The Future of Logistics: Indiana is innovating the way goods move globally.

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The pandemic highlights logistical leadership

Over the years, Indiana has established itself as an integral piece of the logistical puzzle for companies needing an edge in the planning, execution and control of procurement. Since logistics is the lifeblood of every business, it should be a priority for every city and state focused on business growth. For Indiana — with dozens of airports, major water ports, 14 interstates and more than 4,000 miles of rail — logistics is top of mind and a key sector for growth.

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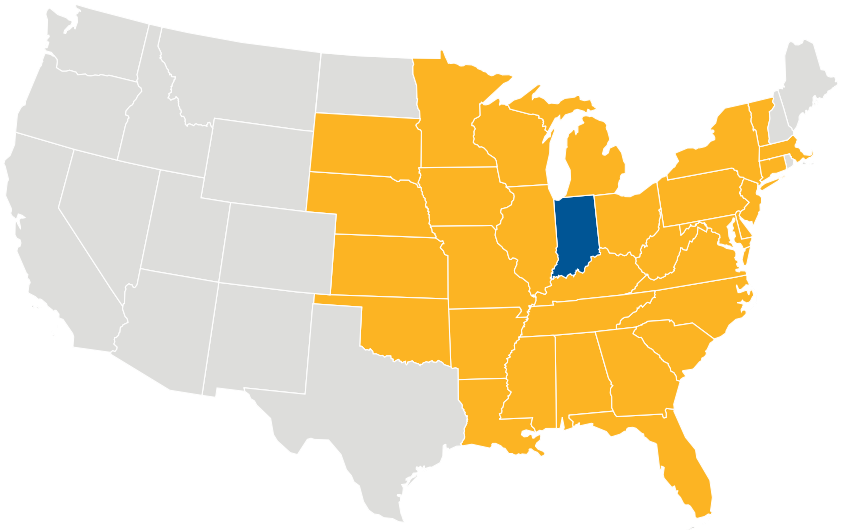
But COVID-19 has put Indiana's strong logistical position to the test like nothing else. The pandemic has created stronger demand for e-commerce, higher shipping rates and an opportunity for high-tech startups. In many respects, COVID-19 has only amplified how essential Indiana's logistical attributes are to national and international markets, and how much business potential is yet to be realized.

Pent-up consumer demand after months of being sheltered in place has been complicated by fewer trucks on the interstate, rerouted ships and grounded planes. Today's new realities are forcing industry leaders to search for innovative solutions that enable new possibilities with technology, and investment dollars are being poured into digital logistics platforms.

Years from now, Indiana likely will be judged by how well it integrates new technology solutions with the old-school attributes it previously mastered. The Hoosier state, centrally positioned, is no more than a day's drive away from 80% of the population of both the U.S. and Canada.

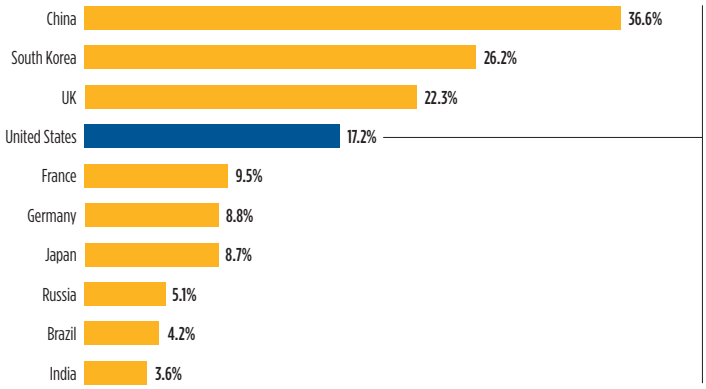
1 Day's Drive



Indiana is a national leader in pass-through interstates and truck tonnage, experiencing more interstate commerce than any other state. Indiana is home to the second-largest FedEx air hub worldwide and is third in total freight railroads. With three maritime ports that together rank sixth in domestic waterborne shipping, Indiana provides the only statewide port system with direct waterway access to two U.S. coasts.

E-Commerce Penetration Varies Considerably from Market to Market and from Category to Category

Global e-commerce share of total retail sales, 2019



US e-commerce share of total market, 2019[1]

Music[2]	87%
Computers	78%
Books	58%
Household Goods[3]	48%
Office Products	41%
Toys	38%
Clothing	27%
Pets	23%
Personal Care	17%
Drugs & Medical Supplies	9%
Food & Drink	4%

Sources: EMarketer, Forrester Analytics, BCG analysis.
1. Comprises all internet-driven purchases, including in-store pickup and digitsal goods.
2. Includes streaming services and digital downloads.
3. Includes dinnerware, cookware, cutlery, linens, and draperies.

Stronger e-commerce demand

Being sheltered in place has forced shoppers to buy online. Even grandparents who may be tech averse have now succumbed to getting an Amazon account for contact-free online shopping.

According to a March 2020 consumer survey from Statista, 5%of consumers aged 65 years and above in the U.S. have bought a product online for the first time due to physical distancing and self-quarantining practices. A third of the survey respondents over age 65 planned on increasing their spending on goods from other marketplaces because of COVID-19.

E-commerce as a percentage of retail sales is now up to 16%, and this even excludes brick-and-mortar retailers' online sales. Bloomberg Intelligence expects e-commerce to retain this market share when life returns to normal due to habits formed during the pandemic. This permanent shift is likely to have real consequences not just for online companies but also for the companies that deliver those packages. Questions abound regarding whether those logistics providers are positioned to handle the sudden volume increase. The companies that can adapt will thrive in this new world order of online shopping and speedy doorstep deliveries.

Even before the pandemic, e-commerce as a percentage of retail sales was steadily growing. From 2017 to 2019, global growth in e-commerce sales outperformed brick-and-mortar sales by a factor greater than 10, and retail sales online are expected to rise from 12% in 2017 to $6.5 trillion, or 22% of total retail sales, by 2023, according to research from Boston Consulting Group.

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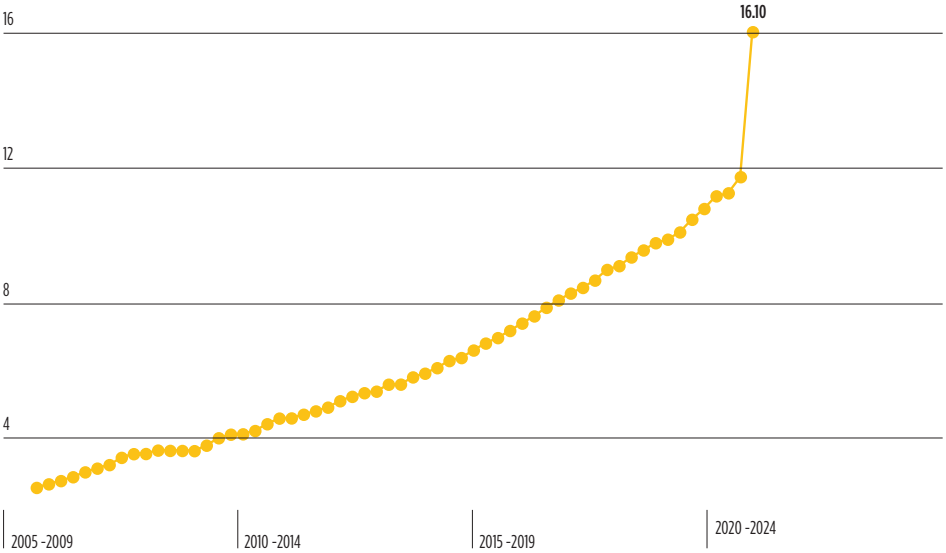
Before the pandemic, several of the world's largest economies, including the U.S., had not reached their potential for e-commerce sales; the U.S. had only 17.2% e-commerce sales as a percentage of total sales in 2019.

The pandemic has created new consumer buying habits and spawned new business models to address the habits. The frequency of online purchases is increasing: By mid-March, half of Chinese consumers had already bought more goods online than they had in all of February, and half of U.S. consumers said they bought groceries online in March because of COVID-19, with one-fifth of them doing so for the first time. It's a sign that the concerns consumers had about online purchases — quality, ordering complexity and security — are quickly dissipating.

The number of retail stores closing permanently because of the pandemic also is forcing retailers to reinvent themselves online. In addition, improvements in same-day delivery from retailers like JD.com, China's largest online retailer, and food services, like Uber Eats, also are increasing online click traffic.

These trends have encouraged FedEx to project that the U.S. market will hit 100 million e-commerce packages per day by 2023; FedEx bumped up its projection by three years because of the pandemic.

E-Commerce as a percentage of total U.S. retail sales



Source: U.S. Census Bureau, Bloomberg Intelligence

More volume, limited capacity means higher rates

Indiana's economy is tied to freight movement, mainly because of its strategic location serving regional, national and international markets. Each year, 724 million tons of freight travel through Indiana, making it the fifth-busiest state for commercial freight traffic. By 2040, freight flow is expected to increase by 60%.

The Indiana Department of Transportation (INDOT) is responsible for maintaining a seamless integration of transportation infrastructure. One-third of the freight on Indiana's transportation network passes through the state without stopping; this means the carriers are stakeholders in the state's freight system. INDOT's goal is to partner with others to provide an integrated freight transportation and logistics system that ensures the efficient movement of goods, materials and services. Recent INDOT innovations have realized tens of millions of dollars in cost savings.

Among the highlights, INDOT now has Virtual Weigh Stations using in-ground sensors to weigh trucks as they travel along interstate and intrastate roads. As trucks cross the sensors, their weight, speed and axle spacings are recorded, even as a camera snaps a photo of the vehicle.

Less capacity, higher rates

Trucks traveling along INDOT roads increasingly command higher freight rates. The trucking industry closely follows the spot market rates -- the hauling prices that exist currently if a freight service provider were to get hired "on the spot." If there are fewer trucks on the road during a given week, but there is a surplus of freight, spot rates will increase. It's a key indicator, because many truck drivers and fleet owners have relationships with shippers and brokers so they can negotiate contracts quickly and get on the road.

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The nationwide shortage of trucks combined with the growth in e-commerce is pushing the spot market higher. Because of COVID-19, many truck fleets haven't had the capacity to take advantage of stronger retail freight volumes. That overflow freight has moved to the spot market. A late-summer surge continued in spot market rates across all equipment types, according to DAT Freight & Analytics.

In general, delivery companies are struggling to keep up with the demand. Market capitalization of the largest companies such as DHL, FedEx and UPS declined 15% to 30%from January 2020 to mid-May 2020. One reason for the declines is that the pandemic forced ocean cargo to be rerouted around Asia and shipping capacity on routes between Asia, and North America has been down significantly compared with pre-pandemic capacity. Those lost trips and weak capacity have led to lost revenue and poor financial results for delivery companies.

Airlines also have shut down routes. With many global air cargo fleets grounded, there's been a shortage of airfreight capacity and a quadrupling of costs for one-way charters of full freighters.

Combined, the ocean and air freight turbulence has increased shipping rates, leaving customers with no choice but to pay up.

Investing in digital logistics platforms

The pandemic exposed supply chain problems that prevented many companies from delivering on promises to their customers, who increasingly expect more product variety and personalized services. In response, companies now are looking for the next generation in logistics management to improve efficiency, transparency, flexibility and traceability. There's mounting pressure, however, to figure out which technologies are worthy of their investments.

Indiana has a roster full of seasoned logistics companies that have dealt with that pressure over the years. These companies are constantly in transition mode; they're continuously setting industry benchmarks, while keeping an eye out for what's next.

Take Integrated Distribution Services, for example. The Indianapolis-based third-party logistics provider is celebrating a its 50-year anniversary in the transportation and warehousing business has adapted to meet the changing needs of the market. In its infancy during the 1960s, the company served the public storage needs of local businesses. During the 1980s, it expanded to include transportation services for the bulk plastics industry. In the mid-1990s, under new ownership, it transitioned again to become a modern logistics provider with

an enterprise-wide warehouse management system. Integrated Distribution became the gold standard for implementing electronic data interchange, a feature now required by most large retailers and manufacturers, and one of the first companies to implement bar code scanning and radio frequency technology in their facilities.

As many of its retailers transitioned to become Ecommerce companies, Integrated Distribution has stayed a step ahead and leveraged its logistics expertise and advanced technology to meet their needs for direct-to-consumer order fulfillment.

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Today, the top emerging technologies in logistics revolve around the Internet of Things, artificial intelligence, robotics, last-mile delivery and warehouse automation, according to data analytics firm StartUs, which analyzed more than 900 startups and emerging companies. Other technologies being explored include the use of blockchain, cloud computing and autonomous vehicles.

The Internet of Things (IoT) creates automated warehouses and tracking of couriers and packages. With IoT, logistics managers have visibility at every step in the supply chain, which can improve inventory management. For example, startup logistics companies using IoT can get detailed diagnostic vehicle reports for fleet managers, including fuel level management and upcoming vehicle maintenance requirements. The IoT also is helping them with route optimization and advanced delivery solutions.

Indiana IOT Lab, located in Fishers, Ind., has become the state's incubator for entrepreneurs, startups and established companies developing IoT solutions to bring to market. The three-year-old initiative underscores Governor Eric J. Holcomb's 2020 Next level Legislative Agenda, which aims to invest $1 billion through the end of the decade in innovation and entrepreneurship.

Logistics platforms integrating artificial intelligence can be programmed to automate manual tasks. For instance, AI-based cognitive automation technology can combine and speed up back-office roles and administrative tasks, which can significantly save money over time. Companies using artificial intelligence today can enable logistics managers with actionable insights on demand forecasting, product replenishment and even weather patterns that might impact deliveries.

Robotics will be used to reduce human error. Logistics companies have plans to use physical collaborative robots and autonomous mobile robots to pick, palletize, package and transport goods in warehouses and facilities. Startups in this space also are using robotic process automation software for invoice processing, storing data for audit trails and completing purchase orders.

Last-mile delivery is the last step in the supply chain, where products move from the warehouse to the customer. This step is typically where many of the cost overruns and delays occur. To combat this problem, logistics companies are testing drones to solve traffic congestion issues in the last mile. They also are utilizing smart locker configurations to enhance security and protection from adverse weather conditions.

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Warehouse automation involves a range of technologies including automated guided vehicles, robotic picking and automated storage and retrieval systems. Startups focused on warehouse automation also are using vertical storage methods to increase height where space is limited.

Indiana has added more than 12.5 million square feet of new warehousing in the past few years. The state has a growing third-party logistics presence and one of the largest warehousing workforces in the country.

To meet tomorrow's logistical demands, state business leaders are banking on that vast industry knowledge perfected over the years dovetailed with emerging technologies.

Clearing a growth path with workforce and incentives

As companies look to start or expand their logistics operations, they will need to find locations with a ready workforce and a supportive business environment to help remove obstacles that could impede growth.

Indiana's 127,000 jobs in transportation and logistics account for more than 4%of the jobs in the state, which is 44% greater than the national average. Most of those jobs are in the truck transportation subsector, and employment in this area is expected to grow by 10.3% through 2026. The warehousing and storage subsector is expected to see the largest increase in employment, adding more than 5,000 jobs by 2026, according to data from Emsi, an affiliate of Strada Education Network.

To train the next group of logistics leaders and technology innovators, schools in the innovation triangle of Indiana University, Purdue University and the University of Notre Dame offer advanced degrees in global supply chain management. Indiana's workforce pipeline for logistics is strong due to key investments in academic programming and on-the-job training.

As an example, Indiana University's 16-week "Supply Chain Management with Digital Technologies" course teaches students an integrated approach to planning, implementing and controlling the flow of information, materials and services. They learn management along the entire product continuum, from raw materials and component suppliers through the manufacturing of the finished product for distribution to customers.

During the course, students also learn how that process is improved with digital technologies, such as blockchain, artificial intelligence and virtual reality, and practice how to leverage those digital capabilities for more granular decision-making in supply chain management.

Even if a logistics company has the workforce problem resolved, it may face hurdles when crunching the numbers to account for inventory. For many small businesses, inventory is a difficult financial consideration because it is so closely tied to the bottom line; You can't deduct inventory expenses from your taxes.

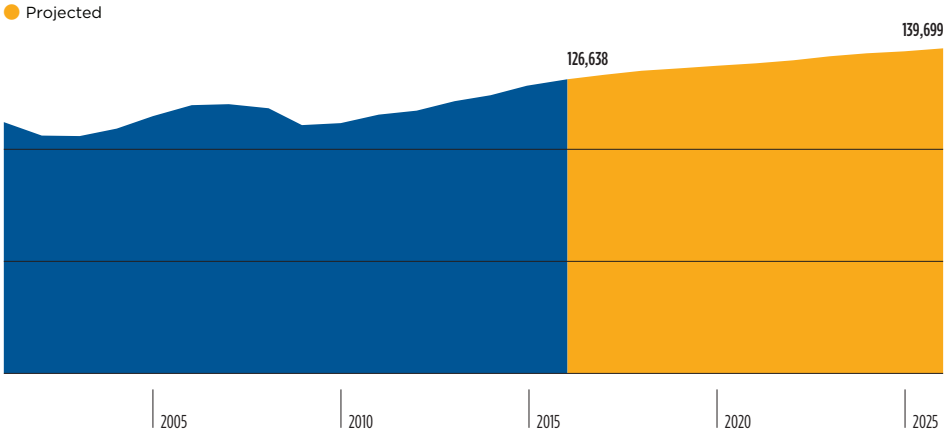
In addition, many states have an inventory tax, an additional property tax against the value of a business's inventory. Given that inventory varies by location, it's difficult to offset the inventory when taxes are due.

When choosing where to set up a logistics company or deciding where to expand, companies would be wise to learn the state's inventory tax rules, which aren't consistent among the states that have them. It's difficult for states to remove inventory taxes because the money goes directly to needy local governments. Alaska, Arkansas, Kentucky, Louisiana, Maryland, Mississippi, Oklahoma, Texas, West Virginia, Vermont and Virginia all impose some form of an inventory tax.

"Logistics companies need a place of financial affordability, stability and a reduced regulatory burden."

Eric J. Holcomb
Governor of Indiana

Transportation and Logistics Jobs Over Time, All Countries



Indiana has a different take: The state not only eliminated its inventory tax, but since 2013 Indiana has provided a logistics tax credit up to 25% of a company's new logistics investment.

"Logistics companies need a place of financial affordability, stability and a reduced regulatory burden," said Indiana Governor Eric J. Holcomb in a recent report on the state of the logistics industry.

Indiana's logistical challenge is to procure companies, which involves planning, execution and eliminating obstacles in that procurement process. With creative policy-making solutions and a commitment to industry partners, Indiana is committed to being a prime location for logistics innovation.