TRANSPORTATION & LOGISTICS

Advancing the Future of Logistics: Tackling the Key Problems Emerged from Daily Operations

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The Varying Changes Happening To The Transportation And Logistics Sector

The trucking industry is a cyclical sector that serves the global economy where logistics companies transport cargo and shipments to big metropolitans and rural areas. When picturing the global logistics network, the first few things that come into most people's minds are freight planes, miles-long trains and container ships. However, the transportation method that carries the vast majority of the world's cargo is trucking.

In the United States, more than 73% of domestic freight by value is carried by trucks. They are the most flexible, convenient and cost-effective tool in connecting places and destinations where trains, planes and ships cannot reach. The roles they play are not just confined to the community level where trucks conducted last-mile delivery but also



appeared on a much larger national scale where trucks are used to conduct longhaul cross-country cargo transportation. Trucks are truly the dominant form of cargo transportation method that brings the world closer together.

However, the trucking industry is feeling the pressures of change, especially during a turbulent period happening right now. Changes are occurring in all aspects, and the trucking industry must overcome these challenges to continue growth. The COVID-19 pandemic has drastically shifted the entire logistics network operations in many ways. The fast-growing e-commerce market and an increasing reliance on online shopping from the public have prompted rising needs to expand the logistics network capacity to support the movements of goods. Many shipping companies and couriers were dealing with unprecedented volumes of packages and parcels during the pandemic.



However, due to the workforce reduction caused by high rates of sick leaves and employee absences, couriers and logistics companies have to face growing demands with limited human resources. Canada Post, the primary postal service in Canada, recorded an all-time parcel delivery record on May 19, 2020, with more than 2.1 million packages delivered across Canada in one day. The corporation was seeing holiday-level shipping demands during the pandemic, with lengthy delays occurring to many packages due to reduced employees allowed in the workplaces and warehouses as a result of physical distancing rules. All these new changes happening in the logistics industry highlighted the need to consider new approaches and innovations to address the problems.

Traditionally, adding more drivers and workers to the distribution centre or delivery forefront has been the easiest way to cope with high demands. Unfortunately, the nature of the pandemic has made this approach almost impossible to implement due to the capacity limit enforced in workplaces. This means that the only realistic way to improve goods transportation and delivery efficiency is by equipping the logistics system with the best possible technologies.



Another new trend emerging from the pandemic is a growing level of shipping and transport activities associated with special commodities. Special commodities often refer to any time-sensitive, temperature-sensitive, hazardous or high-valued commodities required to be transported in a more stringent or specialized environment with special handling procedures. Throughout the pandemic, the logistics network is a lifeline for transporting and delivering medical supplies and critical medicines worldwide. The mission of transporting many time-sensitive and temperature-sensitive pharmaceutical products demands close and precise collaboration between air transportation and ground transportation to make this happen. Any errors, delays or temperature breaches occurring during the transport processes would have a devastating impact on customers and even the local health care system. It's a costly shipping mistake that logistics companies cannot afford.

With widespread globalization and increased travel distances of goods and cargo, logistics companies have to establish technologically advanced monitoring and tracking systems that offer end-to-end protection to guarantee timely and safe delivery of critical shipments around the world. The customer expectations for logistics networks have never been higher in modern days, and logistics companies are responsible for ensuring they are ready for future challenges.

Key Problems Emerged In Daily Operations

Assets Downtime

Because of the health and safety measures implemented in many workplaces, many logistics companies turned their attention to utilize technologies to increase network efficiency rather than hiring new workforces. Technologies have unique advantages of computing and handling work that require high precision and great care. The extremely low error rate of the technological system made them a suitable companion and tool for logistics companies to provide reliable and high-quality service during a challenging time. Through the day-to-day operations, logistics companies found two factors that impede and pose significant difficulties in sustaining high-productivity operations.





The lengthy assets downtime constitutes the single largest source of lost productivity in logistics businesses. Downtime commonly refers to any periods where vehicles and assets are out of service due to unplanned vehicle breakdowns, unexpected checkpoints, roadway incidents or trip delays caused by congestion and other factors. Companies usually have to devote extra human resources and payout additional expenses to recover situations where a vehicle is declared out-of-service.

Picture a scenario when a fully-loaded truck experiences an equipment failure halfway into the trip, forcing the logistics companies to send out replacement trucks and extra staff to rescue the load. This is a really painful event for any logistics company as a reload costs thousands of dollars, and businesses also have to pay overtime for drivers to finish the shift and face a delay in shipments.

Trip delays are a significant component leading to unexpected asset downtime. If the driver is not directed or informed to use the most efficient routing option, they will likely encounter lengthy congestion delays along the way, affecting the service efficiency and on-time performance. Any unforeseen delays will result in longer working hours for drivers and may cause them to work overtime. Drivers who exceed the hours of service requirement have to declare out-of-service in the middle of the shift, costing businesses extra resources to cover the unfinished tasks. here are also health and safety consequences associated with longer drive times as drivers are more likely to experience fatigue, putting their safety and other road users' safety at risk.

Additionally, many truck drivers found that they are experiencing trouble or spending more time searching for parking spaces to park their vehicles for cargo delivery, especially in urban areas where curbside parking spaces are highly limited. They would appreciate more guidance provided to them to save time on locating a parking spot. These are the reasons why many fleet managers praise a highly optimized navigation system as one of the critical features that boost delivery and transport efficiency. Smart routing can further integrate work orders and real-time truck parking availability to provide a customized software experience catered to logistics fleets.

Compliances

Long-haul truck transportation is one of the most regulated sectors in North America. Each country and region has dedicated laws and regulations that govern how the operations should run. Logistics companies must strictly adhere to the safety and service rules set out by the local transportation authorities. Hours of Service (HOS) regulations are some of the most important rules designed to safeguard drivers' safety and reduce collision caused by driver fatigue. However, the complexity of the regulations and the difficulties of conducting large scale hours of service tracking among drivers is widely considered one of the biggest headaches fleet managers face.

Any violation of hours of service rules may cost businesses to pay out huge fines and penalties. Besides, logistics and trucking companies are required to accurately log each drivers' information and service hours to comply with Hours of Service rules. Fleet managers need the right tools to simplify and automate this process so that they can focus on dealing with more urgent operational issues.



Ensuring a safe operation and working environment is of paramount importance in the trucking industry. Truck drivers not only have to follow conventional road rules such as no speeding and no distracted driving, but they also need to follow special traffic regulations laid out for commercial trucks. There are also size and weight limits for commercial vehicles, where drivers, operators and shippers are all responsible for ensuring they comply with the local regulations.

Mobile inspection sites and weigh stations scattered across North America's road network are used to check trucks' weights and compliance with local laws. Charges will be issued to logistics operators and drivers who commit a regulatory offence. Because there is no room for errors in the safety and compliance field, businesses cannot just rely on human efforts to maintain fleet safety and a clean record.

There is a strong concurrence among fleet managers that technologies will serve as an extra layer of protection when human errors occur. Most of the time, drivers won't notice the presence of technologies in the cab, butthey will turn into a life-saving tool at the most critical moments.

Why Compliances And Asset Downtime Are Two Areas That Fleet Managers And Businesses Need To Focus On

1) Cost

Businesses, nowadays, build on the fundamentals of maximizing profits and cutting down on costs. Today's economy remains unstable, and businesses need to tighten their budgets and reserve cash flows to sustain long-term operations. For logistics businesses and truck companies, regularly reviewing companies' expenditures can help companies understand their financial health and look at ways to further control costs. Fleet managers across the trucking industries have identified fuel spending, maintenance costs and the costs of collisions as the largest expenditures for fleet operations. We will dive into each of these cost segments and investigate what contributes to increases in costs.



Fuel Spending

High fuel consumption and fuel expenses can be caused by many factors. Here are five common mistakes that may lead to increases in fuel consumption and decreases in fleets' fuel efficiency:

- Drivers being directed to use longer routes, inefficient routes or routes with congestions, resulting in longer trips and higher fuel consumption
- Fleet vehicles that have poor fuel economy or gas mileage
- Drivers performing harsh braking, harsh accelerations and excessive engine idling during daily work
- Vehicles subject to unexpected breakdowns during the shift, forcing companies to send out replacement vehicles to complete the rest of the work
- Drivers using companies' vehicles to conduct personal businesses and trips

These mistakes might not seem like a severe problem at the beginning, but they can grow into much greater financial burdens and become costly for your businesses as time goes by or as fleet sizes expand. Many of these mistakes not only affect businesses' financial status but also pose threats to the environment and human health. Excessive engine idling can result in loss of gallons of fuel every day.

An idling diesel truck can burn up to 1 gallon of fuel in an hour, which translates to \$2 USD wasted every hour. It can also damage the internal components of the vehicle's engine, including the exhaust system and cylinders, which inevitably lead to more frequent maintenance or repairs and higher maintenance costs. The vehicle's health and useful life will also likely be affected. When it comes to social impacts, engine idling creates pollution that contributes to smog and climate change. Drivers also have a higher possibility of developing asthma and respiratory diseases.



1 hour of idling does not seem like a lot. But for every hour that a truck is idling, one gallon of diesel is wasted. Meaning, it could cost fleets with 50 vehicle fleets who idle 1 hour per day per vehicle en employees salary.



It's clear that fleet managers have the duty to lower engine idling times across the fleet and reduce costs. A major part of this task is educating all drivers about the possible consequences of engine idling, training them with the right procedures for maneuvering vehicles and reminding them to turn off the car when stopping for an extended period of time. But the problem is how to track and evaluate the training's effectiveness and assess whether drivers are following the instructions after the training. Data is generally considered the most accurate and objective metric that provides fleet managers with an overview of the progress and changes. With appropriate sensors and tracking devices installed on the vehicle's historical data and idling time over the day. From there, fleet managers can identify individual drivers who are not complying with the guidance and introduce tailored training to enhance overall fleet performance. Technologies have been designed from the very beginning to help fleet managers capture the problem, collect data, recommend data-driven solutions and conduct routine evaluations and outcome measurements. It's proven to be the most reliable way to cut down the unnecessary fuel expenses.

Maintenance Cost

There is nothing more stressful than unexpected vehicle breakdowns. Unexpected breakdowns are costly for any business as fleet managers have to dispatch additional resources to rescue the situation. Improper maintenance or poorly designed maintenance procedures are among the leading factors that contribute to unexpected vehicle breakdowns. Here are some common fleet management mistakes that lead to high vehicle breakdown rates:

- Not having a preventative maintenance schedule
- Failing to identify any dangerous driving behaviours committed by drivers in your fleet
- Not monitoring vehicles' personal usage or after-hours usage
- Failing to monitor or track vehicles' movement or failing to provide efficient routing for drivers

Failing to address any of these issues may put your fleet at a greater risk of experiencing roadside breakdowns. Creating and planning a routine vehicle maintenance schedule allows maintenance technicians and fleet managers to discover any vehicle issues early.



It is also the necessary step to extend vehicle lifespans and ensure they are operating at peak performance and efficiency at all times. Preventative maintenance will significantly decrease the rate of unexpected breakdowns, saving businesses lots of money that would otherwise be spent on rescuing, recovering and repairing inoperable vehicles.

However, since many trucking companies and logistics companies have a large truck fleet that comprises hundreds of vehicles, it's almost impossible for humans to memorize the maintenance schedules and track each vehicle's service records. Fleet managers need the right tools and platforms that remind and assist them in managing complex maintenance schedules. They want a tool that can send alerts and notifications to them when a vehicle needs to undergo a series of routine maintenance checks and inspections. They want to retrieve and review any vehicles' maintenance history effortlessly. Simultaneously, the maintenance technicians would also appreciate an innovative way of tracking, updating and reporting vehicle maintenance status to the management team. Building a collaborative maintenance platform will benefit all parties and streamline cross-team collaboration workflow in the companies. With preventative maintenance in place, fleet managers can be more confident in vehicle performance and companies can expect to see a reduction in the number of unexpected breakdowns during daily operations. These all translate to a substantial amount of savings in operational and maintenance costs for businesses.





Cost of Collisions

A single roadway accident or collision can be 36 times most costly to businesses than a basic repair. Legal or financial disputes, compensation claims and insurance premiums resulting from an accident can quickly add up and severely impact businesses' financial status. Here are a few common mistakes that businesses might make that could potentially jeopardize a businesses brand image, drivers' safety and financial health:

- Inadequate or insufficient drivers' safety training
- Unsafe drivers schedule that may lead to drivers' fatigue
- Failing to establish internal safety rules and policies or failing to build a safety culture within the company
- Defective vehicles or equipment that pose risks to safe operations
- Failing to install dashcam on the vehicles, resulting in a lack of evidence available to protect drivers and businesses when an accident or dispute occurs

Building a comprehensive fleet safety management program is necessary for every fleet, no matter its size. Besides, companies also need to know how to protect drivers and themselves from unreasonable and false legal claims. When any company's vehicle gets involved in an accident, fleet managers want to know what exactly happened or what caused the accident. They need recorded videos and images of the accident to determine who is at fault and who should be held accountable.

Traditionally, if the dashcam was not installed on the vehicle, trucking and logistics companies will be in a disadvantageous situation during a legal dispute because they cannot supply evidence to prove they are not at fault. Nowadays, with the help of advanced car camera systems, drivers and fleet managers can be more confident when it comes to dealing with accidents. They can retrieve and review accident footage and defend themselves in court if they believe they should not be responsible for the accident. This is a huge leap in innovations for trucking and logistics companies, as it prevents businesses from paying compensation or penalties they should not pay. This allows businesses to keep more money in their pockets and drastically cut down on the costs when dealing with accidents and collisions. There is no doubt that cost management is important for every company. Knowing how to utilize tools to cut down unnecessary spending can help companies reserve cash for future projects and innovations.



A top-down approach allows businesses to conduct an internal evaluation of the financial health in different departments, so management can gain a clear idea of what needs to be done to balance the budget and maintain companies' financial sustainability in the face of uncertainty. Investing in technologies might initially cost businesses a significant amount, but businesses will be surprised by how much they can save in the long run.

2) Laws and Regulations

Conforming to local rules and regulations is the fundamental bottom line for any fleet operations. Fleet managers and drivers must gain a clear understanding of any applicable regulations before hitting the roads. Severe penalties will be issued to logistics operators who do not conform to the rules. Penalties include monetary fines, out-of-service declarations, drivers and carriers audits and carriers' safety rating downgrades. We will explore some common issues fleet managers and drivers face regarding maintaining and monitoring regulatory compliances.

Hours of Service Regulations

Hours of Service regulations are a set of requirements designed to ensure that drivers get enough rest during the day to perform safe driving. The rules are comprised of a series of strict time limits that govern how long drivers can drive during a day. Here are some common mistakes that fleet managers and drivers are likely to make if they comprehend the regulations inaccurately:

- Violate the 13 hours driving time rules (Based on Commercial Vehicle Drivers Hours of Service Regulations in Canada)
- Violate the 14 hours on-duty rules (Based on Commercial Vehicle Drivers Hours of Service Regulations in Canada)
- Violate the 70/120 hours rules; a driver cannot drive after having been on-duty for 70 hours in a 7-day cycle; a driver cannot drive after having been on-duty for 120 hours in a 14-day cycle (Based on Commercial Vehicle Drivers Hours of Service Regulations in Canada)



- Failing to respect and follow the local hours of service regulation when making cross-country trips, as each country or region may have different hours of service requirements
- Failing to complete and record driver log
- Complete false driver logs that contains inaccurate or incomplete information
- Poor, unorganized or outdated driver log book forms and formats

The inability to provide or supply complete and accurate driver logs is the top reason why companies fail inspections, get penalized or are fined. Managing a large set of driver's paper logs is a challenging task for any fleet manager. Paper logs are neither environmental-ly-friendly nor efficient in collecting and recording data and work shift information. It has become an enormous hassle for fleet managers as they are constantly struggling to keep the drivers logs up to date and as accurate as possible. Luckily, the paper log has become history as the new Electronic Logging Device (ELD) rule has gone effective in many countries, including the United States.

In Canada, the use of ELD will become mandatory on most of the federally regulated carriers' commercial vehicles by June 2021, with certain exemptions applied. The Electronic Logging Device rule requires ELD to be used by commercial drivers to prepare hours of service records. It allows fleet managers to easily track how long a driver has driven in a single day to ensure drivers respect their daily limits and accurately log their working hours.





Thanks to ELD's high connectivity, the driver's log can be directly transmitted to the company's cloud platform, simplifying and digitalizing the workflow and eliminating the need to print and store any paperwork. For regulatory compliance purposes, companies must consider investing in an ELD solution now to meet the fast-approaching deadlines. The ELD is also an effective tool in reducing drivers' fatigue and enhancing the overall fleet's safety.

Road Safety Regulations

How to ensure that drivers are following the rules when on the roads is also a main concern for fleet managers. There was no solution in measuring, quantifying and tracking drivers' driving behaviours and performance until today. The driver scoring dashboard is part of the innovation that comes to light thanks to constantly improving telematics technologies. It connects with a range of onboard vehicle sensors to track dangerous driving behaviours, such as speeding and harsh braking along the trip, and generates a safety score for each driver. Based on these scores, fleet managers can quickly identify drivers who consistently perform well during driving and drivers who are constantly violating the road rules. Additional customized training can be offered to drivers who consistently receive a low safety score, and awards and bonuses can be rewarded to drivers who achieve high safety scores. The scoring platform is the leading software that quantifies how well drivers adhere to road safety regulations. Adopting a more scientific way of measuring driver behaviours could lead to improved regulatory adherence and compliance across the entire fleet.

Case Study: A Package's Journey Across The Logistics Network

Have you ordered something online, and on the next day, the item you ordered just magically appeared at your doorstep? Have you ever thought about what happens behind the scenes that takes your package from retailers' warehouses to your home this fast? The United Parcel Service (UPS) delivered an average of 21.1 million packages daily worldwide. During the holiday season, that number could jump to more than 32 million packages delivered every day. It is a combination of advanced technologies, innovations and hard-working staff that make all this possible. This is the journey of how your package travels through the sophisticated logistics network and arrives at your home.

It all starts at the retailers' warehouse where your purchased items get selected, sorted, packaged and labelled so they can be ready to hand over to couriers and shipping companies.



The couriers use trailer trucks that can carry more than 2,000 boxes to transport packages from the fulfillment warehouse to the local sorting centre. During the trip, advanced vehicles' onboard safety features, including driver distraction camera and collision avoidance system, are always running in the background to keep drivers, vehicles and onboard assets safe. Fleet managers can easily track every trailer trucks' locations in real-time and quickly respond to any issues and delays. For drivers, thanks to the smart navigation and tracking system installed on every vehicle, they can always ensure that they have been placed on the fastest routes to their destination. For customers, reliable logistics technologies guarantee that your packages will arrive at your doorstep on schedule and give you real-time location updates on the status of your packages. Once the truck reaches the sorting centre, packages will be offloaded, sorted through sortation conveyor systems and transferred onto a variety of transportation modes. Depending on the distance to the destination or required delivery speed, your package may be loaded onto a long-haul truck, airplane, train or container ship.

Long-haul trucks play a vital role in connecting major sorting centres and distribution warehouses across the continent. These are the shipments processing hubs that prepare your packages for final delivery. Many long-haul trucks' journeys involve border crossings across different countries, where truck operators must ensure that vehicle operations comply with both countries' rules and regulations. Telematics products and devices are the best options for any logistics and trucking companies. They offer an unparalleled level of localized optimization that quickly adapts to the country where the vehicle operates in. The United States-Canada border is one of the busiest logistics transportation channels globally, with more than 30,000 trucks cross the border daily.



Though the United States and Canada have relatively similar commercial trucks regulations, there are still some small variances between them. For example, the drivers can drive up to 13 hours after eight consecutive hours of rest in Canada. In the United States, drivers can only drive a maximum of 11 hours after ten consecutive hours of "off-duty" time. If logistics operators or drivers are not familiar with the local regulations, they may face hefty penalties and fines. Telematics solution eliminates the risks of running into non compliance of rules by automatically identifying the vehicle's location and notifying drivers and fleet managers of the local rules and regulations, so they are always informed about the current rules that apply to them.

Another helpful feature that telematics can offer to drivers and fleet managers is the weigh station bypass service. Traditionally, drivers have to proceed to weigh stations or mobile inspection sites for inspection, which is time-consuming and interruptive to regular operations. These weigh stations are usually located along the highway close to the border between provinces and states.

But now, with weigh station bypass service, drivers have a high chance of receiving bypass clearance from the system if the trucking companies hold spotless safety records and high safety scores. It can significantly boost system productivity and maximize drivers' on-duty time as drivers no longer have to stop at these weigh stations and inspection sites. A more efficient logistics network and fewer stops along the trip translate to faster and more reliable package transport and delivery service for customers.

After the truck completes the long-haul trip and arrives at the final destination sorting facility, the staff will be actively preparing for the packages' last-mile delivery and loading it onto small delivery trucks. Drivers will then visit each residential and business unit assigned to them for package delivery. However, the urban road network and traffic conditions are significantly more complex than those on highways and expressways. Drivers need advanced navigation tools to help them avoid traffic and complete all the assigned work within the hours of service limit. At the same time, they want a more intuitive and easier to use mobile platform that clearly display their upcoming tasks and delivery schedules.



Telematics is the only solution capable of providing crucial information that drivers need in one simple place in an organized fashion. There is a wide selection of add-ons available in the telematics world, giving fleet managers and drivers complete freedom to customize a solution package that works best for them. By adding routing applications to the system, fleet managers can re-route drivers and eliminate wasted time having vehicles stuck in congestion. With smart routing management in place, drivers can now quickly and safely deliver your packages right to your doorstep.

Future Of Logistics

The future of the logistics industry and trucking sectors have never looked brighter. With advancements in technologies in the automobile sector and improved telecommunication technologies, a more connected, smarter and greener logistics system is well on the horizon. Electric trucks, powered by sustainable energy sources, will lead a revolution in the logistics field by drastically cutting down carbon emissions and providing a quieter, more comfortable driving experience to drivers. Businesses can expect a considerable reduction in operational costs and fuel costs by adopting electric trucks. Telematics offers step-by-step guidance and suitability assessment helping fleet managers to smoothly transition into a greener fleet. Fleet managers can see how much they can save in the long run by comparing before and after the fleet electrification process.

The large-scale adoption of 5G, the next generation of wireless technology, is a catalyst for developing fully autonomous vehicles. Safer and smarter autonomous vehicles require ultrafast data transfer and internet connections.





Autonomous vehicles are equipped with hundreds of sophisticated sensors to collect real-time data and images, but it requires a fast wireless connection and high data processing capabilities to handle, process and analyze these data to perform calculation and image processing. The fifth-generation wireless technology brings fast, reliable and responsive networks to connect every asset in the logistics network.

Autonomous trucks will completely transform the whole trucking and logistics industry and bring highly precise, safe and reliable transport experiences for every logistics business. It's a giant leap in technological innovation as it completely eliminates the need for any vehicle operator. It's foreseen to be the game-changing tool that elevates the entire logistics network's efficiency, productivity and safety to the next level.

Conclusion

Similar to many other industries, the logistics and trucking sectors are confronting rapid changes and immense challenges, and like all changes, there are always risks and opportunities. New customer's expectations, new technologies, latest market trends and new operational and business models push all the industry players to change and evolve. During the current challenging time, where the country's travel restrictions are keeping the world far apart from each other, the logistics network is still operating at its full power of connecting the world and bringing the globe closer. There is no doubt that we will rely more on the logistics network in the future, but it will also keep innovating and progressing to serve our lives better.

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