures, 36% experienced frustration with other drivers on the road, 35% were forced to wait for access to loading docks, 37% admitted to non-compliance with hours-of-service rules, and 38% considered their entry-level training inadequate (Chen et al., 2015).

Other studies reveal that the variable nature of income in some trucking sectors is predictive of high turnover (Cameron & Meuris, 2022; Conroy et al., 2021), and the shift that has occurred over the last several decades toward paying drivers by miles driven (which can be affected by traffic, weather, or other structural inefficiencies), rather than by time spent driving, has led to dropping wages and deteriorating job conditions (Viscelli, 2022). Nonetheless, other studies show that the overall job satisfaction of drivers remains relatively high, despite the industry still seeing turnover rates of 90% at large carriers and near 70% at smaller carriers (Gallagher, 2021). What this literature reveals are that

there are at least some serious concerns among drivers about the conditions they face on the road, and even when satisfaction is high due to better compensation or improved relationships between employees and their employers, turnover remains a perpetual issue in the industry.

This turnover has many potential drivers, but a primary one in the last two years has been the COVID-19 pandemic. One study found that the transportation industry in the United States was hit particularly hard by pandemic-induced unemployment, with the trucking industry specifically seeing a higher-than-average unemployment rate caused by the pandemic compared to other essential job occupations (Mack, Agrawal, & Wang, 2021). During the peak of the pandemic, truckers reported that while public sentiments about the industry became more positive, social isolation increased markedly for drivers, and job quality worsened as amenities on the road closed (Sperry et al., 2022). These factors only worsened conditions for many drivers, leading large numbers to leave the industry during the pandemic, adding to the already 300,000 drivers who exit the profession each year (Cerullo, 2022). However, the shock of the COVID-19 pandemic to the industry has also created opportunities. One study determined that wages for truckers increased 38% since the pandemic started, and the per-mile rate charged for trucking services also increased almost 50% (Richards & Rutledge, 2022). This implies that while turnover remains high in the industry, the pandemic may have resolved some of the concerns about compensation. Indeed, some scholars argue that describing the mismatch between driver demand and supply as a “shortage” is a misnomer, since some states, like California, see a large supply of CDL holders even while the industry maintains openings that it cannot fill (Viscelli, 2022). Richards and Rutledge (2022) also point out that the pandemic has revealed that the inability to meet demand for drivers has much more to do with a mismatch in skills needed in the trucking industry and troubles attracting workers to the occupation than a lack of available drivers altogether. It has also been suggested that turnover rates in the industry are potentially misleading, as it may not reflect drivers leaving the industry, but could rather be a sign of churn – drivers leaving specific companies to join others or become owner-operators (O’Brien et al., 2020).

The factors explored here are all largely from a national perspective, providing a general overview of the driver shortage in the United States more broadly. While each state experiences some variety of the previously described causes, it is not a stretch to assume issues surrounding workforce challenges, policy barriers, and working conditions all apply to Washington State as well. There are fewer studies available focusing on the trucking industry in one specific state, and the interstate nature of several trucking sectors makes this approach more difficult. Nonetheless, some regional news outlets and trucking companies have reported more demand for truck drivers that is becoming increasingly difficult to meet (Smith, 2022), and the Washington Trucking Association noted that the shortage is present in the state, exacerbated by the closure of state motor vehicle offices and truck driving schools caused by the COVID-19 pandemic (Washington State Department of Commerce, 2021). In addition, legislation has been introduced to the Washington House of Representatives that would address the shortage of parking spaces for truckers on the road, an issue found nationwide that adds to drivers’ concerns about working conditions and plays a role in high turnover rates among drivers (Washington State Legislature, 2022).

In short, the eight primary causes of the driver shortage identified by ATA in 2021 reflect national trends that are present to some degree in each state, including Washington. The issues around workforce challenges and recruitment, policy barriers, and working conditions on which ATA is most strongly focused are supported by academic studies, news reports, government findings, and industry reports. Because these causes of the driver shortage are quite broad and national in scope, there are numerous

ways that the industry, government, and drivers themselves can chip away at the shortage. The primary focus of this report is to consider whether changes in Washington State CDL requirements, by reducing the number of hours potential drivers must train, would have a measurable effect on one significant end of the driver pipeline: recruitment. The following section explores literature related to licensing requirements, their effect on safety and other metrics, and whether existing studies support the theory that lowering training hours can aid driver recruitment without sacrificing safety standards to help relieve the ongoing shortage in the trucking industry.

Effects of CDL Licensing Changes

Literature on the effects of CDL licensing requirements and the effects of changes in these requirements is unfortunately sparse, but there are at least some studies that explore the relationship between CDLs and their effect on safety and recruitment that may be extrapolated to Washington State. Safety has long been a priority of both drivers and the trucking industry, as it is well known that multiple factors related to the job (such as inattention on the road, distractions, fatigue, speeding, etc.) are the primary causes of safety incidents for drivers nationwide (Peng & Boyle, 2012). It is also common for drivers themselves to perceive safety issues at greater rates than their employers, although both drivers and employers are generally open to improved and increased safety trainings (Spielholz et al., 2008). While the total number of fatal crashes involving large trucks has increased in recent years as the United States has recovered from the Great Recession and economic activity has grown, the rate of fatal crashes per 100 million vehicle miles traveled (VMT) has consistently been below 2 for almost two decades, from highs of near 5 per 100 million VMT in the 1970s and 1980s (FMCSA, 2021). That trend in increased safety also translates to positive safety records for truck drivers in Washington State, which has among the lowest rates of fatal crashes involving large trucks per 100 million vehicle miles traveled (FMCSA, 2021).

While there are many factors that affect safety in the trucking industry, research has shown that CDL requirements play a significant role in increasing safety for drivers. Blower and Kostyniuk (2011) found that truck drivers without CDLs had higher rates of poor driving records than CDL holders, and non-CDL drivers involved in crashes were also more likely to have engaged in actions that contributed to the accidents compared to CDL holders involved in crashes. Another study, while dated, also showed that CDL requirements at both the federal and state level clearly resulted in increased safety (Hugel, 1997). Other state and federal regulations related to drug and alcohol testing have also increased safety by reducing crashes nationwide (DOT, 2008).

Since CDL requirements are related to improved safety, and since both truck drivers and the industry are generally supportive of safety standards and open to continually improving them, the ramifications of changing CDL requirements would likely be significant. While Washington State has CDL requirements that go beyond federal rules, there is not much variance between states and the federal government on the safety effects of rules related to CDL requirements (TCRP, 2001). In short, CDL requirements improve safety across the board, and fewer requirements would likely be related to more safety issues. As Hugel noted (1997), however, even as CDL requirements improve safety, tighter regulations on driver requirements may also play a role in decreasing potential employees for the trucking industry.

Since the primary focus of this report is to determine whether loosening licensing requirements for CDL training in Washington State might improve the recruitment of drivers and alleviate the possible driver shortage for the trucking industry, exploring a parallel scenario may be helpful to determine if

potentially sacrificing safety would be worthwhile if it can bring more drivers into the industry. While aviation and trucking have stark differences in the nature of the work, aviation can serve as a case study for concerns over pilot training and the relationship between required hours set by the Federal Aviation Administration (FAA) for training and the effects of these requirements on pilot recruitment. Like the trucking industry, commercial aviation has suffered a pilot shortage that was only worsened by the pandemic (Schaper, 2022). The FAA requires 1500 hours of training for commercial pilots, but in the wake of the pandemic, Republic Airways asked the FAA to allow for reduced hours for pilot training, arguing that reducing hours would allow the airline to increase the number of available pilots (Schaper, 2022). The FAA rejected the request in September 2022, claiming that reducing training hours would not address the pilot shortage, that the argument that the training hours requirement was causing the pilot shortage was “overly simplistic”, and that the “greater public interest” would be better served by maintaining current safety standards (FAA, 2022).

Like the commercial aviation industry, the trucking industry, along with the federal government and state governments, will have to wrestle with concerns over how effective reducing CDL requirements would really be regarding the recruitment of more drivers to address the claimed shortage compared with whether safety would be sacrificed in the process. The details of this report help address factors that impact commercial driver supply in Washington State and, subsequently, whether reducing CDL licensing requirements would be an effective tool to address potential supply issues and what the ramifications of these changes may be.

ANALYSIS

Driver Supply

CDL Holders Over Time

The DOL provided data on the number of CDL holders in Washington State from 2005 to 2021, and the number of disqualifications from 2006 to 2021 (See Figure 1).⁶ Less than 1 percent of CDL holders received disqualifications each year. The total number of CDL holders in Washington was lowest in 2018 (181,315) and highest level in 2010 (196,713). Starting in 2010 there is an overall trend of decline in total CDL holders. Beyond overall trends, there is a sharp decrease from 2010 to 2014 (approximately 6.19%) and an increase of 3.5% from 2014 to 2015 (See Table 1 Below) before declining again from 2015 to 2018. According to DOL representatives there are several factors that may contribute to these trends, including required medical self-certifications for all CDL license holders which occurred from 2012 to 2014, and legal presence residency checks that began in 2016. Additional policy changes that may impact future trends include stopping and removing Failure to Appear suspensions for non-moving violations.

⁶ Disqualifications in 2004 and 2005 not provided due to data quality issues.

Figure 1: CDL and Disqualifications, 2004-2021

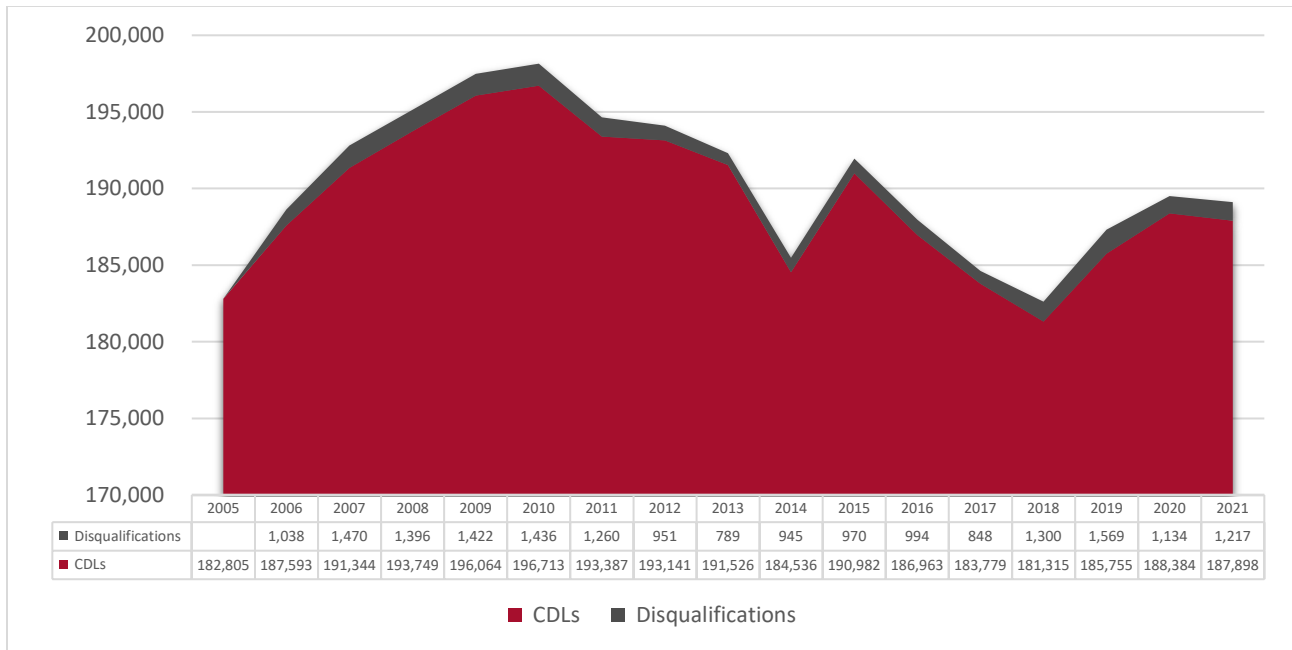
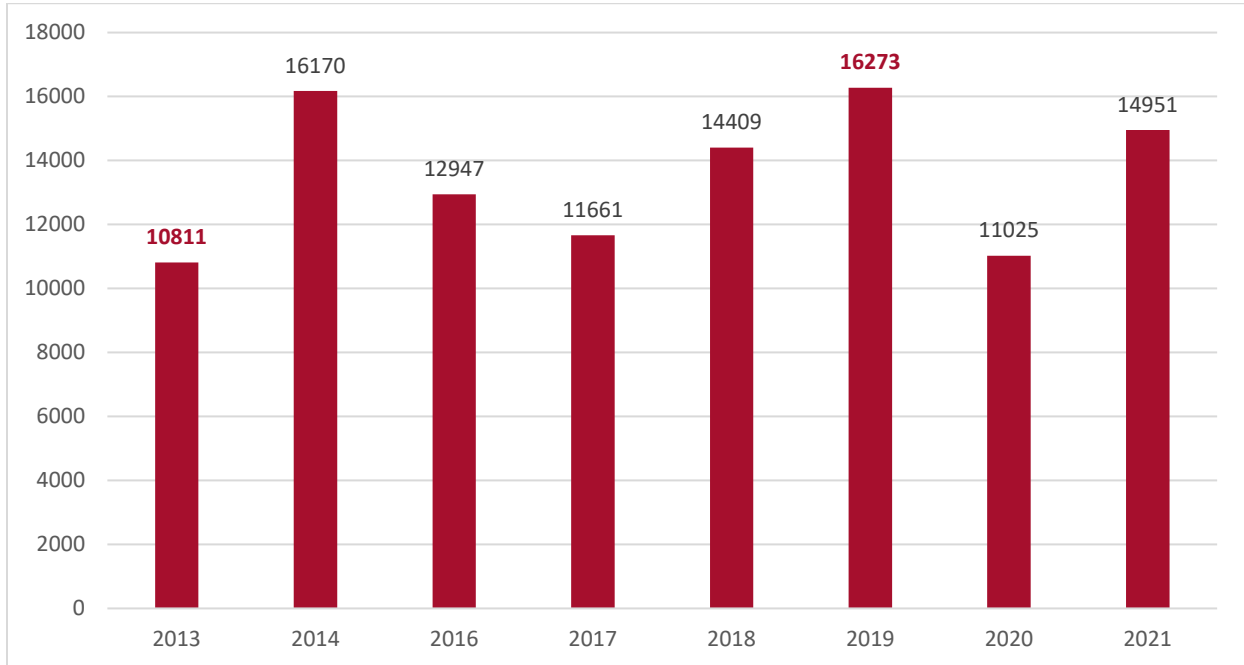


Table 2: CDL Change by Year

YEAR	TOTAL	TOTAL CHANGE PER YEAR	PERCENT CHANGE PER YEAR
2005	182,805	-	-
2006	187,593	4,788	2.619184
2007	191,344	3,751	1.999542
2008	193,749	2,405	1.256899
2009	196,064	2,315	1.194845
2010	196,713	649	0.331014
2011	193,387	-3,326	-1.69079
2012	193,141	-246	-0.12721
2013	191,526	-1,615	-0.83618
2014	184,536	-6,990	-3.64964
2015	190,982	6,446	3.493085
2016	186,963	-4,019	-2.10439
2017	183,779	-3,184	-1.70301
2018	181,315	-2,464	-1.34074
2019	185,755	4,440	2.448777
2020	188,384	2,629	1.415305
2021	187,898	-486	-0.25798

The Department of Licensing also provided data on new issuances of CDLs from 2013 to 2021 (See Figure 2 Below). New issuances have fluctuated greatly year by year with the least new issuances occurring in 2013 (10,811) and the most occurring in 2019 (16,273).

Figure 2: New Issuances of CDLs, 2013-2021



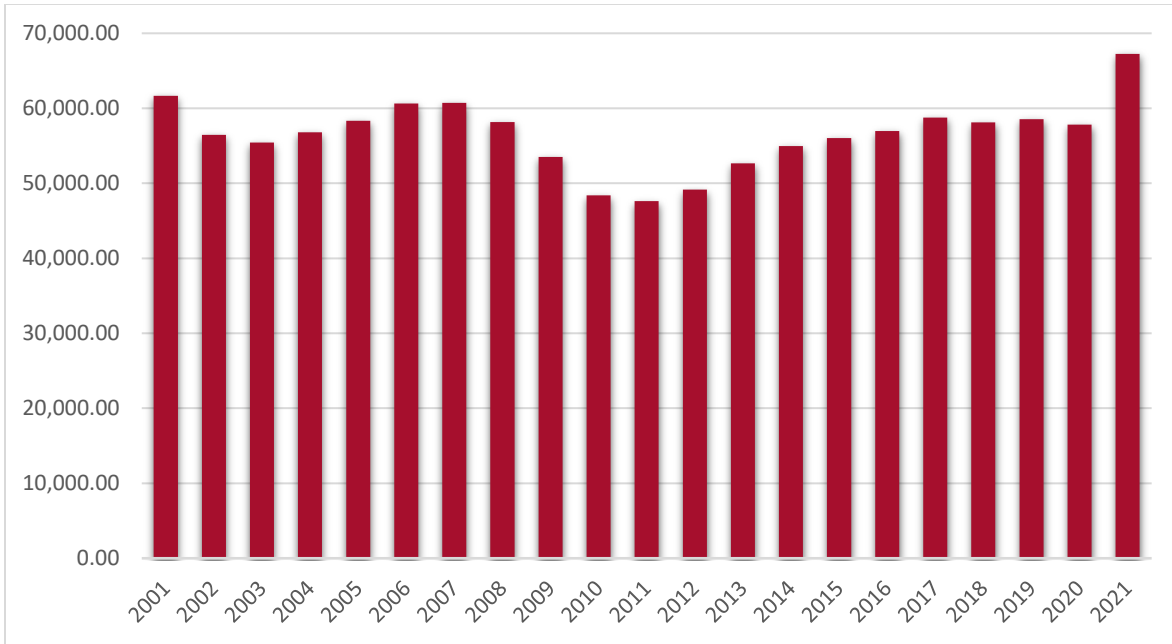
Overall, the total number of CDL license holders in the state indicates that issues with supply of commercial drivers, at least currently, may not be due to a lack of drivers with at least one entry-level qualification for these occupations. This is like the dynamic found in California, as noted by Viscelli (2022), where CDL holders outnumber job openings for drivers even while these positions remain unfilled. From 2005 to 2021, there were over 180,000 individuals who held a commercial driver's license in Washington State. To be fair, there are additional qualifications needed to be employed as a truck driver, including a safe driving record and medical certification, which are not accounted for in this data. To further explore commercial driver supply, we next examine the percentage of the Washington workforce who are truck drivers over time.

Percentage of Civilian Labor Force

Analysis of OEWS state-level estimates reveal that the total number of estimated truck drivers has fluctuated since 2001 with the highest total truck drivers occurring in 2021 (See Figure 3 Below).⁷ There are slight increases in the total number of drivers from 2003 to 2007 and substantial decreases from 2008 to 2011. From 2011 to 2020, the total number of estimated truck drivers fails to reach levels achieved prior to the Great Recession, but the number of truck drivers increases by nearly 10,000 in 2021.

⁷ Data is from BLS Geographic profile of employment and unemployment (U.S Bureau of Labor Statistics, 2022) and BLS occupational employment and wage statistics (U.S Bureau of Labor Statistics, 2022)

Figure 3: Estimated Total Truck Drivers in Washington State, 2001-2021



The percentage of truck drivers to the overall civilian workforce has decreased over time (See Figure 4 and Table 3 Below). In 2001, truck drivers were an estimated 2.06% of the Washington civilian labor force but have remained under 2% for nearly the past 20 years. It reached its lowest point in 2010 (1.37%). In 2021, truck drivers were 1.72% of the civilian labor force, its highest since 2007. Reasons for this increase cannot be established with the available data, but future research should examine whether these trends continue.

Figure 4: Percentage of the Civilian Labor Force, 2001-2021

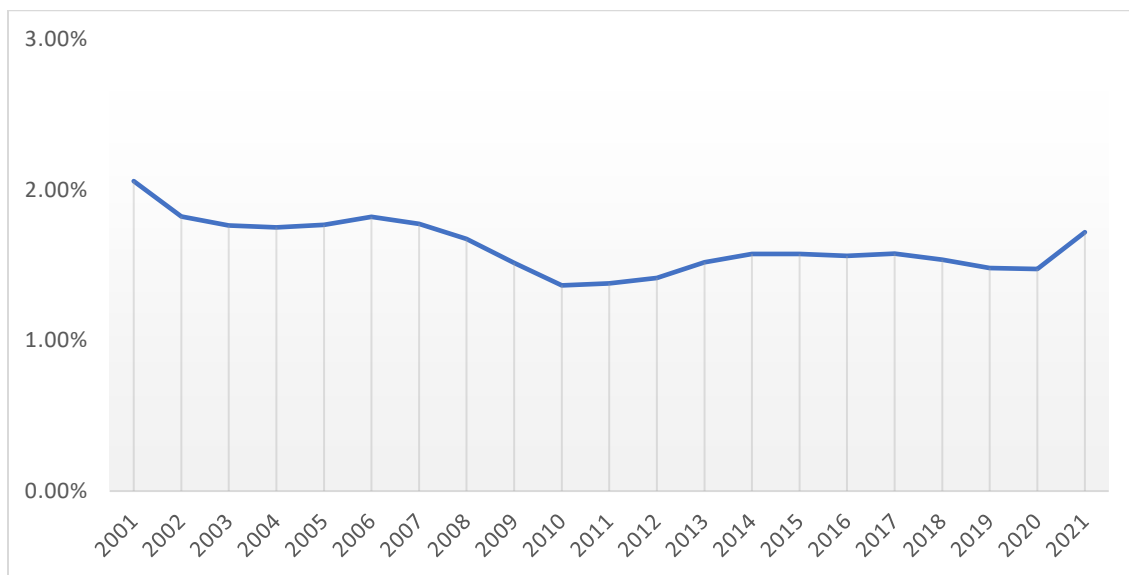


Table 3: Truck Drivers Relative to Civilian Labor Force in Washington State, 2001-2021

	Total Civilian Labor force	Total Truck drivers	% Of Truck Drivers to Civilian Labor Force
2001	2,995,000	61,680.00	2.06%
2002	3,096,000	56,470.00	1.82%
2003	3,140,000	55,440.00	1.77%
2004	3,240,000	56,800.00	1.75%
2005	3,298,000	58,350.00	1.77%
2006	3,327,000	60,650.00	1.82%
2007	3,419,000	60,730.00	1.78%
2008	3,472,000	58,170.00	1.68%
2009	3,532,000	53,530.00	1.52%
2010	3,541,000	48,390.00	1.37%
2011	3,452,000	47,640.00	1.38%
2012	3,473,000	49,180.00	1.42%
2013	3,462,000	52,660.00	1.52%
2014	3,488,000	54,960.00	1.58%
2015	3,555,000	56,020.00	1.58%
2016	3,648,000	56,980.00	1.56%
2017	3,724,000	58,780.00	1.58%
2018	3,781,000	58,110.00	1.54%
2019	3,947,000	58,530.00	1.48%
2020	3,922,000	57,840.00	1.47%
2021	3,910,000	67,240.00	1.72%

The OEWS state level estimates reveal that both the overall numbers of the civilian labor force, for the most part, and truck driver employment has steadily increased since 2011. However, the percentage of truck drivers relative to the civilian population has failed to achieve 2001 numbers and remained stagnant for the past decade. While the rate of truck drivers to the civilian labor force increased in 2021, it is unclear if these trends will remain or drop to pre-COVID levels.

Assessing Labor Market for Commercial Drivers in Washington State

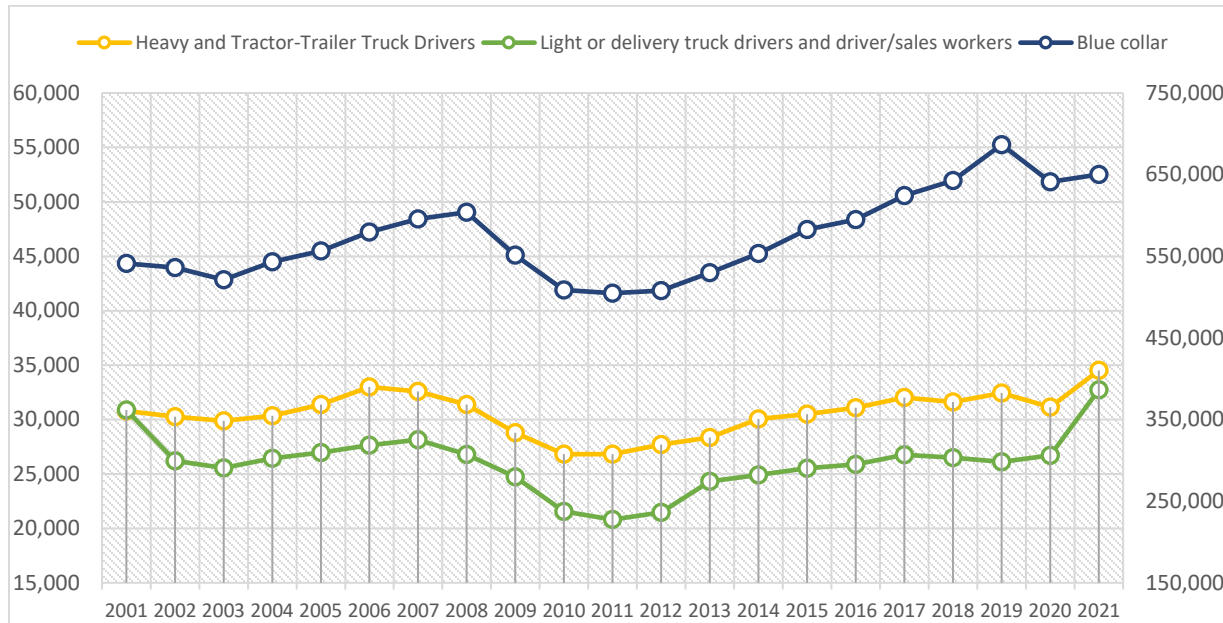
Employment

Following the procedures outlined by Burk and Monaco (2019), evidence of the existence of a “tight” labor market for Washington truck drivers is assessed. First, we compare employment of three types of truck drivers (heavy and tractor-trailer truck drivers, light truck or delivery service drivers, and drivers/sales workers) to blue-collar workers (excluding truck drivers).⁸ Blue-collar workers are used as a comparison due to similar requirements, such as educational background, to enter the occupation. For this assessment, an indicator of a tight labor market would be “employment levels that are either rising or holding steady but not falling” (Burk and Monaco, 2019; Veneri, 1999). As can be seen in Figure 5 below, heavy and tractor-trailer truck driver employment was 30,800 in 2001, and 30,880 for light or

⁸ BLS Occupational employment and wage statistics (U.S Bureau of Labor Statistics, 2022) data used

deliver service drivers and driver/sales workers. From 2001 to 2007, employment for both fluctuated, but generally increases until declines begin in 2008 to 2010 during the economic recession. For heavy and tractor-trailer truck drivers, a pattern of slight increases or maintenance occurs from 2010 to 2019 until a slight decrease in 2020 during the COVID pandemic. For the most part, employment of light or delivery truck drivers/sales workers follows this same pattern. While the demand for truck drivers has remained steady for nearly the last decade, the demand for blue-collar workers shows more substantial increases and potentially suggests a tight market for other blue-collar workers.

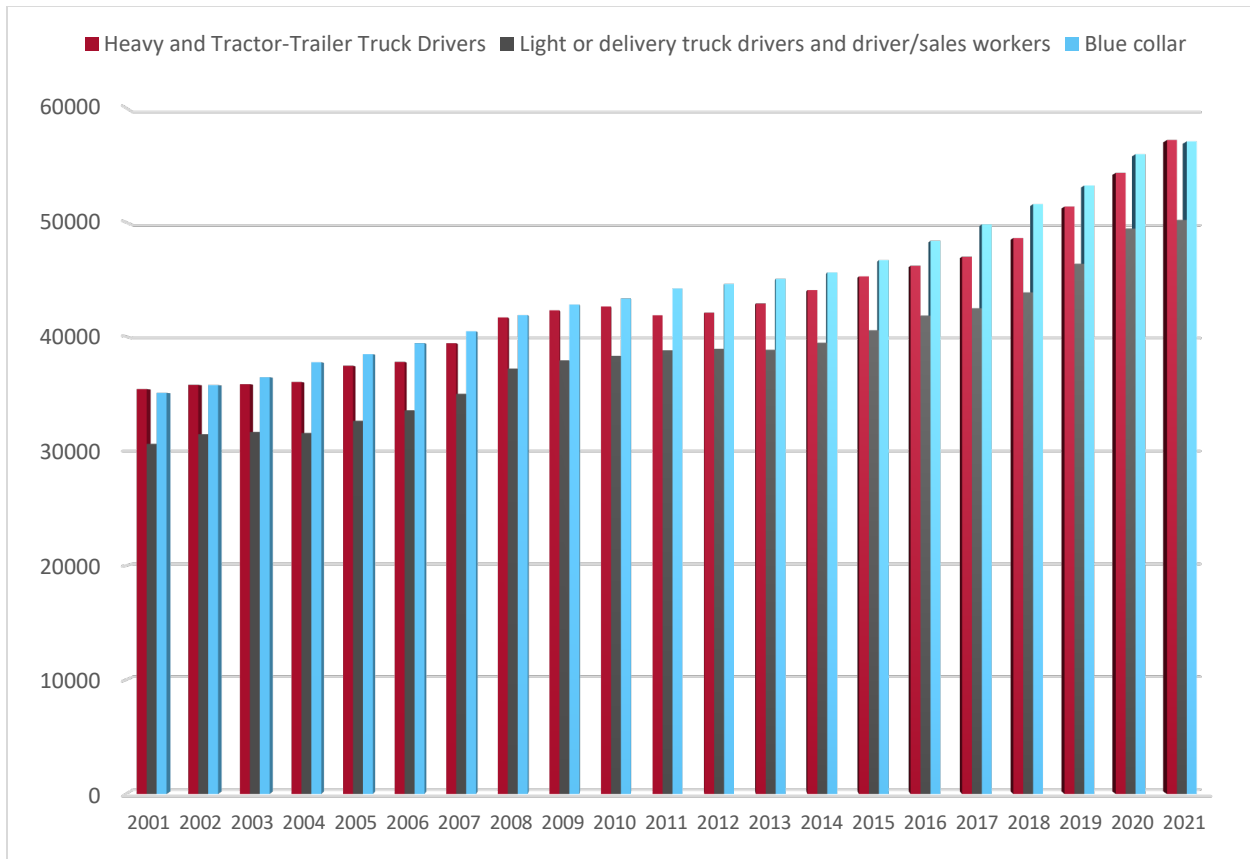
Figure 5: Employment of Truck Drivers (left axis) and Blue-Collar Workers (right axis) in Washington State, 2001-2021



Earnings

An additional indicator of a tight labor market for an occupation is “increasing wages relative to alternative employment opportunities for potential job seekers” (Burk and Monaco, 2019; Veleri, 1999). Figure 6 below shows the estimated earnings for heavy and tractor-trailer truck drivers, all truck drivers, and blue-collar workers. When examining earnings of truck drivers to blue-collar employees, the earnings of heavy and tractor-trailer truck drivers are comparable to blue-collar workers from 2001 to 2021. From 2003 to 2020, the wages of blue-collar workers are higher than heavy and tractor trailer truck drivers, while these drivers make slightly more beginning in 2021. Based on these earnings estimates, this suggests that the labor market for truck drivers in Washington State may not be “tight” in contrast to national-level findings. This, in combination with the previous analysis, suggests that the labor market for other blue-collar workers is tight in Washington. The earnings comparison also suggests that other blue-collar occupations may be an attractive alternative for truck drivers in Washington.

Figure 6: Mean Annual Earnings of Truck Drivers and Blue-Collar Workers in Washington State, 2001-2021



Examining occupation retention using the Current Population Survey (CPS)

To further examine the dynamics of labor market for truck drivers, CPS public-use microdata files⁹ from 2004 to 2018 are utilized. First, a Washington only subset of the CPS Outgoing Rotation Group (ORGs) files was created, and following Burk and Monaco (2019), individuals who were observed twice in the CPS files, twelve months apart were isolated to create “short panels” and compare responses in the first observation to the second observation. The sample created was further restricted in terms of age and gender; focusing on men ages 20 to 65 since drivers must be at least 21 years old to drive across state lines, and men vastly outnumber women in the profession. The final sample included 446 men in Washington state who indicated they were a truck driver during the first observation and/or the second observation.¹⁰ Due to this relatively small sample size, the results of this analysis should be treated with caution.

Each truck driver in the sample is further classified as either for-hire (all transportation and warehousing NAICS Codes 48 - 49) or private carriage (all other industries) using the broader classification of Burk and

⁹ Data from Center for Economic Policy and Research Uniform extracts of CPS ORG (Center for Economic and Policy Research, 2020).

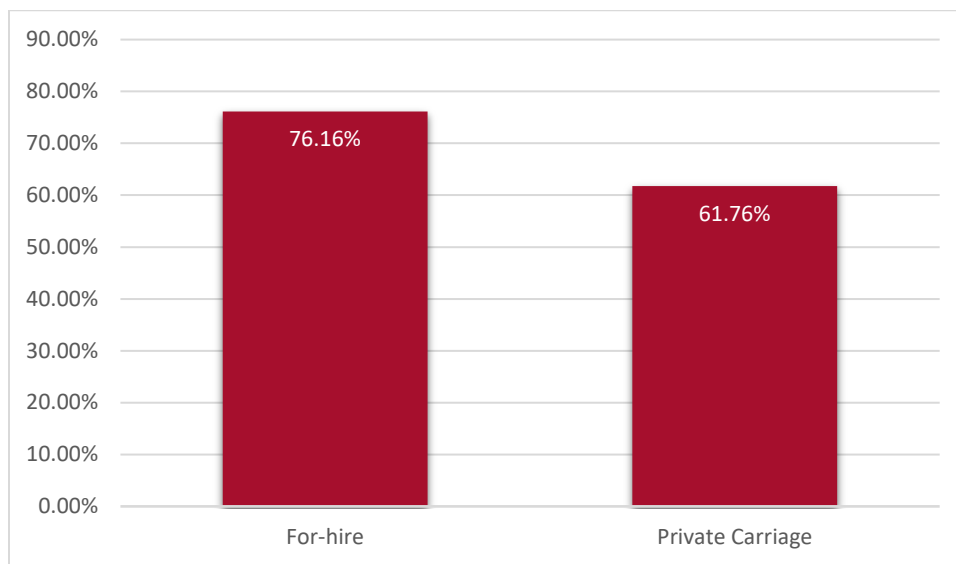
¹⁰ As noted by Burk and Monaco (2019), different categories of truck drivers cannot be distinguished with CPS data as all truck drivers are aggregated into a single occupational code.

Monaco (2019).¹¹ From 2004 to 2018, there was a total of 151 for-hire drivers and 204 private carriage drivers in the CPS data for Washington State who initially report truck driving as their occupation. This classification allows for comparison of truck drivers who are more likely to work long-haul (for-hire) and short-haul (private carriage), and whether that impacts retainment of their occupation from their first observation in the CPS to the second observation twelve months later. Due to the small sample of for-hire and private carriage drivers by year (ranging from 4 to 20 per year), overall occupational retention is examined from the first observation to the second observation.

Overall Retention

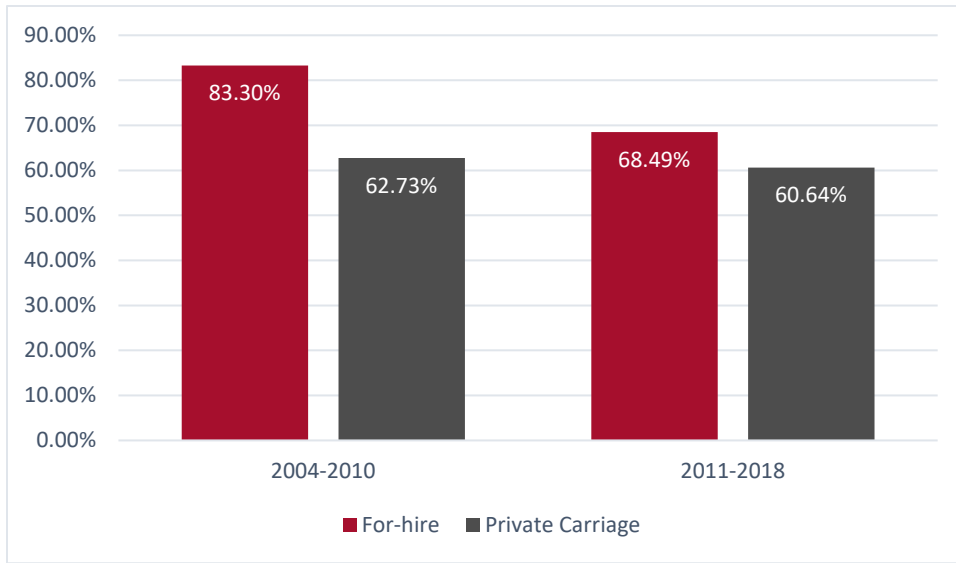
As can be seen in Figure 7, from 2004 to 2018, for-hire drivers retained their occupations in higher percentages from the first observation in CPS data to the second observation (76.16% and 61.76% respectively). To examine trends over time, occupation retention from 2004 to 2010 and 2011 to 2018 is also examined (See Figure 8 Below). While overall retention rates are still high for both for-hire and private carriage drivers, the retention drops considerably for for-hire drivers from 2011 to 2018 compared to previous years. From 2011 to 2018, for-hire drivers retained their occupation in only a slightly higher percentage than private carriage drivers.

Figure 7: Overall Percentage of For-hire and Private Carriage Drivers Who Retain Occupation, 2004-2018



¹¹ For-hire drivers identified using NAICS codes 48-49 (Burk and Monaco, 2019).

Figure 8: Percentage of For-hire and Private Carriage Drivers Who Retain Occupation, 2004-2010 and 2011-2018

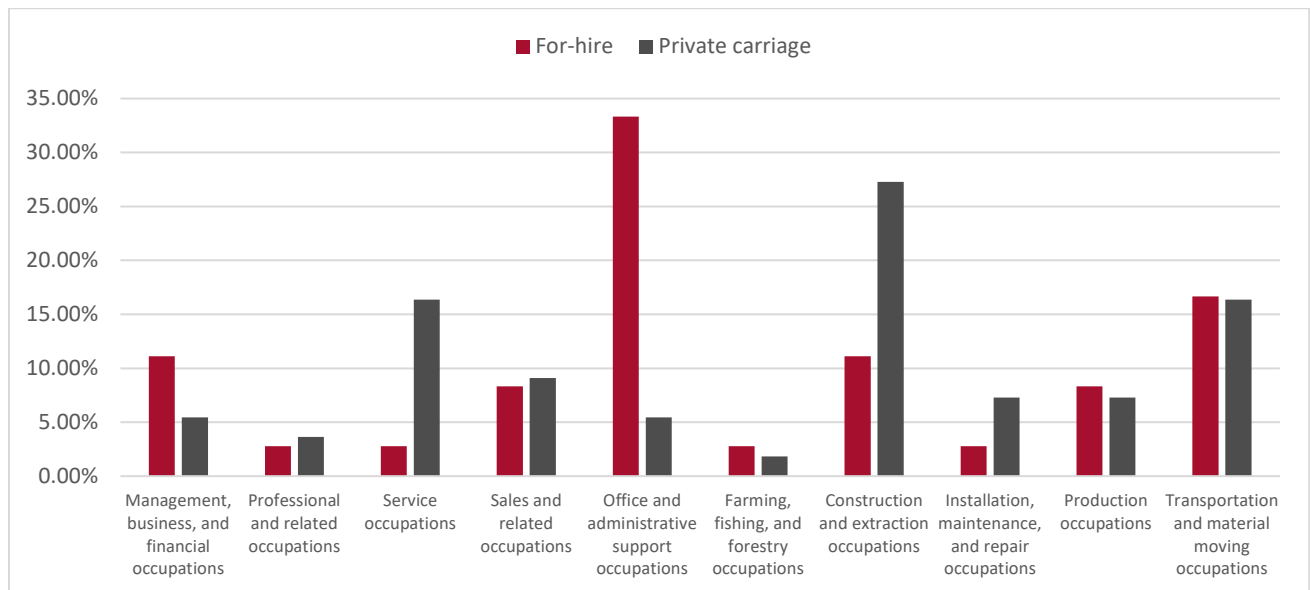


Occupational Change for Truck Drivers

Leaving Occupations for Truck Driving

When examining what occupations are left by those who enter truck driving from the first to second observation, almost one third of for-hire truck drivers come from other blue-collar jobs compared to half of private carriage drivers (See Figure 9 Below). The highest percentage of for-hire truck drivers switch from office and administrative support occupations, while the highest percentage of private carriage drivers come from construction and extraction occupations.

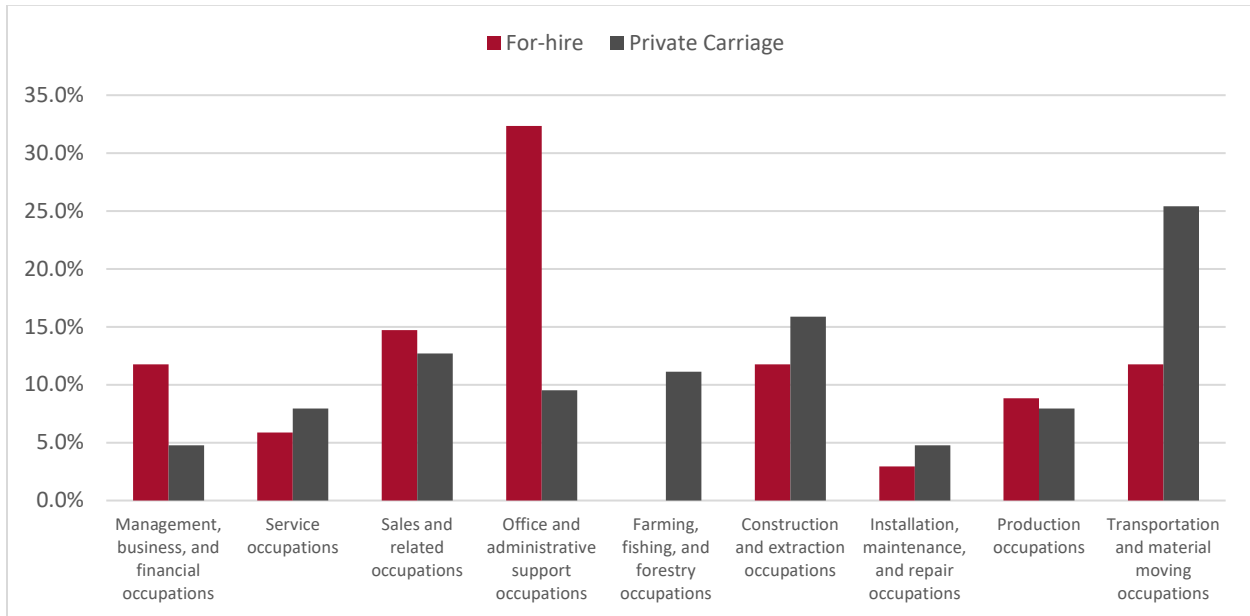
Figure 9: Initial Occupation of Individuals Entering Truck Driving for Observation 2



Leaving Truck Driving for Other Occupations

Interestingly, nearly a third of for-hire truck drivers who leave the profession, leave for office and administrative support work (32.4%), while about a quarter of private carriage drivers move to transportation and material moving occupations (See Figure 10 Below).

Figure 10: Destination Occupation for Individuals Who Left Truck Driving



Industries and Leaving Truck Driving

Over half of those entering for-hire truck driving during the second observation came from transportation and warehousing, while slightly over a quarter of private carriage drivers came from construction (See Figure 11 Below). Similarly, over a third of for-hire drivers leave trucking for transportation and warehousing, and the highest percentage of private carriage drivers (15.87% each) leave trucking for manufacturing and wholesale (See Figure 12 Below). For for-hire truckers in the CPS data, recruitment to the industry came from transportation and warehousing; however, this industry also attracts for-hire drivers away from trucking.

Figure 11: Entering Trucking, Initial industry

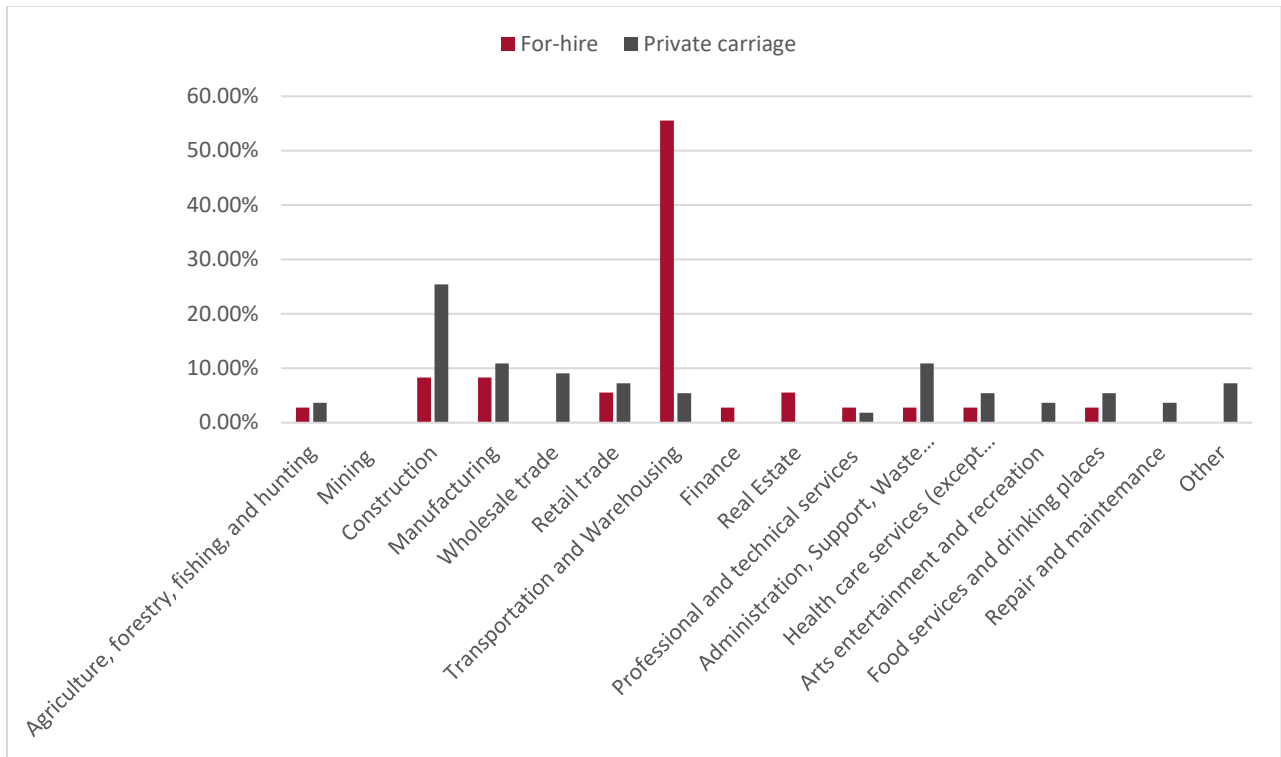
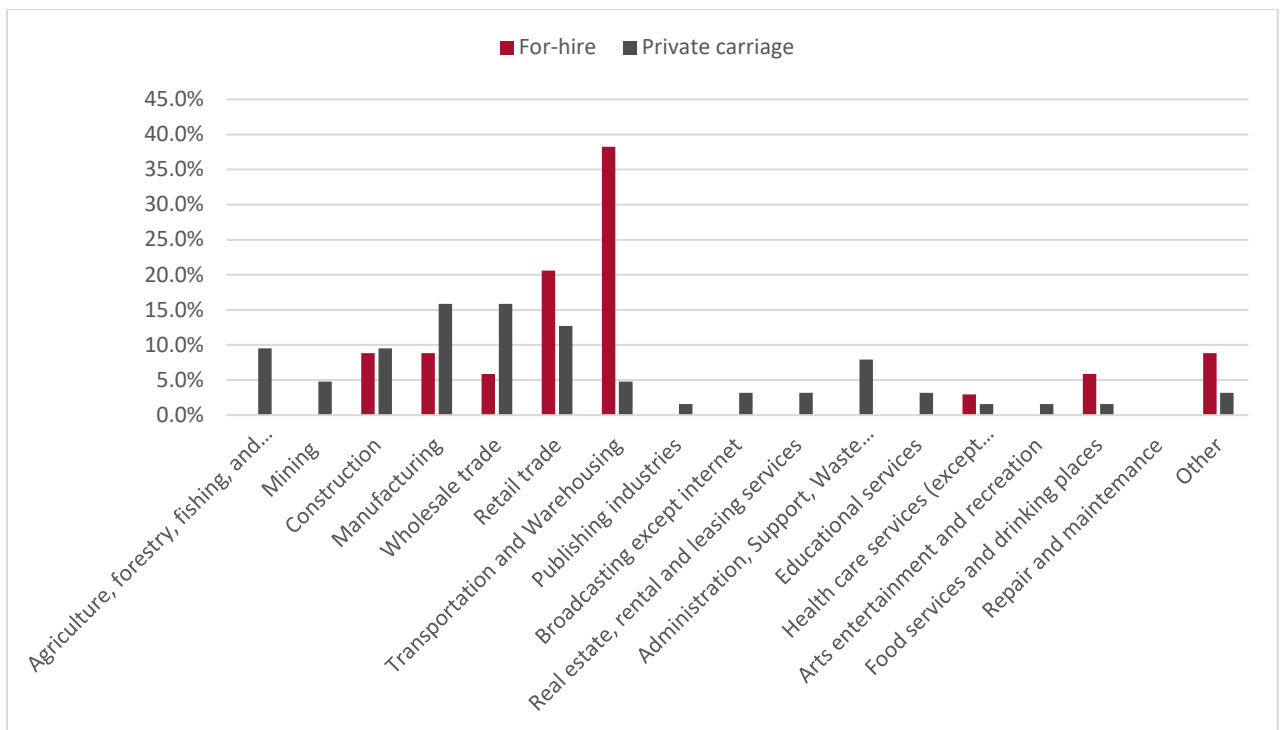


Figure 12: Leaving Truck Driving, Target industry



Concluding Remarks on Truck Driver Supply in Washington

Overall, the findings regarding truck driver supply in Washington state are nuanced. The percentage of truck drivers to the overall civilian workforce has failed to achieve 2001 numbers and remained largely stagnant for the past decade. Given occupational estimates for truck drivers, especially heavy and tractor-trailer truck drivers, the percentage of truck drivers to the overall civilian workforce may be concerning especially if gains made in 2021 do not continue. However, other factors suggest that there may be enough individuals with the entry-level requirements, at least in terms of holding a CDL, to meet demand.

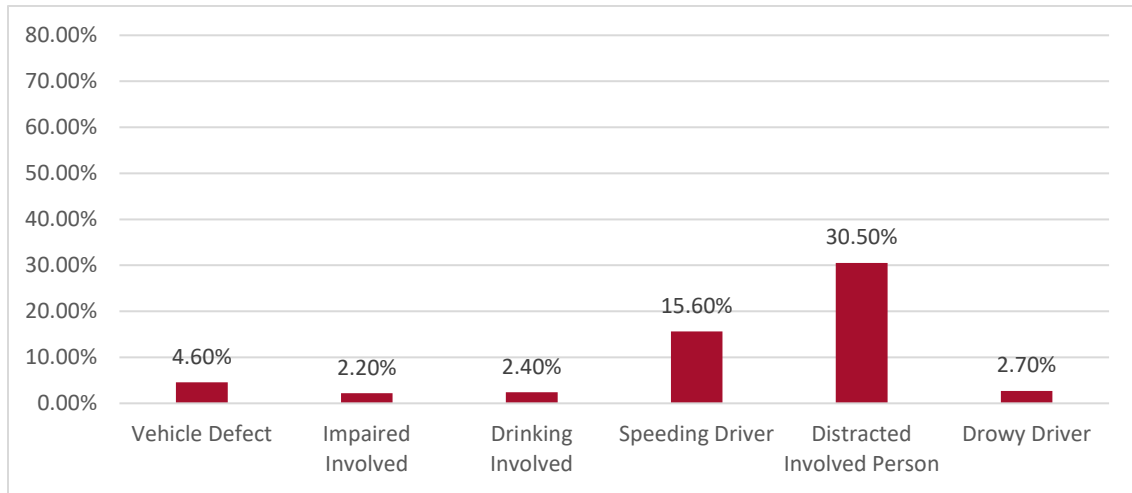
The wage estimates of truck drivers to blue collar workers may provide evidence of a larger issue for the industry in Washington State. While Washington was the top paying state for heavy and tractor-trailer truck drivers in 2021 (U.S. Department of Labor, 2022), the wage estimates from OES for Washington State from 2010 to 2020 indicate that blue-collar workers made more or similar wages to these drivers. While heavy and tractor-trailer truck drivers make more than blue-collar workers in 2021 it is unclear if this will be an ongoing trend. Thus, blue-collar occupations could be an attractive alternative to truck driver employment in Washington State impacting willingness to enter and/or remain in the occupation. Although the sample size is small for the mini-panel data and thus we should be cautious in interpretation, these findings suggest that occupational retention has dropped for for-hire truck drivers, indicating issues that are unlikely to be addressed by adjustment of testing and licensing requirements alone.

Traffic Safety

Collisions: Contributing Factors

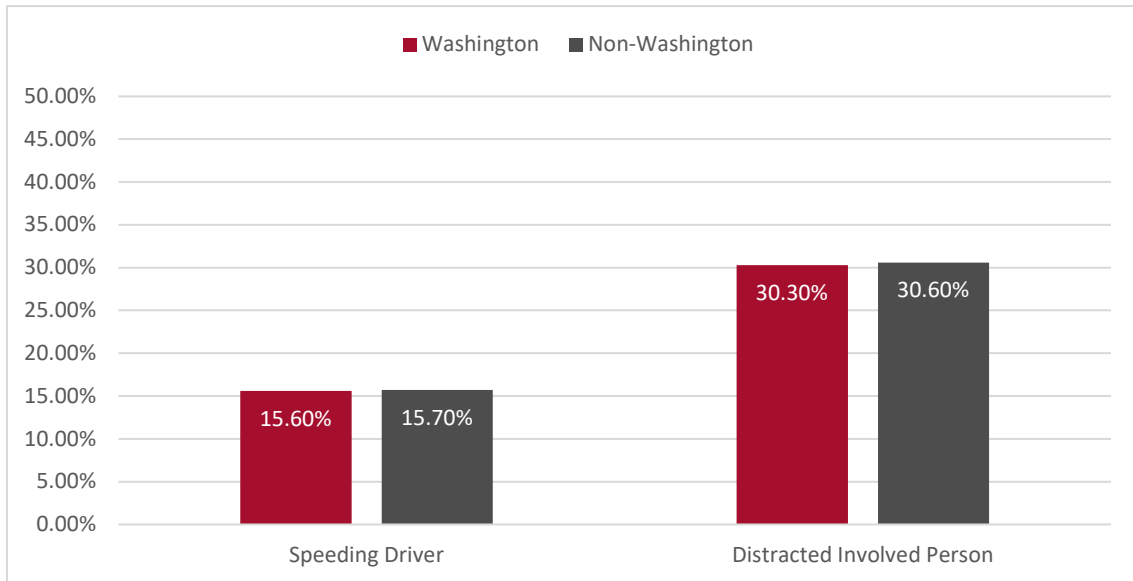
As mentioned, the DOL provided data on 61,832 drivers involved in collisions in Washington who were CDL holders at the time of the collision from 2015 to 2020. For the first analysis, only Class A CDL holders are examined to better isolate potential long-haul drivers and training impact. Removing Class B and Class C licenses and collisions involving vehicles not requiring a commercial license (by vehicle type and vehicle classification codes), leaves 7,555 CDL Class A drivers involved in collisions left to analyze. When looking at contributing factors for collisions, vehicle defect as a contributing cause is rare with over 95% of these collisions (95.4%, 7,027) involving vehicles with no vehicle defects. Focusing on contributing factors, in addition to vehicle defects, which are often used as indicators of risky driving behavior, 30.5% of collisions involve a distracted driver (in either vehicle), or 15.6% involve a speeding driver in either vehicle (See Figure 13 Below).

Figure 13: Collision Contributing Factors, 2015-2020



Next, distracted involved person and speeding driver by state of vehicle registration are examined. Of the 7,555 CDL holders involved in collisions, 5,532 drivers were in vehicles registered in Washington and 2,023 drivers were in vehicles registered elsewhere. Using vehicle registration as a proxy for state of CDL license has several limitations so results should be treated with caution. As can be seen in Figure 14 below, there is little difference between state of vehicle registration and whether a speeding driver or distracted involved person were a contributing factor to the accident.

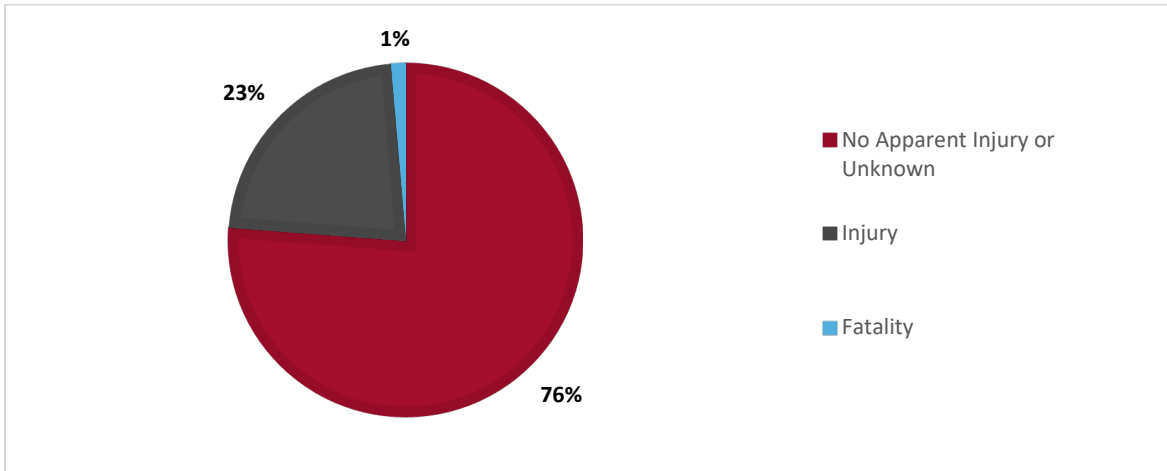
Figure 14: Collision Contributing Factors by State of Vehicle Registration, 2015-2020



Collisions: Severity

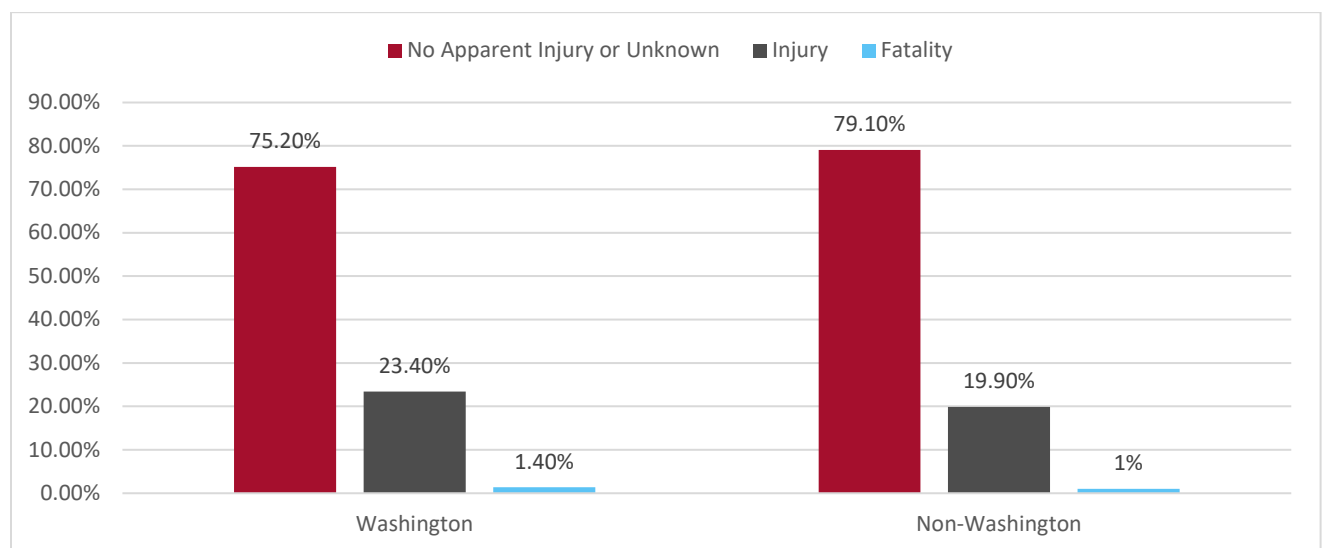
As can be seen in Figure 15 below, when examining collision severity, collisions with no apparent injury or “unknown” are most common (76%) and fatalities comprise 1% of all these collisions.

Figure 15: Collision Severity, 2015 to 2020



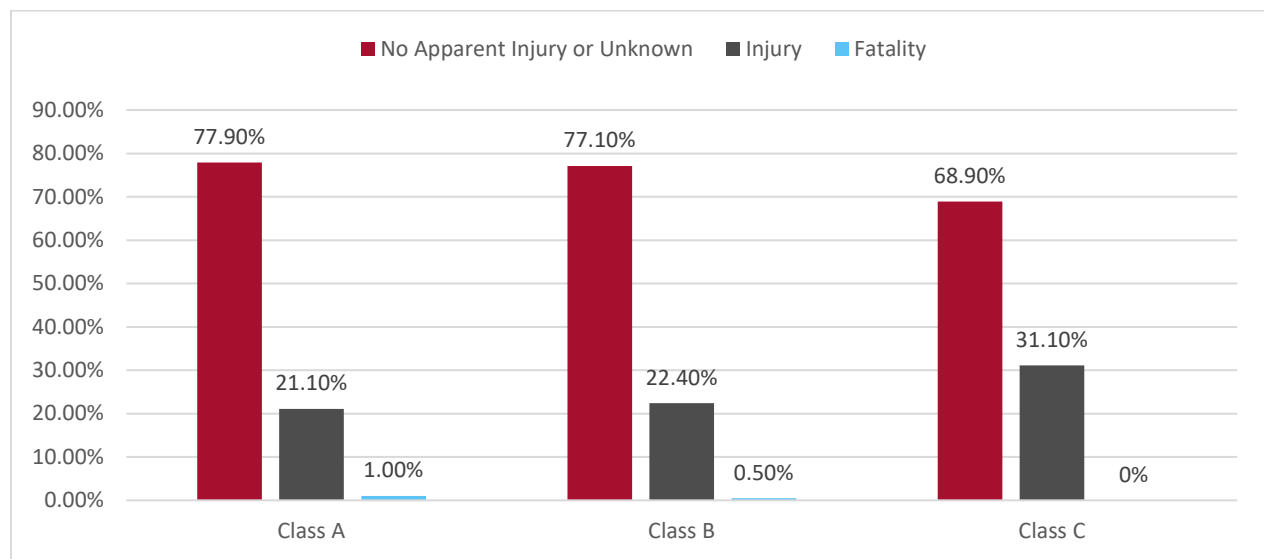
Next, severity of collision by state of vehicle registration are examined to determine if there is a statistically significant impact between the two variables. When examining collision severity by state the vehicle is registered (Figure 16 Below), there is a slight difference in collision severity when comparing Washington and non-Washington registered vehicles and this difference is statistically significant ($\chi^2(2, N = 7555) = 12.803, p < .001$). However, the relationship is very weak ($V < .1$). Based on this and virtually no difference in risky behavior based on state of vehicle registration, multivariate analysis is not conducted.

Figure 16: Vehicle Registration and Collision Severity, 2015 to 2020



Lastly, severity of collision for Washington CDL holders by CDL Class are analyzed to determine if there is a statistically significant impact between the two variables. Since each CDL Class has a different hour requirement, this is used to help determine if number of training hours has an impact on traffic safety outcomes. Using the original dataset provided by DOL, collisions involving vehicles not requiring a commercial license (by vehicle type and vehicle classification codes) and non-Washington State CDL holders were removed. When examining collision severity by CDL Class (Figure 17 Below), there is a slight difference in collision severity when comparing CDL Class and this difference is statistically significant ($\chi^2(4, N = 15577) = 21.121, p < .001$). However, this relationship is also very weak ($VE < .1$). Based on this, multivariate analysis is not conducted.

Figure 17: CDL Class and Collision Severity, Washington State CDL Holders



CDL Test Results

To further explore the impact of increased hour requirements of CDL training on traffic safety, CDL test data provided by the DOL are examined. There are three tests which comprise the CDL test: vehicle inspection (VI, also known as pre-trip), Basic Controls (BCS), and the Road Test (RT). If an individual fails the preceding test, the other tests are canceled and must be rescheduled. Initial CDL comprises 70.4% (116,781) of all tests from 2019 to 2021, while previous failures comprise 27.6% (45,740). For initial CDL tests, 7,274 result in an auto fail (6.2%), and of the auto fail reasons the most common is *Failure to properly demonstrate or verbalize air system checks* (3,575, 3.1% of all scheduled tests, 49.15% of all auto fails). From 2019 to 2021, across all three tests for initial CDL, there were a total of 30,081 cancelations (25.76%). Of these cancelations, 1,958 were canceled due to a no show (1.67%), 8,114 (6.95%) were canceled by the customer, the rest were canceled for a variety of reasons such as no insurance, no valid medical certificate, and vehicle not properly licensed.¹² The percentage of no shows is consistent from 2019 to 2022, ranging from 1.5 to 1.7 percent.

¹² N was removed before calculating frequencies.

Focusing on initial CDL tests only and pass/fail rates for each CDL test are presented Figure 18 below.¹³ Overall, when only examining pass/fail (and not cancellation of subsequent tests when previous tests are failed), pass rates are high across all three tests, although failure is slightly higher for the vehicle inspection. However, when only cases of failure are examined, the vehicle inspection constitutes nearly half (49.6%) of all failures from 2019 to 2022.

Figure 18: Initial CDL Pass/Fail Rates, 2019-2022

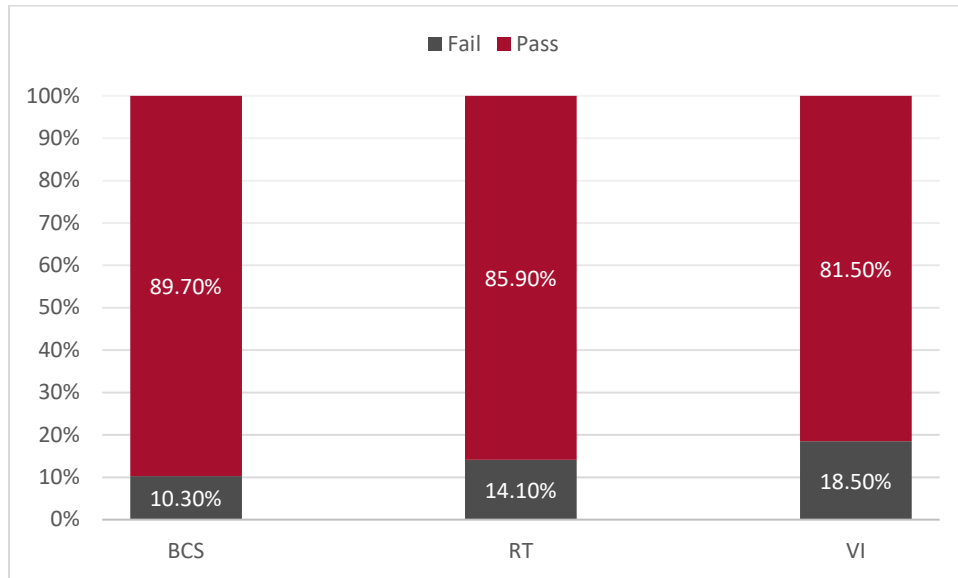
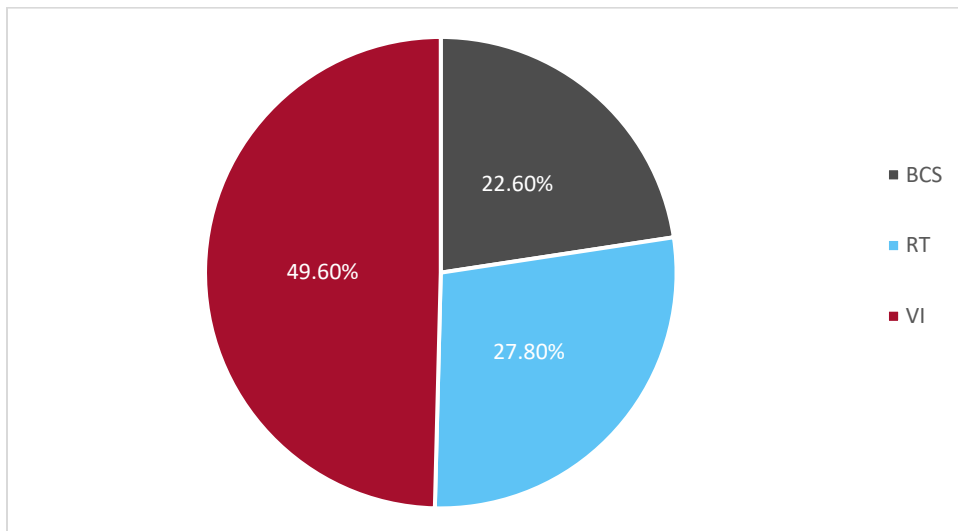


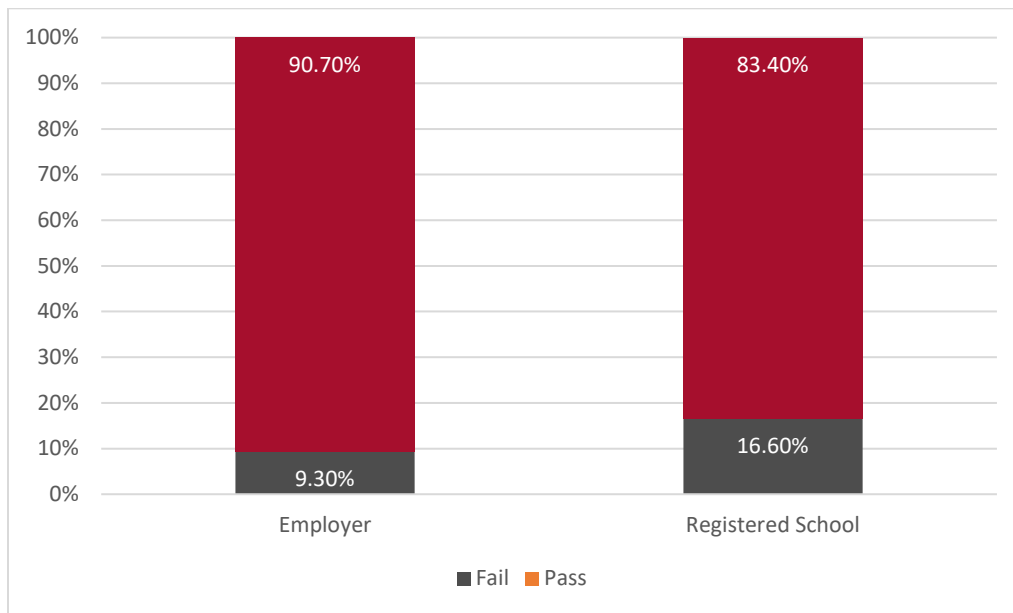
Figure 19: Failures by Test



¹³ For this analysis, canceled (C) and N were removed before calculating frequencies.

Based on the advice of some interviewees, the impact of Washington state’s hour requirement on traffic safety is analyzed by comparing school type (employer or registered school) and performance on the road test which focuses on driving. As mentioned, for CDL class A licenses, registered schools with the state must provide the 160 hours of training while employer-based training programs do not. As can be seen in Figure 20 below, registered schools have slightly lower overall pass rates and higher fail rates on the Road Test than employer-based programs. This is statistically significant ($\chi^2(1, N = 24066) = 233.596, p < .001$). However, the relationship is weak ($V\epsilon = .099$).

Figure 20: Initial CDL Road Test Pass/Fail Rates by Type of School



Interviews/Focus Group

A total of 25 individuals participated in interviews or the focus group from October to November 2022. These individuals represent the stakeholders identified in the legislation and broadly represent education, traffic safety, and industry.

Supply of Drivers in Washington State

It should be noted that while there was some disagreement on whether there is a supply issue for commercial drivers, it was largely agreed that testing and licensing requirements are not a major contributor to supply issues and may have minimal impact on overall commercial driver supply. Many participants focused on other occupational issues, such as wages and hours as an explanation of supply issues. For instance, one industry participant stated that they would not say the number one issue is wages, but increasing wages helped immensely when hiring new drivers. While updating testing and licensing requirements may not impact overall supply, the interview participants overwhelmingly supported streamlining the testing and licensing process.

Driver Recruitment

For those who indicated there was a shortage (most participants), it was noted that these concerns were being faced by the entire workforce, not just industries dependent on commercial drivers. Several

participants stated that it was difficult to get applications for their positions. For example, an individual working in transit stated that when he started in the industry, 90 people would show up to his office interested in positions with his agency and he would hire three, but now if he “can get three in a room” he is lucky. Participants representing private businesses also indicated that applications to open positions has been an issue. When asked if this was due to COVID, one participant stated that this was an issue eighteen years ago when they started in the industry and the issue has never been resolved. This participant noted that they have had success posting jobs on Indeed, but it also feels like some people are “fishing,” just checking to see what jobs are out there and not really interested in the position. This participant, as stated above, stated that increasing wages helped them recruit drivers, but the most important factor in their driver recruitment has been happy employees who then recruit drivers on behalf of the company. Another individual relayed that the biggest issue for commercial driver supply is wages and quality of life, pointing out that you could make similar wages in other occupations without additional educational requirements that are necessary for truck drivers.

Several participants noted the difficulties recruiting individuals, especially young people, to the profession. According to several industry participants, there are misconceptions about the occupation that impact interest and recruitment. Misconceptions mentioned by interview participants included perceptions that “younger drivers cannot get jobs in the industry, that you make little money, that you are gone all the time, and are unhealthy and overweight.” One participant in education noted that these misconceptions can be perpetuated by local schools, especially that you need to go to college to make \$50,000 a year. When speaking at a local high school about truck driving opportunities due to these concerns, they asked how many would consider being a truck driver. Only seven students raised their hands.

Several issues make recruiting younger drivers difficult, including federal restrictions. However, several participants pointed out the importance of recruiting younger drivers and combatting misperceptions of truck driving would also have an impact on recruiting women and people of color to the profession. As several participants who represent organizations that hire commercial drivers mentioned upcoming retirements in their workforce, increased recruitment, especially of young drivers is a concern.

In addition, some representatives of education and industry discussed the openness of the profession. For instance, one of these participants stated that “transportation is one of the few industries where your demographics and background do not matter as long as you can do the job.” This participant noted that they work with former prisoners and felons routinely because “transportation does not care what your past is.” They have successfully placed these former students with local companies. Another participant in education mentioned the benefit of training programs for prisoners and former prisoners as recidivism decreases when these individuals are gainfully employed. This could be a potential avenue for recruitment that has multiple benefits.

Program Costs

Another factor that impacts recruitment is the cost of CDL training. According to one participant in education, the cost of programs in the state can vary from \$2,500 to \$7,000 depending on the school. It is important to note that this is not a one-to-one comparison of costs as lower cost programs may not cover all the fees associated with acquiring a CDL. Another participant stated that financial aid should be available for commercial driving programs as historically there has been no funding; accredited private schools should also have access to these funds. This participant mentioned that Washington State, at

the time of the interview, had announced significant grant funding to support public and private sector CDL education (\$1.5 million for the public sector). While they thought this was helpful, they believe more financial aid funding is required to deal with commercial driver supply and would also help other professions dependent on commercial drivers, such as local schools.

Qualified Applicants

Representatives in the industry indicated that there is also an issue finding qualified applicants for their positions. Beyond getting individuals to apply, finding qualified individuals has been a problem. Some challenges mentioned included finding applicants with proper credentials (e.g., medical certification and good driving record) for available positions. Additionally, several participants mentioned that marijuana testing has been a particular challenge since the state legalized the drug. Based on the interviews, the problem of applicants is two-fold: (1) getting individuals to apply for positions and (2) receiving qualified applicants for positions. This issue has caused some in the industry to adjust their standards when hiring drivers, for instance, hiring entry-level drivers with no experience if they have a good driving record.

Driver Retention

Driver retention is an issue mentioned by several participants. When discussing what impacts driver retention, wages and hours received most attention among interview participants. A participant in the industry discussed the importance of shift flexibility that suits their employee's life situation and schedule has been effective in recruitment and retention. Another participant mentioned that long-haul occupations can be unsustainable, and some schools exacerbate this issue by pushing students to jobs where they make \$40,000 and are gone 340 days a year.

Training, Testing and Licensing Requirements in Washington

Several participants expressed frustrations with the current process around testing and licensing requirements. While there was disagreement on whether there was a need to adjust overall hour requirements, and specific hourly requirements for certain maneuvers, several concerns were shared by most participants.

Testing Backlogs

All the participants involved in CDL education, whether a registered school, or an employer who provides CDL training, stated that testing backlogs are a significant issue that have reverberating effects. Some of these participants noted that it can take from five to eight weeks to test students after they finish a course which has an adverse impact on passing the CDL tests. Many participants stated this was too long. As noted by one participant, "it's a perishable skill" and about "1 in a 1000 can retain the information for six weeks to pass the test." Several stated that they often had to travel significant distances to get their students tested, some traveling across the state. This increases costs to these organizations as they are required to pay lodging, fuel costs, and even additional training to ensure their students do not lose their skills from the end of class to their actual examination.

Frustration was expressed by some participants because they often felt the schools were being blamed for the backlog. Essentially, if students were prepared, then they would pass the tests. However, several factors created the backlog according to these participants, including an influx of students after COVID-19, too few testers in DOL, and too few third-party testers in areas with high CDL student concentration. For instance, the education representative above noted when tested within a week of graduating the program, 90% of their students passed the first time. However, with such a long waiting period, passing rates have fallen considerably.

A participant in education did mention that the DOL is investigating the issue of passing rates. Referencing a DOL presentation in July of 2022, they stated that the average passing rates from January to June were extremely low. This participant also noted that many factors could contribute to low passing rates, including instructor shortage, equipment failure, and other issues.

Several participants stated that there are not enough testers for the state of Washington. One participant said there are approximately 150 testers for the whole state which needs to be remedied soon or “it’s going to be a big problem.” Additionally, one participant in education noted that testing spots must be requested 12 weeks in advance, but CDL programs are considerably shorter than 12 weeks making it difficult to know how many spots need to be requested per class. Representatives of non-registered programs also stated that registered schools have testing priority which exacerbates this issue. Due to the issues scheduling DOL testers, a few representatives of education stated that they do not even try to schedule with DOL, relying completely on third party testers.

The issue of testing backlogs is so prevalent that transit organizations have worked with DOL to get their employees trained as testers. While these organizations were thankful that they could work with the DOL to do this, frustration was expressed because it took much effort and repeat entreaties to make this happen. Concern was expressed over sustainability of these efforts especially if no planning is done for the future (as job retention is an issue everywhere). As stated by one participant, training their own employees solves “the immediate problem but the systemic problem remains.” Testing backlogs are especially problematic for military personnel. An interview participant from an educational institution who works with Military personnel and Veterans stated that even a backlog of a week creates numerous barriers for military personnel. For many, their unit needs them back and will not allow them to stay a week to test. If their unit allows them to stay, they cannot afford to stay in a hotel for a week until the test date. This participant stated that ideally their students would “finish the program on a Friday and test on Saturday.” This educational institution has multiple locations in other states and stated the testing issue is only an issue in Washington State. They also stated that they are now training and testing their military students in other state locations, rather than Washington State, to avoid these issues. The problem of testing backlogs is clearly multi-faceted and needs multiple solutions to address. While passing rates were discussed, participants in education did not support creating a testing standard for school accreditation, especially high standards that were potentially being discussed. For instance, one of these participants mentioned that “the national average of passing the exam is approximately 50% and other industries are around this average as well. If a standard of 70% exists for a school to remain accredited, it does not reflect the realities of testing and creates unnecessary and unequitable testing standards.”

When asked how to resolve backlog issues, most participants stated that more testers are needed. While acknowledging that everyone is having issues with hiring, many participants felt that DOL needs more staff. Additionally, more third-party testers need to be available. Representatives in education, including a representative of an educational institution who trains military personnel and Veterans, stated a desire to become third party testers to help reduce backlogs. However, Washington policy prevents them from becoming third party testers and testing their own students. As noted by a representative in education with CDL programs in multiple states, Washington State is unique in this regard. In their other locations, they can test their own students by keeping examiners separate (the students do not meet the examiners during the program). When mentioned by the interviewer that there may be concern regarding “CDL mills,” this participant stated, “why penalize everyone for some

bad actors...penalize the school.” They then noted again that this is a common practice in the other states where they have programs, and this is unique to Washington.

Many of the participants also noted that the cost structure was contributing to backlogs. Currently, the testing fee is \$250 for two tests. Some have argued this leads to backlog issues because students know they have an additional chance to pass the test, perhaps disincentivizing passing the first time. However, one participant was concerned that the two tests for \$250 also contributed to backlogs because third-party testers only get paid for one test (the first test). Thus, creating an incentive to focus on first-time testers rather than re-testers because they get paid the entire fee up front. Most respondents involved in education in some capacity mentioned changing the cost structure to a per test basis would be more effective to reduce backlogs. Additionally, it was recommended by all these participants that the requirement that students being re-tested must use the same tester be revised to help deal with the backlog. Several stated that cost structure and the re-testing requirement is already being revised by DOL and they were supportive of the change.

Vehicle Inspection Test

The Vehicle Inspection Test (VIC) received much attention from industry, education, and other participants as a contributor to the backlog. According to participants, most students fail the VIC (an assertion that is confirmed in previous analysis). However, the test is criticized for being a “memorization” test where participants fail if they do not use the exact language demanded by examiners. One participant stated that if a driver says “about 50 PSI” instead of “at 50 PSI” for optimal tire pressure, the answer is marked incorrect. It was pointed out by participants that this is especially problematic for English as a Second Language drivers, and impacts equity and diversity in the industry. Essentially, CDL students are being trained to pass the VIC by reciting a script without attention to meaning, and if they fail to repeat the script verbatim, they can fail the test. These participants also noted that so much time must be devoted to learning the VIC “script” that it impacts their ability to focus on other, more important aspects of CDL training, mainly driving and traffic safety. A safety official noted that failing pre-trip (VIC) and the basic controls test is a national issue as the manual is very rigid, but Washington “leans into the assertive end of that manual for pre-trip.”

Further, several participants noted that the VIC is out of touch with the practical realities of truck driving. Most will never use the information in the test for a variety of reasons, including many organizations have other personnel that perform the vehicle inspections (and do not want their employee inspecting under the truck), and the test does not reflect how the industry has evolved in terms of better technology and equipment. While not all participants agreed that the VIC needs to be updated, most participants indicated if testing in Washington State should change, revisions to VIC interpretation and assessment should be considered. As noted by an individual representing safety, “the pressure on pre-trip emphasis could be dialed back...and focus on emphasizing the driving piece.”

Training Content and Hours

There was some disagreement on the impact of training hours and supply of commercial drivers among participants. Some participants recommended reducing the overall hour requirement, while others focus on more adaptability on where hours were utilized. Some of these differences may be due to the organization a participant represented. For instance, most representing safety did not feel the total hour requirement needed to change, and most in industry had either no opinion on total hours or had no complaints about the training requirements. There were disagreements among individuals involved in

education regarding training requirements. For instance, one representative of private education was reluctant to recommend any changes to current training due to the passing rates issues discussed above.

However, other participants involved in CDL training did express that training hours should be more adaptable. For instance, a participant stated that Washington is very restrictive of the hours required per task. In comparison to other nearby states, they believe Washington oversteps on the number of hours and how they require it. As an example, this participant stated that some of their students have been “backing their entire lives” and “if you can back one trailer, you can back them all.” These students need less backing but may need more attention on other tasks, such as “more time with the manual transmission or double clutching.” However, sixteen hours of backing are mandatory, and they must meet this requirement without focusing on what the students’ needs. This participant advocated for more flexibility in how the hours requirement is achieved to better suit student needs. They also expressed that there should be a middle ground between the federal government route, which trust providers to teach appropriately, and the Washington state route which does not seem to trust them at all.

Representatives of organizations in transit also stated there were aspects of training that did not meet their needs. For instance, 90 degrees backing, parallel parking, and pre-test requirements do not apply to their drivers. Additionally, they train in jack-knifing because FMSCA requires it, but it does not apply to their drivers.

Clarifying Requirements

It was also noted that there is confusion between state and federal requirements, and organizations are sometimes provided different answers when they ask state and federal officials. Clear guidance on what are federal rules and what are state rules would help alleviate confusion and is necessary before effective recommendations on training can be made.

Retraining

In Washington, if a driver voluntarily suspends their license for over a year, they must retake CDL training. While barriers to re-entering the commercial driving profession were not frequently discussed among participants, one participant noted that there are refresher programs available but very few. This participant recommended extending the time frame requiring redoing the program from one year to potentially three years or offering short-term refresher trainings and re-testing programs without a specific year requirement. Some participants from industry also noted extended time away from truck driving does not necessarily require complete retraining; those who drove for years should be able take refresher training or simply retest to see if they meet requirements.

Barriers for Military Personnel and Veterans

As noted above, testing backlogs have an outsized impact on military personnel. Delays of even a week can be difficult to accommodate due to costs and responsibilities to their unit. Another barrier that impacts military personnel is the requirement that an individual hold a Washington State Driver’s License before they can acquire a Commercial Learner’s Permit in Washington State. According to a representative in education, the requirement to transfer their driver’s license to Washington State is a major barrier for military personnel which can prevent military personnel from entering CDL training. In fact, this participant noted that many of their military members want to live in Washington after the

military, but due to these barriers, they train and test in Colorado and transfer their CDL license when they leave the military.

Additionally, this participant mentioned that those who get the military skills waiver are often unable to get jobs. This is largely due to companies desiring drivers with experience, and that military vehicles are automatic meaning that the skills do not transfer to many of the vehicles used in the industry. Another participant in education also referenced the issue of Veterans getting jobs when using the Military Skills Test Waiver Program due to these issues.

DISCUSSION/CONCLUSIONS

Considering existing literature on truck driving shortages and their causes, in concert with this evaluation's findings on the state of trucking in Washington, it can be concluded that the problems associated with meeting demand for truck drivers in Washington is related to issues with driver recruitment and retention. Based on the interviews and labor market assessments, the issues of recruitment and retention are widespread and not isolated to industries reliant on truck drivers. In fact, the labor market analysis suggests a tight labor market for blue collar workers and an attractive alternative to truck driving. While adjusting licensing and testing requirements for CDLs in Washington may have limited impact on overall truck driver supply, it is important for alleviating some immediate pressures faced by several industries reliant on truck drivers, but more long term solutions may need to be considered in the future. The following consists of a breakdown of conclusions based on each of the key research questions guiding this evaluation.

Driver Shortages

While the findings regarding commercial driver supply are nuanced, the demand for drivers is still not being met and this has been an ongoing issue, according to some interview participants, for at least the past decade, if not longer. There are clearly some barriers in place that are making it difficult to recruit drivers to meet demand in the industry and retain current drivers. These barriers, as identified in the literature and interviews, include various factors related to the available workforce, the conditions within profession, and policy barriers.

While demand for truck drivers continues to exceed the number of drivers on the road, as is the case nationally, the total number of CDL holders in the state exceeds the number of drivers needed to meet demand. To be fair, the number of CDL holders is only a partial indicator as other qualifications, including experience, good driving record, and other credentials, are needed for many entry-level positions. While some of these requirements can be lifted and some of the businesses interviewed indicated a willingness to train those without the requisite prior experience for their positions, other credentials cannot be compromised. Nonetheless, the issues associated with meeting driver demand are not related to a deficit in trained drivers available in the workforce or a lack of CDL holders more generally. Instead, the problem seems to be related to recruitment and retention, which is also confirmed by interviews with several stakeholders.

For Washington State in particular, the barriers impacting recruitment and retention stem from several factors, including working conditions that include demanding hours and concerns over adequate compensation. While the labor market analysis for truck drivers did not reveal a "tight" market, it does show that other blue-collar occupations may be an attractive alternative to truck driver employment, as blue-collar workers have consistently made more than light or delivery service drivers and driver/sales

workers for the past 20 years, and more or nearly the same as heavy and tractor trailer truck drivers for nearly the past decade. The interview participants largely focused on compensation and working conditions as the major barriers to recruitment and retention in Washington. Additionally, federal policy limiting the age of interstate drivers (which may soon be resolved) and problems associated with federally mandated drug tests for drivers sourced from a state with legal recreational cannabis also impacts recruitment and retention in Washington.

With misconceptions about the profession, failure to recruit younger individuals especially in high school (due to federal policy), competitive compensation and better hours in other blue-collar occupations, the added issues of testing backlogs and lack of available testers, causes a recruitment chokepoint. However, the foundational issues contributing to commercial driver supply in Washington State are unlikely to be significantly impacted by testing and licensing changes.

Current Licensing and Training Requirements

The literature on the impact of licensing requirements on commercial driver supply is sparse; thus, conclusions on the effects of licensing requirements are limited. Based on what research has been conducted, CDL licensing requirements both in the state and nationally are linked to increased driver safety. This is confirmed by both recent safety research and findings from many years ago. While some research suggests that there is little variance regarding safety based on licensing requirements that go beyond federal standards, Washington still ranks among the highest in the country for safety in commercial truck driving. While the analysis in this report does not find a significant relationship between hours of training and performance on the road test (using a comparison between registered programs and employer-based programs), only a weak relationship between collision severity and the state of vehicle registration, and a weak relationship between collision severity and whether the CDL class for Washington CDL holders, we recommend further research before reducing the hours of Washington State training at this time. As federal policy changes went into effect in February 2022, it is too soon to tell whether these policy changes will have a significant impact on traffic safety. Recruitment of women drivers and drivers of color would likely go a long way toward meeting driver supply in Washington and nationally, but a link between training and licensing requirements and recruitment problems has not been established or really examined in the available literature. Recruitment issues for women and people of color into truck driving are rooted in federal policies, perceptions of the occupation, and the culture of the commercial truck driving occupation. However, the interviews did reveal a potential barrier to entering the truck driving profession for ESL students, as the pre-trip portion of the CDL test was heavily criticized for being a memory test where verbatim language must be used and out of touch with current practices. Stakeholder conversations indicate that Washington is very assertive in its interpretation of the pre-trip manual and meaning of answers is not considered, just whether the appropriate script is stated. This strict interpretation has a potentially outsized impact on ESL students and could create inequitable testing standards for these individuals.

The issues with pre-trip and the concerns of how “out of touch” pre-trip requirements are with current trucking practices, suggests that not only testing standards for this portion of the CDL test need to be re-assessed but also training standards could be revised to focus on driving. In fact, while it is not recommended that overall hours be adjusted at this time, flexibility in current training standards at least in terms of where training hours are assigned (rather than the rigid protocols per task currently in

place), would produce more proficient drivers. This flexibility may help alleviate testing backlogs as training programs could adapt training to the current skills of their students.

While training and licensing requirements may have limited impact on recruitment overall, the current requirements in place may have an outsized impact on certain industries. For instance, to get the required passenger endorsement to work in transit, prospective drivers must often retake the entire CDL program much of which does not apply to the organization. This can add weeks of unnecessary training for their potential drivers at taxpayer expense. Recruitment of drivers to transit is already tough as they are competing with other industries with better wages and schedules for drivers. Some transit organizations predict they will not reach pre-COVID levels of drivers until 2025, and many have had to cancel routes and reduce service. Flexibility in training and pre-trip requirements as described above would help alleviate these concerns, as well as not requiring re-taking the entire CDL training to receive a passenger endorsement.

Other factors that Impact Driver Supply

Testing backlogs and lack of testers received the most attention among interview participants when asked specifically how testing and licensing in Washington impacted the supply of commercial drivers. While there is disagreement on what is causing the testing backlog, the resources required to get students tested are often significant and add additional burdens to CDL programs, often at their own expense as they are required to travel significant distances to complete testing. There are not enough testers for Washington state, and with recruitment and retention being an issue everywhere, these problems are likely to continue. Thus, not only does the DOL need more resources to hire staff for this purpose, DOL needs ongoing support to ensure backlogs are alleviated.

To help provide guidance on approximate number of testers that are needed, DOL provided CDL test information for all 50 states in 2021 and 2022, and the number of testers in twelve states: Alaska, Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon, Pennsylvania, South Dakota, and Texas. These states were selected to represent (1) states with more tests than Washington, (2) states with a similar number of tests, and (3) states with fewer tests than Washington. First, the total CDL tests for each year were conducted, followed by a ratio of testers (examiners) to tests.¹⁴ The ratio of tests to testers (examiners) ranges from 3.32 (Montana) to 392.1 (California) in 2021, while it ranges from 4 (Montana) to 437.35 (California) in 2022. As can be seen in Table 4 below, Washington State's ratio is higher than average in both 2021 and 2022, and higher than the median ratio for each year. Washington State has a higher ratio than eight other states: Arizona, Colorado, Idaho, Montana, Nevada, Oregon, Pennsylvania, and South Dakota. Since the mean is susceptible to extreme values, the states with the lowest and highest ratios were removed (Montana and California). When these states are removed, Washington's ratio is still higher than the mean and median for both 2021 and 2022. Based on this, it is recommended that Washington add enough testers to bring Washington's tester/examiner-to-test ratio closer to the median which is both more consistent over time across states and would situate Washington closer to most states examined. To achieve this Washington would need approximately 178

¹⁴ Total tests were calculated by summing test trip totals (pass, fail, and incompletes). DOL provided total testers for 2022. This data was used to calculate ratios for both 2021 and 2022.

to 180 testers (based on 2021 and 2022 total tests respectively). Washington currently has 82 testers so 96 to 98 more testers would be needed.¹⁵

Table 4: Tester (Examiner) to Test Ratios, 2021-2022

State	2021		2022	
	Test Total	Tester/Test Ratio	Test Total	Tester/Test Ratio
Alaska	1374	687	1481	740.5
Arizona	15290	89.94	15821	93.06
California	68614	392.1	76536	437.3486
Colorado	11270	60.92	11956	64.62703
Idaho	5476	80.53	6044	88.88235
Montana	166	3.32	200	4
Nevada	6977	17.23	8238	20.34074
Oregon	6948	38.6	8263	45.90556
Pennsylvania	30018	75.05	35074	87.685
South Dakota	3213	160.7	3173	158.65
Texas	76121	190.3	87689	219.2225
Washington	15340	187.1	16236	198
Ratio Mean All		165.22		179.85
Ratio Median All		85.24		90.97
Ratio Mean No CA, AK		158.73		171.68
Ratio Median No CA, AK		85.24		90.97

Additionally, the fee structure for CDL tests should be revised to a per test basis and the requirement that a student retest with the same third-party tester should be removed to help alleviate the backlog. As mentioned previously, testing and licensing do not significantly impact the supply of commercial drivers, but these issues exacerbate an existing issue and can help reduce frustration with current processes.

RECOMMENDATIONS

The findings indicate both short-term and long-term recommendations to help improve licensing and training requirements, and the need for further research to fully evaluate the impact of Washington requirements and whether adjusting requirements would impact traffic safety.

Recommendation 1: Testing Backlogs

- To help alleviate backlogs, more testers (examiners) are needed. A combination of DOL staff and third-party testers may be ideal. However, to address this need, DOL needs staffing support and sustained resources to ensure sustainability of these efforts. Based on the calculations of median tester (examiner) to tests ratios across ten states in 2021 and 2022 Washington would need an additional 96 to 98 testers (examiners) to bring it closer to the median tester (examiner) ratio, and closer to Oregon, Colorado, Idaho, and similar states (assuming no significant changes in total tests in subsequent years).
- To further address backlogs, the fee structure for CDL tests should be changed to a per test basis (rather than \$250 for two tests). Additionally, the requirement that an individual return to the

¹⁵ This was calculated based on the median across eight states in 2022 (exempting California and Montana) as it is the highest median and thus a more conservative estimate.

same tester when they fail should be changed to help alleviate backlogs. According to interview participants, these changes are underway.

Recommendation 2: Vehicle Inspection Test (pre-trip)

- The concerns over the vehicle inspection test and how it is assessed by Washington State examiners need to be evaluated. If the multiple concerns voiced by stakeholders are accurate, not only is the VIC out of touch with current trucking standards, but it potentially has an inequitable testing impact for ESL individuals. Reviewing current federal standards for pre-trip and how the state is applying these standards is needed as well as evaluation of the impact on different groups. Potentially evaluating whether standards are applied consistently based on geography, examiner, and other factors can also help determine the full impact of VIC concerns.
- The new AAMVA testing modernization should be adopted by the DOL as soon as possible to help address some of these concerns. Once implemented, regular evaluation is necessary to ensure concerns over testing are addressed.

Recommendation 3: Training Hours

- Reducing Washington's 160-hour requirement for Class A licenses is not recommended at this time until further research can be conducted on potential impacts on traffic safety. Resources to support this research should be considered, using a variety of data sources. More data on the effects of the ELDT, especially in neighboring states of Idaho and Oregon, will be available in the future to help evaluate effects of different training.
- Flexibility in how training hours are assigned should be researched further. Several interview participants pointed out that the Washington training is extremely rigid in how hours are assigned, and this often does not reflect student needs. In addition, the focus on pre-trip needed to pass the VIC, and some industries indicating much of the training does not reflect what their drivers will be doing in the field, suggests that training updates are needed. Investigating where training can be more flexible, potential revisions to current training, and even where hours can be potentially cut from certain tasks to focus on driving are warranted. In this process, clear guidance on what is a federal requirement and where the state can be flexible to make changes needs to be clear.

Recommendation 4: Retraining and Retesting

- Re-taking expensive training when voluntarily leaving truck driving for a period over a year is a burden. The re-testing and retraining requirements of other states was investigated, including California, Idaho, New York, Minnesota, Illinois, Michigan, Utah, and Arizona, and found that while the time frame for requiring re-testing varied (from no grace period to approximately two years), retraining was not required. For four states, this included if the license was revoked, downgraded, or voluntarily surrendered. While the scale of this issue is unclear, re-testing without re-training should be an option in Washington State. If an individual fails to pass re-testing, refresher courses should be more available without the need to retake an entire program unless warranted.

Recommendation 5: Recruitment

- As recruitment was found to be an issue both in the review of the literature and interviews, particularly youth recruitment, establishing programs that aid in recruitment into the industry

would be beneficial. To be fair, many educational programs in the state have great recruitment programs for Veterans, women, and the people of color. These programs should be expanded where possible. However, youth recruitment is an important avenue for helping replenish retiring drivers that are expected over the next decade. If the federal pilot program focusing on 18- to 20-year-old drivers is successful, recruitment programs for youth in high schools should be developed.

Recommendation 6: Barriers for Military and Veterans

- For military personnel, duty stations often cannot accommodate extended periods of absence needed to complete CDL training and testing which can be exacerbated by testing and retesting delays. These delays can lead to the need to finance a lengthy stay away for the timeframe required to complete the training, a major barrier for military personnel. Lastly, requiring military personnel and Veterans to acquire a Washington Driver's License to obtain their Commercial Driver Learner's Permit can be a barrier. These issues have led to some personnel being trained in other states, such as Colorado. Reviewing these requirements and their impact on military personnel and Veterans is recommended.



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