



2026 Lineage Cold Chain Insights Survey



Introduction

The 2026 Lineage Cold Chain Insights Survey examines how food and beverage supply chain leaders across North America are navigating a complex and rapidly evolving operating environment. Ongoing policy shifts, sustained growth in refrigerated and frozen food demand, and accelerating adoption of data, automation, and artificial intelligence are reshaping how companies plan, operate, and partner across the cold chain.

Based on a survey of 1,000 decision-makers across the United States (500), Canada (250), and Mexico (250), the findings provide insight into how companies are redefining resilience, evaluating logistics partnerships, and prioritizing investments in data, AI, and operations.

Across the cold chain, leaders are no longer adapting to isolated disruptions. Instead, they are operating in an environment where volatility has become a persistent condition. Against this backdrop, strategic planning is being redefined by external pressures, evolving consumer demand, and operational transformation.

The findings in this report indicate that 2026 could cement a structural shift, as the industry recognizes that 2025's turbulence is now the operating norm for food supply chains.





Executive Summary: **The Cold Chain at an Inflection Point**

As pressures on cold storage networks intensify and external disruptions become more persistent, historical approaches built for stability may prove insufficient. Instead, there is a growing shift amongst food and beverage companies toward fundamentally rethinking how cold chains are designed.

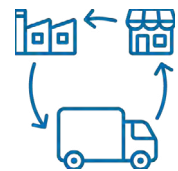
Responding to current market dynamics, those companies are prioritizing and strengthening resilience strategies, increasing investments in data and automation, and seeking closer alignment and collaboration with logistics partners to support more agile and reliable execution. In practice, this means embedding greater flexibility into network design, improving visibility across operations, and working more closely with partners to coordinate decisions and respond to changing conditions in real time.

Together, the data reveals three core dynamics that are shaping how the cold chain operates.

#1

Food Chains are Being Reshaped by Persistent External Pressure

Tariffs, regulation, and political shifts are now being treated as constants in supply chain planning, rather than as episodic disruptions.



56%

of respondents rank these external factors among their top three supply chain decision drivers for 2026.



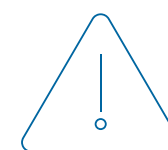
73%

of respondents expect tariffs to negatively impact their company's financial performance this year.



92%

of respondents report making strategic adjustments in response to political shifts.



42%

of respondents describe those changes as significant.

In effect, companies are incorporating external risk into planning cycles and adjusting strategies in real time as conditions evolve, marking a shift toward continuous adaptation. A [McKinsey study](#) found that as disruptions remain the norm, companies have accelerated projects to improve supply chain visibility.

Source: [McKinsey, 2024](#)



#2

AI is Delivering Measurable Operational Advantages

Investment in data and artificial intelligence is increasingly tied to operational performance and is already influencing business outcomes. In fact, 60% of leaders cited data and AI were among the top factors positively impacting their supply chain over the past year, signaling its potential value in complementing the supply chain's existing capabilities. Nearly one-quarter (24%) say returns on AI have already surpassed their company's investments, while 62% report results are meeting or approaching targets.

That momentum is reflected in [PwC research](#), which found that 57% of operations and supply chain leaders already integrated AI into selected functions or throughout their organizations, and 53% are using it to anticipate and mitigate supply chain disruptions.

Taken together, these findings point to a clear takeaway for supply chain leaders: to remain competitive, **AI is no longer experimental but something that should complement core operational processes.**

Source: [PwC, 2025](#)

60% cited data and AI among the top factors positively impacting their supply chain over the past year

24% say returns on AI have already surpassed their company's investments

37% rank productivity and efficiency-driven cost savings as a top AI use case





72%

of food & beverage companies say their logistics providers did not meet all their needs in 2025.

#3

3PL Expectations are Rising, Driving a New Era of Accountability and Opportunity

Logistics providers are facing heightened expectations as supply chain complexity grows. Seventy-two percent of food and beverage companies report that their third-party storage and logistics providers did not meet all their needs in 2025, and 47% believe providers lack up-to-date technology.

Moreover, growth in refrigerated and frozen food categories remains widespread across North America, with 72% of leaders reporting increased demand for their products over the past year. Broader industry knowledge reinforces the popularity of frozen food amongst consumers; according to the [American Frozen Food Institute](#), 76% of consumers now combine fresh and frozen foods within the same meal, while 40% report using frozen foods “frequently” – a measurement that is up from pre-pandemic levels.

With signs of consumer demand growing, improving execution remains an opportunity for cold chain providers. Sixty-six percent of companies surveyed by Lineage report that their supply chains only sometimes keep pace or struggle to keep pace with demand. Companies are seeking partners that can deliver not only capacity, but also flexibility, real-time visibility, and integrated data and intelligence capabilities. Capabilities in these areas are increasingly influencing provider selection, with [Extensiv](#) data showing that 74% of shippers would be at least somewhat likely to switch 3PL providers based on AI capabilities. This shift is redefining how performance is evaluated across the cold chain.

Source: [AFFI, 2026](#), [Extensiv, 2025](#)

THE DATA IN DETAIL:
**Diving Deeper on
Lineage's Cold Chain
Insights Survey**



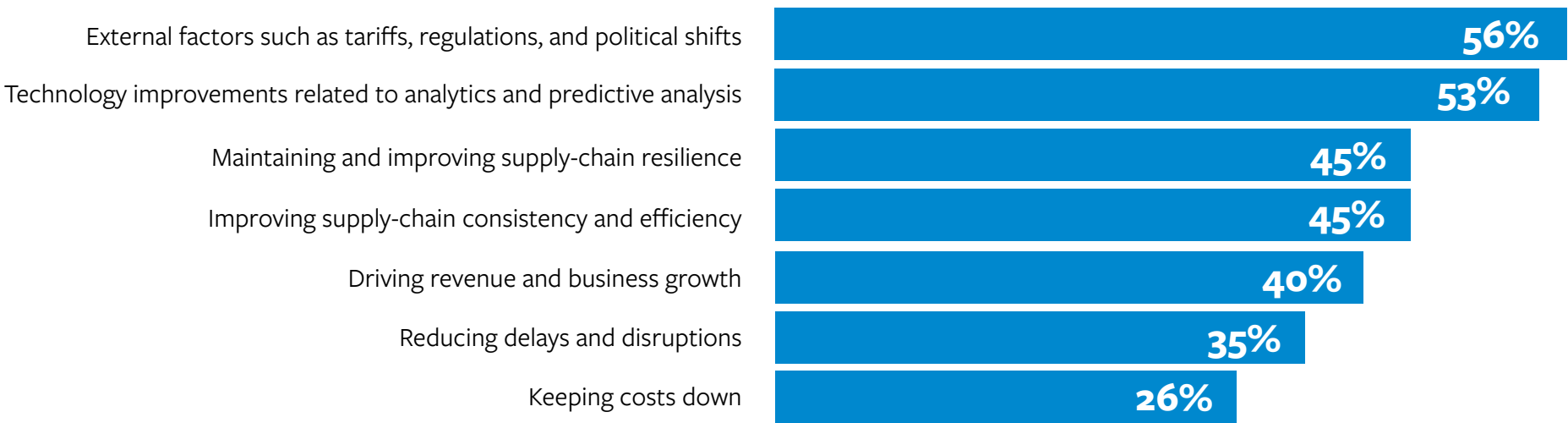
SECTION 1

Resilience is dictated by the larger environment – and here to stay as a priority

External Policy Shifts are the Dominant Force Driving Decision-Making and Plans for 2026

Tariffs, regulation, and political shifts rank as the most influential factors shaping supply chain decisions for 2026, with 56% of leaders placing them among their top three drivers--higher than technology improvements.

Top Factors Driving Supply Chain Decisions in 2026



IMPLICATIONS

External instability, once viewed as a secondary consideration, is now foundational to supply chain planning conversations. More than one-third (36%) of leaders identified these factors as a leading obstacle in 2025, and 57% reported tariff costs were higher than expected.

With 73% anticipating continued financial impact from tariffs and 92% already adjusting their strategy in response, it's clear that companies are embedding policy risk into planning frameworks. This reflects a fundamental, structural shift in how supply chains are designed and managed, moving beyond reactive adjustments and the idea that external risks are merely brief hurdles.



Case Study
Navigating Tariff Volatility Through Integrated Import Strategy

As tariff policies continue to evolve, importers are facing increased complexity in managing cost exposure, compliance, and timing. Lineage's team supports customers with customs brokerage, regulatory guidance, and coordinated import strategies to help them respond quickly and avoid unnecessary risk.

For example, a seafood importer evaluated whether paying a 10% duty was more cost-effective than facing delays, storage fees, and spoilage risk. Lineage provided guidance to help the customer make a more informed decision based on total operational impact.

In another case, for one manufacturer importer with significant tariff exposure, Lineage filed protests across multiple entries, tracked liquidation timelines, and aligned with CBP processes to recover duties and prevent missed refund opportunities.

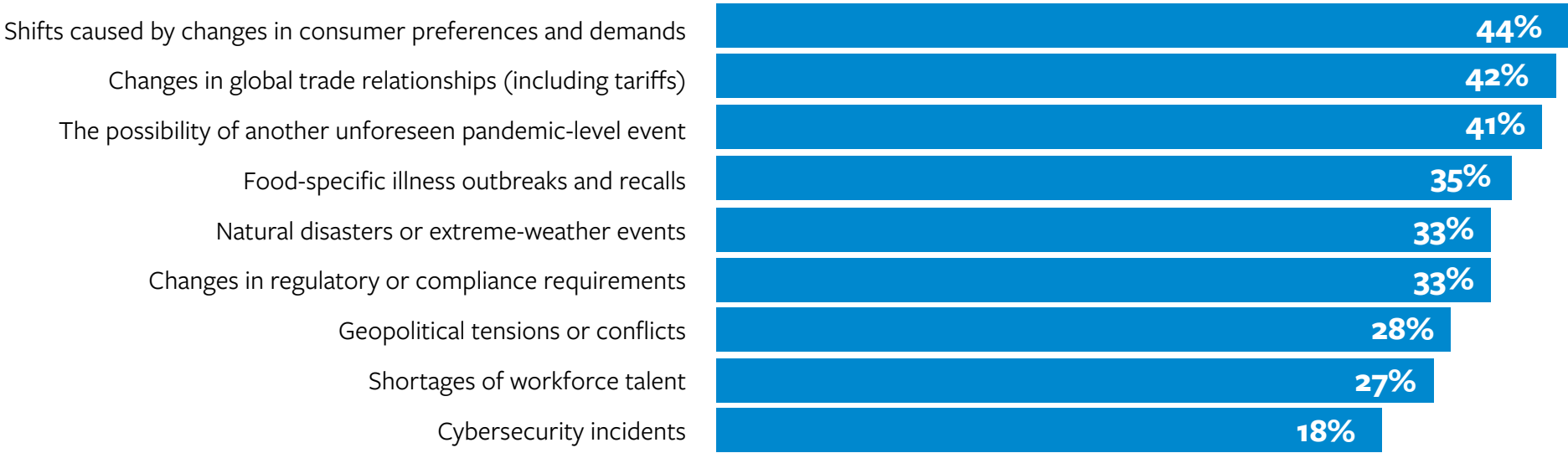
Together, these examples demonstrate how tariff volatility requires both proactive planning and rapid execution. By combining regulatory expertise with integrated coordination, Lineage enables customers to pivot quickly, manage exposure, and keep product moving.



Leaders are Planning Across a Broader Risk Landscape

Supply chain leaders are expanding how they define risk and resilience, navigating a wider range of risks beyond tariffs and trade policy.

Top Concerns Shaping Supply Chain Planning



IMPLICATIONS

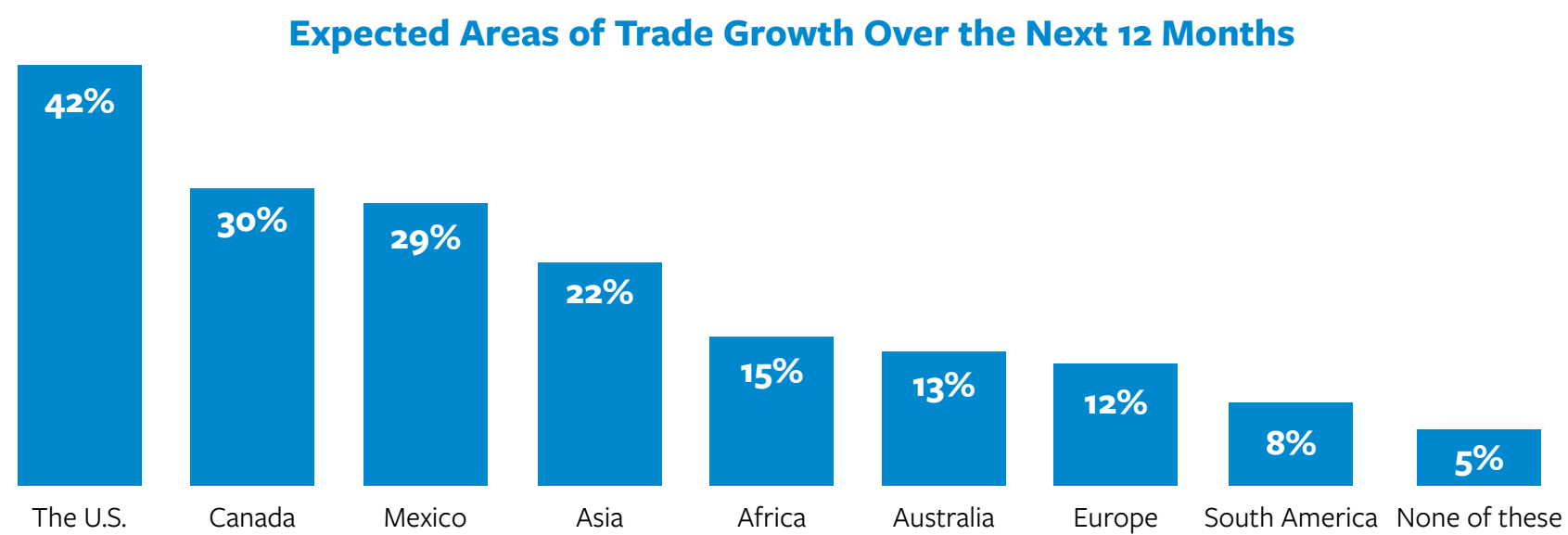
The range of concerns across consumer behavior, trade policy, public health, climate, and workforce issues points to a more complex operating environment, signaling an industry operating under sustained complexity rather than isolated disruption.

Notably, changes in consumer preferences (44%) and trade instability (42%) rank similarly, reinforcing that demand fluctuations and geopolitical exposure are both important considerations when planning.

While no single threat dominates, the cumulative risk environment is reshaping how companies think about their business strategies for the year ahead. Resilience is increasingly defined by readiness for a wide range of scenarios, rather than response strategies for one-off or temporary disruptions. Organizations should consider implementing flexible, scalable solutions to prominent and emerging industry trends that can potentially enhance their ability to do business.

Domestic Trade Realignment is Reshaping Network Strategy

A majority of companies expect trade growth within their own country over the next 12 months, including 67% in the U.S., 62% in Mexico, and 56% in Canada, signaling an increased emphasis on in-country trade even as global trade flows continue to evolve.



IMPLICATIONS

These expectations reflect both policy-driven considerations like tariff exposure and shifting consumer preferences, with 32% of leaders noting increased prioritization of domestic products. While 31% plan reactive responses to tariff changes and 28% are proactively preparing for potential impacts, both approaches point toward greater regional and in-country concentration of trade.

At the same time, cross-border trade remains foundational to the North American food system. Trade between the U.S., Canada, and Mexico continues to account for a significant share of overall food movement, supported by established agreements like USMCA and long-standing transportation networks.

Rather than replacing cross-border flows, companies are adapting how they operate within this interconnected system. Ongoing policy uncertainty is driving a stronger emphasis on contingency planning and geographic flexibility, with companies evaluating alternative routes, diversifying transportation options, and identifying backup facilities to reduce exposure to delays or disruptions.

This is particularly critical in temperature-controlled supply chains, where timing may directly impact product quality. As a result, companies are increasingly positioning inventory and capacity closer to ports, customers, and critical distribution points, while still maintaining the ability to move product efficiently across borders.

Shifting domestic trade patterns are increasing the strategic importance of distributed cold storage networks with strong regional depth that can enable companies to respond more effectively to both structural and near-term changes in trade flows.



Case Study

Data-Driven Network Optimization

When a food manufacturer sought to reduce transportation costs and improve service levels, Lineage applied advanced analytics to evaluate and redesign the customer's distribution network.

Lineage's Global Integrated Solutions and Data Science teams conducted a comprehensive analysis of transportation lanes, warehouse locations, and demand patterns to identify opportunities for improvement. By optimizing how and where inventory was positioned across the network, the teams were able to reduce unnecessary movement while improving alignment with customer demand.

The redesigned network enabled more efficient transportation planning and better utilization of storage capacity, resulting in more than \$2 million in annual savings while improving inventory flow and overall supply chain efficiency.

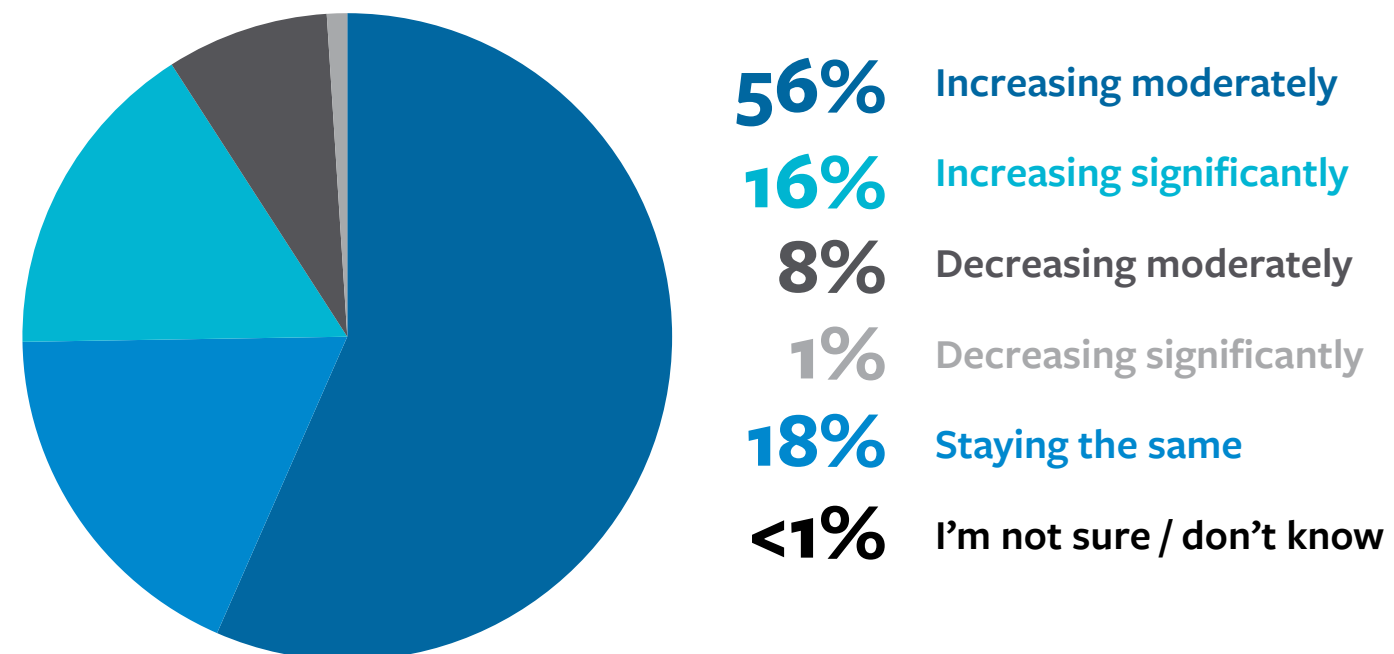
SECTION 2

Resilience is being redefined by the ability to quickly pivot and accelerate

Sustained Consumer Demand Growth is Reshaping Cold Chain Priorities

Demand for refrigerated and frozen foods continues to grow across North America, with 72% reporting increased demand over the past year.

Change in Consumer Demand for Refrigerated and Frozen Foods



IMPLICATIONS

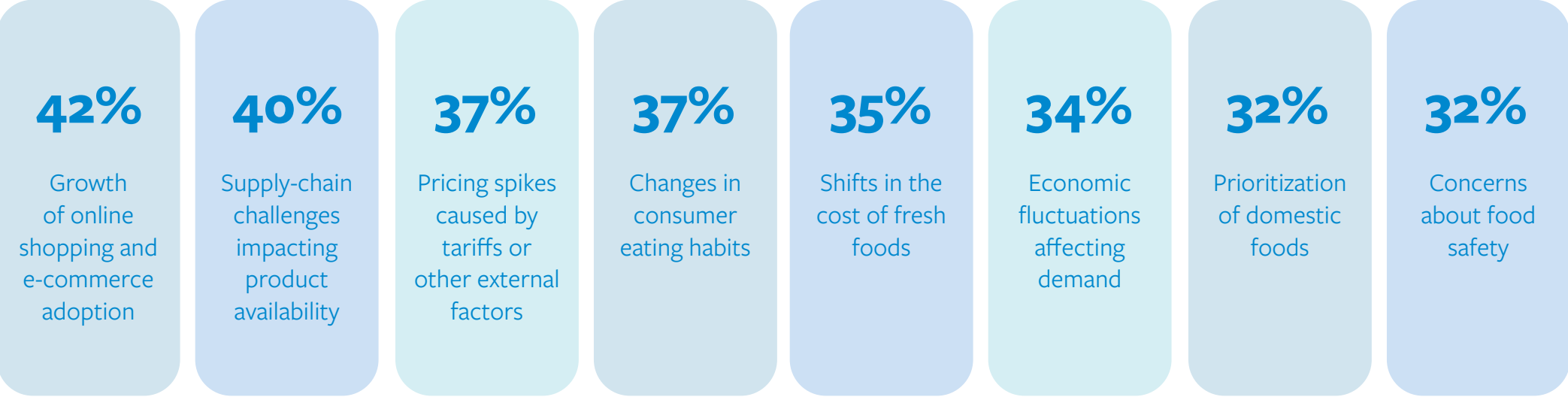
Demand growth is widespread, but it is also becoming more complex to manage. Forty-two percent attribute demand changes to the growth of e-commerce, while 43% report increased demand for private-label purchases, both of which introduce faster purchasing cycles and greater variability.

Complicating this growth, 66% say their supply chain only sometimes meets or struggles to meet demand speed, highlighting a growing disconnect between volume and execution. As rising volume combines with greater unpredictability, existing operating models are being tested, exposing execution gaps across the cold chain and reinforcing the need for capacity that can scale and more predictive approaches to planning.

Consumer Behavior Shifts are Increasing Demand Fluctuations

Beyond e-commerce, there are many factors influencing how consumers fill their grocery baskets, ranging from costs and economic factors to changes in habits.

Key Drivers of Changing Consumer Demand for Refrigerated and Frozen Foods



IMPLICATIONS

For logistics providers, demand growth doesn't just mean increasing volume, as it comes with increased complexity, as well. Consumers' increased use of e-commerce accelerates fulfillment expectations and shortens replenishment cycles, while increased private-label adoption and consumers' cost sensitivity introduce additional variability into purchasing patterns.

These dynamics contribute to the 66% of leaders who report only sometimes meeting or struggling to meet demand speed, highlighting how consumer behavior is directly influencing operational performance. As a result, companies should consider placing greater emphasis on integrating consumer insights and behavioral analytics into forecasting and inventory planning to better manage variability without sacrificing reliability.



Case Study

Enabling Rapid Pivots to Meet Demand in a Race Against Tariffs

When a Canadian frozen food manufacturer faced [impending tariffs on cross-border imports](#), the company had a narrow window to move product into the U.S. before costs increased. With limited time to act, the situation required an immediate shift in how inventory was positioned and moved.

Lineage leveraged its network and import-export expertise to execute a rapid pivot, aligning transportation, warehousing, and cross-border logistics under tight deadlines. This included identifying cold storage capacity near the U.S.-Canada border and coordinating freight movement to accelerate product transfer.

Lineage also provided customs and regulatory support, including bonded storage capabilities that allowed product to be held and released strategically as conditions evolved. Through Lineage Link®, the customer maintained visibility into inventory and shipments, enabling faster coordination across teams.

The result was a fast, coordinated response that allowed the customer to avoid tariff-related costs and keep product moving without disruption.





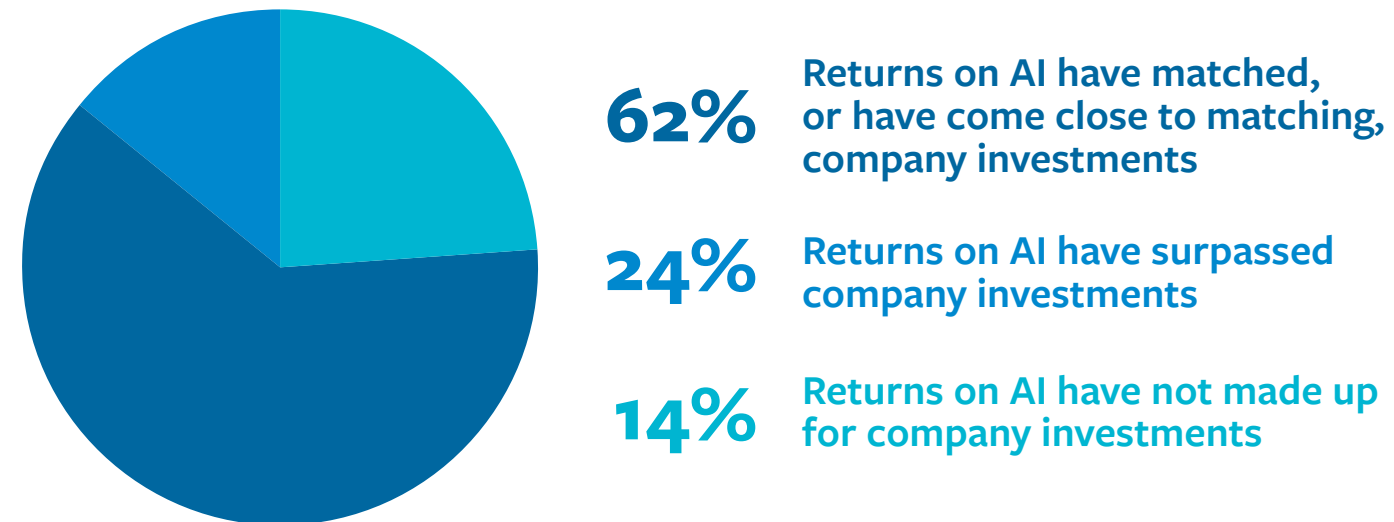
SECTION 3

AI is increasingly viewed as table stakes

AI is Delivering Measurable Operational Advantage

Sixty percent of leaders rank investments in data and AI among the top factors benefiting their supply chain operations over the past year.

Return on Investment in AI Technologies



IMPLICATIONS

The data indicates that AI is already delivering tangible results across supply chain operations. Nearly one-quarter (24%) report AI returns surpassing the company's investment, and 62% say returns are meeting or nearing that benchmark, indicating broad validation of these investments.

AI is most frequently cited as improving planning coordination (45%), productivity and efficiency (37%), and spoilage reduction (34%), directly linking technology adoption to operational outcomes.

Companies are increasingly investing in AI and other technologies to strengthen supply-chain resilience (37%), underscoring the growing role of digital capabilities in optimizing and managing operational complexity. These findings suggest that AI has moved from experimentation to performance multiplier. Companies should consider accelerating integration of predictive tools into daily operations to strengthen reliability and competitiveness, and to set themselves up for short- and long-term returns on AI.



Case Study

Applying AI to Improve Inventory Precision and Warehouse Efficiency

In the complex and often fragmented world of cold chain logistics, variability in inventory flow and limited visibility across points in the supply chain can make coordination and planning difficult. To address this, [Lineage's team developed Sybil](#), a machine learning algorithm designed to bring greater predictability and precision to warehouse operations.

Using a combination of historical and real-time data, Sybil predicts pallet stay durations. This AI technology has transformed what was once a manual, assumption-driven process into a data-informed view of how inventory moves through facilities. This foresight allows warehouse teams to place pallets more efficiently, improving coordination.

To operationalize these insights, Sybil is integrated directly with Lineage's Warehouse Management System (WMS), creating a more connected and responsive system. This integration enables real-time alignment between predictive insights and execution, allowing teams to make faster, more informed decisions as conditions change. Sybil is just one of several algorithms used in Lineage's specialized warehouse execution system, LinOS, to boost operational efficiency. It employs unique, patented algorithms to optimize task allocation among team members and strategically prioritize tasks within our warehouses. Originally designed for automated facilities, Lineage began piloting LinOS in select conventional warehouses in 2025. Early results from these pilots have shown positive results and potential for extensive deployment of LinOS across our warehouse network.

By turning uncertainty into a more predictable and manageable flow of inventory, Sybil helps improve productivity, streamline operations, and support more consistent performance across the cold chain.



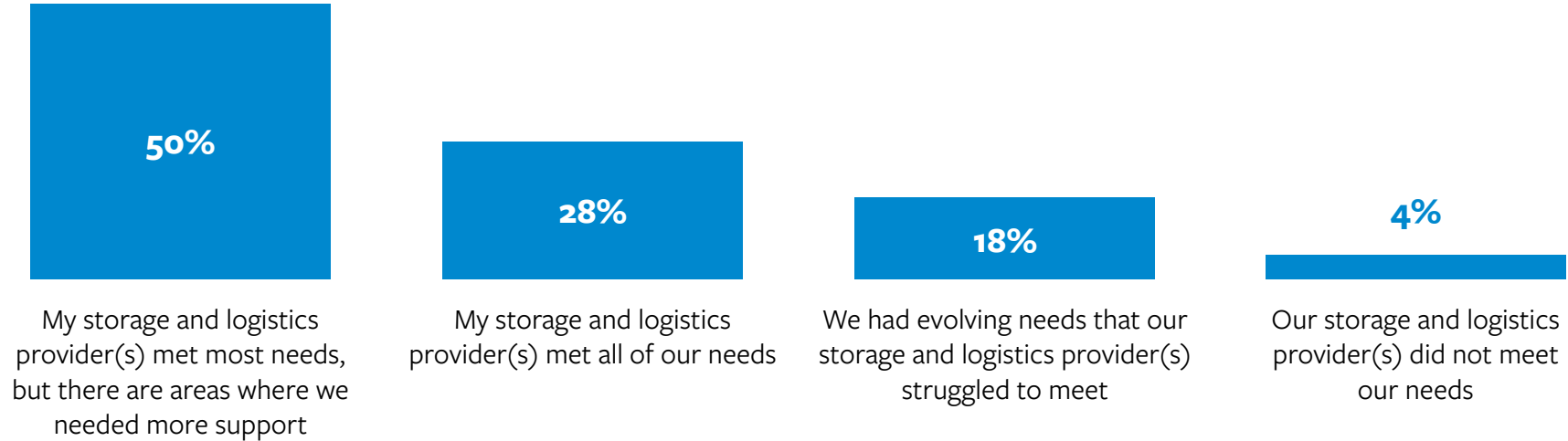
SECTION 4

Customers want more from their 3PL partners

Execution Gaps Persist as 3PL Expectations Rise

Seventy-two percent of companies report that their third-party storage and logistics providers did not meet all their needs in 2025.

How Well 3PL Providers Met Customer Needs



IMPLICATIONS

The gap between expectations and provider performance is becoming more pronounced as supply chains grow more complex. Nearly half of leaders (47%) believe providers are least prepared when it comes to maintaining up-to-date technology, while 45% cite deficiencies in real-time market responsiveness.

At the same time, expectations are expanding beyond core operational performance. These gaps have tangible consequences, as companies whose providers met all needs were more than twice as likely to report effectively meeting demand speed. As a result, logistics partnerships are increasingly being evaluated not only on capacity, but on their ability to deliver intelligence, integration, and coordinated execution to keep up with both the speed of demand and ever-shifting market dynamics. More than ever, performance differentiation is tied to technology enablement.

According to the data, 3PL providers will need to strengthen their partnership models to provide real-time visibility, flexible capacity, and coordinated, data-enabled execution in order to meet customers' needs and remain competitive.



Case Study Seasonal Surge Management in the Cold Chain

When a frozen produce partner [faced a record harvest](#), the seasonal surge created immediate pressure on storage capacity, transportation planning, and inventory flow, with limited room for delay given the perishable nature of the product.

Lineage leveraged its distributed network to absorb the volume, activating 15 facilities to store more than 100 million pounds of product. Coordinated transportation planning and distributed storage capacity helped maintain temperature integrity and minimized disruption during peak season.

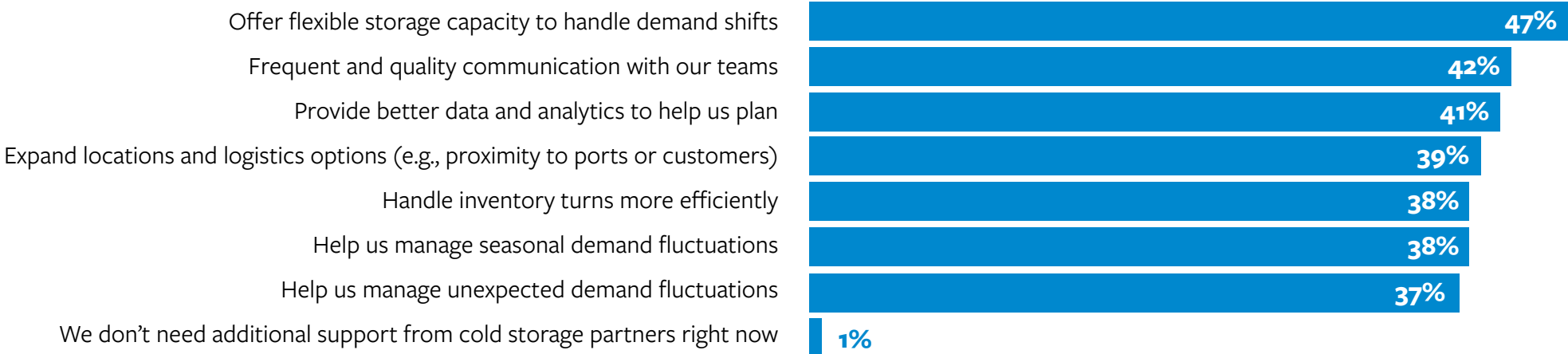
The result was a seamless response to a highly variable demand event, maintaining product quality, reducing operational strain, and enabling continuity across the supply chain during a critical period.



Flexibility and Data Access Define the Modern 3PL Value Proposition

When asked how cold storage providers can best support changing demand, 47% of leaders cite flexible storage capacity and 41% cite better data and analytics for planning.

How Companies Want Cold Storage Partners to Support Demand Shifts



IMPLICATIONS

Demand fluctuations are shifting customer expectations from static capacity agreements with their 3PL provider to more dynamic and responsive models. Leaders cite managing seasonal demand fluctuations (38%) and unexpected demand swings (37%) as ongoing challenges, reinforcing the need for dynamic capacity and responsive planning. At the same time, a desire for frequent communication (42%) and expanded logistics options (39%) further reinforces the need for integrated partnership models.

These expectations extend beyond physical storage to include data, insight, and strategic alignment, with providers increasingly differentiated by their ability to combine flexibility with digital integration and network scale.



Case Study

Using Data to Bring Visibility and Control to the Cold Chain

In complex cold chains, fragmented data across warehousing, transportation, and inventory systems can limit visibility and make it difficult to track product movement in real time. Without a unified view, companies often rely on manual processes and delayed reporting.

To address this, [Lineage developed Lineage Link®](#), a platform that centralizes data across facilities, shipments, and inventory systems to provide a single, real-time view of operations. By integrating inventory data, order management, and shipment tracking, Lineage Link enables customers to monitor product flow and make more informed decisions as conditions change.

For one global food manufacturer, this visibility extended across multiple facilities, allowing teams to track inventory, manage orders, and improve coordination. With consistent, real-time data, the customer reduced manual reporting and responded more quickly to changes.

By turning fragmented data into a connected system, Lineage Link helps customers move from reactive decision-making to more proactive control over their supply chains.





The future of
the cold chain
will be shaped by
**connected,
intelligent,
and flexible
operations.**

Conclusion

The 2026 Lineage Cold Chain Insights Survey reflects an industry in active transition that is adjusting to sustained complexity. Across the cold chain, companies are no longer responding to isolated disruptions, but operating in an environment where turbulent policy shifts, rising demand, and evolving consumer behavior are occurring in tandem with investments in AI, automation, and operational improvements designed to strengthen resilience and help supply chains keep pace with demand.

Resilience is increasingly defined by responsiveness – the ability to integrate data, scale operations, and adapt to changing conditions in real time, rather than more traditional conventions like capacity or cost control. As food supply chains continue to evolve, performance will depend on the ability to combine intelligence, network scale, and execution discipline.

Taken together, these findings suggest the cold chain is entering a new operational era, where sustained disruption, demand variability, and external pressure are reshaping how supply chains are designed and operated. As uncertainty persists, success will depend less on reacting to change or merely weathering it, and more on building systems that are designed to flex with it.

Traditional, capacity-driven operating models are giving way to more connected, intelligence-driven networks built around real-time visibility, predictive planning, and operational flexibility. As these pressures become more structural than temporary, companies that combine intelligence, network scale, and execution discipline will increasingly define reliability and competitive performance in the next era of the cold chain.

Methodology

The Lineage Cold Chain Insights Survey was conducted by Wakefield Research among 1,000 cold supply chain decision makers within the food industry, with 500 from the U.S., 250 from Canada and 250 from Mexico. Respondents were mid-management level or higher from companies with a minimum revenue of \$250,000 USD equivalency and at least 10 employees. Qualifications included utilizing a logistics or cold chain service company and overseeing food products at their company. Data collection via email invitation and an online survey occurred between October 17 and November 7, 2025, preceding recent global events associated with 2026 increased fuel costs. Unless otherwise cited, all data in this report comes from the Lineage Cold Chain Insights Survey.



THE DIFFERENCE IN DEGREES

