

Transportation Industry Outlook

The transportation industry must navigate a confluence of opportunities and challenges—a driver shortage, regulatory pressures, innovative disruptions, and changing marketplaces—to capitalize on the current freight market.

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TRANSPORTATION INDUSTRY OUTLOOK

The transportation industry is vitally important to the global and American economy. According to the American Trucking Associations (ATA), overall freight tonnage will grow more than 25 percent by 2030 to 20.6 billion tons—with revenues increasing 53.8 percent to \$1.6 trillion. Trucking will remain the dominant freight mode, hauling 68.8 percent of the total freight tonnage in 2030.

After 2018 saw record highs for freight demand and rates, demand softened in 2019 due in part to tariffs, manufacturing declines, trade wars, and recession fears. Some economists agree that the industry is stabilizing and nearing supply/demand equilibrium, but other analysts remain mixed on what to expect for the U.S. economy and freight market in 2020, especially in the face of a presidential election. In the long-term, however, as the overall freight tonnage continues to increase with the U.S. population and even slowly growing economy, more drivers and trucks could be necessary to move all the goods required by the American public. In addition to economic factors and uncertainty, transportation companies must contend with a driver shortage, regulatory pressures, and disruptors upending the industry.

DRIVER SHORTAGE

The U.S. professional truck driver shortage hit a high of 60,800 drivers at the end of 2018, up from 50,700 in 2017, according to the ATA. The shortage improved slightly throughout 2019 due to lower demand for freight, but unless there is a significant downturn in the economy, the American Trucking Associations suggests that the industry could be short just over 100,000 drivers in five years and 160,000 drivers in 2028. To keep pace with retiring drivers and economic growth, the industry will need to hire 1.1 million new truck drivers over the next decade—an average of 110,000 per year. To fill these seats with qualified, safe drivers, the industry must make some changes.

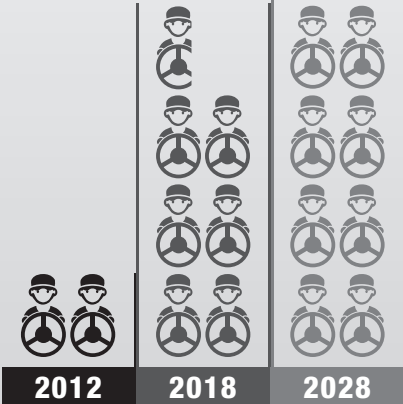
Several underlying factors are contributing to the truck driver shortage, including competition within the industry and from other industries; driver qualifications and requirements; a low national unemployment rate (3.6 percent) means not many people are searching for jobs; trucking regulations that tighten capacity; costly time delays at shipper locations and along America’s deteriorating infrastructure; and difficulty attracting young people to the industry since one cannot acquire a commercial driver’s license (CDL) until age 21. Alarming, an American Transportation Research Institute (ATRI) study found that 55.5 percent of truck drivers are age 45 and older,

and less than 5 percent are in the 20- to 24-year-old age bracket. For younger generations, trucking is perceived to be labor intensive with low pay and poor hours that do not allow for work-life balance.

An ATA workforce development committee was developed to work with federal and state officials to find solutions to these issues. The committee is encouraging the development of robust apprenticeship programs to engage workers before they can officially qualify for an interstate CDL at 21. Outreach to veterans and historically underrepresented communities like women—who currently make up only 7 percent of the commercial driving workforce—will be critical as well. Now, Congress is sitting on bills that would reduce the minimum age for an interstate CDL to 18 years, and the Federal Motor Carrier Safety Administration (FMCSA) recently accepted comments on whether it should propose a pilot program allowing under-21 drivers to operate heavy-duty trucks interstate. A pilot program for under-21 veterans and reservists is already underway. Also, the ATA and other state trucking associations are actively engaged in a public relations campaign to position truck drivers as safe, family-oriented professionals who play a critical role in our nation’s economy and the lives of every consumer.

DRIVER SHORTAGE FORECAST

Each driver icon represents a shortage of 10,000 drivers



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DRIVER PAY AND RATES

To combat the driver shortage, carriers have increased pay and provided sign-on or transition bonuses to attract new drivers, as well as offered performance-based bonuses to retain existing drivers. In 2018, driver wages and benefits topped carriers' cost-per-mile spending for the fourth consecutive year, according to data released in November 2019 by ATRI. Carrier costs on the whole climbed to \$1.82 a mile, a 7.7 percent increase from 2017, with spending on driver wages and benefits accounting for 43 percent of carriers' average marginal cost. The National Transportation Institute expected driver wages to increase just over 7 percent in 2019 following a 10 percent increase in 2018. Still, wage hikes are behind the pace of the growth in the minimum wage and do not make up for the shortfall when adjusted for inflation.

Generally, before carriers can offer their drivers higher pay and bonuses, they must secure rate increases from customers, both in contractual relationships and in the spot market. Rates increased to all-time highs in 2018; according to *Commercial Carrier Journal's* Top 250

rankings report, year-over-year revenue growth of the carriers that disclosed revenue for the last two years was 9.9 percent. However, rates stabilized in 2019 amid a slower growing economy and excess capacity. The Cass truckload index, which tracks contract rates minus fuel surcharges, began to decline in August 2019 after more than two years of year-over-year increases in truckload linehaul rates. And spot market rates are down nearly 20 percent from 2018 highs, though they are at more traditional levels. Morgan Stanley predicts that trucking rates could increase slightly through 2020 because capacity may exit the market due to regulatory pressures, higher fuel prices, and increasing insurance rates in light of nuclear verdicts. Already in 2018, truck insurance premiums increased 12 percent as part of the industry's average marginal costs, and fuel costs went up 17.7 percent, according to ATRI. DAT Solutions expects spot market rates to increase 4 to 6 percent in 2020, and contract rates to climb 2 percent.

The tables below show the results of ATRI's 2019 "Analysis of the Operational Costs of Trucking" report.



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REGULATIONS

President Trump’s administration has been marked by a reduction in the number of proposed regulations actively being pursued by the Department of Transportation, and a split Congress has contributed to regulatory stagnation. However, trucking is highly regulated, and several regulations—or changes to existing regulations—will come into play over the next few years.

Hours-of-Service Flexibility

Since new hours-of-service (HOS) regulations were introduced by the Department of Transportation in 2013, the transportation industry has argued the need for flexibility in the rules. In response, the FMCSA issued in August 2019 proposed changes to the HOS rules with the goal of improving the lives of truck drivers while still ensuring safety on roadways.



The proposed rule changes would not increase a driver’s daily driving time, but they could give professional drivers and companies more flexibility in determining how those driving hours are broken up, allowing drivers to rest when tired and take breaks to avoid major traffic congestion times. The FMCSA accepted comments from the industry on the proposed rules through mid-October 2019. This feedback from stakeholders will help determine if and how the FMCSA moves forward with implementing the proposed changes.

FMCSA’s proposed revisions to the HOS rules include:

- + Increase safety and flexibility for the 30-minute break rule by tying the break requirement to eight hours of driving time without an interruption of at least 30 minutes, and allowing the break to be satisfied by a driver using on-duty, not driving status, rather than off-duty status.
- + Modify the sleeper berth exception to allow drivers to split their required 10 hours off-duty into two periods: one period of at least seven consecutive hours in the sleeper berth and the other period of not less than two consecutive hours, either off-duty or in the sleeper berth. Neither period would count against the driver’s

14-hour driving window.

- + Allow one off-duty break of at least 30 minutes, but not more than three hours, that would pause a truck driver’s 14-hour driving window, provided the driver takes 10 consecutive hours off-duty at the end of the work shift.
- + Modify the adverse driving conditions exception by extending by two hours the maximum window during which driving is permitted.
- + Change the short-haul exception available to certain commercial drivers by lengthening the drivers’ maximum on-duty period from 12 to 14 hours and extending the distance limit within which the driver may operate from 100 air miles to 150 air miles.

National Drug and Alcohol Clearinghouse

Carriers are now required to report drivers’ positive test results and refusals to test into a central Drug and Alcohol Clearinghouse. Employers must also access this database when looking to hire potential drivers—and to query the database annually for current drivers. The clearinghouse became operational on January 6, 2020. Mandatory use went into effect at that time, though FMCSA recently extended by three years the date for state driver’s licensing agencies to comply fully with certain clearinghouse requirements. The extension allows FMCSA time to complete its work on a forthcoming rulemaking to address the states’ use of driver-specific information from the clearinghouse, as well as develop the technology platform through which states will electronically request and receive clearinghouse information.

The clearinghouse will likely cause capacity to tighten and the driver shortage to become more severe because truck drivers will no longer be able to hide positive drug and alcohol tests from potential employers. To accompany the initiation of the clearinghouse in 2020, the FMCSA is doubling the the minimum annual percentage rate for random controlled substance testing for CMV drivers, from 25 percent to 50 percent, in response to rising positive drug-testing rates. As more and more states legalize recreational marijuana use—which federal rules strictly prohibit for CDL holders—a standardized clearinghouse will ensure visibility across the industry and remove impaired and unsafe drivers from their seats.

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Electronic Logging Device Mandate

A mandate requiring electronic logging devices (ELD) for heavy-duty trucks went into effect December 18, 2017, with goal of ensuring regulatory hours-of-service compliance and promoting safety. Since the initiation of the ELD mandate, the number of hours-of-service (HOS) violations in the industry has dropped quite significantly. For instance, over the first two years of the mandate, the number of violations for driving beyond the 11-hour daily limit was down 54.6 percent. Still, some truck drivers remain resistant to complying with the mandate—more than 27,000 truck drivers received a violation for not having an ELD in fiscal year 2019, and 92 percent of those drivers were placed out of service.

As for improving safety, critics of the mandate claim that being “on the clock” has forced drivers to drive beyond speed limits; according to FMCSA data, speeding violations rose 7.8 percent in 2018. And overall, the number of truck-related fatalities on U.S. highways has been rising for several years, but miles traveled are climbing as well. At this point, the ELD mandate has not necessarily reduced highway deaths, but the increase in vehicles and miles traveled makes it difficult to correlate the mandate with the increase or to claim that the mandate has failed to achieve its goal of making highways safer.

For fleets using older electronic log systems that pre-dated the ELD rule, December 16, 2019, brought a key ELD mandate deadline. The initial rule allowed early adopters of electronic logs to continue using their existing systems, classified as automatic onboard recording devices (AOBRD), for two additional years. By December 16, 2019, those carriers running AOBRDs were required to update their systems to an ELD platform. Many large carriers were required to make this switch, which required additional training for office staff and professional drivers alike.



Entry-Level Driver Training Rule

The entry-level driver training (ELDT) final rule mandates certain minimum training requirements for those seeking

to obtain a Class A or Class B commercial driver’s license, or a hazardous materials, passenger, or school bus endorsement. The rule was set to go into effect in February 2020, but FMCSA delayed implementation by two years in December 2019. The final rule requires driver’s license schools, as well as carriers with in-house CDL training programs, to self-certify in a Training Provider Registry and overhaul entry-level driver training courses to provide a curriculum that will be consistent across the country. Training providers wishing to provide ELDT will need to be listed on the Training Provider Registry, and drivers seeking a CDL or endorsement on or after that implementation date must complete the required training as set forth in the ELDT final rule.

According to *Commercial Carrier Journal*, the DOT currently only mandates four topics for CDL training providers: hours-of-service rules, driver qualification and disqualification, health and wellness, and whistleblower protection. The new rule will require schools and trainers to provide 31 specific theory courses as well as 19 behind-the-wheel (BTW) skills courses. Driver candidates will be required to have an 80 percent pass rate in theory courses and the ability to demonstrate proficiency in all 19 BTW skills required in order to pass. The stricter training requirements should have a positive impact on highway safety, but there’s also potential to slow down the labor pipeline in an industry desperate for drivers.

Meal and Rest Break Provisions

Even though the trucking industry is regulated by federal HOS rules, some states have issued their own regulations that are often in conflict with the federal rules. In these states, plaintiffs’ attorneys have used state regulation of trucking companies as the basis of expensive lawsuits related to meal and rest breaks and pay types. And many courts have sided with the states, especially in California.

In a major industry triumph, the FMCSA granted a petition by the American Trucking Associations to block California’s rules in December 2018 in an effort to ensure consistent rules and promote safety. The ATA turned to the FMCSA after Congress failed for four years to restore the strength of the Federal Aviation Administration Authorization Act of 1994 (F4A)—the regulation that broadly preempted states from regulating interstate

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motor carriers. In May 2019, another industry victory came when a California court dismissed a driver’s claims regarding the state’s meal and rest break provisions, saying it does not have the authority to review the merits of the case. However, there will be many more challenges to the FMCSA’s ruling as this continues to be a hot button issue.

Compliance Safety Accountability Overhaul

Compliance Safety Accountability (CSA) is the FMCSA’s carrier scoring program designed to improve safety by identifying at-risk drivers. FMCSA conducts inspections and reviews crash reports and then measures the results using the Safety Measurement System (SMS). Each month, SMS measures a carrier’s previous two years of violations and crash data to calculate a score in seven safety behavior areas called BASICs: unsafe driving, hours-of-service compliance, driver fitness, controlled substances and alcohol, vehicle maintenance, hazardous materials compliance, and crash indicator.

But the regulation has been under fire for a number of reasons since its inception in 2011—namely data quality, use of relative rankings between carriers, and enforcement and reporting inconsistencies between states. Congress ordered CSA scores to be removed from public view until a study could be conducted to identify issues, followed by the implementation of needed changes that better assess a carrier’s safety performance. The National Academies of Science (NAS) completed the Congressionally mandated study on CSA in 2018 and recommended that the FMCSA rework CSA’s Safety Measurement System and its underlying statistical model—so essentially rework the regulation from the ground up, according to *Commercial Carrier Journal*.

Following the NAS’s recommendations, the FMCSA submitted in August 2018 a corrective action plan detailing CSA reforms to the DOT. FMCSA will replace the existing CSA SMS with a new scoring system; work to improve the quality of data used to score carriers; make it easier for carriers to understand and calculate their safety scores; and evaluate adding an absolute scoring system instead of relying only on relative scores that hinge on a comparison to a carrier’s peers, according to *Commercial Carrier Journal*. In addition, FMCSA is working to correct

one of the chief criticisms of the program—the lack of accounting for crash responsibility in scores.

DISRUPTORS

In addition to the driver shortage and regulations contributing to a capacity crunch, carriers are contending with a changing marketplace. The rapid growth of e-commerce has completely changed how and when and for what price consumers want to receive their goods. Transportation companies must ensure that they help their customers meet the expectations of the final consumer of the products. That includes providing transparency and visibility to where a product is and when. In addition, carriers must attract new drivers to haul the freight in the first place—and younger generations have high technology expectations.

Many start-ups and tenured companies alike are creating everything from self-driving trucks to mobile technology systems that can wholly transform—or disrupt—the way business has been done in the past. They’re revolutionizing ways that trucks operate and interact with the central office, as well as how shipments are booked, paid for, and tracked.

Mobile Technology

Workers and customers now expect their business interactions to function like their personal interactions. Like all workers in other industries, truck drivers—particularly young drivers the industry is desperately trying to attract—are fluent in mobile tech use and expect high-functioning technology in the workplace. And shipper customers demand it. To remain competitive, trucking companies must adopt the latest mobile technologies, which can describe a system with mobile capabilities or that can push information to and from a mobile device.



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While many trucking companies were early adopters of mobile technology, these legacy systems have become almost archaic after the rapid advancements in recent years. Unfortunately, many are strapped with “technical debt” from adopting early systems and have limited financial ability to move to the more advanced systems available. But to remain competitive, they must.

The ELD mandate helped carriers to adopt new technology. Many platforms that met the ELD mandate requirements are available on smart phones or tablets instead of the dash-mounted computers that some carriers adopted for logging and compliance prior to the mandate. For a population that’s accustomed to the ease of use offered by mobile technology for personal needs, dash-mounted computers with chunky keyboards or touch screens that require large buttons or styluses are a hassle.

What’s more, drivers and office workers are often tasked with completing jobs or entering data in multiple and separate apps and programs. This context shifting is time consuming, inefficient, and frustrating. Modern mobile technology allows work to be completed within one unified, workflow-centric app that runs on common tablets and smart phones. The dynamic workflow capabilities within mobile technologies ensure that data is captured in a uniform way, enforcing consistent and common practices across the company. Plus, workflow and accurate data can eliminate major driver headaches—like delays from handling paperwork, inefficient scheduling, confusing procedures, and recording detention time, to name a few.

Autonomous Trucks

Innovations to trucks themselves have major potential to disrupt the trucking industry as we know it. Start-ups and the largest truck builders alike are investing billions of dollars to develop trucks capable of driving themselves down America’s freeways. A number of companies are already testing self-driving trucks with a safety driver in the cab.

Self-driving trucks could help companies reduce labor costs by extending the number of hours trucks are in operation and potentially cutting the number of drivers needed for interstate driving. Plus, some believe

autonomous trucks have the potential to be safer—and could therefore reduce insurance premiums—because accidents are largely caused by human error. The industry agrees, however, that drivers will always be critical to navigate city streets for the first and last miles of trips. In fact, self-driving tech developers are positioning the technology as a partner to drivers rather than a job killer—productivity increases, but the job becomes more attractive to drivers. From exit to exit, drivers can perform other tasks, like ensuring data is captured accurately, while the truck runs on autopilot.



While the technology could soon be in place, the challenge is to get autonomous trucks on the road and making money. Several technical and regulatory hurdles to that future currently exist, but a growing number of trucks are already equipped with advanced driver assistance systems that could step in with alerts or autonomous braking and other controls when drivers are slow to react.

Electric Trucks

One of a trucking company’s largest—and often most volatile—operating expenses is fuel, so Tesla’s 2017 announcement about the launch of its wholly electrically powered tractor-trailer could be a game changer. Many other truck manufacturers have entered the electric truck arena as well. A number of major carriers have already reserved Tesla semis, which cost \$150,000 for a model with a 300-mile range per charge and \$180,000 with a 500-mile range. Most diesel-powered tractors cost around \$125,000, but Tesla predicts that the electric vehicle will pay for itself within two years thanks to savings in aerodynamics, reliability, and fuel. The vehicle boasts additional safety features, including wrap around windshields, cameras instead of rearview mirrors, and autonomous systems like automatic emergency braking, automatic lane keeping, and forward collision warning, according to Tesla. The widespread adoption of electric trucks will depend on how they perform in real-world situations, the availability of battery recharging facilities, and the training of workers to service electric vehicles.

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Driver Monitoring

One way the industry is moving to combat accidents is through the use of driver monitoring tools. Electronic logging devices are a type of monitoring system, as they track and report speed, location, and driving status, not to mention where drivers stand within federal hours-of-service requirements. Trucks now widely come equipped with advanced driver assistance systems that use a combination of radar- and camera-based components, like following distance alerts and active braking, that could intercede on the driver's behalf to eliminate or greatly decrease a collision's severity. Any event triggered by the technology is reported to employers.

But more intrusive technologies are also being developed. Ball caps are being developed to measure brainwaves and give a fatigue rating, a critical factor for drivers as many accidents are caused in one way or another by the effects of fatigue. One company is developing a vest that could detect a driver's heart attack and stop the truck as a result. More common, road- and driver-facing dashboard cameras are used to record actions that can negatively affect safety—but also monitor slacking behavior or unauthorized stops. Onboard video event recorder systems link into a truck's engine to record video clips before and after exception-based events such as speeding, forward collision warnings, harsh braking, lane departure alerts, and collisions. Those videos may then be accessed for driver coaching or for litigation in the case of an accident. Some driver-facing cameras even monitor drivers' eyelids for signs of fatigue.

Drivers, who already feel closely monitored by regulators, employers, and their customers (who are demanding real-time data on loads to appease their own customers) are often bothered by the use of these additional monitoring technologies because their trucks serve as their offices—and homes for over-the-road drivers. Others like the idea of working for companies that value providing drivers the resources to stay safe and improve their skills. If the technology can help prevent accidents, provide coaching opportunities after near-misses, and save carriers money, more carriers will likely conclude that the intrusion is warranted.

Robotic Process Automation and Artificial Intelligence

Several technologies are currently helping to drive efficiencies and reduce human error in back offices. With the major influx of data sent and received on a daily and even hourly basis, it is difficult for employees to process, especially if they suffered a night of poor sleep, deal with frequent work interruptions, or are simply having a bad day. These real-life inconsistencies could have an impact on the consistency of work decisions that people make for their customers—which could cause increased costs or delivery delays. But artificial intelligence (AI) enabled software doesn't have inconsistencies—it works as it was programmed to work, reducing errors while handling thousands of business situations. As a result, transportation companies are relying more and more on AI solutions for repetitive administrative tasks, which allows employees to focus on value-added tasks, like analysis, coaching, and customer service.

One key automation technology is natural image processing. The technology recognizes and pulls relevant information from documents like invoices or rate requests, alleviating the time-consuming and error-prone task of manual data entry. Natural image processing reduces paperwork and allows back office staff to focus more on analysis and optimization.

Another significant AI capability is predictive analysis, where computers can find patterns and reach decisions that are outside of a human's capacity to process. Computers can take data from one source and analyze it in context with data from several other sources—which is something the human brain doesn't have power to process, nor do most employees have the time available to try. Predictive analysis is especially compelling from a safety standpoint. Carriers could harness data from in-cab technology—like collision mitigation systems, dash cameras, and ELDs—to create algorithms related to safety, allowing them to determine which drivers are most likely to have a preventable accident or violation. The technology could also help support drivers currently on the road. For instance, if a driver has X number of lane departures in X minutes, an alert could be sent the

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driver's mobile application to see if he or she is okay. Data, in this case, would provide an extra layer of support to professional drivers.

Predictive analysis also has applicability in fleet maintenance. As computers on wheels, trucks produce a multitude of data. That data, if analyzed correctly, can be used to predict and then prevent breakdowns by notifying maintenance teams of necessary preventive maintenance before an issue arises. This technology could reduce downtime and potentially maintenance spend.

Augmented Reality

While augmented reality (AR) technology is still in the development phase, it holds significant opportunity for the transportation industry. AR, coupled with visual learning models, allows workers to perform simple tasks outside of their immediate areas of responsibility, reducing dependency. Consider a driver who breaks down on a highway. Using AR-enabled smart glasses and repair apps, the driver could assess and fix minor problems without a technician. Essentially, a less experienced person could complete a more sophisticated process by leveraging a wearable computer or mobile device.

In another application, heads-up displays can project relevant information on windshields, like driving speed, weather updates, and approaching road delays. The virtual instructions are superimposed on real objects as a driver travels down the road. AR could also help transform warehouse processes; some software is able to recognize serial and barcode numbers, identify objects, and also help employees navigate the warehousing floor to expedite the picking process. This technology could reduce training time and costs, and it's virtually error free.

Internet of Things and Sensors

The Internet of Things (IoT) refers to a connected network of physical devices and vehicles, among other things, that are equipped with software, sensors, and wireless connectivity—meaning they can be monitored and controlled via the internet. IHS Markit predicts that

the IoT will consist of 30.7 billion objects by 2020. In the world of trucking, these things include navigation systems, electronic logging devices, advanced driver assistance systems, and networks of Internet-enabled sensors that monitor everything from tire pressure and trailer temperature to fuel usage and maintenance needs. Sensors can be applied to trailers, pallets, and even trays, allowing for package-level visibility for operations managers and customers. And all of these things produce a vast amount of data that, if used properly, can help create fleet efficiencies and improve safety.

THE YEAR AHEAD

Trucking companies face a host of challenges in the marketplace: workforce concerns, major regulatory pressures, and economic uncertainty fueled by tariffs, trade wars, and a presidential election. But 2020 and beyond will see success for those able to capitalize on modest demand for freight while navigating the driver shortage, industry regulations, innovative disruptions, and changing expectations of consumers. In fact, some experts agree that the industry will see a rebound in mid-2020 thanks to higher rates fueled by constrained capacity in light of regulations, higher fuel prices, and increasing insurance rates. Overall, the freight market is set to favor carriers over shippers in the next year—but, a number of economic factors could quickly turn the tide on that forecast.