RED

The *RUAN* Magazine

BIG RED COMPUTER

These days, heavy-duty trucks are more like computers than vehicles. We like to think of Ruan's trucks as big red computers driving along American highways to deliver products for our customers.

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MILE BY MILE

Keeping pace with the latest Ruan highlights.

Ruan recently had the opportunity to sit on a panel at the Iowa Governor's 2019 Future Ready Iowa Summit: STEM Education + Workplace Partnerships to discuss our Information Technology Apprenticeship Program, which launched in 2017. As part of the program, Ruan partners with Des Moines Public Schools to provide the opportunity for students to gain valuable STEM-related work experience, earn an income, and continue their education. Apprentices work alongside professionals in Ruan's IT department. Apprenticeships last 2,000 hours and offer high school and college credit, real-world industry experience, and increasing pay as experience and responsibilities grow over time.

David Bailey was named this year's Driver of the Year after being selected from a pool of more than 4,600 professional drivers. Bailey, who operates out of T358 in Monroe, WI, has been driving for 28 years, accumulating more than 2.5 million miles. He's been with Ruan since 2012 and has had zero accidents in his career. He is a flex fleet driver for our Metals business unit, serving during start-ups and helping at operations as needed.

Ruan's Terre Haute, IN, operation, led by Dedicated Fleet Manager Matt Mathias, was named this year's Operation of the Year. T026, which serves valued customer Hydrite, was selected based on the operation's demonstration of our Guiding Principles of Safety Focus, People First, Customer Satisfaction, Exceptional Performance, and Continuous Improvement. Drivers haul hazmat finished products for Hydrite, as well as bring in raw materials to make the chemicals. The team averages 18 loads per day at 380 miles round trip. Products hauled include bisulfites, acids, fertilizers, soda ash, and anhydrous ammonia.

During Ruan's Technician Appreciation Week July 7-13, we also hosted our second annual Top Technician Competition in our headquarters city of Des Moines, IA. Out of 10 competitors, James Wheetley (center) of Cedar Falls, IA, took home first place for the second year in a row, earning $2,500 and a chance to represent Ruan at the Technology and Maintenance Council's (TMC) National Technician Competition in Raleigh, NC. Shane Riffe (right) of Phoenix, AZ, placed second, and Devin Hoskins (left) of Gastonia, NC, finished third. Each won a cash prize and a place in TMC's National Technician Competition as well.

America's crumbling roadways and bridges continue to deteriorate in 2019 with a lack of clear direction regarding the future of federal infrastructure funding. This year, the trucking industry will move more than 70 percent of the nation's freight, hauling goods worth more than $12 trillion, according to the American Trucking Associations (ATA). Poorly maintained roads cause traffic congestion, which creates wear and tear on vehicles, wastes fuel and increases emissions, and produces additional stress for drivers. The transportation industry takes a large hit to productivity and faces increased operational costs as trucks sit idle in congested traffic and navigate poor highways.

AT THE CURRENT RATE OF REPAIR IT WOULD TAKE
80 YEARS
TO FIX THE NATION'S STRUCTURALLY DEFICIENT BRIDGES.

Investing in failing infrastructure as a nation can improve traffic flow, reduce emissions, and increase driving safety across the country. Infrastructure investment has the added benefit of creating countless jobs and boosting the economy through increased productivity of the transportation industry.

According to the "Critical Issues in the Trucking Industry" report by the American Transportation Research Institute (ATRI), transportation infrastructure, congestion, and funding are among the top 10 major concerns for the industry. While the report offered several proposed strategies for improving infrastructure funding, the primary method was to increase fuel taxes and other user fees. Other funding options include tolls or a vehicle-miles-traveled fee.

The ATRI report states, "The persistent shortfall of highway funding in the United States is due, in part, to an erosion of federal motor fuels tax revenue. This erosion can be attributed to improvements in fuel economy, inflation, and stagnant fuel tax rates." The federal fuel tax rate has been stagnate since 1993, for both diesel and gasoline. These taxes have also been used for non-highway projects in the past, instead of focusing solely on road infrastructure. By increasing fuel taxes and ensuring the funds go directly to roadway improvement, the country may be able to turn the tide on its failing infrastructure, according to ATRI.

Similarly, the American Society of Civil Engineers (ASCE) regularly publishes infrastructure report cards for states, regions, and the country. In 2019, the country as a whole earned a D+. ASCE brought these report cards before Congress earlier this year, hoping that the easily digestible format of a report card would help communicate to legislatures the importance of infrastructure investment.

Recently, representatives from ASCE and ATA met before the House of Representative's Ways and Means Committee, using the opportunity to push changes to increase federal infrastructure funding. Both organizations support an increase to the federal motor fuel tax as the primary financing solution. Another proposed solution, the Build America Fund, includes funding ideas such as a new 20 cents per gallon fee or increased vehicle registration fees with a focus on hybrid and electric vehicles (as they pay less in fuel taxes but still cause congestion and wear and tear on roadways). The ATA and the proposed fund are firmly against increasing tolls.

In April 2019, Speaker of the House Nancy Pelosi said that Democrats and President Trump had reached an agreement on a $2 trillion infrastructure measure. A few weeks later, President Trump abruptly walked out of a meeting to discuss the measure further and has since stated that he will not move forward with the plan until investigations and allegations against his presidency were stopped. As of October 2019, the future of the infrastructure measure is unsure.

The Highway Trust Fund, the primary source of federal revenue for roadway infrastructure investments—including fuel taxes—is projected to run short of the funds necessary for current spending levels by 2021, according to the Congressional Budget Office. The trucking industry must continue to press legislatures to find new and improved ways of funding and repairing the nation's roadways.

The transportation industry takes a large hit to productivity and faces increased operational costs as trucks sit idle in congested traffic and navigate poor highways.

WHAT IS A 3PL PROVIDER AND WHY SHOULD I TALK TO ONE?

What Is a 3PL Provider?

A 3PL, or third-party logistics provider, is a company that provides complex supply chain management, including receiving product or material from the manufacturer or supplier, guiding it through the distribution or assembly channel, and shipping it to the consumer or retailer.

Contact one of our supply chain experts to learn about how we can handle your logistics and transportation needs.

## solutions@ruan.com | 866-782-6669

Why Would I Need a 3PL Provider?

If any of the following sound familiar, you may be ready to work with a 3PL.

+ Your business is in steady growth mode or you are anticipating a spike in growth.

+ Inventory space is maxed out, and inventory storage expenses are a large part of your budget.

+ Fulfilling orders takes the majority of your time.

+ Managing carriers and determining the best shipment mode is a struggle.

+ You want to expand to a market where you don't have infrastructure.

+ Your focus is on the logistics of your business rather than your business' core competency.

What Are the Main 3PL Services?

3PL Segment	2018 Gross Revenue (US$ Billions)	Ruan Service Capability
Dedicated Contract Carriage (DCC): 3PLs providing dedicated contract carriage services supplying tractors, drivers, and management. Trailers are normally included; contract terms are one to seven years.	18.4	✔ WE DO THAT!
Domestic Transportation Management (DTM): 3PLs providing non-asset-based value-added transportation management services dealing mainly with shipments originating in and destined to North American points. Services are usually performed in conjunction with freight brokerage and are often contractual.	86.5	✔ WE DO THAT!
International Transportation Management (ITM): 3PLs providing non-asset-based value-added international transportation management services. Services are usually performed in conjunction with freight forwarding and are often contractual.	61.9	✔ WE DO THAT!
Value-Added Warehousing and Distribution (VAWD): 3PLs providing long-term contract warehousing or distribution center operations with a host of value-adds.	43.3	✔ WE DO THAT!
Contract Software/Systems: Logistics software providers offer software solutions that enable companies to organize, control, monitor, and optimize their clients' logistics operations and track the progress and have visibility over the operations, progress, and service level agreements.	3.4	✔ WE DO THAT!
Total	**213.5**	✔ WE DO IT ALL!

Source: 2018 Armstrong & Associates
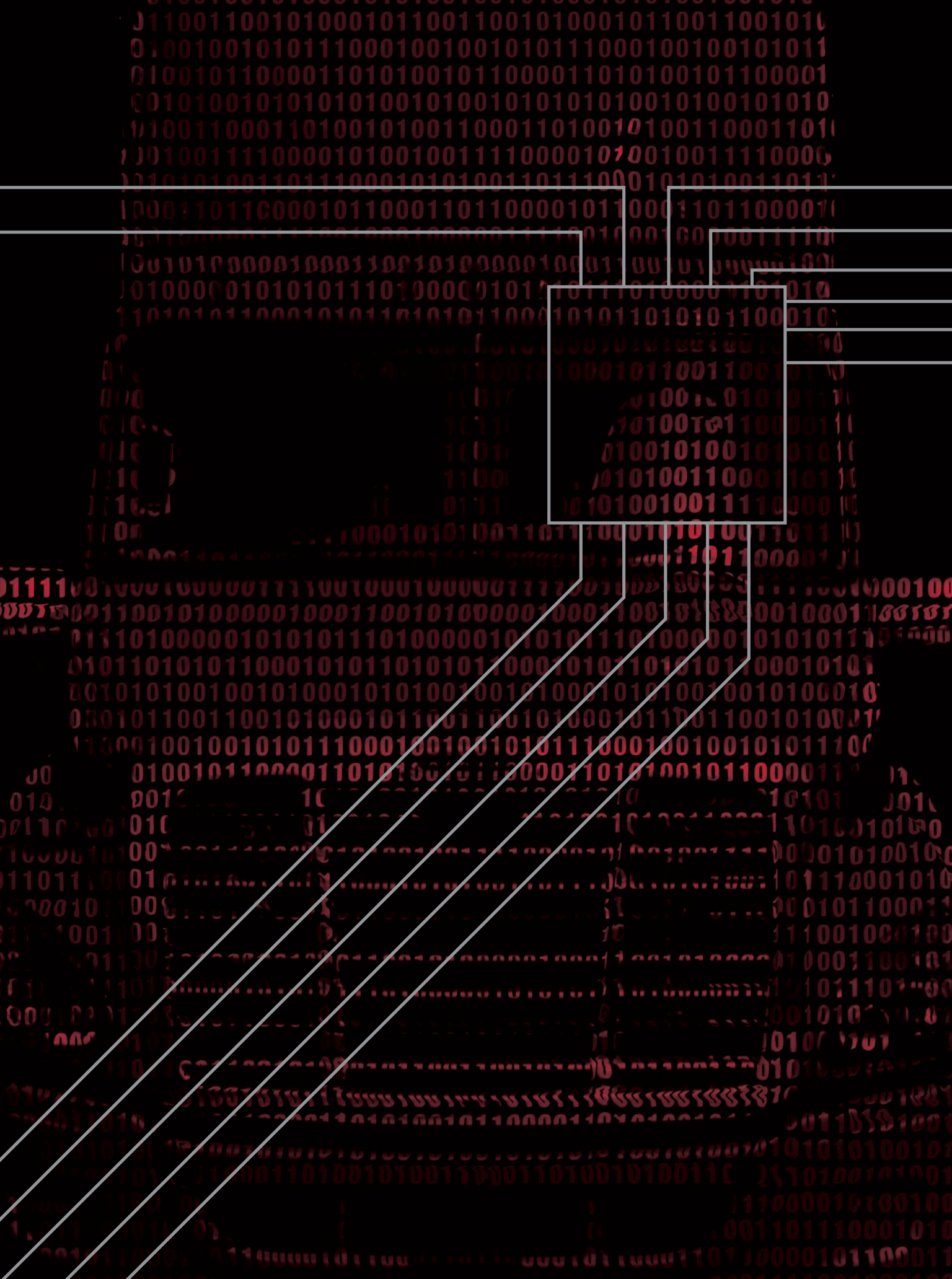
BIG RED COMPUTER

These days, heavy-duty trucks are more like computers than vehicles. We like to think of Ruan's trucks as big red computers driving along America's highways to deliver products for our customers. The last decade has seen tremendous advancement in the technology equipped on trucks and utilized in back offices, and the next decade will see further advancements—many features are coming to life that were once simply a fantasy. Science fiction, if you will. Autonomous trucks. Virtual reality. Drones and bots. These are all the result of significant IT macro trends that have applicability within the transportation industry.

The following macro trends are in focus for transportation companies across the world for a variety of reasons, including safety enhancement, optimization, and improved customer service—and they will continue to develop and be implemented at an increasing rate. Many of these trends fall into the category of artificial intelligence (AI), which can broadly encompass a variety of technologies that execute cognitive-style tasks that emulate human reasoning, according to *Transport Topics*. And it is becoming increasingly prevalent in the transportation industry. Research firm MarketsandMarkets estimates that the AI market for the transportation industry is growing at a compound annual rate of nearly 18 percent from 2017 to 2030, with its size increasing from $1.2 billion in 2017 to $10.3 billion by 2030. Companies that are unable to invest in and utilize many of these emerging technologies will struggle to keep up with industry standards and service levels.

Mobility

Mobile applications—and the resulting consumerization of IT—is currently having a significant impact on the transportation industry. Think about it. You place an order from an online retailer, and it arrives at your door two days later. Between placing an order and receiving it, you get email notifications about its status. And, you can log into your account and track the order's location day or night. Thanks to the visibility consumers have to personal orders, both workers and customers now expect the same in their business interactions.

To remain competitive, transportation companies must adopt mobile technologies, which are basically systems with mobile capabilities or that can push information to and from a mobile device. These apps can specialize in dispatching, hours-of-service compliance, finding truck parking, accessing truck maintenance manuals just by scanning a VIN, etc. Having mobile applications that are integrated and connected to a back office also improves the work experience for truck drivers, warehouse personnel, and operations team members alike. Modern mobile technology essentially allows work to be completed within a 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. This results in clean back end data and, therefore, valuable business insights.

The Ruan Approach

All of our professional drivers are equipped with tablets or smart phones that contain custom and purchased mobile applications. Our proprietary RedTrak app manages dispatching and routing—and provides real-time freight data to our operations teams and customers behind the scenes. RedTrak works in conjunction with our electronic logging and hours-of-service compliance application and RTMS2.0, our transportation management system. Ruan's tablets are also equipped with an app for our employee intranet, allowing professional drivers to access company updates, training, videos, and safety alerts when safely stopped.

"Our mobility strategy is to provide all of our team members an easy-to-use platform that enhances the quality of their work—and therefore our service and transparency to our customers," said IT mobility team Product Owner Andrew Paul. "By developing the application in-house, we can be responsive to changing requirements and support the demands of our customers."
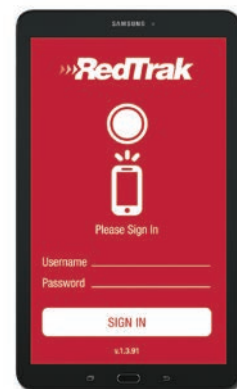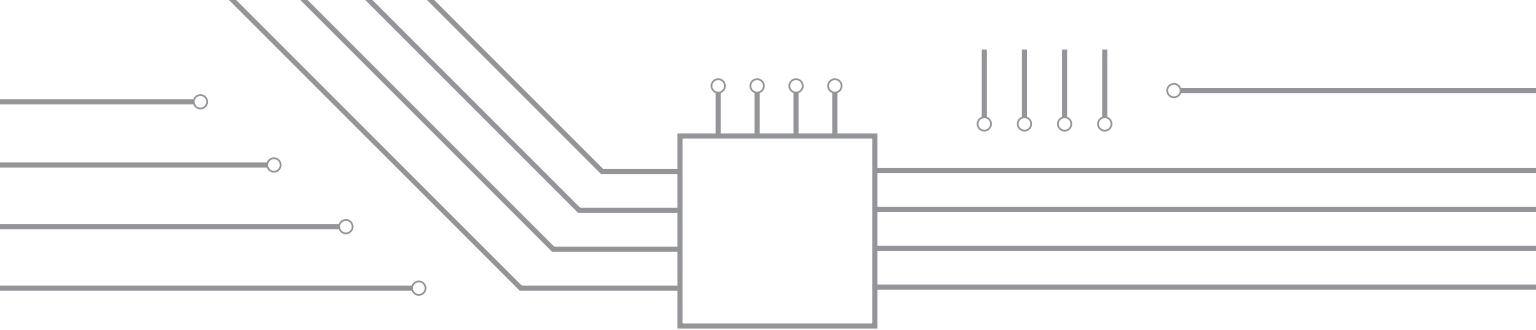
Autonomous and Semi-Autonomous Vehicles

A significant macro trend across the transportation and automotive industries is autonomous vehicles. Billions of dollars have contributed to the development and testing of heavy-duty trucks capable of maneuvering themselves down America's freeways, but their widespread use and adoption is many years down the road. While autonomous trucks could potentially reduce labor costs by extending the number of hours trucks are in operation, professional drivers will always be critical. They will navigate city streets for the first and last miles of trips. From exit to exit, the job of the truck driver could shift to facilitating business processes.

Certainly, the business case for autonomous vehicles is convincing—hundreds of thousands of loads are dispatched daily, and the average age of the American truck driver continues to increase. Few young people are entering the industry. As the U.S. population grows and demand for freight increases, an industry already saddled with a driver shortage is seeking ways to continue to operate and get goods to consumers. Autonomous truck proponents argue that the technology is appealing to drivers—that it should attract a younger, more tech-savvy generation. And, autonomous trucks could prove safer than those driven by humans, who have a capacity for human error. Still, a number of hurdles exist for autonomous trucks to navigate freely on federal and state roads, including regulations and public perception.

While autonomous trucks get most of the headlines, autonomous technology used on trucks can help save lives every day. Trucks now widely come equipped with advanced driver assistance systems that use a combination of radar- and camera-based components, like following distance and lane departure alerts, roll stability controls, and active braking, which could intercede on the driver's behalf to eliminate or greatly decrease a collision's severity. Any event triggered by the technology could be reported to employers, allowing for coaching opportunities. Collision mitigation systems prove time and time again to be worth the investment, and this autonomous technology will continue to find its way into more and more trucks, hopefully reducing the number and severity of accidents on our roadways.

The Ruan Approach

Nearly all of our fleet is equipped with advanced driver assistance systems. Our safety numbers have improved as a result of this technology, and the data the systems provide has opened lines of communication between our operations teams and drivers from a risk management perspective. We have the ability to review data and coach drivers on maintaining proper following distance, reducing speed on ramps and curves, and avoiding hard braking situations.

Ruan also leverages SpeedGauge, a program that takes the GPS location breadcrumbs from our electronic logging devices (ELD) and compares that information to the database of all posted speed limits within the United States. This then generates a report of the fleet's percentage of speeding, along with individual speeding events, which can be used to coach driver behavior and promote safe driving habits.

"We will continue to invest in autonomous technology that can protect our drivers and keep the motoring public safe," said Director of Safety Programs Allison Meiners. "Watching the technology evolve over the years has been impressive."

Robotic Process Automation

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 for customers—which could cause increased costs or delivery delays. But 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.

"Computers are getting smart enough to interact as humans, complete actions like humans, and automate mundane tasks," Ruan CIO Dan Greteman said. 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.
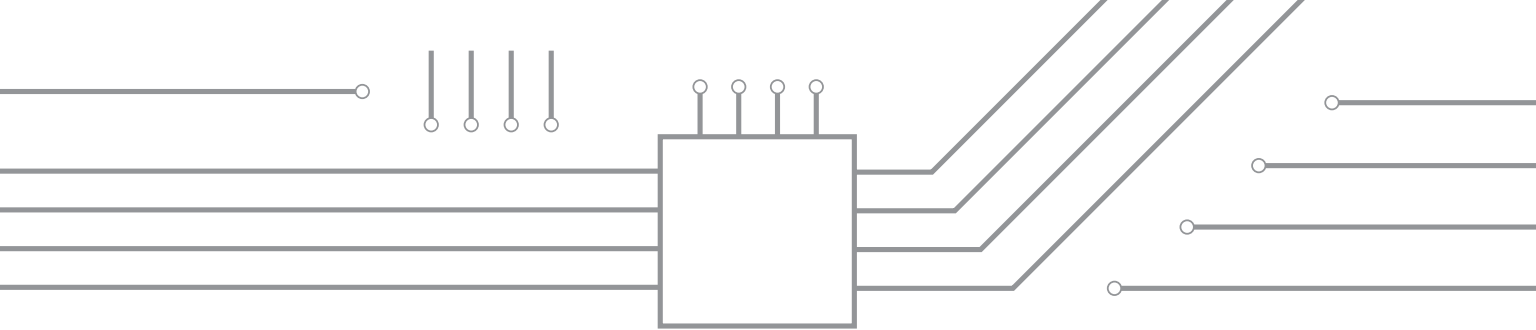
The Ruan Approach

Ruan's powerful transportation management system, which includes top-notch, on-the-market technology and proprietary custom applications, is capable of data-driven optimization using data from multiple internal and external sources. The technology can make ideal load matching decisions, determine the best routes, and integrate with in-cab tools. And, Ruan employs the experts able to get the most out of the software, which means our customers get the most out of it.


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 breaks down on a highway. Using AR-enabled smart glasses and repair apps, the driver could assess and fix minor problems without a technician, according to *Freightwaves*. "Essentially, a less experienced person can complete a more sophisticated process by leveraging an AR-enabled wearable computer or mobile device," Greteman said.

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 can reduce training time and costs, and it's virtually error free.

> "Augmented reality brings data to life. It can provide an optimized reality for our customers and drivers, enhancing service while promoting safety and potentially increasing profitability."
>
> — Dan Greteman, Chief Information Officer

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 can help create fleet efficiencies and improve safety.

Blockchain

Blockchain technology is essentially a decentralized digital ledger to which all parties involved in a transaction share a common view. Without blockchain, each party in a transportation transaction has its own view of various parts of the process—orders, invoices, fuel records, shipment tracking—via their own ledgers. By having all the data on one shared and continually reconciled blockchain where everyone sees the same thing, errors and inefficiencies are reduced.

The Internet of Things is critical to implementing blockchain technology to transportation. Throughout the lifecycle of a load, "IoT-connected objects will continuously update the blockchain for the shipment so that shippers, carriers, and customers stay on the same page, and goods and payment flow without delay or interruption," according to *Freightwaves*. Blockchain brings with it an automation and sophistication that can enable several things, particularly in food safety. In addition to sensors, the IoT enables barcode-level tracking, creating visibility to single SKU. The blockchain containing tracking
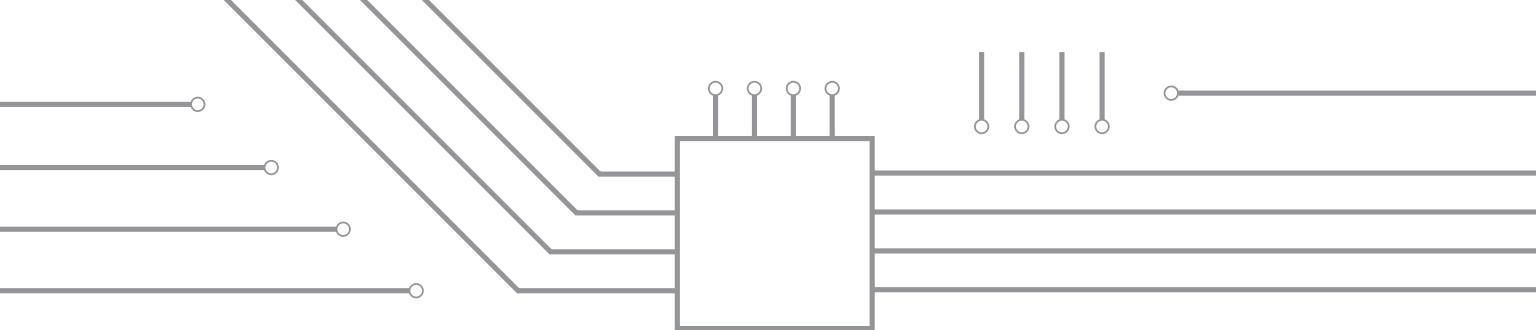
information can be used for reverse logistics if a product needs to be recalled—knowing the product's origins down to the SKU level can facilitate more selective recalls and avoid waste, according to *Forbes*.

The Ruan Approach

Ruan is a member of BiTA, the Blockchain in Transport Alliance, which was formed by experienced technology, transportation, and supply chain executives to create a forum for the development of blockchain standards and education for the freight industry. Ruan also has a six-person internal Blockchain Forum that meets bi-weekly to educate the membership on blockchain technology. The team deployed a prototype blockchain in the first quarter of 2019 to highlight the potential of the technology.

Wearables

While the widespread application of wearable technology is several years down the road, it has several compelling applications, particularly for enhancing safety in trucks. Ballcaps are being created to measure brainwaves and give a fatigue rating, a critical factor for drivers as sleepiness plays a role in many accidents. One company is developing a vest that can detect a stroke or other health emergency and stop the truck as a result. Trucking executives could use these and other biometrics tools, like Fitbits or other fitness devices, to recommend changes to improve the safety, health, and efficiency of workers. Especially as the price point of this technology comes down, it will likely be used by more and more by carriers.

Big Data and Analytics

All of the macro trends above, when applied, generate a tremendous amount of data. The data produced from mobile applications, electronic logging devices, driver wearables, sensors, advanced driver assistance systems, dashboard videos, etc., is more than can be analyzed and comprehended. But if the industry could tap into this valuable resource to measure, improve, and connect operations, just imagine the ROI impact. Determining the actionable data and using it to achieve true service and performance gains is the challenge.

"More data is being generated than ever before," Greteman said. "Now we're figuring out how to assimilate all the data and make it relevant. The key is to be discerning about which data is potentially useful in decision making."

Today's computers are useful in sorting through the data to help transportation companies make meaningful service and performance decisions. According to *Transport Topics*, AI models can find patterns and reach decisions that are outside of a human's capacity to process through predictive analysis. 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 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.

Omnitracs is currently developing a powerful, data-driven AI model that would contribute to driver retention. The software, according to *Transport Topics*, compiles data related to driver performance—like HR reports, accident and violation history, on-time deliveries, in-cab videos, and incidents recorded by advanced driver assistance systems (hard braking, lane departure, etc.)—and makes predictions about certain drivers being at risk of quitting the job. This technology would allow managers to proactively engage these team members and avoid turnover.

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.
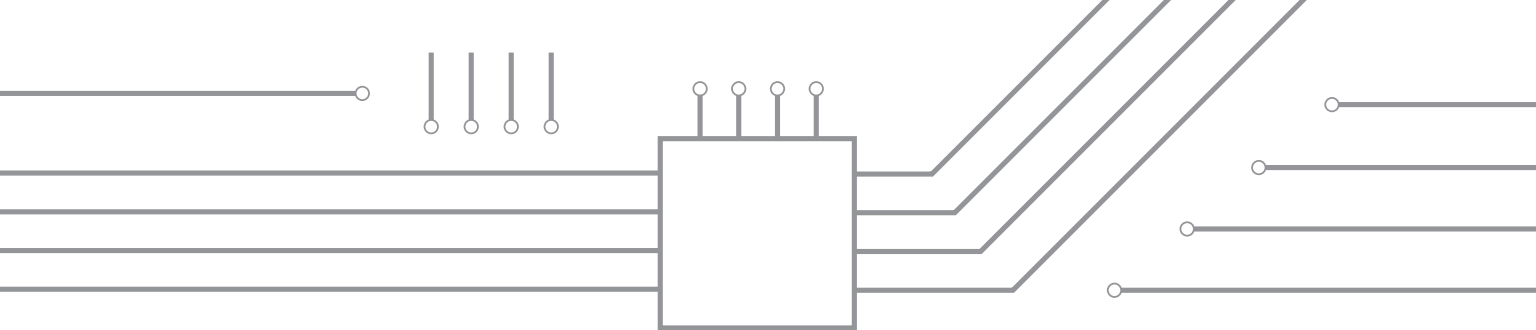
Legacy Modernization

The starting point for many companies trying to capitalize on the impacts of IT macro trends is legacy modernization. "There are many platforms and operating systems out there that are no longer in widespread use and should be replaced with newer versions that can integrate with each other and support new applications, making them more efficient and reliable," Greteman said.

Unfortunately, these systems and software are often expensive, and some carriers are strapped with technical debt from adopting early systems that saw rapid technological advancements after implementation. Therefore, they're left with limited financial ability to move to more advanced systems. However, most IT macro trends require investment in legacy modernization to function.

The Ruan Approach

Ruan has spent the last several years updating our largest legacy revenue-generating programs to stable, supported systems to accomplish business proficiencies and improvements. We facilitate regular updates to our systems to ensure we're using the most up-to-date versions—and we have the experts in place to manage these updates without impacting business operations.

The Human Factor

While IT macro trends are certainly compelling and largely applicable in enhancing multiple aspects of the transportation industry, people are still—and will remain—the industry's greatest asset. Companies need professional IT experts to develop, program, and implement these technologies, as well as alter them as business needs change. And at its core, transportation is about relationships. Carrier and customer. Manager and driver. Customer and driver. Corporate team member and field manager. Computers will never be able to manage the emotions that define these relationships. Instead, by automating mundane and time-consuming tasks, computers will allow their human counterparts to focus on relationship building, retention, and customer service.
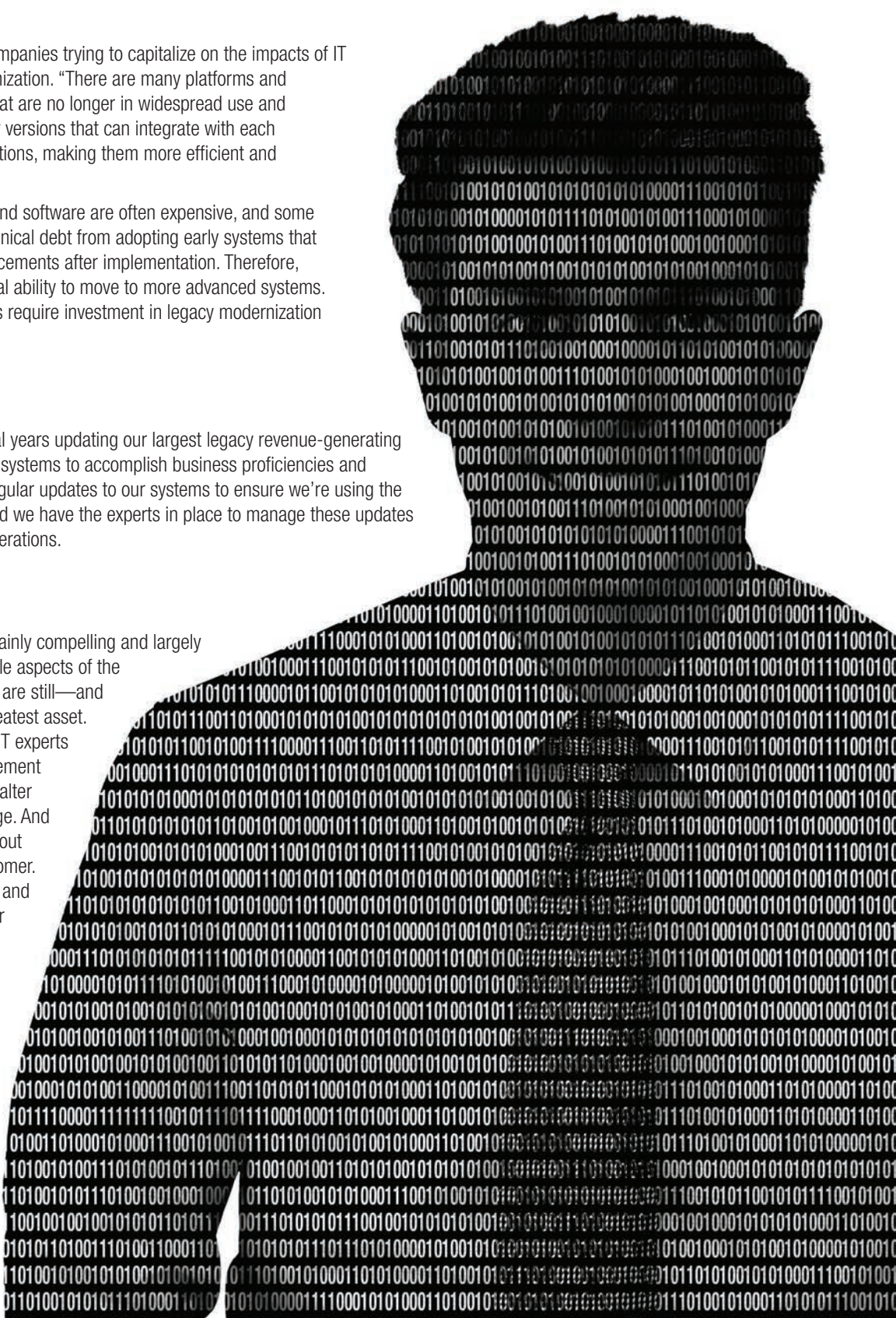
EXPLORING THE FUTURE OF

More and more truck manufacturers and new start-up companies are entering the electric truck arena. And why not? Electric heavy-duty trucks have the potential to reduce environmental concerns due to zero emissions, provide an improved experience for professional drivers, cut maintenance requirements, and eventually offer cost savings to carriers.

Telsa was among the first manufacturers to announce an all-electric truck, but Volvo, Daimler, and others have followed. Ruan has reserved five Tesla electric trucks, slated for mid-2020 delivery, and we have received grants to help offset the initial cost. The price per Tesla will be approximately $180,000. Most diesel-powered tractors cost around $125,000, but Tesla predicts that the electric vehicle will pay for itself within two years due to savings in aerodynamics, reliability, and lower energy costs. According to Tesla, a 400-mile range will be attainable with just a 30-minute charge from one of Tesla's planned Megacharger stations. Some specifics, such as the total operating cost, are still unavailable.

> ## "We are excited to test the Teslas, evaluate their performance, and determine how we can introduce more electric trucks into our fleet."
>
> *— James Cade*
> *Ruan Vice President of Fleet Services*

"We believe that electric trucks make sense and are the future of truck transportation," said James Cade, Ruan's vice president of fleet services, who has consulted with Tesla and sits on Freightliner's Electric Vehicle Council. "We are excited to test the Teslas, evaluate their performance, and determine how we can introduce more electric trucks into our fleet. We are willing to purchase electric trucks from any vendor at this point based on their performance capabilities."

The application of electric vehicles extends beyond the all-electric regional trucks, like the ones Ruan reserved with Telsa. Manufacturers are also developing long-haul hybrid electric trucks, electric yard trucks, electric standby refrigeration trailers, and even solar-powered electric refrigeration units. Electric yard trucks have been deployed for years, and they are the truck of choice for yard hostlers for being cooler, smoother, quieter, and cleaner. In addition, since they have no diesel engine, transmission, or emission control, there's less to maintain and repair. The brushless induction motors and other components are mostly sealed, and they use a single battery pack. Electric yard trucks just need to be plugged in each day—and most sites already have the electrical capacity needed to add charging ability.

Ruan has purchased five Tesla electric trucks. CEO Ben McLean (L) and COO Dan Van Alstine (R) of Ruan were joined by Brenda Neville, president of the Iowa Motor Truck Association, when Tesla visited Des Moines, IA, with an electric truck prototype.

ELECTRIC

A few barriers to entry still exist for widespread, long-haul electric truck use across the country—primarily the lack of charging infrastructure, potential strain on the electric grid to support growth, and the variable cost of the electrical energy itself. But for regional, dedicated routes with a consistent charging hub, electric trucks could be both practical and applicable. Daimler will begin large scale production of its all-electric Freightliner eCascadia in 2021, and it is expected to have a 250-mile range and charge within approximately 90 minutes. (It's worth noting the Daimler's head of trucks Martin Daum is on record with *Bloomberg* saying that if Tesla's promise of a full charge within 30 minutes is true, the manufacturer has passed Daimler by and defied laws of physics.) A truck like this would make sense for two-to-three round trips within the 250-mile charge limit. It remains to be seen, however, if and when electric trucks will be able to travel regionally and find enough charging stations along the route. Carriers would also need to determine if the charging time requirements would cause a loss of driving hours in a driver's day.

Another unknown with electric trucks is maintenance. While technicians will not need to maintain diesel engines or emissions systems, they will need to develop a new set of skills to maintain the electrical systems of these new trucks. Shops would need to create new procedures and safety protocol, especially related to lockout/tagout and dealing with damaged batteries, then complete in-depth and ongoing training. Even new and specific tools and personal protective equipment would be necessary to maintain electric truck technology. Yards and shops would need to undergo proper planning for site configuration with careful consideration for the best non-disruptive charging areas.

Ultimately, as carriers are faced with the decision to use electric-powered trucks, they'll need to determine that the savings on fuel won't be negated by sacrificed payload or performance, or the costs associated with energy and maintenance. Selecting the correct routes and applications will be critical—but Ruan is fully engaged in and supportive of the electric truck future.

EXPECTED BENEFITS OF ELECTRIC TRUCKS

INCREASED ENERGY EFFICIENCY

REDUCED EMISSIONS
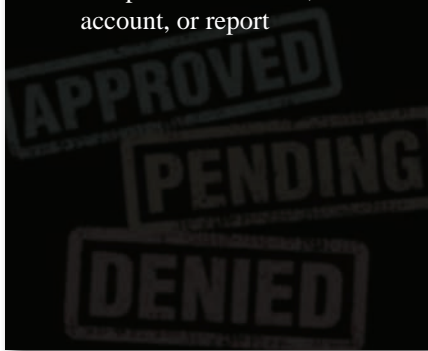
ATTRACT YOUNG DRIVERS

LOWER MAINTENANCE REQUIREMENTS

reg·u·la·to·ry

: an authoritative rule dealing with details or procedure

up·date

: an up-to-date version, account, or report

From electronic logging device (ELD) mandates to minimum new driver training requirements, the transportation industry is highly regulated and always changing. At Ruan, teams across the company stay abreast of potential and impending regulatory changes that could affect operations. By staying up-to-date and being proactive, Ruan ensures regulatory compliance and customer satisfaction. Here are just a few regulatory updates and issues impacting the industry now and in the foreseeable future.

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 Federal Motor Carrier Safety Administration (FMCSA) recently issued proposed changes to the HOS rules with the goal of improving the lives of truck drivers while still ensuring safety on the roads.

The proposed rule changes would not increase a drivers' daily driving time, but they could allow professional drivers and companies more flexibility in determining how those 11 driving hours are broken up within a 14-hour workday, allowing drivers to rest when tired and take breaks to avoid major traffic congestion times.

FMCSA's proposed five key revisions to the existing 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.

FMCSA Administrator Raymond Martinez told industry trade publications that the changes are "a commonsense approach to crafting hours-of-service regulations that are more flexible for truck drivers and promote safety for all who share the road." He added that drivers must navigate a host of challenges in their workday, including congestion, parking issues, and inclement weather. "[Drivers] need some level of flexibility that allows them to work around. Many of them felt they were racing the clock with those AOBRDs or ELDs. We hope that providing this type of flexibility puts a little more power back in the hands of drivers and carriers to make smart decisions with regard to safety and the realities of what they're facing on the roadways."

The FMCSA is now accepting comments from the industry on the proposed rules until mid-October. This feedback from stakeholders will help determine if and how the FMCSA moves forward with implementing the proposed changes.

Under-21 Professional Drivers

The FMCSA recently sought public comment on a potential pilot program that would allow drivers aged 18-20 to operate commercial motor vehicles (CMV) in interstate commerce. Drivers aged 18-20 may currently only operate CMVs intrastate. The FMCSA has asked the industry to comment on the training, qualifications, driving limitations, and vehicle safety systems that it should consider in developing options or approaches for a pilot program for younger drivers.

In the wake of a significant driver shortage—currently estimated at around 60,000—broadening the potential workforce to include those right out of high school is appealing. As demand for freight remains somewhat strong and many existing drivers approach retirement, the industry must find a way to attract new drivers. Since individuals currently cannot earn an interstate commercial driver's license (CDL) until age 21, they are generally already settled in other professions by the time they are eligible to drive a truck. Still, highway safety is of utmost importance, and the FMCSA and industry must ensure that the correct training requirements are in place before allowing young drivers behind the wheel of heavy-duty trucks.

Drug and Alcohol Clearinghouse

In early 2020, carriers will be required to report drivers' positive test results and refusals to test into a central drug and alcohol database. Employers will also be required to access this database when looking to hire potential drivers—and to query the database annually for current drivers. The clearinghouse will become operational on January 6, 2020. Mandatory use will go into effect at that time.

"The Clearinghouse will improve highway safety by helping employers, FMCSA, state driver licensing agencies, and state law enforcement to quickly and efficiently identify drivers who are not legally permitted to operate commercial motor vehicles due to drug and alcohol program violations," according to the FMCSA. "This secure online database will provide access to real-time information, ensuring that drivers committing these violations complete the necessary steps before getting back behind the wheel or performing any other safety-sensitive function."

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.

Entry-Level Driver Training Rule

The entry-level driver training rule, which is slated to go into effect February 7, 2020, 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 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 to overhaul entry-level driver training courses.

Due to technical glitches, the FMCSA has proposed a two-year delay for compliance with certain provisions of the rule related to the Training Provider Registry electronic database.

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.

Electronic Logging Device Mandate

A mandate requiring electronic logging devices for heavy-duty trucks went into effect December 18, 2017, with of goal of ensuring regulatory hours-of-service compliance and promoting safety. Since then, law enforcement has issued out-of-service citations for any violation of the ELD mandate. The number of hours-of-service violations in the industry dropped 52 percent year-over-year in 2019, and fewer than 1 percent of drivers were cited for being out of compliance with the mandate.

While most motor carriers have complied with the mandate, 2019 will see another significant transition for fleets still using older electronic log systems that pre-date the ELD rule. The 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 will have to update their systems to an ELD platform. Many large carriers are required to make this switch, which will require significant training for back office professionals and drivers alike.

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 are using state regulation of trucking companies as the basis of expensive lawsuits related to meal and rest breaks and pay types. 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 (ATA) 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 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 likely be many more challenges to the FMCSA's ruling as this continues to be a hot button issue.

Regulation approved

Regulation pending
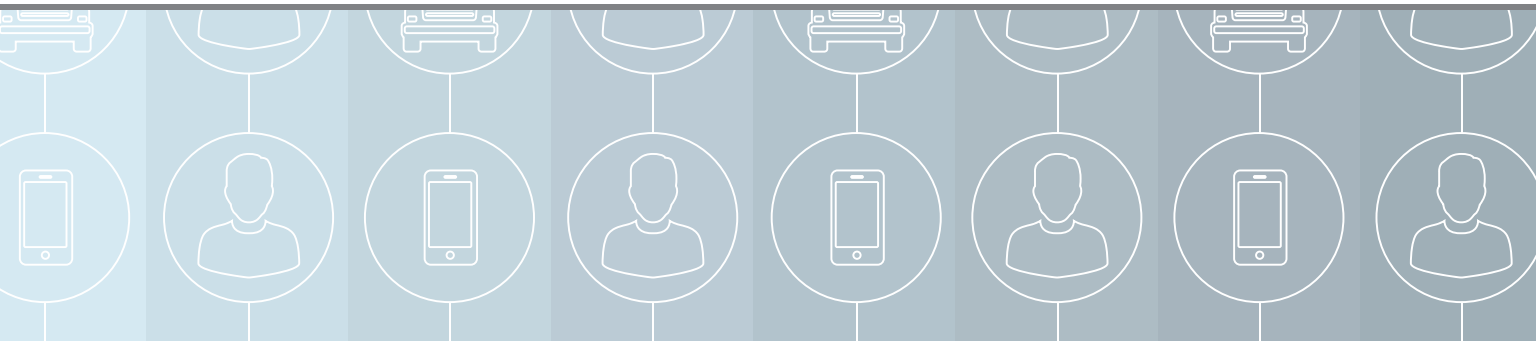
Regulation denied

TECH R2O

Knowing how to quickly set-up and configure supply chain technology so the solutions work for individual customers is the key to getting the most flexible and powerful performance from industry-leading package applications.

Q&A

with Ruan's Director of Integrated Solutions Graham Page

1 What is Ruan's technology platform mix?

One of Ruan's strategic priorities is to invest in technology that improves the lives of our customers and team members. Ruan's approach to business-enabling technology is primarily a package of software applications across transportation management systems (TMS), warehouse management system (WMS), and Network Design. Our platform is based on Oracle Transportation Management (OTM) for logistics management, TMW for dedicated fleet operations, and JDA for both WMS and Network Design solutions. Importantly, we have leveraged our domain expertise to integrate these systems across our organization. However, there are also areas where we build and run our own custom in-house applications when we do not find maturity in the marketplace around solutions that our customers need. A great example of these Ruan-developed applications is what we are doing around driver mobility and customer-facing tracking applications.

2 What sets Ruan's solution apart from other transportation providers?

There are many solution differentiators here at Ruan when we think about our people, processes, and technology. However, I believe that our people and their expertise really set Ruan apart from other asset-based 3PLs.

Our operations are designed with the intent of having dedicated people assigned to each customer, and we don't take the "call center" approach to logistics where a different person or group could be addressing a customer need on a day-to-day basis. Therefore, we become an extension of our customers' operations, and our people become experts in the specific ways that our technology solutions are applied for each customer. This is critical in our success with deploying solutions for the complex supply chain challenges we are solving for our customers.

Our technology solutions teams are consistent from the beginning of a customer engagement during the onboarding process through continuous improvement projects that happen on an ongoing basis throughout the years of engagement. This knowledge about a customer's business, how the systems are set up for that customer, along with the 80+ years of expertise that our teams have on our applications, means that we can be very nimble with technology changes to address our customers' needs and respond to process changes and improvement opportunities quickly.

Our ability to adapt is one of the primary reasons that we lean on package applications as the backbone of our platform. Many of these system changes are performed through "system configuration" that can be completed by a business analyst rather than through "code development" with IT involvement, which typically requires a longer cycle-time from idea to implementation.

CUSTOM SOLUTIONS vs. OFF-THE-SHELF TECH

Another advantage to this approach is that it does not force our customers to fit into a "Ruan" box. Instead, our process allows us to build the "best" box for the customer since every customer is unique. As we think about the end-to-end transportation processes, there are many similarities across customers with the tasks that take place in the middle, such as securing capacity, execution and tracking, and freight payment. But, our ability to tailor solutions in the front of the process with how we capture orders and plan freight and the back of the process with customized billing formats and key performance indicators are critical to meeting our customer's needs. This would not be possible without industry-leading package applications and, more importantly, the knowledge of how to quickly set-up and configure the technology so the solutions work for our individual customers.

3 Should shippers consider hiring a transportation provider instead of purchasing technology to use on their own?

The question of whether to outsource logistics services is an important decision for any shipper. When we speak to shippers that are shifting transportation technology strategies and evaluating whether to "buy" or "partner" for TMS services, it's typically the following areas that drive the "partner" decision:

+ Inability to configure the TMS without expensive outside consulting guidance due to difficulty with developing the necessary in-house system expertise to maintain and change the application to meet evolving business requirements.

+ Integration and training with existing carrier network.

+ Managing the system upgrade process to keep current with TMS functionality and support agreements as well as the ongoing support to the application for business process changes and continuous improvement projects.

+ Cost and timeline overruns with system implementation when performed in-house.

+ Desire to focus on the core functions of the business while partnering with a provider with expertise in managing transportation and the associated technology.

VALUE ADDED

KEYS TO OPERATING A SUCCESSFUL WAREHOUSE

Like the entire transportation industry, technology trends in the warehousing sector are constantly evolving to provide more accurate data, faster shipment of goods, and better use of space. Outdated technology and warehouse management systems (WMS) lead to higher costs and loss of productivity. What key components are necessary to the success of your warehousing operation? Hiring the right team of experienced professionals is a great place to start.

Industry professionals can assist your company in determining the best location for a distribution center for your operation to run smoothly and on schedule. Warehousing space in the U.S. is increasingly difficult to come by, so choosing a location—of either an existing warehouse facility or land to build on—is a science. Some aspects to consider when determining a warehouse location include your current and desired customer base, local workforce availability, and convenient access to your transportation provider.

"Ruan's experience, coupled with our powerful technology, helps us determine the optimal location to find the best existing facility or build site for our customers' operations," said Ryan Brown, Ruan's vice president of integrated solutions sales.

Unlike a decade ago, employing a base of qualified warehouse professionals is a challenge. Workers look for competitive wages, a strong emphasis on their personal safety, and modern technology. Technologies such as robotics, artificial intelligence, and wearables allow warehouse workers to complete their tasks more productively and accurately. Human workers are still a necessity at warehousing operations, but certain technologies can remove operational bottlenecks, decrease workers' time spent on tedious tasks such as counting inventory, limit the frequency of preventable accidents, and minimize the impact of human errors on your operation.

Warehouse Safety

Employee safety is the most important factor in any warehousing operation. Moving vehicles, ladders and tall shelves, pinch points, and trip hazards are just a few of the safety concerns of which to be mindful. According to the Occupational Safety and Health Administration (OSHA), the fatal injury rate for the warehousing industry is higher than the national average for all industries. OSHA identifies the most common safety incidents in warehousing to include:

+ Unsafe use of forklifts

+ Improper stacking of products

+ Failure to use proper personal protective equipment (PPE)

+ Failure to follow proper lockout/tagout procedures

+ Inadequate fire safety provisions

+ Repetitive motion injuries

Some solutions to these incidents are simple. All employees must wear the assigned PPE at all times, review and practice proper lockout/tagout procedures, not lift more than the employee is comfortable with, and so on. Others require consistent training. Additionally, OSHA offers the following practices:

+ Keep areas with a drop off of more than four feet roped off.

+ Floors and aisles should be clear of clutter and other hazards.

+ Ensure team members have enough time to complete their tasks safely.

+ Give workers periodic breaks to avoid fatigue that can lead to injury.

+ Keep your warehouse well ventilated.

+ Implement and practice lockout/tagout procedures.

"Thorough and consistent training is imperative to creating a culture of safety at your operation," said Ruan Sr. Vice President of Safety, Compliance, and Operations Support Chad Willis. "It is the responsibility of everyone on our team to identify and eliminate possible safety hazards."

WA RE H OU SE

Software and Technology

A number of TMS and WMS offerings are available for purchase in the marketplace. This technology is constantly changing and advancing and provides a breadth of options for various needs. But when purchasing this technology, it is important to have a team that can use all the vast capabilities of whatever platform you choose. Most software offerings are updated regularly, which means consistent training for team members will be required to keep your operation moving smoothly and efficiently. Even the smallest change can disrupt the warehouse operations—but can be avoided with proper preparation and education.

The Ruan Approach

Ruan uses JDA for both our WMS and Network Design needs. RTMS2.0, Ruan's customized transportation management system technology, combines JDA with Oracle Transportation Management, our logistics software, and TMW, our dedicated fleet operations software, to provide our customers with a platform to best fit their needs. The integration of these three systems gives our customers visibility to their product during all stages of handling. JDA is at the forefront of this integration and is vital to implementing the technological advancements the warehousing industry will be experiencing in the coming years.

More important than the software itself is the team of experts we have on staff to operate these applications. This team allows us to configure the JDA technology however our customers require, whether that includes cross docking, kitting, subassembly, and much more. Having our own in-house team to operate this WMS means we are not reliant on a third-party organization; instead, we can provide our customers with flexibility and real-time data, as well as cost savings.

Operating a successful warehouse is a greater challenge than ever before. Choosing the best location for your facility, deploying customized technology, prioritizing team member safety, and employing industry experts will ensure your customers' products are stored properly and delivered on time.

WHAT IS THE BIGGEST CHALLENGE FACING THE WAREHOUSING INDUSTRY IN THE NEXT FIVE YEARS?

"Staying abreast of the latest available technology will be important in the next few years. This includes investing financially in the best software and machines, obtaining and training team members to operate the technology, and having the ability to maintain the technology. Available facility space and labor will also be a significant challenge."

– Ryan Brown, Vice President of Integrated Solutions Sales

Ruan's Warehousing Services

+ Facility identification and design

+ Receipt to stock, trans-load, and cross dock

+ Pallet pick, case pick, each pick

+ Kitting and subassembly

+ Parts sequencing for lineside delivery

+ Container loading, unloading, blocking and bracing, drayage

+ Export consolidation for international shipments

+ Return processing

+ Real-time inventory processing

+ Inventory management

+ Robust Cycle Count program

+ Electronic Kanban (eKanban) fulfillment

+ Label customizations

RUAN

3100 Ruan Center
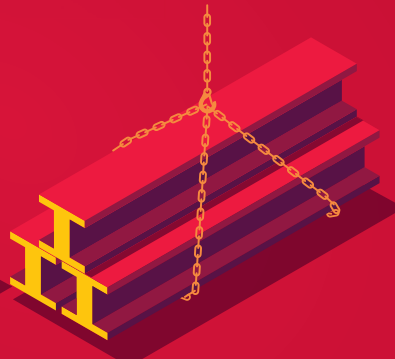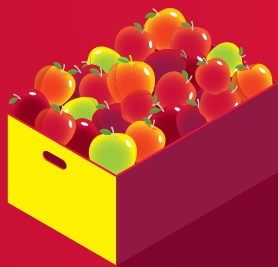666 Grand Avenue
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When you're choosing between 3PLs, make sure you're doing an apples to apples comparison of the proposals. Ruan's Integrated Supply Chain Solutions bring additional value to every shipment through our people, process, and technology platform.

With more than 87 years of experience, we provide a wealth of knowledge to each client. And our process generates savings by optimizing your supply chain, whether your customized solution requires managed transportation, warehouse management, Ruan assets, or more. And our flexible, best-of-breed technology platform scales to meet your needs, improving visibility and reducing spend.

For more information about how we can design a solution that brings more value to you (whether you're shipping apples or steel), **call (866) 782-6669 or visit ruan.com.**

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