

Transportation, Distribution, and Logistics Bridge Curriculum

Social Studies Resources

TDL Social Studies Outcome #1 - Activity 1

How a Steel Box Changed the World: A Brief History of Shipping

By [GTCrepost](#) March 6, 2019

Container shipping moves 95% of all manufactured goods around the world. In 2017 more than four trillion dollars of products were sent over the oceans. It's an industry that underpins the global economy. But it wasn't always as big or as efficient as it is today.

The idea of shipping started in 3rd Century BC when merchants realized that sending products overseas was cheaper and faster than by land. Early on, goods were loaded onto ships in sacks, barrels, and wooden crates with scores of dock workers squeezing them on decks or in tight spaces below. Ships often spent more time at ports than sailing, and not much changed until 1956. That is when American truck driver Malcolm McLean stacked 58 metal boxes on a ship going from New Jersey to Houston. This idea completely revolutionized the industry. The containers not only protected the products, but when the ships docked at ports, truck beds and freight trains could take them away without repackaging. A flurry of innovation followed, and container sizes were standardized. In 1966 Moore-McCormack Lines started the first transatlantic container service. And then in 1968 one of the first modern container ships hit the water. The Japanese Hoki Maru carried 752 20-foot containers, using a standard still used today. Cargo can now be moved from purpose-built vessels to rail and roads. All in massive volumes, cutting transport costs by at least 75%. This led to the emergence of global shipping behemoths like Denmark's Maersk line, France's CMA CGM, and China's Cosco.

By the 1980s around 90% of manufactured goods were containerized. From designer dresses and food to home goods, electronics and heavy machinery. Globalization exploded as ships moved Asian goods to the West, and vice versa, making stops at dozens of ports along the way. Recently the Panama and Suez canals were expanded allowing for bigger ships to cross and in greater numbers but it's not all been smooth sailing.

The industry has been plagued by too many ships in the water sparking a series of price wars that plunged many operators deep into the red and completely sank others. This caused a wave of consolidation seeing the top 20 ocean carriers shrink to 11, a number that is expected to get even smaller. Shipping has also seen criticism from government and environmentalists, who say it's responsible for around a quarter of the world's nitrogen-oxide pollution. In response, operators are adopting cleaner fuels, like natural gas.

Today the industry continues to boom. Container ships are as high as the Empire State Building if turned upright and can move more than 20,000 boxes each. A single container can hold 10,000 iPads, at a cost of \$0.05 each from Shanghai to Hamburg. The average TV coming to the US from China cost less than \$2 to ship. The most recent growth has been in refrigerated shipping. Fresh produce, food, and flowers that once only moved by plane are now shipped on satellite-tracked reefer boxes that keep them fresh. Bananas can last in these for up to 50 days.

So what does the future hold? Likely, crew-less behemoths running on batteries that can move 50,000 containers. Global cargo distributed through blockchain technology that will eliminate paperwork and further cut costs. Later this year the first so-called "Tesla of the seas" will hit the water in the Norwegian fjord. Moving fertilizer from a production site to an export port. The ship will replace thousands of truck routes through populated areas.

Transcript of video:

<https://www.wsj.com/video/series/a-brief-history-of/how-a-steel-box-changed-the-world-a-brief-history-of-shipping/CF460889-9984-483E-AF44-324330B89ECA>

TDL Social Studies Outcome #2 - Activity 1

Driving Through Seasons: Weather Challenges and How to Overcome Them in Trucking

October 15, 2023

<https://www.serviceonetransportation.com/weather-challenges-and-how-to-overcome-them-in-trucking/>



At Service One Transportation, we understand that truck driving is not merely a job, but a lifestyle. It requires dedication, skill, and the ability to navigate through a variety of challenges, including those presented by changing seasons. This post will delve into the diverse weather conditions our drivers face and how they can overcome these hurdles.

The Unpredictability of Spring

Spring brings a sense of renewal, with flowers blooming and trees budding. However, for truck drivers, it also brings unpredictable weather patterns. One moment it could be sunny, and the next, a heavy downpour could reduce visibility and make roads slippery.

To overcome these challenges, our drivers always stay updated with the latest weather forecasts. This allows them to be prepared for sudden changes and plan their routes accordingly. They also maintain safe following distances, especially during rain, to ensure there's ample stopping time.

The Heat of Summer

Summer might seem like the perfect trucking season with its long daylight hours and generally clear roads. However, high temperatures can cause issues. Extreme heat can lead to tire blowouts, engine overheating, and dehydration for the driver.

Our drivers combat these challenges by conducting thorough pre-trip inspections and paying close attention to tire pressure and coolant levels. Hydration is also critical. They ensure they have enough water on board before setting off.

The Beauty and Beast of Fall

Fall is known for its beautiful foliage, making for some scenic drives. However, fallen leaves, when wet, can create slippery surfaces, and early frost can lead to icy patches on the road.

Our drivers are trained to handle these conditions. They watch out for leaf piles on the road and drive slowly in areas prone to frost. Regular inspections of the braking system are also carried out, as brakes are crucial for safe driving in these conditions.

The Harshness of Winter

Winter is perhaps the most challenging season for truck drivers. Snow, ice, and freezing temperatures can create hazardous driving conditions and cause mechanical problems for the truck.

At Service One, we equip our vehicles with winter tires for better traction and ensure they're well-maintained to prevent breakdowns in the cold. Our drivers also carry emergency kits complete with food, water, warm clothing, and blankets in case they get stranded.

The Power of Preparation

Regardless of the season, preparation is key in the trucking industry. This includes not only physical preparations like vehicle maintenance but also mental readiness. Our drivers are trained to stay calm under pressure and make safety their top priority, no matter what Mother Nature throws their way.

Moreover, Service One Transportation is proud to have a team of professional drivers who understand the importance of their roles. They navigate through each season with an unwavering commitment to delivering goods on time and ensuring the supply chain remains unbroken.

As we drive through different seasons, we continue to learn, adapt, and grow. After all, every challenge overcome is a testament to our resilience and dedication as a family-owned trucking company in Wisconsin.

At Service One, we believe that our drivers are not just employees, but vital members of our family who keep America moving, no matter the weather. And for that, we thank them.

Join us at Service One, where we value your skills, respect your profession, and offer you the flexibility and benefits you deserve. Whether you're a new driver or an experienced owner-operator, we have a place for you in our family. Apply today and start driving through the seasons with us.

Load and Go: A Comprehensive Guide to Efficient Load Management for Truck Drivers

January 6, 2024

<https://www.serviceonetransportation.com/load-management/>



Truck driving is a demanding profession that requires a unique set of skills and knowledge. One essential aspect of the job is load management, which refers to the process of loading, transporting, and unloading goods. Effective load management can significantly improve your efficiency, safety, and overall job performance. This comprehensive guide will provide you with valuable tips and strategies to enhance your load management skills.

Understanding the Importance of Load Management

Before we delve into the specifics, it's crucial to understand why load management is so important. Proper load management ensures that goods are safely and efficiently transported from one location to another. It minimizes the risk of damage to the cargo, helps maintain the vehicle's balance and stability, and maximizes fuel efficiency. Improper load management, on the other hand, can lead to accidents, increased fuel consumption, and unnecessary wear and tear on the vehicle.

Proper Loading Techniques

The way you load your truck can significantly impact its handling and performance. Here are some key considerations:

- **Weight Distribution:** The weight of the cargo should be evenly distributed across the truck's axles. Uneven weight distribution can make the truck difficult to control and increase the risk of tipping over.
- **Securing the Load:** All items should be securely fastened to prevent them from shifting during transit. Use straps, chains, or other securement devices as appropriate.
- **Overloading:** Never exceed the truck's maximum payload capacity. Overloading can damage the vehicle and make it unsafe to drive. Refer to the manufacturer's specifications for the maximum weight and dimensions allowed.
- **Loading Order:** Start by loading the heaviest items first, placing them near the front of the truck. Then load lighter items on top and towards the back. This will help distribute weight evenly and maintain vehicle stability.
- **Avoid Overhang:** Cargo that protrudes beyond the truck's edges can be dangerous for both the driver and other motorists. Make sure to secure overhanging items properly or choose a larger truck if necessary.
- **Stacking:** When stacking items, make sure to evenly distribute weight and stack boxes carefully to prevent them from toppling over during transit.
- **Fragile Items:** Fragile items should always be packed separately and marked as fragile to prevent damage during transport.
- **Special Considerations:** Certain types of cargo, such as hazardous materials or live animals, require special handling and may have specific regulations that must be followed. Always consult with the appropriate authorities before transporting these types of items.

Planning Your Route

Planning your route in advance can help you avoid delays and ensure timely delivery of the goods. Consider factors such as traffic conditions, road work, weather challenges, and the availability of rest stops. Use a reliable GPS system and keep an updated map handy for reference.

Regular Maintenance and Inspections

Regular maintenance and inspections are crucial for safe and efficient load management. Check the condition of your truck and its load securement devices before each trip. Pay particular attention to the tires, brakes, and suspension system, which can significantly affect the truck's handling and stability.

Compliance with Regulations

Truck drivers must comply with various regulations regarding load management. These may include weight limits, securement requirements, and restrictions on certain types of cargo. Familiarize yourself with these regulations and ensure that your practices are in line with them.

Investing in Technology

Advancements in technology can significantly streamline the load management process. For example, telematics systems can provide real-time data on vehicle performance and cargo status, while loading automation can ensure accurate and efficient loading. Consider investing in these technologies if they're within your budget.

Training and Continuous Learning

Lastly, remember that effective load management is a skill that can be honed over time. Seek out training opportunities, stay updated on industry trends, and learn from experienced drivers. Continuous learning will enable you to adapt to changing conditions and continually improve your load management practices.

In conclusion, efficient load management is a critical aspect of truck driving. By understanding its importance and implementing the strategies discussed in this guide, you can enhance your performance, safety, and job satisfaction. So load up, plan your route, and hit the road with confidence!

4 Ways Unions Make Our Economy and Democracy Stronger

The Center for American Progress - Jul 11, 2024

<https://www.americanprogress.org/article/4-ways-unions-make-our-economy-and-democracy-stronger/>



Members of the Boston Teachers Union and their supporters rally in support of contract measures in Boston's Nubian Square on June 5, 2024. (Getty/The Boston Globe/Erin Clark)

Unions are a critical force in American society, ensuring that everyday Americans can earn decent pay and benefits and have a voice in our democracy. Study after study has shown that unions make our economy and democracy stronger by boosting wages for workers, reducing wage inequality, increasing voter turnout for union and nonunion voters alike, and providing a counterbalance to wealthy interest groups. This is part of a historical tradition of unions playing a powerful role for American workers: Unions helped create the 40-hour workweek, child labor laws, and improvements in health insurance. At their height in 1945, unions represented one-third of all U.S. workers.

Unfortunately, decades of attacks on unions, weak U.S. labor laws, and a changing economy have caused union membership to steadily decline; in 2023, unions represented just 10 percent of workers. However, in recent years, the popularity and activity of unions has grown to levels not seen in decades, bolstering their ability to deliver on these benefits.

The growing popularity of unions

Growing numbers of workers are trying to form unions. There was a more than 50 percent jump in union petitions from 2021 to 2022, with a continued increase into 2023. Strike activity has also increased significantly, overwhelmingly led by unionized workers: There were 33 major strikes in 2023 involving 458,900 workers—the largest number of strikes in two decades.

Meanwhile, nearly half of nonunion workers say they would like to join a union, and more than two-thirds of the public support unions. Gen Z, in particular, is the most pro-union generation alive today, even more so than older workers when they were the same age.

Unions are increasingly popular for good reason. New data confirm that unions raise wages and wealth for all workers, while their decline explains the rise in wage inequality. At the same time, unions increase political participation and ensure the middle class is represented across a range of issues.

1. Unions raise wages for workers from every background

When workers come together in unions, they can negotiate for higher wages and benefits. Research has consistently demonstrated that unions raise wages for various types of workers. New data on 2023 workers from the “earner study” portion of the Bureau of Labor Statistics’ Current Population Survey (CPS) confirm these findings.

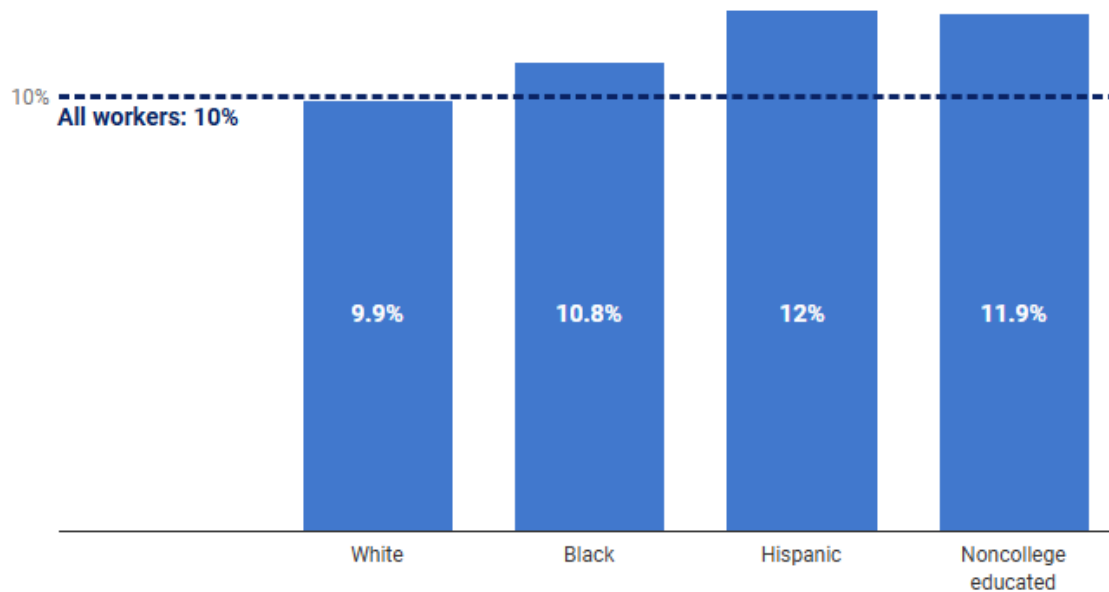
Figure 1 shows the union wage premium—or the percent change in weekly earnings due to union membership—for various types of full-time workers based on the new data. After controlling for factors such as race, gender, age, occupation, and education, among others, the union wage premium for all workers is 10 percent. Thus, on average, workers who join a union can expect to see a 10 percent increase in their weekly earnings; specifically, women who join a union can expect a 7.8 percent wage increase. The union wage premium is highest for Hispanic workers (12.0 percent) and workers without a college degree (11.9 percent), meaning union membership can close racial and educational wage gaps. Notably, these figures may underestimate the total impact

of unions on all workers' pay due to the "union threat effect," which occurs when union workplaces put upward pressure on wages at nonunion companies.

FIGURE 1

Unions raise wages for workers across demographic groups

Union wage premium over similar nonunion workers



This sample includes all employed full-time workers between the ages of 25 and 64, excluding self-employed workers. Wages represent workers' weekly earnings (rounded) at their current job in 2023 dollars before deductions. A worker is considered part of a union if they are covered by a union contract. Wage premiums control for several characteristics of workers, including their sex, race, education, age, region, citizenship status, industry, and occupation. Source: Authors' analysis of 2023 Earner Study (monthly sample) in Sarah Flood and others, "Integrated Public Use Microdata Series, Current Population Survey Data for Social, Economic, and Health Research: Version 8.0 (dataset)" (Minneapolis: Minnesota Population Center, 2020), available at <https://cps.ipums.org/cps/>. Chart: Center for American Progress

In addition, union membership increases workers' wealth—the total value of what people own minus the value of all their debts. Unions can help increase household wealth by improving job stability and providing enhanced benefits such as pension plans and health insurance. Recent Center for American Progress analysis of the Federal Reserve's Survey of Consumer Finances (SCF) shows that union households hold \$338,482 in median wealth while nonunion households hold \$199,948. Thus, a typical union household is 1.7 times as wealthy as a typical nonunion household.

How unions help workers: The story of Raquell Rivera

The economic power of unions may be best exemplified by the stories of those like Raquell Rivera, a Michigan resident who went from living in a homeless shelter to owning her own home in the span of four years. In a recent op-ed for *The Michigan Independent*, Raquell shared that after leaving home at the age of 19 due to unsafe living conditions, she spent two years couch-surfing and living in youth shelters. One day, she saw an advertisement that encouraged her to apply for a pre-apprenticeship program offered by Michigan's Women in Skilled Trades (WIST) program. Today, she's a journeywoman carpenter and proud member of Carpenters Local 1004; and last November, she bought her first home.

Raquell shows how unions can help make a middle-class lifestyle a reality for workers.

2. The decline in union membership helps explain the rise in wage inequality

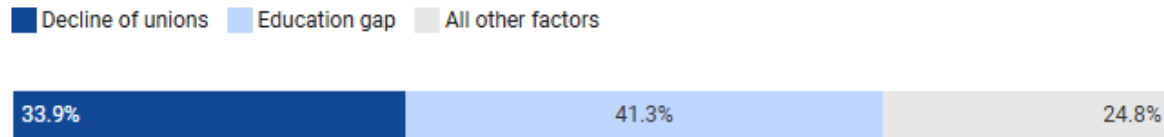
The decline in union membership has eroded some benefits of the union wage premium because fewer workers are receiving them. Due in part to union decline, workers' real wages have remained stagnant, and there has been a corresponding increase in wage inequality.

As Bruce Western of Harvard University and Jake Rosenfeld of the University of Washington found when looking at the effect of union density on rising wage inequality, the decline of unions from 1973 to 2007 explains up to one-third of rising wage inequality among men and one-fifth of rising wage inequality among women. (see Figure 2) Many other studies have similarly reached the conclusion that declining union strength is a key contributor to rising wage inequality.

FIGURE 2

The decline of unions accounts for roughly one-third of the rise in male wage inequality

Decomposition of the change in variance of log hourly wages for full-time men in the private sector, 1973–2007



Note: The "decline of unions" includes the impact of the declining union membership rate and industry-region unionization. "Education gap" represents the growing wage inequality between college-educated workers and those without a college degree. Source: Bruce Western and Jake Rosenfeld, "Unions, Norms, and the Rise in U.S. Wage Inequality," *American Sociological Review* 4 (76) (2011): 513–537, available at <https://www.asanet.org/wp-content/uploads/savvy/images/journals/docs/pdf/asr/WesternandRosenfeld.pdf>. Chart: Center for American Progress

Rising wage inequality hurts workers. It leads to economic and political concentration of power, erodes social cohesion, reduces intergenerational mobility, and decreases the share of wealth going to the middle class.

3. Unions increase political participation in our democracy

In addition to economic benefits, unions increase political participation, particularly voter turnout, in democracies. They help decrease the costs and increase the benefits of participation, so more people get involved. Unions achieve this in a number of ways—from simply knocking on doors and letting people know about an election to helping people get to the polls.

In addition, unions inform their members of the benefits of democratic participation, disclose which elected officials have provided the most support, and encourage members to vote for pro-worker politicians. Therefore, it is no surprise that research

shows weakening unions lead to fewer working-class candidates serving in state legislatures and Congress.

While being a union member makes a person more likely to vote and participate in politics, unions also increase participation among nonmembers, as nonunion members are often the recipients of union efforts to educate and mobilize. For example, according to analysis by political scientists Benjamin Radcliff and Patricia Davis, unions help increase voter turnout rates across states. After applying relevant controls, a 1 percentage point increase in union density in a state increases voter turnout rates by 0.20 to 0.26 percentage points. In other words, if unionization were 10 percentage points higher during the 2020 presidential election, 3.1 million to 4 million more Americans would have voted.

As an increasing number of citizens feel their democracy is no longer responsive to their needs, the role unions play is ever more important.

4. Unions are one of the few interest groups that represent middle-class interests

Lastly, across a range of issues, unions represent and advocate for policies central to the middle class. According to research by political scientist Martin Gilens, while most powerful interest groups advocate for policies that predominantly benefit their narrowly defined members, relatively few interest groups focus on policies that the middle class supports. All in all, of the 40 interest groups Gilens studied, only eight strongly supported the interests of the middle class, including all five of the unions studied.

Of the organizations that represent middle-class interests, unions are arguably the most important because they advocate for a wide range of issues—from raising the minimum wage to increasing health care coverage and promoting retirement security. Other

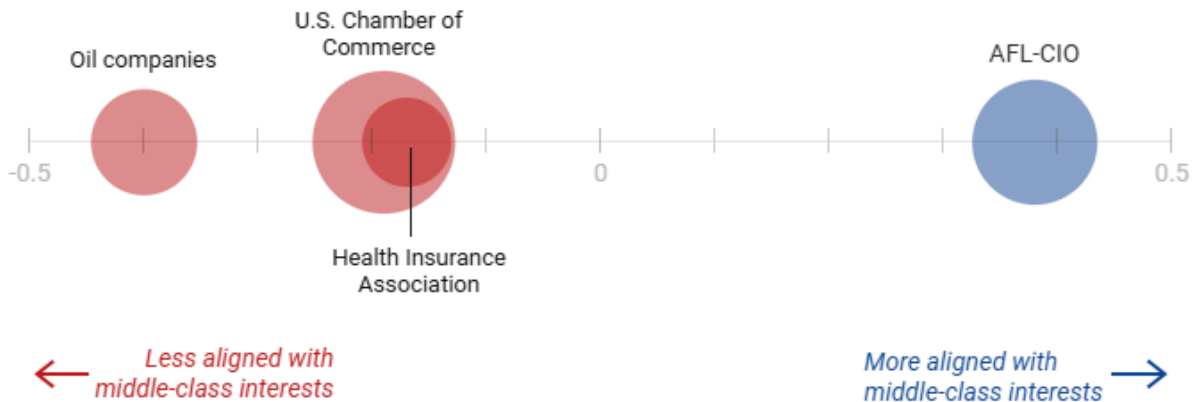
groups aligned with the middle class, such as universities, generally take positions on a relatively small number of the policy areas Gilens reviewed.

Figure 3 shows a modified analysis of Gilens' research, focusing on the effect of unions. It arranges four economic policy-based interest groups along an axis based on their correlation with middle-class policy interests. The correlation is based on how similar the policy preferences of Americans at the 50th income percentile are with an interest group's preferences—as determined by poll questions from 1981 to 2002. The size of each interest group is based on the number of proposed policy changes that group supports. The AFL-CIO was chosen to represent unions because it is the largest federation of unions in the United States.

FIGURE 3

Unions support middle-class interests across a range of issues

Correlation between select interest groups' policies and middle-class interests, with bubble size corresponding to each interest group's number of proposed policy changes



Interest groups shown have statistically significant correlations. Bubble size increases proportionally to the number of proposed policy changes. Source: Martin Gilens, *Affluence & Influence: Economic Inequality and Political Power in America* (Princeton, NJ: Princeton University Press, 2013). Chart: Center for American Progress

As shown in Figure 3, the AFL-CIO is much more closely aligned with middle-class interests than the Health Insurance Association (now known as AHIP), the U.S. Chamber of Commerce, and oil companies. In Gilens' dataset, the AFL-CIO advocated for 301 policy changes compared with the Chamber of Commerce's 392, oil companies' 216, and the Health Insurance Association's 152. Thus, unions help advance numerous major policy changes that are more closely aligned with middle-class interests.

At the same time, anti-middle-class interest groups spend significantly more money on lobbying, meaning unions remain an important check on their power. For example, despite their similar range of supported policy changes, the U.S. Chamber of Commerce spent \$69.6 million on lobbying in 2023, compared with only \$5.2 million by the AFL-CIO.

If the middle class is to regain its policymaking voice and economic strength, reinvigorated unions will be critical in the fight for their interests.

5 Top Hazards for Commercial Trucking and How to Prevent Them

December 14, 2021

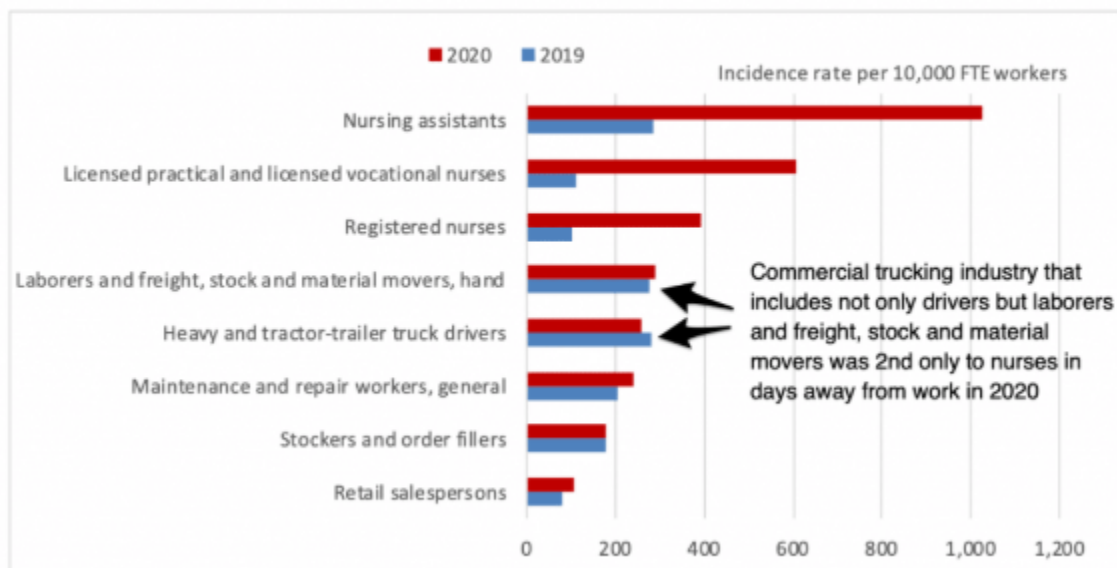
<https://www.libertysafety.com/safety-blog/transportation/risks-facing-truck-drivers/>

The transportation industry is an essential part of the U.S. economy, and without it, our supply chain would collapse. Yet research indicates that truck drivers were second only to nurses on days away from work due to injury or illness. Identifying the risks and applying safety measures are critical to keeping trucks on the road.

According to American Trucking Association research, 72.5% of the supply chain load goes by truck. And the 2020 Bureau of Labor Statistics economic trends show that commercial trucking employed the most people in the transportation industry.

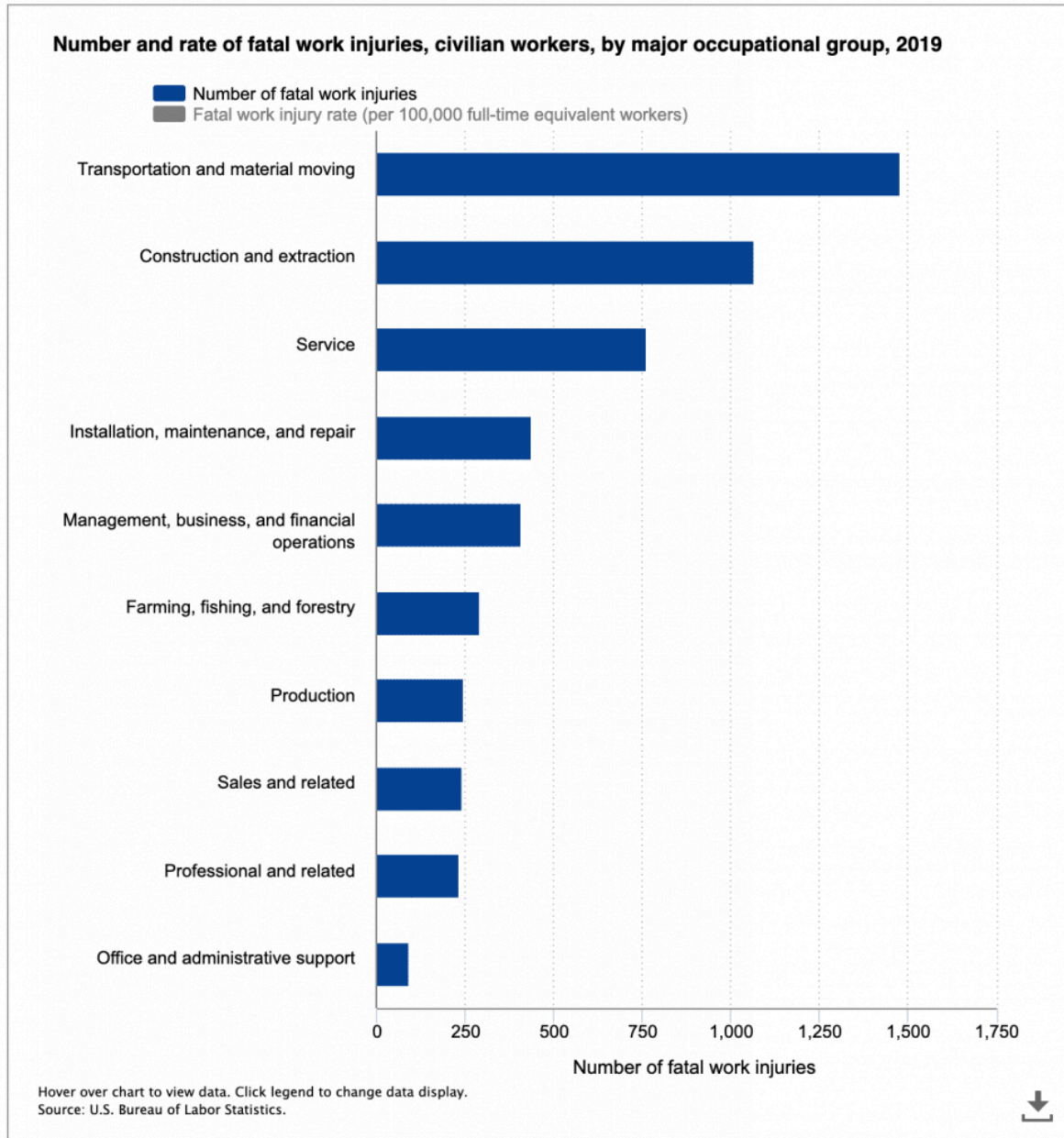
But this past year, it's been a challenge to keep the industry moving. Commercial trucking was second only to nursing in a year monopolized by a pandemic for reported days away from work (DAFW) due to injury or illness.

Chart 3. Incidence rates for cases resulting in days away from work in selected occupations, private industry, 2019-20



Source: Bureau of Labor Statistics

And the [Bureau of Labor Statistics](#) (BLS) reports that events involving transportation incidents account for the largest share of workplace fatalities, most of them in long-distance trucking.



OSHA's 5 Main Trucking Hazards and Suggested Preventions

The [Occupational Safety and Health Administration](#) (OSHA) is aware of the statistics and has identified the most commonly reported safety and health hazards along with

suggested solutions. We've listed them below including some of the most popularly requested PPE.

1. Overexertion/fatigue

Reaction times, awareness, and decision-making abilities fall by as much as 50 percent when someone is sleep-deprived.

Long work hours may also increase the risk of injuries and accidents and contribute to poor health and overall worker fatigue. Support and intervention are essential to combat a demanding work schedule and the fatigue that comes with it.

2. Strains and Sprains

Loading or unloading a truck or lifting heavy boxes, bins, garbage cans, etc., can lead to musculoskeletal disorders (MSD) of the neck, back, and upper extremities.

Many industries have successfully implemented ergonomic interventions that include modifying existing equipment, changing work practices, and purchasing new tools or other devices to assist.



Caption: Along with efficient processes, the DuraWear™ back support belt can offer ergonomic assistance to workers lifting heavy objects.

3. Slips, Trips, and Falls

Falling from the cab of a truck, falling on stairs, or into other worksite openings are possible reasons for workplace injury for truckers. Setting in place controls is the first suggested action.

Keep in mind these types of accidents can be significant. Safety boots are an excellent idea to have in the truck cab for workers to use at job sites too.



Caption: The Durawear™ yellow rubber slush boots are perfect for an over the shoe option for your workers. They're fabric lined with a bar-tread outsole that offers excellent slip resistance.

4. Getting Struck By or Against Objects

Being struck or pushed against objects may happen when a driver opens containers, hitches, or attaches trailers to trucks.

OSHA mandates that employers enforce head protection for workers who may be at risk for head injuries. Hard hats are also often necessary and sometimes required at delivery sites.



Caption: The DuraShell™ cap style hard hat comes in assorted colors with a low profile design and easily adjustable suspension for a comfortable fit. Meets ANSI Z89.1 Standard Type 1, Class C, G, E.

5. Transportation accidents

More than half of fatalities for truck drivers are caused by vehicle-related injuries inside or outside the cab. Proactive employer policy can do much to promote vehicle safety on and off the job.

The OSHA manual stresses the importance of being seen on the job site for just this reason. A hi-vis vest means a worker is less likely to be involved in an accident during the day or night or even inside around people operating moving machinery.



Caption: A HiVizGard™ Class 2 all mesh vest will ensure visibility with its 2” wide silver retro-reflective stripes and bright yellow color. It’s easy to wear with a zipper front closure and plenty of pockets.

Other Frequently Used Protective Equipment in the Trucking Industry:

Work Gloves

From loading freight to hooking up a trailer, truck drivers need hand protection. Safety gloves that are specially designed for flexible coverage are a good choice.



Caption: A pair of Insulated Grain Cowhide Drivers Gloves will protect a worker's hands in and out of the cab. They are 3M® Thinsulate® lined with a keystone thumb, providing flexibility and giving it an ergonomic design.

Safety Glasses

Protecting a workers' eyes is something often overlooked, but because the environment at any destination may be unknown, it's a good idea to be prepared.



Caption: Sporty, semi-frame, and lightweight, the iNOX™ ROADSTER II™ safety glasses meet or exceed the ANSI Z87.1-2015 standard requirements.

Hearing Protection

Another overlooked precaution, hearing protection, is essential when around loud machinery or other tractor-trailers. The disposable styrofoam ones work well and are easy to travel with.

Caption: The DuraPlugs™ disposable foam earplugs are super soft and have easy insertion and removal with a noise reduction rating of 32dB. One size fits all.

Available Information and Resources

Truckers are an integral part of the movement of materials between air, land, and sea. It's every safety manager's job to ensure that their drivers stay as safe as possible through it all.

The [U.S. Department of Transportation \(DOT\)](#) provides links to the primary safety sites within the DOT that can help address any health and safety issues in each area.

Air

- [Safety](#). The Federal Aviation Administration (FAA) develops and implements tools and processes to facilitate more effective use of safety data, both inside and outside the agency, to help improve aviation safety.

Land

- [Reducing Highway Fatalities](#). The Federal Highway Administration (FHWA) reports on the national fatality and injury rates every year.
- [Driving Safety](#). National Highway Traffic Safety Administration (NHTSA) provides information on distracted driving, driver education, and occupant protection among other topics.
- [Federal Railroad Administration \(FRA\)](#) makes available railroad safety information, including accidents and incidents, inspections, and highway-rail crossing data.

Sea

- **Marine Safety Center** works directly with the marine industry in the development of safety standards and policies, response to maritime casualties.

Improving worker safety

Taking a closer look at commercial trucking means addressing the disproportionate number of workplace injuries and fatalities that occur. Keeping those workers safe is a critical component to keeping it running.

Identifying the risks, putting the appropriate strategies in place, and using the recommended PPE will help the workers in the commercial trucking sector and help keep our economy moving forward.

When it comes time to find the best selection of PPE, whatever type of fleet you are in charge of keeping safe, Liberty Glove and Safety can help. Contact us to learn more about our line of personal protective equipment.

20 Safety Tips for New and Seasoned Truck Drivers to Remember

By: Buchanan Hauling, September 25, 2023

<https://www.buchananhauling.com/resources/blog/20-safety-tips-for-new-and-seasoned-truck-drivers-to-remember>

Let's clarify from the outset that statistically, truckers exhibit a higher level of safety on the road compared to most other drivers. A University of Michigan study underscored this fact, revealing that commercial vehicle accidents were primarily caused by passenger cars (81-91%), with 70% of these accidents attributable to actions taken by passenger vehicle drivers and 16% to errors made by truck drivers, occurring simultaneously in 10% of cases.



Now, you might wonder why we're discussing safety as a trucking and logistics firm, given this commendable track record. The biggest reason, at Buchanan, we take immense pride in 'Setting the Standard for Safety, One Mile at a Time'. We actively seek and hire safety-conscious drivers for our team.

The other reason we're sharing safety tips within a trucking and logistics company pertains to concerning trends in the trucking industry. Jury awards exceeding \$10 million have surged dramatically, with the average size of verdicts exceeding \$1 million skyrocketing nearly 1,000% from 2010 to 2018, leaping from \$2.3 million to \$22.3 million. What makes things worse is a substantial portion of lawsuits targeting truckers and trucking companies revolve around claims of driver negligence.

Our aim is to empower truckers to take a proactive approach to their preparation and enhance their defensive driving skills while operating a truck. In the quest to understand the causes of serious accidents, the Federal Motor Carrier Safety Administration

(FMCSA) and the National Highway Traffic Safety Administration (NHTSA) conducted the Large Truck Crash Causation Study (LTCCS). This study unveiled critical events leading to collisions, including 32% involving lane departures, 29% due to speed, cargo shifts, vehicle failures, or adverse road conditions, and 22% stemming from rear-end collisions. Drivers were found responsible in 87% of cases, primarily due to decisions and awareness issues, such as excessive speed, tailgating, distractions, and inattention. While vehicle maintenance contributed to just 10% of crashes. Regardless of your experience, it never hurts to safeguard both your wallet and your life with these 20 straightforward safety tips.

1. Prioritize Yourself

Your well-being is crucial

Maintain health by eating, exercising, and resting adequately

Set a goal to get 7+ hours of sleep nightly

Adjust your truck's seat, steering, and device navigation for comfort

Find safe locations to take short walks that do not include the shoulder of a highway



2. Plan Your Trip in Advance

Enhance your safety significantly by pre-planning your trip. Stay updated on roads, traffic, construction, and state regulations. Plan meticulously before starting your journey. Be vigilant about potential hazards, including:

High crime areas: Shipments attract theft, endangering drivers. Many cargo thefts and hijackings occur within a few miles of the load's origin. Choose safe stops, avoiding poorly lit or remote places

Traffic congestion: High traffic increases accident likelihood. Identify congested route segments, ready to slow down or take an alternate path
Find safe locations to take short walks that do not include the shoulder of a highway

3. Know the Forecast for Where You Will be Driving

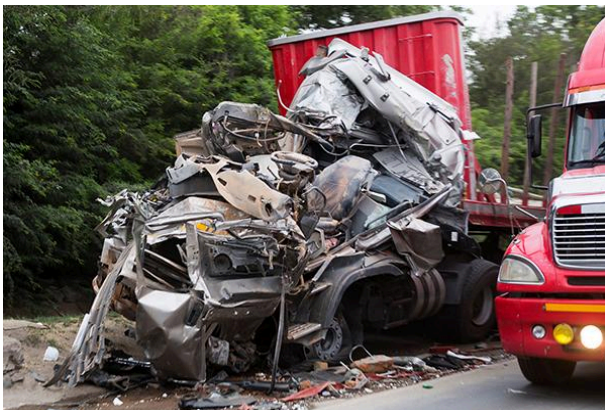
Inclement weather leads to 21% of crashes. Utilize bad weather tips and Buchanan driving policy.

4. Disconnect

Keep your phone down. Buchanan prohibits mobile use while driving commercial vehicles. Nearly 500,000 crashes per year involve large trucks. Safe, attentive driving can help avoid road problems.

5. Simple Safety - Entries and Exits

Use three points of contact when entering or leaving your truck. Prevent slips and falls by maintaining a secure grip with both hands. You will also want to be sure you buckle up before getting on the road. It's not only a law but a safety imperative. Wear your seatbelt always. CDC states you're 30 times more likely to be ejected during a crash without it.



6. Defensive Driving

Defensive driving is your greatest safeguard, considering you lack control over other drivers' actions. Most motorists lack safe practices around big trucks.

To maintain effective defensive driving:

Watch Blind Spots: Stay alert to blind spots: around 10-15 feet ahead, behind the trailer, on the passenger and driver sides

Lane Change: Be cautious when turning or switching lanes

Safe Following Distance: Follow FMCSA guidelines of 1 second per 10 feet of vehicle length at 40 mph, with an extra second for speeds over 40 mph. Class A truck and trailer's 72-foot length calls for 7 seconds under 40 mph and 8 seconds over

Stay Prepared: Emergencies arise quickly, especially on highways. Stay calm; if you become stressed, find a safe spot to regain composure. Monitor conditions a quarter-mile ahead and adjust speed for potential risks

Curvaceous Caution: Large trucks should reduce speed on curves, even if the limit seems acceptable. Slow 5-10 mph below the posted speed to prevent tipping due to your vehicle's center of gravity

7. Check Mirrors

Mirror check every 8-10 seconds to catch vehicles in blind spots. Maintain awareness of mirrors, hood, road, and gauges.

8. Use Lights for Visibility

Turn headlights on 30 minutes before dusk until 30 minutes after sunrise. Signal early and keep signals on until the turn is complete.

9. Keep Your Cargo Secure

A poorly secured load can lead to a tractor-trailer unit losing control through jackknifing or rolling over. Even for flatbed loads, improper securing poses risks to drivers and others on the road. To prevent shifting or falling cargo, employ suitable securing tools for both your equipment and load type. For dry vans and refrigerated cargo, employ load locks, airbags, and cinch straps as necessary. For flatbed trailers, adhere to load-specific regulations using appropriate straps or chains as required, in line with DOT guidelines.



10. Maintenance Schedules

Maintaining a routine preventive maintenance plan is vital for safe commercial vehicle operation. In an article, FMCSA highlights maintenance as a prime factor behind tractor-trailer accidents. Establish a schedule with a mechanic if you don't already have one. Buchanan Hauling, as of the writing of this article, offers tire and brake work, repair to lights, DOT inspections, and preventative maintenance services to trucks even if they are not part of their fleet.

11. Pre & Post Trip Inspections

Pre and post-trip inspections are vital for detecting equipment flaws before they jeopardize safety. Federal rules mandate at least one daily inspection, documented in your hours of service log. Prioritize these areas during your vehicle check:

Steering System: Assess steering column play, rack components, power steering fluid, and steering tires

Braking System: Inspect the air compressor, brake lines, pads, drums, calipers, low air pressure alarm, and brake lights

Other Areas: Scrutinize fifth wheel assembly, headlights, marker and signal lights, and tires

If unsure about inspection details, approved checklists from FMCSA, USDOT, mechanic shops, or Buchanan Hauling's Service Department are available. Inspections are crucial for safety and must never be neglected.

12. Avoid Distractions

An accident takes only seconds to occur. We know that it takes a lot longer for a loaded truck to stop. Stay alert on long drives, avoid distractions, and prioritize the road.

As mentioned above, no phone use while driving

Silence radio in heavy traffic, bad weather, or tough conditions

Set GPS and eat any food before even starting the engine to reduce distractions



13. Use a GPS or Mapping Device

While a specialized trucking GPS aids route accuracy, it shouldn't be your sole guide due to its imperfections. A truck atlas is your superior choice for confirming truck-approved paths and avoiding issues. For congested regions, use an atlas to plan detours around traffic or construction. Additionally, many facilities provide step-by-step directions alongside load paperwork. If not, and you're uncertain about a route, communicate with the facility or dispatcher before arrival for accurate directions.

14. Prepare for Dangerous Road Conditions

Ever-changing road conditions pose risks to all drivers, particularly those of larger vehicles like trucks. Be vigilant for these hazardous scenarios:

Icy Roads: Heed weather and road reports to anticipate winter conditions. If alerts indicate ice or you encounter it, find a safe spot to wait for state maintenance to clear roads. Apply standard winter driving tips

Snow: Unplowed snow can transform into ice. In some areas, highways mandate chains. Chains help in heavy snow but are futile on icy roads. If roads are icy, wait for clearance

Rain: When it rains it can create slick surfaces due to oil residue. Reduce speed, stay in control, and be cautious of slow/stopped vehicles in low visibility

Fog: Drive slower in dense fog with low-beam headlights. Use markers and flashers for visibility

Disabled Vehicles: Slow down and shift lanes when passing roadside disabled vehicles. If unable to switch lanes, slow further. Beware of hidden dangers

Road Construction: Follow construction signs and speed limits; watch for workers and machines. Around one-third of fatal work-zone accidents involve large trucks. Drive carefully in construction and school zones. Fines for violations double in these areas; CDL holders face additional penalties

Accidents: Reduce speed or stop safely when approaching accidents. Use flashers and clear paths for emergency vehicles

Animals on the Road: Avoid sudden maneuvers for animals; hitting them may be safer. Some companies discipline drivers who evade animals due to potential accidents

15. Take Adequate Breaks

Driver fatigue is a major trucking accident cause. New drivers, especially, must heed tips like taking breaks to avoid fatigue. FMCSA tackles this with hours of service (HOS) rules:

14 hours of on-duty time in 24 hours

11 hours of driving time in 24 hours

8 hours of driving before a 30-minute break

10 hours sleep to reset 14-hour and 11-hour limits

With the added precision of electronic logging, it has tightened HOS compliance. These rules prioritize safety for drivers and road users. Studies have also shown that fatigue mirrors driving under alcohol or drugs.

16. Invest in a Dash Cam or Event Data Recorder (EDR)

Prioritizing accident prevention is essential, but unforeseen events are inevitable, even for safe drivers. Determining faults in accidents can be complex. To safeguard against unjust blame, legal repercussions, higher insurance fees, and job loss, consider a reliable dash cam. We see funny and even scary videos caught on dashcams all the time on social media. Some of those likely protected a driver and his company from fraudulent claims. Yearly, numerous truck drivers are exonerated from fault accusations due to dash cam evidence. Invest in a dash cam to potentially save yourself from such situations.

17. Maintain Space Cushion

Keep 7-8 seconds between you and the vehicle ahead; increase to 14 seconds in poor weather. Always remember that you're in control of a 72-foot, 80,000-pound vehicle. Understanding your stopping distance based on load weight and size is vital for safety. Adapt your speed and space according to road conditions.

Monitor nearby drivers, allowing space for their actions. You're the pro driver; focus on your control. When in the city, monitor about a block ahead of you, and when on the Highway, scan about a quarter mile ahead so you can increase reaction time.

When conditions worsen, exercise added caution and increased space. Monitor not only the front space but also the sides. If a vehicle remains beside you, slow down further, allowing them to pass and expanding your truck's space.

18. Situational Awareness

Maintaining situational awareness aids in preventing accidents and adapting to road changes. The habit of regularly checking mirrors ensures constant vigilance.

However, this is just one aspect of trucking situational awareness. Other factors include:

- Use the path left by the previous truck to guide your backing
- Signal when changing lanes or turning
- Wide turns to avoid nearby objects due to off-tracking
- Prior to reversing, inspect the surroundings with a 360-degree walk

Inspect the parking area before parking, unloading, or coupling to a new trailer
Choose well-lit spots
Engage four-way flashers and honk before reversing
Double-check before lane changes, intersection entry, or pulling onto roadways

19. When unloading freight

Check if the freight is against the door before opening
Open doors slowly
Swing the door with both hands to prevent the wind from catching it
Secure the door with a tie-back cable or chain
Lift freight safely using the proper technique
Ensure no workers or forklifts are in the trailer before leaving the dock

20. Be Predictable

Remember, others can't read your thoughts, and many drivers lack understanding of sharing the road with large commercial vehicles. Prioritize safe operation for you and fellow road users. Here's what it entails:

Early Signals: Activate turn signals well before changing lanes or turning

Steady Lanes: Minimize unnecessary lane changes; expert drivers keep within lane lines

Consider Fellow Truckers: If another big truck trails you, anticipate their slower stopping time. Signal and slow sooner

Consistent Speed: Maintain steady speeds to prevent congestion and retain safety space

Thoughtful Overtaking: If unable to swiftly pass another truck, abstain. Passing can create congestion, diminishing your safety zone

Safety Top Priority: Safely working, driving, and returning home to family is paramount. No load is worth compromising safety

Road Conditions: Slow down or halt during perilous conditions

Distraction Elimination: Stop for texts; that 4.6 seconds can save lives

Vehicle Maintenance: Ensure well-maintained brakes, tires, and steering

360-Degree Awareness: Stay vigilant, manage blind spots, and halt when tired

Defensive Driving: Drive cautiously to prevent accidents

In this guide, we explored truck driver safety tips that encompass every facet of your journey—starting from pre-trip preparations and spanning through on-road navigation, arrival procedures, and concluding with post-trip inspections. Whether you're a seasoned professional or a newcomer to the industry, these reminders hold immense value in ensuring your safety and the safety of others on the road. Prioritize safety on the road, valuing your life and the lives of others above all else.



Avoiding Common Tugboat And Barge Safety Hazards

Archway Marine Lighting, 2024

<https://www.archwaymarinelighting.com/marine-safety/avoiding-common-tugboat-and-barge-safety-hazards/>

Working on inland waterways is an inherently dangerous profession, and tugboat and barge workers are especially susceptible to danger. There's huge potential for danger across the industry, but some accidents are more common than others because of the inherent dangers.

Stranding and foundering are probably the most common losses experienced by tugs and barges. This is usually caused by one or a combination of factors such as engine failure, underpowered tug, outdated navigation charts, and towline or related tow gear failure. Capsizing is also commonly attributable to some of the above factors and sometimes caused by inadequate stow and/or securing of cargo which compromises stability or structural failure.

Another common accident would be a collision with other vessels. This is commonly caused by crew negligence, poor watchkeeping, inadequate display of lights and shapes by tugboat and/or barge, and defective navigation aids.

Others include fire losses, typically caused by poor housekeeping, unsafe practice, crew negligence, inadequate/poorly maintained fire-fighting equipment, and/or nature of cargo (inherent vice). In certain regions, piracy and hijacking is also a common occurrence; this can be caused by poor watchkeeping, poor voyage planning, and/or very little to no anti-piracy measures.

Knowing which dangers are most common and what to do to mitigate risk keeps everyone safe – on the water or off.

Tugboat Safety

Tugboats offer high horsepower speeds, large towing lines, and heavy-duty winches and drums to get the job done. Those winches are part of what makes tugboats effective at towing barges, but they'll also be the cause of extreme on-the-job injury. Crews can get entangled in these winch wires, and all of the towing equipment causes a tripping hazard. The tugboat deck leaves room for slippery conditions, heavy lifting, crushing injuries, or falling overboard. All of these present an incredible risk of accident or even death.



Barge Safety

Just as on tugboats, there's no shortage of dangers on a barge. Fires can easily happen on deck barges, and you need to have prevention measures and tools to extinguish fires if they do pop up. Surface conditions should be ideal, coated in non-slip surfaces, and free of obstructions that could cause a fall overboard. Deck barges are confined spaces with limited room for movement, and the equipment being used on-board needs to be properly maintained to avoid mechanical-related accidents.

Safety On The Water

There are dangers to navigate as you travel the inland waterways too and there's no match for the elements of nature. Large-scale vessels like barges on shallow waterways create suction that impacts vessel maneuverability. Barges must also frequently pass by each other in tight spaces like canals or narrow rivers. Operators must be highly trained to avoid collisions and handle them in case of emergency. Lack of preparation could leave cargo damaged or worse, barge worker injury.



On The Docks

Barge docks are primarily used for one of two reasons – loading or unloading – and built for cargo and not necessarily for people. Falling into the water is a big risk for employees working on docks, and even robust safety gear like a life jacket can't protect against getting pinned between a dock and a vessel. Constant motion from barges on the water, movement of pedestrian traffic, and limited space are additional factors that complicate working on the dock. Create a checklist that addresses the following areas:

- The gangway is maintained, repaired, and secured
- Each side of the gangway has a railing with a minimum height of 33 inches
- Rails are made of wood, pipe, chain, wire, or rope and are kept taut
- Each gangway is properly trimmed and equipped with midrails
- The walkway is provided if the gangway foot is more than 1' away from the apron edge
- Supporting bridles are kept clear and drafts of cargo do not pass over the access point

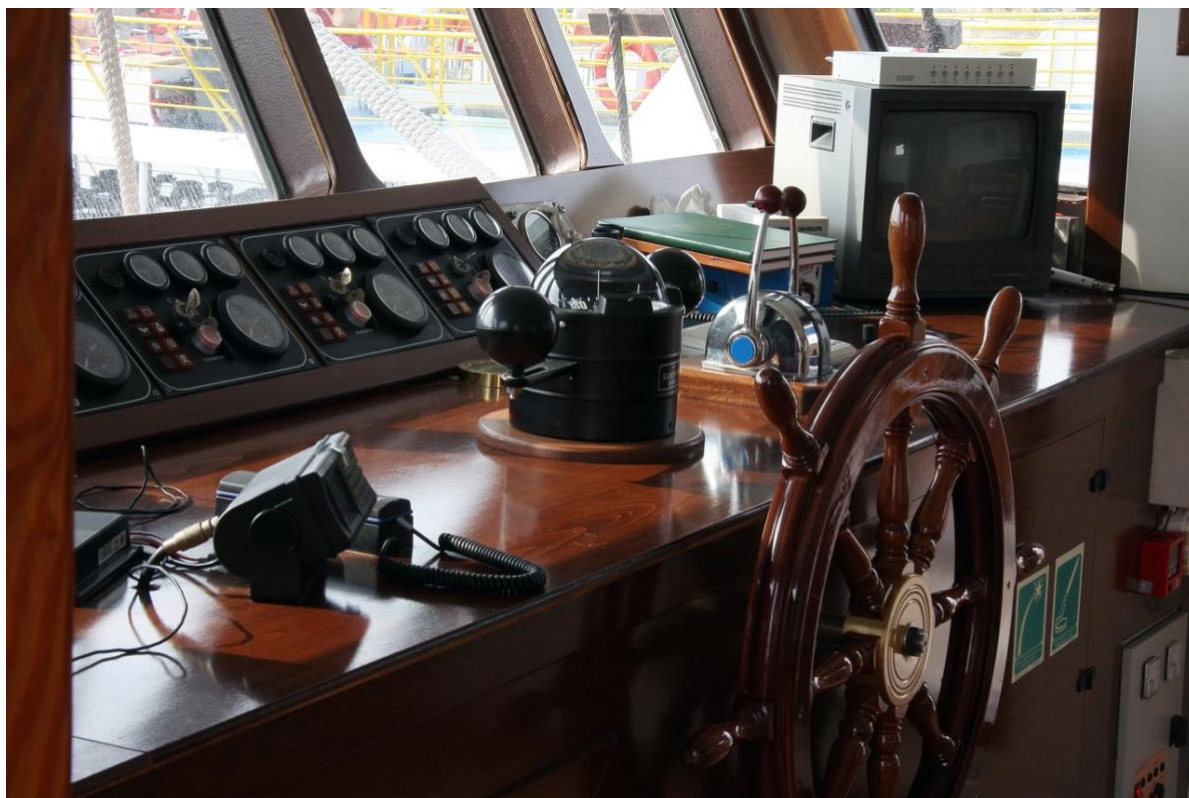
Continuing training and creating a culture of safety can go a long way towards reducing and even eliminating hazards. Ensure that your crew is certified to work on the specific vessel being operated, and there's clear communication about what everyone will do in case of emergency.

You also need to ensure that your barges, tugboats, and docks are outfitted with the right tools and gear to maintain that culture of safety. Work with a barge supply company that has experience with tugboat and barge safety solutions, and can provide top-quality expertise and products. Archway Marine Lighting has been working with barge fleet and maritime decision-makers for over 30 years, and we can help provide these safety tools.

TUG AND BARGE NAVIGATIONAL SAFETY: NAVIGATION BEST PRACTICE, SAFE WATCHKEEPING AND COLREGS COMPLIANCE

Maritime Mutual Risk Bulletin No. 45

May 7, 2021



INTRODUCTION

Tug and cargo barge units are designed to provide low cost and uncomplicated water transport. The ton mile operating cost of such units is certainly economical. However, tug and barge operations present some complex challenges in relation to their navigational safety. The consequences of getting it wrong can be both severe and very costly.

MM RB's Nos. 31 and 32 were focussed on tug and barge stability and the necessity for stability awareness and regulatory compliance at the beginning and throughout all stages of a tug and barge voyage. This RB highlights the three interrelated elements of tug and barge navigation safety which are (1) Navigational Best Practice (NBP), (2) Safe Watchkeeping and the (3) International Regulations for Prevention of Collisions at Sea (COLREGS) compliance.

BACKGROUND

The essential connection between the three navigational safety elements is that they must be all be conducted correctly and simultaneously by a tug's navigational watchkeepers. If one or more of these elements fail, navigational safety will be impacted and the voyage may be at significant risk.

The STCW Convention requires tug officers to hold valid Certificates of Competency (COCs) which verify their safe navigation competence. Unfortunately, perhaps as a consequence of the more relaxed discipline often found on board tugs and small vessels, COC training and competence can be impacted by navigational complacency and 'human element' error.

So what can be done by Members to support and motivate tug and barge navigation safety through the careful and consistent application of its three interrelated elements on board their vessels?

NAVIGATION SAFETY AWARENESS

The first step is to ensure that tug and barge crews are provided with clear advice on their navigational safety obligations along with instructions on how this is to be accomplished. This information can best be provided as part of a flag state approved ISM Code or NCVS equivalent Safety Management System (SMS) and its supporting Safety Management Manual.

The SMS manual should include detailed procedures which explain the three elements of tug and barge navigational safety and the method of verifying that these procedures have been carried out for each and every voyage.

The second step is to ensure that the Member's internal audit of every tug's SMS includes the requirement to review the implementation of the three elements of navigational safety together with the Master and deck officers. Any amendments which may be required to improve these procedures should of course be made at this time.

As an assistance to Members, the three safe navigation element processes are summarised below.

1. **Navigational Best Practice (NBP)**

Ensuring NBP outcomes for a tug and barge voyage requires the preparation of both a Tow Plan and Voyage Plan. These plans should be recorded either in writing or electronically and kept on board for flag state and/or port state control (PSC) inspection.

- **Tow Plan** – should include, but not be limited to, the following checks and confirmations:
 - Tug is of suitable size, manning, sea-keeping, horse power (HP) and bollard pull (BP) for the tow and the voyage.
 - Tow line, towing bridle condition and all fittings and connectors are carefully checked to ensure Safe Working Load (SWL) and/or Breaking Load (BL) and their overall condition are within safe limits.
 - Spare tow line and towing bridle are available on board the tug and/or are pre-rigged as emergency towing gear on board the barge.
 - Towing hook or towing winch quick release devices are tested as fully operational before each and every tow connection.
 - Crew are mustered to a 'tool box' meeting and PPE (including PFD) check before each towline connection, adjustment and disconnection.
 - Tug and barge stability is adequate and meets regulatory compliance throughout the voyage.
 - Emergency/contingency plans have been prepared, inclusive of port of refuge details.
 - Voyage Plan, as detailed below, has been completed and approved by the Master.
- **Voyage Plan** – should be based on, but not limited to, the advice provided in [MM RB No. 27, Voyage Planning](#) and should include the following checks and confirmations:

- All charts and navigational publications required (inclusive of ports of refuge) are on board and corrected and up to date, inclusive of any navigational warnings.
- Route to be taken clearly marked, including safe transit times (day/night transits), times when passing through narrows, under bridges or areas of high traffic density, tight bends in rivers and adjacent river berths.
- Areas of reduced depth, tidal limitations, currents expected and regulatory speed requirements during the voyage to be clearly noted.
- List of bridges with maximum and minimum heights adjusted for tidal range tide height at expected time of transit to be available.
- Weather forecasts to include outlook for at least 48 hours.
- Confirmation of sufficient fuel, water and spares on board, inclusive of a weather delay reserve.
- Tug BP is sufficient to ensure that at all times during the voyage and conditions expected, the tug and barge unit (whether fully loaded or empty) will be able to maintain a safe course at a speed of not less than 2 knots over the ground while navigating in coastal, confined or shallow water. NOTE: The minimum speed requirement of 2 knots on a safe course is based on the recommendation made by [Class DNV Towing Recommendations](#) at Para. 3.2 Minimum Bollard Pull of Tug. MM endorses this industry best practice recommendation.

2. Watchkeeping to STCW Standards

Watchkeeping should be conducted in compliance with the STCW Code, Chap. VIII, Section A – VIII/2 and Section B – VIII/2 or with the tug's flag state NCVS equivalent regulations. These regulations provide a detailed list of navigational watchkeeping obligations. The requirements which are particularly relevant to tug and barge watchkeeping are summarised as follows.

- A proper lookout must be maintained by sight, sound and all means appropriate (e.g. VHF, AIS and Radar) at all times in accordance with COLREGS Rule 5.
NOTE: It is accepted that on board tugs and smaller vessels, the person steering

may also act as the lookout provided that weather conditions, visibility, traffic density and proximity to danger make it safe to do so.

- The officer in charge of the navigational watch (OOW) must check the course steered, speed and position at frequent intervals using all navigational aids available.

NOTE: This means that there must not be total reliance on GPS positions and speed indication alone and this must be double checked by radar and visual observations.

- The OOW shall, by taking compass or radar bearings in accordance with COLREGS Rule 7, ascertain whether risk of collision with other vessels exists. If such risk exists, the OOW must take early and positive action to avoid collision.
- The OOW shall use the radar (set to an appropriate range scale) at all times in restricted visibility or when in congested waters.
- The OOW shall notify the Master immediately if restricted visibility is encountered or if vessel traffic or other circumstances are causing concern.
- The OOW shall monitor the proper operation of both the tug's and barge's navigation lights throughout the watch.
- When a pilot is on board, their presence does not relieve the Master or OOW from their watchkeeping duties including keeping a proper lookout, the regular plotting of the tug's position and the obligation to take back the conduct of the tug immediately if the pilot's actions cause concern.

3. COLREGS Compliance

The COLREGS Part B – Steering and Sailing Rules 4 through 19 detail the obligations of vessels approaching one another in both clear and restricted conditions of visibility. Space does not permit a full review of all of these Rules within the context of their application to tug and barge towing situations. However, some of the principal concerns relating to past tug and barge collisions with other vessels are listed below:

- **Rule 5, Lookout**, has already been referred to above as an integral part of element 2. Watchkeeping. In particular, it is essential that a visual lookout be maintained at all times in conjunction with reference to radar, AIS and ECDIS (if available) displays. NOTE: Time and time again, collision investigations reveal that poor lookout and an associated lack of situational awareness has been a primary causative factor. As

such, a dedicated and continuous visual lookout through the bridge windows must always be maintained.

- **Rule 9, Narrow Channels**, provides that a tug and barge unit proceeding along a narrow channel must, so far as it is safely practicable, keep to the starboard side of the channel or fairway.
NOTE: It is accepted that obstructions or shallow areas in a channel may necessitate a derogation from Rule 9 in order to transit such areas. However, this must be accomplished with extreme caution and only after ensuring that all other vessels and tug and barge units in the area are alerted by whistle warning signals and VHF communications.
- **Rule 13, Overtaking**, provides that any vessel, including a tug and barge unit, which is overtaking any other shall keep clear of the overtaken vessel.
NOTE: The most frequent problem experienced by vessel's OOW is to ascertain whether his vessel is overtaking i.e. 'coming up with another vessel from a direction more than 22.5° abaft the other vessel's beam'. This can be assessed visually or, more accurately, by using a radar plot or AIS data. If there is any doubt, Rule 13, Para (c) obligates the OOW to keep clear of the other vessel. Regrettably, this 'stand on' vessel obligation to take action is frequently forgotten.
- **Rule 14, Head-On Situation**, provides that when two power driven vessels – including tug and barge units – are meeting head-on or nearly head-on so as to involve a risk of collision, then each shall alter course to starboard so as to pass on the port side of the other. By reference to the red sidelights situated on the port side of each vessel, this is known as a COLREGS compliant 'red to red' pass.
NOTE: Head-on collisions are easy to avoid if each vessel complies with Rule 14 and alters course to starboard. What should always be avoided are situations in which vessels communicate with each other by VHF and agree to pass 'green to green'. This COLREGS derogation has led to scenarios where one vessel OOW panics at the last moment and then alters course across the bow of the other vessel in an attempt to pass 'red to red'. A collision often results and the deliberate and causative contravention of Rule 14 will increase the culpability of both vessels.
- **Rule 15, Crossing Vessel**, provides that when two power driven vessels – including tug and barge units – are on crossing courses, then the vessel which has the other on her own starboard side shall 'give way'. If, as required by Rule 8, this action is taken early, it is normally accomplished by the 'give way' vessel altering her course substantially to starboard towards a point astern of the 'stand on' vessel. It may

also be necessary to reduce the speed of the give way vessel.

NOTE: Many crossing vessel situations have turned into collisions because the 'give way' vessel does not give way early enough or at all. The Master or OOW of the 'stand on vessel' then wastes precious time by repeatedly calling the give way vessel on the VHF. Instead, Masters and OOWs must apply Rule 17, Action by Stand On Vessel, which provides that they must take action as soon as it becomes apparent that the give way vessel is not taking appropriate Rule 15 action. Failure to do so will increase the apportionment of liability to the stand on vessel as the courts do not approve of the use of VHF radio over the immediate obligation to follow the Rules and take action.

CONCLUSION AND TAKEAWAY

Navigational safety on board all vessels should always be paramount to risk management and the avoidance of loss. In relation to tug and barge units, this requirement, is often more difficult to accomplish as a consequence of smaller crews and the inherent problems related to towing heavily laden barges in confined waters and often strong current conditions.

A strong safety culture in any organisation starts at the top. MM tug and barge unit Members are therefore encouraged to review the current navigational safety practices on board their vessels. As part of this process, Members should ensure that their Masters and crews are provided with SMS manuals and procedures which support and motivate the implementation of the three elements of navigational safety which have been summarised in this Risk Bulletin.

TDL Social Studies Outcome #6 - Activity 5

Revolutionizing Air Cargo: The Role of Artificial Intelligence

Lars Winkelbauer, September 1, 2023



Artificial intelligence (AI) is ushering in a new era for the air cargo industry, transforming the way we approach logistics and operations. With AI technology, researchers and engineers are able to optimize flight systems, minimize risks, and eliminate delays. By incorporating AI into air cargo operations, we are witnessing a significant enhancement in safety and efficiency throughout the entire supply chain.

One of the key advancements in this domain is the development of software platforms like PARAATM, which seamlessly integrates AI, radar, and GPS signaling. By harnessing the power of AI, these platforms enable proactive management and analysis of large-scale data, leading to optimized flights and streamlined operations.

AI also plays a crucial role in managing human factor errors and predicting potential issues in advance, further bolstering safety measures in air travel. By leveraging predictive analytics, AI technology helps to eliminate uncertainties and ensure that flights are executed with precision and accuracy.

Key Takeaways:

- Artificial intelligence is revolutionizing the air cargo industry, optimizing operations and improving efficiency.

- AI-powered software platforms like PARAATM enable proactive management and analysis of large-scale data, leading to optimized flights.
- AI helps in managing human factor errors and predicting potential issues in advance, enhancing safety in air travel.
- By incorporating predictive analytics, AI technology ensures flights are executed with precision and accuracy.
- The role of AI in air cargo is reshaping the industry and propelling it towards a more innovative and efficient future.

AI Optimization in Air Cargo: Boosting Efficiency and Accuracy

Artificial intelligence (AI) optimization is revolutionizing the air cargo industry, bringing about significant improvements in efficiency and accuracy. By harnessing the power of AI technology and machine learning, cargo airlines can optimize various aspects of their operations for smarter decision-making and enhanced performance.

One of the key areas where AI optimization is making a difference is in route planning. AI-powered systems analyze real-time data on flight patterns, weather conditions, and cargo demand to optimize routes and schedules. This not only ensures efficient use of resources but also helps in minimizing delays and optimizing fuel consumption.

Furthermore, AI technology enables predictive analytics in air cargo, allowing for forecasting of maintenance requirements. By analyzing historical data and patterns, AI-powered systems can predict when maintenance is needed, reducing downtime and avoiding costly repairs. This proactive approach to maintenance planning contributes to overall efficiency and cost savings.

The Benefits of AI Optimization in Air Cargo

The integration of AI technology in air cargo also extends to automation in cargo handling and logistics. AI-powered systems can automate tasks such as loading and unloading of cargo, sorting, and labeling packages. This not only improves efficiency but also reduces labor costs and minimizes the risk of errors. By leveraging AI technology, cargo companies can streamline their operations and ensure accurate and timely delivery of cargo.

In summary, AI optimization in air cargo is transforming the industry by boosting efficiency and accuracy. From route planning to predictive maintenance, AI-powered systems bring valuable insights and automation to the supply chain. By embracing AI technology and its applications, cargo airlines can optimize their operations, improve customer satisfaction, and stay ahead in the competitive air cargo market.

Benefits of AI Optimization in Air Cargo

Optimized route planning and scheduling for efficient resource utilization

Predictive analytics for forecasting maintenance requirements and reducing downtime

Automation in cargo handling and logistics to improve efficiency and reduce labor costs

Enhanced accuracy and timeliness in cargo delivery

AI and IoT in Air Cargo: Enhanced Tracking and Monitoring

The combination of AI and IoT (Internet of Things) in air cargo enables enhanced tracking and monitoring throughout the transportation process. By utilizing machine learning algorithms and IoT sensor technology, cargo companies can track the location, temperature, and condition of their cargo in real-time. This seamless integration allows for quick identification and resolution of any issues that may arise during transit, ensuring the safety and quality of the cargo.

Improved Tracking and Real-Time Insights

With AI and IoT, air cargo companies can access detailed insights and analytics regarding their cargo. Sensor data from IoT devices can be analyzed by AI-powered systems to predict maintenance needs and identify potential bottlenecks in the supply chain. This real-time information enables airlines to make data-driven decisions, optimize operations, and minimize downtime.

Efficient Resolution of Issues

Thanks to AI and IoT, cargo companies can proactively address potential issues during transit. For example, if there is a sudden change in temperature or humidity that could impact the cargo's quality, AI algorithms can alert the relevant personnel in real-time. This allows for immediate corrective actions, ensuring that the cargo remains in optimal condition throughout its journey.

Data Collected	Air Cargo Benefits
Location	Real-time tracking and improved route planning
Temperature	Prevention of spoilage or damage to temperature-sensitive cargo
Humidity	Maintenance of cargo quality and prevention of damage
Motion	Detection of mishandling or potential cargo loss

The integration of AI and IoT in air cargo provides a comprehensive and transparent view of the cargo's journey. By harnessing the power of real-time data and advanced analytics, cargo companies can ensure efficient tracking, timely resolution of issues, and ultimately deliver a superior customer experience.

Autonomous Systems in Air Cargo: Advancing Efficiency and Safety

The use of autonomous systems in air cargo is revolutionizing the industry, advancing efficiency, and ensuring safety. By combining robotics technology with AI, cargo handling processes such as loading, unloading, sorting, and labeling can be automated. This automation not only improves efficiency but also reduces labor costs and minimizes the risk of human errors.

Autonomous systems play a vital role in enhancing safety by ensuring accurate and precise handling of cargo. With the integration of AI technology, these systems can analyze data in real-time, making informed decisions to optimize operations. The AI-powered robotics can navigate through complex warehouse environments, ensuring seamless cargo movement and minimizing delays.

Enhanced Efficiency

Autonomous systems in air cargo significantly enhance efficiency in various aspects of operations. The use of robotics streamlines cargo handling processes, allowing for faster loading and unloading times. This results in decreased turnaround times for aircraft, optimizing the utilization of resources and increasing overall productivity.

Additionally, autonomous systems can operate 24/7, eliminating constraints related to human labor. They can efficiently perform repetitive tasks, such as sorting and labeling packages, with high accuracy and precision. This automation not only saves time but also reduces the risk of errors, ensuring the seamless flow of cargo throughout the supply chain.

Improved Safety

The integration of AI technology in autonomous systems enhances safety measures in the air cargo industry. By relieving humans from physically demanding tasks, the risk of injuries and accidents is minimized. AI-powered robotics can handle heavy or hazardous cargo in a controlled manner, reducing the likelihood of incidents.

Moreover, these autonomous systems are equipped with advanced sensors and algorithms that enable them to detect potential risks and obstacles. They can automatically adjust their trajectories to avoid collisions or accidents, ensuring the safe transportation of cargo. With AI technology continuously monitoring and analyzing data, any anomalies or malfunctions in the system can be quickly detected and addressed, further enhancing safety standards.

Benefits of Autonomous Systems in Air Cargo

1. Increased efficiency in cargo handling processes
2. Reduced labor costs and minimized human errors
3. Enhanced safety measures and risk mitigation
4. Improved productivity through 24/7 operations

In conclusion, the use of autonomous systems in air cargo is advancing the efficiency and safety of operations. By integrating robotics and AI technology, the industry is experiencing streamlined cargo handling processes, reduced labor costs, and improved safety standards. The future of air cargo relies on the continued development and implementation of autonomous systems, shaping the way we transport goods by air.

AI Applications in Air Cargo: Transforming the Supply Chain

The integration of artificial intelligence (AI) technology in the air cargo industry has led to significant transformations in the supply chain. AI applications have revolutionized route optimization, cargo handling, and decision-making processes, improving efficiency and overall performance. By analyzing vast amounts of real-time data, AI-powered systems enable cargo airlines to make smarter decisions, resulting in better route planning and schedule optimization.

One of the primary applications of AI in air cargo is the automation of processes such as cargo handling and logistics. AI technology allows for the efficient loading and unloading of cargo, sorting of packages, and labeling, reducing manual labor and increasing operational efficiency. Additionally, AI-powered systems can analyze historical data and predict demand, enabling cargo companies to manage inventory effectively and ensure timely deliveries.

Improved tracking and monitoring

The combination of AI and Internet of Things (IoT) sensor technology has enhanced tracking and monitoring capabilities in the air cargo industry. By using machine learning algorithms and IoT sensors, cargo companies can track the location, temperature, and condition of their cargo in real-time. This enables quick identification and resolution of any issues that may arise during transit, ensuring the quality and safety of the cargo.

Furthermore, AI technology plays a crucial role in predictive analytics for air cargo. By analyzing historical data and patterns, AI-powered systems can forecast maintenance needs, optimize resource allocation, and minimize downtime. This proactive approach to maintenance ensures that cargo airlines can operate efficiently and reduce costly repairs, leading to improved overall supply chain performance.

In summary, AI applications in air cargo are transforming the supply chain by optimizing routes, automating processes, and enhancing tracking and monitoring capabilities. The integration of AI technology enables cargo companies to make data-driven decisions, improve operational efficiency, and ensure the timely and safe delivery of goods. The future of the air cargo industry relies on continued advancements in AI technology and its successful integration into various aspects of the supply chain.

AI Applications in Air Cargo	Benefits
Route Optimization	<ul style="list-style-type: none"> – Smarter decision-making – Improved route planning and schedule optimization
Cargo Handling Automation	<ul style="list-style-type: none"> – Efficient loading and unloading – Sorting and labeling automation
Predictive Analytics	<ul style="list-style-type: none"> – Forecasting maintenance needs – Optimize resource allocation – Minimize downtime
Enhanced Tracking and Monitoring	<ul style="list-style-type: none"> – Real-time tracking of location, temperature, and condition – Quick issue identification and resolution

Predictive Analytics in Air Cargo: Enhancing Operational Efficiency

One of the key aspects of leveraging AI technology in the air cargo industry is the application of predictive analytics. By analyzing historical data, shipping information, and other relevant factors, AI-powered systems can forecast prices in real-time, providing shippers and carriers with reliable and up-to-date information. This enables better management of costs and price negotiation while improving overall supply chain performance.

With predictive analytics in air cargo, companies can make data-driven decisions when it comes to optimizing their operations. By understanding demand patterns, traffic conditions, and other influencing factors, cargo airlines can adjust their schedules and

routes accordingly. This not only enhances efficiency but also reduces delays and ensures timely delivery.

Furthermore, predictive analytics can play a crucial role in identifying potential maintenance needs. By analyzing data on aircraft performance, AI systems can detect patterns and indicators of mechanical issues, allowing airlines to proactively address them. This helps minimize downtime, optimize resources, and improve overall operational efficiency in the air cargo industry.

Benefits of Predictive Analytics in Air Cargo:

- Real-time price forecasting for better cost management and negotiation
- Data-driven decision-making for optimizing routes and schedules
- Proactive identification of maintenance needs to minimize downtime
- Enhanced operational efficiency and resource optimization

Benefits	Description
Real-time price forecasting	Allows for better cost management and negotiation by providing up-to-date information on pricing trends.
Data-driven decision-making	Enables cargo airlines to optimize their routes and schedules based on demand patterns and traffic conditions, improving efficiency.
Proactive maintenance identification	Helps airlines identify potential mechanical issues in advance, minimizing downtime and optimizing resources.
Operational efficiency	Enhances overall efficiency in the air cargo industry by leveraging insights from predictive analytics.

Predictive analytics, when combined with AI technology and machine learning algorithms, empowers air cargo companies to make informed decisions and optimize their operations for maximum efficiency and profitability. By effectively harnessing the

power of data, the air cargo industry can continue to enhance its operational performance and meet the growing demands of the modern world.

AI Technology in Air Cargo: Shaping the Future of Aviation Safety

The incorporation of AI technology in air cargo is revolutionizing the industry, paving the way for enhanced aviation safety. AI has become instrumental in developing innovative software platforms that optimize air traffic management, mitigate risks, and ensure safe flights. By leveraging AI technology, researchers and engineers are able to analyze large-scale data, make accurate predictions, and plan actions to proactively address potential risks and delays in air cargo operations.

One of the key advantages of AI technology in air cargo is its ability to focus on human factor errors and create a deeper understanding of how humans interact within the aviation industry. By identifying potential risks and weaknesses in the system, AI-powered solutions can contribute to the design of safer and more efficient air cargo operations. This includes minimizing errors and improving the overall safety and reliability of flight systems.

AI Applications in Air Cargo

AI technology is being utilized in various applications within the air cargo industry, further shaping the future of aviation safety. Machine learning algorithms, a subset of AI, are used to analyze vast amounts of data to optimize routes, schedules, and cargo handling procedures. These AI applications in air cargo enable data-driven decision-making and enhance operational efficiency.

AI Applications in Air Cargo	Benefits
Optimization of routes and schedules	Smarter decision-making, improved efficiency
Automated cargo handling and logistics	Reduced labor costs, increased efficiency
Predictive analytics	Enhanced forecasting, better supply chain performance

With AI technology in air cargo, the industry is embracing innovation and actively working towards safer and more efficient air travel. The continuous development and integration of AI technology will play a pivotal role in shaping the future of aviation safety, ensuring a secure and seamless experience for air cargo operations.

Conclusion

In conclusion, artificial intelligence (AI) is revolutionizing the air cargo industry, bringing about significant advancements in efficiency and optimization. By harnessing the power of AI technology, air cargo companies can enhance their operations, improve safety measures, and transform the supply chain.

The incorporation of AI optimization in air cargo has revolutionized route planning, leading to smarter decision-making and improved scheduling. AI-powered systems analyze real-time data on flight patterns, weather conditions, and cargo demand to optimize routes and schedules, resulting in boosted efficiency and accuracy. Moreover, AI applications in air cargo automation, including the use of robotics, have automated cargo handling processes and reduced labor costs, while enhancing safety and precision.

Predictive analytics, another crucial aspect of AI technology, enables air cargo companies to enhance operational efficiency by making data-driven decisions. By analyzing historical data and shipping information, AI-powered systems can forecast prices, improving cost management and overall supply chain performance. This integration of AI technology and predictive analytics empowers the industry to optimize operations for maximum efficiency and profitability.

In the future, the continued development and integration of AI technology will shape the aviation industry, with a particular focus on safety. By harnessing the power of AI and understanding the role of humans in aviation, innovative software platforms are being developed to ensure safe flights, mitigate risks, and optimize air traffic management. As the industry embraces AI technology, the air cargo sector is leading the way in innovation and shaping the future of aviation.



U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

DOT CHART 15

Hazardous Materials Markings, Labeling and Placarding Guide

Refer to 49 CFR, Part 172:

Marking - Subpart D







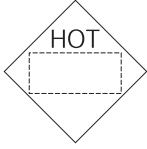
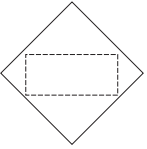

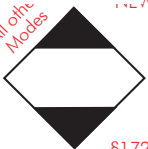




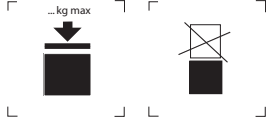

Labeling - Subpart E

Placarding - Subpart F



NOTE: This document is for general guidance only and should not be used to determine compliance with 49 CFR, Parts 100-185.

HAZARDOUS MATERIALS MARKINGS

<p>Package Orientation (Red or Black)</p>  <p>or</p>  <p>§172.312(a)</p>	<p>Keep Away from Heat</p>  <p>§172.317</p>	<p>OVERPACK</p>  <p>§173.25(a)(4)</p>	<p>Fumigant Marking (Red or Black)</p>  <p>§172.302(g) and §173.9</p>	<p>INHALATION HAZARD</p>  <p>§172.313(a)</p>	<p>HOT</p>  <p>§172.325</p>	<p>Biological Substances, Category B</p>  <p>§172.332(a)</p>	<p>UN3373</p>  <p>§173.199 (a)(5)</p>
<p>All other Modes</p>  <p>§172.315</p>	<p>Air Only</p>  <p>§172.316</p>	<p>ORM-D, Transition December 31, 2020</p>  <p>§172.316</p>	<p>UN1755</p>  <p>§172.316</p>	<p>Excepted Quantity</p>  <p>§173.4a(g)</p>	<p>Marking of IBCs</p>  <p>§178.703(b)(7)(i)</p>	<p>Marine Pollutant</p>  <p>§172.322</p>	

* The new limited quantity marking designates hazardous material packages prepared for air transport (Y) and packages not prepared for air transport (all other modes). The ORM-D classification and the use of packagings marked "Consumer commodity, ORM-D" is authorized until December 31, 2020, for domestic highway, rail, and vessel transportation. Transitional exception—Square-on-point with Identification Number: except for transportation by aircraft and until December 31, 2014, a package containing a limited quantity may be marked with identification number, preceded by the letters "UN" or "NA".

Hazardous Materials Warning Labels

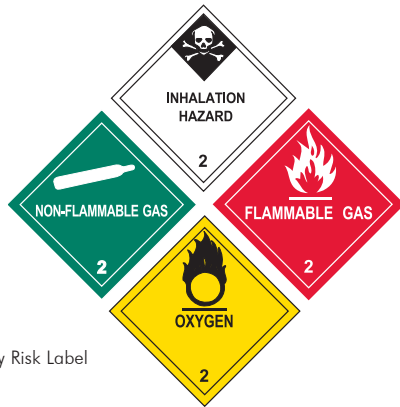
Actual label size: at least 100 mm (3.9 inches) on all sides

CLASS 1 Explosives: Divisions 1.1, 1.2, 1.3, 1.4, 1.5, 1.6



§172.411

CLASS 2 Gases: Divisions 2.1, 2.2, 2.3



§172.405(b), §172.415, §172.416, §172.417

CLASS 3 Flammable Liquid



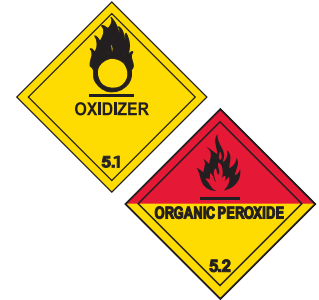
§172.419

CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet: Divisions 4.1, 4.2, 4.3



§172.420, §172.422, §172.423

CLASS 5 Oxidizer, Organic Peroxide: Divisions 5.1 and 5.2



§172.426, §172.427

* Include compatibility group letter.

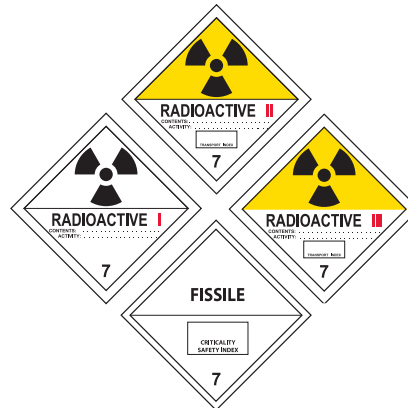
** Include division number and compatibility group letter.

CLASS 6 Poison (Toxic), Poison Inhalation Hazard, Infectious Substance: Divisions 6.1 and 6.2



§172.323, §172.405(c), §172.429, §172.430, §172.432

CLASS 7 Radioactive



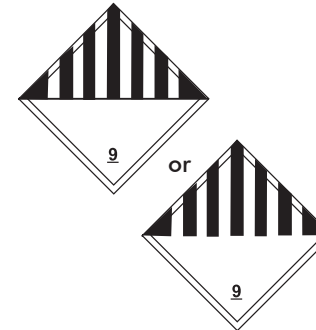
§172.436, §172.438, §172.440, §172.441

CLASS 8 Corrosive



§172.442

CLASS 9 Miscellaneous Hazardous Material



§172.446

Cargo Aircraft Only



§172.448

Empty Label



§172.450

For Regulated Medical Waste (RMW), an Infectious Substance label is not required on an outer packaging if the OSHA Biohazard marking is used as prescribed in 29 CFR 1910.1030(g). A bulk package of RMW must display a BIOHAZARD marking.

Hazardous Materials Warning Placards

Actual placard size: at least 250 mm (9.84 inches) on all sides

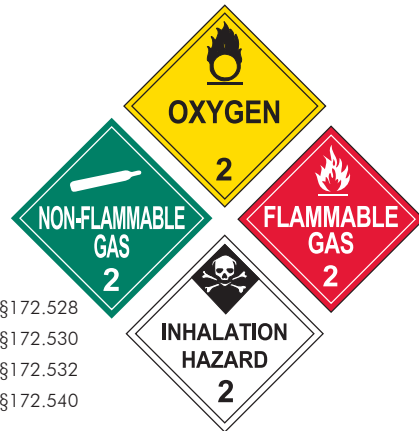
CLASS 1 Explosives



§172.522
§172.523
§172.524
§172.525

* For Divisions 1.1, 1.2, or 1.3, enter division number and compatibility group letter, when required; placard any quantity. For Divisions 1.4, 1.5, and 1.6, enter compatibility group letter, when required; placard 454 kg (1,001 lbs) or more.

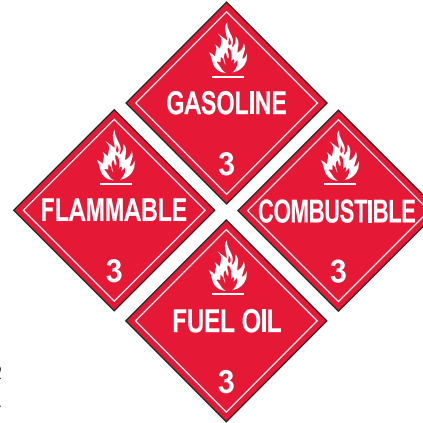
CLASS 2 Gases



§172.528
§172.530
§172.532
§172.540

For NON-FLAMMABLE GAS, OXYGEN (compressed gas or refrigerated liquid), and FLAMMABLE GAS, placard 454 kg (1,001 lbs) or more gross weight. For POISON GAS (Division 2.3), placard any quantity.

CLASS 3 Flammable Liquid and Combustible Liquid



§172.542
§172.544

For FLAMMABLE, placard 454 kg (1,001 lbs) or more. GASOLINE may be used in place of FLAMMABLE placard displayed on a cargo tank or portable tank transporting gasoline by highway. Placard combustible liquid transported in bulk. See §172.504(f)(2) for use of FLAMMABLE placard in place of COMBUSTIBLE. FUEL OIL may be used in place of COMBUSTIBLE on a cargo or portable tank transporting fuel oil not classed as a flammable liquid by highway.

CLASS 4 Flammable Solid, Spontaneously Combustible, and Dangerous When Wet



§172.546, §172.547, §172.548

For FLAMMABLE SOLID and SPONTANEOUSLY COMBUSTIBLE, placard 454 kg (1,001 lbs) or more. For DANGEROUS WHEN WET (Division 4.3), placard any quantity.

CLASS 5 Oxidizer & Organic Peroxide



Organic Peroxide, Transition-2011 (rail, vessel, and aircraft) 2014 (highway)

§172.550, §172.552

For OXIDIZER and ORGANIC PEROXIDE (other than TYPE B, temperature controlled), placard 454 kg (1,001 lbs) or more. For ORGANIC PEROXIDE (Division 5.2), Type B, temperature controlled, placard any quantity.

CLASS 6 Poison (Toxic) and Poison Inhalation Hazard



§172.504(f)(10), §172.554, §172.555

For POISON (PGI) or PGII, (other than inhalation hazard) and POISON (PGIII), placard 454 kg (1,001 lbs) or more. For POISON-INHALATION HAZARD (Division 6.1), inhalation hazard only, placard any quantity.

CLASS 7 Radioactive



§172.556

Placard any quantity - packages bearing RADIOACTIVE YELLOW-III labels only. Certain low specific activity radioactive materials in "exclusive use" will not bear the label, but the radioactive placard is required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with §172.504(e) Table 1 and §173.427(a)(6).

CLASS 8 Corrosive



§172.558

For CORROSIVE, placard 454 kg (1,001 lbs) or more.

CLASS 9 Miscellaneous



§172.560

Not required for domestic transportation. A bulk packaging containing a Class 9 material must be marked with the appropriate ID number displayed on a Class 9 placard, an orange panel, or a white square-on-point display.

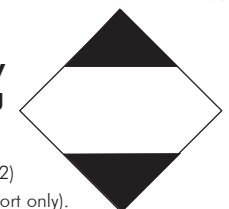
Dangerous



§172.521

A freight container, unit load device, transport vehicle, or rail car which contains non-bulk packages with two or more categories of hazardous materials that require different placards specified in Table 2 §172.504(e) may be placarded with DANGEROUS placards instead of the specific placards required for each of the materials in Table 2. However, when 1,000 kg (2,205 lbs) or more of one category of material is loaded at one loading facility, the placard specified in Table 2 must be applied.

Limited Quantity Marking



§172.315(a)(2)
(Vessel transport only).

Safety begins with communication!

General Guidelines on Use of Warning Labels and Placards

LABELS

See 49 CFR, Part 172, Subpart E, for complete labeling regulations.

- The Hazardous Materials Table [§172.101, Col. 6] identifies the proper label(s) for the hazardous material listed.
- Any person who offers a hazardous material for transportation MUST label the package, if required [§172.400(a)].
- Labels may be affixed to packages when not required by regulations, provided each label represents a hazard of the material contained in the package [§172.401].
- For labeling mixed or consolidated packages, see §172.404.
- The appropriate hazard class or division number must be displayed in the lower corner of a primary and subsidiary hazard label [§172.402(b)].
- For classes 1,2,3,4,5,6, and 8, text indicating a hazard (e.g., "CORROSIVE") is NOT required on a primary or subsidiary label. The label must otherwise conform to Subpart E of Part 172 [§172.405].
- Labels must be printed on or affixed to the surface of the package near the proper shipping name marking [§172.406(a)].
- When primary and subsidiary labels are required, they must be displayed next to each other [§172.406(c)].
- For a package containing a Division 6.1, PG III material, the POISON label specified in §172.430 may be modified to display the text PG III instead of POISON or TOXIC. Also see §172.405(c).
- The ORGANIC PEROXIDE label [§172.427] indicates that organic peroxides are highly flammable. Use of the ORGANIC PEROXIDE label eliminates the need for a flammable liquid subsidiary label. The color of the border must be black and the color of the flame may be black or white.

PLACARDS

See 49 CFR, Part 172, Subpart F, for complete placarding regulations.

- Each person who offers for transportation or transports any hazardous material subject to the Hazardous Materials Regulations must comply with all applicable requirements of Subpart F [§172.500].
- Placards may be displayed for a hazardous material, even when not required, if the placarding otherwise conforms to the requirements of Subpart F of Part 172 [§172.502(c)].
- For other than Class 7 or the DANGEROUS placard, text indicating a hazard (e.g., "FLAMMABLE") is not required. Text may be omitted from the OXYGEN placard only if the specific ID number is displayed on the placard [§172.519(b)(3)].
- For a placard corresponding to the primary or subsidiary hazard class of a material, the hazard class or division number must be displayed in the lower corner of the placard [§172.519(b)(4)].
- Except as otherwise provided, any bulk packaging, freight container, unit load device, transport vehicle or rail car containing any quantity of material listed in Table 1 must be placarded [§172.504].
- When the aggregate gross weight of all hazardous materials in non-bulk packages covered in Table 2 is less than 454 kg (1,001 lbs), no placard is required on a transport vehicle or freight container when transported by highway or rail [§172.504(c)].
- Notes: See §172.504(f)(10) for placarding Division 6.1, PG III materials.
- Placarded loads require registration with USDOT. See §107.601 for registration regulations.
- The new ORGANIC PEROXIDE placard became mandatory 1 January 2011 for transportation by rail, vessel, or aircraft and becomes mandatory 1 January 2014 for transportation by highway. The placard will enable transport workers to readily distinguish peroxides from oxidizers [§172.552].

PLACARDING TABLES

[§172.504(e)]

TABLE 1

Category of material (Hazard Class or division number and additional description, as appropriate)	Placard name
1.1.....	EXPLOSIVES 1.1.....
1.2.....	EXPLOSIVES 1.2.....
1.3.....	EXPLOSIVES 1.3.....
2.3.....	POISON GAS.....
4.3.....	DANGEROUS WHEN WET.....
5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled).....	ORGANIC PEROXIDE.....
6.1 (Materials poisonous by inhalation (see §171.8)).....	POISON INHALATION HAZARD.....
7 (Radioactive Yellow III label only).....	RADIOACTIVE ¹

¹RADIOACTIVE placard also required for exclusive use shipments of low specific activity material and surface contaminated objects transported in accordance with §173.427(b)(4) and (5) or (c) of the subchapter.

TABLE 2

Category of material (Hazard Class or division number and additional description, as appropriate)	Placard name
1.4.....	EXPLOSIVES 1.4.....
1.5.....	EXPLOSIVES 1.5.....
1.6.....	EXPLOSIVES 1.6.....
2.1.....	FLAMMABLE GAS.....
2.2.....	NON-FLAMMABLE GAS.....
3.....	FLAMMABLE.....
Combustible Liquid.....	COMBUSTIBLE.....
4.1.....	FLAMMABLE SOLID.....
4.2.....	SPONTANEOUSLY COMBUSTIBLE.....
5.1.....	OXIDIZER.....
5.2 (Other than organic peroxide, Type B, liquid or solid, temperature controlled).....	ORGANIC PEROXIDE.....
6.1 (Other than materials poisonous by inhalation).....	POISON.....
6.2.....	(None).....
8.....	CORROSIVE.....
9.....	Class 9 (See §172.504(f)(9)).....
ORM-D.....	(None).....

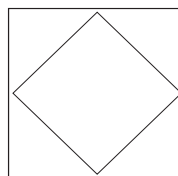
IDENTIFICATION NUMBER DISPLAYS



§172.332

Appropriate placard must be used with orange panel.

IDENTIFICATION NUMBER MARKINGS ON ORANGE PANELS OR APPROPRIATE PLACARDS MUST BE DISPLAYED ON: (1) Tank Cars, Cargo Tanks, Portable Tanks, and other Bulk Packagings; (2) Transport vehicles or freight containers containing 4,000 kg (8,820 lbs) in non-bulk packages of only a single hazardous material having the same proper shipping name and identification number loaded at one facility and transport vehicle contains no other material, hazardous or otherwise; and (3) transport vehicles or freight containers containing 1,000 kg (2,205 lbs) of non-bulk packages of materials poisonous by inhalation in Hazard Zone A or B. See §§172.301(a)(3), 172.313(c), 172.326, 172.328, 172.330, and 172.331.



§172.527

Square white background required for placard for highway route controlled quantity radioactive material and for rail shipment of certain explosives and poisons, and for flammable gas in a DOT 113 tank car [§172.507 and §172.510].

This Chart is available online at the following link: <http://phmsa.dot.gov/hazmat>



U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

USDOT/PHMSA/OHMIT/PHH-50
1200 New Jersey Avenue, SE
Washington, D.C. 20590
Phone: (202) 366-4900
Email: training@dot.gov

PHH50-0138-0413

TDL Social Studies Outcome #7 - Activity 3

15 Types of Physical Hazards and How to Prevent Them

Written by Michael Purser, OSHA Education Center

https://www.oshaeducationcenter.com/what-are-physical-hazards/?gad_source=2&gclid=Cj0KCQiAs5i8BhDmARIsAGE4xHxAidnIX9qYW0_1LaQGm_lbyLGqxMJCwGgkTQ0c9eZEvfXS7gOwtacaAn-IEALw_wcB



Workplace injuries and fatalities are preventable. If you prepare to face the dangers present where you work, you can reduce your risk of suffering a serious on-the-job injury. Physical hazards are the most common safety threats you face on a day-to-day basis.

This article will help you understand the risks associated with most roles, including a list of 15 occupational hazard examples.

Types of Hazards

The risk factors workers face can be broadly classified by the way they inflict harm on the human body. Different regulatory bodies have different systems for classifying dangerous substances or situations.

The Globally Harmonized System of Classification and Labeling of Chemicals (GHS) provides three groups. The National Institute for Occupational Safety and Health (NIOSH) breaks workplace safety risks in the health care industry into five categories.

For this discussion, we will divide hazards into three groups: biological, chemical and physical. Since this is an article about physical hazards, let's make a quick list of other safety hazard examples.

Chemical

From bleach and hydrochloric acid to carbon monoxide and smoke, this group includes any kind of toxic irritant. Common risks include:

- Skin burns or blindness from exposure to bleach
- [Burns to the lungs](#) and other mucous membranes from inhaling chlorine gas
- Exposure to asbestos

Biological

Exposure to harmful biological agents usually results in illness, such as:

- Cancer resulting from repeated workplace carcinogen exposure
- Hantavirus contracted from rodent droppings
- Bloodborne pathogens acquired from bodily fluids

Types of Physical Hazards in the Workplace

While the examples above are harmful, they aren't the focus of this article. Physical hazards usually involve tissue damage through the transfer of energy from an object to the human body. Since that's a very broad generalization, let's break down some of the most common types encountered on jobsites.

Environmental

These are the most common types you are likely to face at work. Risks range from getting a splinter to being caught in an arc flash.

More workers are injured each year by falling than any other environmental or physical hazard. Deadly falls from elevated surfaces and common slips or trips can both cause major injuries.

Confined spaces can be particularly deadly. A cramped area like the inside of a storage tank, an excavation or a trench could cause a structural failure or present an asphyxiation risk.

Not all environmental hazards will cut, crush or scald. Extreme temperatures are just as likely to cause injuries. Working in the sun or on a hot factory floor can lead to life-threatening heat stress. Winter work or a refrigerated warehouse can induce cold stress.

Most people become acclimatized to loud noises over time, but that doesn't stop hearing damage. [Hearing protection](#) and noise reduction will reduce threats that are all too easy to ignore.

Those are just a few common scenarios. There are many more.

Environmental Hazard Examples:

- Eye damage from metal shavings or unprotected welding
- Fractures or sprains from falling from a ladder
- Repeat stress from poor posture or other ergonomic failures
- Concussions suffered from falling tools or debris
- Lacerations or amputations caused by missing or improper machine guarding

Radiation

Radiation isn't just about glowing waste. Ionizing radiation is a devastating threat to human health. Most people will never experience acute radiation syndrome, but small, repeated radiation in industrial settings can lead to chronic health complications.

That includes frequent exposure to excessive ultraviolet (UV) radiation – the non-ionizing radiation in sunlight.

Radiation Hazard Examples:

- Thermal damage induced by microwave or radiofrequency machinery
- Overexposure to X-ray or computed tomography (CT) equipment
- Melanoma or other cancers caused by sunburns
- Blindness resulting from looking directly into lasers

Electrical

Electricity represents a significant danger to human tissue. An electrical shock occurs when a live current passes through the body, which can sear flesh or even stop a heart.

Electrocution (a fatal shock) is a serious threat when lockout/tagout standards or other crucial electrical safety procedures are ignored. Arc flashes are even more hazardous and can strike seemingly without warning.

Electrical Hazard Examples:

- Contact with exposed wiring leading to electric shock

- Fatal electrocution caused by completing an unguarded high-voltage circuit
- Injuries sustained following a sudden arc flash

Fire

There are dozens of causes of workplace fires, from poor storage of oily rags to an uncontrolled release of molten steel. Surprisingly, kitchen mishaps are the **leading cause** of office and store fires. But any uncontrolled burn is dangerous.

Fire Hazard Examples:

- Smoke inhalation and lung irritation
- Third-degree burns from prolonged contact with flames
- Fatal asphyxiation or immolation

How to Prevent Physical Hazards

Benjamin Franklin's famous adage, "An ounce of prevention is worth a pound of cure," still applies. Careful preparation, sound prevention strategies and the proper use of personal protective equipment (PPE) can mitigate almost any kind of occupational risk.

OSHA Education Center is the leading provider of online safety training, offering more than 150 safety courses. All are available 100% online, allowing you to train at your pace from any internet-connected device.

Sign up for any of our industry-leading training courses today to protect yourself, your colleagues and your employees from all kinds of physical hazards in the workplace!

TDL Social Studies Outcome #7 - Activity 1, Article 1

How Has Transportation Affected Globalization: Essential Influences

Written By: Fulfyld Team, February 20, 2024

<https://www.fulfyld.com/blog/how-has-transportation-affected-globalization/>



In today's interconnected world, globalization has become a key driving force behind economic, social, and cultural changes.

Globalization refers to the increasing interconnectedness and interdependence of countries through the exchange of goods, services, information, and ideas. But how has transportation affected globalization?

While there are various factors contributing to globalization, transportation plays a significant role in facilitating and shaping this phenomenon, and we're going to find out how.

Transportation Infrastructure and Its Influence on Globalization

Transportation hubs, such as airports, seaports, and highways, are crucial for global connectivity and economic growth. Airports serve as global gateways, linking cities and countries, and acting as catalysts for business development and tourism.

Seaports are vital hubs for global trade, handling large volumes of cargo and facilitating trade routes. Highways and intermodal terminals enhance regional connectivity, connecting different modes of transportation and promoting economic integration.

Advancements in transportation technology have further amplified the impact of transportation on globalization.

Digital and smart transportation systems have improved efficiency and safety, enabling real-time tracking, intelligent routing, and optimized logistics. Understanding what is logistics planning can help businesses enhance their supply chain strategies for globalization.

These technological advancements have also influenced e-commerce and online marketplaces, making global trade more accessible and efficient.

The potential of autonomous vehicles to transform transportation and further integrate global markets is also an area of growing interest.

Historical Perspectives on Transportation and Globalization

Throughout history, different forms of transportation have played crucial roles in the expansion of globalization.

The Silk Road, for example, enabled extensive trade between East Asia, the Middle East, and Europe, fostering cultural exchange and economic growth.

The Age of Exploration saw the emergence of maritime transportation, connecting continents and facilitating both trade and colonization. The Industrial Revolution brought about the development of railways and steamships, revolutionizing transportation and enhancing global connectivity.

Modern Modes of Transportation and their Global Consequences

In modern times, air transportation has played a pivotal role in transforming global travel and trade. The rapid and efficient movement of people and goods across borders has accelerated globalization.

Air travel has also given rise to the global tourism industry, allowing travelers to explore new destinations and experience different cultures.

Additionally, air transportation has greatly influenced international business operations and supply chains, enabling businesses to expand their reach and access global markets.

Maritime transportation has been a key driver of globalization, especially with the advent of massive container ships. Businesses looking to expand internationally can benefit from international fulfillment services that streamline logistics and cross-border shipping. These ships have facilitated the globalization of manufacturing, allowing goods to be produced in one part of the world and shipped to another.

The expansion of shipping routes has opened up new markets, promoting trade between distant countries. However, the environmental impact of maritime transportation raises concerns about pollution and the need for sustainable practices.

Road transportation, while often overlooked on the global scale, plays a vital role in local and regional globalization. Road networks connect:

- Rural Areas
- Cities
- Manufacturing centers

These connections are supporting economic development and facilitating the movement of goods and people.

The growth of industries dependent on road transport, such as logistics and delivery services, has been closely linked to globalization. Moreover, the influence of road transportation on urbanization and suburbanization cannot be underestimated.

Challenges and Future Trends in Transportation and Globalization

Despite the significant progress made in transportation and globalization, there are challenges that need to be addressed. Many developing regions still face infrastructure limitations, hindering their connectivity and integration into the global economy.

Harmonization of regulations and standards for international transportation is also essential to facilitate seamless cross-border movement of goods. Companies utilizing how can real-time inventory improve supply chain efficiency can optimize stock levels and reduce delays in global trade.

Finally, sustainability and environmental concerns are shaping the future of transportation, driving the need for greener alternatives and practices. Companies can take steps toward sustainability with eco-friendly fulfillment services that reduce their carbon footprint in logistics and distribution.

Conclusion

By now, it's quite clear how transportation has affected globalization. From historical trade routes to modern air, maritime, and road transportation, the movement of people and goods has accelerated global integration.

Transportation infrastructure, advancements in technology, and global challenges all contribute to the ongoing evolution of transportation and its impact on globalization.

As the world becomes increasingly interconnected, transportation will continue to be a key driver of globalization, supporting economic growth, cultural exchange, and international cooperation. For businesses looking to optimize their logistics and supply chain operations, Fulfyld offers tailored solutions to enhance efficiency and scalability.

TDL Social Studies Outcome #7 - Activity 1, Article 2

How Transportation Transformed Our Connected World

By: Dale Dick, July 18, 2023

<https://www.irtheory.com/how-transportation-affected-globalization/>

Transportation plays a pivotal role in the process of globalization by enabling the exchange of goods, services, information, and ideas across the globe. It encompasses various modes such as air, land, sea, and rail, each contributing to the seamless movement of people and resources. The increasing interconnectedness resulting from transportation advancements has propelled the growth of international trade, cultural diffusion, and technological exchange.

Historical Perspective: Evolution of Global Transportation

1 The Silk Road: Connecting East and West

The ancient Silk Road serves as a testament to the historical significance of transportation in fostering globalization. Stretching from China to the Mediterranean, this network of trade routes facilitated the exchange of goods, ideas, and cultures between Asia and Europe, leaving an indelible mark on the world's history.

2 Age of Exploration: Maritime Expansion

The Age of Exploration witnessed the rise of maritime transportation, as explorers ventured into uncharted territories. Christopher Columbus's voyage to the Americas, Vasco da Gama's discovery of a sea route to India, and Ferdinand Magellan's circumnavigation of the globe expanded trade networks and brought diverse cultures into contact.

3 Industrial Revolution: Revolutionizing Transportation

The Industrial Revolution marked a turning point in transportation with the invention of steam-powered locomotives and the expansion of rail networks. This breakthrough innovation revolutionized the movement of goods and people, enabling efficient and rapid transportation across continents.

Key Factors Driving Globalization through Transportation

Infrastructure Development: Building Connections

The development of transportation infrastructure, including roads, ports, airports, and railways, has been instrumental in driving globalization. Robust infrastructure allows for the efficient flow of goods, reduces trade barriers, and facilitates economic integration between nations.

Technological Advancements: Shrinking Distances

Technological advancements, such as the invention of airplanes, containerization, and the internet, have significantly reduced the time and cost associated with transportation. These innovations have transformed the global supply chain, enabling businesses to operate on a global scale and fostering international trade.

Multimodal Transportation: Seamless Integration

The integration of different transportation modes, known as multimodal transportation, has enhanced connectivity and accelerated globalization. Combining air, sea, road, and rail transportation allows for the seamless movement of goods across various regions, optimizing efficiency and reducing transit times.

The Impact of Transportation on Global Economy

Transportation's influence on the global economy cannot be overstated. It has revolutionized supply chains, expanded markets, and stimulated economic growth worldwide. Here are some key aspects of transportation's impact on the global economy:

Trade Facilitation: Enabling International Commerce

Efficient transportation networks facilitate international trade by connecting producers, suppliers, and consumers across borders. Through the movement of goods, transportation provides the necessary infrastructure for businesses to engage in global commerce, promoting economic development and prosperity.

Foreign Direct Investment (FDI): Creating Opportunities

Transportation plays a vital role in attracting foreign direct investment (FDI) by ensuring the seamless movement of capital and resources. Multinational corporations rely on well-developed transportation systems to establish global operations, tap into new markets, and leverage comparative advantages.

Job Creation and Economic Integration

The transportation sector is a significant source of employment, generating jobs in various segments such as logistics, infrastructure development, and maintenance. Additionally, transportation facilitates the integration of regional economies, enabling the efficient allocation of resources and fostering economic interdependence.



Cultural Exchange and Global Connectivity

Transportation has been a catalyst for cultural exchange, promoting understanding and interconnectedness between diverse societies. It has facilitated the exchange of ideas, art, music, and traditions, enriching global cultural diversity. Here are some examples highlighting the role of transportation in cultural exchange:

Tourism: Bridging Cultures

The ease of travel made possible by transportation has fueled the growth of tourism, enabling people to experience different cultures firsthand. Tourism promotes cultural understanding, creates cross-cultural friendships, and contributes to the preservation of cultural heritage.

Migration: Connecting People

Transportation has played a pivotal role in migration, allowing individuals to move across borders in pursuit of new opportunities or to escape challenging circumstances. As people relocate, they bring their unique cultures, traditions, and perspectives, contributing to the cultural fabric of their host countries.

Virtual Connectivity: Breaking Digital Barriers

In the digital age, transportation extends beyond physical movement. The internet and advancements in telecommunications have transformed transportation into virtual connectivity. This form of transportation allows for instant communication, collaboration, and cultural exchange across borders, fostering a global community.

Environmental Implications: Balancing Sustainability and Globalization

As transportation has advanced, so have concerns about its environmental impact. The need to reconcile globalization with sustainability has prompted initiatives and innovations aimed at reducing transportation's carbon footprint. Here are some measures and challenges associated with achieving sustainable transportation:

1 Green Transportation: Embracing Sustainability

The adoption of greener transportation alternatives, such as electric vehicles, renewable energy-powered ships, and eco-friendly aviation initiatives, demonstrates a commitment to sustainable development. These advancements aim to reduce greenhouse gas emissions, mitigate climate change, and foster eco-friendly transportation practices.

2 Challenges and Solutions

Transportation sustainability faces challenges such as urban congestion, inadequate infrastructure, and dependence on fossil fuels. However, innovative solutions like smart city planning, public transportation improvements, and investment in renewable energy infrastructure hold promise for creating a more sustainable transportation system.



Advancements in Transportation: Transforming Globalization

The continuous advancements in transportation have revolutionized the process of globalization, pushing the boundaries of connectivity and accessibility. Here are some notable advancements that have significantly impacted globalization:

Air Transportation:

- Introduction of commercial jetliners, such as the Boeing 707 and Airbus A380, enabling faster and long-distance air travel;
- Development of international airports with state-of-the-art facilities, promoting global connectivity and facilitating efficient passenger and cargo movements;
- Expansion of air cargo services, allowing for the rapid transportation of goods across continents.

Maritime Transportation:

- Containerization revolutionized maritime transportation by standardizing cargo handling and enabling efficient loading and unloading processes;
- Construction of mega container ships, capable of carrying thousands of TEUs (twenty-foot equivalent units), leading to increased efficiency and reduced shipping costs;
- Implementation of advanced tracking and logistics technologies, enhancing supply chain visibility and improving overall maritime operations.

Road Transportation:

- Construction of extensive highway networks connecting cities and countries, facilitating the movement of goods and people;
- Introduction of efficient logistics systems, such as GPS tracking and fleet management software, optimizing route planning and delivery operations;
- Adoption of electric and hybrid vehicles, reducing carbon emissions and promoting sustainable road transportation.

Rail Transportation:

- High-speed rail networks, such as the Japanese Shinkansen and the European Eurostar, offering fast and efficient travel between major cities and regions;

- Expansion of rail freight services, providing a cost-effective and environmentally friendly alternative for transporting goods over long distances;
- Integration of rail systems across borders, promoting cross-border trade and connectivity between countries.

Technological Innovations:

- Hyperloop technology, a proposed mode of transportation with high-speed capsules traveling through low-pressure tubes, promising ultra-fast intercity and international travel;
- Autonomous vehicles and drones, revolutionizing last-mile delivery and transportation services, enhancing efficiency and reducing human error;
- Integration of artificial intelligence (AI) and data analytics in transportation management systems, optimizing operations, improving safety, and enhancing the overall transportation experience.



Future Trends in Transportation and Globalization

The future of transportation holds exciting possibilities for further advancing globalization. Emerging trends and technologies are set to reshape the way we connect and interact globally. Here are some anticipated future trends in transportation:

Sustainable Transportation Solutions:

- Continued development and adoption of electric and hydrogen-powered vehicles, reducing reliance on fossil fuels and minimizing carbon emissions;
- Expansion of renewable energy infrastructure to power transportation systems, promoting a sustainable and clean energy future;

- Integration of smart city concepts, incorporating advanced transportation systems and infrastructure to create environmentally friendly and efficient urban spaces.

Hyperconnectivity and Digitalization:

- Increased reliance on digital platforms for remote work and virtual collaboration, reducing the need for physical transportation;
- Advancements in 5G technology, enabling faster and more reliable communication networks, essential for autonomous vehicles and smart transportation systems;
- Integration of Internet of Things (IoT) devices in transportation, enabling real-time monitoring, predictive maintenance, and improved overall efficiency.

Mobility as a Service (MaaS):

- Shift towards mobility solutions that prioritize access over ownership, such as ride-sharing services, bike-sharing programs, and on-demand transportation;
- Integration of different modes of transportation under a unified platform, allowing users to seamlessly switch between public transit, rideshares, and other mobility options;
- Emphasis on creating sustainable and inclusive transportation systems that cater to the diverse needs of urban and rural communities.

Space Exploration and Interplanetary Transportation:

- Advancements in space travel technology, fostering the potential for interplanetary colonization and travel;
- Commercial space tourism, offering individuals the opportunity to experience space travel and witness Earth from a new perspective;
- Utilization of space-based resources for sustainable development on Earth and beyond.

Conclusion

Transportation has played an indispensable role in the process of globalization, enabling the seamless movement of goods, people, and ideas across the world. It has transformed the global economy, facilitated cultural exchange, and fostered a sense of interconnectedness. As we continue to advance technologically, the challenge remains to balance the benefits of transportation with sustainability, creating a future where globalization and environmental responsibility go hand in hand.

8 Strategies to Manage Customer Delivery Expectations

Caroline Hassett, November 24, 2023

<https://smartroutes.io/blogs/8-strategies-to-manage-customer-delivery-expectations/>

Not long ago, waiting patiently for a package was just part of the online shopping experience. Back then, days or even weeks of anticipation was the norm. Then came the likes of Amazon, shaking up the game with its Prime membership and free lightning-fast shipping. Suddenly, waiting for ages was no longer on the cards. This move set a new pace, redefining what customers came to expect. Quick delivery wasn't just a luxury anymore; it became an everyday demand. And guess what? Now, a whopping 96% of us link "fast delivery" with getting our hands on something the same day!

Retailers have since found themselves trying to figure out how to ship things faster without breaking the bank. The pressure is on for businesses to be faster, smarter, and more innovative in how they handle deliveries. In this blog, we will take a look at exactly what customers are now expecting from their delivery experience, the challenges in meeting these expectations and how we recommend you go about managing your customers soaring expectations.

The Evolution of Customer Expectations

Gone are the days of patient waiting; today's customers are all about speed. We're talking about a demand for same-day, next-day, and two-day deliveries—all without the extra fees.

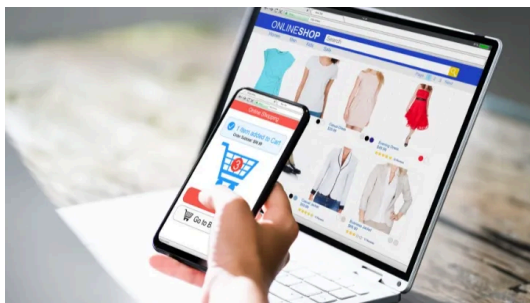
But it's not just about the speed. Customers now crave control over their deliveries. They want the flexibility to tweak details, like changing delivery addresses post-purchase, opting for in-store pickups, or adding last-minute items to their orders. This shift sets a new standard: fast and flexible, no exceptions.

This transformation didn't happen overnight. What used to be an added bonus—fast deliveries—has now become the baseline. Same-day and next-day deliveries aren't luxuries anymore; they're expected. And the ability to customize orders post-purchase? That's the new norm.

The Challenges in Meeting Customer Expectations

Brand Loyalty and Delivery Delays: Customers tend to forge strong connections with brands they trust. However, this loyalty isn't always set in stone. If a customer is eagerly anticipating the arrival of their package, but the delivery date comes and goes, and the package is nowhere in sight. This hiccup in the delivery process is enough for customers to start questioning the reliability of the brand they once trusted, even long-standing customers may become frustrated enough to cut ties with your brand, prompting customers to seek alternatives. The one-off disappointment might seem minor to a business, but to the customer, it often becomes the defining memory associated with them.

Abandoned Shopping Carts: One of the main reasons customers choose to abandon their online shopping basket is the addition of the delivery costs right at the end. It causes nearly 70% of consumers to abandon their carts — right when they are about to finalize their purchase. (Nearly half of consumers attributed abandoned carts to extra shipping fees!). This statistic speaks volumes about the significance of transparent and reasonable shipping costs in the eyes of customers.



Lack of Control with 3PLs: By entrusting delivery control to a 3PL and relinquishing direct oversight, businesses inadvertently pass on the responsibility for the delivery experience. Consider this scenario: an unforeseen delivery delay arises due to external factors. Yet, despite the 3PL's involvement, customers might associate this delay with the business itself, unaware of the 3PL's role in the process. This lack of transparency blurs the lines of accountability, leaving businesses unable to proactively address or notify customers about the issue. While 3PLs undoubtedly offer expertise and efficiency, businesses must leverage the strengths of a 3PL while preserving a seamless customer experience.

External Delivery Dilemmas: Picture this: a delivery schedule meticulously planned, routes optimized, and time slots assigned for on-time deliveries. But reality often throws curveballs. Traffic jams stretch for miles and bad weather closes roads, each slowing down the whole process. These unexpected delays aren't just minor inconveniences; they can effectively throw off the entire schedule, impacting every delivery down the line. These external factors don't just disrupt schedules; they impact the brand's commitment to on-time deliveries. These disruptions aren't within the driver's control, yet they bear the brunt of ensuring these deliveries happen.

The Cost of Speedy Deliveries: Faster deliveries often come with added expenses—expedited shipping, increased labor costs for rush orders, and more. These costs eat into profit margins, posing a significant challenge for businesses, especially when customers expect these speedier services without shelling out extra cash. Maintaining service quality amid these demands is critical. Businesses can't afford to compromise on the quality of the delivery experience, even when pressured to expedite.

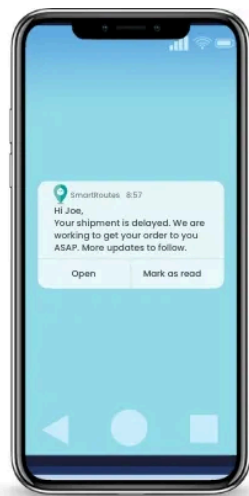
8 Strategies to Manage Customer Delivery Expectations

As we have discussed, there are several challenges presented when attempting to meet customers' delivery expectations. We have put together 10 worthwhile strategies that can help you manage your customers expectations:

1. Improve Customer Communication

Imagine a scenario where a delivery faces an unexpected delay due to inclement weather or unforeseen traffic congestion. Instead of leaving customers in the dark, a notification informing them of the delay transforms what could be perceived as a setback into an opportunity to build trust.

A simple message explaining the situation, expressing regret for the inconvenience, and outlining steps being taken to expedite the process lends a personal touch. It shows customers that their satisfaction matters and that the business values their time and trust. It's a good idea to use a CRM or a route planning tool with notifications built in. This way you can swiftly send emails and/or text messages to the affected customers.



2. Offer a Range of Delivery Options

Customers expect an adaptable delivery experience that suits their diverse preferences and lifestyles. Free delivery, often with a more extended delivery timeframe, is a popular

choice, offering cost savings for customers who prioritize economy over urgency or specific delivery dates. On the other end of the spectrum are the expedited options—same-day, next-day, or 2-day deliveries—ideal for those willing to pay a premium for heightened control and speed.

While offering a range of delivery choices is a great way to meet customer expectations, it's crucial for businesses to strategically select options that align with their capabilities and customer demands. Choosing between these options involves assessing the cost implications. Expedited deliveries come with higher operational costs, from expedited shipping fees to the need for enhanced logistics and resources. Starting with a strategic selection of 2-3 choices enables effective planning and management. Testing the waters and analyzing customer preferences can guide the addition or removal of specific options, ensuring a balanced and profitable offering.

3. Offer Free Delivery

As mentioned earlier in this blog, unexpected costs at the checkout stage can cause consumers to abandon their carts. Offering free delivery is a great way to make your customers happy. Consider offering free delivery for spending over a certain amount of money. So instead of charging a separate delivery fee, absorb the delivery cost for high-value orders and this feels like a bonus for customers. It also nudges them towards increasing their cart value to unlock this benefit, which can lead to higher profits.

Remember, you can still offer premium or expedited delivery options at an additional cost for those who seek it. But this flexibility will definitely ensure that every customer finds a delivery option that aligns with their preferences.



4. Delivery Incentives

Delivery incentives are a great way to manage expectations. These incentives, whether time-sensitive or tied to order volume, are like friendly nudges that encourage customers to shop smart and plan ahead.

- **Time-Sensitive Incentives:** You may foresee a surge in orders before Christmas. By offering a time-sensitive incentive, you can urge customers to place their orders by December 16th, for example, to guarantee delivery in time for Christmas Day. It's a win-win, by using a time sensitive incentive you ensure you're not rushed off your feet trying to complete orders last minute and customers know they will receive their order by placing it in time.
- **Volume-Based Deals:** Say you're aiming for those bigger orders. Offering free delivery on orders over €60 will encourage customers to add a few more items to their cart to receive their free delivery perk.

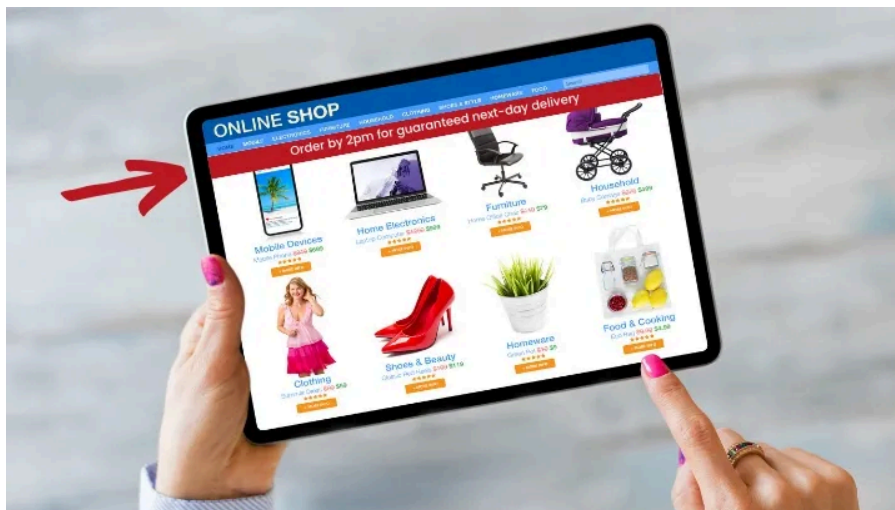
By clearly outlining what's doable, you're giving your customers the heads-up. If they decide to place an order later, they know not to expect their order in time. If they choose not to meet the minimum spend threshold, they know to expect delivery fees.

5. Display Cut Off Times

It's important when running your eCommerce shipping strategy to set realistic expectations regarding delivery times. One effective strategy is to prominently display

cut-off times on your website, providing customers with a clear understanding of when they need to place their orders to guarantee specific delivery options.

By stating, for instance, "Order by 2pm for guaranteed next-day delivery," you are clearly outlining what you need to ensure they receive their order the next day. By incorporating clear and explicit cut-off times in your messaging, you're not just setting expectations, but you're also fostering a sense of trust and reliability, crucial elements in building long-lasting relationships with your customer base."



6. Sustainable Delivery

As environmental consciousness grows, customer expectations lean heavily toward eco-friendly practices in all aspects of business, including sustainable delivery services.

By integrating sustainable methods, businesses can not only align with ethical values but also attract a growing demographic of environmentally conscious consumers.

Implementing route planning tools is one effective strategy. These tools analyze and optimize delivery routes, minimizing fuel consumption and emissions. They ensure efficient navigation, reducing unnecessary mileage and enhancing overall delivery speed while conserving resources. Transitioning to electric vehicles substantially decreases carbon emissions, offering a cleaner and more environmentally friendly alternative to traditional fuel-powered vehicles. Moreover, adapting the vehicle type to suit the delivery area is crucial.

7. Provide Accurate ETAs

By providing accurate ETAs, businesses offer customers a clear window into when their packages will arrive, significantly reducing uncertainty and frustration. Route planning software plays a crucial role in achieving these accurate ETAs. This technology serves as a dynamic tool that optimizes delivery routes based on various factors such as traffic conditions, distance, and even weather forecasts. By utilizing this software, companies can accurately anticipate when they will reach their customers' door.

When notifying customers of the ETA, you can also choose to add a live tracking link. With this link, customers gain visibility into the exact location of their package at any given time. This transparency fosters trust and confidence in the service while keeping customers informed and engaged throughout the delivery process.

8. Offer Contactless Delivery

Implementing contactless delivery as an available option is a significant enhancement to the overall delivery service. A substantial number of customers anticipate and value the option of contactless delivery. This preference involves having their packages securely left at their doorstep or in a predetermined safe location of their choice. This approach aligns seamlessly with the changing preferences of consumers, making it a highly appealing and customer-centric offering.

By providing this option, you're not only meeting customer expectations but also safeguarding their health and convenience. However, it's crucial to ensure a streamlined process by capturing proof of delivery. This step guarantees that customers are informed about the exact timing and location of their package delivery, instilling confidence and reliability in your service.

Keep Your Customers Happy with SmartRoutes

Enhance your customer satisfaction with SmartRoutes, your ultimate solution for efficient delivery operations. Our cutting-edge route planning technology is designed to streamline and optimize your delivery processes, ensuring that your customers receive their orders promptly and with precision.

With SmartRoutes, you can exceed customer expectations by delivering on time, every time. By aligning with their delivery preferences, you not only meet their needs but also significantly boost customer retention rates. Happy customers are loyal customers, and our platform empowers you to solidify those relationships.

Experience the difference firsthand by trying SmartRoutes for free over the next 7 days.

As you implement our system, you'll witness immediate improvements in the delivery experience. From quicker deliveries to smoother operations, our solution will revolutionize how you manage and fulfill orders.

Five Bold Predictions For Transportation Technology In 2025

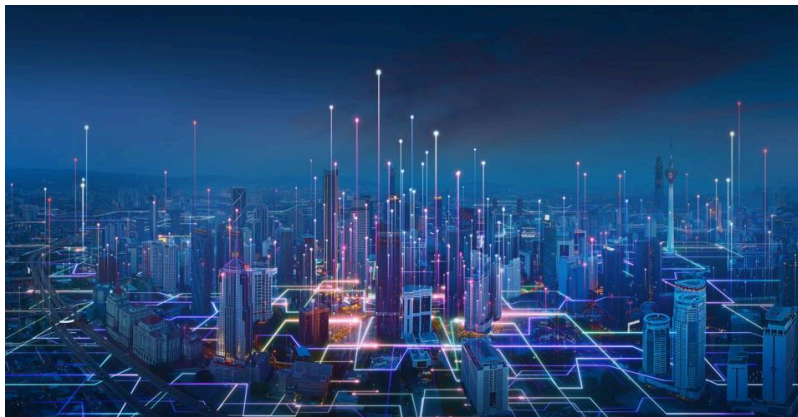
By Regina Clewlow, Contributor, January 8, 2025

<https://www.forbes.com/sites/reginaclewlow/2025/01/08/five-bold-predictions-for-transportation-technology-in-2025/>

As cities around the globe grapple with rapid urbanization, evolving mobility demands, and the pressing need for sustainability, technology continues to reshape how we navigate urban environments. These changes are driven by emerging trends and innovations that promise to make transportation systems smarter, more efficient, and more equitable. Based on the latest developments and industry insights, here are five bold predictions for transportation technology in 2025:

1. The Rise of AI-Driven Urban Mobility

Artificial intelligence (AI) is already transforming urban mobility, but 2025 will mark a turning point. AI-powered algorithms will play a more prominent role in optimizing traffic flows, improving safety in the public right-of-way, predicting transportation demand, and even personalizing mobility experiences for users. Cities will increasingly deploy AI to support management of mobility fleets, ensuring they're in the right place at the right time. Expect AI to also enhance real-time curb management, reducing congestion and enabling seamless deliveries in bustling urban areas.



2. Curb Space as a Revenue Driver

Curbside real estate has long been undervalued, but its strategic importance is becoming evident to multiple stakeholders. By 2025, more cities will adopt dynamic curb pricing models, using real-time data to adjust fees for loading zones, parking, and passenger pick-up/drop-off areas. With the rise of e-commerce, food delivery, and ride-hailing, this digital transformation of the curb will create new revenue streams for cities while improving traffic efficiency. Advanced curb management platforms will be instrumental in this shift.

3. Digital Twins Will Become the Norm for City Planning

Digital twin technology—virtual replicas of physical assets and systems—will become a cornerstone of urban planning and management. In 2025, cities will increasingly rely on digital twins to simulate and analyze transportation networks, test new policies, and predict the impact of infrastructure changes in the right-of-way before implementation. This will lead to smarter, data-driven decisions, saving both time and resources. Transportation departments will use digital twins not only to model traffic flows but also to optimize the placement of EV charging stations, bike lanes, and other critical infrastructure. In the long-term, digital twin technology can not only serve as a valuable resource for city planning, but also for real-time response and management to unplanned events such as weather emergencies and temporary street closures, allowing cities to respond and act more rapidly to change.

4. The Acceleration of Electrification

The electrification of transportation is accelerating, and 2025 will see widespread adoption of electric vehicles (EVs) across various modes of transport. Cities will expand their EV charging networks, integrating them with curb management systems to ensure efficient use of space. Fleet electrification, from buses to delivery vehicles, will also gain momentum as governments introduce stricter emissions regulations. However, this

transition will require robust data platforms to manage charging demand and ensure equitable access for all communities.

5. Policy and Tech Collaboration Will Define Success

Technology alone cannot solve urban mobility challenges; policy plays a critical role. By 2025, we'll see deeper collaboration between various stakeholders from technology providers to major fleet operators, who will need to work closely with city governments to create equitable and sustainable transportation systems. Data-driven decision making will continue to become standard, fostering transparency and trust between private connected fleet operators and public agencies. Policies will increasingly be more flexible and nimble to account for a rapidly-changing ecosystem of mobility operators, from micromobility to autonomous vehicles, ensuring that new transportation options can flourish while improving transportation equity and safety.

Why These Predictions Matter

The transportation sector is at a crossroads, with the potential to drive both economic growth and environmental progress. However, realizing this potential requires bold action and innovative thinking. By embracing AI, digital twins, electrification, and smart policies, cities can create more livable, sustainable, and efficient urban environments.

The tools and technologies to support this transformation are more accessible than ever. Empowering cities with data-driven solutions and innovative platforms can help them navigate these complex challenges effectively. By fostering collaboration and leveraging advanced digital tools, we can collectively shape a future of mobility that benefits everyone.