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NTT DATA PennState PENSKE

Third-Party Logistics Study

Results and Findings of the 26th Annual Study

Contents

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Executive Summary

Current State of the 3PL Market

The past year has been full of volatility for shippers and their logistics providers, but the *2022 26th Annual Third-Party Logistics Study* shows that shippers and their third-party logistics providers continue to experience benefits from their relationships. Both groups have worked together to navigate fluctuating demand, capacity problems and uncertainties in the market. Ultimately, some of the data from this year's study may be interpreted to reflect a modest decline in some performance ratings provided by shippers.

As in the past, shippers, also known throughout the study as users of 3PL services, continue to have high expectations of what they need from logistics and supply chain service providers. 3PLs are continuing to increase their technological and digital capabilities, improving service, optimizing networks and driving efficiency. The majority of shippers—89%—reported that their relationships with their 3PLs generally have been successful. A higher number—98%—of 3PLs agreed that their customer relationships generally have been successful.

Among 2022 study respondents, 73% of shippers and 95% of 3PL providers agree that the use of 3PLs has contributed to improving service to the shippers' customers. Additionally, 73% of 3PL users (the shippers) and 90% of 3PL providers agree that 3PLs provide new and innovative ways to improve logistics effectiveness. What's more, 64% of 3PL users and

86% of 3PL providers agree that the use of 3PLs has reduced overall logistics costs.

The most frequently outsourced activities remain those that are more transactional, operational and repetitive. The most prevalent activities shippers outsource are domestic transportation (67%), warehousing (63%), customs brokerage (46%), international transportation (44%) and freight forwarding (49%). Researchers found that the IT Gap remains static, and 94% of shippers agree that IT capabilities are a necessary element of 3PL expertise. More than half—58%—of shippers indicate they are satisfied with their 3PLs' IT capabilities.

The most frequently-cited technologies this year were those that are more execution- and transaction-based, including control tower visibility (60%), transportation management-scheduling (51%), transportation management-planning (51%), cloud-based solutions (49%) and transportation sourcing (40%).

Sustainability and ESG: Impacts on 3PL-Customer Relationships

Sustainability is a growing priority for investors, employees, consumers and the public, and companies are adopting initiatives to help achieve goals and objectives in this critical area. Supply chains hold some of the greatest opportunities for breakthroughs and advancements.

Key drivers for established environmental, social, governance (ESG) programs include consumer trends and preferences and environment and climate impacts, followed by diversity, equity and inclusion (DEI) and social contribution and responsibility.

Among shippers, 59% indicated their organization had an ESG program with defined goals and objectives, and 51% indicated their supply chain had an ESG program with defined goals and objectives. Just under half of 3PL providers, 45%, said their organization had an established ESG program.

Only 20% of shippers feel that their 3PLs' ESG programs are further ahead of their own programs, while 65% of 3PL providers feel that their customers' ESG programs are further ahead of their own programs.

However, there are some challenges associated with implementing an ESG program. The greatest challenge is cost, which was cited by 67% of shippers and 52% of logistics providers. Yet only 8% of shippers and 8% of providers felt that the inability to validate return-on-investment improvements represented a prevalent challenge.

Respondents also said it is challenging to gather the support of others across the supply chain, with 46% of shippers and 30% of providers identifying this as a challenge.
Supply chain areas felt to have made the greatest progress with ESG include sourcing and procurement, supplier management, manufacturing, transportation and warehousing. As part of this year's study, researchers found several facilitators that could positively impact 3PL-customer relationships in relation to ESG, such as executive sponsorship/commitment and having structured ESG goals and plans.

The Intelligent Supply Chain: The Role of Technology

All of the links within the supply chain connect people, processes and information from multiple players, and data and digitization enable those links to connect even faster. Technology plays a critical role in the supply chain, and 3PLs reported that they are seeking out and investing in emerging technologies that can provide value and efficiency to shippers.

Promising technologies include 5G, real-time data transmission, Internet of Things and data analytics.

More than half of shippers (52%) and 3PLs (63%) said 5G technology is either moderately or critically important. 5G, the 5th generation of mobile networks, is designed to provide comprehensive connectivity among virtually everyone and everything, including machines, objects and devices, enabling users to move more significant amounts of data more quickly. As a result, it should enhance supply chain operations, performance and real-time communications, ultimately driving the digital supply chain.

The ability to provide real-time data, which enables visibility and exception management, can create a competitive advantage for 3PLs. Providers are investing in the technology, with 53% of 3PLs reporting that they can provide real-time data to clients in 50% or more of their supply chain services and 23% reporting they can provide it in a quarter to a half of their services.

Internet of Things technology also improves connectivity while driving digitization, mobile computing, analytics and cloud-based technology, changing how shippers and logistics providers conduct their operations.

3PLs said they are investing in Internet of Things technology to improve workforce productivity (63%), improve real-time decision making (57%) and create a competitive differentiator in the market (57%). Shippers are also investing to improve real-time decision making (53%), but also to improve customer satisfaction (53%), improve workforce productivity (33%) and improve asset utilization (33%).

More and more cloud-based systems are being used, and transportation management systems are the most-used cloud technology, with 69% of 3PLs and 61% of shippers using the solution. 3PLs are investing more in cloud-based warehouse management systems (69%) compared to shippers (24%) as well as order management systems (49% of 3PLs compared to 34% of shippers).

Those within the supply chain said they plan to make significant investments over the next three years. For 3PLs, top investment areas include robotics, such as high-dense storage, pickers and palletizers (38%), autonomous forklifts (35%) and wearables (35%). Shippers are focused on increased investment in intelligent data analytics (26%), robotics (20%) and autonomous forklifts (20%).

Cold Chain: Planning and Moving Sensitive Loads

The safety and quality of products moving within cold chains—supply chains specializing in the planning, loading and movement of temperature-sensitive freight—is paramount. Logistics providers must perform flawlessly to ensure product integrity, meet regulatory requirements and maximize efficiency.

A comprehensive cold chain strategy contributes to overall success, and 89% of shippers reported having one. However, a smaller number of 3PLs—62%—agreed that shippers had a comprehensive cold chain strategy.

Companies are using a mix of in-house and outsourced services within their cold chains. Packaging and handling are handled in-house to a greater extent than storage and warehousing, and transportation is the most frequently outsourced service.

There are several services 3PLs must have to meet shippers' cold chain requirements. The most important is having a range of cross temperature/cold chain types, such as refrigeration to deep freeze, according to 67% of shipper respondents. That is followed by active temperature monitoring (56%) and product traceability with proof of compliance (56%).

Meeting cold chain requirements can create several challenges, and shippers and 3PLs are experiencing those challenges differently. While 38% of shippers rank proper-last-mile handling as a challenge, only 8% of 3PLs view it as a challenge. More 3PLs—50%—view temperature monitoring as a challenge compared to 31% of shippers. This year's 3PL respondents reported that their top challenge is infrastructure investment and maintenance (75%) compared to 31% of shippers who see it as a challenge. More 3PLs (38%) see technology investment and maintenance as a challenge than shippers (23%).

Opportunities exist within the cold chain, and most shippers, 91%, and 3PLs, 100%, said they expect demand for cold chain capacity to increase over the next three years. Both shippers (70%) and 3PLs (52%) said COVID-19 has accelerated their growth plans, increasing their need for more cold chain capacity.

As a result, 70% of shippers said they expect to grow in-house cold chain capabilities and talent over the next three years, while 50% said they plan to outsource more of their cold chain capabilities. About 90% of 3PLs said they plan to expand their cold chain capabilities and service offering.

Continuing the Conversation: The Effects of COVID-19

COVID-19 drew national and global attention to the supply chain. Disruptions occurred throughout the supply chain, highlighting weaknesses and the need for contingency planning and risk mitigation strategies.

In this year's study, researchers took a deeper look at the effect the pandemic had on shippers and their logistics providers, as well as how their experiences have shaped their future plans. Shippers and 3PLs reported similar impacts, with 29% of each group citing a net negative financial impact from the pandemic; 42% of shippers and 21% of 3PLs said they experienced a neutral impact. However, 30% of shippers and 23% of 3PLs reported a net positive impact.

3PLs reported logistics bottlenecks and backlogs in all areas of the supply chain and roughly half—48%—said the pandemic had a net negative impact on operations and volume capacity.

Overall, 3PLs indicated they were better prepared to face a major disruption than shippers. More than half of 3PLs—55%—reported that they were somewhat prepared with a level of readiness plan in place prior to COVID-19, and 25% said they were prepared with a readiness plan in place. Among shippers, 43% said they were somewhat prepared and 18% said they were prepared. Just 4% of 3PLs and 5% of shippers said they were unprepared.

Those percentages shifted when both groups were asked about their performance during the pandemic. Based on their experience, 53% of 3PLs said they were prepared and 31% said they were somewhat prepared. Among shippers, 18% said they were prepared and 43% said they were somewhat prepared.

The areas of supply chain shippers said were most impacted by the pandemic included international transportation and logistics (43%), sourcing and procurement (30%) and manufacturing (24%). Among 3PLs, the areas that were most affected by the pandemic included labor/workforce management (33%), manufacturing (24%), and international transportation and logistics (23%).

No one wants to be caught unprepared, and 96% of 3PLs and 100% of shippers said they are enhancing their readiness and continuity planning. The top five areas 3PLs are currently working to improve based on current approved projects and budgets are data analysis and visibility (50%), labor management and scheduling (48%), domestic transportation and logistics (38%), and warehouse distribution and operations (38%).

Shippers reported currently working to improve demand forecasting (42%), capacity forecasting (40%), international transportation and logistics (38%), supply chain network design or redesign (36%), and data analysis and visibility (33%).

Contemporary Issues

There are several critical issues shippers and 3PLs are facing in today's supply chains that will shape demand for services and the future of shipper-3PL relationships. This year, the study team looked at the need to rebalance networks. Researchers also delved into the role of supply-chain-as-a-service, which enables individual links in the supply chain, from procurement and production to last-mile delivery, to be performed by a third party.

Past efforts to reduce inventory levels have reduced waste, but significant disturbances, including the COVID-19 pandemic, drew attention to what can happen when supply chains become too lean. More than half—62%—of shippers said they believe that supply chains have become too lean, taking out too much in an effort to reduce cost and on-hand inventory.

Additionally, 68% of shippers believe that supply chains have become too global and must be rebalanced towards more regional and local/domestic ecosystems within larger global enterprises. The majority of shippers—83%—said they plan to adjust sources of supply as a direct result of efforts to rebalance towards regional and local/domestic sources.

For shippers, several factors are contributing towards global rebalancing, including increased need for supply chain resilience (71%), increased awareness of supply chain vulnerabilities (63%) and more restrictive trade policies (41%).

Traditionally supply chains have been viewed as cost centers and a frequent go-to organization by CFOs and CEOs in search of cost savings. Supply chain as a service (SCaaS) is an opportunity to rethink the underlying role of supply chains and provides a new business model that generates alternative revenue streams not just for 3PLs but also for shippers.

Supply-chain-as-a-service is becoming more and more possible through the use of cloud technologies, which enable companies to leverage available technologies and service partners to manage all or part of their supply and demand networks. The challenge to 3PLs is to identify unmet needs in the marketplace and to match alternative models to capture untapped revenue sources.

3PLs currently have several supply-chain-as-a-service offerings, including logistics as a service (77%), inventory management as a service (57%), returns management as a service (51%) and reverse logistics as a service (51%). They are also planning to expand their offerings, with 23% reporting plans to offer supply chain management as a service within the next three years, 21% have plans to introduce returns management as a service, and 20% plan to introduce last-mile as a service.

Currently, just 10% of shippers are utilizing an as-a-service model, 12% are presently reviewing options, and 5% plan to explore their options over the next year. Similarly, only 5% of shippers offer supply chain services to other companies, but 15% said they are currently reviewing options, and 10% plan to explore options over the next year.

Supply chain challenges continue to affect shippers and logistics providers throughout the past year, and several factors are shaping short- and long-term supply chain needs. Shippers and 3PLs continue to adjust to market demands and capacity constraints, but it may take 18 to 24 months or more before supply chains may be in balance.

Although things are moving slowly, they are still moving, and the supply chain has proven to be resilient even as the pandemic, natural disasters and regional issues create new obstacles to overcome.

Current State of the 3PL Market

Shippers and 3PLs Work to Rebuild Supply Chains

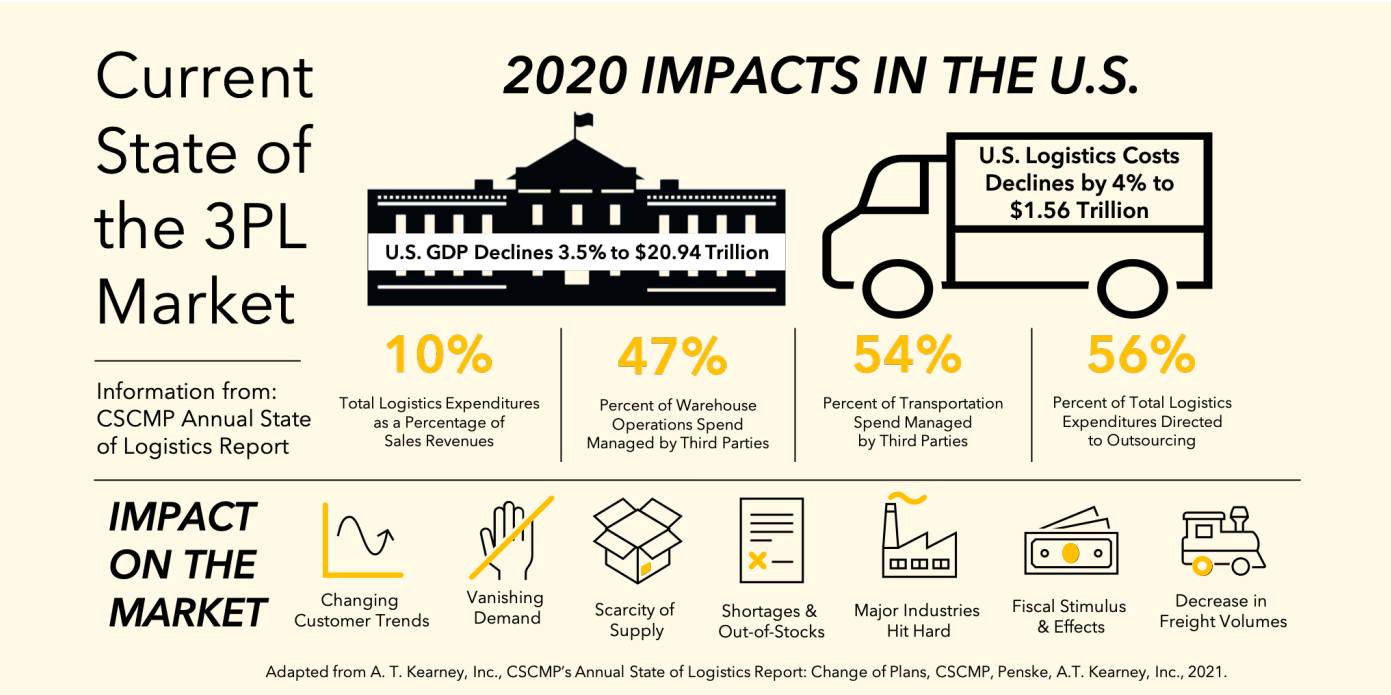
In recent years, the term "disruptive" has been used mostly in a positive context. In the realm of supply chain management, disruptive innovation has been used to refer to the development and use of positive, "game-changing" technologies and improvements to our supply chains. While this trend continues, 2020 and 2021 have also proven to be disruptive to our supply chains, but in the context of being unexpected, distressing and intrusive.

Often, supply chains go unnoticed because they work seamlessly. Manufacturers, retailers and even consumers are used to finding the items they want when they want them. However, COVID-19 put a spotlight on supply chains, uncovering the downsides of just-in-time inventory and the frustration that can build when both raw materials and finished goods don't arrive on time or are not available for purchase. Supply chain disruptions were made worse by numerous weather events across the globe, the Suez Canal blockage, port congestion, port closures and pipeline outages.

The pandemic also exacerbated the driver shortage, with some drivers leaving the industry with no intention of returning and several driving schools and licensing agents closing their doors. Various regulatory changes, which took tens of thousands of drivers out of the workforce, already affected the driver base. At the same time, consumer demand for services waned and orders for durable goods increased, adding to a capacity shortage in some markets.

However, recent supply chain challenges have accelerated the adoption of technology and demonstrated the need for visibility. They also showed the value of third-party logistics providers that were able to pivot resources, such as equipment and drivers, to those industries that surged during the pandemic. 3PLs also play a critical role in contingency planning and network optimization, which are becoming increasingly important.

The recently-released *CSCMP Annual State of Logistics Report* speaks directly to these circumstances in its introduction: "After a wild ride in 2020, this year's report identifies an industry buffeted by the COVID-19 pandemic. Costs for many transportation and warehousing services rose in 2020 (and 2021), while most volumes dropped. Consumer demands intensified even as the networks that would deliver products were scrambled while new threats loom. The result is that no logistician was able to simply stay the course in these timeframes, and conditions ahead will require even greater adaptability and nimbleness." The newest version of this annually-published CSCMP report was appropriately sub-titled change of plans.



Adapted from A. T. Kearney, Inc., CSCMP's Annual State of Logistics Report: Change of Plans, CSCMP, Penske, A.T. Kearney, Inc., 2021.

[1] A. T. Kearney, Inc., CSCMP's Annual State of Logistics Report: Change of Plans, CSCMP, Penske, A.T. Kearney, Inc., 2021, page 1.

Introduction

The *2022 26th Annual Third-Party Logistics Study* provides the latest perspectives on relationships between shippers and 3PLs, why there is mutual agreement on the success of these relationships, and areas for improvement. The report also addresses the contemporary circumstances that pose challenges for even the best organizations.

The *Annual Third-Party Logistics Study* continues to show that shippers and third-party logistics providers generally report benefits from their relationships, even as supply chains have been under stress both domestically and abroad. In addition to the impacts of COVID-19, major disruptions to supply and demand for many types of products and services have complicated the task of effectively managing supply chains. Although we have seen shippers and 3PLs engage in collaborative efforts to flex as may be needed and meet demand, there are still major areas where additional improvement is needed.

As reported in recent years, shippers continue to have greater expectations of what they need from logistics and supply chain service providers. While these organizations have responded with the best that they can offer, it is apparent that overall issues with managing supply and demand, including capacity, have in many instances become overwhelmingly difficult.

A critical look at 3PLs and their customers identifies several areas of innovation and advancement that are helping to enhance their efficiency and effectiveness. The following are having significant positive impacts on the current state of the supply chains in which they participate.

Analytics and Digital Transformation.

Advances in these areas have greatly facilitated the conversion of data into information and leveraging the availability of analytics to provide more robust solutions to supply chain problems. While the ability to effectively manage digital information helps 3PLs and customers improve their planning and operations, the supply chains they serve are also beneficiaries of these advancements. In addition to the greater availability and use of predictive and prescriptive analytics, access to AI, machine learning and cognitive capabilities are also game-changers.

Transparency, Visibility, 5G Networks and IoT.

As the importance of information technology to the effective functioning of supply chains continues to accelerate, the capabilities of 5G and IoT will help immensely with objectives relating to supply chain transparency, visibility and collaboration. Coupled with the use of current and emerging mobile technologies, the enhanced availability of real-time information among people and machines in supply chains will contribute significantly to the overall agility and responsiveness of supply chains.

Sustainability.

Among the current priorities for many organizations and supply chains is a focus on sustainability. This is apparent by observing the current and growing emphasis on areas such as: environmental, social and governance issues (ESG); diversity, equity and inclusion (DEI); corporate social responsibility (CSR); and the notion of the "circular" economy that advocates the 3Rs (reduce, reuse and recycle). There are great opportunities for 3PL-customer relationships to make progress in these important areas, and so the topics of sustainability and ESG are among the special topics covered in the *2022 26th Annual Third-Party Logistics Study*.

Talent.

Human resources are always a priority for most organizations, and excellence in supply chains starts with having the right people in place at the right time. As a result, the HR area of many organizations has been elevated in status due to the critical need for people and talent to deal effectively with the increasingly lofty goals and objectives of supply chains. These concerns are apparent at all levels of management and operations at 3PL and customer organizations, and the topic of having sufficient "bench strength" to meet the needs of the future has become front and center.

Shipper Experiences with 3PLs: Updating State of the Market

The past year has been volatile for many 3PLs and their customers. Complicating factors have included the sometimes wildly fluctuating demand for certain types of products, capacity problems for many asset-based providers of logistics and supply chain services, and uncertainties in the markets served and represented by 3PLs and their customers.

Even still, the *2022 26th Annual Third-Party Logistics Study* again confirmed that most shippers—90%—report that their relationships with their 3PLs generally have been successful. As is typical, a higher number of 3PLs—98%—agree that their customer relationships have been successful.

Figure 1 summarizes these metrics and other relationship-focus issues. Perhaps not surprisingly, some of the data from this year's study may be interpreted to reflect a modest decline in some of the performance ratings provided by shippers. For example, this year's survey indicated that 73% of shipper respondents agreed that the use of 3PLs has contributed to improving service to the shippers' customers. This is a decrease from the previous year's result of 88%. Most likely, this year's lower percentage reflects uncertainty and challenges in the freight markets. Similarly, but not as strikingly, there was a modest decline from 76% to 73% of customers who felt that 3PLs provided new and innovative ways to improve logistics effectiveness. Also, 64% of shippers agreed that the use of 3PLs has contributed to reducing overall logistics costs, down from the 68% reported last year.

Figure 1: Key Perspectives from 3PL Users and Providers

Users Shippers in Agreement (%)		Statement	3PL Providers in Agreement (%)	
2021	2022		2021	2022
91%	90%	The relationships between shippers and 3PLs generally have been successful	99%	98%
88%	73%	The use of 3PLs has contributed to improving service to customers	98%	95%
76%	73%	3PLs provide new and innovative ways to improve logistics effectiveness	92%	90%
68%	64%	The use of 3PLs has contributed to reducing overall logistics costs	96%	86%
62%	**56%**	**Overall shippers are increasing their use of outsourced logistics services**	**94%**	**79%**
59%	57%	Shippers are reducing or consolidating the number of 3PLs used	77%	77%
50%	49%	Shippers are collaborating with other companies, even competitors, to achieve logistics cost and service improvements	79%	75%
	30%	Shippers are returning to insourcing many logistics activities	42%	38%

Current Challenges

Supply chains have experienced a number of significant challenges over the past two years, and it has become apparent that it will take time to effectively rehabilitate and perhaps renew some of the capabilities that now need attention. Also, history has shown that the aftermath of disruptive events does not always include a "return to normal." In the context of supply chain management, this suggests that a valuable component of the recovery process will be to assess opportunities to innovate and improve in ways that may need to receive attention. Some of these critical areas include the following:

Matching Supply and Demand.

This challenge goes right to a key mission of most or all supply chains, and that is to balance supply and demand. While great progress has been made in improving the efficiency and effectiveness of many supply chains, disruptive events can surface risks and vulnerabilities that previously may have been of lesser concern. The agenda for many supply chain organizations now is to reevaluate and improve all processes that are related to achieving alignment between supply and demand. There is a great opportunity and need for 3PLs and their customers to focus on improved abilities to forecast and manage demand and provide visibility throughout the supply chain. This responsibility needs to be shared among all participants in the supply chain.

Rethinking, Reinventing and Transforming Supply Chains.

Considering that many supply chains are in a state of disarray, challenges and opportunities lie ahead to identify and assess new and improved ways to create value for the end-user customers, consumers, patients and warfighters. The first step in the pursuit of improvement is to create a useful understanding of the current or "as-is" state of the supply chain and then to determine how best to transform this into a desired future or "to-be" state. An important element in this process is to meaningfully examine and assess the core competencies of the individual organization and what the future looks like in terms of markets, customers, products and services. This task is relevant to all supply chain participants, including 3PLs, 4PLs and other providers and facilitators of supply chain services.

Change Management.

The management of change has never been easy, but the current complexities and disruptions facing many supply chains have exacerbated the challenges of this important process. The success of any change management initiative will depend on having an accurate understanding of what needs to be changed and what improvements are expected as a result. Several other important factors include a dedication to a comprehensive and robust change process, willingness to consider innovative ideas and initiatives, and having the time, energy and commitment to responsibly follow the recommended steps in the change process that is adopted.

Managing the End-To-End (E2E) Supply Chain.

Considering the disruptions faced by many supply chains over the past couple of years, there is a need to improve the functioning of our "end-to-end" (E2E) supply chains. While the "integrated supply chain" concept makes sense in theory, we have seen numerous examples of where the (supply) chain is "as strong as its weakest link." This underscores the need for 3PL/customer relationships to be successful for the sake of the involved organizations and the broader reaches of the supply chain.

3PL/User Spending Patterns on Logistics and 3PL Services

Current and recent years' survey data relating to financial aspects of users' logistics and 3PL expenditures are included in Figure 2. The survey question defines total logistics expenditures to include transportation, distribution, warehousing and value-added services. Overall, the data from the current year is relatively similar to that of recent years, but there are some thought-provoking differences.

- First, shippers report that total logistics expenditures as a percentage of sales averaged 11%, which is higher than the percentages reported for the two previous years. This is an interesting finding, as the current *CSCMP Annual State of Logistics Report* indicates that logistics costs declined to 7.4% of GDP in 2020 from higher percentages reported in previous years. Comparing these two metrics over time, the percentages from the *Annual Third-Party Logistics*

Studies have been higher than those reported in the *CSCMP Annual Study*, but their year-over-year changes have been directionally consistent. Disparities in the relative percentages are because the metrics are different from one another. Our conclusion is that the 11% cited in **Figure 2** indicates some combination of rising logistics costs for shippers/users of 3PL services and/or general declines in organizational sales revenues.

- Second, the other average percentages reported in **Figure 2** for the 2022 study are significantly lower than those from the previous year or two. Included are percentages relating to total logistics expenditures directed to outsourcing (down from 53% average to 40%); transportation spend managed by third parties (down from 64% to 51%); and warehouse operations spend managed by third parties (down from 48% to 37%). While it will be insightful to see how these metrics change between the current and next year's studies, it is apparent that shipper expenditures over the past year for commercial logistics services declined significantly.

Figure 2: Selected Financial Aspects of Users' Logistics and 3PL Expenditures

Selected Information	2019 Study	2020 Study	2021 Study	2022 Study
Total Logistics Expenditures as a Percentage of Sales Revenues	11%	10%	9%	11%
Percent of Total Logistics Expenditures Directed to Outsourcing	53%	56%	53%	40%
Percent of Transportation Spend Managed by Third Parties	50%	54%	64%	51%
Percent of Warehouse Operations Spend Managed by Third Parties	34%	47%	48%	37%

Expectations in Shipper-3PL Relationships

Previous to this past year, shippers were experiencing improved service, greater supply chain optimization, and increased value in their logistics and supply chain operations. The focus by 3PLs on helping to facilitate dynamic, responsive and efficient supply chains resulted in shippers seeing their products get to market faster, making more near-real-time decisions, and flexing their capabilities up or down based on demand. Unfortunately, the stressful freight market of the past year included volatility in demand for freight services among many shippers and capacity issues among many 3PLs and asset-based logistics service providers.

Based on the understandable inclination of many shippers and 3PLs to do what is necessary to achieve efficiency and effectiveness of their operations, there appears to be a continuing interest on the part of both to work with other organizations when necessary to accomplish these goals.

As shown in **Figure 1**, 49% of shippers and 75% of 3PLs agreed they would collaborate with other companies, even competitors, to achieve logistics cost and service improvements. The shipper figure is approximately the same as the previous year's 50%, while the 75% for 3PLs compares with 79% for the previous year.

[2] A. T. Kearney, Inc., ibid.

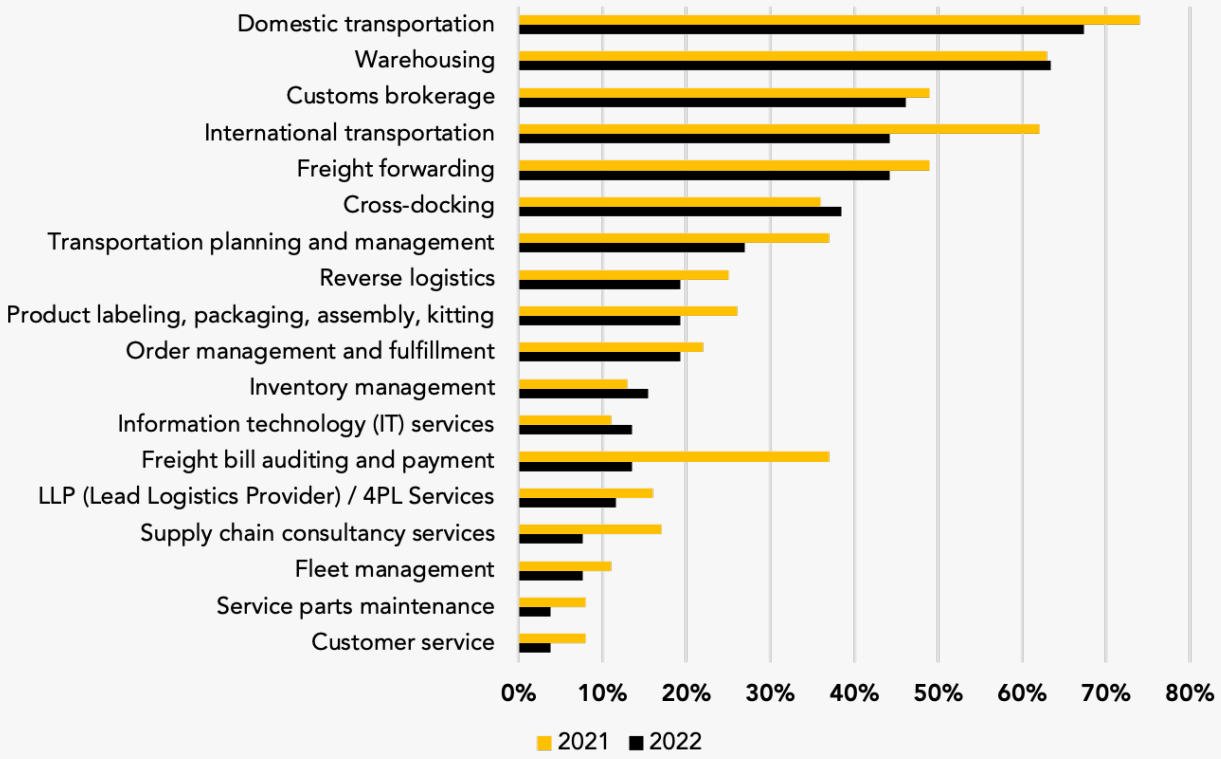
What Shippers Report Outsourcing

Each year, the *Annual Third-Party Logistics Study* asks shippers to indicate which logistics services they currently outsource to a 3PL. **Figure 3**'s metrics show the percentages of shippers indicating they outsource the specific logistics services. Generally, most of the percentages reported in **Figure 3** are lower than those from the previous year's study. This could be attributed to a different composition of survey respondents, but it is also likely that the recent disruptive events may have also been responsible for current disparities.

Some of the more interesting findings are related to the outsourcing of transportation and transportation-related services. The percentage of shippers indicating outsourcing of domestic transportation services decreased from 74% in the previous year's study to 67% in the current year, and the outsourcing of international transportation services decreased from 62% to 44%.

A related example is that the outsourcing of transportation planning and management decreased from 37% in last year's study to 27% in the current study. Also, 13% of the shipper respondents indicated they outsourced freight bill auditing and payment services, which is a significant decrease from the previous year's finding of 37%. The use of 3PL-provided supply chain consulting services declined from 17% to 8%, and the use of LLP and 4PL services declined from 16% to 12%.

Figure 3: Shippers Continue to Outsource a Wide Variety of Logistics Services



COVID-Related Decreases?

COVID both created and exacerbated financial concerns at companies globally, and many worked to limit spending to preserve cash. Given the disruptions of the past year, researchers were not surprised to see a decrease in the use of some outsourcing and consulting services.

"Outsourcing transportation planning and management and freight bill auditing and payment services are a value-added service, but these could be the first areas you cut back on if your revenue is down and you need to cut costs," said Sylvie Thompson, supply chain transformation practice leader, NTT DATA. That could have contributed to decreased outsourcing and less use of consulting services as companies shut down projects, temporarily insourced work, or negotiated alternative pricing and payment schedules.

"We saw several companies in the middle of multi-year ERP rollouts shut them down unless they were on the verge of going live," Thompson said. "They said, 'We need our people to focus on what is important right now.'"

It is also possible companies chose to complete work in-house if they saw demand drop. That would allow them to not only reduce outsourcing costs but also help keep their workers employed.

Companies may have also negotiated alternative pricing and payment schedules as they focused on their budgets.

These decreases may or may not indicate a longer-term trend. Researchers will closely monitor the use of these services in future studies.

3PL's IT Capabilities: Is the "IT Gap" Stuck in Neutral?

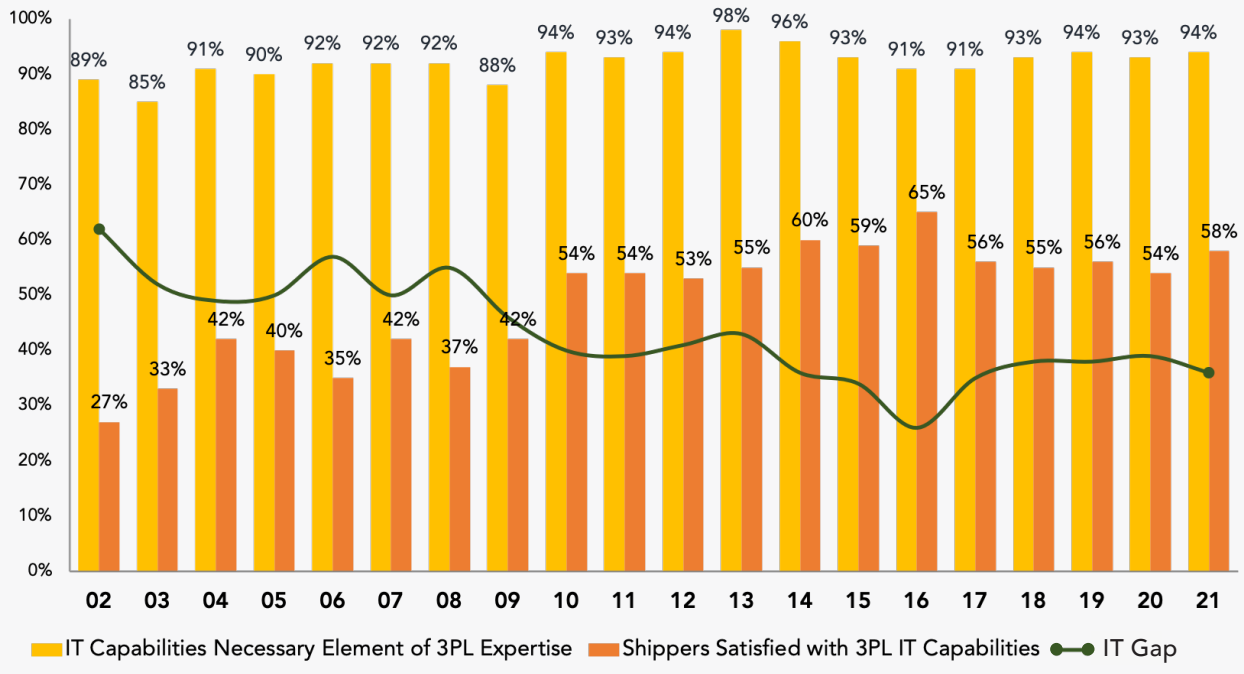
The *Annual Third-Party Logistics Study* has been tracking the "IT Gap" for the past 20 years. This analytic is equal to the percentage of shippers feeling that information technology capabilities are a necessary element of 3PL expertise and subtracting from that figure the percentage of shippers who indicate satisfaction with 3PL IT capabilities.

Figure 4 charts the behavior of these individual analytics and the IT Gap from 2002 to the present. Looking at the far-right side of the bar chart, the IT Gap of 36% is the difference between the 94% figure for a necessary element of 3PL expertise and the 58% shipper satisfaction rating. A few observations include:

- Current year results indicate that 94% of shippers agree that IT capabilities are a necessary element of 3PL expertise, and 58% of shippers agree they are satisfied with 3PL IT capabilities.
- As observed since these questions have been included in the annual survey, the percentages of shippers agreeing that IT capabilities are a necessary element of 3PL expertise have consistently been at very high levels. In contrast, the percentages of shippers agreeing they are satisfied with 3PL IT capabilities rose from 27% in 2002 to 54% in 2010 and have been relatively stable since then, with most of these percentages in the mid-high 50% range with a couple of years in excess of 60%. Allowing for some variations in this metric from year to year, the trend over the past ten years or so has been relatively flat.
- The above details raise the question of whether or not the IT Gap is "stuck in neutral." A logical conclusion of the data indicates this may be true. Looking more deeply into the world of IT and its relevance and utility to 3PLs and shippers, recent years have seen a steady flow of advances in tools and technologies that enrich the effectiveness of 3PL-customer relationships and technology contributes to improvement in overall supply chains. Future versions of the *Annual Third-Party Logistics Study* will also evaluate additional analytics that may provide valuable perspectives on the satisfaction experienced by shippers and 3PL users on the rapidly advancing array of relevant information technologies.

There is a continuing need to better understand the specific types of 3PL-provided or managed information technologies that are credited with creating value for their shipper customers. **Figure 5** outlines shipper responses to the question, "Which information technologies, systems or tools must a 3PL have to

Figure 4: Is the "IT Gap" Stuck in Neutral



successfully serve a customer in your industry classification?" For comparison purposes, **Figure 5** also includes shipper percentages from the previous year's study.

Consistent with the results of recent *Annual Third-Party Logistics Studies*, the more frequently-cited IT capabilities tend to be more execution and transaction-based, including transportation management-scheduling (51%), transportation management-planning (51%), transportation sourcing (40%), and warehouse/distribution center management (38%). When compared with the percentages reported in the previous year's study, however, each of these current year percentages are much lower. One interpretation is that the disruptive events of the past year have resulted in shippers focusing more internally for these types of IT-related resources instead of relying on the commercial sector.

A very interesting finding from this year's study is the heightened needs reported by 3PL users for technology-based capabilities such as control tower visibility, tracking and asset management (60%), cloud-based solutions (49%), and advanced analytics and data-mining tools (38%). These percentages are all significantly higher than those reported in recent studies and suggest that 3PL users are focusing attention on some of these more strategic IT-based capabilities.

Figure 5: Shipper Views of IT-Based Capabilities Needed from 3PLs

Information Technology	2021 % Reported by Shippers	2022 % Reported by Shippers
Control tower visibility (visibility, tracking, & asset management)	37%	**60%**
Transportation management (Scheduling)	72%	**51%**
Transportation management (Planning)	69%	**51%**
Cloud-based solutions	23%	**49%**
Transportation sourcing	51%	**40%**
Warehouse/distribution center management	51%	**38%**
Advanced analytics and data mining tools	27%	**38%**
Web portals for booking, order tracking, inventory management, and billing	40%	**36%**
Supply chain planning	35%	**30%**
Customer order management	29%	**30%**
CRM (Customer relationship management)	17%	**28%**
Global trade management tools (including customs processing and import/export documents mgt)	17%	**26%**
Distributed order management	29%	**21%**
Yard management	27%	**21%**
Network modeling and optimization	45%	**19%**
Warehouse automation	27%	**17%**
RFID	9%	**13%**
Blockchain	8%	**9%**
Robotic Process Automation (RPA)	12%	**9%**
Wearables (biometrics, health & safety, etc.)	9%	**2%**

Current Status of Outsourcing vs. Insourcing

Since the *Annual Third-Party Logistics Study* was launched more than 25 years ago, there have been shifts in the percentages of shippers indicating increases in their use of outsourced logistics services and those indicating a return to insourcing many of their logistics activities.

Outsourcing:

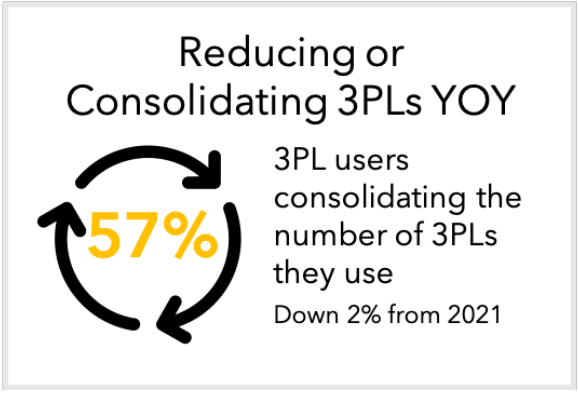
This year, 56% of shippers indicate they are increasing their use of outsourced logistics services, which compares to a figure of 62% reported last year. Also, 79% of 3PL providers agreed their customers experienced an increase this year in their use of outsourced logistics services, compared to 94% last year. This is understandable considering the reduced freight volumes that were experienced by many shippers over the past year. Again, the year-over-year figures' differences tend to vary somewhat based on the composition of survey respondents for each year.

Insourcing:

Close to one-third—30%—of shippers indicate they are returning to insourcing many of their logistics activities, which is lower than the 37% reported last year. Additionally, 38% of 3PL providers agree that some of their customers are returning to insourcing, in contrast to the 42% reported last year.

Reducing or Consolidating 3PLs:

This year, 57% of 3PL users report reducing or consolidating the number of 3PLs they use. This percentage figure is only slightly less than the average of 59% reported in the previous year's study.



Key Takeaways

Included among findings of the Current State of the Market for the *2022 26th Annual Third-Party Logistics Study* are the following:

- The *2022 26th Annual Third-Party Logistics Study* again confirms that both users and providers of 3PL/4PL services have positive evaluations of their relationships. This year, a strong majority of shippers—90%—report that their relationships with their 3PLs generally been successful. A higher number of 3PLs—98%—agree that relationships have generally been successful. These findings are consistent with those of previous year's studies.

- Impacting some of this year's study results and findings, however, are the disruptive circumstances that have proven to be distressing and intrusive to the effective and efficient function of global supply chains. Findings from this year's *Annual Third-Party Logistics Study* sometimes raise more questions than answers. In short, global supply chains have had to deal with many unprecedented issues, and future studies hopefully will help to anticipate and better understand where supply chains and shipper-3PL relationships may be headed.

- Among the high-profile areas of innovation and progress that are relevant to these relationships are: analytics and digital transformation; transparency, visibility and 5G networks and IoT; sustainability; and talent. Ongoing development and improvement continues to be underway in these areas, despite current challenges in logistics and supply chain management.

- Additional topics of relevance for the success of supply chains and 3PL-customer relationships include matching supply and demand, transforming supply chains, change management and managing end-to-end supply chains.

- Users of 3PL services report that 40% of their total logistics expenditures are related to outsourcing, which is down significantly from the 53% reported in the prior year's study. Also, total logistics expenditures as a percentage of sales revenues were reported at 11%, which is higher than the percentages reported in the two previous years. The percentage of transportation spend managed by third parties was 51%, and the percentage of warehouse operations spend managed by third parties was 37%. Both reflect decreases from the figures reported in the previous year's study.

- When asked about the types of logistics services outsourced to 3PLs, the results generally paralleled those of earlier studies. A significant difference, however, was that the overall percentages for specific types of services were either flat or somewhat decreased from those of the previous year.

- The IT Gap remains relatively unchanged, with 94% of shippers currently agreeing that IT capabilities are a necessary element of 3PL expertise, and 58% of shippers indicating they are satisfied with their 3PLs' IT capabilities. This finding resulted in a question as to whether the IT Gap might be "stuck in neutral," which we will focus on in future research. Also reported are the increased priorities by shippers on more strategic IT-based capabilities such as control tower visibility, tracking and asset management (60%), cloud-based solutions (49%), and advanced analytics and data-mining tools (38%).

- While current findings suggest that 56% of shippers surveyed are increasing their use of outsourced logistics services, overall freight volumes were generally down on a year-over-year basis. Also, 57% of 3PL users report reducing or consolidating the number of 3PLs they use. This percentage has been relatively consistent over the past several years.

Sustainability and ESG: Impacts on 3PL-Customer Relationships

The relevance, importance and commitment to sustainability is evident among many organizations throughout the world. Regardless of the exact definition of sustainability being used, investors, employees, consumers and the public are placing pressure on companies to be good stewards. In response, companies are increasingly accepting responsibility for examining their operations to help achieve goals and objectives in this critical area. There is overall widespread concern for sustainability, and it is entirely logical that supply chains hold some of the greatest opportunities for breakthroughs and advancements.

McKinsey & Co. estimates that a typical consumer products company's supply chain creates far greater environmental and social costs than its own manufacturing operations, accounting for more than 80% of greenhouse-gas emissions and more than 90% of their impact on air, land, water, biodiversity and geological resources.[3]

Whereas supply chains historically have focused attention on flows and processes related to the movements of products, services, information and funds, the concern for sustainability in the supply chain has become front and center.

There is significant current emphasis on areas such as: environmental, social and governance issues (ESG); diversity, equity and inclusion (DEI); corporate social responsibility (CSR); and the notion of the "circular" economy, which represents an expansion of the "life cycle" approach to supply chain management.

Focus on ESG

For purposes of this study, the concept of ESG has been selected to anchor our reporting on how 3PL-customer relationships can impact sustainability in the context of supply chains. This framework provides a well-structured approach for better understanding the progress being made towards environmentally friendly, socially acceptable, and ethically responsible business practices. The three elements of ESG and their connection to supply chain management are outlined below.

Environmental.

Generally, environmental goals relate to reducing the overuse and destruction of natural resources and threats to all forms of life. Initiatives that are designed to address tactical environment concerns include the development of "carbon-neutral" activities and processes; biodegradability; alternative and renewable energy sources; reverse logistics; and circular supply chain strategies, to name just a few. One opportunity area that is relevant to many 3PL-customer relationships and that provides numerous opportunities to enhance environmental sustainability is transportation management. Specific examples in this category would include fuel efficiency, capacity utilization, advances in electric vehicle technology, and improved vehicle scheduling and management. Additionally, other key supply chain process areas also will score well in terms of opportunities to contribute to environmental sustainability.

Social.

The social element of ESG focuses on identifying and managing the impacts of organizations and their supply chains, both positive and negative, on people. Recent experiences have highlighted the importance of issues such as diversity, equity and inclusion; work-life balance; fair labor practices; and human rights in our supply chains. The inclusive attributes of supply chain visibility reflect the importance of preserving these principles throughout supply chains.

Governance.

This component of ESG reflects the commitment of an organization to responsible decision-making and execution by those who establish priorities, goals and objectives. Most frequently, this involves actions taken by senior and executive management and boards of directors. Just as "good processes lead to good results," good governance should promote and foster sustainability both internal to the organization and with other supply chain participants and stakeholders. Some examples that relate to how 3PLs and their customers can collaborate on sustainability include improving relationships, increasing data and cyber security, and using visibility to help address anti-corruption or bribery.

In an overall sense, sustainability initiatives have tended to be the most mature on the environmental aspects of ESG, but there currently is increasing activity and progress on social and governance elements.

[3] Sims, Cody, www.IndustryWeek.com, May 10, 2021.

Examples of Corporate Actions on Supply Chain Sustainability

In April 2021, Honeywell pledged to be carbon neutral in its facilities and operations by 2035 and said it would continue to investigate and evaluate carbon emissions up and down its supply chain and to quantify and address them where possible, said Evan van Hook, chief sustainability officer for Honeywell. Honeywell plans to meet its goals by converting to renewable energy sources, completing capital improvement projects in its sites, electrifying its fleet of company vehicles and using credible carbon offsets.[4]

In early 2021, FedEx announced a bold goal to achieve carbon-neutral operations globally by 2040, which will be funded, in part, through the first sustainability bond issued by a North American transportation and logistics company. FedEx said it is committing more than $2 billion over the next several years to support initiatives designed to make FedEx operations more sustainable across its aviation and vehicle fleets and at our facilities.[5]

These types of commitments are expected to increase, especially given that the Biden Administration in January rejoined the Paris Agreement, a legally binding international treaty on climate change. As a result, more companies are expected to make similar commitments to sustainability.

In June, truck, bus and construction equipment company Volvo Group said its pathway to reach the goals of the Paris Climate Agreement had been validated by the Science Based Targets initiative. Volvo Group has announced a series of climate initiatives and targets, including a goal to achieve net-zero value chain emissions by 2040. "We are committed to take the lead and transform our industry towards a more sustainable future," said Martin Lundstedt, president and CEO of Volvo Group.[6]

ESG and Corporate Governance

As expressed by Commissioner Hester M. Peirce of the U.S. Securities and Exchange Commission, "many advocates behind the global environment, social and governance movement argue that prosperity alone is not a sufficient measure of society's progress." In addition to agreeing with the emphasis on ESG, he suggests it is important to bring about lasting, positive change to countries, but without sacrificing the very means by which many lives have been enriched and bettered.

Considering mounting pressure to embrace a single set of ESG metrics that could be applied globally, however, the Commissioner said "a single set of metrics will constrain decision-making and impede creative thinking." This reflects his belief that a common set of ESG factors are complex, not readily comparable across issuers and industries, and are continually evolving. More directly, his concern is that global metrics for ESG would "impose new costs on common companies, decrease the attractiveness of our capital markets, distort the allocation of capital, and undermine the role of shareholders in corporate governance."[7]

Fortunately, many companies have found that environmental sustainability does not need to be at odds with economic sustainability. ESG can result in increased efficiencies and savings that enable viable sustainability goals to advance the needs of shareholders. For example, the use of transportation management systems improves efficiency through improved routing and better utilization.

> *"If you put in a transportation management system, you're going to get reduced miles traveled, you're going to get fuller trucks, you're going to get CO2 savings at the same time you get cost savings."*
>
> **Steve Banker, Vice President, Supply Chain Management for ARC Advisory Group**

Also, benefits are likely to include reduced carbon emissions and related cost savings. Internet of Things (IoT) and 5G technology can improve efficiency, enable machine learning and automation, and increase data-driven decision making, all of which may lead to potential savings. Additionally, a robust ESG framework is a natural extension of a company's risk management activity as it increases the focuses on procurement, supply chain partners, and the entire supply chain.

Given the critical and broad role of ESG, the ESG framework is extremely suitable for research on sustainability as it pertains to 3PL-customer relationships. While several large, global investment management companies appear to focus on politicizing the importance of sustainability, it must not impair their fiduciary responsibility to their clients and customers.

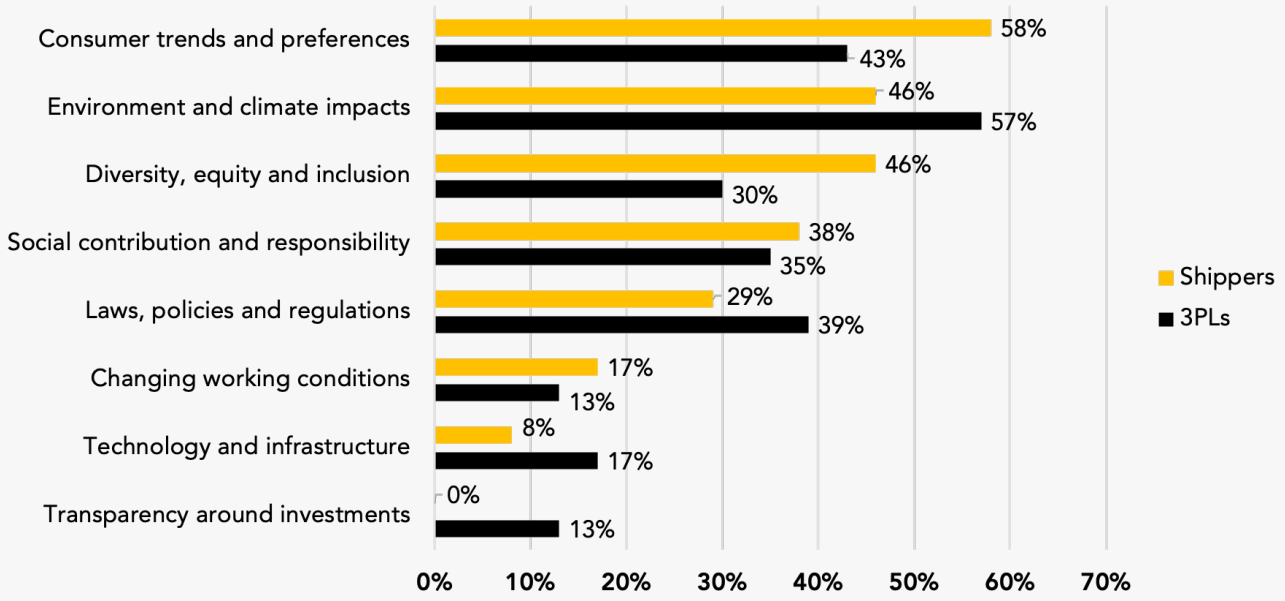
ESG at 3PL and Customer Organizations

A goal of this year's survey was to develop baseline information regarding the extent to which 3PLs and customers were involved in ESG-related activities and initiatives. Of the 3PL users who participated in the survey, 59% indicated their organization had an established ESG program with defined goals and objectives, and 51% indicated their supply chain had an ESG program with defined goals and objectives.

Among 3PL providers, 45% indicated their organization had an established ESG program. When asked about ownership of their organizations, 49% of 3PL users indicated they were publicly owned and 51% privately owned. These percentages were very different for 3PL providers, with 13% indicating public and 87% private. This distinction was thought to be relevant because, in a very general sense, privately-owned organizations are less regulated or controlled in many ways compared to publicly owned organizations.

Figure 6 provides a perspective on the key drivers responsible for the launching of an ESG program at 3PL user and provider organizations. Respondents to this question were asked to select three choices among the drivers listed. The most frequently selected of these were consumer trends and preferences and environment and climate impacts.

Figure 6: Key Drivers in Launching ESG Programs

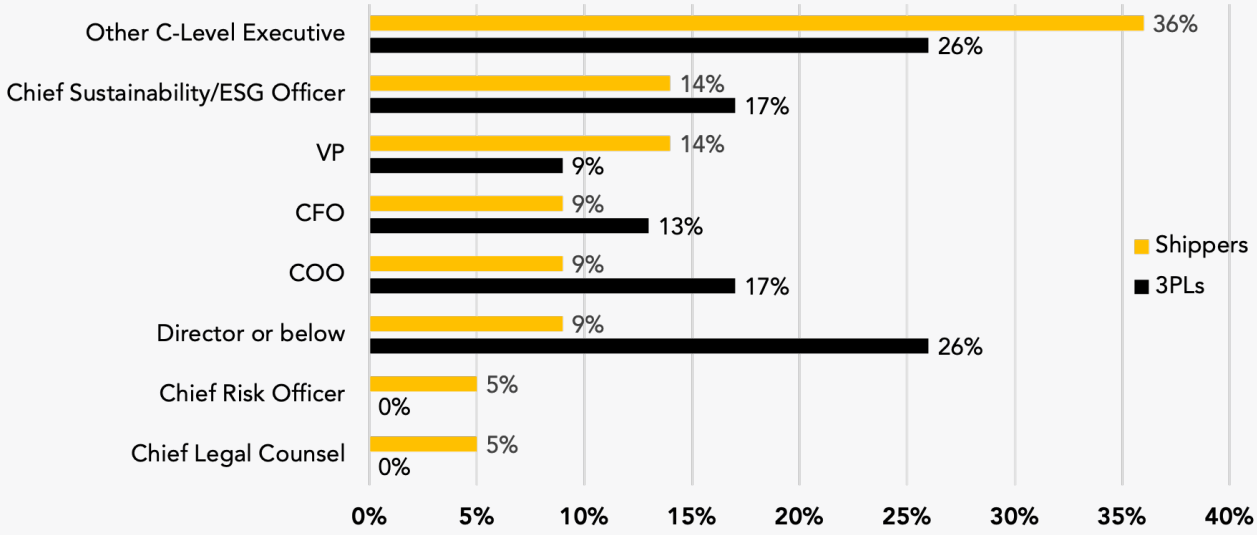


Next were diversity, equity and inclusion (DEI) and social contribution and responsibility. Interestingly, existing laws, policies and regulations were judged to be of lesser importance with launching an ESG program.

4 https://www.honeywell.com/us/en/news/2021/04/how-we-will-reach-carbon-neutral-by-2035
5 https://www.fedex.com/content/dam/fedex/us-united-states/sustainability/gcrs/FedEx_2021_ESG_Report.pdf
6 https://www.volvogroup.com/en/news-and-media/news/2021/jun/news-3994597.html
7 Peirce, Hester, "Rethinking Global ESG Metrics," Views – the Eurofi Magazine, April 2021, p. 208.

When asked about who was responsible for the ESG program in the organizations participating in the study, the responses were quite varied. The data in **Figure 7** seems to raise more questions than are answered, as the top choice for responsibility was "other" C-Level executive. This is even though other named executives included vice president, chief financial officer, chief operations officer, chief sustainability/ESG officer and chief risk officer. Perhaps another choice that should have been included among the listed responses to the question is chief human resources officer.

Figure 7: Responsibility for ESG in 3PL User and Provider Organizations



One explanation for the responses to this question is that in the earlier stages of an ESG program, there may be a wide range of people who may be motivated to take on responsibility for ESG. Longer-term, most organizations would likely formalize responsibility in a chief sustainability officer, ESG officer or chief risk officer.

Another possibility is that ESG initiatives affect multiple areas within an organization, so there may not be one clear owner of the efforts. There are multiple layers where companies can address ESG, and manufacturers, shippers and logistics providers are using a multi-pronged approach to drive improvement.

For example, Johnson & Johnson addresses ESG issues throughout the company, including procurement, and logistics. The company's Health and Humanity 2020 Goals report outlines its sustainability efforts, which include reducing absolute carbon emissions 20% by 2020 and 80% by 2050; enrolling suppliers covering 80% of the company's spend in its Sustainable Procurement Program; and increasing the recyclability of consumer product packaging to 90+% (on a weight basis) via design and partnerships in five key markets where mature recycling infrastructure exists.[8] Additionally, the Johnson & Johnson Enterprise Governance Council (EGC) serves as the primary governance body overseeing ESG topics and supporting the implementation of the its Enterprise Risk Management Framework.[9]

FedEx's 2021 ESG Report noted that in addition to its goals to be carbon free, in 2020, FedEx Express created a Global DEI Governing Board to oversee DEI efforts throughout the FedEx Express operating company. Plus, FedEx Services Supplier Relationship Management (SRM) is responsible for advancing supplier diversity and sustainability through a consolidated set of policies, tools and governance practices.

8 https://www.jnj.com/_document/johnson-johnson-health-for-humanity-2020-goals?id=0000015c-adde-d4cb-a5fd-efdef8110000
9 https://healthforhumanityreport.jnj.com/our-approach/sustainability-governance

ESG Is Relevant for Shippers and Logistics Providers

Figure 8 includes some high-level indicators relating to the relevance of ESG at 3PL user and provider organizations. Among respondents, 85% of 3PL users and 83% of 3PL providers agree that ESG is included in their organization's supply chain and growth strategies. Replies also show ESG priorities extend to both customer organizations and supplier organizations, and, for 3PL users, to logistics service providers. These findings suggest that ESG priorities extend beyond the individual organizations themselves, and to other supply chain partner organizations.

Figure 8: Profile of ESG at Participating Organizations

Involvement with ESG		Percent in Agreement	
		Shippers	3PLs
ESG included in supply chain/growth strategies		85%	83%
Supply chain ESG priorities include:	Customer organizations	55%	87%
	Supplier organizations	80%	78%
	Logistics service providers	90%	--
ESG priorities help to achieve:	Efficiencies	60%	56%
	Cost savings	50%	65%
	Profitability	50%	70%
	Competitive advantage	70%	78%
Our 3PLs' ESG programs are further ahead of our own program		**20%**	**--**
Our customers' ESG programs are further ahead of our own program		**--**	**65%**

Additionally, the data in Figure 8 indicates both 3PL users' and providers' ESG efforts help to achieve efficiencies, cost savings, profitability and a competitive advantage. Last, a very interesting finding is that only 20% of 3PL users feel that their 3PLs' ESG programs are further ahead of their own programs, while 65% of 3PL providers feel that their customers' ESG programs are further ahead of their own programs.

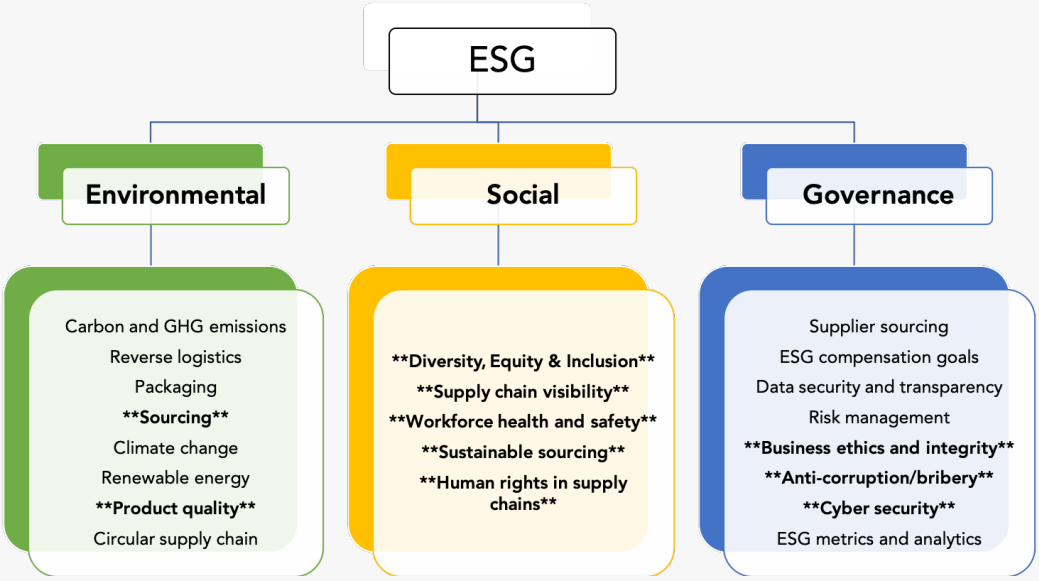
Supply Chain Focus Areas Related to ESG

Illustrated in **Figure 9** are several examples of supply chain focus areas relating to the three elements of ESG. They include activity and process areas that are relevant to many supply chains, which also may be candidates for inclusion in ESG strategies.

Those activities and processes receiving an average rating of 70% or more in the high category are designated in Figure 9 through the use of asterisks (**).

The current year's global survey asked shipper respondents to consider each of these activities and processes, and for each to indicate the level of importance for achieving supply chain ESG criteria. The levels of importance were simply stated as high, medium and low.

Figure 9: Example Supply Chain Focus Areas Related to ESG



Environment.

While the areas of sourcing and product quality were the only ones receiving 70%+ ratings, the category of environment also includes several other high-profile areas, such as climate change, renewable energy and, more recently, the concept of the circular supply chain.

Social.

Within this category, all five of the listed activities and processes received 70%+ ratings by survey respondents from 3PL user organizations.

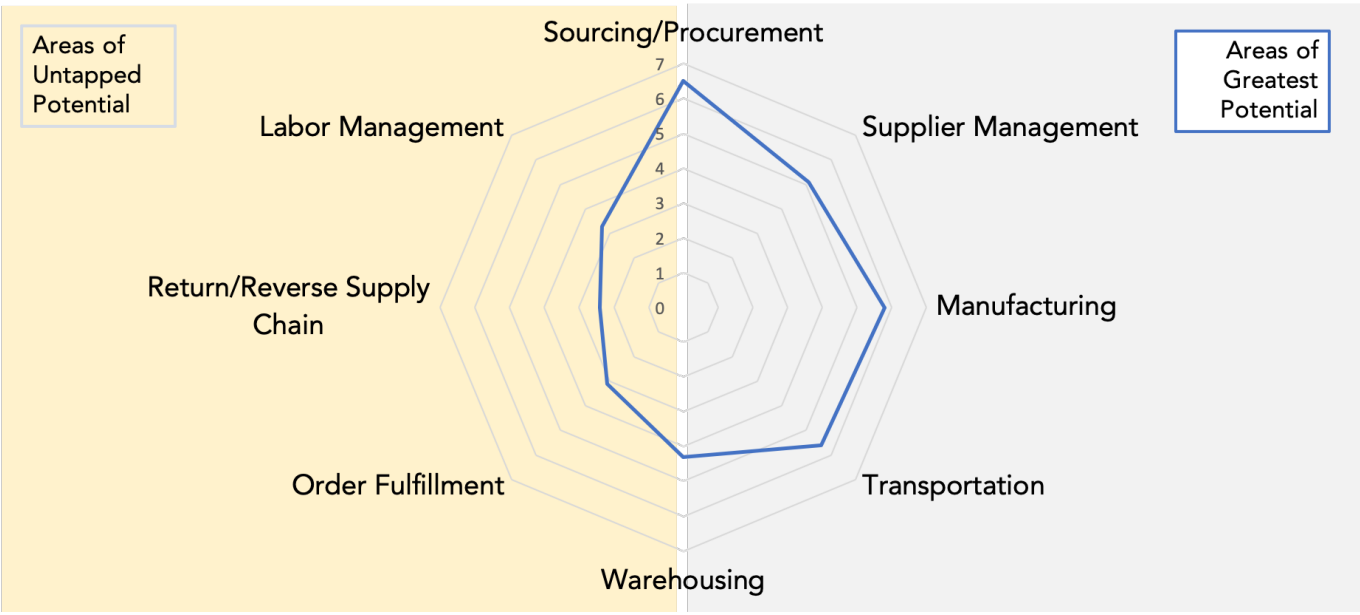
Governance.

More highly rated activities and processes in this category included business ethics and integrity, anti-corruption/bribery and cyber security.

The activities and process in **Figure 9** receiving a 69% or lower rating by survey respondents, are clearly prominent focus areas for attention in ESG programs.

Figure 10 provides an additional perspective on supply chain process areas and their potential for achieving significant progress on ESG priorities. Based on survey responses from 3PL users, this figure indicates that the areas of greatest potential include sourcing/procurement, supplier management, manufacturing, transportation and warehousing. Alternatively, areas characterized as representing untapped potential include labor management, return/reverse supply chains, and order fulfillment.

Figure 10: Supply Chains Areas with Greatest ESG Progress



One recommendation for further reading is the ESG Report published by Forward Air Corp., which outlines the company's commitment, plans and priority areas for accomplishment in the areas of environment, social and governance. Forward Air is a leading asset-light freight and logistics company serving the U.S. and Canada. The ESG Report is available for download at the company's investor relations website at https://ir.forwardaircorp.com/esg.

A second suggestion is to review the comprehensive materials published by XPO Logistics that relate to its approach to ESG, which include very detailed information about its use of ESG scorecards. Access to the materials is available at https://sustainability.xpo.com.

Challenges Faced with ESG Programs

Figure 11 lists challenges that may be associated with ESG programs and indicates the percentages of 3PL users and 3PL providers who indicated they have faced these challenges. However, there are some differences as reflected by the circumstances faced by these two categories of survey respondents. The challenges can be segmented into four groupings.

Figure 11: Challenges Faced with ESG Programs

Focus Area	Challenges	Shippers	3PLs
Financial	Cost of implementation	67%	52%
	Unable to validate ROI improvements	8%	8%
Regulatory and Protocol	Changing regulatory requirements	38%	35%
	Lack of standard protocols to guide the ESG program	33%	9%
	Balancing disclosure with protecting confidentiality	21%	4%
	Lack of clear regulatory requirements	16%	17%
Skills and Technology	Resources with required skills	42%	30%
	Lack of tools and technologies to support ESG program	25%	35%
Leadership	Ability to gather support of others across supply chain	46%	30%
	Leadership support across the organization	21%	39%
	Lack of framework to define ESG program	21%	13%

Financial.

According to 3PL users and providers, the greatest challenge associated with ESG programs is the cost of implementation. This view is shared by 67% of users and 52% of providers. Interestingly, only 8% of users and 8% of providers felt that the inability to validate ROI improvements represented a prevalent challenge.

Regulatory/Protocol.

Changing regulatory requirements are cited as a challenge by 38% of users and 35% of providers. When asked about a lack of standard protocols to guide the ESG program, this was indicated to be a challenge by 33% of users, but only 9% of providers. This disparity may bear some relationship to the fact that a much larger portion of 3PL providers self-identified as private organizations rather than public. Since private organizations typically experience less government involvement in their businesses than do public organizations, this may help to explain this difference.

Skills and Technologies.

The findings reported in Figure 11 are somewhat inconclusive as pertains to skills and technologies needed to support an ESG program. While 42% of 3PL users and 30% of 3PL providers identified included having resources that match desired skills among the challenges they face, only 25% of users and 35% of providers indicated challenges with lack of tools and technologies to support an ESG program. As many of the responding organizations may be in the early stages of involvement with ESG, they may not yet have a full understanding of what specific skills and technologies may be most needed.

Leadership.

When asked about ability to gather support of others across the supply chain, 46% of users and 30% of providers identified this as a challenge. While this finding suggests some element of concern, it is consistent with the earlier discussion in this report about the wide range of executives

who have responsibility for ESG in their organizations. The topics of leadership support across the organization and lack of a framework to define the ESG program do not appear to represent significant challenges. Overall, this year's research relating to challenges reflect the newness of ESG and indicate that most of the survey respondents may be in the earlier stages of identifying their strategies and plans to achieve the objectives of ESG. Also, as initiatives relating to sustainability and ESG continue to gain traction, organizations of all types will need to figure out how to reward and incentivize performance in these areas.

> *"ESG will continue to evolve as a strategic business imperative across industries, an opportunity for organizations to create long-term value and broaden the connection with their customers, shareholders, and employees. Additionally, given the increased social conscience about environmental affairs, a successful business strategy without an enterprise wide ESG initiative, will face acceptance challenges in the marketplace because of the expectations and universal awareness of the marketplace."*
>
> **Edmund Tribue, Risk and Compliance Practice Leader, NTT DATA Consulting.**

The Broader Context of ESG in 3PL-Customer Relationships

Considering the need for supply chain organizations to be aligned regarding end-to-end supply chain objectives, collaboration between 3PLs and customers on ESG matters would enhance the strength of their relationships. Figure 12 shows 3PL and customer perspectives on factors that may have a positive impact on relationship matters relating to ESG. Among respondents, 58% of 3PL users and 43% of 3PL providers agreed that executive sponsorship and commitment were very positive factors when dealing with matters relating to ESG. Another very positive factor was the availability of structured ESG goals and plans.

Equally important, 52% of 3PL providers view encouragement from customers to be a positive factor. Also ranked more highly by 3PL providers are the ability to collaborate with customers on ESG (35%) and the willingness (of customers) to share ESG information with 3PLs (35%).

Figure 12: Positive Impacts on 3PL-Shipper Relationships Relating to ESG

Factors Having Positive Impact	Shippers	3PLs
Executive sponsorship and commitment	58%	43%
Structured ESG goals and plans	50%	30%
Availability of ESG metrics and analytics	29%	22%
Ability to collaborate with 3PLs and Shippers on ESG	25%	35%
Social and public pressure	21%	22%
Formalized relationship management strategies	17%	4%
Encouragement from 3PLs and Shippers partners	17%	52%
Trust	17%	22%
Willingness to share ESG information	13%	35%

Future Transformation

One major observation from research into sustainability and ESG as related to 3PL-customer relationships is that many of the participating organizations are at a very early stage of development and sophistication. This can vary greatly depending on the size, resources and commitment of the company.

While there are numerous examples of involvement with specific activities and processes relating to the elements of ESG, there is a significant need for the creation, structure and coordination of strategic plans to guide and achieve further progress.

Stated simply, there is a great need to recognize the transformational opportunities that can be related to the pursuit of sustainability and ESG. Effectiveness with this objective will require 3PLs and their customers to work together in pursuit of higher-level aspirations.

10 Meridian Compensation Partners, LLC, Meridian Client Update, Vol. 12, Issue 7, May 24, 2021.

Key Takeaways

The following summarizes some of the key findings from this research into impacts of sustainability and ESG on 3PL-customer relationships:

- It is widely recognized that there are numerous ways in which the management of supply chains may contribute significantly to the pursuit of sustainability. While there are many options to organizationally structure a commitment to sustainability, the ESG concept provides an opportunity to focus on environmental, social and governance factors. While much of the current progress has focused on the first of these, a well-rounded priority on achieving sustainability will involve all three.

- Of the 3PL users who participated in the survey, 59% indicated their organization had an established ESG program with defined goals and objectives, and 51% indicated their supply chain had an ESG program with defined goals and objectives. Among 3PL providers, 45% said their organization had an established ESG program.

- Key drivers in launching ESG programs for 3PL users and providers included: consumer trends and preferences, environment and climate impacts, diversity, equity and inclusion, social contribution and responsibility, and laws, policies and regulations.

- A wide range of executives may be involved in ESG. As ESG-related initiatives receive further attention in individual organizations, it is likely that principal responsibility will be vested in a chief sustainability officer, ESG officer or chief risk officer.

- Both 3PL users (shippers) and providers indicated that ESG priorities are included in their supply chain and growth strategies. To varying degrees, ESG was viewed as helping to achieve efficiencies, cost savings, profitability and a competitive advantage. Generally, it was felt that ESG programs at 3PL user organizations were more fully developed than such programs at 3PL provider organizations.

- This research identified specific activities and processes that would be consistent with the individual elements of ESG, which also related to the relationships between 3PLs and their customers. Focus areas rated as being highly important included sourcing; product quality; diversity, equity and inclusion; supply chain visibility; workplace health and safety; sustainable sourcing; human rights in supply chains; business ethics and integrity; anti-corruption/bribery; and cyber security.

- Supply chain areas felt to have made the greatest progress with ESG include sourcing and procurement, supplier management, manufacturing, transportation and warehousing.

- ESG program challenges included issues relating to financial, regulatory and protocol, skills and technologies, and leadership. The cost of implementation of ESG programs, changing regulatory requirements, and the ability to gather the support of others across supply chains were among the bigger challenges.

- This year's research found several facilitators that could have positive impacts on 3PL -customer relationships in relation to ESG, such as executive sponsorship/commitment and having structured ESG goals and plans.

The Intelligent Supply Chain: The Role of Technology

Supply chains are complex, connecting people, processes and information from multiple players. In today's supply chain, data and digitization are enabling all links in the chain to connect even faster. Plus, new technology, such as 5G, the Internet of Things, artificial intelligence and machine learning, holds the potential to uncover opportunities, increase efficiency and reduce risk within the supply chain.

Shippers and logistics providers understand that technology plays a critical role in the supply chain, and 3PLs reported that they are continually monitoring the landscape for emerging technologies and bringing them to shippers when they are practically viable.

> *"The evolution of these tools holds the potential to make meaningful progress in solving some of the age-old problems inherent in trucking, warehousing and logistics."*
>
> **Andy Moses, Senior Vice President of Sales and Solutions for Penske Logistics.**

"The path to success is people and machines working together. Machines are uncovering patterns in large volumes of data that are very difficult for the human eye to catch, capture and distill. This information can then assist people who need it at a supervisory level and to make decisions."

Kevin Smith, CEO of Sustainable Supply Chain Consulting, said 3PLs are making some of the biggest investments in technology. "That works to the shippers' and manufacturers' advantage because they can get that from 3PLs without investing in it themselves," he said.

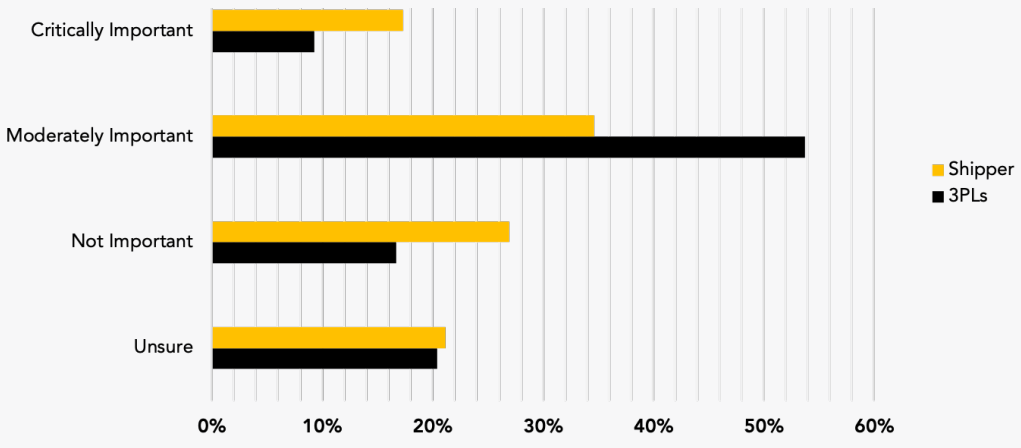
5G Technology

The rollout of 5G technology—the next generation of mobile networks—has been underway in the United States for more than two years. All major cellular carriers now have a version of 5G available nationally, and 5G modems are constantly evolving to improve speeds and coverage. 5G, the 5th generation of mobile networks, is designed to provide very comprehensive connectivity among virtually everyone and everything, including machines, objects and devices, enabling users to move more significant amounts of data more quickly.

As a result, 5G technology can improve artificial intelligence, machine learning and robotics applications. Significant potential exists for using 5G capabilities to enhance supply chain operations, performance and real-time communications, ultimately driving the digital supply chain.

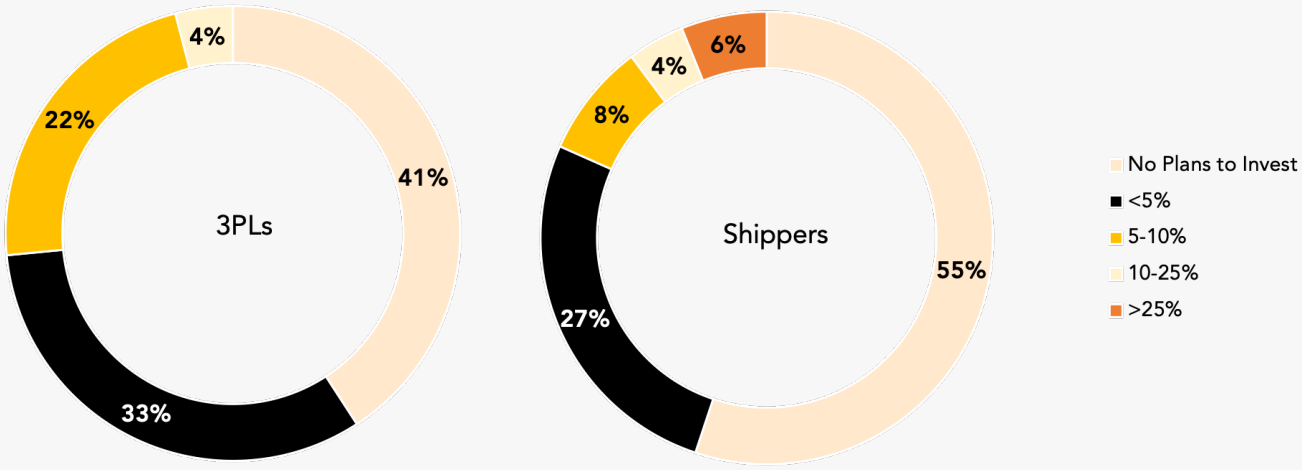
More than half of shippers taking part in the 3PL study feel 5G technology is either moderately (35%) or critically (17%) important. Just 27% of respondents said it was not important, shown in **Figure 13**. A higher number of 3PLs are interested in the technology, with nearly 54% citing it as moderately important and 9% saying it is critically important.

Figure 13: The Importance of 5G to Future Offerings



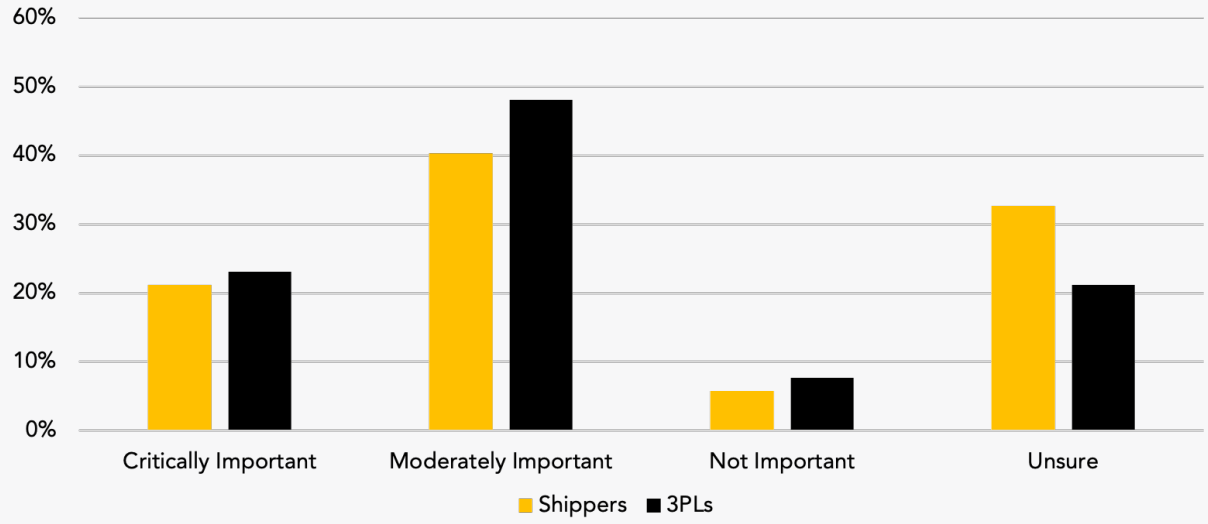
This is also reflected in the research on who is investing in 5G technology, with 3PLs investing more heavily, detailed in **Figure 14**. Shippers plan to invest less in 5G, with 55% saying they have no plans to invest in 5G rollout and integration and 35% reporting that they plan to invest between 1% and 10% of their annual IT budget in the technology. Among 3PLs, a smaller number (41%) said they have no plans to invest in 5G in the next five years, and more (55%) plan to invest between 1% and 10% of their annual IT budget to 5G rollout and integration.

Figure 14: Percentage of Annual Budget Allocated to 5G Rollout and Integration in the Next Five Years



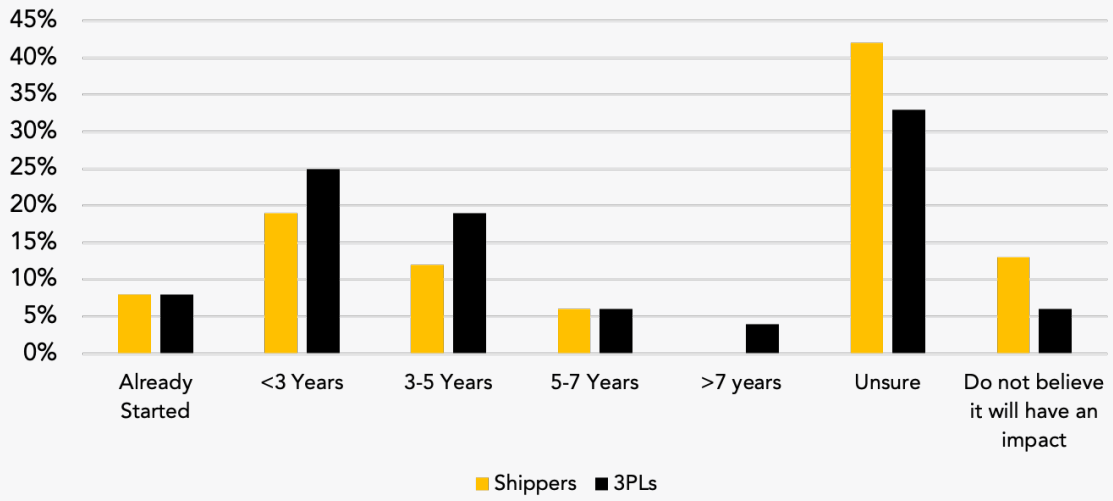
Just over half of 3PLs—56%—said they feel it is moderately or critically important to provide 5G-enabled services to their clients, while just under half of shippers—46%—reported that it is moderately or critically important that their 3PLs are 5G enabled, shown in **Figure 15**.

Figure 15: The Importance of Offering 5G Services



The same number of 3PLs and shippers—8%—said 5G is already having a net positive impact on their supply chain; 25% of 3PLs and 19% of shippers expect to see an impact in less than three years. However, 33% of 3PLs and 42% of shippers are unsure of when 5G would have a positive impact on their supply chain services **(see Figure 16).**

Figure 16: Timeframe for Expected Positive Supply Chain Impacts from 5G



Real-Time Data

Real-time data within the supply chain is extremely valuable, allowing companies to get ahead of disruptions, predict peaks and improve planning. Data can drive more collective decision-making across informational silos that exist within shippers' operations.

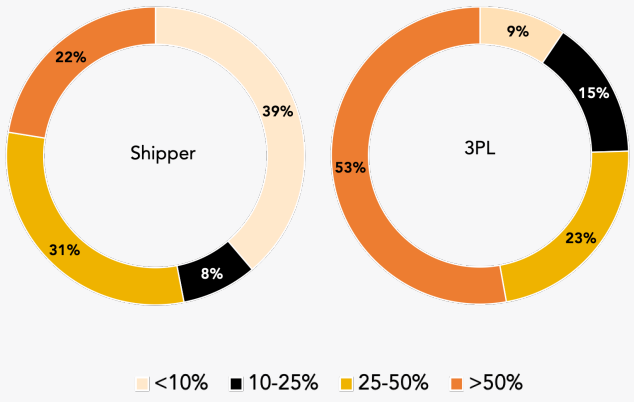
Having an accurate line of sight into each part of the supply chain provides usable information on where products are and when they will arrive and can speed decision making, inform orders and help mitigate problems before they occur.

For decades, 3PLs focused on improving their response to a disruption, such as a truck breaking down or a load not moving at the designated time. Now, technology is enabling 3PLs to prevent defects or exceptions from even occurring.

> *"There is a very robust frontier to use data to prevent things from going wrong in the first place."*
>
> **Andy Moses, Senior Vice President of Sales and Solutions for Penske Logistics**

The ability to provide real-time data can create a competitive advantage for 3PLs that have invested in the technology (see **Figure 17**). More than half of 3PLs—53%—said they can provide real-time data to clients in 50% or more of their supply chain services; 23% said they can provide it in a quarter to a half of their services. Those numbers decrease for shippers, with just 23% saying 50% of more of their supply chain can provide real-time data; 31% said 25%-50% of their supply chain can provide real-time data.

Figure 17: Percentage of Supply Chain Services Offering Real-Time Data



Real-time data enables visibility and exception management. "It alerts everyone to few transactions among the vast sea of transactions that are out of tolerance," Moses said, adding that the information can get to the interested parties. "If it is something the operating team needs to deal with, we're going to alert them. If it has a downstream impact on other stakeholders, such as consignees, it is alerting them as well," he said.

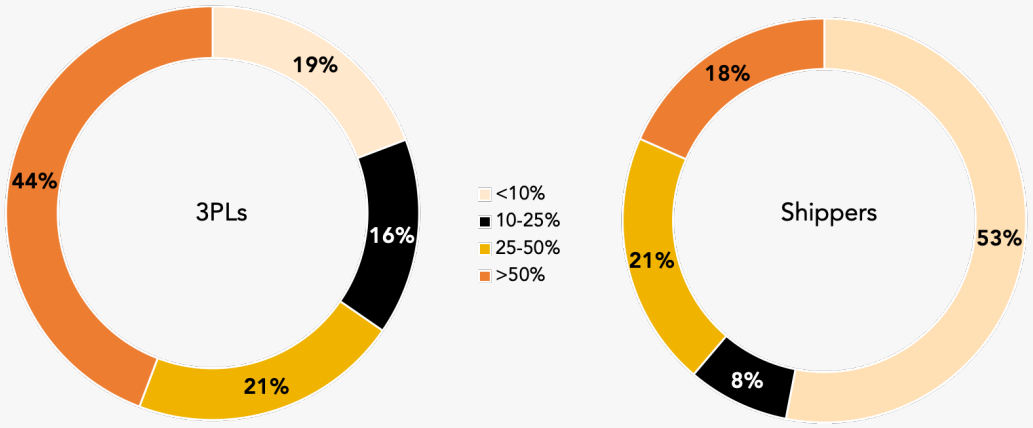
Increased information could also help supply chains sync up supply chain sourcing and transportation, optimizing pricing and improving mode selection.

"We've been developing and implementing tools that allow us to understand in real-time what rates should be. There are thousands of freight lanes. Having the technology to help understand what rates really are is empowering," Moses said. "It gives you a sense of when you should be bidding things out and when you're in decent shape."

Remote Supply Chain Controls

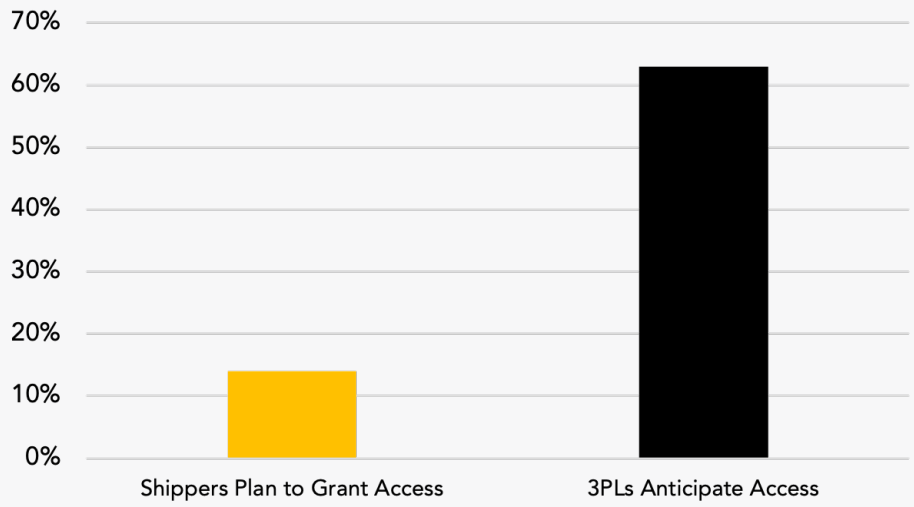
There is a disparity among 3PLs whose supply chain services can be actively controlled or altered remotely; 44% of 3PLs and just 18% of shippers reporting that more than half of their services can be handled in this manner. On the opposite end, just 19% of 3PLs reported that less than 10% of their supply chain services can be actively controlled and altered remotely, compared to 53% of shippers said less than 10% of their supply chain can be actively controlled and altered remotely (**Figure 18**).

Figure 18: Percentage of Supply Chain That Can Be Actively Controlled/Altered Remotely



Very few shippers, 14%, said they currently or plan to in the near future provide remote supply chain controls to their third-party providers. However, 63% of 3PLs currently or plan to in the near future have remote supply chain controls in their clients' supply chains, detailed in **Figure 19**.

Figure 19: Current or Near Future Plans to Provide Remote Supply Chain Controls



Internet of Things Technology

Internet of Things technology is driving digitization, mobile computing and analytics, changing how shippers and logistics providers conduct their operations. IoT also improves connectivity, which creates increased visibility and the real-time ability to influence the supply chain, resulting in an intelligent supply network.

Connectivity can identify how individual decisions will impact different stakeholders. "Historically, there are multiple influences in supply chains. There is value in navigating toward the best overall outcome versus an outcome that might optimize one piece of the supply chain but sub-optimize the whole," Moses said.

3PLs reported that they are investing in Internet of Things technology to improve workforce productivity (63%), improve real-time decision making (57%), and create a competitive differentiator in the market (57%), shown in Figure 20. Shippers are also investing to improve real-time decision making (53%), but also to improve customer satisfaction (53%), improve workforce productivity (33%) and improve asset utilization (33%).

Figure 20: Leading Drivers of IoT Investments

	3PL	Shippers
Not investing in IoT technology	20%	23%
Increase revenue	31%	
Generate alternative pricing models	14%	
Create a competitive differentiator in the market	57%	
Improve workforce productivity	63%	33%
Improve real-time decision making	57%	53%
Improve remote support of employees and managers	28%	12%
Improve customer satisfaction	51%	53%
Improve asset utilization and asset management	31%	33%
Enable scalability and performance enhancements	33%	

Cloud-Based Solutions

3PLs and shippers are using cloud-based technology, shown in **Figure 21**, including private cloud (41% of 3PLs 33% of shippers), a mix of public and private cloud structures (33% of 3PLs and 35% of shippers), and public cloud (18% of 3PLs, 12% of shippers).

Figure 21: Cloud Structures Companies Leverage

Which type of cloud structures do you leverage?

Answer Choices	Responses	
	Shippers	**3PLs**
Private Cloud	33%	41%
Public Cloud	12%	18%
Distributed Public Cloud	6%	4%
Hybrid (Mix of Public and Private)	35%	33%
Not migrated to the Cloud	14%	4%

Logistics providers are embracing cloud-based technology at a higher level than shippers. Transportation management systems are the most-used cloud technology, with 69% of 3PLs and 61% of shippers using the solution. 3PLs are investing more in cloud-based warehouse management systems (69%) compared to shippers (24%) as well as order management systems (49% of 3PLs compared to 34% of shippers). Shippers, however, are using cloud-based technologies for sales and operation planning at a slightly higher rate (34%) than 3PLs (31%). See **Figure 22.**

Figure 22: Cloud-Based Supply Chain Systems

Which of your following supply chain systems are cloud based?

Answer Choices	Responses	
	Shippers	**3PLs**
TMS: Transportation Management Systems	61%	69%
S&OP/IBP	34%	31%
OMS: Order Management Systems	34%	49%
Demand Planning	32%	18%
Supply Planning	29%	24%
WMS: Warehouse Management System	24%	69%
LMS: Labor Management System	13%	37%

In 2020, Penske Logistics shifted its data into the cloud, so field users and ultimately customers can access it there with improved time and speed. Running reports takes less time, and customers can check on the status of delivery or inventory. "Things that used to take an hour or two to run happen a lot faster. It is also clear shippers want mobile access," Moses said.

The use of the cloud also supports heavy-duty analytics, which is important to shippers who are showing they want reporting as well as around-the-clock access to data. Penske's connected fleet team is making information accessible to customers 24/7, with customers have direct report writing discretion and capabilities. "That is very different from connecting with your business contact at Penske, asking for something, them running the report and sending it back," Moses said. "We're building the means to democratize further the data that comes out of our execution systems."

New Technology Investments

3PLs and shippers are investing in new technology, as illustrated in **Figure 23**.

3PLs are currently experiencing significant labor challenges within the warehouse, and technology, including robotics and artificial intelligence, can help support available workforces. Robotics, for example, can drive automation in the warehouse, allowing 3PLs to utilize their workforce in other areas of the operation.

Smith said he expects automation to increase as e-commerce grows. "3PLs are investing in automation, and they should," he said, adding that automation can reduce real estate needed because buildings get taller and require less labor. "The cost of real estate and the cost of labor will drive more people to automation, and 3PLs are right on the cutting edge."

Automation may hold particular value within the cold chain. "Do you want to work in a refrigerator or freezer? Not many people do," Smith said. "Automation is one way around that."

Technology can aid with scheduling make it easier for gig-type workers or part-time workers to plug into and take advantage of opportunities. Additionally, data can support AI, identifying employees at risk of leaving and help managers intervene.

Current focus areas include intelligent data analytics, with 43% of 3PLs and 26% of shippers investing in the technology. Additionally, 28% of 3PLs and 24% of shippers said they are investing in smart warehouses.

Figure 23: Future Technology Investments

	Invested in the Last 3 Years	Currently Investing In	Plan to Invest within the Next 3 Years	No Plans to Invest Currently
Digital Supply Chain Twin	2%	29%	10%	59%
Intelligent Data Analytics (AI/ML)	12%	26%	26%	36%
Smart Warehouse (Warehouse of the Future)	5%	24%	10%	61%
Productivity Sensors	10%	22%	10%	59%
Electric Trucks	8%	20%	10%	62%
Smart Factory (Industry 4.0 / Factory of the Future)	12%	20%	10%	58%
Wearables (Workers, Drivers)	10%	19%	12%	59%
Drones	5%	15%	5%	75%
Robotics (High-Dense Storage, Pickers, Palletizers)	8%	12%	20%	60%
Autonomous Yard Jockeys	2%	10%	5%	83%
Autonomous Forklifts	2%	8%	20%	70%
Autonomous Trucks	7%	8%	5%	80%

The use of digital supply chain twins—a virtual supply chain replica that simulates an actual supply chain using real-time data and snapshots to forecast supply chain dynamics—is increasing. Digital supply chain twins can identify volatility and uncertainty and provide insights into optimization. Shippers are investing in digital supply chain twins at a higher rate than 3PLs (29% compared to 19%).

Respondents also plan to make significant investments over the next three years. For 3PLs, top investment areas include robotics, such as high-dense storage, pickers and palletizers (38%), autonomous forklifts (35%) and wearables (35%). Shippers are focused on increased investment in intelligent data analytics (26%), robotics (20%) and autonomous forklifts (20%).

To obtain a return on investment, some technologies, such as each-pick robotics, require a time commitment that runs longer than a standard three-year contract. Technology providers are increasingly realizing the obstacles 3PLs face with securing a ROI and have embraced a lease program to make technology investments more practical and payback periods more relevant.

Penske Logistics recently utilized leasing to outfit a warehouse with each-pick robotics. "Some of the providers are getting creative in terms of how they allow companies like ours to consume these technologies. That is an evolution that the emerging tech industry is realizing," Moses said. Within the study, the majority of both groups show little interest in investing in autonomous trucks or autonomous yard jockeys currently.

Technology Speeds Warehouse Operations

Smart glasses have continued to evolve and are expected to get even better with the release of 5G, said Dave Bushee, senior vice president of information technology for Penske Logistics. "The glasses see the label and will greenlight the area we need to pick in. Everything else will be red," he said, adding that the technology minimizes the number of mis-picks.

While the technology already works over standard WiFi, Bushee said he expects 5G to revolutionize it. "5G reduces the amount of latency, so it is much more real-time, which is important because there is a large amount of data that has to travel back and forth," Bushee said.

Key Takeaways:

- Among shippers, 35% said 5G technology is moderately important, and 17% said it is critically important. A higher number of 3PLs are interested in 5G technology, with nearly 54% citing it as moderately important and 9% saying it is critically important.

- 3PLs are investing more heavily in 5G technology, with 55% reporting that they plan to invest between 1% and 10% of their annual IT budget to 5G rollout and integration; 41% said they have no plans to invest in 5G in the next five years. Among shippers, 55% said they have no plans to invest in 5G rollout and integration, and 35% said they plan to invest between 1% and 10% of their annual IT budget in the technology.

- More than half of 3PLs—53%—said they can provide real-time data to clients in 50% or more of their supply chain services; 23% said they can provide it in a quarter to a half of their services. Among shippers, just 23% said 50% of more of their supply chain can provide real-time data; 31% said 25%-50% of their supply chain can provide real-time data.

- Just under half of 3PLs—44%—and 18% of shippers reporting that more than half of their services can be handled remotely.

- 3PLs are investing in Internet of Things technology to improve workforce productivity (63%), improve real-time decision making (57%), and create a competitive differentiator in the market (57%). Shippers are also investing to improve real-time decision making (53%), but also to improve customer satisfaction (53%), improve workforce productivity (33%) and improve asset utilization (33%).

- 3PLs and shippers are using cloud-based technology, including private cloud (41% of 3PLs 33% of shippers), a mix of public and private cloud structures (33% of 3PLs and 35% of shippers), and public cloud (18% of 3PLs, 12% of shippers).

- Transportation management systems are the most-used cloud technology, with 69% of 3PLs and 61% of shippers using the solution. 3PLs are investing more in cloud-based warehouse management systems (69%) compared to shippers (24%) as well as order management systems (49% of 3PLs compared to 34% of shippers). Shippers, however, are using cloud-based technologies for sales and operation planning at a slightly higher rate (34%) than 3PLs (31%).

- Current focus areas include intelligent data analytics, with 43% of 3PLs and 26% of shippers investing in the technology. Additionally, 28% of 3PLs and 24% of shippers said they are investing in smart warehouses. Shippers are investing in digital supply chain twin at a higher rate than 3PLs (29% compared to 19%).

- For 3PLs, top investment areas include robotics, such as high-dense storage, pickers and palletizers (38%), autonomous forklifts (35%) and wearables (35%). Shippers are focused on increased investment in intelligent data analytics (26%), robotics (20%) and autonomous forklifts (20%).

Cold Chain: Planning and Moving Sensitive Products

The events of the past year have brought the discussion of cold chains front and center. Whether it was vaccine distribution discussions that introduced the concept of ultra-cold supply chains to the public, food supply shortages on grocery store shelves or the spike in-home delivery for restaurant meals and groceries, cold chain garnered attention.

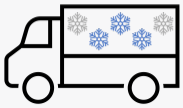
Cold chains—supply chains specializing in the planning, storing, loading and movement of temperature-sensitive products—must perform flawlessly to ensure the cold chain remains intact throughout the product's journey all the way to the end-user or consumer. Maintaining temperature parameters, meeting regulatory requirements and maximizing efficiency is critical in cold chains, and 3PLs and shippers are relying on infrastructure, technology and human resources to deliver products on time and within range.

Each link in the cold chain must be connected. "If you have a breakdown at some point in the food supply chain, you can have problems with quality and safety," said Lowell Randel, senior vice president of government affairs for the Global Cold Chain Alliance.

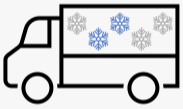
Proper handling and regulatory compliance is a top concern for shippers. "You're concerned with improving the quality, efficacy or health," said Tom Madrecki, vice president of supply chain and logistics with the Consumer Brands Association.

How Cold is Cold?

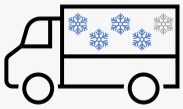
Cool Chains
53 to 57 °F
12 to 14 °C



Frozen
5 to -13 °F
-15 to -25 °C



Refrigeration
36 to 46 °F
2 to 8 °C



Deep Freeze
-15 to -25 °F
-25 to -30 °C

Ultracold
More than -94 °F
More than -70 °C

Cold Chain Services

Shipper respondents with cold chains reported a mix of in-house, partially outsourced and fully outsourced services.

Among respondents that outsource packaging and handling cold chain services, 24% of shippers reported fully outsourcing these services, with 44% reporting that this function was fully in-house. When we compare to our historical response range when asked across all respondents in the study's Current State of the 3PL Market section, the rate of outsourcing in this category is 20-25%. The reported responses for cold chain are aligned with overall results with deep freeze (-25 to -30 degrees Celsius) most often fully outsourced and refrigeration (2 to 8 degrees Celsius) most often fully in-house (see **Figure 24**).

Figure 24: Packaging and Handling Services

Type of Cloud Chain	Fully In-house	Partially Outsourced	Fully Outsourced
	44%	32%	24%
Chill/Cool Chains 12 to 14° C (53 to 57° F)	1	5	4
Refrigeration 2 to 8° C (36 to 46° F)	2	2	5
Frozen -15 to -25° C (5 to -13° F)	3	3	2
Deep Freeze -25 to -30° C (-13 to -22° F)	5	1	1
Ultracold more than -70° C (more than -94° F)	4	4	3

When it comes to storage and warehousing, the results demonstrated a greater percentage of shippers using a combination of both in-house and outsourcing services. A smaller number, 17%, of shippers are fully outsourcing, with 39% reporting in-house operations. More shippers, however, are using a mix of in-house and outsourced services, shown in **Figure 25**. Partially outsourced received the most responses at 44%.

When we compare to our historical response range when asked across all respondents in our Current State of the 3PL Market section, the rate of outsourcing in this category is greater than 60%. The 17% for fully outsourced is significantly below the > 60% baseline. However, when you combine partially outsourced at 44% and 17% for fully outsourced, the response is more in alignment with the baseline achieving 61% of shippers outsource at some level.

Figure 25: Storage and Warehousing Services

Transportation	Fully In-house	Partially Outsourced	Fully Outsourced
	0%	55%	45%
Chill/Cool Chains 12 to 14° C (53 to 57° F)		3	2
Refrigeration 2 to 8° C (36 to 46° F)		1	5
Frozen -15 to -25° C (5 to -13° F)		2	1
Deep Freeze -25 to -30° C (-13 to -22° F)		4	3
Ultracold more than -70° C (more than -94° F)		5	4

Transportation is outsourced more frequently than non-temperature-controlled supply chains, with no respondents reporting handling cold chain transportation exclusively in-house, shown in **Figure 26**. For shippers that fully outsource, frozen is outsourced most often, while refrigeration is most often partially outsourced and less likely to be fully outsourced.

Figure 26: Transportation Services

Last Mile	Fully In-house	Partially Outsourced	Fully Outsourced
	0%	46%	54%
Chill/Cool Chains 12 to 14° C (53 to 57° F)		5	1
Refrigeration 2 to 8° C (36 to 46° F)		3	3
Frozen -15 to -25° C (5 to -13° F)		4	2
Deep Freeze -25 to -30° C (-13 to -22° F)		2	4
Ultracold more than -70° C (more than -94° F)		1	5

The last mile is outsourced most often. Full outsourcing of the last mile at 54% was reported more often than other transportation services at 45% fully outsourced. In this category, once again, we saw no respondents reporting managing cold chain last mile exclusively in-house, shown in **Figure 27**. For shippers, chill/cool chain (12-14 degrees Celsius) is fully outsourced most often while deep freeze and ultra-cold (> -70 degree Celsius) is most often a mixture with only partially outsourced.

Figure 27: Last-Mile Services

Last Mile	Fully In-house	Partially Outsourced	Fully Outsourced
	0%	46%	54%
Chill/Cool Chains 12 to 14° C (53 to 57° F)		5	1
Refrigeration 2 to 8° C (36 to 46° F)		3	3
Frozen -15 to -25° C (5 to -13° F)		4	2
Deep Freeze -25 to -30° C (-13 to -22° F)		2	4
Ultracold more than -70° C (more than -94° F)		1	5

Challenges in Operating a Successful Cold Chain

The cold chain requires a certain level of sophistication from both shippers and logistics providers. As expected with temperature-sensitive shipments, there are several unique challenges within the cold chain, shown in **Figure 28**. Shippers and 3PLs experienced challenges differently, which likely speaks to the role each party plays.

Between shippers and 3PLs, there was relative alignment on challenges such as recruiting skilled labor, proper storage and proper truck transportation. A lack of skilled labor is not unique to cold chains. It is a challenge across all supply chains resulting in driver shortages to rising wages. Shippers and 3PLs are also mutually responsible for transportation, which would include storage prior to shipping. As noted above, transportation is a mix of in-house and outsourced services, with both shippers and 3PLs working together to achieve success.

There were three areas of divergence between shippers and 3PLs on the relative challenges posed in cold chain management. Those areas included proper handling, proper last-mile handling, and infrastructure investment and maintenance.

Shippers (62%) ranked proper handling as the greatest challenge to operating a cold chain compared to only 25% of 3PLs. These results appear opposite to what one would expect given the level of outsourcing and joint efforts via partially outsourcing to 3PLs within cold chains, as noted earlier in this section. Shippers, having outsourced the service yet ranking this as a high concern, may imply that the services provided by 3PLs are not meeting their expectations. While the low ranking by 3PLs may imply a lack of awareness by 3PLs of this misalignment between expectations and services rendered.

Further, 39% of shippers rank proper last-mile handling as a challenge, but only 8% of 3PLs view it as a challenge. Last-mile delivery has been noted to have numerous challenges regardless of temperature. The low ranking by 3PLs is surprising when you add the additional complexity of last-mile delivery within cold chains.

Large shipments are broken down into smaller units. As packages become smaller, there is less mass to retain thermal temperature. This is combined with repeat opening and closing of the last-mile delivery vehicle. Numerous stops and openings increase the likelihood of a temperature variance if the smaller delivery packaging is not materially sound and properly handled.

Whether the delivery is vaccines to hospitals, clinics, pharmacies and physicians' offices or fresh produce to restaurants, grocery stores and homes, last-mile delivery is a critical point of potential failure impacting the temperature integrity of the chain and ultimately impacting the quality of the product. This may further imply a misalignment of expectations between shippers and 3PLs.

3PLs (75%) view infrastructure investment and maintenance as their greatest challenge, while only 31% of shippers rate it a challenge. This variance may simply be a perspective issue. 3PLs choose to provide services in the cold chain over non-temperature-controlled services and, as such, must justify the additional investment cost and unique conditions to build an effective case to engage in these services. Shippers, on the other hand, are simply in that business. Their industry and product portfolio drives their need for cold chains and is in many ways simply a cost of operating. Without an effective cold chain, they would not exist.

> *"Infrastructure investments are a major cost center for the 3PL, and the shipper is really just outsourcing that."*
>
> **Lowell Randel, Senior Vice President of Government Affairs for the Global Cold Chain Alliance**

Lastly, temperature monitoring also received a differing sense of challenge ranking. 3PLs (50%) view temperature monitoring as a challenge compared to 31% of shippers.

"Potentially, shippers are comfortable that the temperature monitoring is well in hand even though they are outsourcing it, in many cases, to a 3PL. They may feel like it isn't a high concern because they haven't had a lot of issues. It is a higher issue for the 3PL because the providers would lose business if they don't perform," Randel said.

Figure 28: Greatest Challenges within the Cold Chain

Shippers			3PLs		
Rank	Challenges	%	Rank	Challenges	Rank
1	Proper Handling	62%	1	Infrastructure Investments and Maintenance	75%
2	Regulatory Compliance	38%	2	Temperature Monitoring	50%
3	Recruiting Skilled Labor	38%	3	Technology Investment and Maintenance	38%
4	Proper Last Mile Handling	38%	4	Recruiting Skilled Labor	38%
5	Product Packaging	31%	5	Proper Truck Transportation	38%
6	Proper Storage	31%	6	Regulatory Compliance	29%
7	Proper Truck Transportation	31%	7	Proper Handling	25%
8	Infrastructure Investments and Maintenance	31%	8	Proper Storage	25%
9	Temperature Monitoring	31%	9	Shipment Preparation	13%
10	Technology Investment and Maintenance	21%	10	Proper Last Mile Handling	18%

Challenges create market opportunities. Logistics providers focusing on the cold chain are currently exploring different solutions and transportation models that help shippers to flex their operations to meet market demands. Most 3PLs involved in the cold chain want to be seen as a complete supply chain solution provider for their customers, and they may have a broader menu of services than their customers are utilizing currently.

Safety and Risk Mitigation

Proper handling and regulatory compliance are top concerns for shippers, which makes visibility, traceability and data analytics important areas for innovation.

Through visibility and traceability, logistics providers can maintain a chain of custody as well as temperature monitoring to ensure the safety of temperature-controlled products. This also helps shippers comply with regulatory requirements, such as the Food Safety Modernization Act, and government-mandated record keeping.

Visibility and other technology solutions do add a layer of cost, but companies are finding ways to use visibility to drive value is important.

"There is technology that monitors potatoes from the time they arrive to assess moisture level, size and shape," Madrecki said. "They're looking at that not from compliance but from a quality yield. There is also an increased level of sophistication with healthcare where you tend to have products that are more expensive and that have that vulnerability."

Shippers and 3PLs can leverage emerging IoT solutions to gather data and convert it into proactive monitoring and ultimately remote corrective action. Being able to react quickly is important when transporting sensitive products, and IoT devices could provide additional value by maintaining the temperature integrity of the chain. Early insight could also help logistics providers avoid weather or traffic delays, re-route shipments in the event of potential delays or immediately redirect a load in the event of a recall.

The human resources involved in cold chain operations also play a vital role in product integrity, which is likely why recruiting skilled labor was in the top five list of challenges from both shippers and 3PLs.

"Labor has continued to be a significant issue and probably will be for the foreseeable future. That is driving more and more members to look at automation," Randel said, adding that automation was a trend prior to the pandemic, but even more so now. "Now the equation is easier to justify. There are also a lot more options."

Issues surrounding labor availability, whether that's truck drivers, warehouse workers or manufacturing plant workers, will require the industry to think more creatively. Automation within the warehouse may help ease some labor concerns (see the section: The Intelligent Supply Chain to learn more about automation).

Addressing labor concerns may also require creative work from policymakers, such as expanding the available pool of professional truck drivers by allowing those 18-21 to haul freight across state lines inside the United States.

Within the cold chain, there is an added layer of difficulty surrounding finding the right professional driver, as refrigerated loads typically have specific handling instructions and may require more driver involvement, requiring drivers to have skills beyond traditional freight drivers.

Increased Demand

Global population growth, increased consumer demand for fresh products, strong grocery e-commerce sales and a wider variety of perishables are driving the need for cold storage space, and cold chain demand is expected to increase.

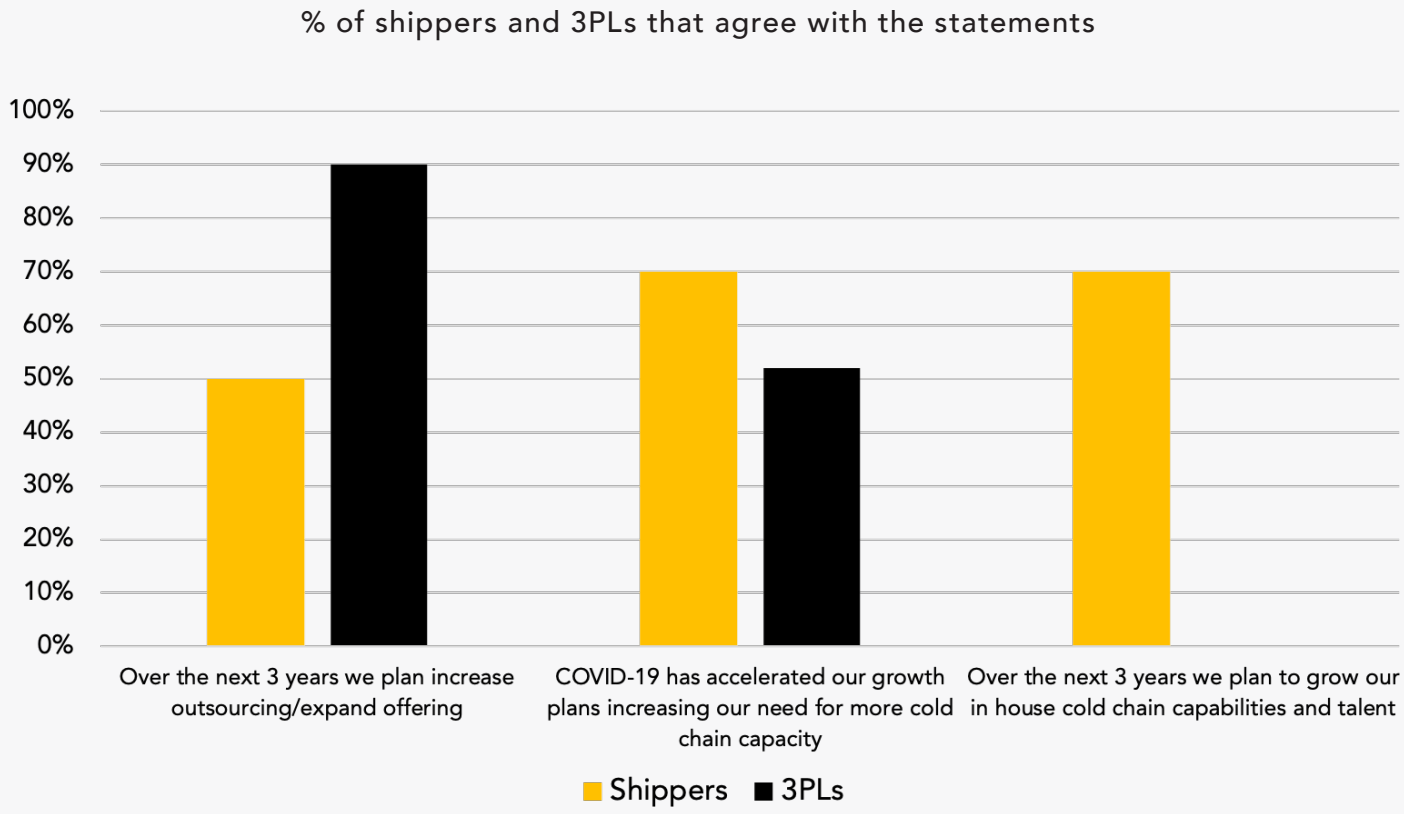
Currently, demand for cold chain services is so high that the finding of available, cost-effective is difficult, Madrecki said. "There is increased demand for services that are more specialized," he said.

What's more, some shippers are opting for cold chain services to preserve the shelf life of products even if temperature-controlled trailers aren't a necessity. "I've seen more shippers gravitate toward cold chain services that aren't necessarily 100% needed. You can move a truckload of shelf-stable rolls without a cold chain, but by having one, you add another few days to the product's life expectancy," Madrecki said. "There is a trade-off when you're working with a retail partner to guarantee freshness or a longer quantity."

Reducing waste for manufacturers and retailers and providing value to consumers can justify the added cost of cold chain services.

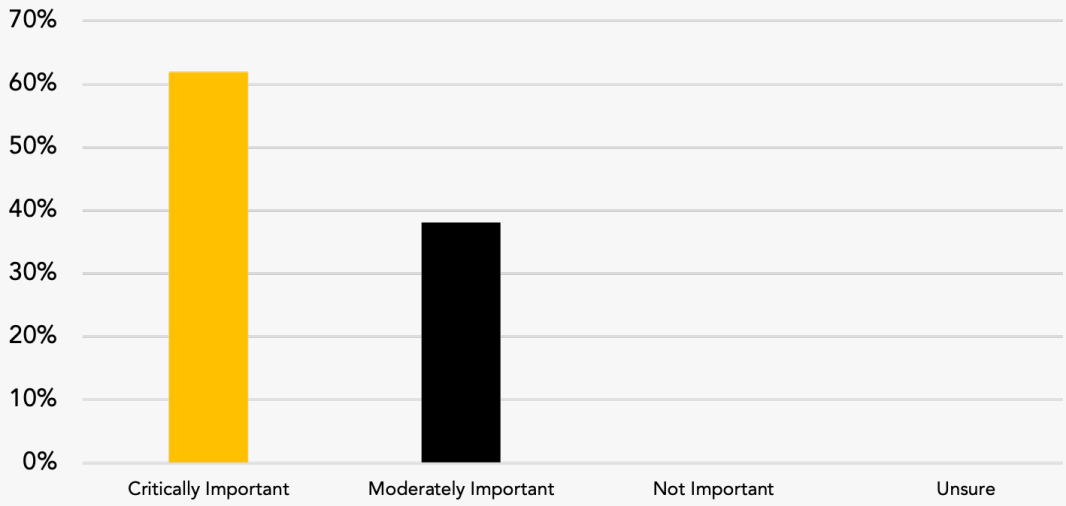
Most shippers, 91%, and 3PLs, 100%, said they expect demand for cold chain capacity to increase over the next three years. Both shippers (70%) and 3PLs (52%) said COVID-19 has accelerated their growth plans, increasing their need for more cold chain capacity **(Figure 29).**
To help meet that growth, 70% of shippers said they expect to grow in-house cold chain capabilities and talent over the next three years. In addition, 50% said they plan to outsource more of their cold chain capabilities, indicating a continuation of the mix between in-house and outsourced services. About 90% of 3PLs said they plan to expand their cold chain capabilities and service offering.

Figure 29: Cold Chain Growth



Overwhelming, 3PLs said cold chain services are important to their company's growth over the next three years, with 62% saying they're moderately important and 38% saying they are critically important, shown in **Figure 30**.

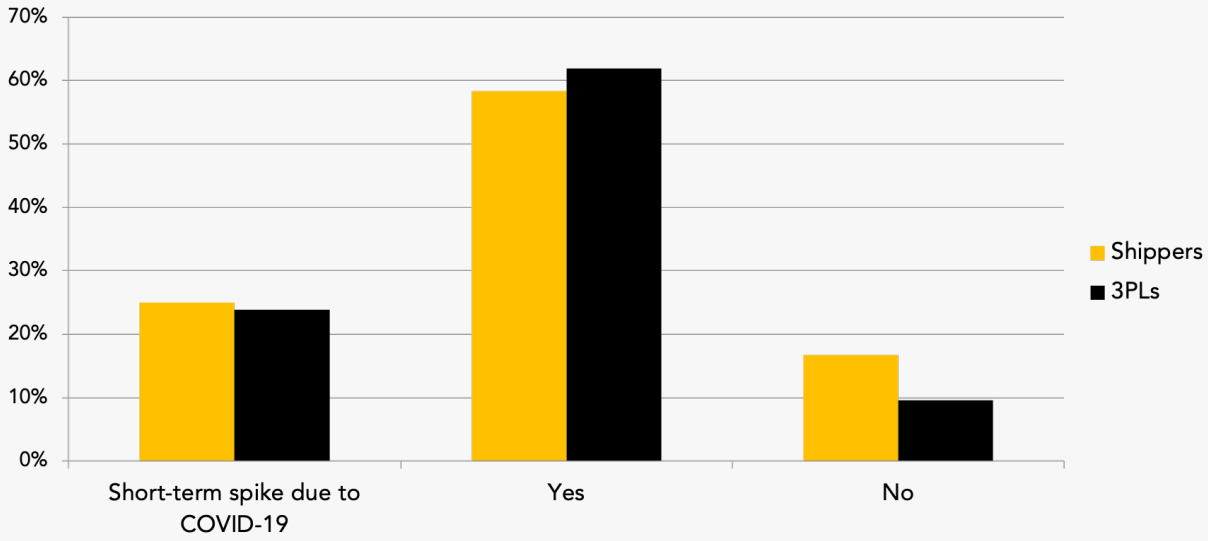
Figure 30: Importance of Cold Chain Services to Future Growth



Capacity Concerns

3PLs and shippers said there is increased competition for cold chain capacity that crosses multiple industries, shown in **Figure 31**.

Figure 31: Increased Competition for Cold Chain Capacity



Some capacity challenges are market-dependent. "There isn't a shortage of capacity in every market, but, on the whole, there is sufficient demand to justify new construction," Randel said, adding that there has been more building based on specific customer demands rather than spec buildings.

There are several solutions that can help address cold chain capacity, including increased visibility and operational improvements. "It is tweaking around the edges. You can become a shipper of choice and develop long-term relationships, but it doesn't get to the underlying lack of capacity," Madrecki said.

Confidence in Cold Chain Strategy

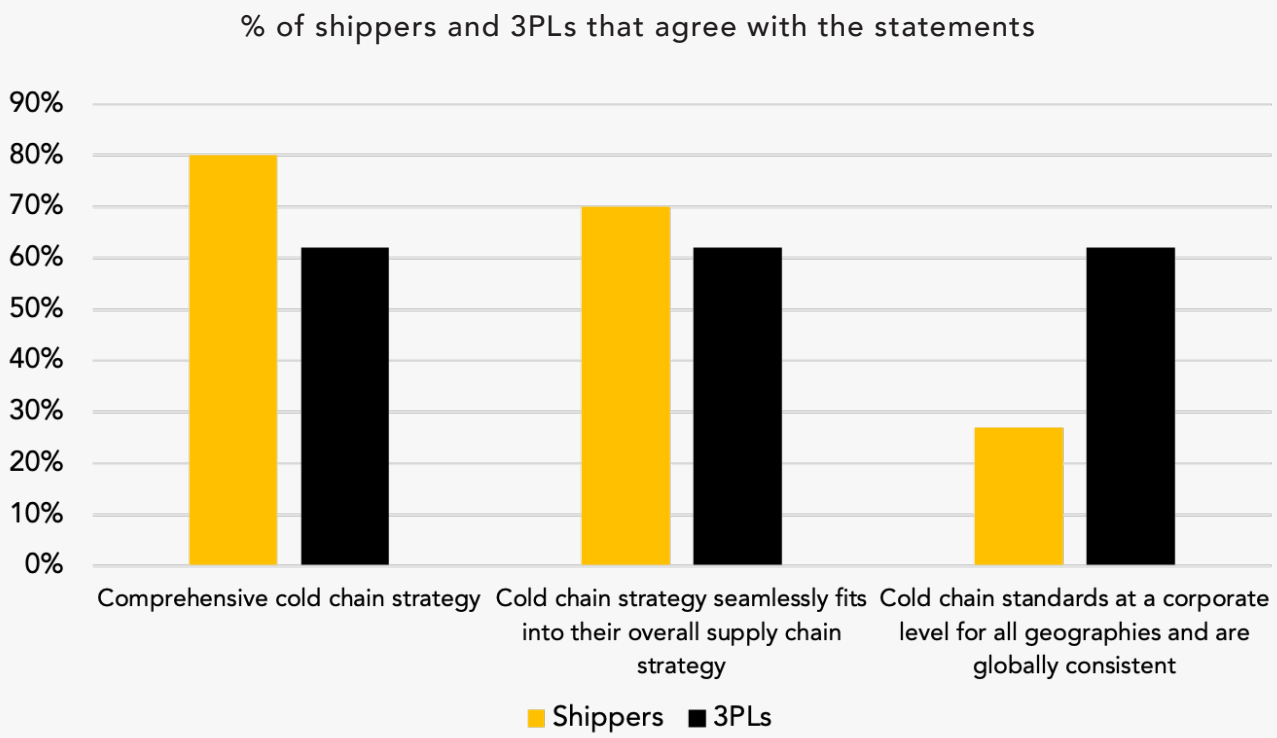
Shippers feel confident in their cold chain abilities, with 89% reporting a comprehensive cold chain strategy. However, just 62% of 3PLs agreed that shippers had a comprehensive cold chain strategy (see **Figure 32**).

Additionally, 70% of shippers said their cold chain strategy fits seamlessly into their overall supply chain strategy. Still, a smaller number of 3PLs, 62%, agreed that shippers' cold chain strategy fits seamlessly into their overall supply chain strategy.

As the rate of temperature-sensitive products launched to market increases and as the diversity of advanced technology continues to thrive, yesterday's cold chain strategy is likely not the strategy to meet tomorrow's needs requiring a revisit for both shippers and 3PLs.

For 3PLs and carriers, technology investments can ensure the proper handling and regulatory compliance the shippers need, providing additional value from logistics providers. "I think there is probably an opportunity to market themselves and align their needs with their customers in terms of how they talk about what they're doing," Madrecki said.

Figure 32: Confidence in Cold Chain Strategy



Government Interest in Supply Chain

There is a growing recognition by the government that the food supply chain, and therefore the cold chain, is critically important. In May 2021, the U.S. Department of Agriculture solicited comments on a department-wide effort to improve and reimagine the supply chains for the production, processing and distribution of agricultural commodities and food products in response to an executive order signed by President Biden on Feb. 24, 2021.

"The comments received will help USDA assess the critical factors, risks, and strategies needed to support resilient, diverse, and secure supply chains and ensure U.S. economic prosperity, national security, and nutrition security for all Americans," the USDA said in a written release. "Such supply chains are needed to address conditions that can reduce critical processing and infrastructure capacity and the availability and integrity of critical goods, products and services."

In comments to the USDA, the Global Cold Chain Alliance said visibility and disruption will be key to building a resilient cold chain.

Top 10 Services: a 3PL Must Have to Successfully Service Cold Chain Requirements

1. Cross temperature/cold chain types
2. Active temperature monitoring
3. Product traceability with proof of compliance
4. Multi-temperature shipping capabilities within the same vehicle
5. End-to-end cold chain services
6. Regulatory compliance support & documentation
7. Ability to remotely alert driver of potential out of bounds reading
8. Ability to package product for cold chain transportation
9. Risk analysis & profiling
10. Cold chain & non-cold chain supply chain services

Key Takeaways

- Most shippers, 91%, and 3PLs, 100%, said they expect demand for cold chain capacity to increase over the next three years. Both shippers (70%) and 3PLs (52%) said COVID-19 has accelerated their growth plans, increasing their need for more cold chain capacity.

- To help meet anticipated demand, 70% of shippers said they expect to grow in-house cold chain capabilities and talent over the next three years, while 50% said they plan to outsource more of their cold chain capabilities. About 90% of 3PLs said they plan to expand their cold chain capabilities and service offerings.

- Shippers feel confident in their cold chain abilities, with 89% reporting that they have a comprehensive cold chain strategy. However, just 62% of 3PLs agreed that shippers had a comprehensive cold chain strategy.

- Among shippers, 70% said their cold chain strategy fits seamlessly into their overall supply chain strategy. A smaller number of 3PLs, 62%, agreed that shippers' cold chain strategy fits seamlessly into their overall supply chain strategy.

- Shipper respondents with cold chains reported a greater mixture or hybrid approach with a combination of both in-house and outsourced services across the cold chain vs. pure outsourcing as seen in non-temperature-controlled supply chains.

- Shippers and 3PLs experienced challenges differently. Shippers' top five challenges include proper handling, regulatory compliance, recruiting skilled labor, proper last-mile handling and product packaging. 3PLs' top five challenges include infrastructure investments, temperature monitoring, technology investment and maintenance, recruiting skilled labor and proper truck transportation.

Continuing the Conversation

The Effects of COVID-19 on Supply Chain

The impacts of COVID-19 on supply chains globally remain unprecedented in modern times. The research team added a section in the *2021 Annual Third-Party Logistics Study* to better understand the short- and long-term effects the pandemic had and will continue to have on supply chains.

Considering the continuation of the pandemic with no corner of the globe left untouched, the research team decided to continue this conversation.

COVID-19 not only brought significant challenges to the supply chain but also highlighted weaknesses within each link in the supply chain and demonstrated the need for contingency planning and risk mitigation strategies. At the same time, the pandemic highlighted the ability of those within the supply chain to adapt.

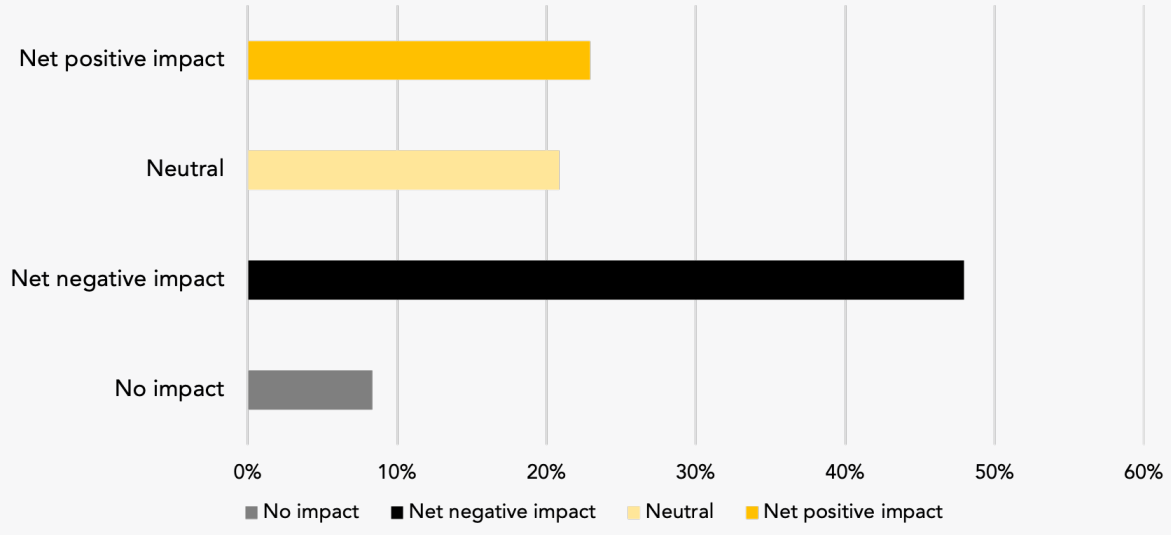
> *"When the problems started with COVID-19, a lot of things fell apart, but supply chains did not fall apart. Supply chains saved the world. We wouldn't have had PPE, vaccines, medicine or supplies in the stores when people panicked."*
>
> **Kevin Smith, CEO of Sustainable Supply Chain Consulting**

"When things started to go south, supply chains started to adapt. They are adapting and changing every day. Not one supply chain professional threw their hands up in the air and quit," Smith said.

One of the effects of COVID-19 is that 3PLs have become more important to the supply chain, Smith said. "When things go crazy, 3PLs become important because of their scale," he said. "It is about creating resilience. Individual companies have a hard time creating the capacity, the resilience and the buffering that 3PLs can because 3PLs have access to carriers, real estate and networks that an individual company wouldn't have otherwise."

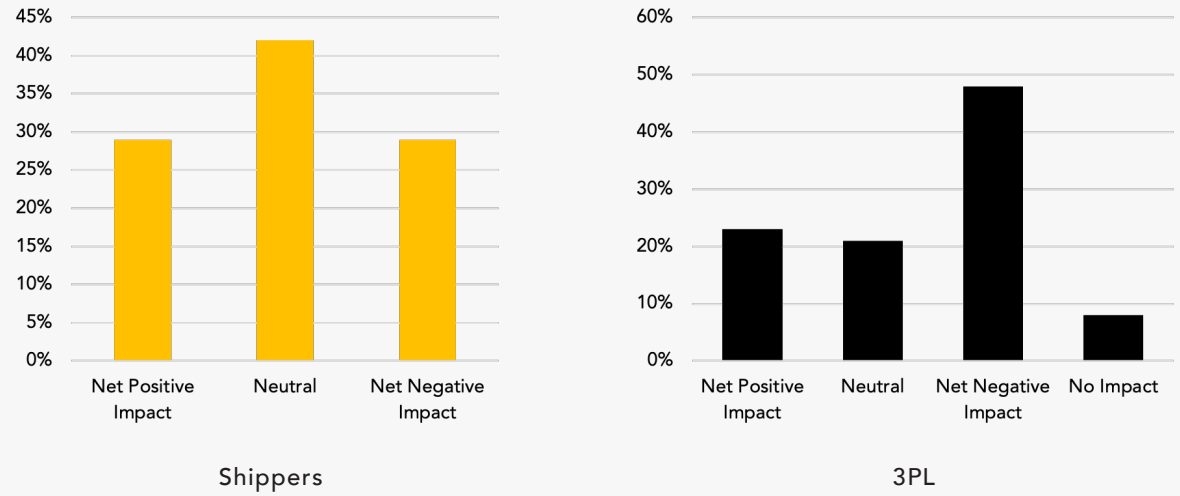
The pandemic forced everything from shutdowns to surges in demand and shortages in supplies. The result, 48% of 3PLs reported a net negative impact on operations and volume capacity due to the pandemic (**Figure 33**).

Figure 33: Impact on 3PL Operations and Volume Capacity



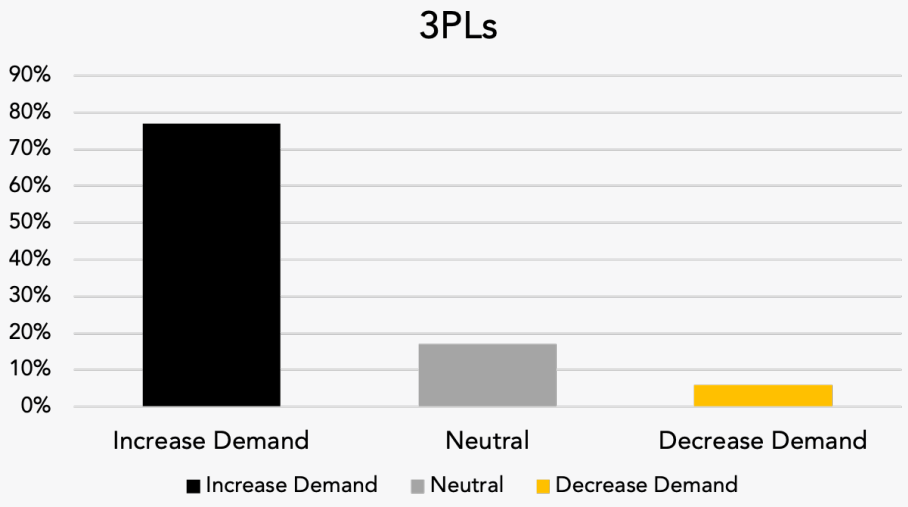
However, that capacity reduction did not translate into financial impacts. The study found that 71% of shippers and 3PLs reported either a neutral or net positive financial impact on their organizations. While a greater number of shippers than 3PLs said they experienced a net positive impact, with 30% of shippers and 23% of 3PLs as shown in **Figure 34**, the operational impacts appeared not to have resulted in negative financial impacts.

Figure 34: Net Financial Impact of the Pandemic on Shippers and 3PLs



Further, 3PLs are optimistic about the future, with 77% reporting that they expect the pandemic to increase demand for their service over the next three years (**Figure 35**).

Figure 35: Future Impact of the Pandemic



Despite the scope and severity of the pandemic, many shippers were optimistic about recovery when asked how long they thought it would take their supply chains to return to normal operations as part of the *25th Annual Third-Party Logistics Study*. Last year, 46% of shippers reported that recovery will take less than three months, and only 6% of shippers expected it to take longer than 12 months.

These results were surprising to the research team. In the *2021 Annual Third-Party Logistics Study*, researchers stated, "With the failure to control the pandemic continuing in the United States and the rolling wave of COVID-19 clusters of outbreaks in parts of Europe, such as Germany and Spain, it is unclear if and to what extent current impacts to supply chains will be exacerbated or how long it will take for supply chain organizations to recover."

When asked as part of the *26th Annual Third-Party Logistics Study*, shippers were less optimistic. Few shippers expect rapid returns to normal operations, with 7% reporting less than three months and 35% of shippers expect a return to take 6-12 months. A greater portion of shippers is unsure if they will return to pre-COVID-19 levels shifting from 10% to 14%, shown in **Figure 36**.

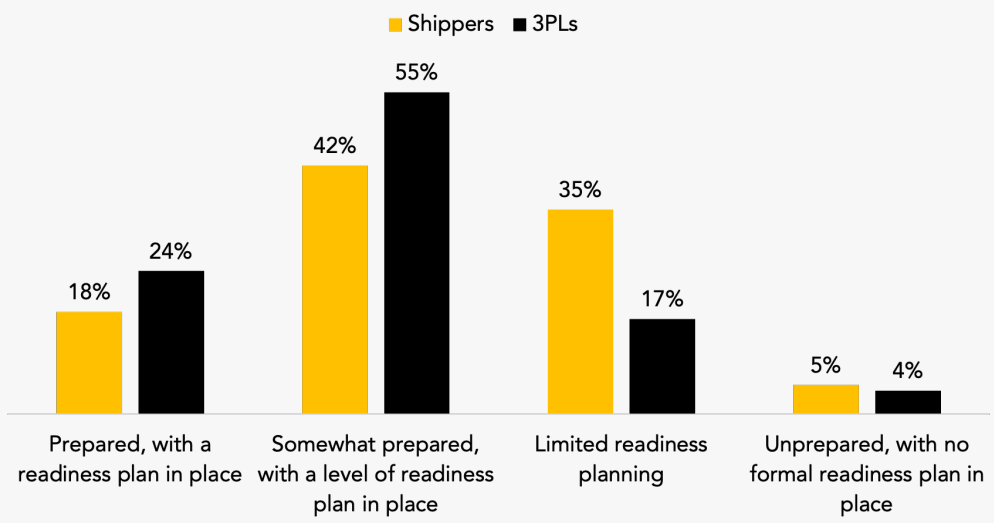
Figure 36: Length of Time Needed for the Supply Chain to Return to Normal

Shippers	%
No impact, no time needed	5%
Already back to normal operations	26%
<3 months	8%
3-6 months	10%
6-9 months	21%
9-12 months	14%
>12 months	2%
Unsure if or when we will return to normal operational levels	14%

The *26th Annual Third-Party Logistics Study* took a deep dive into specific supply chain areas shippers and 3PLs want to improve as well as long-term improvements both parties plan to make to shore up their supply chains.

While the pandemic caught nearly everyone by surprise, 3PLs indicated they were better prepared to face a major disruption, despite its cause. More than half of 3PLs—55%—reported that they were somewhat prepared with a level of readiness plan in place prior to COVID-19, and 25% said they were prepared with a readiness plan in place, compared to 43% of shippers who said they were somewhat prepared and 18% who said they were prepared (**Figure 37**). Just 4% of 3PLs and 5% of shippers said they were unprepared.

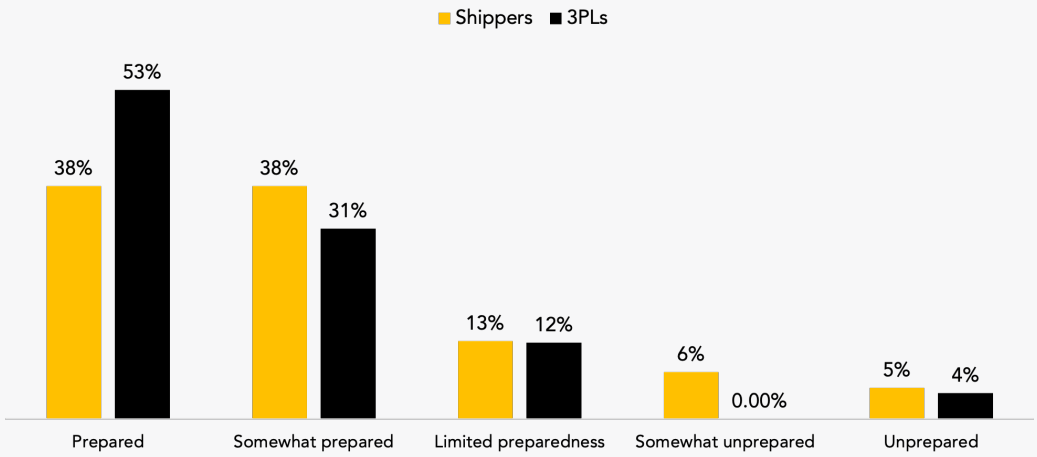
Figure 37: Levels of Preparedness Prior to COVID-19



Based on their performance during the pandemic, not surprisingly, there was a downward shift in how both 3PLs and shippers rated themselves on their level of preparedness. Just over half of 3PLs, 53%, said they were prepared based on performance, and 31% said they were somewhat prepared. Among shippers, 18% said they were prepared based on performance, and 43% said they were somewhat prepared, shown in **Figure 38**.

Steve Banker, vice president, supply chain management for ARC Advisory Group, said there were some companies ahead of the curve on supply chain preparedness. "You think back to the earthquake and tsunami in Japan that shut down automotive supply chains. They knew after that event that this was possible," he said. "There is much more recognition of this now than there used to be."

Figure 38: Readiness Based on Pandemic Performance

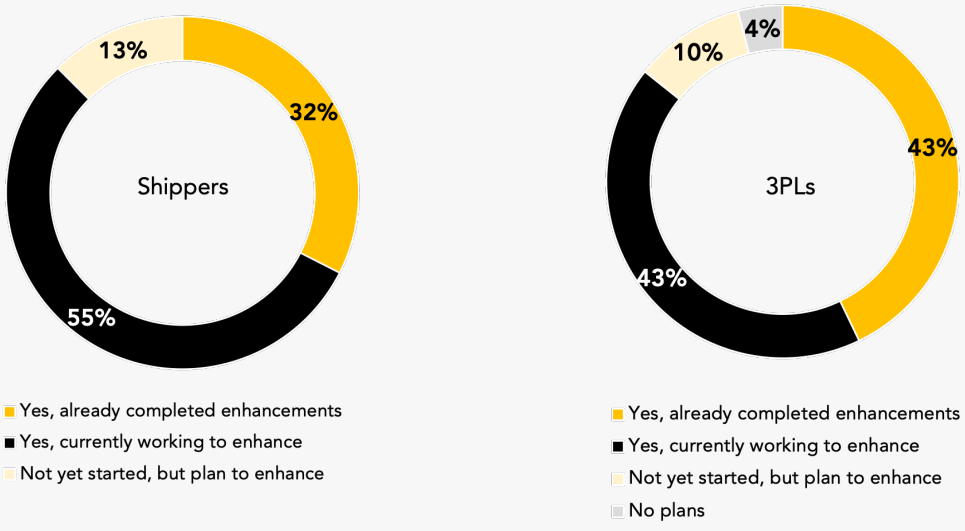


Shippers and 3PLs have taken the lessons learned from COVID-19 disruptions, and both groups—100% of shippers and 96% of 3PLs—said they are enhancing their readiness and continuity planning, detailed in **Figure 39**.

"I think one thing COVID taught us is we need agility," Banker said, adding that agility is different than resilience. "Agility is a function of your supply chain and how it is designed. Resilience is a function of your business strategy and financial reserves."

Slightly more 3PLs (43%) said they have already completed enhancements, compared to 33% of shippers. More than half of shippers—55%—and 43% of 3PLs said they are currently working to enhance their readiness and continuity planning.

Figure 39: Shippers and 3PLs are Enhancing Readiness and Continuity Planning



As described in **Figure 40**, shippers said the areas of the supply chain most impacted by the pandemic included international transportation and logistics (43%), sourcing and procurement (30%) and manufacturing (24%). Other areas that were impacted included domestic transportation and logistics (21%) and supplier network (18%).

The most impacted areas of the supply chain differed for 3PLs. Among 3PLs, labor/workforce management ranked the highest at 33%, followed by manufacturing (24%), international transportation and logistics (23%), and customer network—customers unable to accept delivers/orders (21%).

Figure 40: Supply Chain Areas Most Impacted by the Pandemic

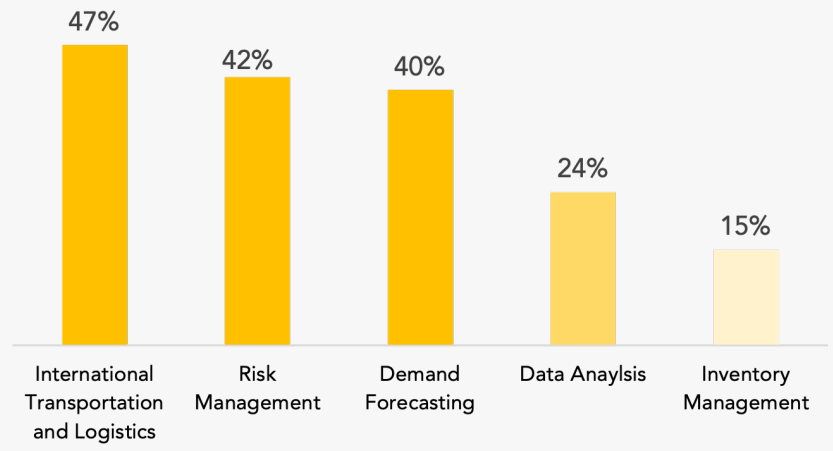
Shippers			3PLs		
Rank	**Impacted Area**	**%**	**Rank**	**Impacted Area**	**%**
1	International Transportation and Logistics	42.86%	1	Labor / Workforce Management	33.33%
2	Sourcing and Procurement	30.00%	2	Manufacturing	24.44%
3	Manufacturing	24.39%	3	International Transportation and Logistics	23.40%
4	Domestic Transportation and Logistics	20.51%	4	Customer Network (Customers unable to accept delivers/orders)	20.83%
5	Supplier Network	17.50%	5	Supply Chain Planning	17.02%
6	Inventory Management	13.16%	6	Inventory Management	16.67%
7	Supply Chain Planning	12.82%	7	Order Management and Fulfillment	15.22%
8	Warehouse and Distribution	10.00%	8	Warehouse and Distribution	14.58%

The pandemic highlighted weaknesses within the supply chain. As part of this year's study, researchers asked shippers and 3PLs about specific supply chain areas they need to strengthen to prevent future disruptions. 3PLs cited domestic transportation and logistics (44%), data analysis and visibility (38%), capacity forwarding (36%), labor management and scheduling (36%) and demand forecasting (32%).

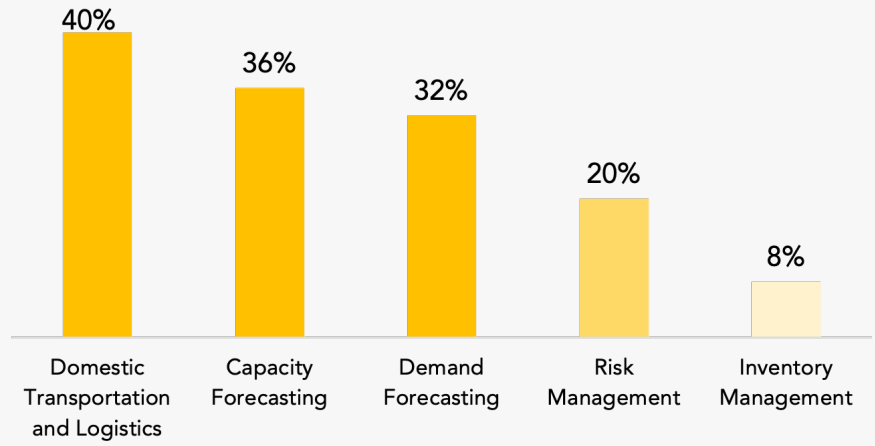
Priorities shift slightly for shippers. For shippers, international transportation and logistics ranks first at 47%. Risk management is second at 42%. Demand forecasting and domestic transportation and logistics tie for third and fourth at 40%, and capacity forecasting ranks fifth at 29%. **Figure 41** details all performance areas included within the survey.

Both groups changed their priorities since last year's study. In the *2021 25th Annual Third-Party Logistics Study*, shippers and 3PLs agreed on the top three areas in most need of strengthening after COVID-19, which were readiness and continuity planning, data analysis, and visibility and risk management.

Figure 41: Supply Chain Areas Needing Strengthening



Shippers



3PLs and Providers

The top five areas 3PLs are currently working to improve based on current approved projects and budgets are data analysis and visibility (50%), labor management and scheduling (48%), domestic transportation and logistics (38%), and warehouse distribution and operations (38%), see **Figure 42**.

Shippers reported currently working to improve demand forecasting (42%), capacity forecasting (40%), international transportation and logistics (38%), supply chain network design or redesign (36%), and data analysis and visibility (33%).

Significant work is underway to improve supply chains around the globe. As a result, budgets are also increasing. Among shippers, 38% said their supply chain budgets have increased. Only 15% said they have experienced a reduction in their budget allocation. Additionally, 30% said there has been no change in dollars allocated or their focus on supply chain initiatives; 18% said they are experiencing no change in dollars allocated but have changed their focus.

Figure 42: Areas 3PLs and Shippers are Working to Improve Based on Approved Projects and Budgets

	Shipper	3PL
Demand Forecasting	42%	26%
Capacity Planning	40%	16%
International Transportation and Logistics	38%	26%
Supply Chain Network (re)design	36%	18%
Data Analysis and Visibility	33%	50%
Domestic Transportation and Logistics	29%	38%
Risk Management	22%	18%
Manufacturing Operations	20%	4%
Order Management and Fulfillment	16%	22%
Scenario Management	15%	8%
Labor Management and Scheduling	11%	48%
Warehouse and Distribution Operations	9%	38%
Other (please specify)	4%	4%
Reverse Logistics	0%	8%

Key Takeaways

- The pandemic created financial impacts for shippers and 3PLs, with 29% of each group citing a net negative financial impact; 42% of shippers and 21% of 3PLs said they experienced a neutral impact; 30% of shippers and 23% of 3PLs reported a net positive impact.

- 3PLs also experienced logistics bottlenecks and backlogs in all areas of the supply chain, ranging from ports to surface transportation, with Just under half of 3PLs—48%—reported a net negative impact on operations and volume capacity due to the pandemic.

- More than half of 3PLs—55%—reported that they were somewhat prepared with a level of readiness plan in place prior to COVID-19, and 25% said they were prepared with a readiness plan in place; 43% of shippers who said they were somewhat prepared and 18% who said they were prepared.

- Based on their performance during the pandemic, 53% of 3PLs said they were prepared, and 31% said they were somewhat prepared. Among shippers, 18% said they were prepared, and 43% said they were somewhat prepared.

- Specific supply chain areas 3PLs plan to improve include domestic transportation and logistics (44%), data analysis and visibility (38%), capacity forwarding (36%), labor management and scheduling (36%) and demand forecasting (32%).

- Shippers plan to improve international transportation and logistics (47%), risk management (42%), demand forecasting (40%), domestic transportation and logistics (40%), and capacity forecasting (29%).

- The top five areas 3PLs are currently working to improve based on current approved projects and budgets are data analysis and visibility (50%), labor management and scheduling (48%), domestic transportation and logistics (38%), and warehouse distribution and operations (38%).

- Shippers are currently working to improve demand forecasting (42%), capacity forecasting (40%), international transportation and logistics (38%), supply chain network design or redesign (36%), and data analysis and visibility (33%).

International Outlook: Supply Chain Management in India

The COVID-19 pandemic has adversely affected global supply chains and has had different impacts across geographies. Some countries were affected more than others, but the biggest impacts have stemmed from revenue losses, increased cost of doing business and idle capacity, which collectively hampered more than half the world's businesses.

In India, the unprecedented migration of labor during the first COVID wave shook the very foundation of supply chains in the country, said Niraj Singhal, senior vice president of international consulting for NTT DATA. Manufacturing activity came to a standstill leading to accumulated losses worth billions of dollars and led to the closure of several small enterprises and increased unemployment.

In the second wave, the costs amplified due to a steady rise in fuel and commodity prices and low storage and transportation capacity, among others.

However, for several players, the first shock wave came as a benefit as it helped businesses optimize and digitize their supply chains and process high volume deliveries faster than ever, thereby reducing cancellations and reaching out to inaccessible rural zones as well.

The Indian e-commerce market is likely to surge at a compound annual growth rate of 19.6%, becoming a $98.4 billion (U.S. dollar) market by 2023[11], due to a shift in consumers' preference from in-store to online platforms. This exponential growth in e-commerce is likely to lead to increased use of supply-chain-as-a-service models as well as the Uberization of freight, creating large warehousing, transportation and logistics platforms, driven by flexibility and optimization (see more in the section Risk of Non-Traditional Models (SCaaS)).

Special thank you to Niraj Singhal, senior vice president of international consulting for NTT DATA

International Outlook: Supply Chain Management in Singapore

Strategically located, Singapore has built on its geographical advantage, ranking top in Asia since 2007, according to the World Bank's Logistics Performance Index.

This can be attributed, in part, to its efficiency in customs clearance. For example, Singapore processes 90% of their permit applications submitted electronically within 10 minutes, clears 90% of physical cargo within eight minutes and connects to 600 ports in 123 countries.

Singapore had already started to see shifts because of increased trade wars, trends of nationalism and protectionism, issues of sustainability and human rights considerations before the pandemic. The COVID-19 pandemic caused massive global economic disruptions in 2020. Singapore was not spared as the economy recorded its worst full-year recession since independence. The COVID-19 pandemic has led to both demand- and supply-side shocks to the Singapore economy. Sectors that have been the most severely affected are those that rely on international trade and travel, including air transport.

As outbreaks and infection surges continue in and around Singapore, restrictions that will impact flow of trade should be expected. Post Pandemic, Singapore's export-oriented industries are expected to benefit from overall rising global trade. As companies are moving from China to other parts of Asia, the challenge they will face is how to rebuild fractured supply chains and shortages of supply chain skills within the region.

Special thank you to Niraj Singhal, senior vice president of international consulting for NTT DATA

11 https://www.frontiersin.org/articles/10.3389/ffutr.2021.660116/full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Contemporary Issues

The Need to Rebalance

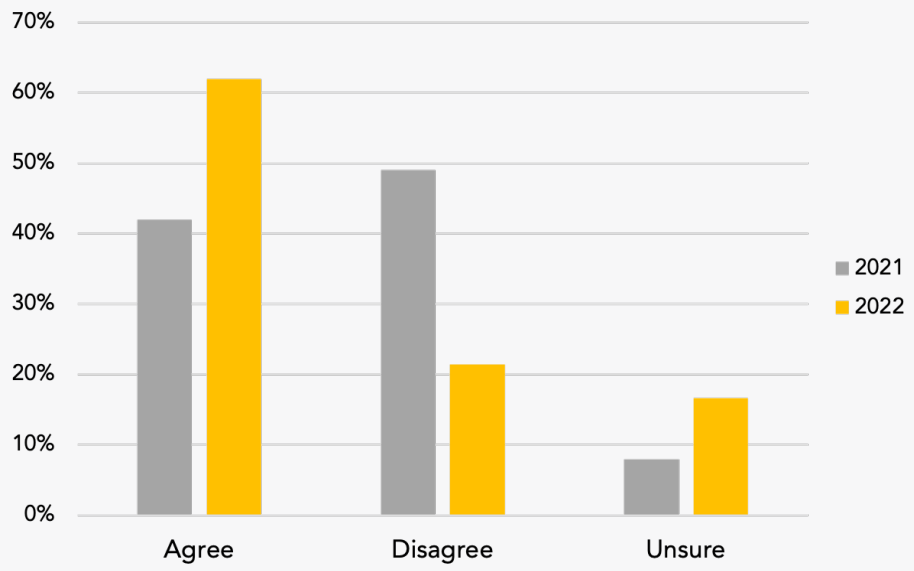
For years, supply chains have focused on reducing inventory levels and cutting costs by embracing lean principles. The basic concept of lean is to cut the most waste possible while leaving enough to ensure things run under the best-case scenario. These efforts, as noted in the *2021 Annual Third-Party Logistics Study*, have largely been successful in reducing waste across the supply chain. However, these efforts have undoubtedly impacted the resilience and agility of supply chains to respond to significant disturbances, including the COVID-19 pandemic. The events of this past year have drawn attention to the risk of becoming too lean. Many businesses learned the hard way that a lack of inventory can impact customer satisfaction and sales opportunities. In this year's A*nnual Third-Party Logistics Study*, researchers asked shippers to detail supply chain disruptions as well as their plans to rebalance supply chains.

More than three-fourths of shippers—83%—reported they experienced disruption in the supply of key materials. More than half—62%—of shippers said they believe that supply chains have become too lean, taking out too much in an effort to reduce cost and on-hand inventory, shown in **Figure 43**.

This is a significant change from the prior year's findings. In the *2021 25th Annual Third-Party Logistics Study*, 42% of shippers agreed that supply chains had become too lean, with 49% disagreeing with the statement.

Currently, inventories are at a scary historical low, said Kevin Smith, CEO of Sustainable Supply Chain Consulting. "For every piece sold, there is only about a month's worth of inventory available. Typically, you'd have ratios of 1:2 or 1:1½," he said.

Figure 43: Have Supply Chains Become Too Lean?

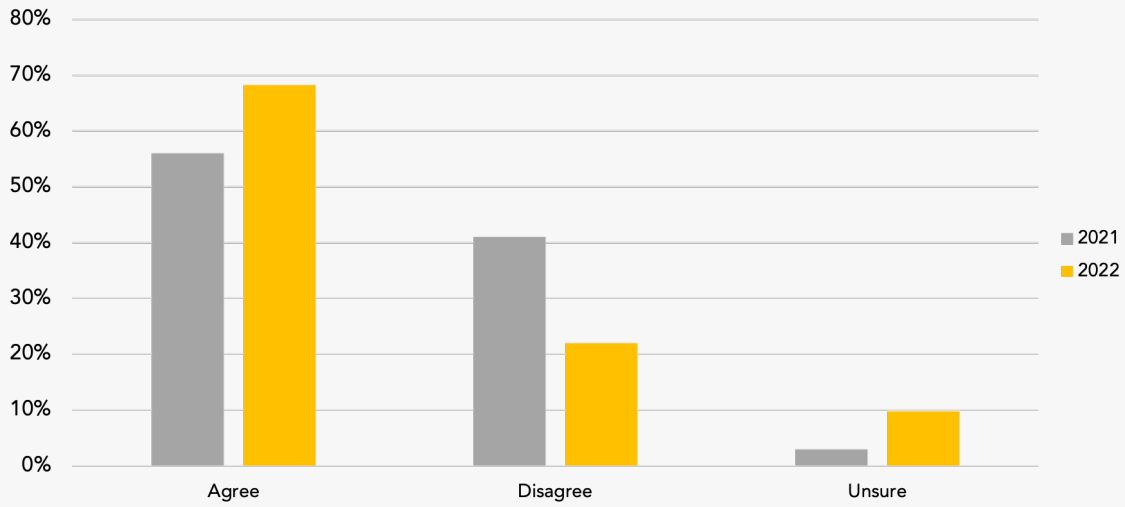


However, the answer isn't necessarily buying more inventory. The answer is better visibility, Smith said. "If you know where the product is, you can make better mathematical conclusions about where it needs to be," he explained. "With inventory, there are only three things you need to know. One is the forecast which is always wrong. Then it is safety stock. How much do you have to keep so you don't run out? The third is the timing. When do you have to replenish? Visibility is a huge piece of that now."

Similarly, 68% of shippers believe that supply chains have become too global and must be rebalanced towards more regional and local/domestic ecosystems within larger global enterprises (see **Figure 44**). While a majority of shippers believed that supply chains had become too global, the percentage is up significantly from the prior year's result – 68% vs. 56% of shippers.

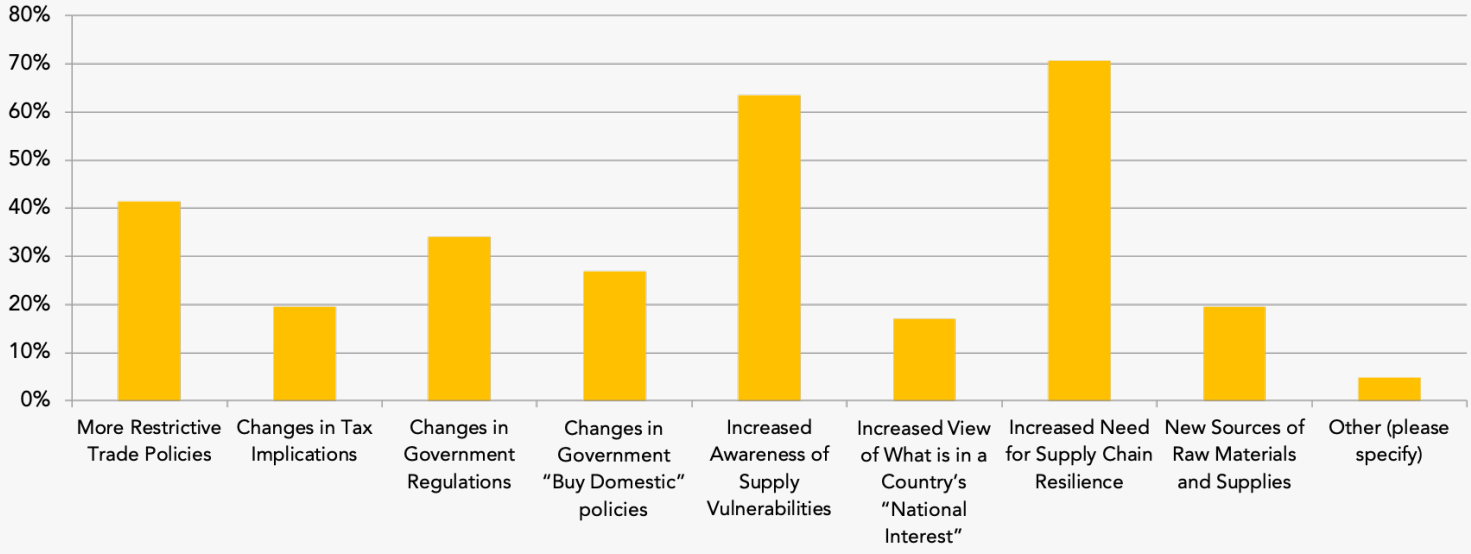
As the pandemic continues and supply chain issues shift from surging demand to intensifying raw materials shortages, more shippers are unsure what this all means for global supply chains and whether they should consider global rebalancing, with 10% reporting unsure compared to 3% in the previous year.

Figure 44: Have Supply Chains Become Too Global?



For shippers, several factors are contributing towards global rebalancing, including increased need for supply chain resilience (71%), increased awareness of supply chain vulnerabilities (63%) and more restrictive trade policies (41%). All of the factors are outlined in **Figure 45**.

Figure 45: Top Factors Contributing to a Global Rebalancing



However, industries and expertise tend to grow up in one region, and it takes years to shift a supply chain. "It isn't just getting a new supplier that is up to your quality standards, which that alone takes time. There are all of these other things that go along with it," said Steve Banker, vice president of supply chain for ARC Advisory Group.

That includes evaluating port and rail infrastructure as well as providers with industry knowledge within the regions, Banker said.

Notably, since 2019, many businesses have looked at moving out of China. Other countries in the region, including Vietnam, Indonesia, Thailand and Singapore, have been competing for business.

> *"Nearshoring and reshoring absolutely is going to happen. It has been happening quietly for the last few years."*
>
> **Kevin Smith, CEO of Sustainable Supply Chain Consulting**

However, nearshoring doesn't mean products are produced directly near a customer. "If you're North America and move manufacturing to Columbia, you still have to move product. Supply chains are still going to be global, but we're going to reassess the cost-benefit analysis," Smith said. "Twenty years ago, it was pennies to the dollar to manufacture in China. It isn't like that anymore."

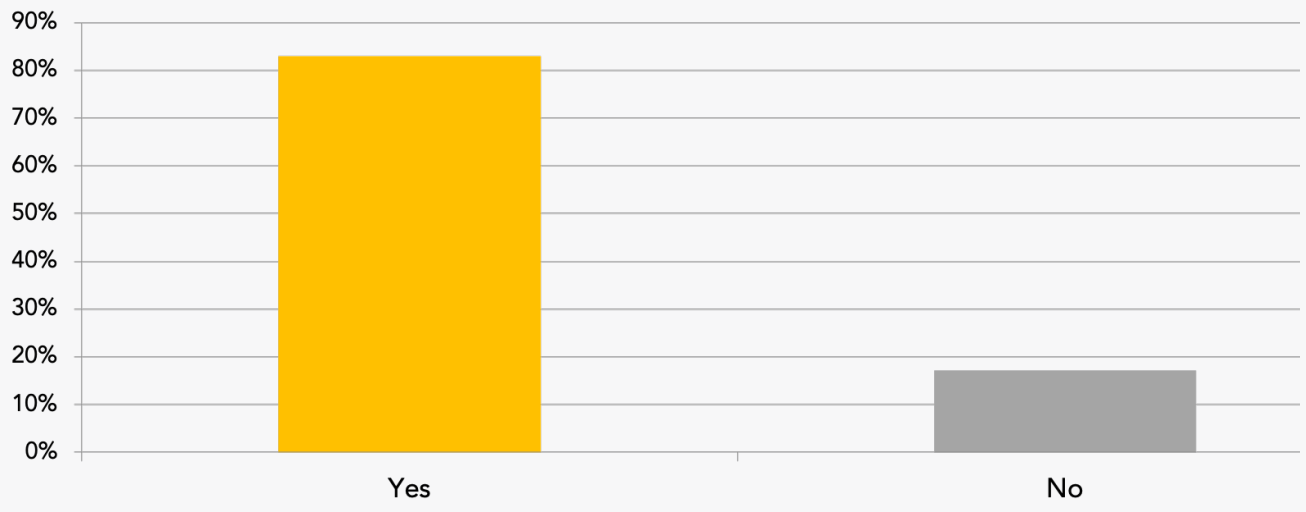
While production is moving out of China, it is not necessarily moving away from Chinese producers. Many Chinese managers are moving to Southeast Asia, starting new companies or creating subsidiaries. That means even if companies believe they are moving out of China, they are not moving away from China.

For shippers, it could be more important to look at where they source products. Traditionally our focus was on ensuring no single source of supply within our Tier One supply base. Some even looked at Tier 2 and suppliers or suppliers. Those that found they were single-sourced worked to expand their supplier portfolio or helped suppliers secure alternative sources of supplies.

As a result of the pandemic, supplier management is quickly adapting and a new definition of single source of supply is emerging. A single source of supply can now mean a single country or region. Organizations need to understand if their various suppliers are clustered within countries or regions that would result in disruption across all of their suppliers within key categories in the event of a major disruption.

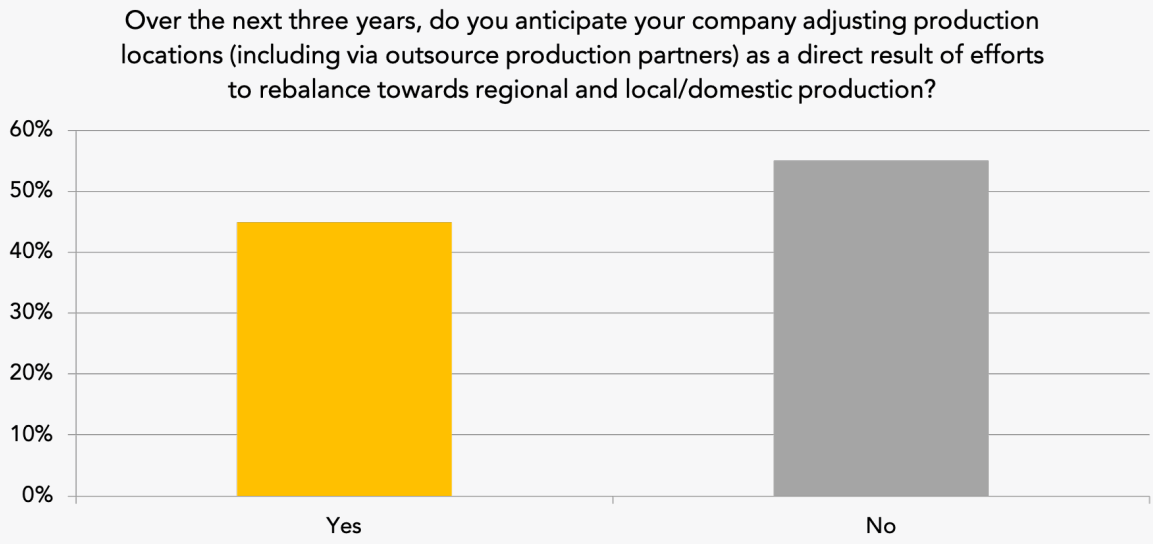
The majority of shippers—83%—said they plan to adjust sources of supply as a direct result of efforts to rebalance towards regional and local/domestic sources (**Figure 46**).

Figure 46: Shippers' Anticipated Supply Source Adjustments Over the Next Three Years



However, less than half of shippers—45%—said that they anticipate adjusting production locations over the next three years, including through outsourcing to production partners, as a direct result of efforts to rebalance towards regional and local/domestic production, shown in **Figure 47**.

Figure 47: Shippers' Anticipated Production Locations Over the Next Three Years



As supply chains shift, logistics providers will play an essential role in filling the gap and helping shippers manage both agility and risk.

Shippers will need new sources for transportation, warehousing and distribution services. There are also opportunities for enhanced 4PL services as well as end-to-end risk management services. End-to-end risk management providers map and monitor a company's full supply chain, searching thousands of publications and social media for keywords indicating a potential issue. These could include phrases such as Tianjin port fire or port strike.

"The first company to know there was a fire at Tianjin can start routing things out of Tianjin to different ports. If you're two days later, those other ports are already full," Banker said, adding that timeliness is critical.

Additionally, risk management providers can monitor for a suppliers' name coupled with disruptive events such as bankruptcy. That can alert a company to quickly find an alternative source. When disruptions occur, hours and even minutes count.

Logistics providers can help shippers optimize their supply chain through various what-if scenarios, cross-border expertise and contingency planning. Visibility will remain a vital tool for identifying, mitigating and reacting to potential disruptions.

The *2021 Annual Third-Party Logistics Study* noted the potential for increased nearshoring as organizations reacted to disruptions due to the pandemic and the U.S.-China trade war was a real and likely outcome of the pandemic. The results of the *2022 Annual Third-Party Logistics Study* serve only to support those findings and indicate that the coming change is likely to occur faster than originally anticipated. Time-sensitive deliveries, lean supply chains, increased demand uncertainties and shorter product lifecycles necessitate a dynamic supply chain and increased agility for shippers and their third-party logistics providers.

Will inventories increase as shippers try to minimize disruptions? Will supply chains shift to move production closer to consumers? How rapidly will a global balancing occur? What role will 3PLs play in optimizing supply chain networks?

Risk of Non-Traditional Models (SCaaS)

Traditionally, as discussed in the prior section, "The Need to Rebalance," supply chains have been viewed as cost centers and a frequent go-to organization by CFOs and CEOs in search of cost savings. Supply chain as a service (SCaaS) is an opportunity to rethink the underlying role of supply chains and provides a new business model that generates alternative revenue streams not just for 3PLs but also for shippers.

Gartner's October 2020 Supply Chain Executive Report, "Competing Against Non-Traditional Supply Chains," noted that based on their research, more than half of supply chain organizations across a range of industries believe that they are at risk of being disrupted by competitors in the coming years. The highest perceived risk of being disrupted comes from a range of non-traditional competitors.

In August, Walmart announced its new line of business, Walmart GoLocal, which will provide last-mile deliveries to other merchants.

> *"Walmart has spent years building and scaling commerce capabilities that support our network of more than 4,700 stores, and we look forward to helping other businesses have access to the same reliable, quality and low-cost services."*
>
> **John Furner, President and CEO, Walmart U.S.**

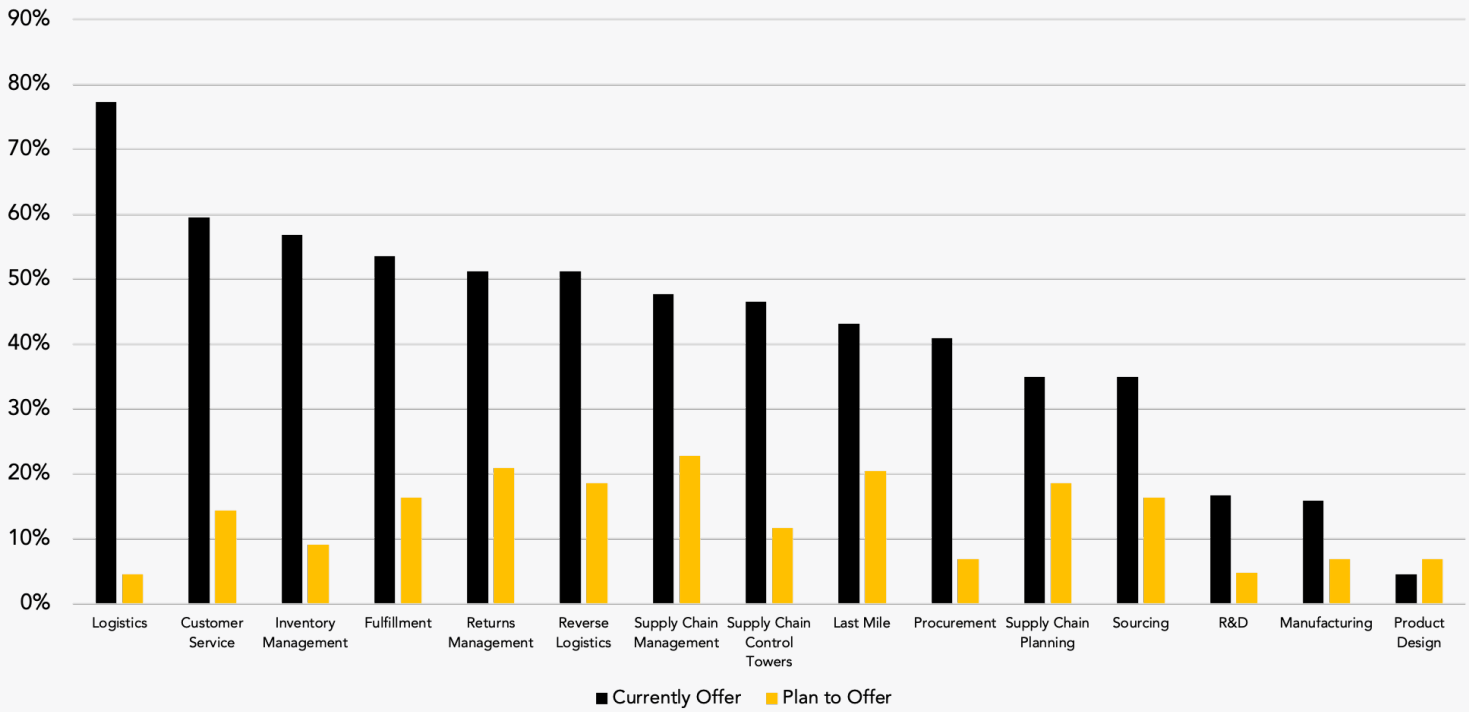
Tom Ward, senior vice president, last mile, Walmart U.S., said the retailer has worked hard to develop a reliable last-mile delivery program for its customers and is pleased to use it for local merchants. "Be it delivering goods from a local bakery to auto supplies from a national retailer, we've designed Walmart GoLocal to be customizable for merchants of all sizes and categories so they can focus on doing what they do best, leaving delivery speed and efficiency to us," he said.

Amazon is often cited as the poster child of a non-traditional competitor to 3PLs. The *2021 Third-Party Logistics Study* further discussed the impacts Amazon has had on the 3PL market. Successful supply chains of the future will embrace multiple operating models and service providers. This could create a new stream of competition for 3PLs as companies offer functions of their supply chain that were traditionally core competencies to them to other companies as a means of generating revenue.

The challenge to 3PLs is to identify unmet needs in the marketplace and to match alternative models to capture untapped revenue sources. This will include flex capacity, on-demand usage and non-dedicated services wrapped in more modern and digitally-enabled bundles.

3PLs reported that they currently have several supply-chain-as-a-service-offerings (see **Figure 48**), including logistics as a service (77%), inventory management as a service (57%), returns management as a service (51%) and reverse logistics as a service (51%).

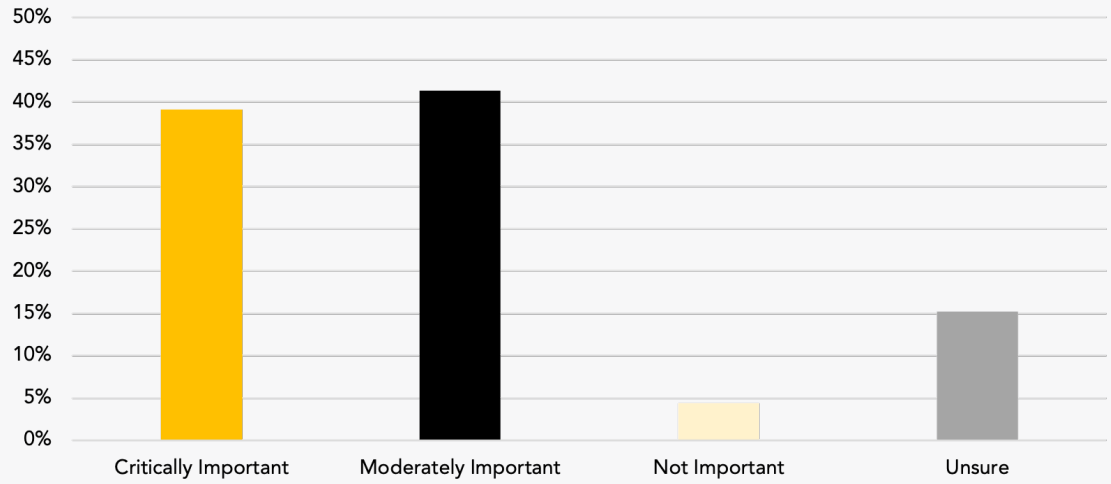
Figure 48: Supply Chain as a Service Solutions 3PLs Offer Currently or Plan to Offer in the Near Future



3PLs also have plans to expand their SCaaS offerings, with 23% reporting plans to offer supply chain management as a service within the next three years, 21% have plans to introduce returns management as a service, and 20% plan to introduce last mile as a service.

Further, 3PLs appear to have recognized the importance of SCaaS models. 3PLs believe SCaaS is either moderately important (41%) or critically important (39%) to their future offerings (**Figure 49**).

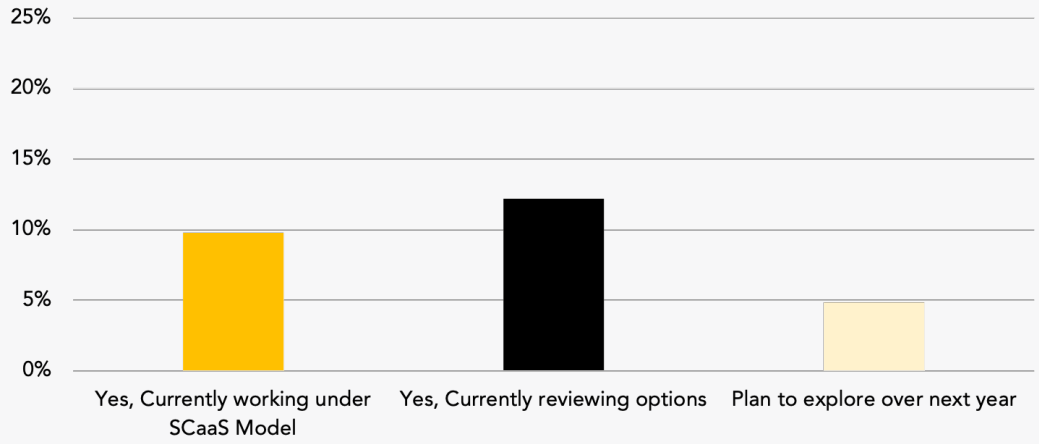
Figure 49: Importance of SCaaS to Future 3PL Offerings



As SCaaS advance, supply chains will become more modular. Managing this increased complexity will require increased data and automation as well as a control tower views to manage the full supply chain effectively.

While most shippers have not considered opting for supply chain services under an as-a-service model with a 3PL, 10% are currently working within a supply chain as a service model with a 3PL, 12% are presently reviewing options, and 5% plan to explore their options over the next year (**Figure 50**).

Figure 50: Shippers Considering a SCaaS Model



Similarly, as outlined in **Figure 51**, few shippers, 5%, currently offer supply chain services to other companies. However, 15% said they are currently reviewing options, and 10% plan to explore options over the next year. While 70% have not considered this option, it does represent close to one-third of shippers exploring SCaaS models whereby they would offer their own core supply chain functions to others.

Figure 51: Shippers Offering SCaaS to Other Companies

The post-pandemic world could provide an opportunity to reshape supply chains for those willing to be disruptors.

How will 3PLs adapt to this changing model and determine which services are viable as SCaaS offerings and to which shippers? How will shippers determine which functions to offer to other companies in a SCaaS offering?

What benefits will the use of SCaaS provide to shippers and those opting to use their SCaaS services? How will those within the supply chain manage increased complexity as supply chains become more modular?

Keeping the Supply Chain Connected

Supply chain challenges continue to make headlines, and several factors are altering short- and long-term supply chain needs. Top threats recently impacting global supply chains include cyber threats, distribution disturbances, government intervention, demographic changes in the workforce and logistical execution. Undoubtedly, disruptions such as COVID-19 have a greater magnitude today because supply chains have changed dramatically in recent years.

While shippers and their logistics providers continue to adjust to market demands and capacity constraints, it may take 18 to 24 months or more before supply chains may be in balance. "Normal for the supply chain is you have to adapt and change," said Kevin Smith, CEO of Sustainable Supply Chain Consulting. "We're going to have to live with this and figure out how to deal with it over time."

Smith praised all that supply chains have been able to accomplish amidst unprecedented challenges associated with COVID-19. "Things are moving slowly, but they are still moving," he said.

COVID not only crippled a lot of supply chains at the beginning of the pandemic in 2020 but also continues to force shutdowns (see the section Continuing the Conversation: The Effects of COVID-19 for additional information on the pandemic). "When COVID shuts things down, we try to look for workarounds and get things back into the pipeline," Smith said.

Panic buying set off a chain of events that impacted the cold chain. "You may have gone to the grocery store and not seen the same selection as you expected pre-COVID, but there wasn't a lack of food," said Lowell Randel, senior vice president of government affairs for the Global Cold Chain Alliance. "We went from 50% of the consumer dollar spend at home and 50% away to probably 80-20. That creates a shift in the supply chain. It also means can we work with the federal regulators to get flexibility on things like labeling and packaging to shift food from a bulk environment to a retail environment or international trade or vice versa."

Many goods move by container ships, which are loaded at ports, but ports worldwide continue to be impacted by COVID-19. In August 2021, a COVID outbreak partially shut one of the world's busiest container ports, the Ningbo-Zhoushan port in China, and in June 2021, a COVID outbreak at the Yantian port in China decreased volume. On the air cargo side, a similar COVID experience in late August 2021 caused a suspension of freighter operations at Shanghai's Pudong International Airport.

Sharang Goyal, a business consultant for NTT DATA, said 42% of supply chain management is originating or ending in Asia, so anything that happens in that region has a strong impact on the global supply chain.

Many parts of the world are still deep in the pandemic, said Sylvie Thompson, supply chain transformation practice leader at NTT DATA. Few countries have been able to obtain ample supplies of vaccines, and outbreaks affect the movement of goods.

In addition to disruptions to transportation, 3PLs and manufacturers have had to prioritize operations, creating a supply chain shift, Smith said. "Corning makes glass. All of a sudden, we needed millions and millions of vials for vaccines. Corning had to shift operations, and they made a lot of vials for the vaccines," he explained.

Similarly, oxygen supplies were directed to healthcare needs, limiting supplies for manufacturing facilities that needed the gas to cut, bend and weld steel. That, along with shortages of semi-conductors, has impacted the production of Class 8 tractors. Current semi-conductor shortages are expected to last for quite some time.

Logistics providers also had to prioritize available capacity. "3PLs that were involved in refrigerated operations picked up a lot of the slack on vaccine distribution," Smith said. "You don't always hear about companies that said, 'What do we have to do to make sure we move this vaccine?' 3PLs have made tremendous gains by prioritizing what needed to be done."

At the same time, consumer demand is up. Within the United States, government spending for stimulus and infrastructure programs has driven up the consumption of industrial and consumer products. Plus, consumers in many parts of the world shifted from purchasing services to purchasing goods.

The World Bank said the global economy is poised to stage its most robust post-recession recovery in 80 years in 2021. The United States and China are each expected to contribute about one-quarter of global growth in 2021.

Political and regulatory changes worldwide are also affecting supply chains. Trade disputes, particularly with China, have also affected the supply chain and has caused some manufacturers to consider shifting operations (see more in the section The Need to Rebalance).

Australia is heavily dependent on imports and exports. Australia's main supplier of imports is China. Those imports include chemical imports in health (human medicine manufacturing), energy (fuel and coal product refining) and water treatment industries. China accounts for nearly two-thirds of the value of all exports, primarily iron-ore.

Recent geopolitical hostilities between China and Australia are hampering these supply chains. Many organizations have said delays as much as doubled import time. Plus, shipping costs increased by nearly 300%. Capacity constraints and surging demands for imports have compounded COVID-19-related challenges of restricted movement of people, including skilled personnel across ports. Education and tourism are the most impacted sectors.

However, in Australia, the supply chain issues have not been severe enough to affect operations materially for domestic firms, with only 10% of them are experiencing severe concerns.[12] Smaller firms more affected. There have been higher costs of air freight and containers; nonetheless, air freight accounts for only a small share of Australia's total goods trade, suggesting that the issues faced were relatively minor.

Puneet Chopra, director, business consulting, retail and corporate banking, NTT DATA, said Brexit, coupled with COVID, has affected a lot of supply chains in Europe. "A lot of these European nations, by being part of the European Union, were dependent on each other. When you take the U.K. out of the equation, supply chains break. You don't have the backward or forward integration," he said.

Border closures in the E.U. also affected operations. For example, border closures caused trucks to form 37-mile-long lines on the A4 highway after Poland closed its border with Germany in March 2020, driving up costs. Moreover, the cost of sending a container from Asia to Europe is about 10 times higher now than in April 2020 due to the disruption. In the most recent COVID-19 wave, facilities continue to remain shut, and the problem is exacerbated with a 30% drop in demand, which is still recovering slowly.

12 https://www.rba.gov.au/publications/smp/2021/may/pdf/box-b-supply-chains-during-the-covid-19-pandemic.pdf

Europe is quite fragmented. Even the largest transportation companies here cover only 10% of the market. This makes businesses heavily dependent on disparate 3PL providers, resulting in poor collaboration and delivery visibility issues. With the introduction of tariffs, customs duties and other barriers to trade, Brexit has accentuated the implications of how manufacturers source materials and components, assemble products and access consumer markets. Companies in the U.K. are grappling with record low levels of stock and retail selling prices are rising at the fastest pace since November 2017.

European industries are evolving in different ways according to their context-specific features, but their evolutions are mainly characterized by digitalization and the adoption of enabling technologies, new business models and value offers, as well as new roles and structures of the supply chain.

European companies are adopting practices for digitalization across their supply chains, such as products and services, sourcing, production process, supply chain configuration and customer relationships. In Germany, more than half of the 3,000 firms polled by the Association of German Chambers of Industry and Commerce expected widespread supply-chain problems to persist into next year but companies are evolving their supply chain strategies to cope with the them.

Those within the supply chain are focusing their time and energy to develop new supply chains to meet shifting needs in Europe, and Chopra said there will be large investments in the future.

Supply networks, which revolve around collaboration that serves the end customer, may take on greater importance as companies move toward platforms that support tight collaborative workflows between suppliers, distributors and customers. These platforms should have a solid information flow when it comes to plans, forecasts, shipments, estimated times of arrival and inventories. All of those involved need to have access to such data, which will make the supply chain more reactive and dynamic and, therefore, resilient.

The key to future proofing supply chains would include investment in the circular economy and reverse logistics, which can augment environmental sustainability. Secondly, lean warehousing can eliminate unnecessary traveling time and activities that lack added value. Omnichannel logistics can be a new standard for the future of logistics, which aid real-time monitoring of material flows and enhance the customer experience.

How will shippers and 3PLs come together to keep the supply chain connected as challenges and disruptions remain? How will country-specific issues affect the global supply chain? How long will it take for new supply chains to develop to meet new and shifting demands?

13 https://www.supplychainbrain.com/articles/33651-the-world-economys-supply-chain-problem-keeps-getting-worse

The Ripple Effect of Supply Shortages: A Look at Rubber

Products as well as the supply chains they move through are tightly connected. As a result, when a shortage or disruption occurs, the ripple effect can be vast. A close look at one product can bring supply chain challenges to life, and rubber is the perfect example.

Natural rubber is produced from sap of trees found in warm, humid countries, including Thailand and Vietnam. Currently, rubber is used in 40,000 different products, ranging from flip-flops to personal protective equipment, such as the masks and gloves that have been desperately needed throughout the pandemic.

The rubber industry has faced several challenges in recent years. Floods and storms in 2019 and 2020 significantly damage trees and fungus, due to warmer temperatures, has killed off trees. Plus, COVID-19 meant that rubber producers were not able to plant new rubber trees, which take seven to ten years to mature.

About 90% of all rubber is moved via the ocean at some point in its journey, which means port shutdowns and a lack of containers when ports reopened affected the movement of rubber. The Suez Canal blockage also had a significant impact on the movement of rubber due to the geographical location of the supply.

Additionally, in the areas where rubber is produced, such as Thailand, vaccination rates remain low. Only about 9% of Thailand's population has been fully vaccinated, and those within the country are dealing with devastating outbreaks, which continue to cause production issues.

While global rebalancing and innovation is an option for many industries, rubber has fewer solutions. One option is to incubate alternative sources in other regions. While not as well known, dandelions produce latex. Another option is to find synthetic rubber options, but that can take time to develop, and some products must use natural rubber.

Tight supply or shifts in production and sourcing translate into changes in the supply chain. Manufacturers may opt to increase inventories, transitioning from just-in-time manufacturing practices.

Furthermore, a potential rubber shortage could affect the actual movement of goods since it is used in tires, anti-vibration parts, wires and gaskets used in trucks and airplanes.

About the Study

The *2022 26th Annual Third-Party Logistics Study* utilizes multiple research streams to provide an objective look into the third-party logistics industry both from a user or purchaser of services (shipper) perspective and from a providers' perspective. Throughout the year, researchers also explore views and trends from leading organizations that do not currently utilize external services from a 3PL provider, which are noted in the study as non-users.

The study's goal is to investigate leading trends and uncover how shippers and 3PLs can collaborate to improve service and drive value. The study examines growth within the 3PL industry as a whole and specific sub-segments of the industry. It also looks at overall growth and development, what shippers outsource and what 3PLs offer, why shippers outsource to 3PLs, and the value they gain from those relationships. Additionally, researchers investigate trends and issues that are expected to alter the future state of logistics outsourcing.

When developing the study, the research team establishes topics of interest, develops the survey instrument, conducts the research, analyzes the results, writes this report, and presents and shares the findings. As part of this year's research, the team engaged shippers and 3PLs/4PLs with an email survey and focused interviews. Due to continued disruptions and travel uncertainties surrounding the COVID-19 global pandemic, workshops and discussions were conducted virtually. Included among these was a virtual, interactive session with supply chain executives as part of the summer 2021 Supply Chain Leaders Forum held by Penn State's Center for Supply Chain Research®. Researchers hope to resume in-person research events during the development and conduct of the 2023 study.

Contributions from industry representatives, supporting organizations and sponsor firms are vital to the study and have helped maintain and sustain the report for the past 26 years. Shippers and 3PLs generously participated in the surveys and interviews needed to produce this year's study, and, once again, the *26th Annual Third-Party Logistics Study* is dedicated to those who have made this possible.

The *Annual Third-Party Logistics Study* has been designed to serve as a resource and tool for shippers and 3PLs, as well as those trying to understand and become familiar with the industry. The study has become a widely anticipated, heavily referenced index on the state of the 3PL industry.

Just as the transportation and logistics industry has changed and evolved throughout the past 26 years, so has the study. However, the report maintains its focus on people, processes and technology, relationship management and the end-to-end supply chain. The current year's survey component yielded 345 respondents, which represents a modest decline from last year's total of 421 respondents. The opinion of the study team is that this result is due to the very unusual and unexpected events of the past and current year.

This year, researchers saw a slightly different industry mix than in years past. There was a significant decrease in respondents reporting work in the 3PL/4PL logistics and merchandising/retail trade industries but a significant increase in respondents working in the professional services/consultancy industries. This could be a result of the increased professionalization of the larger supply chain sector. There was also an increase of respondents working in the agriculture, forestry, fishing and hunting industries.

Within the ESG section, there was a good split (50/50) of public and private companies within the shipper responses. However, the 3PL responses were overwhelmingly from private companies, which is not surprising given each sector's general makeup of ownership types.

Results included in the "Current State of the 3PL Market" section of this report reflect responses from current users of 3PL and 4PL services located primarily in North America (85%), Europe (6%), South America (4%) and Africa (2%).

The Annual 3PL Study Process

Steps and elements of the development of the *Annual Third-Party Logistics Study* include:

Accessibility:

Links to the Web-based survey were circulated through *Annual Third-Party Logistics Study* supporting organizations for distribution to their members and affiliates. This year's survey closed in July 2021, yielding 345 usable responses from both users and non-users of 3PL services and providers of 3PL services. The study report and additional materials are also presented via its dedicated website, www.3PLstudy.com.

Topics:

In addition to measuring core trends in the 3PL industry, the *Annual Third-Party Logistics Study* conducts in-depth examinations of contemporary supply chain topics that affect both users and providers of 3PL services. This year's topics include: Sustainability and ESG: Impacts on 3PL-Customer Relationships; The Intelligent Supply Chain: The Role of Technology; and The Cold Chain: Planning and Moving Sensitive Loads. To continue the conversation, researchers also addressed the continuing effects of COVID-19 on the supply chain. This year's contemporary issues cover nearshoring, the risk of becoming too lean and future offerings.

Contributing Sponsors:

The *2022 26th Annual Third-Party Logistics Study* sponsors include NTT DATA, Penske and Penn State University. Copyright for the *2022 26th Annual Third-Party Logistics Study* is held by C. John Langley Jr., Ph.D., and NTT DATA.

Supporting Organizations:

Each year, several supply chain organizations facilitate the research process by asking members and other contacts to respond to the survey. In addition to completing the survey, individual companies help by enabling executives to participate in focused discussions and by lending subject matter expertise. These include:

- Penn State University
- Reverse Logistics Association (RLA)
- Council of Supply Chain Management Professionals (CSCMP)
- Consumer Brands Association
- Global Cold Chain Alliance (GCCA)

Multiple Research Streams: A distinguishing feature of the *Annual Third-Party Logistics Study* is the incorporation of multiple streams of research undertaken by the study team to validate and illuminate the findings in this report. The team solicits survey topic ideas throughout the year from key industry participants and through desk research conducted by the team and NTT DATA, which also helps to vet potential topics of interest. Survey topics and questions attempt to reflect key issues and trends facing both users and providers of logistics services.

Wide Coverage: The *Annual Third-Party Logistics Study* is presented and discussed in prominent supply chain industry venues, including the following:

- Presentations at influential industry conferences, such as the Council of Supply Chain Management Professionals (CSCMP) EDGE Conference and Exhibition, as well as annual events conducted by The Logistics Institute – Asia Pacific at the National University of Singapore; and executive education programs available through the Center for Supply Chain Research® at the Pennsylvania State University and Penn State Executive programs.
- Analyst briefings, which are typically conducted in the weeks following the release of the annual study in the fall.
- Magazine and journal articles in publications, such as *Supply Chain Management Review, Logistics Management, Inbound Logistics, Logistics Quarterly, Supply Chain Quarterly* and *Supply Chain Digest.*
- Webcasts conducted with media and publications, including Supply Chain Management Review, Logistics Management, SupplyChainBrain, Stifel Nicolaus and others.

Definitions: Survey recipients were asked to think of a "third-party logistics (3PL) provider" as one that provides or manages one or more logistics services for its customers. A "fourth-party logistics (4PL) provider" is one that may manage multiple logistics providers or orchestrate broader aspects of a customer's supply chain. To ensure confidentiality and objectivity, 3PL users were not asked to name any specific 3PLs they use. Correspondingly, the *Annual 3PL Study* does not generate any information that could lead to ratings or rankings of 3PL providers.

Components of the *2022 Third-Party Logistics Study*

Research and analysis for the Current State of the Market chapter sets out to:

- Understand what shippers outsource and what 3PLs offer.
- Identify trends in shipper expenditures for 3PL services, and to recognize key shipper and 3PL perspectives on the use and provision of logistics services.
- Determine how 3PLs add value to their customers' supply chains.
- Update researchers' knowledge of 3PL-shipper relationships and to learn how both types of organizations are using these relationships to improve and enhance their businesses and supply chains.
- Understand the benefits reported by shippers that are attributed to the use of 3PLs.
- Assess the importance of 3PL capabilities relating to people, process, technology, and execution/ implementation.
- Document what types of information technologies and systems are needed for 3PLs to successfully serve customers, and to assess the extent to which this success is being achieved.
- Examine why customers outsource or elect not to outsource to 3PLs.

The Special Topics section is crafted to take an introspective view of the future of the 3PL industry and shipper-3PL relationships. Topics are chosen based on what was learned from the study process and current trends in the industry. This year's sections include:

- Sustainability and ESG: Impacts on 3PL-Customer Relationships
- The Intelligent Supply Chain: The Role of Technology
- The Cold Chain: Planning and Moving Sensitive Loads

Continuing the Conversation provides a valuable update on still-relevant topics covered in previous versions of the report as needed. This year, researchers examined the continuing effects of COVID-19 on the supply chain.

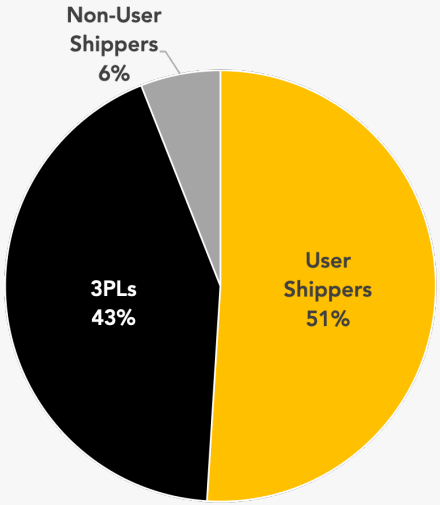
The Contemporary Issues section is crafted to take an introspective view of the future of the 3PL industry and shipper-3PL relationships. Topics this year included the need to rebalance supply chains, the risk of non-traditional models and keeping supply chains connected.

About the Respondents

Shippers

Figure 52 reveals the percentage of shipper respondents to the survey, including both users (51%) and non-users (6%) of 3PL services and the percentage of 3PLs (43%). The non-user responses are helpful because they provide valuable perspectives on why they do not currently use 3PLs and several other relevant topics. Shipper respondents are typically managers, directors, vice presidents and C-suite executives.

Figure 52: About the Respondents



Six industries reported by shippers accounted for almost 80% of the overall respondents, shown in **Figure 53**.

Figure 53: Respondents' Major Industries

Manufacturing	**25%**
Other	**15%**
Life Sciences, healthcare, and Pharmaceuticals	**12%**
Retail and Consumer Brands	**11%**
Food and Beverage Manufacturing or Distribution	**8%**
Automotive	**7%**
Aerospace and Defense (including Airlines)	**5%**
Federal, State and Local Government	**3%**
Hi-Tech and Consumer Electronics	**3%**
Construction and Heavy Machinery	**2%**
Financial Services, Banking, and Insurance	**2%**
Oil, Gar, Mining and Extraction	**1%**
Telecommunications, Media, and entertainment	**1%**
Utilities and Energy Providers	**1%**

Figure 54 includes shippers' anticipated total sales for 2021.

Figure 54: Shipper Respondents' Anticipated Sales

More than US$25 billion / €20 billion	**US$10 billion - less than US$25 billion** / €8 Billion - less th	**US$1 billion - less than US$10 billion** / €800 million - less than €8 billion	**US$500 million - less than US$1 billion** / €400 million - less than €800 million	**US$100 million - less than US$500 million** / €80 million - less than €400 million	**Less than US$100 million** / €80 million
23%	14%	12%	8%	18%	25%

3PLs: 3PL executives and managers responded to a similar, but separate version of the survey. 3PL respondents represent: 1) several global operating geographies; 2) an extensive list of industries served (actually quite similar to the shipper-respondent industries); and 3) a range of titles, from managers to presidents/CEOs. About 6% expected 2021 company revenues above U.S. $25 billion or more (approximately €20 billion), while 3% expected revenues between U.S. $10 billion and $25 billion (€8 billion to €20 billion). Approximately 8% of the 3PL firms expected revenues of U.S. $1 billion to $10 billion (approximately €800 million to €8 billion), while about 10% reported revenues of U.S. $500 million and $1 billion (approximately €400 million to €800). About 23% reported revenues of between U.S. $100 million and $500 million (approximately €80 million and €400 million), and 50% reported anticipated total sales of less than $100 million (about to €80 million).

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