SPECIAL ISSUE
LOGISTICS 2017 PLANNER

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INSIGHT

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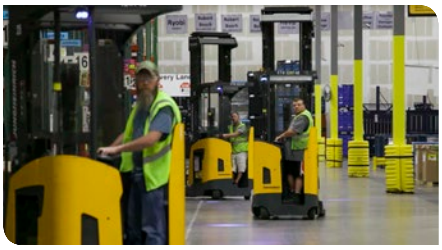

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INFO

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SPECIAL SUPPLEMENT

2017 LOGISTICS PLANNER

The 2017 Logistics Planner provides detailed information on the segment leaders that stand ready to help you meet your transportation and logistics challenges.

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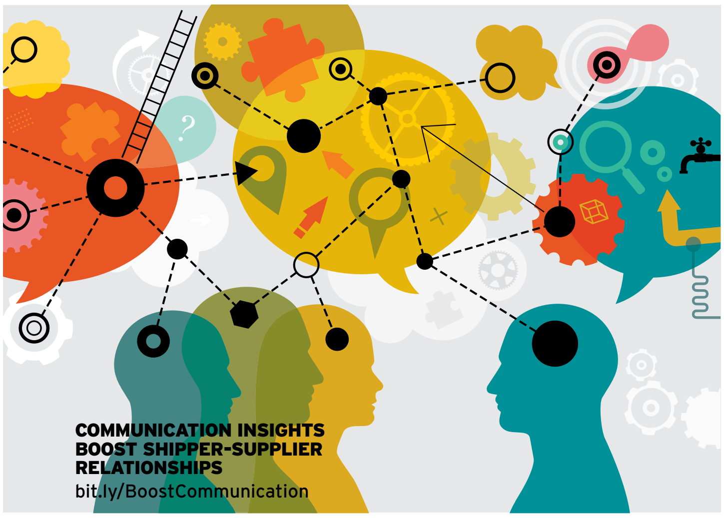

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ONLINE EXCLUSIVES

How to Beat Amazon at the Retail And Supply Chain Game in 2017 bit.ly/2017SCGame

Nick McLean, CEO, OrderDynamics

With Amazon eating everyone's lunch, retailers that don't begin making adjustments and investments in their omni-channel strategies in 2017 will feel serious repercussions by 2020. Here's how to get started.

Communication Insights Boost Shipper-Supplier Relationships bit.ly/BoostCommunication

Preston Charles, Consultant, Worldwide Advancement Consulting

Shippers who acknowledge they have the power to enable their own supplier base to satisfy their needs, as well as their customers', are on the right track. Follow these tips to improve supply chain efficency by effectively communicating with your suppliers.

Supercharging Your Supply Chain And Logistics Career bit.ly/SCLogisticsCareer

Tisha Danehl, Vice President, Ajilon Professional Staffing

Take your logistics and supply chain career to the next level by understanding how your skills can impact an organization, networking with other industry professionals, and continuing to develop critical skills. Use this advice to move your career forward.

3PL RESOURCES

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Choose the services and capabilities you need from a provider and the Decision Support Tool will find matching companies from our Top 100 3PL database – and more than 100 other leading 3PLs.

3PL Request for Proposal bit.ly/IL3PLRFP

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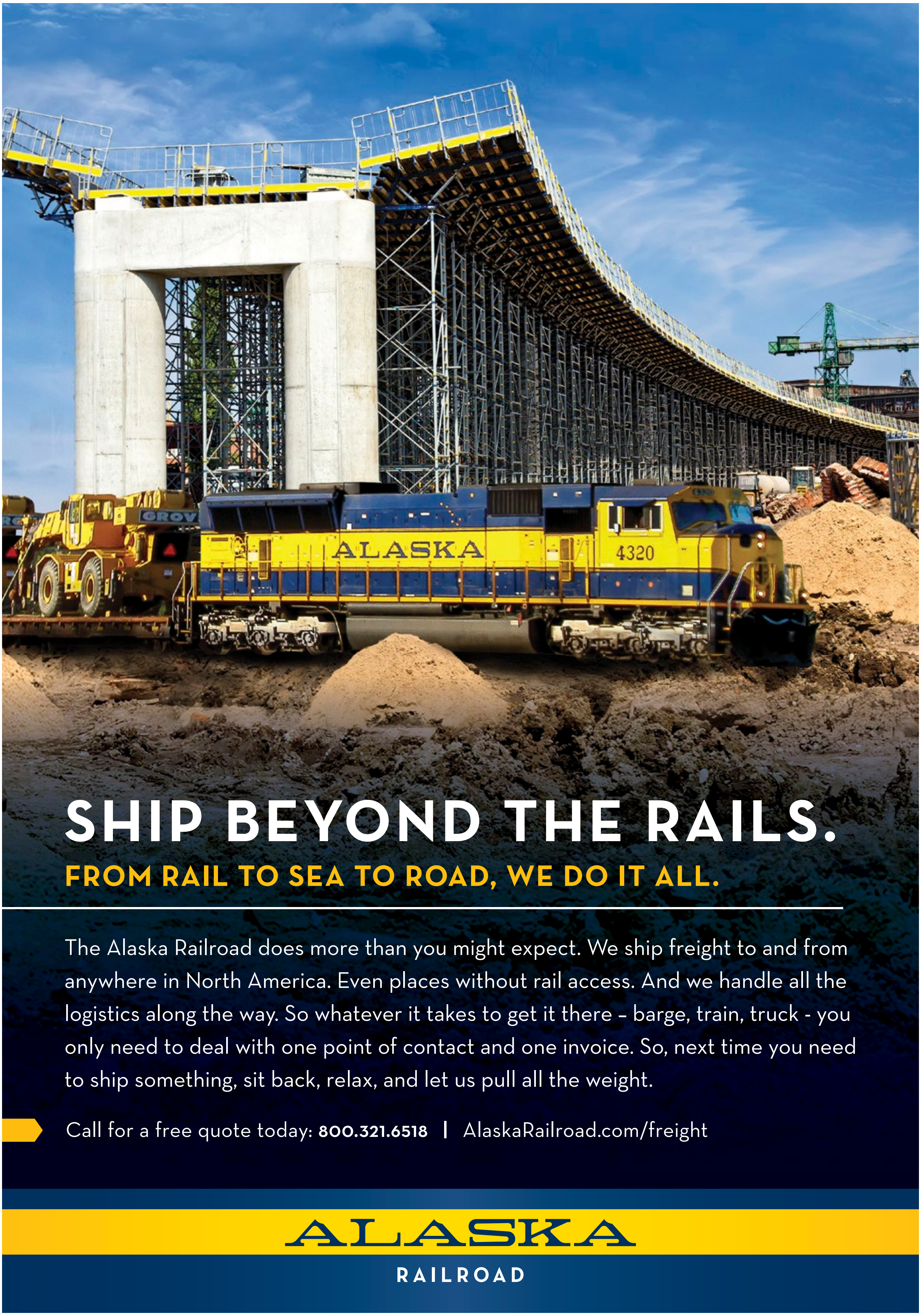

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CHECKINGIN

by Keith Biondo | **Publisher**

Wild Ride?

When the *IL* team came up with the original issue theme for the 2017 Logistics Planner–The Upside of Down–we were anticipating yet another long term of challenging economic stagnation. The theme was that our mantra of demand-driven or inbound logistics practices would help enterprise managers and owners squeeze every last ounce of value out of company operations to position them in tight economic sectors. They could still improve logistics practices to achieve an upside.

And then something happened in the political realm that turned our issue theme, and the rest of the world, upside down.

Will the coming political change reverse the slow economic growth many had anticipated for the next four years? Many think so. The International Monetary Fund (IMF) recently raised its forecast for U.S. economic growth, citing President Trump's policies.

The IMF projects growth at 2.3 percent for 2017 and 2.5 percent for 2018. U.S. growth for 2009-2016 averaged only 1.5 percent, the poorest performance in modern history.

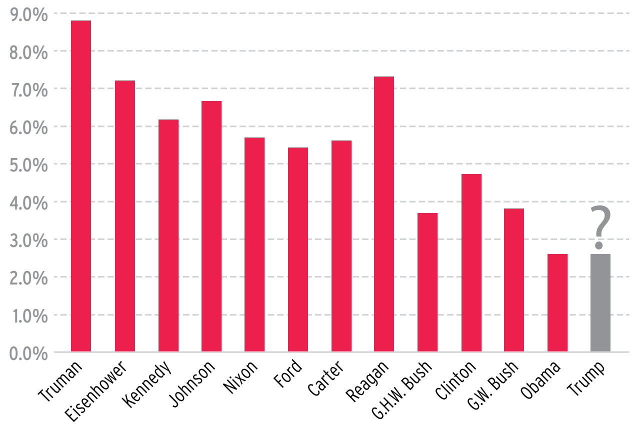
The expansion and reshoring of manufacturing, and projected job and spending growth, will kick domestic consumer spending into high gear. Walmart, Kroger, Ford, GM, Apple, SAP, Foxconn, Softbank, Dow, Bayer, IBM, and more all made job promises. And Amazon.com recently promised to create 100,000 full-time jobs in the United States over the next 18 months. Many more companies too numerous to list say they will increase hiring and investment in the United States. With jobs going up and taxes coming down, businesses and consumers will be poised to spend.

Housing starts are already up and proposed infrastructure spending will generate greater need for transport and logistics services. Will capacity be tighter? Likely. Foreign direct investment in the United States will increase dramatically, according to news reports.

So while four or eight more years of slow growth was expected, the opposite is likely. How will that impact logistics and supply chain networks? Are your logistics operations positioned to scale up efficiently?

Real GDP Growth by President, Post-WWII

Percentages reflect the best year of growth during each president's term.



Source: U.S. Department of Commerce's Bureau of Economic Analysis
Figures compiled by Jeffrey H. Anderson, Hudson Institute

But higher interest rates and a trade war could wipe away any business gains resulting from tax and regulation cuts, the IMF cautions. Today's supply chain networks were carefully crafted over the past decade, as were vendor and supplier relationships, import strategies, technology links, and carrier, forwarder, and 3PL contracts. Is all this supply chain infrastructure at risk given the uncertainty in the global trade arena?

More importantly, if this man-caused disaster happens, can your supply chain network live through it or will your enterprise operations skid to a halt?

So which will it be for your business–a fast scale up or a business free-fall? You might say that, given Trumpism, many business leaders are riding a rollercoaster–fast and upside down–with no sure end in sight, their supply chains bumping around in the last car.

World-class logistics practices can't answer those questions. But one thing is for certain: demand-driven logistics delivers agility and flexibility to help you navigate the twists and turns of any future ups and/or downs. ■

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CHECKINGIN

Felecia Stratton

by Felecia Stratton | **Editor**

Hold On Tight!

Just like in logistics, our editorial and design team meets many months in advance to forecast upcoming content and issue themes. So, when we met eight months ago to develop the Logistics Planner issue theme, we thought we had a good understanding of what was in store for 2017.

After spirited discussion, we decided on this theme: The Upside of Down. What did we mean? That when economic and other indicators are down, demand-driven logistics can help extract value from your company operations and use supply chain change to drive enterprise efficiencies.

Then, like the rollercoaster on our cover, a quick change in direction resulted in our forecast fail.

Given the presidential election results and the actions of the new administration, many readers are now planning to use best transportation and logistics practices to manage expansion as a result of expected rapid growth in market opportunities.

So, just as any good practitioner of inbound logistics would do, we matched our content supply to reader demand, and hope the articles in this issue will help you align your company's demand signals to supply more closely, helping you stay right side up if your supply chain turns upside down. As the rollercoaster trends up quickly, best logistics practices give your enterprise the vitality to scale up rapidly without disrupting operations and continue to serve customers while expanding markets and adding new ones.

Readers tell us that they look for this issue, and value and use the Logistics Planner profiles all year long. Creating this resource wouldn't be possible without our legions of contributors and sponsors, in addition to an amazing editorial, design, and production staff—Lauren Muskett, Katrina Arabe, Sean Doyle, Jeof Vita, Amy Palmisano, and Sonia Casiano—who all get the job done even on our own rollercoaster of a production schedule.

We have been producing the Logistics Planner for more than two decades. This year, possibly tracking the rapid change in the U.S. economy, I was pleased to see many new companies participating because it offers you a broader range of services and solutions to consider. And, many veteran Planner participants use their profile to report how they have expanded and invested to help you adapt to the rapid pace of change driven by trends such as e-commerce and supply chain impatience.

Having these great logistics and supply chain partners at your side can be the difference between riding the rollercoaster we're all on with your teeth gritted and your hands tightly gripping the safety bar, or anticipating the next thrill and enjoying the ride. ■

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READER EMAIL

Choosing a Warehouse Location
bit.ly/morethanjustprice
Contributor Patrick O'Healy discusses a metric I'm not familiar with: container velocity breakeven point (BEP). Can you explain this? How was it determined the BEP was 455 containers monthly?

Joshua Dorfman, Vice President,
Marketing and Sales,
American Wire Group

O'Healy replies: *I used the term "container velocity breakeven point" as a description of the concept. It is not a universally adopted term, but intended to be descriptive. This is predicated upon being in a submarket where there is no variance in labor rates, utilities, or other governmental agency incentives as we largely see in the LA Basin. The premise is that if you combine rent and drayage costs, there is an intersecting line where the combined costs are optimum. The optimum location is where the combination of drayage and rent is the lowest. 455 containers was a hypothetical example.*

While the numbers in the original article have changed, the basic premise has not.

Patrick G. O'Healy, SIOR,
O'Healy Commercial
Real Estate Services

SOUNDBITE

"Supply chain is the next frontier in sustainability. Managing the environmental impact of your own operations is expected behavior. But the greatest opportunities for reductions are typically outside of direct operational control, in the supply chain."

– TOM DELAY, Chief Executive, Carbon Trust, which partners with organizations to promote sustainability, upon announcing that suppliers worldwide achieved CO_2 reductions equivalent to about 478 million tons in 2016.

HOT TOPICS | *IL* articles getting the most impressions on LinkedIn: 3PLs & Carriers: At Your Service: bit.ly/3PLsAtYourService • Meet Me in St. Louis: bit.ly/MeetMeinStLouis • How Driverless Trucks Will Change Supply Chain Strategy: bit.ly/driverlesstruckschangeSC • Panama Canal Expansion: Locks and Load: bit.ly/locksnload • 10 Tips: Protecting the Food Supply Chain: bit.ly/protectfoodSC

HASH IT OUT

Frank Mullens @FrankMullens
Double Chicken Avocado Salad Combo at El Pollo Loco with *Inbound Logistics*' Protecting the Food Supply Chain ~ 10 tips

EXCHANGE

How Driverless Trucks Will Change Supply Chain Strategy
bit.ly/driverlesstruckschangeSC
The driverless truck phenomenon is closer to reality than you think, and that means it's time to start strategizing how this could impact supply chains.

Paul Kelly
Driverless vehicles are coming and will certainly change the way we handle our supply chains. However, it will be some time before they become mainstream enough to make that difference. Regulations and government are two of the obstacles to overcome, as well as the technology to safely operate on the open roads. The recent test run in the UK is a sure sign of things to come, but it's still a few years away from the norm.

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Good Question...

READERS WEIGH IN

What's your supply chain resolution for 2017?

We will continue to promote a responsible and ethical supply chain, working with all of our suppliers to ensure safe working and living conditions and that sourcing commitments are met while raising the standards of the treatment of workers.

Jose Varela
Vice President
3M Personal Safety Division

Not to trust all statistics or polls. Supply chains are becoming too unique to each company, so like we learned during the election, you can't trust all the data when it has been skewed or doesn't apply to your specific problem.

J.P. Wiggins
Vice President of Logistics, 3Gtms

I am targeting wasteful spending within my operations to identify where I can save some money. Cost per pound is a great metric to use to get that transportation cost below 35 percent of warehousing and transportation budgets. Let's rock it in 2017!

Jessica Hillyer
National Account Executive
LeSaint Logistics

Increasing predictability. As the supply chain continues to evolve and change to meet changing consumer preferences, demand and a focus on areas like supply chain optimization are even more important today to embrace technology to enable accurate and timely forecasting.

Reinhard Steup
Senior Manager
HAVI Supply Chain Management

"We need to double down on technology. Global supply chains are a chess match, and everyone still seems to want to play checkers with Excel spreadsheets, emails, and phone calls. I'm going to use technology to become Bobby Fischer."

Jeff Wehner
Co-founder and COO, Haven

Some companies still have no plan for HS 2017 reform. It impacts 200+ countries and territories, tariff schedules, trade agreements, government regulations, and multiple systems, and can lead to a rocky transition if you were not ready on Jan. 1, 2017.

Preston Barton
VP, Sales, Content Business, Descartes

Our focus for 2017 is to continue to simplify the supply chain for SMEs: offering more online services to allow every business to competitively trade across the global supply chain—no matter what their size.

Tarek Sultan
CEO and Vice Chairman, Agility

Helping our customers become supply chain-first businesses in order to uncover new ways to innovate and outpace their competition – all by utilizing the latest cloud and AI technologies that define the autonomous supply chain.

Shariq Mansoor
CEO, FusionOps

HAVE A GREAT ANSWER TO A GOOD QUESTION?

Participate next month. We want to know:

Who would be on your Mount Rushmore of transportation and logistics visionaries?

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Leveraging Your Routing Guide

A routing guide plays an important role in setting the strategy for carrier selection. It is essentially a shipper's guide to choosing a carrier to move a particular shipment. While there are many forms of routing guides, an increasing number of companies switched from paper to online portals and beyond to enhanced transportation management system technology that enables dynamic routing guides for maximum cost savings and service improvement.

Steve Barber, vice president of operations at Transplace, offers the following tips to get the most out of your routing guide.

1 **Balance your routing guide approach.** Determine what lanes you want in your routing guide versus how much goes into a backup matrix or spot market. You can realize savings or protect important capacity by tweaking your routing guide to correspond with spot market rates in a particular area.

2 **Select your mode first, then your carrier.** Before you choose a specific carrier, make a mode decision based on cost, as opposed to more general weight or cube guidelines. Then use your routing guide to select the right truck, intermodal, less-than-truckload, or parcel carrier based on the logistics strategy.

3 **Base your guide on your overall logistics strategy.** Factor in the importance you place on using asset-based carriers versus third-party logistics providers, customer service standards, and cost savings goals.

4 **Use data.** Keeping careful track of historical lane, performance, and cost data for your carrier base is critical to ongoing routing guide strategy.

5 **Leverage technology.** Paper routing guides, and even static routing guides available via a portal, are no longer adequate. Advanced transportation management systems are available to shippers of all sizes managing all supply chain complexities, and can give your organization a cost savings and efficiency boost.

6 **Keep it simple.** Make sure your strategy and routing guide are as simple as your network will allow. Minor savings may not be worth a multi-tiered, multi-load routing guide. And just because technology makes a certain level of complexity available, doesn't mean it is the right solution.

7 **Know your routing guide depth.** How many routing guide carriers do you need for a specific lane? For example, if you have a high-volume route, you may need access to more carriers to ensure that you have all bases covered. If you have a lane with low volume, you might not need as large of a carrier selection.

8 **Communicate clearly.** Ensure that you carefully communicate carrier awards, expectations, and compliance guidelines with anyone using your routing guide, as well as with your carriers. This includes key information such as ship-to and ship-from locations, drop-trailer, and labeling requirements.

9 **Create stakeholder scorecards.** Publish stakeholder scorecards weekly to track key performance indicators and data. You'll want to have scorecards for your ship points—suppliers, distribution centers, and others—as well as your carriers. That way, if something in your routing guide isn't effective, you can utilize these weekly scorecards to get to the root of the problem and fix it.

10 **Stay the course.** Set a logistics strategy that works for your organization and stick with it. You can revise your routing guide to make any necessary changes for enhanced efficiency as needed, but a best practice is to completely reconstruct your guide no more than once each year. ■

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READER

PROFILE

as told to Karen M. Kroll

Aaron Leach is senior director of supply chain with Wayne Farms, LLC, in Oakwood, Ga. He has held this position since 2013. Wayne Farms is the sixth largest vertically integrated producer and processor of poultry in the United States.

RESPONSIBILITIES

Inbound and outbound logistics, warehousing and inventory control, and supply and demand planning.

EXPERIENCE

Director of strategic planning and director of financial planning and analysis, both with Wayne Farms; senior business analyst, financial analyst, and accountant, all with Rich Products Corporation.

EDUCATION

B.S., Business Administration, University at Buffalo, Buffalo, N.Y., 1998.

Aaron Leach: A Bird's Eye View of the Supply Chain

THE ON-TIME DELIVERY PERCENTAGE AT WAYNE FARMS today is slightly more than 97 percent, to a 15-minute window. When I took over the supply chain function in 2013, on-time delivery operated in the mid to high 80 percent range.

In the past, many of the challenges centered around a lack of process, both with our carriers and brokers, and internally. Now, we're much more deliberate in planning our supply and loads. We know when our customers need products. We back up to a realistic ready time from our plant, and then use realistic transit times.

We also benchmark every indicator in our processes: How many pickups and appointment schedules were on time? How far in advance were those made? What were the carrier-related delays, shipping-related delays, or product shortages?

At Wayne Farms, our birds grow to their target weight anywhere from 38 to 60 days, and we process more than 7 million birds per week. If I'm off one-tenth of a pound across those birds, that's 700,000 pounds of product. That means 17 to 18 truckloads worth of product could be impacted by one-tenth of a pound of variance in bird weight. That's where my finance background comes into play—I understand the numbers and know how to analyze data.

I concentrated in finance at the University of Buffalo and started my career in accounting and corporate planning with Rich Products. I was director of finance for Wayne Farms for a number of years before transitioning to supply chain. We were performing poorly in some of our planning, logistics, and distribution functions. The company asked me to see what I could do to rehabilitate those processes.

In the past, nobody truly owned

The Big Questions

Describe a dream adventure.

I'd like to bike the Continental Divide down the Rocky Mountains from the Canadian to the Mexican borders.

What do you like to do outside of work?

I recently finished my fourth Iron Man triathlon.

What advice would you give your 18-year-old self?

One piece of advice I'd give myself is not to be so self-centered and be patient. If you focus on working hard, delivering results, and just doing the right thing, everything will work out the way it should.

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responsibility for the supply chain and getting goods from suppliers to customers. My background helped me analyze and find supply chain inefficiencies.

Even as we've improved, we've been able to keep the same carriers. We're loyal to our partners and give them the chance to work through the challenges. I believe collectively we're much stronger.

Developing and maintaining solid relationships is critical. We've been successful in reducing costs and improving on-time delivery based on the relationships we've formed. I have strong leaders in my group, and I engage and enable them to make smart decisions. I also trust my carrier and broker partners to do the right things, and enable them to make the right decisions.

To improve costs, obviously you can go to a carrier or vendor and try to get a lower rate, but that tends to be short lived. The key is implementing processes, measuring them, and making sure you're effective every day. That's where we take costs out. We tend to be obsessed with processes.

For instance, our loading times needed to improve. We realized the inefficiencies resulted because the production department didn't formulate accurate ready times, and trucks sat for longer than they should. We had to go back upstream and make sure our planning and production processes were in place and accurate.

I try to truly practice servant leadership. Everyone wants to do well, so I'm here to help them find solutions. When people know your intention is not to fix the blame, but to fix the problem, they will work with you more freely. ■

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LEADERSHIP

Conversations With
The Captains of Industry

By Merrill Douglas

Russ Smyth
CEO, HAVI

Geared Up for Growth

ONE DAY IN 2010, RUSS SMYTH GOT A phone call from Ted Perlman. Smyth assumed that the reason for the call was a social occasion. At the time, Smyth was CEO of tax services company H&R Block.

Perlman is one of the founders of HAVI, a global supply chain services company headquartered in Downers Grove, Ill. Before his role at H&R Block, Smyth had spent most of his career at McDonald's, a major customer of HAVI. All the while, Smyth and Perlman were friends, enjoying dinners and social events together with their wives throughout the years.

"I thought the call would be an invitation to dinner or a concert," Smyth says. But Perlman had another invitation to offer: Would Smyth consider joining HAVI as its CEO?

Smyth accepted, and has held the top executive spot at HAVI ever since. He recently talked to *Inbound Logistics* about the elements of leadership, and how he has been building on the company's legacy success, helping to propel it to its next level of growth.

***IL:* When Ted Perlman offered you the CEO position, why did you think the job would be a good fit?**

Having worked with HAVI for many years, I knew it offered a unique and expansive collection of supply chain services. It was a big, complex, global company, which fit my background and interests. I felt that Ted's personal values and the company culture aligned well with my own values and my sense of how to run a business. I also knew it was an organization full of very talented people. Lastly, Ted wanted someone to reinvigorate the company for further growth. I've always enjoyed growth challenges; I'm not a maintenance type of guy.

***IL:* What values did you feel you and Perlman had in common?**

Number one is transparency—being open and honest with our customers and our people. Second is a long-term approach to business. As a private company, HAVI has the luxury of taking the long view, without pressure to show monthly or quarterly results. Also, the way Ted treats and values people within the organization is consistent with what I believe is the key to any successful relationship and business model. Because of that approach, I knew he had hired, developed, and retained very good talent.

***IL:* When you joined HAVI, what items did you put at the top of your agenda?**

For the first six months or so, I did a whirlwind global tour, holding a series of listening sessions to give me a better understanding of what makes HAVI tick and what our core strengths were. Once I had a good feel for the business, I wanted to get us refocused on key drivers that would help accelerate our growth. We could do that by finding new business opportunities with existing customers, and by building and diversifying our customer base.

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***IL:* What are the hardest supply chain challenges your customers face today, and how does HAVI help with those?**

Consumers' needs and expectations are changing rapidly. Consumers want what they want, when and where they want it, and at an affordable price. Historically, supply chains have been very complex, and they're often managed in siloes. Often, they tend not to adapt well to a rapidly changing environment. At HAVI, we take a holistic view; we understand that an action in one part of the supply chain can have implications and unintended consequences elsewhere. Because we take this approach, we can serve as a one-stop shop for end-to-end supply chain management.

***IL:* Most of your customers are in the food service industry. What's one industry trend that is forcing them to develop new supply chain strategies?**

Technology will have a huge impact on how restaurants and food service companies interact with their customers. Innovations such as mobile ordering and mobile payment give you direct access to individual consumer information that, if used properly, will provide tremendous insight into buying patterns and behavior, and on how you can serve your customers in new, unique ways. Companies will be able to customize marketing messages to individual consumers or, for example, run promotional activities on three hours' notice or less. This will create a lot more variability in consumer demand, and supply chains will have to figure out how to meet that increased variability. They'll have to be much more flexible, and we have to move faster than we've ever had to in the past.

***IL:* How would you describe your leadership style?**

I'm very customer focused: I take an inside-out look at our business first and foremost. And I'm a situational leader. In a complex, global business like HAVI, no one style is going to work. I have to be a bit of a chameleon, reading each situation and environment and adapting my leadership style to effectively deal with the challenges or opportunities we face. I think every good leader has to do that in today's working environment.

Also, when I became HAVI's CEO, I immediately recognized the talent that I had experienced as a customer. It is so critical to me to continue to attract, retain, and grow that same caliber of people moving forward, because if nothing else, we are a business of people, intelligence, relationships, and creativity. So I gave myself another role—Chief Talent Officer—and spend nearly half my time focused on people, talent, and ensuring we have the right teams and individuals in place to adapt and lead as our business and industry continue to grow and evolve.

***IL:* Tell us about an experience early in your career that helped to shape the leader you are today.**

I started my career on the finance side. As I made the transition from that role to a line management role at McDonald's, I spent the better part of one year working in restaurants. My work there included sweeping parking lots and cleaning toilets. That critical experience made me appreciate the impact that front-line employees have on customers. Often, decisions made in corporate headquarters don't consider the positive or negative impacts those decisions can have on the front line. I always challenge myself to think about how we're affecting the people who work directly with our customers.

***IL:* What traits do you most admire in other leaders?**

I appreciate people with real passion for and commitment to what they do. I admire and respect people who show courage under fire and stand firm in doing what they think is right, even when it's not the most popular choice and they face a great deal of outside pressure to do something different. I also have a lot of respect for people who are transparent. They open themselves to tough questions and have to respond by painting a picture that's both clear and inspirational.

***IL:* What advice would you offer to your 20-year-old self?**

One, enjoy it more. When you're working hard and running fast on the treadmill, it's tough to remind yourself to take a time-out and celebrate the things you've accomplished, without getting complacent. Two, make tough people-decisions faster. The biggest mistakes I've made in business have been not moving fast enough on people who I knew were not the right leaders for their positions. Three, trust your gut. The world isn't perfect, and you can't wait for all the facts. You have to use the facts combined with your instincts and experience. ■

Two-Part Harmony for The Right and Left Brain

Russ Smyth doesn't mention this to many people, but while majoring in accounting in college, he also studied music. His instrument is the guitar.

"Part of what I learned growing up was left brain focused, and part of it was right brain focused," Smyth says. "I think that has shaped how I deal with things in business. I have a 'What are the facts?' side—concrete thinking and a focus on business process. But I try to balance that with the creative, entrepreneurial side—the frustrated musician in me."

Smyth says he still plays guitar, "although not as often as I'd like."

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LEADERSHIP INSIGHTS

From taking a hands-on approach to unlocking their team's potential, these supply chain sector CEOs reveal the strategies and secrets behind great leadership.

I define a great leader as someone who takes a hands-on approach. It's important to ensure leaders don't distance themselves too much from their team. There's nothing in the business that I haven't done or wouldn't continue to do.

Angela Eliacostas
Founder and CEO, AGT

One quality that makes a great leader is confidence when it comes to making tough decisions. There will inevitably be times in which it is critical to have a leader who can weather storms with strength and shrewdness.

Kristy Knichel
President and CEO, Knichel Logistics

I've found three attributes that differentiate good leaders from great leaders: courage, clarity, and compassion. Courage to lead through the most difficult situations, coalescing your team around clear priorities, and always working from empathy.

Adriene Bailey
Chief Strategy Officer, Yusen Logistics (Americas)
Chairman, Intermodal Association of North America

Great leadership means constantly assessing the current business environment and tapping into your teams' expertise and insights to rapidly respond to incoming information. When combined with an innate gut level reaction, leaders are able to adjust plans and strategies.

Sue Welch
CEO, Bamboo Rose

If you can get people excited, accountable, and empowered to move your idea forward, then you might really have something!

Dan Clark
Founder and President, Kuebix

I believe in an honest, transparent approach and lead by example each day.

Jamie Overley
CEO, East Coast Warehouse

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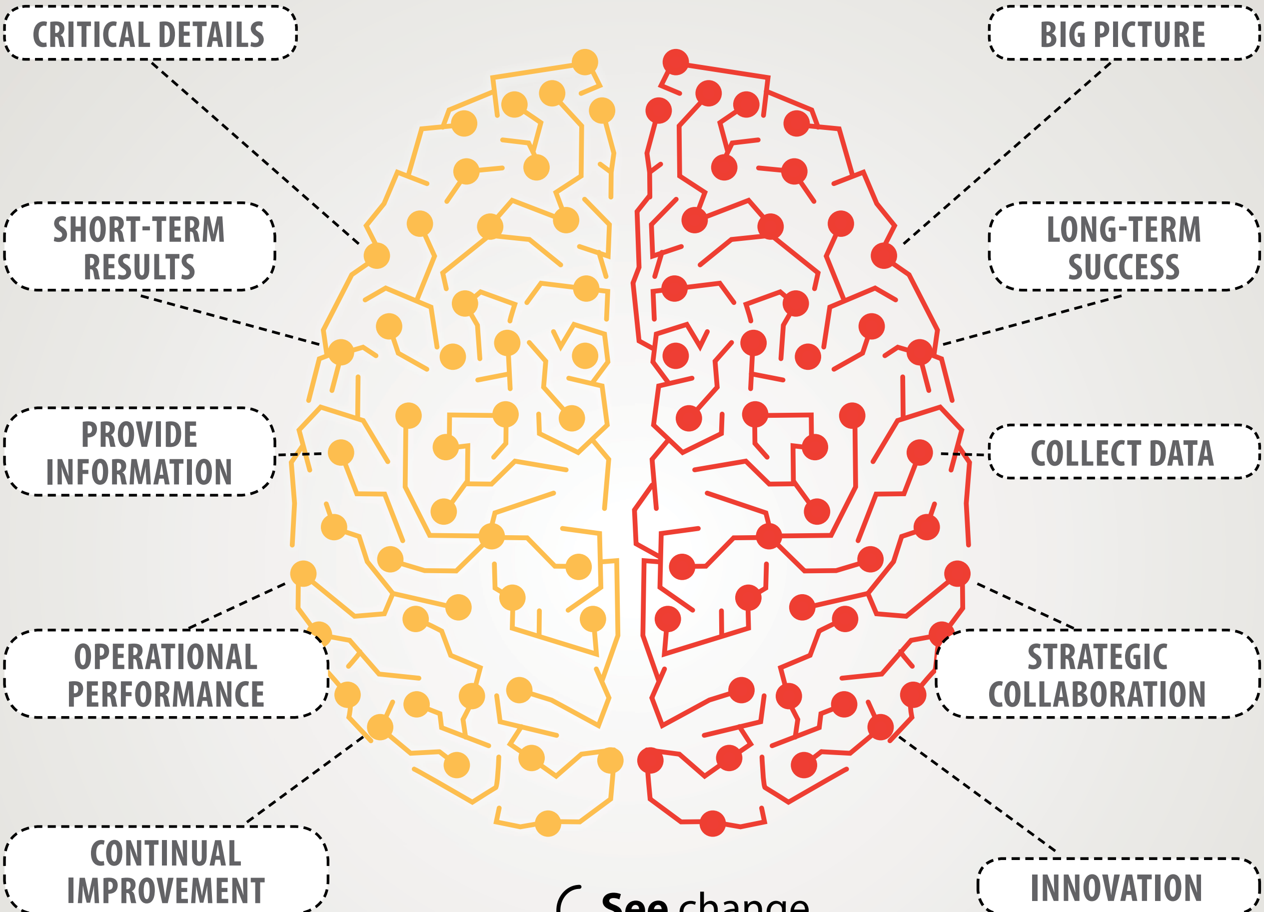

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LEADERSHIP INSIGHTS

My favorite definition of leadership is 'taking people where they wouldn't go themselves.' Great leaders look ahead, and their vision influences change in a way that prepares others for the future. They think critically, act collaboratively, and understand the impact of their decisions along the value chain.

Ann Drake
CEO, DSC Logistics

Leadership is listening to people all around you. It is always being open to new ideas and solutions—even if they are uncomfortable. It is defining and setting clear expectations to those you lead and helping them to accomplish their goals and push their limits.

Arch Thomason
CEO
Sunland Logistics Solutions

Great leadership is defined by how you can inspire people to continuously improve and unlock their highest potential. The key is to balance the need to deliver results through clear strategy and goals with the importance of creating a culture based on openness, trust, and respect.

Greg Hewitt
CEO, DHL Express U.S.

Great leadership involves vision, innovation, trust, and hiring the right people. We have a work environment where executives work alongside employees out in the open, fostering an environment and company culture like no other.

Jeff Silver
CEO and Co-founder, Coyote Logistics

Great leadership occurs 24/7/365, in and out of the workplace, in homes and communities.

Kirsten Hall
CEO, Logistics Planning Services

Good leaders inspire a shared passion for the work being done at every level in the company.

Monica Wooden
CEO and Co-founder
MercuryGate International

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NOTED

THE SUPPLY CHAIN IN BRIEF

GOOD WORKS

▲ **CSX** employees teamed up with several charitable organizations at **Funston Elementary School** in Chicago to make a number of improvements, as part of the railroad's "Beyond the Rails" initiative to improve the communities it serves. Volunteers built an outdoor learning space; constructed picnic tables, benches, and planters; painted the basketball court and playground equipment; and illustrated murals.

▼ **Averitt Express**, a transportation and supply chain management services provider, contributed $10,000 to the **American Red Cross** to help with relief efforts in Tennessee, which was impacted by wildfires and tornadoes. The Red Cross operates three locations in the area to provide shelter and necessities for evacuees.

OnTrac, a regional logistics provider in the western United States, provided more than 5,000 cans of non-perishable food and $1,500 in cash to kick off the annual 102.5 KNIX Ben & Matt's Million Can Crusade. The radio station's food drive helps the **Society of St. Vincent de Paul**, a Catholic charity, provide food for hungry families during the holiday season.

The **Pete Nance Boys & Girls Club** named third-party logistics provider **a2b Fulfillment** its 2016 Business Partner of the Year. For the past four years, a2b served as a corporate sponsor for the Boys & Girls Club and donated an art studio where children have the opportunity to explore their creative talents.

m&a

Logistics software provider **Descartes Systems Group** bought **4Solutions**, a provider of cloud-based business-to-business supply chain integration solutions for the Australian healthcare sector. The purchase increases Descartes' footprint in Australia and Southeast Asia.

Canadian trucking company **TransForce** purchased the truckload shipping business of supply chain solutions provider **XPO Logistics**. TransForce gained 3,000 tractors, 7,500 trailers, and 29 physical locations from the deal, and will use the assets to expand its U.S. truckload services.

SEALED DEALS

▲ Air cargo handler **Worldwide Flight Services** (WFS) landed a three-year contract to provide cargo handling and trucking services for **Pakistan International Airlines** (PIA) in the United Kingdom. WFS now handles export and import cargo for PIA's flights at London Heathrow, Birmingham, and Manchester airports.

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SEALED DEALS

▲ **Microsoft** selected **TMC**, a division of C.H. Robinson, as its global logistics management provider. TMC provides Microsoft with global technology and services to manage its supply chain across more than 100 countries and all transportation modes.

▶ Logistics provider **Agility** inked a six-year deal with Sweden-based tire wholesaler **Amring** to provide warehouse services, as well as tailored, value-added services such as mounting and assembling of wheels from its logistics center in Gothenburg, Sweden. Agility will also coordinate inbound and outbound transport for Amring, and provide supply chain assessment and consulting services.

m&a

Verizon Communications acquired telematics solutions provider **Fleetmatics Group PLC**. Under the deal, Fleetmatics' 42,000 customers, 826,000 subscribers, and portfolio of products are now part of Verizon Telematics.

FIDELITONE, a supply chain management firm, bought order fulfillment services company **Total Solutions LLC**. The deal enhances FIDELITONE's portfolio and ability to provide third-party fulfillment services for the health and wellness industry.

GOOD WORKS

▲ **Lufthansa Cargo** and the **German Red Cross** signed a new framework agreement that simplifies and accelerates the preparation of aid flights. The new terms help the Red Cross and Lufthansa bring aid supplies and support to crisis and disaster areas more rapidly than they could previously.

recognition

▼ **Michael B. Romano**, president of supply chain solutions provider Associated, was recognized with the **2016 Supply Chain Leadership Award** by The Supply and Value Chain Center at Loyola University Chicago's Quinlan School of Business. The award recognizes individuals demonstrating responsible leadership with a focus on personal integrity, ethical behavior, and a balance between justice and fairness.

Military Times named third-party logistics provider **Unishippers Global Logistics** a **top franchise opportunity** for U.S. military veterans. This is the third consecutive year that the company has won the award.

Logistics Tech Outlook magazine named **nVision Global Technology Solutions**, a provider of freight audit and payment software and services, a **2016 Top 10 Transport Management Solutions Provider**. Winners are selected by a panel of experts, industry professionals, and technology leaders.

Third-party logistics provider **Redwood Logistics** was named one of the **Best Entrepreneurial Companies in America** by *Entrepreneur* magazine. Companies on the list were identified based on the results of a study of independently owned companies that analyzes four metrics: innovation, growth, leadership, and impact.

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[INFOCUS] **NOTED**

THE SUPPLY CHAIN IN BRIEF

GREEN SEEDS

▲ **UPS** launched its first U.S.-based e-Bike service in Portland, Ore. The electrically assisted tricycle is part of the company's commitment to reduce carbon emissions, traffic, and noise in population centers. Portland was chosen because UPS already uses traditional bicycles seasonally in the city; the company hopes to expand to other metropolitan areas in 2017.

▼ Transportation company **J.B. Hunt Transport Services** received the **SmartWay Excellence Award** from the U.S. Environmental Protection Agency for the seventh consecutive year. The award recognizes the company's continued commitment to environmental responsibility in freight transportation and the supply chain.

Logistics solutions provider **CHEP** and automotive exhaust, heater, and air conditioner manufacturer **Eberspächer** won a **Product Innovation** award from Automotive Global Awards for their supply chain. The companies partnered to develop a reusable packaging solution for intercontinental sea freight that replaces disposable packaging and eliminates waste while increasing product protection and reducing cost.

Ecovadis, a company that evaluates businesses on their corporate social responsibility (CSR), ranked logistics solutions provider **GEODIS** in the top 9 percent of all suppliers evaluated for its ongoing CSR policy, and first in its category, which contains 252 companies. Ecovadis examines companies in four areas: environment, social, business ethics, and responsible purchasing.

recognition

American Trucking Associations' Safety Management Council awarded **Lisa Gonnerman**, vice president of safety for Ruan Transportation Management Systems, the recipient of its **2016 National Safety Director Award**. The honor recognizes Gonnerman's commitment to establishing strong safety cultures throughout her career in trucking.

Transportation and logistics provider **Werner Enterprises** was named a **2017 Military Friendly Employer** by *G.I. Jobs* magazine. This is the 11th time Werner has received the award, which recognizes the company's effort and ability to provide job opportunities, hiring practices, and retention programs for transitioning service members and their spouses.

UP THE CHAIN

◀ **David Porter** joined smart home services provider **Vivint Smart Home** as its chief procurement officer. Porter is responsible for sourcing, procurement, and supply chain management across the company.

Jian Irish, Ph.D., was appointed senior vice president of supply chain at pharmaceutical company **Kite Pharma**. Irish is responsible for establishing and securing a reliable supply chain, including sourcing, logistics, inventory management, and supply and operations planning.

KEEN, an outdoor footwear company, hired **Jens Christian Meier** as executive vice president of the global value chain. In his new role, Meier manages owned manufacturing, third-party sourcing, planning, distribution, and logistics for everything from raw materials to finished products.

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TRENDS

SHAPING THE FUTURE OF LOGISTICS

Amazon Shows Apptitude

by Jason McDowell

Amazon continues to rattle nerves in the transportation sector. In 2015, the company launched a fleet of branded trucks to help shuttle cargo between facilities. In 2016, it leased 40 cargo jets, and Amazon China registered as a U.S. freight forwarder. These moves made third-party logistics (3PL) and trucking companies understandably anxious, considering that Amazon accounted for 60 percent of U.S. online sales growth in 2015. That's a lot of package weight to throw around.

Now Amazon is releasing an Uber-like cargo app that would connect truckers directly with available cargo, effectively cutting out the middleman. The announcement has large 3PLs preparing for the worst.

Let's answer some questions to better understand the app's impact.

■ **Why is Amazon pushing into the transportation sector?** Amazon spent $5 billion out of pocket on shipping in 2015. For a long time, supply chain impatience driven by one- and two-day shipping has had Amazon losing its proverbial pants on its Prime program. The company created a problem that it now has to fix if it doesn't want to keep losing billions every year to provide low-cost and free shipping to consumers. Amazon hopes to make Prime profitable by cutting out intermediary fees, and finding other ways to more efficiently feed the beast that it created.

Profits aside, Amazon is on better footing than any other shipper to pull off something like this. It drives such a large percentage of shipping volume nationwide that it already has the analytics, technology, and distribution infrastructure in place.

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■ What does the app mean for truckers? Owner-operators and small truckers will gain long-term steady business thanks to the app, which will also optimize routes and provide driving directions. By cutting out fees from intermediates, Amazon should, in theory, be able to pay drivers more than the industry standard. Money talks, so if Amazon delivers, it will earn the loyalty of the independent trucking market.

For bigger fleets, the app won't necessarily be a bad thing. Like load boards, Amazon will provide truckers with another way to find easy backhauls.

There may be some hiccups aligning the app with truckers as electronic logging device rules and rest regulations likely change under the new administration and court battles settle, but overall the app should be good for trucking, especially drivers.

Then there's the effect on the driver shortage. If Amazon can pay drivers better through money gained by cutting out intermediaries, what happens to the driver pool as the shortage continues to grow? Large fleets will struggle to hang on to drivers if they don't find ways to remain competitive, whether through pay, or other means.

■ Is Amazon trying to compete with FedEx and UPS? If Amazon ever makes this play, it's unlikely that it will be soon. To some degree, Amazon may always need to utilize FedEx and UPS resources. It's just dollars and cents. With Amazon's resources, bringing shipping in-house can save money if done properly.

The app is not a direct attack on FedEx and UPS. That said, Amazon is expected to exceed FedEx's package volume within three years and UPS's within seven, according to RBC Capital Markets. Those are packages that FedEx and UPS won't move, so those organizations will definitely take an indirect hit in the pocketbook.

■ Will the app be a "brick killer"? What happens to brick-and-mortar retailers as Amazon continues to consolidate its power base across sectors? With big data, near-instant delivery, and now lowest possible expedited transport costs in play, how do the old bricks stack up?

It's difficult to quantify the in-store versus retail shopping experience. Can an instant Amazon delivery compete with the ability to try on shoes in the store? Can grocery delivery stop people from swinging by the store for milk on the way home? Certainly Amazon hasn't been an easy competitor for brick-and-mortar retailers, but their physical presence still offers something that Amazon doesn't have (for now).

Those who continue to pay close attention to customer needs and wants and adapt accordingly should be okay. If Amazon eventually opens its app to other shippers, some may even benefit.

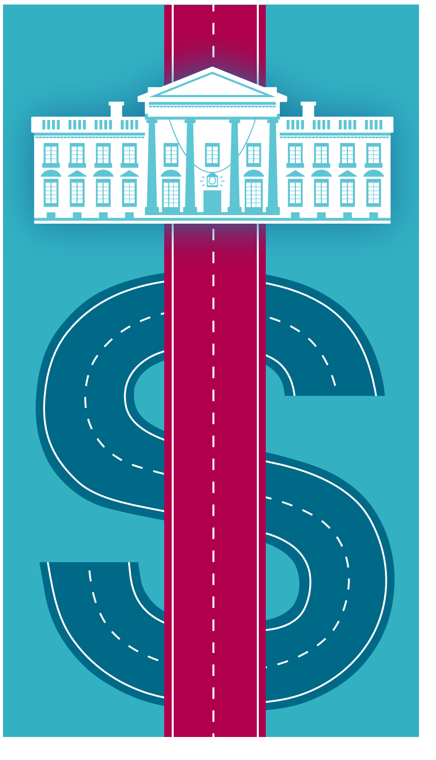
■ Will 3PLs and brokers go the way of the ghost? The short answer is no. The big dogs especially won't struggle too hard to weather Amazon's app. They have big clients, and big shippers move too much volume to deal with the hassle of sending shipments piecemeal via an app.

This could change down the road as transportation management systems and other technologies begin to integrate the Amazon solution. In the near future, small and mid-sized asset-based 3PLs will need to step up their game and tailor solutions to be competitive with and/or work alongside Amazon. It's difficult, but not impossible.

For asset-light brokers, the challenge is even greater. If smaller shippers can save 15 percent just by switching to an app to move their cargo, they will do it. These providers will need to show both old and new clients that they provide some sort of value beyond the shipment itself. Those that fail to do so will struggle to remain relevant.

To prepare, brokers should try to secure capacity now so it's available in the aftermath of the app launch. If another capacity crisis hits, it's likely that Amazon will find the loyalty of trucking companies before brokers will.

President Trump's Trillion-Dollar Infrastructure Plan



Since Donald Trump was elected president, the American political landscape has been divided in a way seldom seen in U.S. history. There is one area, however, where conservatives and liberals might find common ground. President Trump's infrastructure plan—which bears a price tag of $1 trillion—has garnered some support from Democrats in Congress. The president promises to implement the plan within his first 100 days in office.

"We are going to fix our inner cities, and rebuild our highways, bridges, tunnels, airports, schools, hospitals," Trump said during his acceptance speech in November 2016. "We are going to rebuild our infrastructure, which will become second to none and we will put millions of our people to work as we rebuild it."

But how? Currently, Trump's plan involves luring private investors to lend money to state and local governments to fund infrastructure projects. These

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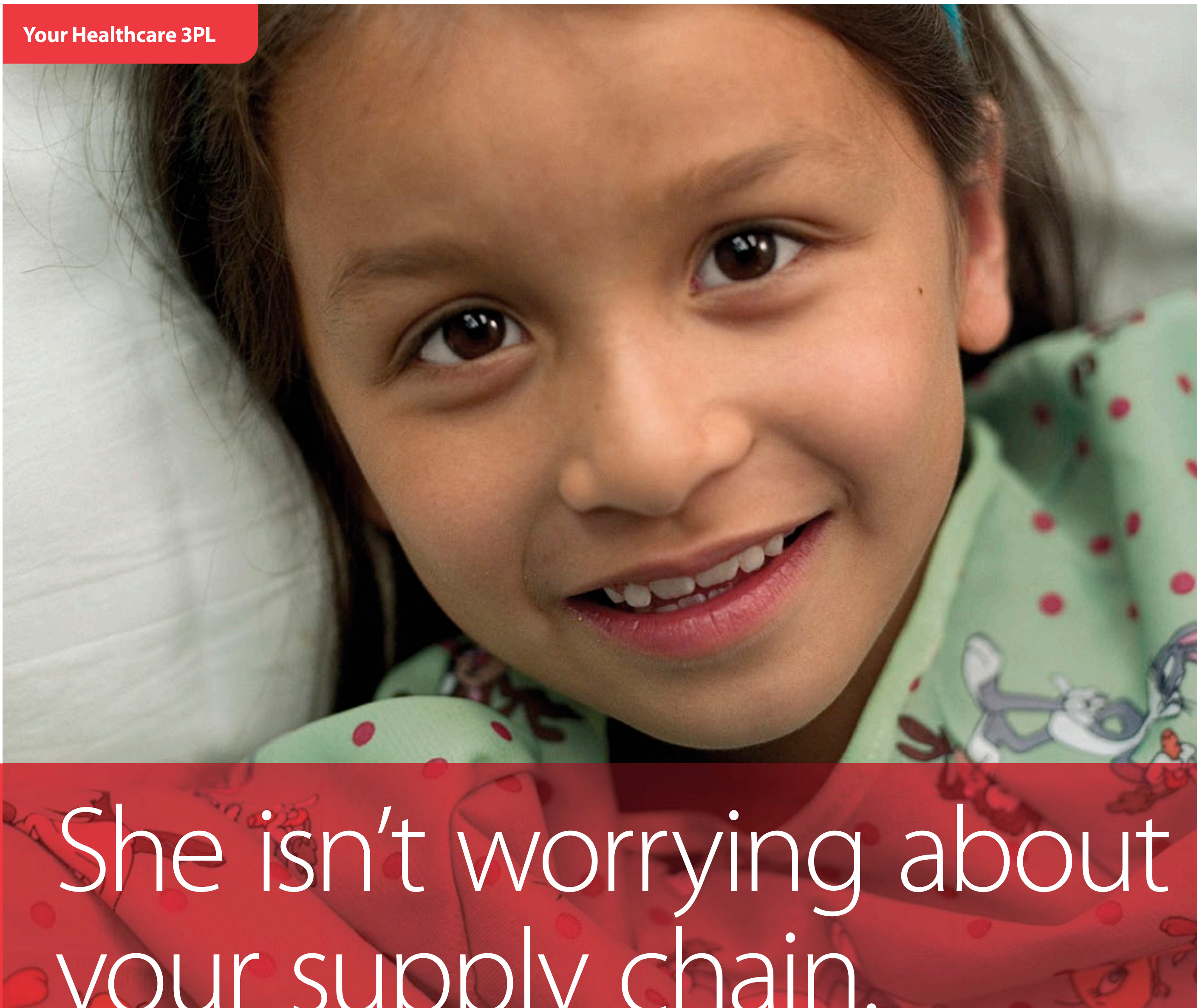

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investors will receive $137 billion in federal tax credits over the next 10 years for their support.

In addition, Trump has proposed a repatriation fee for companies that invest into infrastructure profits that have been hidden in tax havens overseas — ironically, an idea proposed by President Obama and supported by Clinton, but blocked by Congress. Investors would also benefit from the ability to boost fees — such as driver fees on toll roads, or water and sewage fees to customers — to increase their return on investment.

"With negative interest rates throughout the world, it's the greatest opportunity to rebuild everything, to get shipyards and ironworks all jacked up. We're just going to throw it up against the wall and see if it sticks," Steve Bannon, Trump's chief strategist, told the *Hollywood Reporter* in an interview.

While interest rates in the United States aren't currently negative, they are very low. This could make financing projects feasible, assuming the rise in public spending doesn't spook lenders and increase the cost of borrowing money.

Critics argue that this approach won't solve the nation's infrastructure problem. While toll roads, ports, airports, water systems, and other revenue-generating infrastructure will see no shortage of funding under Trump's private investment plan, regular old congested highways, crumbling bridges, and projects that don't generate any direct revenue won't be so appealing to investors.

To address this flaw, there has been talk from the President's camp of an infrastructure bank that could address these other projects, but fiscal conservatives shot down similar initiatives under the Obama administration.

An infrastructure bank could work in tandem with private investment to make sure the whole of American infrastructure receives the attention it so direly needs. But it remains to be seen if President Trump can strong-arm his own party into the commitment.

Congress Repeals Portion of Trucker Restart Requirements

Faced with a government shutdown in December, Congress pushed through language in a spending bill that repealed the overnight rest provision of the 34-hour restart requirement. Trucking companies are cheering the move, while safety

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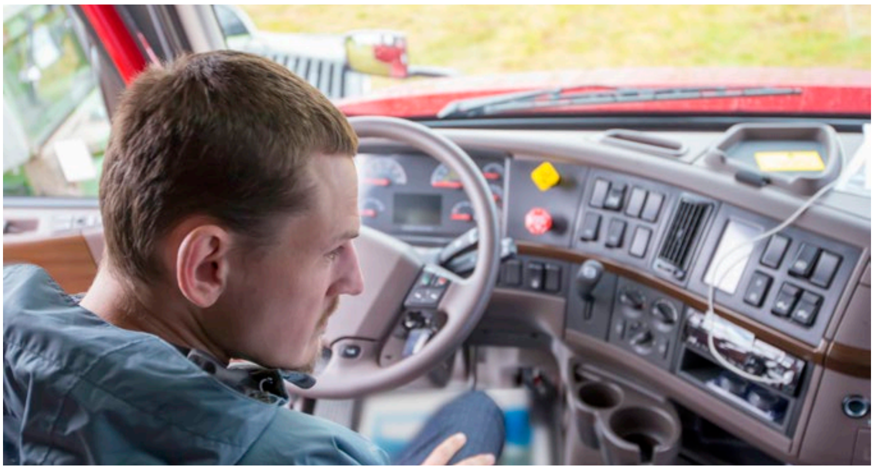

Truckers say the overnight rest provision of the 34-hour restart requirement hampers efficiency and impacts delivery times.

watchdogs are less than thrilled.

Until it was repealed, the provision required that truckers who work a 70-hour week must rest for 34 hours straight, and during the reset period, drivers must sleep two nights between 1 a.m. and 5 a.m. Trucking companies have complained about the rule since its implementation, claiming that it forced them to stop in unsafe or overly expensive places. Truckers also complain that their efficiency has been affected as the rules interfere with delivery times.

"The American Trucking Associations thanks Congress for including what should be a permanent fix to the hours-of-service restart in this Continuing Resolution, and we look forward to its final passage into law to resolve this issue," said American Trucking Associations President and CEO Chris Spear in a public statement regarding the repeal.

"Reverting to the pre-July 2013 restart shifts the emphasis back to safety by removing flawed data from the rulemaking process," he adds. "The entire industry will now be able to comply with this rule thanks to a common sense approach championed by a bipartisan group of legislators."

In spite of more stringent safety regulations, the number of people injured in truck-related accidents has increased by

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57 percent since 2009, according to the federal government. Safety watchdogs claim stricter regulations are necessary to combat this problem, but the regulatory leash has already been increasingly tightened on drivers in recent years.

With the number of accidents continuing to climb regardless of tighter rules and enforcement, the argument could be made for letting truckers use their own best judgment about when to rest. The fate of the rest of the 34-hour restart legislation is pending further research by the Federal Motor Carrier Safety Administration.

States Take FAST Look Into the Future

After ignoring the troubled state of American transportation infrastructure for far too long, Congress implemented the Fixing America's Surface Transportation (FAST) Act in 2015. The FAST Act not only provided nearly $11 billion over five years in dedicated funds for freight initiatives, it also required all 50 states to have a freight plan in place by December 2017.

Seventy-one percent of states already are working on making some sort of freight plan FAST Act-compliant, according to *State of Freight II—Implementing the FAST Act and Beyond*, a joint study by the American Association of Port Authorities (AAPA) and American Association of State Highway and Transportation Officials (AASHTO). In addition, 57 percent of states have presented 6,202 freight projects that need funding from the program, and 35 percent of states have submitted more than $259 billion in necessary projects (*see chart*).

The first round of FAST Act projects has already been funded, with $759 million spread over 18 projects—one-third are port-sponsored and half are sponsored by state transportation departments.

DEVELOPING FREIGHT PLANS:
A SUMMARY OF INVESTMENT NEEDS

29 States + 6,202 Projects = $258,698,283,920

Rail–Broken out even further, 10 states provided freight rail needs at $5.9 billion for 270 projects.

Distribution–4 states provided distribution project needs at $581,620,200 for 25 projects. An additional 6 states provided 27 projects with no cost estimates, bringing the total project number up to 57 for 10 states.

Inland Waterway–13 states submitted a total of 365 inland waterway surface transportation projects. Seven states submitted 298 projects with projected costs totaling $13 billion.

Highway–3,152 projects totaling $96 billion from 12 states. 39 states submitted projects with no cost estimates attached to them.

Undefined–3 states submitted projects without breaking projects out into modes and costs. The totals are 747 projects, totaling $143.7 billion.

Multimodal–A growing demand.

Source: *The State of Freight II-Implementing the FAST Act and Beyond,* AASHTO, American Association of Port Authorities

AAPA and AASHTO emphasize the need for transportation departments and port authorities to work together on projects to increase the efficiency of intermodal freight movement. Thirty-eight out of 50 states and Washington D.C., are connected by navigable waterways and marine highway routes, the report says.

To most effectively use the limited funds FAST Act provides, AAPA and AASHTO recommend the following four actions:

1. Continue providing states with Highway Trust Fund money for freight projects, and leverage private sector investment through the U.S. Department of Transportation's Build America Bureau and Freight Advisory Committee.
2. Begin providing additional supplemental funding outside of the Highway Trust fund for multi-modal freight projects, and fund discretionary grant programs.
3. Re-establish and fund the Office of Multimodal Freight Transportation to organize multimodal freight planning within the Department of Transportation.
4. Ensure that the Harbor Maintenance Tax can only be used for its intended purpose: maintaining navigation channels.

Hamburg Süd Acquisition Not A Done Deal

Maersk Line reached an agreement with Oetker Group to acquire Hamburg Süd, the world's seventh-largest container shipping line. The deal isn't expected to be viewed favorably by the U.S. government, whose approval will be necessary before the deal can move forward.

"The acquisition will need to get approval from the Federal Maritime Commission in the United States," says Chris Rogers, a research analyst for global trade intelligence firm Panjiva. "The Department of Justice may also want a look at the deal.

"There is always a chance the deal gets blocked," he says. "Other deals in the

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sector about the second-tier players consolidating have been blocked, and here we have the number-one player 'hoovering up' smaller competitors."

In the short-term, at least, the deal will have little impact on the shipping sector, even if approved. "It is difficult to see the deal resulting in a noticeable amount of capacity to help tighten the market," Rogers says. "The CEO of Maersk has said he prefers a light touch deal, which would suggest the synergies referred to by management will come on the utilization rate rather than capacity reduction front.

"Furthermore, Hamburg Süd's fleet is relatively young, so it's not as if there are large swathes of it that need to be reduced," he adds. "Finally, neither company has massive orders for new vessels, so there won't be a significant impact on new builds."

The deal isn't set to close until the end of 2017, and will need regulatory approval not only from the United States, but also from the European Union, China, Korea, Australia, and Brazil. That's a long way off, and a lot of hurdles to jump.

iPhone Maker May Expand to U.S.

Japanese telecommunications and internet company Softbank, Sprint's majority shareholder, plans to invest $50 billion in the United States and create 50,000 jobs in the process. That announcement comes after a December 2016 meeting between then-President-elect Donald Trump and Masayoshi Son, the CEO of Softbank.

Son was not specific about where the investments would go, but paperwork from his meeting with Trump prominently displayed the Foxconn logo next to that of the SoftBank Group, strongly suggesting that at least some jobs and investment would go toward establishing additional operations for Foxconn in the United States. Foxconn is the world's largest contract electronics manufacturer, and a major producer of Apple's iPhone.

One day after the meeting, Foxconn confirmed that it was exploring a U.S. expansion: "While the scope of the potential investment has not been determined, we will announce the details of any plans following the completion of direct discussions between our leadership and relevant U.S. officials." The statement did not name those officials.

Foxconn has established manufacturing sites in Indiana and Virginia. It's not clear whether any new investment would involve an expansion of those existing facilities, or something new.

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Self-Driving Truck Delivers 50,000 Cold Ones

Uber's Otto self-driving truck recently delivered its first payload, moving 50,000 cans of beer from Loveland to Colorado Springs.

At one point, we've all probably wanted a robot that could bring us a beer. But how about 50,000 beers? After several months of closely monitored testing and evaluation by the Colorado Department of Transportation, Otto—the self-driving wing of Uber—has done just that.

Otto partnered with Anheuser-Busch to haul a trailer full of beer more than 120 miles down Colorado Interstate 25—from the Anheuser-Busch facility in Loveland, Colo., through Denver, to Colorado Springs. This is the first time a self-driving vehicle has shipped commercial cargo.

"The success of this pilot shipment is an example of what is possible when you deploy self-driving technology," says Lior Ron, co-founder of Otto. "It also showcases the importance of collaboration with forward-looking states like Colorado and innovative companies like Anheuser-Busch.

"By embracing this technology, both organizations are actively contributing to the creation of a safer and more efficient transportation network," he adds.

The self-driving mode only works when the vehicle is operating on a highway. The truck changes lanes only if absolutely necessary and maintains a safe distance from other vehicles. In city traffic, where pedestrians, bikes, and other factors complicate road conditions, a human driver takes over.

Rather than replace drivers, the technology is meant to complement them. During long highway stretches, drivers could sleep, catch up on paperwork, read, or perform any number of tasks. When regulations catch up with the technology, it's likely that drivers could even comply with rest rules while the truck is still in motion.

The Most Connected Retailer Wins (But by the Fastest Path)

All the moving pieces in the retail supply chain remind me of a Rube Goldberg machine: too many stops and complications to get to where we want to go. And the speed we need to keep up with wired, always-on customers is daunting.

Tremendous behind-the-scenes growth in retail digitalization will help retailers keep pace. We are finally taking advantage of all things digital in retail's backend—even in product development where "connectivity" traditionally meant emails, spreadsheets, phone calls, and a bit of duct tape.

The retailers that will stay alive and thrive will be the ones who embrace digital collaboration and B2B marketplaces for their product development teams. Fast.

Here are a few predictions for the retail industry in 2017:

Digital marketplaces will be king: Digital marketplaces are new to the B2B space, but adoption of more visual, collaborative and social tools will drastically increase in 2017. Retailers will begin to shop just like consumers in these connected B2B marketplaces, speeding up and streamlining tedious and burdensome backend processes and ultimately, getting better products to market faster.

Intellectual property (IP) security will be a major concern: Use of tools like Pinterest and Instagram to collect proprietary ideas will decline as retailers realize the risks of using public networks to house designs and inspiration—even with password protection in place. Merchants and designers will seek platforms that provide the ease of use and functionality of beloved social networks while ensuring IP protection.

Product development will become a social exercise: Product development will be less about buying physical items and more about buying and sharing ideas. As retailers collaborate and leverage the knowledge and experiences of those around them, they'll be better positioned to inspire and create great products that consumers actually want to buy.

As more retailers recognize the need for backend connectivity, buyers throughout the retail supply chain will move toward adopting a centralized software work hub. This technology will allow for quick implementation of digital marketplaces, closer monitoring of intellectual property security, and will open the door for social collaboration.

—Sue Welch, CEO, Bamboo Rose

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64% of shoppers say delivery speed is important when buying online.

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*Source: Seamless Retail Survey Results 2015

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Amazon Go features advanced shopping technology that eliminates the need to wait in line to pay. Using the Amazon Go app, customers enter the store, take the products they want, and go.

Grab Your Groceries and Go

Amazon is shaking up the retail game again with its new Amazon Go convenience store in Seattle. Customers walk into the store, get whatever items they want, and walk out again without the hassle of a checkout line. On its website, the retailer calls it the "just walk out shopping experience."

When shoppers enter the store, they scan their phones using an app that is linked to their Amazon account. As they pull items on the shelf, the app senses the action and puts the item into a virtual cart. Replacing the item on the shelf removes it from the cart.

Once shopping is done, consumers just walk out of the store. A few minutes later, they'll receive a receipt from Amazon for the items they left with.

"Four years ago we asked ourselves: what if we could create a shopping experience with no lines and no checkout?" the company says on its website. "Could we push the boundaries of computer vision and machine learning to create a store where customers could simply take what they want and go? Our answer to those questions is Amazon Go."

Amazon accomplishes this feat through a mix of several technologies, including computer vision, sensor fusion, and machine learning. The Seattle pilot store is the product of several years of work, and seems to at least partially confirm long-time rumors that the e-commerce giant plans to expand into the physical retail space.

Manufacturers Get Ready For 'Made in America'

President Trump promises to bring manufacturing back to America, and drive a "Made in America" movement that would spur the economy and provide good-paying jobs. Manufacturers operating on a global scale may need to take steps to prepare now.

"Manufacturers should look for opportunities to improve efficiency and margin protection," says Jason Dea, director of product marketing for environment, health, and safety solutions provider Intelex. "For many years, the easiest way to protect profit margins has been the offshoring of either suppliers, production, or both. If stricter trade tariffs come into play and a wave of onshoring happens as a result, then businesses will need to account for this in their strategic and budgetary planning.

"The other opportunity to drive greater margins and efficiencies in a business is to re-evaluate processes that support the productivity of existing resources," he adds. "We can expect a renewed focus on processes such as quality management or even safety management as opportunities to drive greater efficiencies, productivity and ultimately margins emerge from existing onshore resources."

Businesses should also be prepared for President Trump to follow through on promises to scrap or renegotiate existing trade deals, such as NAFTA, which could result in trade wars and rising supplier prices.

"Generally speaking, free trade should work in favor of global companies and encourage countries to specialize in the sectors that align with their resources while reducing the costs of offshoring what they may be deficient in," says Dea. "While Trump is staunchly pro-business, he's also staunchly anti-globalization.

"From a macro-economic standpoint, Trump's stance is somewhat counterintuitive," he says. "If the United States renegotiates or pulls out of trade deals, the biggest potential impact will be to the profit margins of many organizations. The possibility of international trade restrictions and new tariffs are associated with a presumed smaller, local supplier pool and higher costs in almost every industry."

It's not all bad, however. "On a positive note as it relates to health and safety, there is a chance of much greater compliance with environmental regulations because a predominantly onshore supply chain can be easier to manage due to the lack of multi-jurisdiction complexity," Dea says.

More good news is that these changes won't happen overnight. Companies that take steps to prepare now should be able to weather whatever surprises an onshoring movement or new trade deals can bring.

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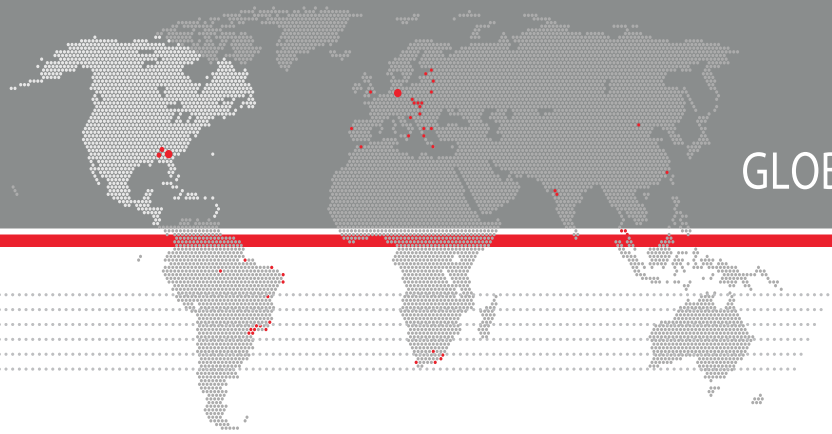

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FMC OKs Ocean Alliance

The Federal Maritime Commission (FMC) approved the Ocean Alliance, allowing COSCO Shipping, CMA CGM, Evergreen Marine, and Orient Overseas Container Line to share vessels, book and share cargo space among each other's ships, and enter into working agreements in international trade lanes.

The alliance should allow the companies to better compete against the 2M Alliance—formed in 2014 by Maersk Line and Mediterranean Shipping Co.—on Europe-to-Asia trade routes. Sharing resources, new alliances and consolidation help carriers cut costs in an environment plagued by overcapacity.

Orient Overseas Container Line (OOCL) is part of a new Alliance enabling ocean carriers to offer competitive products and comprehensive service networks on international trade lanes.

"The Commission worked hard to balance the needs of not only Ocean Alliance applicants, but all other parties involved in the intermodal supply chain, with the ultimate goal of safeguarding competition in international oceanborne common carriage, with the American shipping public foremost in mind," said FMC Chairman Mario Cordero in a public statement.

"The agreement going into force represents a consensus of what will allow Ocean Alliance carriers to achieve efficiencies without harming the marketplace," he adds.

The FMC's ruling gives the Ocean Alliance permission to begin sailing on U.S. trade routes immediately, but the Alliance isn't expected to begin operating until April 2017.

It's All About the Data of Things

As the Internet of Things (IoT) becomes more prevalent, what we know today as Big Data will seem as quaint as a flip-phone. The total volume of data generated by IoT will reach 600 zetabytes (a zetabyte is one billion terabytes) per year by 2020, Cisco estimates. Every pallet, truck, and forklift will contribute to this data deluge.

With growth in the number of commercially available IoT solutions, 2017 will see many new deployments, many of which will likely end up overwhelmed by the resulting data, and struggling to extract intelligence from it. Avoiding that expensive outcome requires shifting attention away from the shiny side of IoT—sensors, lights, and actuators—and toward the top where the bits reside.

For supply chain managers, putting the data first and being prepared to fully utilize the inputs is essential. Several key tips to make this process work:

- Include analytics solution providers early in the planning.
- Verify that the infrastructure is ready to handle the soon-to-be-generated data.
- Take the extra step to run simulated data through existing systems.

These steps will help current supply chains stay up to date for future innovations such as edge-computing—an important idea in IoT system design. In this model, some data-processing is done very close to where it is being generated so not everything needs to traverse up to the cloud. Think an on-board vehicle computer processing pallet temperature data, with alerts generated locally. "A key issue for IoT in the coming years is subsidiarity, i.e. performing the data analysis at the appropriate level," according to Cisco.

Another key development in the year ahead: The analytics side of IoT will soon become almost entirely machine-learning (ML) driven. ML works best, revealing unexpected insights, when lots of data is collected but users stay agnostic about outcomes. To prepare for this change, users should ensure they implicitly center initiatives around proving a hypothesis, which would be underutilizing the power of IoT and ML.

So rather than collecting data with an aim to prove, say, that reefer temperature outages happen during commute hours, collect as much data as you can about the reefer, everything in it, and everything associated with it such as traffic, weather, and driver. By doing so, you help your ML-driven analytics engine reveal unexpected correlations.

Finally, develop a process flow that can accept and act on the real-time decisions that IoT makes possible. Prioritize recommendations and actions over reports. After all, reports are just more data waiting to be processed.

— PV Subramanian, Founder & CEO, Visybl

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GLOBAL

THE WORLD AT A GLANCE

by Jason McDowell

Manufacturing Supply Chains: What Does the Future Hold?

Nobody can predict the future, but some are certainly qualified to make educated guesses. Over the next decade, manufacturing growth depends on successful engagement with consumers, according to *IDC FutureScape: Worldwide Supply Chain 2017 Predictions*, a new report from IDC Manufacturing Insights.

The report makes the following 10 predictions for the decade to come:

1. By 2019, 50 percent of manufacturing supply chains will benefit from digital transformation. Outdated business models or functional structures will hold the rest back.

2. By 2020, 50 percent of mature supply chains will use cognitive computing/artificial intelligence and advanced analytics for deployment-based planning and to eliminate sole reliance on short-term demand forecasts.

3. By the end of 2018, 90 percent of manufacturing supply chains will use B2B commerce networks as the primary collaboration tool for demand, supply, service, and new product development.

4. By the end of 2017, 35 percent of supply chains will actively use supply chain control towers with expanded use of integrated business planning.

5. By the end of 2020, 50 percent of manufacturing supply chains will have the capability, either in-house or outsourced, to enable direct-to-consumption shipments and home delivery.

6. By the end of 2019, 90 percent of manufacturing supply chains will use cloud applications within supply chain fulfillment to reduce complexity and increase speed and visibility.

7. By the end of 2018, 75 percent of large enterprise manufacturers will have transitioned to capabilities-based procurement processes within their businesses.

8. By the end of 2019, the use of Internet-of-Things sensors for real-time information sharing across organizational borders will boost manufacturing supply chain productivity and efficiency by 30 percent.

9. By the end of 2020, 50 percent of manufacturers will derive business value from the integration of supply chain,

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plant operations, and product and service life-cycle management.

10. By 2018, technology-enabled risk and resiliency capabilities will have become a key element of value for 75 percent of manufacturing supply chains.

"The coming years will greatly alter the technology landscape for supply chain organizations," says Simon Ellis, vice president of global supply chain strategies, for IDC Manufacturing Insights. "While the predictions offered here largely focus on the near to mid-term, the impact of many of these will be felt for years to come.

"It is worthwhile to note that predictions are not finite but rather occur on a continuum of change within the wider ecosystem of the manufacturing industry and global economy," he says.

Global Connectedness Increases, Future Uncertain

The Great Recession caused many countries to turtle up and focus on their own problems. Now, however, global connectedness has exceeded pre-recession levels, according to the fourth edition of the DHL *Global Connectedness Index*, an analysis of the state of globalization around the world.

In 2015, globalization's expansion slowed, but didn't slip backwards. Additionally, data shows that the world was approximately 8 percent more connected in 2015 than it was in 2005.

Even with this data available, it's difficult to predict where globalization goes from here. "Policymakers have a substantial impact over whether globalization will advance or reverse and there is uncertainty in how this will evolve in the coming years," says Mike Parra, CEO, DHL Express Americas. "Looking forward, levels of global connectedness may increase, stagnate, or even suffer a sharp reversal. But given the parameters of the current situation, it is unlikely that increases could yield a state in which the differences or barriers between countries can be ignored.

"Nor is it probable that decreases could lead to a state in which the similarities or bridges that unite countries could be disregarded," he adds. "Social media and shared economic platforms have brought people and markets together, and we believe that that connectedness is unlikely to be reversed anytime soon."

Still, the global political climate has many companies wondering what they can expect. For example, Britain's exit from the European Union has made many global businesses uneasy.

"What needs to be evaluated is whether we are seeing a broader trend toward isolation and protectionism, which could prove powerful enough to reverse recent gains," says Parra. "Any significant impact of Brexit on aggregate levels of global connectedness could only come via contagion to other countries.

"It is too early to determine where this is the case, which is why the positive global trends revealed in this year's report are presented with some uncertainty," he notes. "There are many factors that could buffer the impact of Brexit on its global connectedness, most notably its breadth of connectedness.

"The UK ranks first out of 140 countries in the breadth of its international interactions, and – given the importance of physical proximity to connectedness – the European Union is likely to continue to

TOP 10 GLOBALIZATION HOTSPOTS

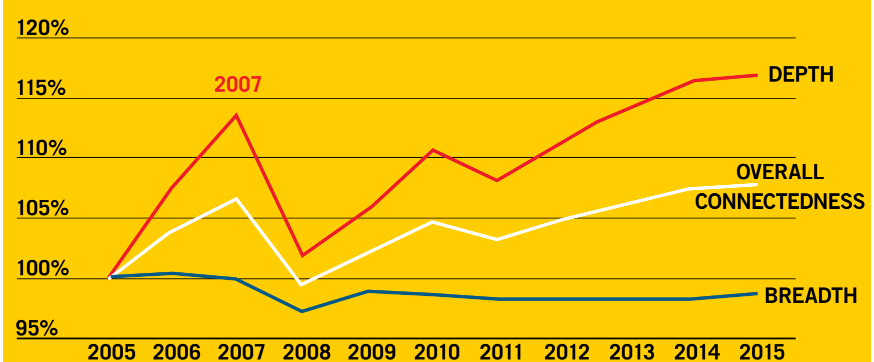
1. **SINGAPORE**
2. **MANAMA**
3. **HONG KONG**
4. DUBAI
5. AMSTERDAM
6. TALLIN
7. DUBLIN
8. GENEVA
9. ABU DHABI
10. SKOPJE

Globalization hotspots are the cities with the most intense international flows of trade, capital, people, and information compared to their internal activity.

Source: DHL Globalization Index 2016

GLOBALIZATION SURPASSED ITS PRE-CRISIS PEAK, ADVANCED MODESTLY IN 2015

Current evidence — some still preliminary —suggests the world is about 8% more connected in 2015 than it was in 2005.



DEPTH measures the proportion of flows (and accumulated stocks) that cross national borders.

BREADTH captures the geographical distribution of international flows (and stocks).

Source: DHL Globalization Index 2016

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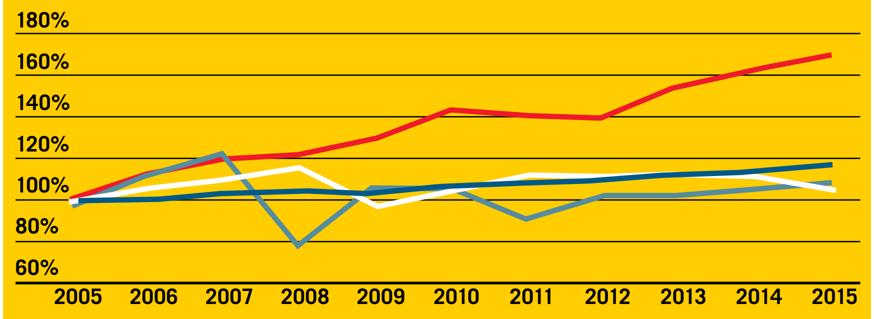
INFORMATION FLOWS ARE A BRIGHT SPOT FOR GLOBAL CONNECTEDNESS



This illustration shows the depth of trade, capital, information and people flows. Depth measures the proportion of interactions that cross national borders.

INFORMATION International information flows have expanded swiftly since 2005

PEOPLE International people flows have grown modestly

CAPITAL Gains in international capital flows have been limited

TRADE The proportion of output traded across borders has declined

Source: DHL Globalization Index 2016

be the UK's largest export-import partner. The extent to which this separation impacts their connectedness is largely in the hands of the European Union and UK."

The results of the U.S. presidential election have also left many speculating about its impact on globalization.

"The Trans-Pacific Partnership would likely have served to increase the connectedness of smaller partners, such as Chile and New Zealand, much more than it would have impacted Japan and the United States," Parra says. "However, these developments do reinforce the powerful role policy makers play in the future of global connectedness.

"As with Brexit, if this is indicative of a trend toward increasing isolationism, it could result in a reversal of the recent trend toward increasing connectedness," Parra says. "That possibility is supported by Global Trade Alert, which reported 50 percent more discriminatory trade policy measures in 2015 than 2014.

"However, as stated in the report, the future of globalization is unclear, and those policies don't independently translate to the reversal of globalization as much as they support its ambiguity," he adds.

Slim: Trump Could Be Good For Mexico

Despite continuing talk about putting up a wall between the United States and Mexico, Donald Trump's presidency could wind up actually being good for Mexican business, says Carlos Slim, Mexican business magnate and one-time richest man in the world.

"It is going to be bad for the first few months, but President Trump is talking about expanding the economy of the United States," Slim told *Mexico News Daily*. "If they do grow at 4 percent and lower taxes for the middle class, that would be fantastic for Mexico, as the American people would have greater purchasing power for the goods and services that Mexico exports."

To reap the rewards of increased exports, Mexico needs to turn its gaze inward, according to the businessman. With an annual investment of $250 billion, Mexico can achieve growth rates of 5 percent as it had in the 1980s, Slim said.

Additionally, if Mexico can leverage increased production and create more jobs within its own borders, the country may not lose so many unemployed members of its workforce to their northern neighbor. With the exchange rate hovering around 20 pesos per dollar, Mexico can remain competitive due to its cheap labor, Slim said.

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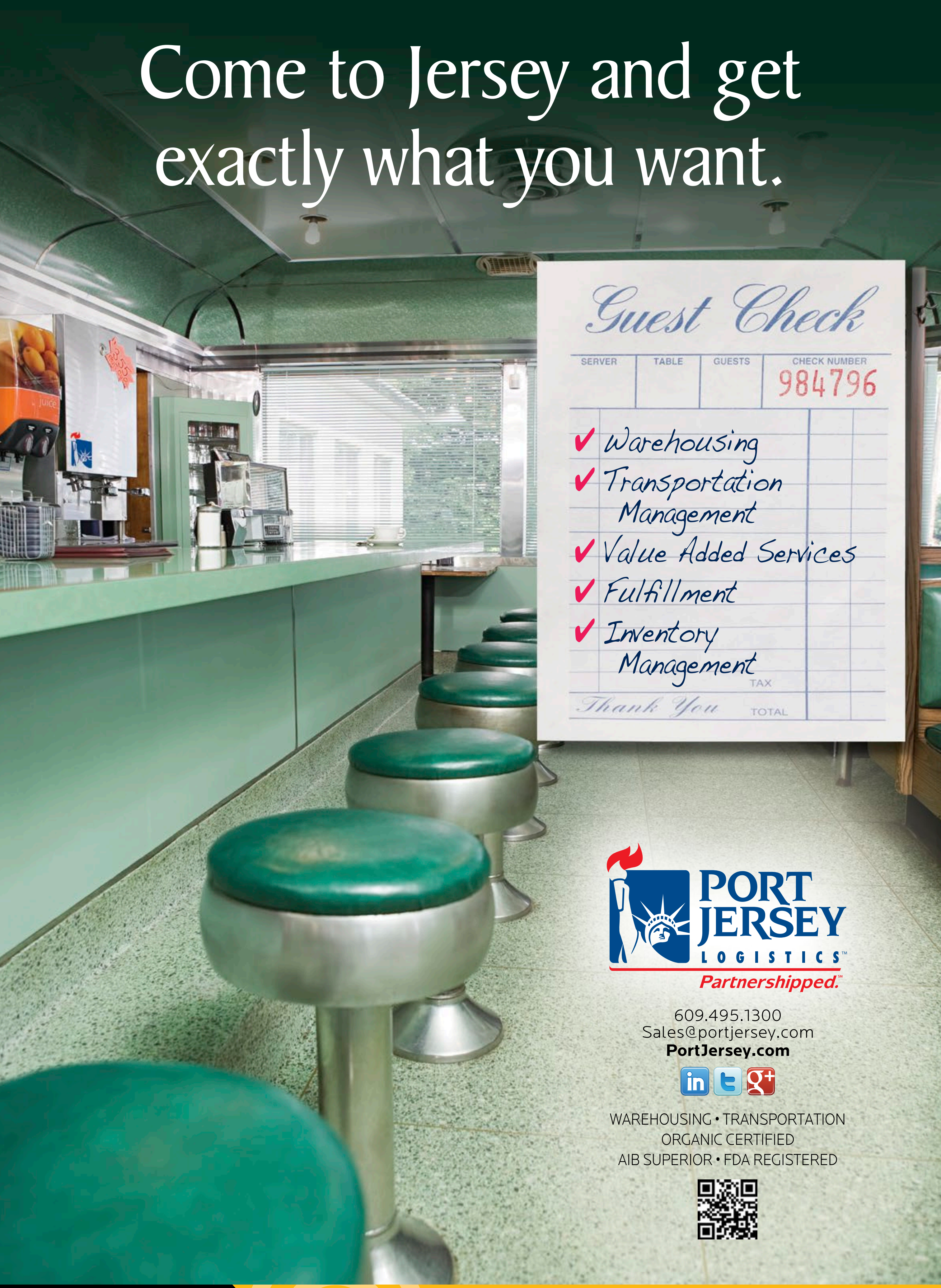

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Air Cargo's Link In the Global Value Chain

For developing countries, the ability to become part of global value chains (GVCs) depends on the ability to specialize in a specific area, such as production, research and development, or assembly, according to *Value of Air Cargo: Air Transport and Global Value Chains*, a report from the International Air Transport Association (IATA). For those nations hoping to successfully become links in these chains, air cargo infrastructure is crucial.

There is a direct correlation between air cargo connectivity and a country's total trade value. A 1-percent increase in air cargo connectivity is associated with a 6.3-percent increase in total imports and exports, the report says.

To continue facilitating global economic development, IATA recommends the air cargo industry and world governments focus on the following five priorities:

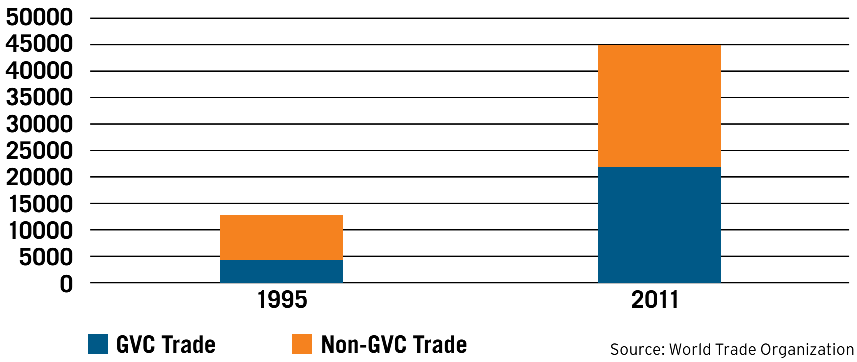
1. Further the use of electronic air waybills and e-freight.

2. Implement submission of all

Global Value Chains: A New Trade and Development Paradigm

Global Value Chains (GVCs) enable countries to specialize in narrowly defined tasks, such as component production, research and development, or assembly. Tasks originating in a variety of countries are then combined, through a complex network of trade and investment links, to produce finished goods such as cars, computers, cellular phones, and even aircraft. The World Trade Organization estimates that almost half of global trade flow takes place within GVCs — and GVC trade has been growing more rapidly than other types of trade since the 1990s.

GVC and non-GVC trade in goods and services, 1995 and 2011, billion USD



Source: World Trade Organization

READY.

With our own fleet of trucks fully equipped and ready to go, Syfan and our carrier partners will be fully ELD compliant by mid-year with new shipment reporting requirements.

WILLING.

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regulatory documents through a single channel.

3. Reduce duplicate procedures between border agencies.

4. Introduce risk management controls at borders to reduce illegal activity and expedite legitimate trade.

5. Implement processes to release shipments in advance of arrival.

"Facilitating trade with efficient air cargo processes requires a strong partnership between governments and industry," said Glyn Hughes, global head of cargo for the IATA, in a public statement. "Governments have the important role of implementing global standards and agreements to facilitate trade and make it possible for airlines to modernize processes.

"In turn, the industry needs to embrace these opportunities to improve competitiveness and provide customers with enhanced shipping quality, service, and better predictability," he adds.

India Ponders Air Cargo Increase

India is focusing on leveraging the untapped potential of its air cargo sector.

India is looking at expanding its national airfreight infrastructure. Traditionally, cargo in the country moves by highways or waterways, while flights are reserved mostly for moving people. But if all goes well, that is about to change.

"In India, the movement of cargo through airlines hardly exists because you have only two airlines and three aircraft as compared to hundreds of aircraft in other countries," Ashok Gajapathi Raju, India's aviation minister, told *The Indian Express*. "We need to develop it, and the government sees it as an opportunity to double the income of farmers."

Currently, moving cargo by air is inefficient, and moving perishable cargo is nearly impossible because of clearance times.

"If the dwell time in the airport is more than 72 hours, the perishable goods will have to be discarded," Raju said. "We are working on those areas to streamline the transaction process, at the same time encouraging businesses to take up interest in promoting the interest of the farming community."

The initial focus of the Aviation Ministry will be expanding rural connectivity within India. Raju also notes that the country has an abundance of produce that could be exported to neighboring countries by air, if only the infrastructure existed. He expects upcoming growth in India's aviation sector to exceed 20 percent.

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Supply Chain Challenge?
SOLVED!

Deploying Pharmaceutical Foreign Trade Zone Services

MD Logistics leverages FTZ services to provide game changing benefits to its customer base.

THE CHALLENGE

Even the most efficient supply chains must overcome the most rigorous requirements associated with U.S. Customs and FDA compliance. Despite a company's efforts to make upstream and downstream improvements, these regulations can impede the speed to market and compromise overall supply chain efficiency. As a trusted partner with several industry-leading manufacturers of pharmaceutical and medical device products, MD Logistics is tasked with ensuring a safe and secure supply chain for valuable, temperature-sensitive products.

THE SOLUTION

After auditing a major pharmaceutical client's processes, MD Logistics quickly realized deploying Foreign Trade Zone (FTZ) services for their client would be a game changing solution, offering several benefits, including lower risk, increased efficiency, and speed to market when importing product. More specifically, FTZ services allow a customer's product to quickly flow to market, move immediately to a secured and monitored facility without waiting for customs clearance, and maintain a consistent temperature throughout the process.

After securing FTZ status and finalizing the organizational structure needed to remain compliant, MD Logistics activated the solution within its pharmaceutical facility for ambient (controlled room temperature), cold chain (2 to 35 degrees Celsius) and extreme cold chain (below -20 degrees Celsius) products. Upon realizing the tremendous benefit to its customer base, and further streamlining its internal processes, MD Logistics began to offer pharmaceutical foreign trade zone solutions to other customers.

To learn more about MD Logistics' solutions, email info@mdlogistics.com, call 317-838-8900, or visit www.mdlogistics.com.

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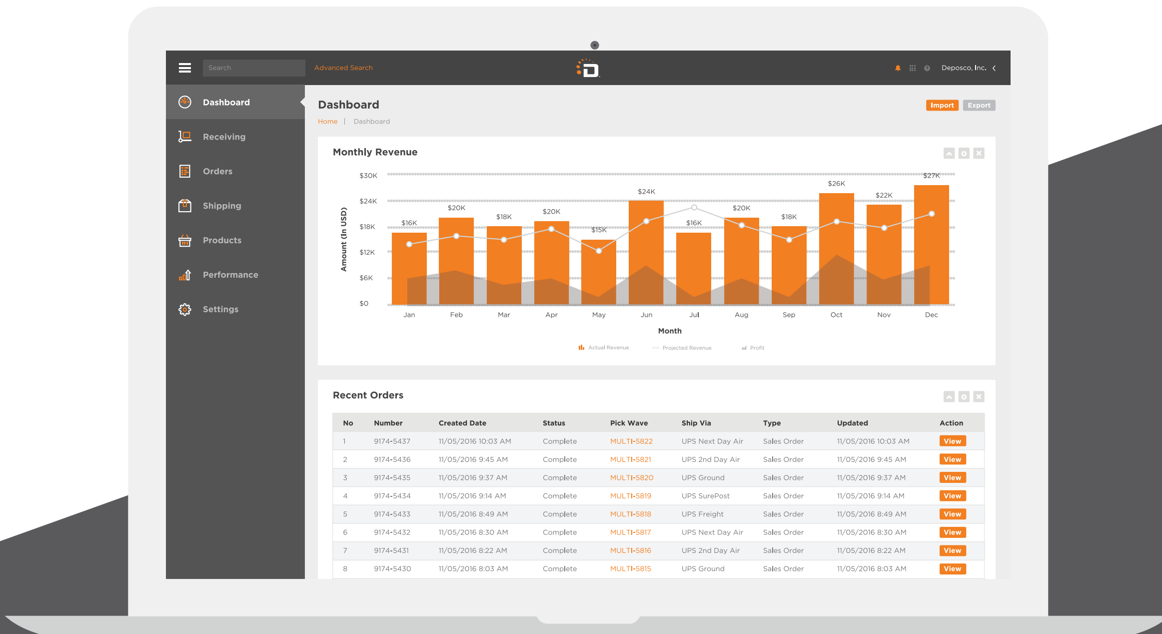

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Supply Chain Challenge?
SOLVED!

Improve Warehouse Productivity With Reach Trucks

Jungheinrich® reach trucks help LeanCor's mission to advance the world's supply chains.

THE CHALLENGE

LeanCor Supply Chain Group is a trusted supply chain partner with a mission to advance the world's supply chains. Centrally located in Florence, Ky., they have been meeting the logistics needs of lean manufacturers since 2005.

Through a business expansion, taking on additional clients as a lean 3PL provider, LeanCor had a need to streamline and improve the efficiency of forklift usage in their various warehouse environments. Operating on a 24/7 schedule, it was necessary for LeanCor to get the right equipment in place to efficiently work through their 8-hour shifts.

THE SOLUTION

Partnering with their local Jungheinrich dealer, LeanCor found the ETR series of Jungheinrich® pantograph reach trucks as the perfect fit for their lean focus. Designed for energy efficiency and operating two shifts on one battery charge, the reach trucks allow their operators to work longer on one battery charge, improving productivity and saving time for better efficiency.

Tom Kinder, operations manager at LeanCor explains, "We don't change (our forklift) batteries here. We just run the truck throughout the shift and opportunity charge. The quick-charge system is definitely more efficient and it's a cost savings."

LeanCor now relies on its fleet of Jungheinrich reach trucks for bulk order picking, put-away and replenishment. Key features like its tight turning radius, compact lift truck design and long run times help give LeanCor the competitive edge they need to support their customers.

LeanCor relentlessly focuses on lead-time reduction and recognizes that the pace-setting process guides all supply-chain activities. The ETR reach truck was able to meet their high demands and fast-paced schedule for a more efficient operation.

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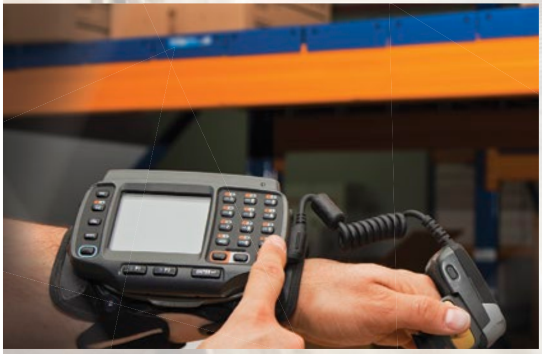

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We have invested significantly in systems and technology and maintain long-term relationships with all of the other interim suppliers along our clients' boxes journey. As a result, our clients can track their merchandise at every step through and from our warehouse to multiple points of destination.

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Supply Chain Challenge?
SOLVED!

Transplace TMS Causes Chemical Reaction

Transplace's technology and expertise help Brenntag streamline operations and realize greater visibility.

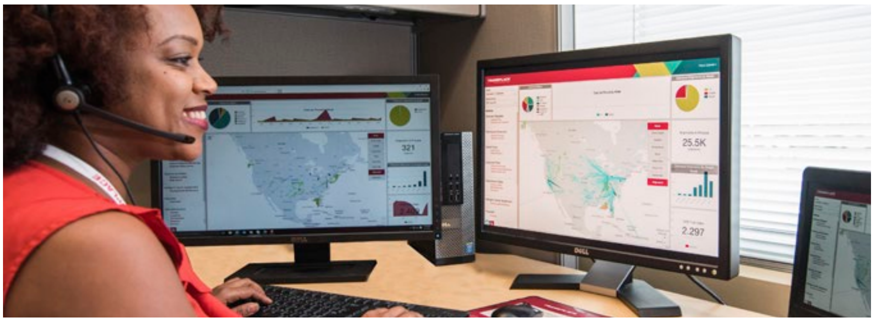
THE CHALLENGE

With more than 10,000 products and 140 locations throughout North America, Brenntag North America, a leading chemical distributor, has a large number of shipments going in and out of facilities. The company recognized the opportunity to increase visibility of all inbound, outbound, direct and stock transfer shipments and streamline its supply chain operations by centralizing its transportation management activities. The goal was to have all less-than-truckload (LTL), dry van, flatbed, bulk tank and intermodal shipments – across every location and business unit – managed in a transportation management system (TMS).

THE SOLUTION

Brenntag North America identified Transplace as the ideal partner because of its comprehensive logistics technology and experience in the chemical sector. Using Transplace's proprietary software-as-a-service (SaaS) TMS to manage all of its inbound and outbound shipments allowed Brenntag to streamline its operations and realize greater visibility of the entire shipment lifecycle; optimizing and tracking shipments in real-time while providing status updates to customers.

Electronic tendering capabilities provide a clear view of shipment tenders, and the TMS's automated process for finding and assigning the lowest cost approved LTL carrier saves time while reducing freight costs. Leveraging Transplace's procurement tool has given Brenntag North America access to a larger network of carriers and brokers with the simple click of a button in order to get a load covered quickly and at the most competitive cost – generating significant cost savings. Additionally, automating the invoicing process helped ensure payment accuracy and produced further annual savings.



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Paul Thompson, Founder and Chairman, Transportation Insight
877-226-9950 • info@transportationinsight.com

Shaking Up the Brown Box: Big Winners in Supply Chain Evolution

With the infusion of multi-modal, multi-channel platforms, e-commerce is shaking the supply chain industry upside down. The consumer is now able to outrun the industry, and shippers are questioning their competency to continuously evolve their supply chains. To implement transformational strategies, operations teams are facing broad and deep investments in diversified technology and human resources to hit performance expectations. Disruptors such as e-commerce, omni-channel, the Internet of Things, near-shoring, import/export compliance, automation and the speed of business have accelerated the need for best practices and reinvention. Shippers today are seeking digital intelligence and a more fully integrated, multi-modal supply chain to achieve visibility, speed, efficiency, innovation and – most importantly – customer satisfaction.

To create synergy between strategic technologies and analytics, many shippers are aligning with partners to help them evolve their supply chain into an adaptable value stream. Companies cannot effectively manage what they cannot measure, and as the digital thread further penetrates the supply chain, data provides deeper understanding of the supply chain's current and future state. Data can be collected, measured and analyzed through every stage from raw material sourcing and production to last-mile delivery and invoice audit and payment.

Insight from that data provides what decision-makers absolutely must understand: optimal cost-to-serve scenarios, whether for a particular SKU or an individual customer. They are using integrated, continuous analytics, modeling, simulation and planning tools that can develop "what-if" scenarios critical to improving the supply chain in the face of potential disruptions. This becomes increasingly important as companies continue to onshore or nearshore their operations to focus on the purchase of fewer SKUs that can be customized and retrofitted into a variety of different products.

Data insight and analysis can also support development of risk/contingency plans, while providing greater understanding of:

- Product level profitability
- Most efficient lanes
- Preferred distribution center locations

Many companies will be challenged to independently create the technology and visibility that enables all parties to understand where a product is in process, the optimal locations to fulfill a shopping cart order and the best last-mile delivery networks. Manufacturers, retailers and distributors will likely rely on extensive analytical resources in the future, possibly to navigate change with emerging intelligent sensors, smart applications, robots and drones. Shippers can position themselves for greater success by partnering with a holistic supply chain resource that can help them gain end-to-end supply chain visibility and control while multiplying their supply chain expertise.

A technology-driven progression is especially important for retailers desiring a larger share of the e-commerce pie. The need to move faster is critical, not just to the strategic and operational aspects of the supply chain, but also to the hidden opportunities for improvement within freight invoices, parcel invoices and agreements. Shippers benefit from collaboration with a partner who has visibility to enormous volumes of shipping data. Expertise, combined with technology such as Insight TMS®, best practices such as Extended LEAN® continuous improvement for the supply chain and a web-based business intelligence portal such as Insight Fusion®, can be game changing for many companies which could not sustain a competitive advantage alone.

The digital thread of automation is also driving enterprise transformation. Streamlined business processes are critical to success, particularly where effective communication and product visibility play increasingly important roles. As such, initiatives toward more sustainable supply chains are on the rise, as shippers look to be more efficient and serve customers for the long term. And with more millennial executives, sustainability is evolving from a buzz word to a conviction. The next-generation executive wants their business not only to make customers better, but also to make the world better.

So, as shippers ponder how it will all shake out, we continue to see online buying patterns influence the shipping patterns and distribution networks, from a pair of shoes in a small brown box to major items such as washing machines and hot tubs. Business-to-consumer demand is set to outpace supply in the marketplace. Those who can solve that problem will be the big winners in the next phase of supply chain management.

Supply chain innovator Paul Thompson is Founder and Chairman of Transportation Insight, a lead logistics provider offering e-commerce and multi-modal (LTL, Parcel, TL) supply chain solutions. Globally recognized for advanced analytics, technology and Co-managed Logistics® services, Transportation Insight is a 2016 SmartWay Excellence Award Recipient.

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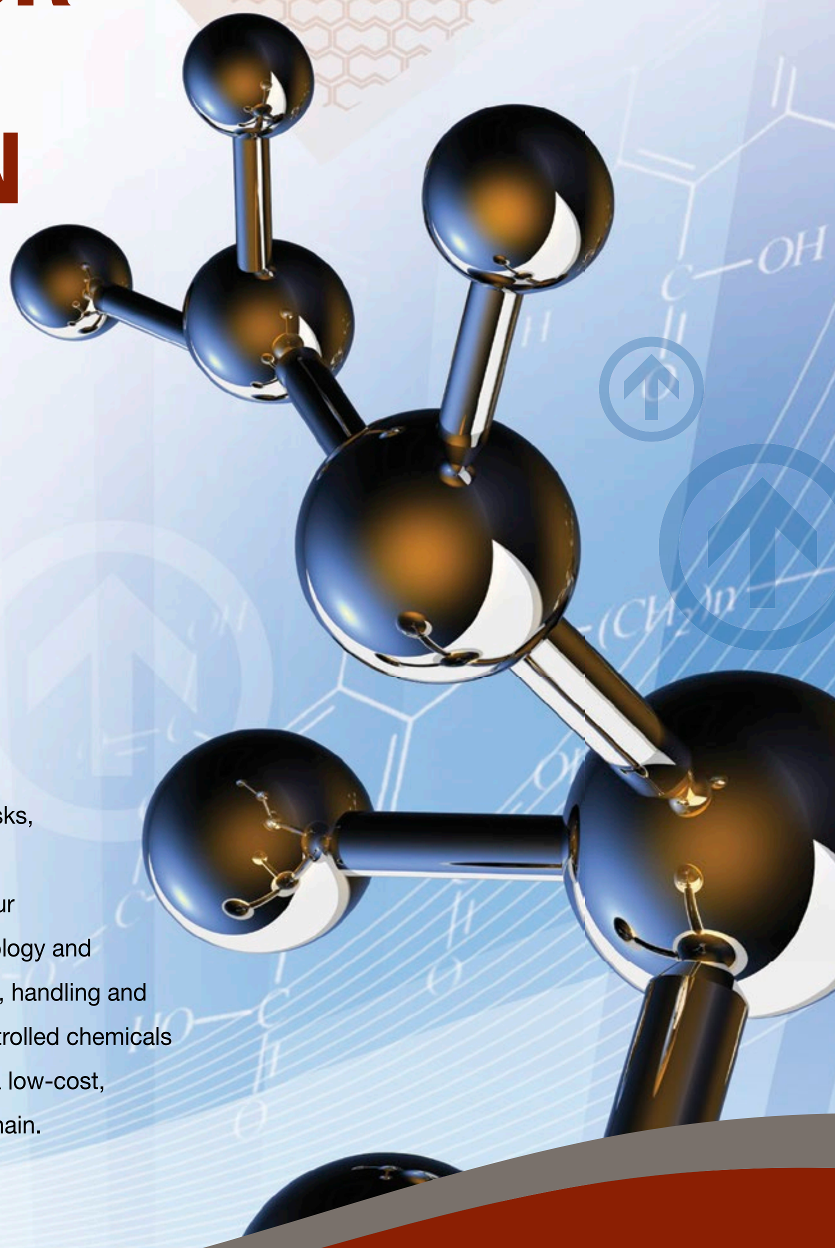

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George Prest, CEO, MHI
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Industry 4.0 is the X Factor That Will Transform Today's Supply Chains

The enigmatic X Factor—that unknown element that will take supply chains to the next level. As is so often the case in our industry, there's not just one transformative technology that will produce revolutionary change within our field, but rather many.

The MHI Annual Industry Report examined the concept of the digital, always-on supply chain, defined as: "An integrated set of supply networks characterized by a continuous, high-velocity flow of information and analytics, creating predictive, actionable decisions that better serve the customer."

That definition, as it turns out, sounds a lot like the term "Industry 4.0," also called the fourth industrial revolution (the first being steam- and water-powered mechanization in the 1800s; the second debuted in the early 1900s with electric-powered linear assembly lines; and the third was marked by the integration of computers, robotics and automation of connected, fixed-line machinery in the 1970s).

Industry 4.0 expert Markus Lorenz, partner and managing director of The Boston Consulting Group's industrial goods and operations practices, describes it as a trend toward greater interconnectivity between automated equipment. Through data exchange between cyber-physical systems enabled by the technologies mentioned above—plus device interoperability and communications supported by the Internet of Things (IoT)—Industry 4.0 supply chains will be transformed by intelligent machinery. Letting the machines make smart decisions with minimal human intervention will yield greater productivity, faster throughput and dramatically fewer errors.

But how?

Lorenz attributes such gains to the ability of "Industry 4.0 systems to reach far beyond the limits of a facility's four walls or the confines of a single organization," he says. "These cyber-physical systems interact with each other via standard, Internet-based protocols. Further, they continuously analyze data to predict failure, then adapt to changes by reconfiguring themselves."

Thus, in an Industry 4.0-enabled supply chain, it will be possible to collect and analyze data across all machines, yielding faster processes that are more flexible, more efficient and produce higher-quality goods at reduced costs.

Industry 4.0 will transform the supply chain workforce.

Our industry continues to be challenged by the perception that manufacturing and warehousing facilities are dark, dirty and stagnant; that the work is physically demanding, repetitive and offers limited potential for advancement. While that hasn't been true for decades, Industry 4.0-enabled supply chains will not only offer dynamic, interesting and challenging jobs, it will also create millions of them.

Lorenz's research on the impact of Industry 4.0 on Germany's manufacturing industry shows that 600,000 traditional jobs will be lost in the next decade—and subsequently replaced by more than 1 million new ones. And, he predicts a similar workforce evolution in the United States.

These new careers will demand new skill sets, as the nature of the work changes. Traditional tasks will be replaced by: industrial data analysts; data modeling, simulation and interpretation specialists; mechanical and industrial engineers; autonomous robot and vehicle task and routing coordinators; digitally assisted field service technicians; and research and development specialists.

But which systems and solutions should companies invest in to become Industry 4.0 ready?

At MHI, we see a direct correlation between those X Factor technologies and Industry 4.0 preparedness; indeed, it's no accident that MHI selected "Solve for X" as the theme of ProMat 2017.

As one of the largest global material handling and logistics expos, ProMat 2017 runs April 3-6 at McCormick Place in Chicago. Across the 350,000 square feet of show floor, more than 850 exhibitors will showcase the latest technologies and solutions that are essential for maintaining competitiveness throughout manufacturing and the supply chain. Further, at 8:45 a.m. on Tuesday, April 4, Markus Lorenz will deliver the keynote "Industry 4.0 – How Intelligent Machines are Transforming Supply Chains," to help attendees gain a better understanding of this trend and what it means for their businesses.

Industry must embrace the benefits and the opportunities intelligent, connected machines will provide—not only for organizations, but also for individuals in our daily lives.

I hope you'll accept MHI's invitation to Solve for X and learn more about Industry 4.0 at ProMat 2017. For more information or to register, please visit promatshow.com.

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Mark Johnson, Senior Vice President of Transportation and Solutions, Kane Is Able
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The Pragmatist's Guide: 10 Simple Strategies to Reduce Freight Costs Now

Freight transportation is your biggest logistics expense, so it's likely that you're under constant pressure to drive down these costs. Here are 10 ideas to consider as we head into 2017. Some of these strategies may encounter resistance from the "not the way we do it here" crowd. But let's face it, any meaningful cost reduction initiatives will require change. Savings estimates are not cumulative.

1. Contract steady lane volume. If your carrier knows he is going to work with you every day, and is going to get a regular flow of freight in the same lane, he can market those backhauls and build out his network. As a result, you'll pay less because the carrier is more efficient. POTENTIAL SAVINGS: 2%–12% versus traditional lane pricing.

2. Ship on off-peak days. Shipping one day later or earlier can yield measurable savings. Friday is typically an off-peak day for shipping consumer goods because most retailers want product to the store by Thursday so it can be ready for sale at the weekend. POTENTIAL SAVINGS: 10% versus peak ship days.

3. Invest in relationships, not RFPs. Don't do the yearly RFP dance in order to show management you're serious about reducing freight costs. Instead, forge strategic, longer-term carrier relationships. This allows carriers to mine for other customers in the area to create a more efficient network with minimal deadhead miles. A carrier that is maximizing assets is more profitable and will give you better rates. POTENTIAL SAVINGS: 3%–5% per year (these savings can easily double when capacity tightens).

4. Reduce dunnage. A lot of products require air bags, strapping, blocking and bracing to prevent them knocking together during a trip across the ocean or on a long-distance truck ride. But sometimes shippers go overboard in trying to prevent damage. Carriers can help you skinny down on dunnage to reduce costs – without increasing damage. POTENTIAL SAVINGS: 1%–3% per load.

5. Use a load board. If you have a one-off shipment and put it on a load board, you'll probably catch a low rate, especially if the carrier can handle it as a backhaul. Carriers love backhauls because they're making money when they would otherwise incur costs for empty miles. For a backhaul, many are willing to offer a rate that simply covers fuel costs, plus a little bit extra. POTENTIAL SAVINGS: 20%–40%.

6. Offer night pick-ups. This may give carriers an opportunity to make your load into a backhaul by offering them pick-up times between 6 p.m. and midnight. For example, a carrier might turn down a load that's requested for a mid-afternoon pick-up because it conflicts with another run. But a later pick-up allows him to make his delivery and fill his backhaul with your freight. POTENTIAL SAVINGS: 15%–20% off standard rates.

7. Ship more product, less often. Lobby your customers to take larger orders. It's a lot cheaper to ship six pallets at once than to send two pallets every two days. But retailers tend to look for smaller shipments more often, so you need to create incentives for them to take more inventory than they think they need. POTENTIAL SAVINGS: up to 50% versus the smallest LTL loads, when minimum charges may kick in.

8. Look for carriers based near your ship-to points. That way your load is more likely to become a backhaul for them and you'll get a lower rate. It's surprising how many shippers don't investigate carrier terminals near their frequent ship-to locations. POTENTIAL SAVINGS: 15%–40% versus a non-backhaul rate for that lane.

9. Load smarter. Maximizing the cube of a product, stacking the product so you take fewer pallet spots, even boxing it differently, all help make it easier to get more cargo packed onto a pallet and into a trailer. Your freight's footprint will impact the cost. Ask your carrier for a recommendation on building more efficient pallets. POTENTIAL SAVINGS: up to $150 per pallet space.

10. Outsource your transportation department. For smaller companies especially, freight management is not a core competency. Hiring, training and maintaining a transportation staff, and keeping up with systems requirements, can be expensive and time-consuming. Outsourcing freight management transfers the financial burden of staffing and capital expenditures and also opens the door to innovative solutions that on-the-ball carriers should be suggesting. POTENTIAL SAVINGS: 10%–35% off the current cost to manage.

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Dan Clark, Founder and President, Kuebix
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Cloud Collaboration Increases Supply Chain Efficiency

Defined as the art of working together to produce or create something, collaboration has become a focal point for organizations that want to work smarter, better, and more efficiently in today's competitive business world. Enabled by technology, companies and individuals are working together to achieve common goals, open new lines of communication, and foster both creativity and cooperation in new and previously inaccessible ways.

Collaboration is especially critical in the supply chain, where many different stakeholders play a role in the success of the larger "machine," if you will. "Supply chains face a common challenge," according to Accenture's Supply chain management in the cloud report. "Detailed knowledge of operations is held locally creating silos—organizational, functional, and cultural—and these undermine effective collaboration between different elements of the supply chain, increasing the likelihood of problems emerging at a late stage, and limiting options for response."

To overcome these challenges, procurement, logistics, accounting, merchandising, sales, and planning must be working from the same playbook on the internal side. Externally, suppliers, carriers, brokers, and other business partners all play their own respective roles in the success or failure of the overall supply chain.

We started seeing fewer "failures" when cloud computing came on the scene and delivered on its promise to connect all factions of the supply chain via the web. So rather than dealing with siloed entities that only talk to one another when they had to—usually via phone, email, or fax—companies started using sophisticated online platforms to enhance visibility and collaboration in real-time and on a 24/7 basis. In the grocery industry, for example, we're seeing more companies moving away from traditional purchase order (PO) issuance via enterprise resource planning (ERP) or disparate legacy systems, and over to cloud-based solutions. Those solutions incorporate the structured and unstructured information stored in many different databases—and other pieces of information—and consolidate it into a single, central repository that's visible to all supply chain partners in real-time.

To call cloud a breakthrough for supply chain collaboration would be a major understatement. By giving supply chain partners high levels of visibility, accurate information, and transparency in real-time, cloud computing improves supply chain efficiency for companies of all sizes and across all industries.

Suddenly, a company's logistics department booking a $500 shipment with a specific carrier is seamlessly sharing that information to all key stakeholders in real-time. The company's accounting department receives the agreed upon rate for audit and payment purposes. The executive management team sees that the shipment was booked at a $300 savings, because the logistics team had full visibility of all carrier rates and selected the best possible quote. Finally, the carrier itself has visibility of the shipment for scheduling purposes, track and trace updates, and invoice management.

On the supplier side, cloud collaboration eliminates numerous time-intensive, manual processes. When a buyer places an order in Kuebix for example, that information gets automatically integrated into a central repository of information known as a supplier portal. That portal gives the supplier real-time visibility over what was purchased to avoid issues like missed shipment promise dates and carriers coming to pick up freight that's not yet ready to ship. This, in turn, results in higher levels of customer service and happier buyers.

Additionally, increased collaboration and communication between procurement and suppliers leads to better shipping decisions. A logistics planner who has real-time visibility over orders and shipments, for instance, can communicate with suppliers to adjust shipping schedules and consolidate freight into more affordable truckload (TL) opportunities. Or, maybe he or she can opt for LTL over high-cost parcel delivery methods. Whatever the scenario, having a collaborative, cloud-based platform helps all entities in the supply chain make better decisions that, in turn, result in improved efficiencies and reduced costs.

At last count, the worldwide public cloud services market was projected to grow 16.5 percent in 2016 to $204 billion, up from $175 billion in 2015, according to Gartner, Inc. As more companies realize that traditional communication methods like fax and email just don't cut it in today's business world, and as more of them replace their legacy technology systems with more sophisticated platforms, the benefits of cloud-based collaboration will increase exponentially.

Kuebix provides a disruptive SaaS TMS built on the latest cloud technology that is changing how companies purchase and manage freight. The Kuebix platform is unique in that it is well suited for smaller companies, but will scale for the largest enterprises or the most complex supply chains. Learn more about Kuebix at www.kuebix.com.

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Alan Toliver, Chief Logistics Officer, Redwood Logistics
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What Supply Chain Resolutions Are You Making This Year?

Another year is upon us and with it comes a new opportunity to do things differently; to do things better. No doubt you have things you didn't get to last year, have ideas about what needs to change and maybe even have problems that keep you up at night. If you have been managing your supply chain the same way for a while, if your business is experiencing change and/or growth or if you simply know there has to be a better way, then now is the time to take action. After all, if you are not evolving, you are dying.

Before you can effectively and confidently transform any area of your supply chain, it is essential that you have good data. The best place to obtain this data is from your TMS. If you don't have one, then look to your ERP. A good starting point is to review the areas that you are being evaluated on by your customers and management. This should include cost, service and quality. Look at these areas to develop your supply chain resolutions for 2017.

Cost

Explore areas that don't get much attention – the big line items always get the most. But are you spending too much each month on areas like detention that just get approved with no plans to change behavior? Look for areas of waste and systematically go about eliminating it. It is not always about continuously driving down carrier rates. If capacity tightens this year, rates will go up. Have you reviewed consolidation opportunities lately or evaluated mode shifts to help drive down costs? Go beyond just broad cost metrics and dig into the details to further find ways to reduce costs. Identify a few areas that are ripe for the picking and assign them to the rising stars and hard chargers within your team – this will be great exposure for them and it will make your supply chain leaner.

Service

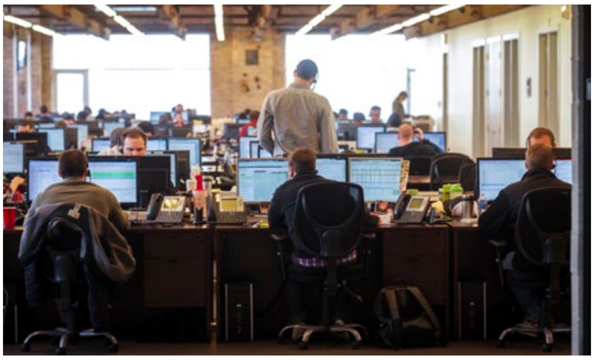
Customers are getting more and more demanding in all industries. Make sure you know how well you are servicing your customers and that you have plans to improve poor performance. It is essential that you measure your providers and hold them to the high standards you agreed on. Part of this includes knowing what you require of them, but also what your role is in helping them succeed. A small change in your process might improve things for your providers, so ask them what in your process adds complexity for them. Also make sure you know what your customers want and need. You may be getting product to your customer the next day when they don't need it for two or three days. This may be adding unnecessary costs to your supply chain.

Quality

Getting your products picked up on time and in a cost-effective manner doesn't do any good if the product doesn't arrive in the same condition or quantity that it left in. Work with carriers that you have confidence in. Quality applies to data as well. Are you receiving the necessary data from your vendors and carriers to allow you to plan properly and make good decisions? If not, identify the gaps and work to resolve them.

Start with things that you know you can manage and directly impact. Build momentum and get some immediate wins. Change takes time and energy. Make it a team effort and engage the key stakeholders. Visibly measure your progress so the team feels invested. Write down your ideas. Discuss them as a group. Be the leader you want to be and your organization needs you to be. Consciously drive change in 2017.

If you start early and stay focused, I think you'll be pleased come December 31st.



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Peter L. Coratola Jr., CEO/Founder, Ease Logistics
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The Potential of Change

With schools across the country rapidly increasing the use of technology in the classroom, recent graduates entering the logistics workforce expect similar atmospheres. Without even realizing it, these individuals have trained themselves in a variety of ways to further their career. They are comfortable spending hours a day behind the computer, checking their emails religiously, and adhering to the forever changing landscape that is the university's internal website. They have spent the last few years glued to their laptops; quickly learning and adapting to each professor's different software standards.

So, when they enter the workforce, why would we rip away the technology they have been educated with? Changing certain parts of the business to meet the expectations of millennials may be time consuming and expensive, but will be worth the investment for the future.

Plain and simple, graduates are expecting to complete their work just how they did in college. From turning in papers to taking an exam on the internet, many of their classes were completely paperless. Changing a few areas in the office will ease the transition from school to work.

A proper area for your new employees is a vital resource for their success. For 3PL companies that revolve around the internet, there are a variety of ways to help your employees. First and foremost, laptops and desktops should run the newest software available because most students' personal computers will be running the same platform. With many companies still running an operating system three generations old, it is time to invest in the updated version of Windows 10. Newer platforms also allow for expansion, including running multiple screens.

For 3PL companies, phones are also a vital part of the company. Outside the realm of business, landlines are a dying breed. These younger people will not have experience with the phones at first. These landlines should operate in a similar fashion to their smartphones. With a phone call sometimes not the best form of communication, there is software available to directly text from your computer.

Beyond the workplace, the numbers side of business can quickly be customized to fit the millennials' needs. 3PL could be completely done online if it wasn't for some companies that still request paper copies of their legal documents. Paper copies will soon be history. ACH payments that directly send money from bank to bank have many positive aspects. You will not be spending time stuffing envelopes full of checks, your payments will be secure, and you will be able to control exactly when customers receive their money. Transitioning away from such a solid foundation is frustrating and time consuming, but it will ensure your business will be prepared for the future.

After changing a few aspects in your company, you will begin to notice just how the investment paid off. Desktops will be less cluttered, electronic documents will be easy to find on the server, and your employees will be comfortable in the work environment.

Set your mind at ease and recognize the potential for millennials and their technology.

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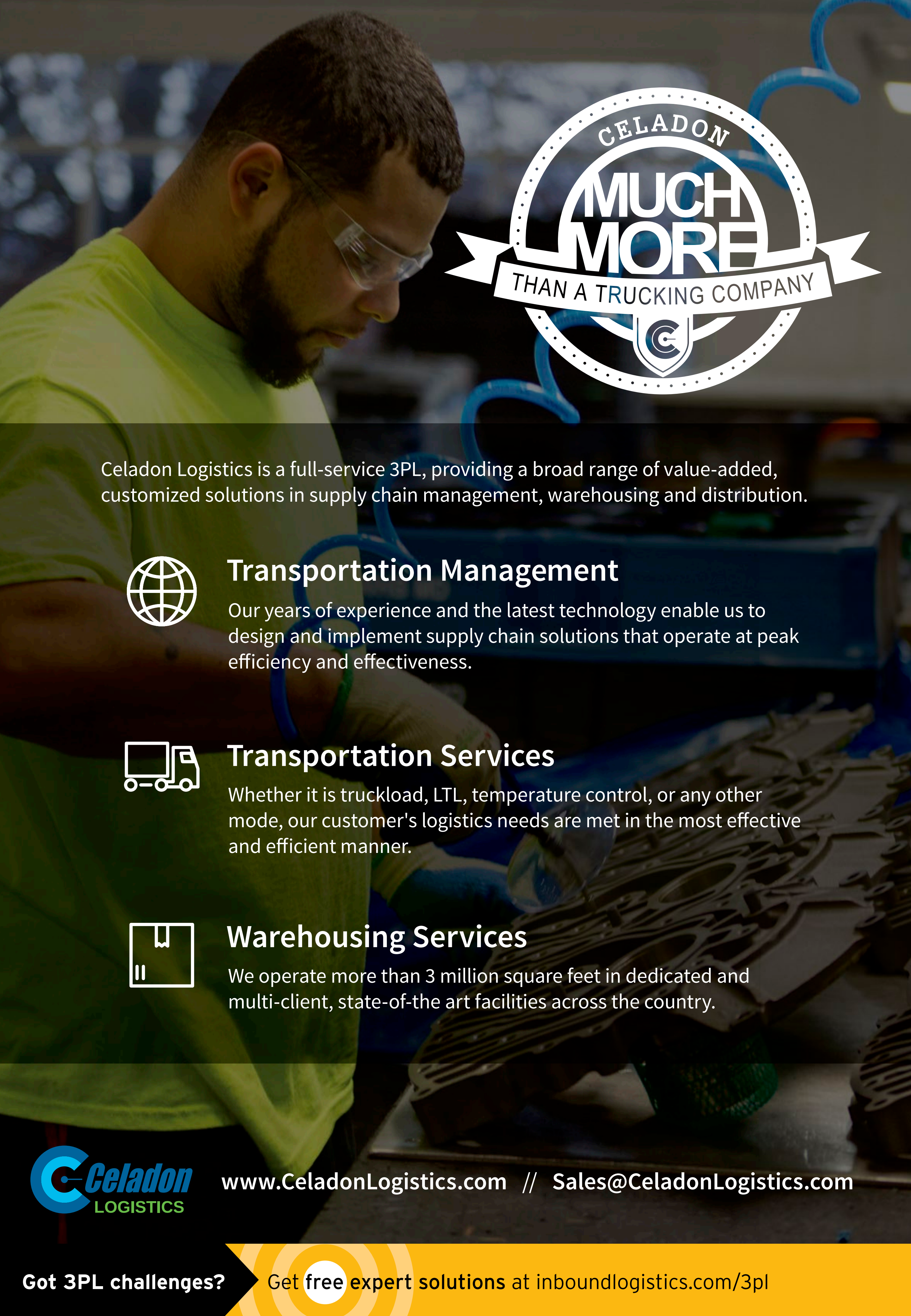
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How the Right Shipping Software Impacts Your Bottom Line

Choosing the right shipping software is critical because it impacts your company's bottom line. Here are eight steps to take to ensure you choose the right solution for your company's individual needs.

1. Guarantee that you're paying the lowest freight costs possible on all your shipments. Combined with the costs and/or business rules that have been established in your business, shipping software allows you to automate which carrier and service level is chosen. So, if a customer doesn't mind how long it takes to receive their order, certain shipping solutions enable your company to choose a carrier that will deliver in five to seven business days. This dramatically cuts down on shipping costs.

2. Producing carrier-certified shipping labels, manifests and other required documents is simple. Multicarrier shipping software enables companies to easily meet requirements for compliant labeling, without having to change printers, label stock, or systems. This reduces carrier charge-backs for non-compliant issues, and reduces the overall amount spent on freight.

3. Deliver more orders quickly to ultimately enable you to grow your business by shipping from any inventory source. Combining powerful shipping software with improved physical flow decreases the amount of time and effort it takes to ship a package without incurring additional costs. Eliminating steps will improve the speed of package processing and avoid lost or incorrectly shipped packages.

4. Mid to high volume shippers are able to increase operational efficiencies and add growth potential. The flexibility of scalable solutions allows your business to grow, whether you are adding locations, stores, e-commerce sites or international shipping destinations.

5. Integrating all your systems and technologies leverages a cost-effective, interconnected supply chain. Shipping software is often designed with a modular architecture, allowing you to install, pay for, and maintain only those modules that your business actually needs, saving both time and money.

6. Have increased visibility for live package status, delivery updates and shipment history for internal and customer use. Shipping software allows complete order visibility within the enterprise, and instant tracking once packages leave your facility. This visibility empowers customers to track their own packages, which in turn, saves your shipping and customer service departments' time.

7. Allows you to meet increasing customer expectations for shipment delivery. Shipping is the end process for all of the efforts that have been made at each stage of the commercial chain, from acquiring the customer to making the sale. The happier a customer is when they receive your parcel, the more likely they are to order again.

8. Tracking returns and the reverse logistics process will be streamlined as well. Having visibility of every point of a parcel's journey, including returns, is vital for operational efficiency.

10 Ways to Save While Shipping

1. **Reduce or eliminate Air Waybills:** Use an automated shipping system. Audit invoices for fraud and address errors.
2. **Understand carriers' annual parcel rate increases:** Know the weights of your actual shipments when discussing discounts with your carriers.
3. **Determine if signature delivery is truly necessary:** Utilize email notifications with tracking numbers or the USPS® Electronic Return Receipt (eRR).
4. **Examine the true delivery need of your recipients:** Utilize tools that show the delivery times and cost of services.
5. **Create a shipping label *only* when needed:** Only create a shipping label for a shipment when it will actually be shipped. Utilize reports for keeping track of shipments.
6. **Assign department cost centers for *every* shipment:** Institute business rules and technology—mandate users input department cost centers for all shipments.
7. **The Thursday/ Friday factor:** Avoid carriers that charge extra costs for using a Saturday service. No extra cost with USPS®; Saturday is a regular business day.
8. **Determine the organizational impact of inbound shipments:** Determine the process flow of shipments arriving throughout the day. Set policies for personal shipments.
9. **Understand every surcharge:** Understand which charges are avoidable. Audit your invoices regularly. Assign cost centers and pinpoint the users, recipients and services that are causing the greatest increase in costs.
10. **Educate people in your organization:** Communicate preferred carriers and services. Understand your carrier contracts.

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THE LEAN SUPPLY CHAIN

BY PAUL A. MYERSON
Professor of Practice in Supply Chain Management at Lehigh University and author of books on Lean for McGraw-Hill, and supply chain for Pearson
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Using Network Optimization Technology To Enable Your Lean Supply Chain

From a lean and agile supply chain perspective, an optimally designed supply chain can significantly improve margins, support expansion into new markets, enhance the customer experience, and reduce operating costs.

Optimizing your supply chain network helps achieve more value and less waste through keeping lower inventories, maintaining the right stock levels, and choosing the right transportation modes and warehousing strategies.

Without an optimized supply chain network, it becomes difficult to execute on a lean strategy. For example, if your business ships small orders and has grown in the U.S. Southwest, but your finished goods distribution centers are located in the Midwest and Northeast, it might make sense to open a distribution center in the Southwest. This type of analysis helps you determine the precise size, location, and market to serve.

Optimizing Performance

As customer requirements become more complex in today's demand-driven, omni-channel environment, supply chain optimization studies build the foundation for the logistics and fulfillment operations of many successful companies.

As a result, companies need to frequently reevaluate their supply chain networks, as happens with the lean concept of continuous improvement. These evaluations optimize supply chain performance, which can strategically create value and enable profitable growth in new and existing markets.

Supply chain network optimization studies can be fairly technical, requiring specialized software and often consulting advice with a price tag as high as $100,000. That's why many small to mid-sized enterprises tend to either not do this type of study at all, put it off, or just use rough guess-timates. As a result, they may leave significant money on the table, as well as a variety of wastes in their internal and extended supply chains.

Network optimization software evaluates the total supply chain—from manufacturing and suppliers through warehouses and distribution centers all the way to distributors and end customers. The typical tools used to perform supply chain network design are based on quantitative modeling and optimization, which refers to selecting a best element from some set of available alternatives.

The use of models enables you to evaluate the overall system's complex relationships and trade-offs by connecting large numbers of variables in a framework that makes it easier to define relationships. Quantitative tools to perform this type of analysis also make translating an operational strategy into a financial business case more straightforward.

Putting the Tools to Work

Network optimization study deliverables usually include where to locate facilities, the size of these facilities, what transportation modes to use, and long-term sourcing decisions. As the name implies, network optimization tools seek to optimize performance across an entire supply chain network.

Companies can use this breed of tool either as an integrated part of a suite of advanced planning and scheduling tools or as a standalone application to analyze only supply chain design decisions.

My new book from Pearson further explores how the use of network optimization studies and other readily available technology can enable and energize your supply chain. ■

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[E-COMMERCE]

BY TODD MILLER
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Solving the E-Commerce Puzzle

Inventory is now on-demand, and predicting what consumers will want on any given day is tricky. Add to that the already challenging scenario that consumers want to shop and purchase goods at any time and from anywhere—and supply chain logistics for e-commerce inventory gets even more complex and complicated.

Many retailers and brands haven't solved the e-commerce puzzle just yet. Quarterly earnings are dismal, major retail corporations are laying off employees and closing stores, and Amazon is dominating the space and setting the bar for customer experience.

To overcome the challenges that e-commerce presents to the supply chain, retail companies should consider taking the following steps:

■ **Make brick-and-mortar stores part of the supply chain.** Omni-channel fulfillment is an absolute must for retailers and brands to survive and succeed in today's commerce world. Many retailers struggle with profitably executing an omni-channel model. In order to compete—especially against the behemoth that is Amazon—retailers need speed and efficiency so they can provide a seamless, unified, and on-demand shopping experience for their customers.

With the rise of e-commerce and growing consumer preferences, the most sophisticated retailers are making their stores part of the supply chain by turning them into mini distribution centers.

When it comes to peak season, for example, retailers should have a process in place that helps them determine exactly where an online purchased item should be shipped from—a distribution center across the country or a retail store around the block. This reduces costs for retailers and fulfills orders in the fastest way possible for consumers.

■ **Leverage dropshipping to reduce risk and costs.** Dropshipping allows retailers to expand their product assortment and test new products without the risk and cost of inventory overhead.

The retailer doesn't have to store this inventory—the supplier or manufacturer keeps it, and the retailer buys it as the consumer buys it. This is a more efficient model for retailers because it results in inventory moving less frequently, keeping transportation costs down. Dropship improves order processing time, decreases inventory carrying cost and risk, and delivers the product to the customer faster.

■ **Consider a centralized order management system.** Technology has been changing the supply chain for decades, and with e-commerce, ensuring all points of the supply chain are running smoothly and efficiently is even more critical. In 2015, Nordstrom, for example, announced its plan to spend $1.2 billion on e-commerce and new stores. Investment in technology is now required to provide the seamless shopping experience that today's consumer demands.

As soon as a consumer buys something, the purchase needs to drop into the retailer's order system, and then be integrated with all the other touchpoints required from when the consumer clicks purchase to the point of delivery.

Centralized and Scalable

Currently, many companies' systems are still siloed—inventory management, customer relationship management, store fulfillment, and point of sale. Using a centralized and scalable system with intelligent order routing makes integration between order and delivery seamless. This is essential for meeting today's consumer's heightened expectations and demands, particularly during peak season, and ensuring the retailer is meeting its business objectives.

A centralized system ensures purchases are delivered in the exact way the customer wants, while also helping the retailer maximize the profitability of each and every order. ■

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IT MATTERS

BY GLENN JONES
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How to Find Value in Big Data

There's an endless amount of big data, but only storing it isn't useful. The value is in what you find in the data. Instead of aggregating all the data you're getting, you need to define the problem that you're trying to solve and then gather data specific to that problem.

Today we have the capability to leverage data because of technology advances, specifically in computers and memory technology, as well as in advanced data science methods. The technologies to gather and cleanse data have existed for a long time, but now we can collect it faster so that it's more useful. The key pivot point is that the underlying computing infrastructure has reached a point where it allows us to economically aggregate specific data.

Using Technology To Sort Through Data

Much of that ability has to do with the advent of cloud computing, which has enabled the sharing of resources across multiple customers or datasets. This, in turn, has ended the problem of needing a massive datacenter dedicated to a single problem set for big data analysis. By being able to divide computing power across multiple problems, it is much more economical to gather the requisite data, and harmonize and cleanse it quickly.

In the past, organizations had to aggregate data monthly, and by the time they were able to detect an issue from the analysis, the point of fixing the problem had already passed. So the speed with which the data is accessed is critical to making it useful.

Of the three defining properties or dimensions of big data—volume, variety, and velocity—the value resides most in velocity. By being able to look at information and apply all the deep analytical techniques and advances in data science, we now can be predictive much more rapidly about what we believe will happen based on the trends uncovered in the data. This allows us to create alternatives for supply chain and operational plans that we can execute, if necessary, before an issue becomes critical.

Of course, supply chains are driven by lead times. If you can be alerted to an issue before reaching that lead time hurdle, you have a much greater chance of altering plans comprehensively to meet customer demand or reroute product or find a new supplier.

Social Studies

One specific area where companies find data analysis increasingly profitable is social media, where data is proliferating at astonishing rates and the insights gleaned are proving particularly useful. After analyzing social media data, you can apply science to determine whether individual ratings are positive, negative, or neutral; once you determine a rating, you can find the common phrases associated with it.

For example, a manufacturer may see that 60 percent of negative comments concern a particular product; or a logistics provider may see a preponderance of negative comments related to a particular route or distribution center. This type of information culled from big data provides insight into what is causing customer dissatisfaction, and enables you to address the root causes sooner. ■

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CARRIERS CORNER

BY ANTHONY BERRITTO
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The Slow, Steady Decline Of the Owner-Operator Model

Today, we face the slow extinction of independent owner-operators. These self-reliant business owners are dealing with a myriad of regulations that will soon make the owner-operator model impractical, and its survival improbable.

Of the 3.5 million truck drivers in the United States, about 350,000 are owner-operators, according to the Owner-Operator Independent Drivers Association. If you are a shipper dependent upon owner-operators to move your freight, shifting sands in the trucking industry put you at risk.

Regulations Squeeze Already Low Profit Margins

Trucking is a commodity business. Transportation companies squeeze independent drivers for the lowest cost and these businesses, in turn, must operate at razor-thin margins. Government regulations now make it even harder by limiting their earning potential and adding operating costs.

Hours-of-Service regulations are reducing potential earnings and the government is strictly enforcing the rules with electronic logging devices.

To meet new government emissions standards, the Environmental Protection Agency estimates $12,800 in additional upfront costs for owner-operators to upgrade to the most fuel-efficient tractors.

Regulations, whether they reduce revenue or jack up overhead expenses, combine to paint a bleak picture for future owner-operator profitability.

Carriers hire drivers as independent contractors to avoid federal and state tax withholding, healthcare coverage, and other employee-related overhead. They depend on this model to be profitable, and the owner-operators are happy to get the business—including shippers, who pay a reasonable rate.

While most owner-operators value and protect their status as independent, a segment of that community believes they are anything but, and have fought and won in court to re-classify them as company drivers. The most prominent example is the $228-million settlement by FedEx, which used the independent contractor model as a foundation of its business model.

If you are a large shipper, you may feel a step removed from these events because you may not have a direct contractual relationship with the owner-operator. You'd be wrong.

For example, Macy's contracted with two logistics companies to provide dedicated contract carriage services for home delivery. Because Macy's asked for decals on truck doors, a driver dress code, and adherence to its defined routing, the court ruled that drivers should have been classified as Macy's employees. The retailer and the logistics companies had to pay a $6.8-million settlement.

As we enter a new era of labor law, it's clear that you, the shipper, could ultimately be held financially responsible for driver misclassification settlements.

Joining the Ranks

Owner-operators are being driven to extinction and that may not be a bad thing. From a shipper's perspective, it would lessen risk. Re-classification of owner-operators amounts to a ticking time bomb for beneficial cargo owners.

For independent drivers, regulatory pressures may induce more to become company drivers. Sure, they would lose a degree of independence. But they would gain greater security.

Owner-operators won't go away completely. You just may need to look a little harder to find them. ■

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BY HOWARD ROSENBERG
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Rethinking Reverse Logistics For Online Apparel Returns

As virtual shopping bags replace physical ones, it's important for retailers to update their policies and logistics strategies to align with consumer behavior and expectations.

This is particularly the case when deciding how to handle apparel returns, which boast one of the highest return rates: One in three purchases are sent back.

This trend, and the growing cost associated with it, creates a new urgency for e-retailers to rethink their reverse logistics processes. This includes what happens to the merchandise that cannot be returned to virtual shelves and is slated for liquidation on the secondary market.

Expediting Recovery Through Technology

Technology is revolutionizing the way organizations liquidate their returned or excess merchandise. A web-based solution makes it possible to have thousands of buyers compete for the inventory, pushing prices up versus one or two liquidators negotiating them down offline.

Some of the world's largest apparel retailers and e-retailers use technology in the form of customized business-to-business (B2B) online auction liquidation marketplaces to sell inventory directly to business buyers across the globe, increasing recovery by 30 to 80 percent. This type of technology platform helps deliver the highest possible price, automate the sale process, establish a faster sales cycle, and generate proprietary market intelligence in the form of real data on market prices.

When it comes to a B2B marketplace for your customer returns and excess inventory, knowing how to best assemble inventory—as well as how to target, drive, and sustain the right buyers—will substantially increase recovery and efficiency.

Here are some tips:

- Segment buyers by apparel type, condition, and lot size to better drive demand.
- More bidder competition among the right buyers will mean higher prices every time, so investing in attracting new buyers is critical.
- Repeat buyers can result in a triple-digit percentage increase in recovery rates. This is particularly the case with secondary market apparel buyers.
- How auction lots are assembled is extremely important, so consider segmenting by commodity category or original MSRP per item. Even the time of year can make a difference.

Have Knowledgeable Leaders in Place

While it's clear that a technology-based B2B liquidation program will automate the sales process, keep in mind that to achieve optimal results proactive management is critical and requires a dedicated and experienced team to manage it well. Leveraging expert knowledge will provide the most effective outcome.

Given that e-commerce returns are projected to grow 15 percent annually and apparel is the second-largest e-commerce market, there is no denying that high apparel return rates will be the new normal across the e-retail landscape. ■

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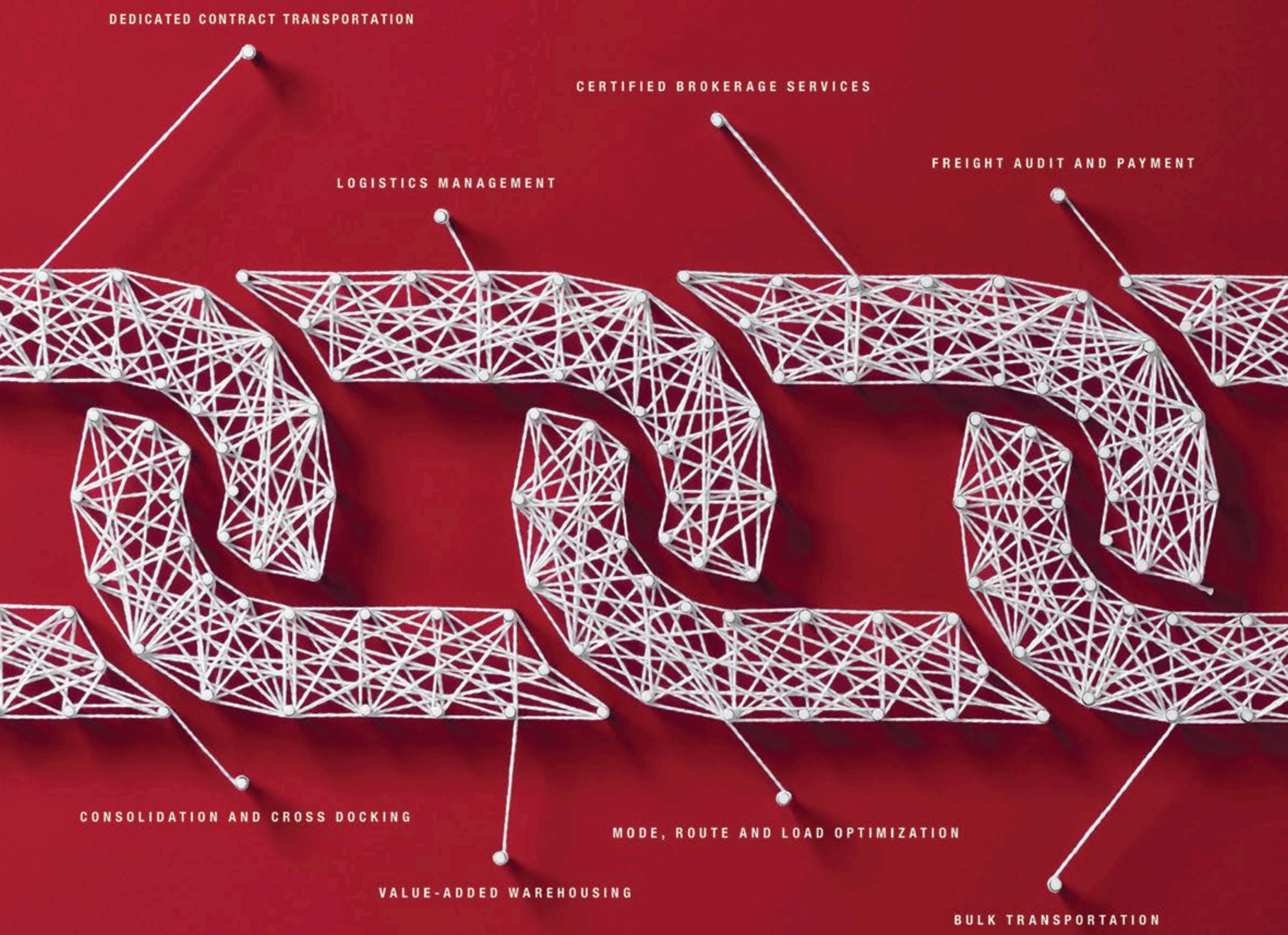

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VIEWPOINT

BY SVEN THIESEN
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Evaluate Partners Before You Sign the Contract

In an increasingly competitive global environment, every element of the supply chain must be effective and efficient—to deliver the right quality products, on time and at the right price. Empowering your procurement team before supplier selection is key.

For companies that outsource materials, parts, and equipment, the potential for quality issues and hidden costs can be considerable. Engaging qualified personnel, or a qualified third party, during the outsourcing contract period or purchase order is vital.

Including subject matter experts—and extending the discussion beyond the purchasing department—can help overcome the tendency of companies to be overly dependent on contract writing. Manufacturers can focus on selecting a business relationship with the right supplier partner.

Conditions and requirements may change throughout the contract period. Being able to fine-tune, or make significant changes to attain or maintain quality and competitiveness, is important, and must be as close to real time as possible, to avoid adversely affecting supply chain timing requirements.

Keys to Outsourcing

Before the contract is signed, manufacturers should rigorously evaluate technical, supply dependability (including supplier skill and experience), and cost, especially if they're fully outsourcing a product. Cost evaluation includes providing a reasonable level of supplier profit. Deep discounts or bare bones pricing, which can place the supplier's business at risk, is not a win for either company.

During the supply period, qualified personnel must be involved on an ongoing basis. Technically and operationally qualified procedures, tools, and inspection methods are required to produce a quality outsourced item.

Too little engagement, or engagement by less than appropriately qualified people, can result in substandard quality. If too much purchasing company engagement is required, however, the cost of resources may not be reflected in the actual cost of the contract. This can result in a false belief that the outsourcing contract made financial sense but, in reality, the total cost is hidden.

Time zone differences can also result in scheduling issues and higher resource involvement, even if quality is not compromised. For instance, English may be the language of international management but may not be as common on the factory floor. Levels of worker turnover can be high, putting quality or schedules at risk.

In an OPTIS research report, a North American operations director revealed outsourcing did not compromise quality at his firm because supplier quality management and dedicated procedures are in place, including inspections and audits. A vice president of sales and marketing also interviewed in the report addressed the issue of local outsourcing, having both positive and negative experiences. Potentially the more touches of a part, the more chances for problems; and the shorter the timeline, the more challenging.

Sharing Common Goals

Aligning all parts of the supply chain to work toward a common set of objectives demands cooperation, communication, and a shared management of risk. Now more than ever, manufacturers are pressuring their suppliers to deliver quality products, on time, and at the right price.

Suppliers have to be lean, fast, and innovative to meet their clients' needs. To ensure they're capable of being exactly that, manufacturers need to bring in expertise across the whole business to ensure they get a strategic partner that can fortify the supply chain. ■

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THE FINE PRINT

BY CHRIS COTTER
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When to File Loss and Damage Claims: Know Your Rights

Damage, loss, and delays are inescapable. When these events occur, the shipper has to file a claim to recover the loss. Shippers should understand the claims process and law because the legal principles are unique to the shipping industry.

First, it is important to understand that a cargo claim is based on a breach of contract by the carrier, and not whether the carrier was negligent. In a transportation contract, the carrier agrees to move cargo and the shipper agrees to pay the carrier. Implicit in this arrangement is that the cargo will arrive undamaged. If the cargo is lost, damaged, or delayed, the basic contract for carriage has been breached.

In order to prevail on a claim, shippers have the initial burden of proving their claim. Shippers must prove good condition at origin, damaged condition at destination, and the amount of damages. After establishing these three elements, the burden of defense shifts to the carrier.

Determining the Rules

The mode of transportation dictates which legal principles apply. For instance, motor, rail, domestic water, international ocean, domestic air, or international air all have different time limits for filing claims and different deadlines for initiating lawsuits if a claim is denied.

The starting point for rail and motor carriers are two federal statutes—one for rail and one for motor—that are colloquially known as the Carmack Amendment.

The Carmack Amendment also sets minimum time standards for filing claims (nine months from the date of delivery) and for initiating lawsuits (two years from the date the claim is denied).

The essence of the Carmack Amendment is that carriers are considered to be virtual insurers and are strictly liable for cargo claims. There are, however, five recognized exceptions or defenses: an inherent vice of the product or an act of God, the public enemy, a public authority, or the shipper. The carrier must also show that it was free of negligence.

The Carriage of Goods by Sea Act (COGSA) governs ocean shipments to and from the United States. Under COGSA, an ocean carrier has 17 defenses, including act of God and latent defects not discoverable by due diligence. As with the Carmack Amendment, however, even when the facts establish such a defense, the carrier must also show that its negligence did not contribute to the loss.

Watching the Time

For ocean shipments, the timeline to file a claim is only three days from delivery, and the deadline to file suit is one year from the date of delivery.

For air carriage, different rules apply depending on whether the shipment is domestic or international. For domestic shipments, the air carrier's tariff sets the time limits and limits of liability. These limits can be short—seven days or fewer. The limit of liability can also be low—50 cents per pound.

For international shipments, the Montreal Convention of 1999, an international treaty, sets the time limits and limits of liability. A claim must be filed within 14 days of delivery for damage and within 21 days for delay.

Whatever the mode, the first step to recover a loss and damage claim is filing a claim. Shippers must file the claim with the transportation carrier, and not the insurance carrier. A claim filed with the insurance carrier is not considered a duly filed claim for purposes of meeting the claim-filing time limit. ■

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BY BOB DAYMON
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Going for Brokers

Over the past 18 months, we have seen a significant shift toward shippers utilizing brokers as their primary carriers. Many shippers abandoned the strategy of focusing on asset-based carriers, and now load their routing guides with brokers as the choice of record.

We also see brokers being able to meet the detailed requirements of many shippers and fill the same strategic partner concept an asset-based provider typically holds.

From our point of view as a transportation management provider, Penske has been involved in many shipper bids of late and asked the question: Why the big swing in strategy?

Here's what we are finding:

■ **Capacity is a key driver to shifting contracted lane business to brokers.** Many brokers are able to leverage their carrier base and relationships to meet the ongoing demands of shippers. In addition, the equipment demands many shippers placed on carriers were typically difficult for brokers to meet; they now can be met.

■ **Visibility and reliability that is on par with any asset-based provider.** One of the biggest reasons shippers shied away from brokers was a lack of visibility. In many cases, the service issue was one of perception more than anything. With today's tracking technology, there is no longer a void in visibility.

■ **The concept of dedicated capacity was traditionally held by an asset provider.** We have seen many brokers now fulfill the same service using their provider base. This has allowed shippers to take advantage of the favorable pricing that many brokers provide.

■ **There is no lack of a capacity constraint or forecasted constraint in the near future.** There is plenty of capacity in the market. Looking forward into 2017, many economists predict favorable capacity, with little concern for tightening demand. This has allowed shippers to expand their use of brokers.

■ **Hybrid solutions seem to be common.** In this scenario, the shipper consolidates the asset carrier base to a small pool of managed carriers. This allows them to build a strategic relationship with the asset-based carrier, helping the service provider match lanes where they are strong or need freight, providing the carrier lanes that are consistent and predictable.

Many shippers then single source the tail activity; overflow shipments; and those that are ad-hoc or do not meet the standard shipment profile to brokers. This allows the brokers to perform where they are strong. From our perspective, this is a good strategy to deploy through your annual procurement cycle.

Looking Ahead

The trend to utilize brokers will continue through 2017. The true test of the concept will occur when we see capacity tighten and rates begin to escalate.

A few thoughts to ponder moving forward:

- Will brokers still be able to meet the needs of shippers?
- Will the partner carrier networks that brokers rely on begin to take their assets elsewhere to improve margins?
- How will asset carriers react to long-term customers who have focused on brokers in a soft market?

Unfortunately, many of these questions cannot be addressed with quantitative data and we will have to wait for market conditions to change before we know the answer.

Becoming a Preferred Shipper

Shippers with a hybrid strategy will be able to best navigate tightening capacity. We all want to be the preferred shipper. A partnership with the asset carrier—and broker—will be your key to ensuring that a carrier and broker treat you as the preferred shipper. ■

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SMART MOVES

BY JESSICA DANKERT, CSCP
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Tackling Retail Logistics: Build Your Team First

The retail industry is changing at a faster pace now than at any other time in history. We are only at the dawn of the new world order: connected retail. Supply chain is on the front lines of the ongoing revolution.

When RILA and Auburn University recently surveyed retail supply chain executives, 98 percent rated talent—recruiting it, keeping it, developing it—as one of the top three critical needs in this new retail landscape.

How do you build the supply chain team that will stare down and conquer the challenges ahead? Here are some top tips shared by supply chain executives at leading U.S. retailers:

■ **Drive innovation.** Your supply chain team—and your entire organization—must prioritize innovation. If you keep your people engaged and striving for the horizon, they're more likely to stick around and stay committed to the organization.

On an individual level, make outside learning and professional development a requirement for every team member. On an operational level, define a dedicated process—distinct from the day-to-day operations of your supply chain—to facilitate, focus, and reward innovation.

■ **Diversify skill sets.** Many of the most successful retail supply chain executives in the industry spent several years outside the world of retail supply chain. "The years I spent working in finance and in merchandising have been invaluable in my current role running this organization's distribution strategy," reports a vice president of distribution at a large automotive retailer. People who have succeeded in varied roles and functions have shown an ability to adapt—a must to work in today's supply chain.

Seek out candidates with unique or non-traditional work experience, and lock onto those who are a cultural fit with your organization. And, for your existing team members, get creative with professional development plans. Help facilitate a career plan of job rotations, cross-functional roles, and other ways to build a diversity of experience, skills, and connections.

■ **Don't forget to network.** Invariably, each person comes away from networking with new ideas or practices to try with their teams. Look for peers you can call when you have an issue, and bounce ideas off of each other.

"We've been using the nine-box grid for talent planning for a long time," reports a senior vice president of supply chain from a leading specialty apparel retailer, "but the discussion at our recent peer group meeting gave me some great ideas for how to make it more actionable."

Many groups and industry events—including RILA, CSCMP, and APICS—enable networking and benchmarking among your supply chain cohorts. In addition, look for opportunities outside your industry or functional area.

■ **Fill your Pipeline.** Establishing a partnership with a university or two is a great way to build a pipeline of supply chain talent. Interact with the professors in the school's supply chain department, offer real-world cases they can inject into their lessons, visit as a guest speaker, source interns from their program, partner on research projects, and benefit from a room full of fresh brain power.

Finding time in your schedule may be tough, but the longer-term payoff for your organization and succession planning is worth it.

The supply chain of the future is full of opportunities and challenges. But with the right team and talent on your side, you'll be positioned for success. ■

The insights in this article are a preview of the upcoming discussion at RILA's 2017 Retail Supply Chain Conference in Orlando, Feb. 12-15, 2017 (www.rila.org/supplychain).

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Staying Right Side Up When Your Supply Chain Turns Upside Down

Even when times are uncertain, the benefits of demand-driven logistics are a sure thing.

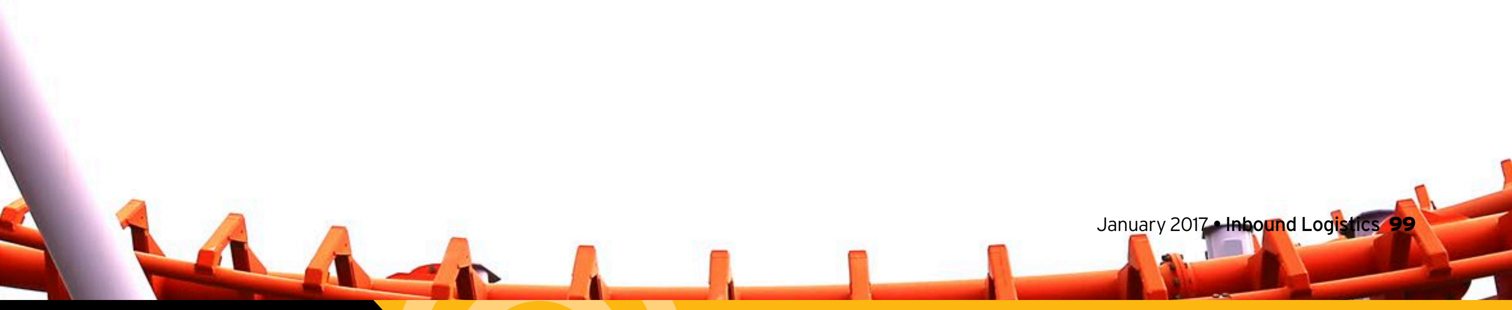
By Merrill Douglas

This is neither the best of times nor the worst of times. Surely, the U.S. economy has come a long way since the dark days of 2009. In November 2016, the U.S. Commerce Department reported that the nation's Gross Domestic Product had expanded by 3.2 percent during the third quarter. But when viewed over the long term, the economy's performance is not so impressive. In July 2016, a *Wall Street Journal* headline termed the recovery since 2009 "the weakest of the post-World War II era."

With a new administration in Washington, economic prospects are particularly uncertain. But most would agree that the era we're living through right this minute is not an economic boom.

Luckily, even when financial charts trend downward, there's an upside for shippers who know where to look. In some cases, companies save money, or make more, specifically because of conditions that arise in the supply chain thanks to the economy. In other cases, shippers take advantage of services, technologies, or government programs that help them to become more efficient and cut their expenses. When sales grow soft, there's nothing like a smaller number on the expense side to bolster the bottom line.

Let's consider some of the bright spots shippers face today in four areas: transportation, global trade, technology, and logistics outsourcing.



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Good news for shippers: No capacity crunch and lower rates for truckload shipments.

Transportation Upside: Capacity

For shippers, maybe the best news to emerge from the current economy is a more plentiful supply of transportation capacity. These days, shippers have an easier time finding space they need on trucks and other modes. And as supply has increased, rates have dropped.

"Capacity is a big advantage right now," says Marty Wadle, senior vice president, supply chain at Ruan Transportation in Des Moines, Iowa. "I haven't seen a lot of impact in less-than-truckload (LTL) transportation." But abundant truckload capacity is definitely helping shippers.

"When the overall economy is down, that's when logistics has the most leverage due to overcapacity," says Joel Zeller, director of global logistics at Arctic Cat, a manufacturer of snowmobiles and all-terrain vehicles based in Minneapolis.

That capacity isn't distributed evenly everywhere. The market is a bit tighter for shippers who need refrigerated transportation, says West Hutchison, senior vice president of transportation at refrigerated carrier Americold, in Atlanta.

At Americold, the emphasis isn't so much on driving down rates as on using sound strategy to reduce total costs. "We're chasing delivered value, and that helps leverage our infrastructure—especially on the transportation side—to provide greater control, support, and predictability to the supply chain," says Carl Fowler, Americold's senior vice president of regional accounts.

Consolidation Strategies

One important strategy for delivering value is consolidation. Consider a truck that leaves Virginia fully loaded with freight for several customers and drops product in Missouri, Utah, and Washington. Each time the truck leaves a stop, it travels with more empty space, providing less value for the cost of the trip.

"We try to eliminate those empty pallet miles by pooling together customers who are delivering to similar geographic areas, trying to get them closer to a truckload cost rather than an LTL cost," Hutchison says.

That strategy works only if the 3PL has obtained solid commitments from its carriers. "When we go through periods when there is some additional capacity in the market, we're more focused on making sure we've got carriers with high service records and good on-time delivery performance," Hutchison adds. Strengthening those relationships is more important than shaving an extra one or two percent off a carrier's rate.

Along with shippers transporting LTL-sized orders, Americold has started applying consolidation to full truckloads. "For instance, if a customer ships 30,000 pounds today, and pays a truckload cost on 100 percent of that load, we'll find another 10,000 pounds from a different shipper to add onto that truckload," Hutchison says.

In that case, the owner of the 30,000-pound load would pay just 75 percent of the truckload rate for that move. "On repeatable loads, we see savings of up to 25 percent by participating in that truckload consolidation program," he notes.

Zeller uses contract negotiations to keep costs under control. "It's not about decreasing rates; it's about the carrier getting into lanes that they find most attractive," he says. Because business dynamics change from year to year, it makes sense to reconfigure his assortment of carriers to benefit both parties. "It also allows the carriers to price themselves out of lanes that they don't want," he adds.

Brian Broadhurst, vice president, transportation solutions at Spend Management Experts (SME) in Atlanta has clients who use a similar strategy. SME is a supply chain consulting firm that helps shippers

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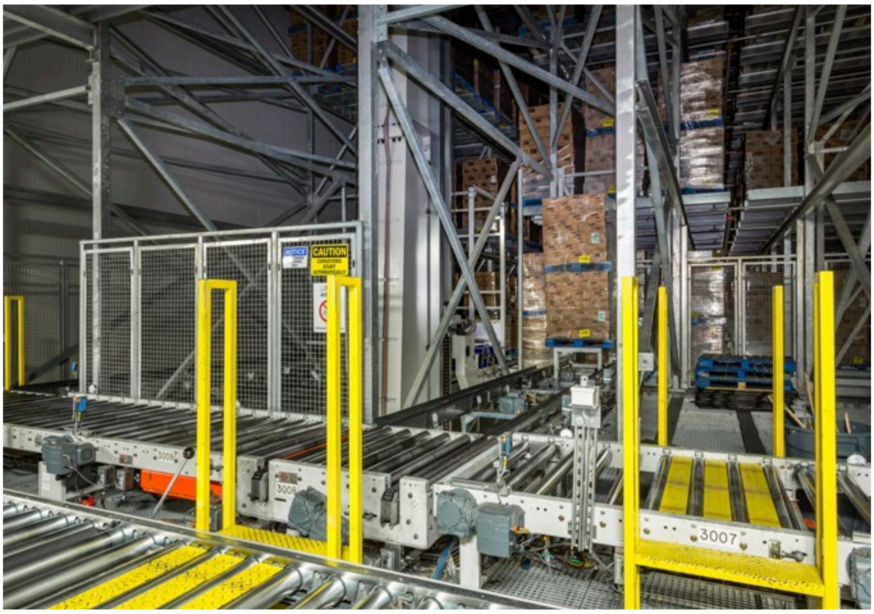

Service providers such as Americold invest in technology to schedule carriers in and out of loading docks quickly.

reduce transportation and fulfillment costs.

The trick is to learn to understand your carriers' cost structure. "Once you do that, you can work with the transportation providers to help them reduce their own costs," Broadhurst says. That allows the carrier to charge less without reducing its margin. "Then it's a matter of going to the right carrier base to find who can move for the right rates on the right lanes."

Broadhurst also advocates taking a holistic—rather than a siloed—view of transportation spending. "You want to leverage all your spend on a single mode at one time, for two reasons," he says. "One is simple economies of scale. There's more leverage in the marketplace with more volume."

The second reason is that you want to find opportunities to combine lanes. "If you take the puzzle apart too much, what could have been a round-trip move for a carrier becomes two one-way moves," Broadhurst says. "That increases their cost structure and their cost to you."

Depending on TMS

Many shippers rely on transportation management systems (TMS) to help them cut transportation costs, improve service, and gain efficiencies. "Regardless of the environment we're in, TMS covers the spectrum of functions that a transportation organization will manage," says Gregg Lanyard, director of product management at software developer Manhattan Associates in Atlanta.

Most shippers conduct bids for transportation contracts in the first quarter of the year, although in the current economy, many companies are pushing those events into the fourth quarter of the previous year.

"The TMS provides the ability to run procurement events, do what-if scenario analysis, and help understand what's optimal for both you and your service providers, based on their network changes," Lanyard says. "That's one area where, in this economy, there can be great efficiencies."

Besides using their TMS to help secure advantageous contracts, shippers turn to IT systems to gain efficiencies in day-to-day transportation execution. The benefits don't always come on the road. Data and communications also provide an advantage on the loading dock.

"We see shippers invest in technology to make sure carriers get in and out quickly," Wadle says. Companies use dock scheduling solutions to keep carriers happy and earn a position as a shipper of choice.

"Shippers are working with their carriers to provide visibility based on their onboard technology and GPS information," Wadle explains. That tells staff at a facility whether an inbound load will arrive on time. If it won't, the shipper might let another truck slip into that earlier position.

Ruan offers technology needed to maintain that kind of agility. "If a carrier was slated to be at the dock at 2 p.m., and we know it won't arrive until 4 p.m., we can be proactive with our shipper and let them know they have an opening at this dock."

For shippers and 3PLs that work with smaller carriers, another key to maintaining access to truck capacity, even when it's plentiful, is to pay your bills quickly.

"The capacity is there, but smaller carriers that provide good service have to make payroll and buy fuel," Wadle says. Ruan tries to pay carriers as soon as it receives proof of delivery. "We try to pay within one to three business days of that transaction," he says.

Some shippers try to delay payment by as much as 60 days. "That does not ingratiate them with smaller carriers," Wadle says. "And then you lose out on the capacity."

Technology Upside: Visibility

One big advantage that shippers gain from technology in any economy is visibility into all aspects of the supply chain, from the disposition of inventory to the status of customer orders to the location of goods in transit. Today, that view can also include product held by a shipper's supply chain partners.

"Technology has given us a much better picture of what's happening outside the four walls of the facilities that may be in our supply chain," says Lanyard.

Companies have long used electronic data interchange to share supply chain data. But today, onboard computers, GPS receivers, and other mobile devices take visibility to a higher level. "That leads to much better data within the TMS," he says. And that more abundant, accurate, and timely information helps shippers and carriers provide better service.

"Now that we have an increased amount of data coming in from the TMS, we can make better operational decisions that allow us to continuously improve our transportation options," Lanyard says. For instance, a shipper can use data the TMS collects about on-time pickups and deliveries, and other service metrics, to

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evaluate its carriers and encourage better performance.

Lennox International, a manufacturer of climate control systems based in Richardson, Texas, and a Manhattan Associates customer, has spent a lot of time building the data channels that allow it to track materials and products as they move through its supply chain.

"In the past, we had no clue where a product was or when it was going to get here," says Keith Nash, the company's vice president of process and technology. "It was very hard to plan."

Today, Lennox uses its TMS to track product movement and status, with a goal of gaining end-to-end visibility and eventually sharing that view with customers. "We get about 300,000 calls annually from customers asking 'Where's my stuff?'" he says. "If we can let them punch a button on our portal to get that information, we'll avoid some of those calls, and they'll be much happier."

Americold uses a proprietary IT system that allows its customers to monitor the product that the 3PL manages on their behalf. "It gives our customers the ability to see what we have in inventory, and control its movement," Fowler says. New technology available today lets companies monitor demand signals from the point of sale all the way back to the point of production.

SaaS Brings Benefits to Everyone

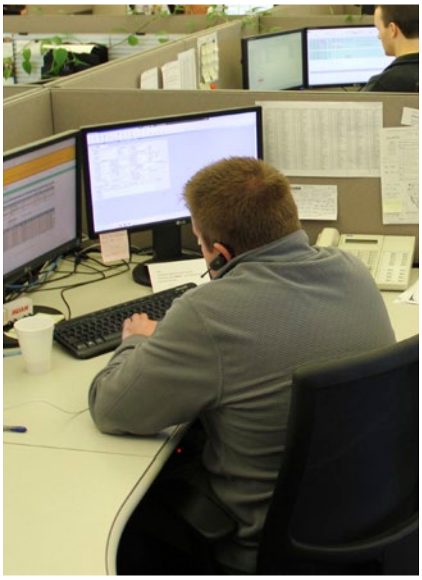
Visibility and the other benefits of logistics technology are now available to many more companies, thanks to the arrival of cloud solutions, also called Software-as-a-Service (SaaS).

In the past, only larger companies could look to a TMS to help make them more efficient and improve service to customers, says Lanyard. The cloud brings those benefits to everyone, with no need to make big upfront hardware and software investments or ask the IT staff to manage the solution.

Cloud-based solutions also offer an easy way to supplement an ERP program, providing functions that the large solution doesn't, says Jeff McCauley, vice president of global accounts at Integration Point, a provider of global trade technology in Charlotte, N.C. In the past, some IT departments were reluctant to embrace a solution that the company didn't host on its premises. "But they now see the benefits of not only embracing the cloud, but using it to fill gaps that they see overall," he says.

Technology that transforms large volumes of data into useful information offers another bright spot for shippers. For instance, companies use analytics software to learn more about customer demand and prepare in advance to execute orders.

"The software notices patterns and uses machine learning to recognize what those patterns are," says Mary Rollman, strategy managing director, supply chain with consulting firm Accenture. Her team at



Tapping into a service provider's technology offers shippers integration and visibility.

Accenture works with clients in a broad variety of industries. "That will help companies position their inventory—having it in the right place so they're not doing shipments across the United States from a different warehouse."

When inventory is located to match demand patterns, there's less need for expensive expedited shipping.

Lennox International is one company that uses the wealth of data available from its IT systems to support analytics. "We build a lot of predictive capability," Nash says. Eventually, instead of using people to handle exceptions that occur in distribution, it will be possible to train machines to handle those exceptions, he says.

Robotics also bring new efficiency to the supply chain. Some companies are investing in automated systems to offset the fact that overseas labor isn't nearly as cheap as it used to be.

"Traditional low-rate labor areas are no longer low-rate," says Nick Foy, vice president of strategy and innovation at ModusLink, a 3PL based in Waltham, Mass. But as the cost of hiring people to work in factories and warehouses overseas increases, the cost of implementing machines to perform some of that work is coming down.

"There are a lot more startups involved in this space than before," he says. While it used to cost more than $100,000 to buy a system that performed a single task, a company can now buy a multi-tasking automation system for far less.

Robotic Partners

In ModusLink's Riverside, Calif., facility, the company recently implemented robots that pick and put away product alongside human workers. "These two-armed robots are able to do 360-degree turns, and they're fast," Foy says. "As we look to reduce our costs and increase quality, we are focusing heavily on automation."

Automation has also brought efficiencies to a facility in Brno, Czech Republic, where ModusLink provides services to GoPro, which makes most of its wearable cameras and accessories in South China. It moves the cameras to ModusLink facilities in Hong Kong, Brno, and Riverside to be packaged for retail sale and then shipped to regional markets.

"In the Czech Republic, the competition for labor has increased dramatically in the past two years," says Scot Briggs, director of worldwide distribution and logistics at GoPro in San Mateo, Calif. "As a result, wages are going up." ModusLink has applied robotics there to increase efficiency and save money for GoPro.

For example, robots now place each packaged product inside a plastic bag to protect it until it gets to the store shelf. Robotic systems also install mandatory safety stickers inside the battery compartments of GoPro's cameras.

"We used to employ multiple people with tweezers attempting to manually place the stickers," Briggs says. "Not only is the robotic system faster, but it is more accurate and less expensive in the long run."

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Arctic Cat relies on a 3PL to manage inbound and outbound shipments of its snowmobiles and all-terrain vehicles.

Global Trade Upside: New Sourcing Strategies

The recent presidential election has cast doubt on the future of America's role in major free trade agreements. But some industry observers say that the United States will actually see trade agreements expand under a Trump administration, with bilateral agreements between the United States and other countries, such as the UK and Japan, replacing multilateral agreements such as the North American Free Trade Agreement and the Trans-Pacific Partnership (TPP).

"After withdrawing from TPP, the Trump administration has indicated it will pursue bilateral trade agreements," says McCauley.

Those who rooted for the TPP include attendees of the October 2016 annual conference of the Footwear Distributors and Retailers of America, which McCauley attended. Those retailers should not despair for a future of duty reduction.

"The need for free trade agreements to spur economic growth and domestic jobs, and to help in containing consumer costs by allowing careful duty reduction, will continue to be a shared priority of the Trump administration and global business leaders, regardless of the trade agreement names," he says.

TPP would have reduced trade barriers among 12 Pacific nations, including the United States but not including China. Virginia Thompson, vice president of product management at Integration Point, says she thinks that Congress will eventually ratify several new bilateral agreements negotiated directly with the United States, and President Trump will sign them.

"Either way, we could see a huge change in the opportunity importers have to save on duties at the time of import, and that exporters have in terms of new markets that are open to them," she says.

Another potential agreement, the Transatlantic Trade and Investment Partnership (T-TIP), addresses commerce between the United States and members of the European Union. Given the changes occurring to the EU because of the withdrawal of the UK, this multilateral agreement could also give way to bilateral pacts between certain countries, Thompson says.

Rethinking Sourcing Strategies

However the prospects for those trade compacts might play out in the future, one thing appears sure: companies continue to seek financial advantages by re-thinking their sourcing strategies.

"We see an increase in regional sourcing and nearsourcing, especially for the United States," says Cory Margand, co-founder and CEO of SimpliShip, a firm in Rochester, N.Y., that operates an online marketplace for international freight.

With labor rates rising and young factory workers choosing high-tech employers over companies that make products such as shoes, China is no longer the go-to region for manufacturing. "It's not so low-price when you can't get workers," Margand says. So companies are looking to new regions, such as Africa, and even experimenting with 3D printing some of their product components in the United States.

"As duty rates continue to change, and trade programs continue to proliferate, buyers constantly look for new, better opportunities," McCauley says. Increasingly, companies look to software to help them decide which countries they should consider as sources for materials and products. "They're looking for tools that can do the estimates and what-if analyses," he adds.

One way some companies use sourcing to gain an advantage these days is to use a distributed strategy, keeping sourcing close to the point of sale. Instead of making shoes in China, for example, and then building a logistics network to ship them to markets in five parts of the world, a company might set up five different manufacturing sites.

For example, McCauley says, these companies might ask, "If I can source the materials in Vietnam, can I hit the Malaysian market more easily?"

Companies that ship product in and

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out of the United States eagerly anticipate the day when they can complete all their import declarations at once. The federal government's Automated Commercial Environment (ACE) is evolving into a platform called the Single Window, a portal for reporting to U.S. Customs and to any of the 47 regulatory agencies that might need to know about an import or export.

Two or three regulatory agencies are already operating on the Single Window, and as many as 10 more could join the system in 2017.

"This will make it easier for the trade, as well as for Customs and the other participating government agencies (PGAs) to share and receive information and then reply back electronically," says Michael Weick, customs manager at Subaru in Cherry Hill, N.J., and an Integration Point customer. "It will not only be a time saver, but it will also save on paper and paper filing."

In past years, a shipper had to fill out a separate paper declaration for each agency that needed to approve an import, deliver those documents, and then wait for clearance before customs would physically release the goods. "It would take three to five days to clear cargo," Weick says. The Single Window entry will speed up that process significantly.

As a company prepares to import a product, and the user enters that item's tariff classification number into the Single Window, the system will automatically determine which PGA the user needs to report to, and will collect the appropriate data. "The good news is, they will allow you to file these well enough in advance that the agency should be able to sign off in plenty of time for the ETA, or better yet, in advance of it," Weick says.

Companies involved in global trade have been clamoring for the Single Window for years, because it drives tremendous efficiencies. "Getting it all on the same platform, submitting it once, and using more automation on the agency side to drive their release decisions is absolutely a benefit to the trade," he says.

Outsourcing warehousing and other logistics services frees shippers to focus on their core business.

Market Opportunities

A strong U.S. dollar has generally depressed exports in recent history, but that's not true in every industry. Agricultural producers are seeing more demand for their products outside the United States, says Hutchison at Americold.

For example, Russia and China are more open to purchasing American poultry these days, Hutchison says.

"I read that there's a shortfall of something like 650 million metric tons in beef production to support the Chinese food supply chain," says Americold's Fowler. China also is short on temperature-controlled food distribution capacity, he says. Those shortages present opportunities for both Americold and its customers.

Recent projects to deepen the ports of Savannah and Charleston spell good news for Georgia's large poultry industry, Fowler adds. "The ability to take product from the area and export it from the Southeast ports to Asian markets through the Panama Canal we view as a very positive thing for both the producers here and the producers overseas."

Among companies that sell their products into many global markets, some are looking for financial advantage by rethinking their supply chains. At GoPro, Briggs cites problems getting product into Brazil. "Duties in Brazil run 80 to 100 percent of the value of the product," he says. Brazil would like manufacturers to set up operations within the country. "But their economy is so volatile, it's hard to build a big enough business where that can make sense for you."

To cut the cost of shipping to that market, GoPro now sends cameras to Brazil in non-working condition and uses a partner there to install firmware and package the units for retail sale. "That enables us to lower the cost base to which they apply duties and taxes," Briggs says. "That's an interesting way to use partners to open large markets that have unique requirements."

3PL Upside: Focus on Core Business

Whether the economy is weak or strong, companies outsource supply chain activities to third-party partners for a variety of reasons. The most obvious is to let the shipper focus on its main competencies, whether that's manufacturing widgets, developing a brand, or running retail channels.

"It's about asking, what is your core business? Toward what do you need to put your time, your talent, and your operating money?" says Larry Johanson, president of Johanson Transportation Service, a 3PL based in Fresno, Calif.

A 3PL is ready to assume those tasks that a company doesn't identify as central to its business. "We become your traffic department," Johanson says. "We bring a high level of expertise. We qualify all our carriers and do a lot of monitoring. We're available 24/7, and we hold ourselves to a high standard."

In a competitive transportation marketplace, where a majority of carriers are small- to mid-sized trucking companies, it takes a great deal of effort to maintain a high level of service and safety. "Consider the internal technology it takes just to make sure that insurance and safety records are up to par and maintained," says Randy Gabardi, vice president of corporate operations at Johanson Transportation Service. "A company has to spend a vast amount of resources in an area that's not their primary focus."

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That's also where a third-party partner such as Johanson comes in. "We can provide all the technology, manpower, and resources," Gabardi says. "And because of the number of carriers we have relationships with, and the amount of business we do across the board, we can offer a higher level of service at a reasonable rate."

Besides simply freeing a shipper from certain operational tasks, a third-party partner brings value because of the industry savvy and resources it commands.

"Customers are asking us to help differentiate and support at a broader and more strategic level," says Americold's Fowler. "They don't want to tie up their critical capital in big logistics expansion projects, big infrastructure changes, or big IT capital purchases." They want a perspective on the marketplace and supply chain best practices that isn't available from the vantage point of a single company in a single industry.

"It's less about getting shippers a different rate, and more about recognizing transportation trends, and bundling solution sets and service offerings around the opportunities that are manifesting themselves—new ways to provide value in this economic environment," Fowler says.

Leave it to the Experts

Arctic Cat relies on Ruan to route and manage its inbound and outbound shipments, and to maintain and monitor carrier contracts. But it also looks to Ruan and other 3PLs for industry expertise.

"I am always challenging my 3PL providers to keep their knives sharpened," Zeller says. "I'm stuck in a manufacturing area, and can't keep up on everything going on in the industry. I hold the 3PLs accountable for making sure I know about those things."

For instance, he expects a 3PL to evaluate the company's established logistics processes and recommend improvements.

Along with expertise, supply chain outsourcing provides agility, which helps a company stay profitable through all manner of economic fluctuations.

"3PLs give me more flexibility than I'd have with my own people," says Zeller. In an economic downturn, if he needs to remove people from his payroll, the 3PL picks up the slack. And the 3PL can assign more or fewer associates to his account as business volume requires.

Zeller also appreciates the way the 3PL keeps bringing in new talent with fresh perspectives. For example, he says, Ruan recently hired a new analytics specialist. One day, this person will be promoted to another position, and another analyst will fill that slot.

"I don't always like the change," Zeller says. "But I do like the fact that I've got young talent who will challenge me to think differently and offer suggestions about what we should be looking at."

Ebb and Flow

Given the seasonal fluctuations in customer demand, it wouldn't be efficient for GoPro to run its own packout centers—the facilities where product goes into its retail-ready packaging. "About half of our packout business takes place in the fourth quarter," Briggs notes.

ModusLink can handle demand ebbs and flows more efficiently because it serves numerous customers in a single facility. In Brno, for instance, the 3PL serves more than one dozen customers in one facility, running two shifts to accommodate their needs.

"We're not all demanding high volume at the same time," Briggs says. "They're able to spread the ebbs and flows across at least 13 different customers." Toward the year-end holiday season, when many of those customers do see a surge in volume at the same time, ModusLink adds a third shift if necessary.

"I can't do that if it's just me and I'm running my own packout center," Briggs says. "Outsourcing is a huge leverage in a business like mine that is so volatile from a volume standpoint."

ModusLink designs the customer mix in its regional facilities around a principle called "reverse seasonality," specifically choosing customers whose demand volumes peak at different times. "We don't always get it right, but we try to smooth it out as much as we can," says Foy.

Outsourcing to a 3PL with regional facilities around the world also helps GoPro deal efficiently with the unique needs of different markets. That's particularly true in Europe, where new regulations require companies to "localize" their products, providing packaging, instructions, and other materials in the local language.

"I'm localizing in nine languages now," Briggs says. "Regionalizing the packout with a partner like ModusLink enables me to make decisions about the language mix as close to the customer as possible.

"If I guess wrong—and I always guess wrong—I can rework it in-region," he adds. "I don't have to go back to China to do that."

ModusLink has been postponing services such as localization until the last minute for GoPro for a long time. "More of our clients are asking for that service, holding the raw materials as late as possible to make decisions about the language, which software to put on the product, and what instruction manuals to include," Foy says.

From 3PL to 4PL

As companies seek greater advantages from outsourcing, more of them are turning to the use of fourth-party logistics providers (4PLs)—integrators who manage a broader range of services than traditional 3PLs, Rollman explains. Those additional activities might include order management, invoicing, and fielding customer inquiries.

The 4PL model provides a particular advantage to companies that are entering new markets around the world. A service company working for numerous clients in an Asian market, for example, can operate more efficiently there than a global company could on its own.

"The 4PL is local, and there are language opportunities," Rollman says. "They know and understand the market. They know when things are happening that you couldn't get the sense of if you were in a center of excellence or hub thousands of miles away."

For example, consider what it takes to operate in a region where each of several countries requires very specific information on all invoices. "A 4PL has people who know and understand that without having to learn it the hard way," Rollman says.

It's impossible to say which way the U.S. economy will move in the coming months. But whether the arrows trend up or down, logistics professionals will always be able to find opportunities in their supply chain operations and demand-driven logistics practices. ■

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OMNI-CHANNEL RETAIL

ROADMAP to PROFIT

Omni-channel retail supply chains are forging new paths to profitability.

Here's what they look like.

By Lisa Harrington

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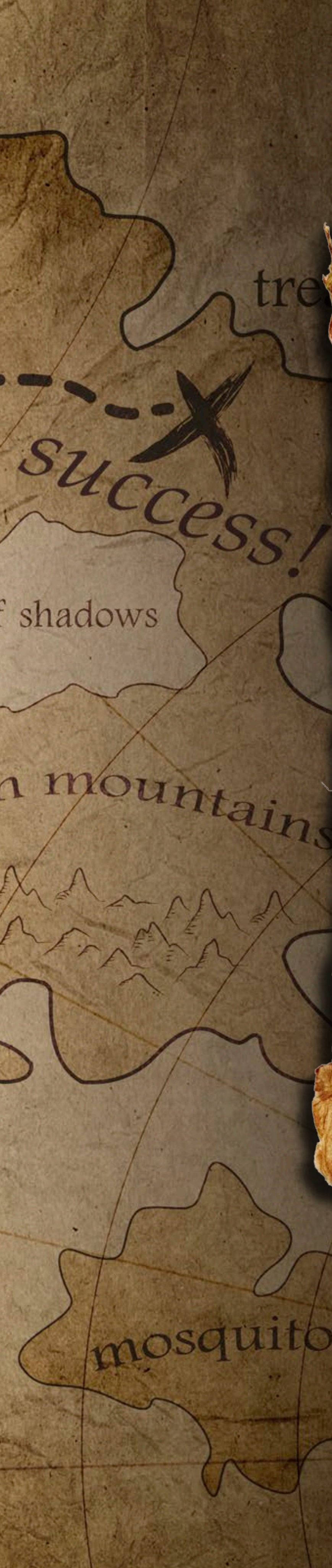

Global e-commerce sales will reach $3.5 trillion within the next five years. That sounds like great news for retailers. But there's a catch.

The fact is, more than one decade into the omni-channel phenomenon, many retailers still lose money on e-commerce—or, at best, break even.

A traditional brick-and-mortar retailer typically operates at a profit margin of five percent or below. However, the cost of fulfillment and logistics for online orders can be up to four times higher per unit than conventional brick-and-mortar models. Final-mile delivery is expensive; fulfillment costs for picking order quantities of one ("eaches") are higher than case picks; and high return volumes further erode margins.

This is not news to the retail sector. According to an Ernst & Young survey of global retailers, 86 percent of respondents think "current supply chains are not fit for purpose to deliver a successful omni-channel offering." Eighty-one percent believe that "supply chain transformation – not incremental improvements – is required to succeed in an omni-channel world."

"On a scale of one to five, with five being a perfectly operated, profitable omni-channel solution, where is the industry? I'd say we're at 2.5," says Perry Belcastro, vice president fulfillment services at third-party logistics provider Saddle Creek Logistics Services.

The trillion-dollar question, therefore, is how do you manage omni-channel retail and make a profit? What does the "right" omni-channel supply chain look like and how do you implement it?

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To answer this question, let's start with some background on the industry, and what is now known as "the Amazon effect."

Amazon sets the competitive bar for omni-channel retail. Only a handful of the largest retail chains in the United States have the customer base and supply chain infrastructure in place to mimic Amazon's fulfillment capabilities.

To provide Amazon-like service, therefore, many retailers have turned to their store network to fill the gap. "Stores are no longer just the end of the supply chain," notes Mike Passales, chief supply chain officer at Chewy and former vice president, fulfillment and transportation at Target in a recent report. They are now an integral part of the omni-channel offering.

Let's Get Physical

Having physical inventory close to the customer – in the store – enables retailers to offer flexible fulfillment and return options, as well as shorter delivery times that can match those of the leading online pure plays. Store fulfillment also allows for inventory synergies across channels and the opportunity for in-person upselling.

Store-based fulfillment will continue to grow. Ninety percent of the retailers responding to an Accenture survey expect store-based fulfillment to account for up to 35 percent of their total online order volume. Eighty percent of these retailers also plan to enable up to 80 percent of their stores for store-based fulfillment. Ninety-three percent of respondents cite that enabling ship-from-store had resulted in a positive uplift in online revenue, 77 percent indicated it had reduced their fulfillment costs, and 88 percent said it had improved their customer satisfaction metrics.

However, store fulfillment poses a number of challenges, including:

- High picking costs of using store personnel, and complexities of managing store personnel roles.
- Highly sophisticated inventory management systems required to maintain true inventory accuracy.

The second point, maintaining in-store inventory accuracy, continues to stymie most retailers. "There is an ongoing conflict with the in-store inventory," the head of operations for an upscale UK-based retailer notes. "A customer takes the time to check online for a product, see it is in the store, jump into her car, arrive at the department store, browse and shop at her leisure only to find out that the product she was just about to put her hands on has been taken by somebody else picking it up for a home-delivery order." The result: a dissatisfied customer who is likely to share her experience on social media.

Profitable omni-channel supply chains depend on key capabilities such as real-time control over inventory access and allocation.

The store fulfillment model is evolving, however, as retailers get smarter about managing this offering. According to the latest research from the Retail Industry Leaders Association and Auburn University, rather than use all stores as fulfillment nodes, leaders are adopting a hub-store strategy. This approach consolidates store fulfillment inside larger and/or centrally located stores rather than establishing fulfillment capability across the entire retail network. The hub store may keep larger inventories or have extra backroom space to support picking of high-volume items.

Whatever model retailers pursue, one fact is clear. "The desire on the part of companies to try and compete with Amazon has significantly raised supply chain costs and complexity," observed Brittain Ladd, former Deloitte consultant, in a 2015 industry roundtable discussion on omni-channel retailing.

A Total Cost Approach

In the face of this complexity, retailers need a supply chain that can handle forward and reverse product flows effectively, efficiently, and profitably. More specifically, explains Fred Takavitz, senior vice president, DHL Supply Chain, building a profitable omni-channel supply chain rests on eight key capabilities:

1. A flexible physical fulfillment network designed to support the various fulfillment requirements.
2. Real-time visibility into the entire pool of inventory, to reduce safety stock and inventory carrying costs.
3. Dynamic, real-time control over access and allocation of inventory.
4. Processing and shipping of individual orders at the lowest cost, regardless of the source.
5. Flexible fulfillment paths to meet demand, regardless of source channel.
6. Maximized efficiency in every part of the supply chain to meet customer expectations.
7. An effective, cost-controlled returns process.
8. Minimum cost to serve.

These capabilities are built on a foundation of accurate and complete cost information – answering the question, 'exactly what does it cost to satisfy each and every customer order, regardless of channel?' Surprisingly, says Richard Sharpe, CEO of Competitive Insights, few retailers can fully answer this question.

"Retailers know their costs at a high P&L level," Sharpe says, "but close the door and go off the record, and they admit they don't have the visibility into profitability by item or customer. They need this information to operate profitably. They can't afford to treat every customer and channel the same."

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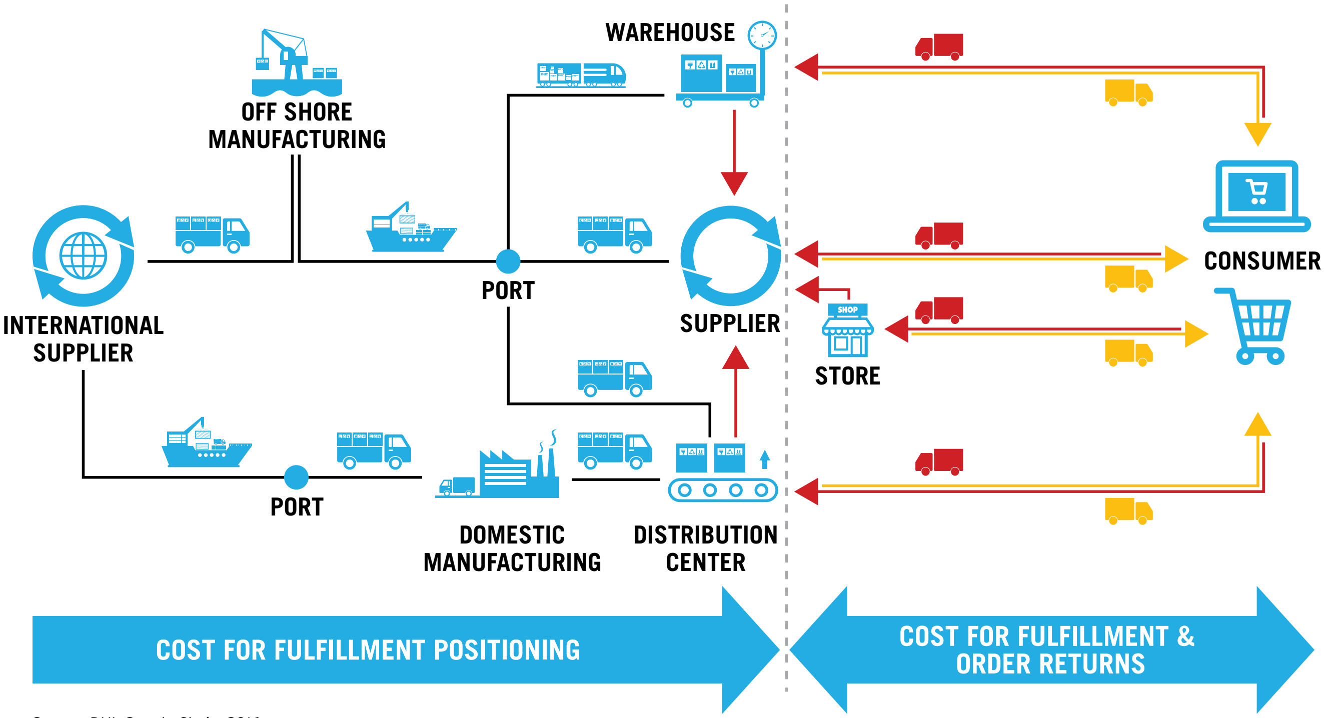
FIGURE 1: **Omni-Channel Total Cost to Serve**



Source: DHL Supply Chain, 2016

Granular cost information is hard to get a handle on, in large part because omni-channel commerce introduces a multitude of different cost dynamics that add significant complexity to the supply chain. This complexity stems from the fact that consumers have adopted a mindset that they will return many of the products they order.

"This returns paradigm creates a double hit to the P&L," Sharpe notes. "Returned products not only incur the sunk costs associated with fulfilling the order, but the revenue associated with the sale is actually returned to the consumer."

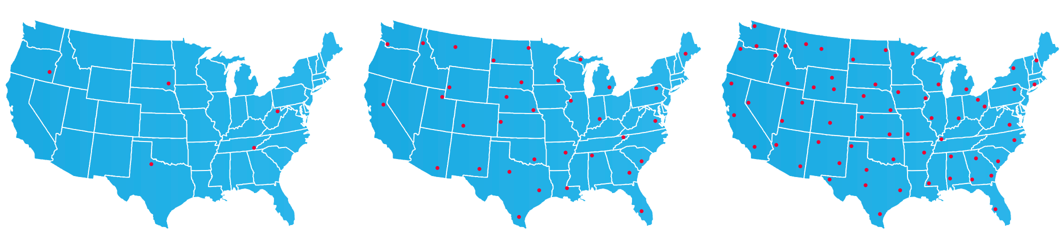
A total cost approach, then, starts with having cost and profit visibility at the product and customer level. With this information, a retailer can begin to segment customers by the net revenue, cost, and profitability associated with fulfilling their needs. "But the information has to be accurate and comprehensive," Sharpe insists, "otherwise you're wasting your time."

More specifically, the total cost to serve an omni-channel consumer can be broken down into three parts: the costs to position products to be ready for order fulfillment activities — including inventory carrying costs, the costs associated with fulfilling the order to the consumer and, when applicable, the costs associated with a product(s) being returned (*see Figure 1*).

Understanding the true costs of storage and handling, inventory carrying, and outbound delivery costs, allows the retailer to develop appropriate strategies for delivery

FIGURE 2: **Supply Chain Responsiveness**

Optimum facility count for required service levels in U.S. (to cover 90% of population)



Target service level	**2-3 days**	**Next day**	**Same day**
Radius covered by 1 facility	**~650 miles**	**~150 miles**	**~90 miles**
# of facilities needed	**~5**	**40-50**	**80-100**

Source: DHL Supply Chain, 2016

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FIGURE 3: Inventory Management Practices

	SEPARATE	CROSS-ALLOCATION	FULLY INTEGRATED
	Bricks-and-mortar and e-commerce stock are managed separately	In general, stock managed separately but cross-allocation can happen periodically (monthly/weekly) depending on demand	Bricks-and-mortar and e-commerce stock are merged and can be dynamically reallocated minute-by-minute
+	No expensive IT investment required	Ability to achieve some omni-channel advantages in a discrete manner	Provides true omni-channel customer experience and enables back-end optimization
-	Limits front-end and back-end optimization opportunities	Manual cross-allocation effort	High up-front investment required

Source: DHL Supply Chain, 2016

options and speed, inventory and fulfillment and network design.

Delivery is a critical driver of customer satisfaction. Retailers must find the right mix and balance of delivery options, whether for home delivery, store collection and fulfillment, or delivery to a pick-up point.

"Speed and cost are inextricably linked," with cost rising as speed increases," notes Marcel Beelan, vice president, global business development fashion and lifestyle, DHL Supply Chain. "An effective delivery strategy optimizes for both service and cost – and again, is based on accurate total cost data."

Delivery parameters directly affect network design and costs. In the United States, a two- to three-day day delivery lead time requires approximately five facilities across the country, explains a recent DHL report. A next-day service level requires an additional 40 to 50 facilities and, for same-day service, the number is closer to 100 (*see Figure* 2).

One has only to look at Amazon's rapid expansion of its fulfillment center footprint to see this strategy playing out. The e-commerce giant operates 200-plus fulfillment centers in the United States alone, with more on the way. Here again, Amazon's network expansion raises the omni-channel service bar, escalating the pressure on all retailers.

An expanded physical network has a downside, however. "A lot of retailers are betting on the fact that having product closer to the consumer is essential," says Sharpe. "But when you do that, your inventory carrying costs go through the roof. So this may be an OK strategy for gaining market share today, but it probably isn't sustainable over time."

Inventory and Fulfillment Approaches

For a retailer managing brick-and-mortar and e-commerce channels, the most critical decision regarding inventory management is whether to separate or integrate inventories for different channels. There are three typical industry practices regarding inventory management: separate, cross allocated, and fully integrated (*see Figure* 3). Omni-channel leaders are moving toward the fully integrated model, otherwise known as the channel-agnostic approach.

This 'seamless inventory strategy' treats demand the same regardless of channel or fulfillment location, and requires retailers to build inventory positioning flexibility across the network, the RILA-Auburn University study notes. It allows for a single integrated stock to be allocated dynamically in the most cost-efficient way across channels.

Dynamic order fulfillment capabilities leverage the entire stock throughout the supply chain. Orders are allocated in real time, based on a number of parameters including: shipping cost, picking cost, inventory levels, demand forecast and unit value. *Figure 4* (below) shows how this system works, using the example of a shirt ordered in Boston for next-day delivery.

This model requires a substantial investment in highly sophisticated inventory and order management technology. "While this is certainly best practice, most companies have a long way to go in realizing this integrated model," Beelan reports.

To sum up, a best-in-class omni-channel retail supply chain model looks like this:

FIGURE 4: Flexible Fulfillment Model

Customer in Boston orders a shirt for next-day delivery

System checks possible fulfillment options; shirt available in 5 stores and 2 distribution centers

Closest location is a store in New York, but this SKU is in high demand

In Los Angeles, the SKU is overstocked and will soon go on discount

Based on total landed cost, the order is allocated to the store in Los Angeles

Store in Los Angeles packs shipment and sends with next-day delivery to Boston

Source: DHL Supply Chain, 2016

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- **Inventory.** Single stock at all levels (DC and stores) with full visibility and real-time allocation.
- **Fulfillment and warehousing.** Flexible fulfillment with real-time order management decision-making.
- **Delivery.** Best-fit providers portfolio, dynamic delivery operations, IT-enabled optimization for service and cost.
- **Network.** Design mapped to fulfillment and returns customer service and brand strategy, aligned to cost-profit considerations.
- **Returns.** Optimized returns management by cost, speed, profit management.

The Importance of IT

Information technology underpins the profitable omni-channel retail operation, and required investments are substantial. "You have to invest in IT, or find a provider who has done so and partner with them," insists Takavitz. "You cannot succeed without this foundation. Period."

Next, standardize operating processes as much as possible. "It's a balancing act," Takavitz notes, "but the more you can standardize, the better your cost and profitability profile will be."

Strengthening the Core

Consider outsourcing. "Many retailers and merchants are good at product development, marketing, and branding, but logistics is not their core strength," says Belcastro of Saddle Creek. Retailers may want to look for an Amazon alternative—a third-party logistics firm with the breadth of capabilities to provide Amazon-like solutions."

"This is a tremendous potential opportunity for logistics service providers," suggests Sharpe, "but they must move fast to capitalize on it – because Amazon is on it."

Finally, on a higher level, profitable omni-channel retailing "all starts with self reflection," Belcastro notes. "Define or redefine your mission as a retailer. How do you want to position the brand with respect to meeting your customers' expectations? That provides the foundation for your omni-channel strategy.

"Successful omni-channel retailing is about driving more profitable sales and growth," he adds. "That should be the expectation that directs all of your activities."

A best-in-class omni-channel retail model features flexible fulfillment and warehousing.

Do retailers have a choice whether or not to embrace omni-channel fully? "If you don't participate, you'll be out of business," says the chief supply chain officer for a global fashion retailer. "The question is moot. So spend your time looking at best practices and figuring out what works and what doesn't."

"Through it all," he concludes, "the customer has to be at the center of our strategy. Then we have to figure out how to give customers the products they want, with the quality of service they expect, and do so faster and cheaper than ever before." ■

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FIRING ON ALL CYLINDERS

The popularity of classic auto restoration revs up an extensive multi-channel logistics network to meet the needs of enthusiasts. Buckle up, let's go for a ride.

BY CHARLIE FIVEASH

Two decades ago, original equipment manufacturers (OEMs) in the automotive industry thought they had mastered the spare parts distribution market. Then, along came a new wave of specialty automotive parts distributors and wholesalers who added a whole new dimension to the automotive supply chain. Today's spare parts market now consists of more than just carburetors and catalytic converters on traditional automobiles. As Americans' fondness for trucks and automobiles continues to grow, specialized parts represent the fastest growing subset of the automotive aftermarket.

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Many providers specialize in one brand of car. Omix-ADA, for example, serves Jeep enthusiasts by offering more than 20,000 parts and accessories, and supplying nearly all the Jeep parts retailers and warehouse distributors in the United States and 100 countries worldwide.

The emerging specialized parts sector of the automotive supply chain is vast and complex, growing at 8 percent per year, according to the Specialty Equipment Market Association (SEMA), a California-based trade and advocacy group for the specialty automotive industry. To facilitate this growth, SEMA hosts an annual international show in Las Vegas, drawing more than 100,000 buyers, exhibitors, and industry leaders. The November 2016 show featured 2,500-plus new accessories, parts, tools, and auto components.

The automotive parts revolution started decades ago with showcase wheel rims and hubcaps, and then evolved into specialty lights, bumpers, and window shields. With the popularity of light trucks for daily transportation, some pick-up and off-road enthusiasts — as well as sedan and SUV owners — have discovered the power of the "lift." While usually associated with pick-up trucks and 4 x 4s, a typical suspension lift raises a vehicle's shocks and leaf springs by 4 to 6 inches. The higher clearance increases the elevation of the wheel-well, accommodating larger tires for off-road and aesthetic purposes.

Today, a whole cottage industry has emerged to serve the specialized parts and accessory aftermarket in the auto, off-road, and light truck supply chain. One specialty manufacturer that has captured the demand for spare parts and accessories is Omix-ADA. The metro Atlanta-based manufacturer provides specialty parts for the Jeep aftermarket – from LED light mounts to pink winches for both modern and vintage Jeeps– and warehouses more than 25,000 SKUs.

The spare parts auto aftermarket represents a $39-billion industry, according to SEMA. While specialty parts represent the emerging sector of the automotive aftermarket, auto accessories and specialized parts have been around for 50 years. For example, Auto Ventshade was founded in Jacksonville, Fla., in 1935 as a manufacturer of protective window and roof shields. The company was eventually acquired by Lund International, a conglomerate of nine specialty auto parts manufacturers that cover brand-name accessories from floor liners to fender flares.

RESTORE AND ACCESSORIZE

Specialized distributors make up a separate industry sector within the automotive aftermarket. Manufacturers and distributors within the specialty aftermarket focus on individual makes, models, or eras of autos — from antiques, restorations, accessories, and specialized parts for showmanship or practicality. A prime example of a specialty manufacturer aligned to a specific era of automobiles is Auto Metal Direct (AMD).

The company is a wholesaler of sheet metal products for muscle cars. With its automotive parts manufactured exclusively in Taiwan, AMD specializes in restoration parts for high-performance Mopar, GM, Dodge, and Plymouth models produced in the muscle car era — 1958 to 1977. While seemingly narrowly focused, AMD's emphasis on muscle cars represents

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“Will the music stop after every muscle car in the world has been restored?”

– **Mark Headrick,** President
Auto Metal Direct

As consumer interest in restoring vintage autos, like this classic Ford Mustang, continues to grow, specialized parts now represent the fastest growing subset of the automotive aftermarket.

an exclusive sector of American-made auto enthusiasts who restore vintage-era autos known for speed, style, and performance.

“We often wonder if one day the music might stop after every muscle car in the world has been restored,” jokes Mark Headrick, president of Auto Metal Direct, referring to the perceived limited number of high-performance muscle cars still on the road today. “But fortunately our business continues to grow each year.”

DRIVING RETAIL CHANNELS

Wholesalers such as Omix-ADA and Auto Metal Direct sell to a host of distributors and retailers including Summit Racing, an Ohio-based retailer founded more than four decades ago. Retailers such as Summit sell online to the general public or through three regional superstores located in Ohio, Nevada, and Georgia. The brick-and-mortar locations also serve as distribution centers to service Summit’s substantial online and call center sales volumes.

Restoring vintage autos and trucks has been a popular pastime for decades, but as America’s iconic vehicles — Mustangs, muscle cars, Jeeps, and light trucks — have come more in vogue, restoring older classic models requires remanufactured parts and an accompaniment of accessories. With the popularity of classic auto restoration, an extensive multi-channel distribution network has emerged to meet the needs of restoration enthusiasts, encompassing e-tail and brick-and-mortar retailers.

Within any sector of the automotive spare parts business, tracking the number of SKUs is a constant challenge. In the specialty parts and accessory aftermarket, the SKU proliferation is equally as daunting as the original equipment manufacturers (OEM) sector. Omix-ADA manages a total SKU count of 25,000, but the wholesaler’s targeted parts focus falls in the 15,000 range. On the OEM side, the SKU count is similar by comparison. At Porsche, for example, the spare parts SKU numbers fall in the 18,000 to 25,000 range, says Bob Semsch, manager of logistics and process improvements for Porsche Cars of North America.

The SKU count continues to expand in the parts aftermarket, as manufacturers design, produce, and reproduce accessories and specialty parts to accommodate customers following a particular brand or accessorizing an off-road or vintage vehicle.

“Ten percent of our employees are engineers,” says Brandon Seadorf of Omix-ADA. “Our designers use auto-CAD and 3D printing to test-fit a new part or accessory prior to sending the design to our manufacturing partner for tooling, stamping, or processing.”

FUEL FOR GROWTH

As demand for new products maintains its growth trajectory, manufacturers will continue to design and produce new lines of accessories for off-road vehicles and light trucks. To meet strong customer demand, Omix-ADA imports 45 ocean containers per month — mostly from China — to its

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185,000-square-foot distribution facility in Suwanee, Ga.

To stay ahead of the competition and follow automotive industry trends, companies such as Omix are not just in the import and distribution business; they are also innovators.

"We design and produce as many as 50 new products every month," says Seadorf. "Some are small accessories, but to meet our customers' needs, several parts need to be adapted or upgraded over time."

NETWORK DESIGN

Several specialty parts wholesalers have implemented a strategic approach to their distribution channels and network design, evaluating the optimal way to serve global distributors. While OEMs primarily service their dealer networks with one- to two-day deliveries from strategically located DCs, specialty aftermarket wholesalers have learned that their delivery platform is not as time critical.

"Our customers don't demand next-day service," says Rodney Willis, senior warehouse operations manager, Omix-ADA. With less pressure to meet time-definite delivery, specialty parts and accessory wholesaler providers have maintained a single-source DC solution that meets customers' cost, control, and service expectations.

OEMs are different, however. "An OEM can no longer serve its North American platform with only one or two centralized distribution centers," notes supply chain consultant Fred Kimball of Distribution Design, a New England-based advisor to the automotive industry.

In 2007, Omix-ADA rolled out a network distribution strategy to service its growing customer base in North America. Omix implemented a hybrid approach to a multi-location DC design by partnering with a national public warehouse to launch three U.S. locations. Working with its third-party logistics (3PL) partner, Omix opened strategically located DCs in Nevada, Kansas, and Virginia.

Eventually, Omix decided to consolidate the three DCs into one central location in Kansas City, but later changed its warehouse network, consolidating its North American distribution channel back to its primary DC in Suwanee.

"We found that our customer base didn't necessarily require one- and two-day deliveries," says Gonzalo Manotas, Omix-ADA's director of purchasing.

Later, Omix-ADA decided to insource its warehousing and distribution, discontinuing the relationship with its 3PL after the regional warehouse concept didn't yield the increase in sales the company had projected. "We thought a faster delivery model to our customers would result in more sales, but it didn't move the needle enough to justify the added expense," Manotas says.

Other specialty parts distributors and manufacturers have contemplated a hub-and-spoke distribution model, particularly after assessing the shipping distance from key customers.

"With our strong customer base in California, we considered a West Coast warehouse a few years ago," says Headrick. "But it came down to control and staffing. We can offer two- to three-day shipping to our West Coast customers, so the cost to set up a second warehouse in Nevada or California would not have yielded the payback we projected."

Cost is also a major factor in commissioning a new DC. "Freight savings are typically the main driver in deciding where to locate a DC," notes Anu Goel, executive vice president of aftermarket and services with Volkswagen Group of America.

Despite the potential freight cost savings, opening a DC in a new market can be costly. "Volkswagen's approximate cost to open a new full-scale distribution facility is several million dollars," Goel notes.

With most specialty parts wholesalers embracing a central distribution location strategy, outbound distribution is critical. Both Omix-ADA and Auto Metal Direct operate only one major warehouse in North America, citing better operating control and customers satisfied with delivery times.

"From our Suwanee warehouse, we can service most of our delivery channels within two days," says Manotas. "Unless it's a backorder or rush shipment, our standard delivery times meet the needs of our distributors."

Like Omix-ADA, Auto Metal Direct has elected to maintain a single DC in its delivery service model. But as its parts demand expanded, discussions emerged about a West Coast delivery depot.

"With our strong customer base in California, the company looked intensely at the viability of a West Coast warehouse," explains Headrick. "But after surveying customers, we found the three-day delivery target to be adequate from their perspective."

Like Omix, AMD considered the services of a 3PL to kickstart its West Coast distribution. "We looked at integrating with a 3PL initially, but a West Coast DC never materialized, so today we still operate and ship from our one U.S. warehouse," Headrick adds. "This single distribution point currently meets our distributor and retail delivery expectations."

DOWNSTREAM DISTRIBUTION

Wholesalers in the aftermarket parts industry depend on a network of distributors and retailers that specializes in automotive parts and accessories. One well-known multi-channel distributor in the specialty auto parts industry is Summit Racing, which has been selling aftermarket specialty parts since 1968.

To better understand the automotive aftermarket supply chain for specialty spare parts, distributors such as Summit also function as retailers. As manufacturers in the supply chain, Omix-ADA, Auto Metal Direct, and Lund supply to Summit Racing. All three manufacturers rely on their respective dealer networks through key distributors/retailers such as Summit.

Another retail distribution channel for specialty automotive parts is the brick-and-mortar stores including O'Reilly Auto Parts, AutoZone, and NAPA. "When considering our sales network, we have a broad reach," Manotas says.

The reach of the specialty parts and accessories market extends beyond the household names in the traditional retail stores. "Omix-ADA is in 44 Amazon warehouses," says Manotas. "We've met with Amazon's senior logistics staff in Seattle, and they understand the automotive specialty parts business. Amazon is an important partner in our retail network."

The broad retail approach can be summed up in one word: brand. For automotive enthusiasts in the off-road, muscle car, or truck restoration sectors, popular brands sell parts and particularly accessories. Retailers and consumers seek popular

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wholesale brand names, such as Omix-ADA's *Rugged Ridge* line. Similarly, AMD relies on brand loyalty among muscle car restoration enthusiasts.

Shipping and parts storage have always been top challenges for the automotive industry. Auto parts are typically larger, requiring a greater warehouse footprint than other distribution-related industries. Additionally, many automotive parts are bulky, and difficult to package and ship. Consider a car bumper, for example. It requires specialized packaging due to its size, configuration, and need for protection during shipping.

"With 100 LTL shipments weekly, we can fill two to three trailers every day on outbound deliveries," says Rodney Willis, senior operations manager at Omix-ADA.

"We thought a faster delivery model to our customers would result in more sales, but it didn't move the needle enough to justify the added expense."

– **Gonzalo Manotas,** Director of Purchasing, Omix-ADA

WELL, ISN'T THAT SPECIAL

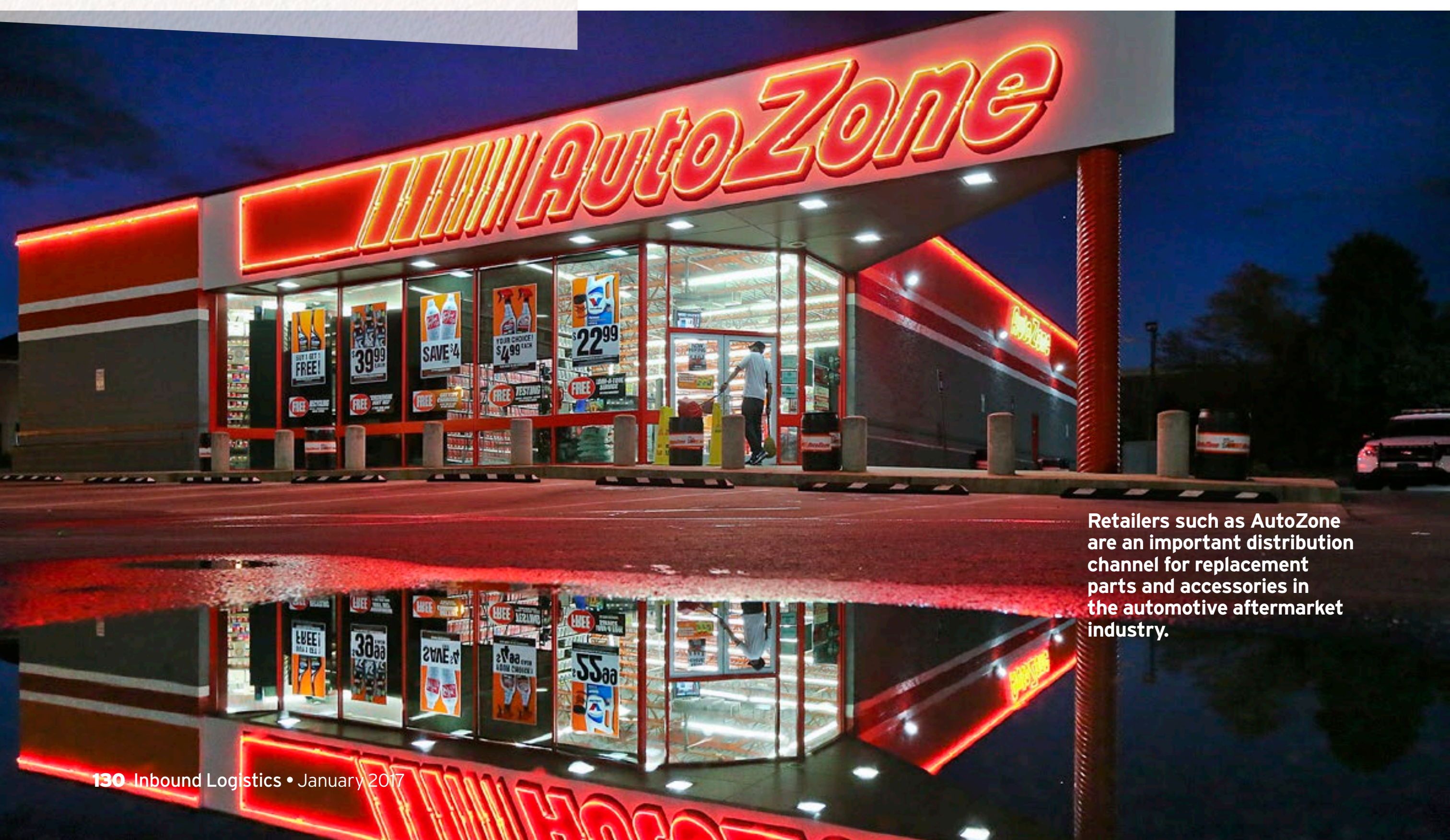
With the rising popularity of restoring and accessorizing vintage autos—including trucks and off-road vehicles—specialization has become the focus. Particularly with the high SKU count among auto wholesalers, most specialty aftermarket parts distributors have stayed within the confines of their core competency: Mustangs Unlimited focuses on vintage Ford Mustangs, Auto Metal Direct's market is strictly muscle cars, and Omix-ADA's primary emphasis is the Jeep aftermarket.

Other manufacturers gravitate toward specific specialty parts. For example, Fullerton, Calif.-based Discounted Wheel Warehouse sells only wheels and rims for all makes, models, and vintage eras.

Omix-ADA sells almost exclusively Jeep parts and accessories. The company designs, produces, and ships to a global distributor network that sells to Jeep enthusiasts—along with a host of other OEM brands in the off-road submarket. "With our emphasis on 'all things Jeep,' our market is broad due to the SKUs we carry, but our coverage is two inches deep," says Seadorf. Still, specialization and brand loyalty drive the market.

For most employees in the specialty parts aftermarket, working in the automotive parts industry is more than just a job or a paycheck. Car and light truck enthusiasts infiltrate the automotive aftermarket supply chain workforce. "Our long-term employees have typically been people who like to tinker with cars," says AMD's Headrick.

It's the same story at Omix-ADA. "Look at our employee parking lot and you'll see mostly Jeeps," says Manotas. "We love the brand, which makes the job that much more fun."



Retailers such as AutoZone are an important distribution channel for replacement parts and accessories in the automotive aftermarket industry.

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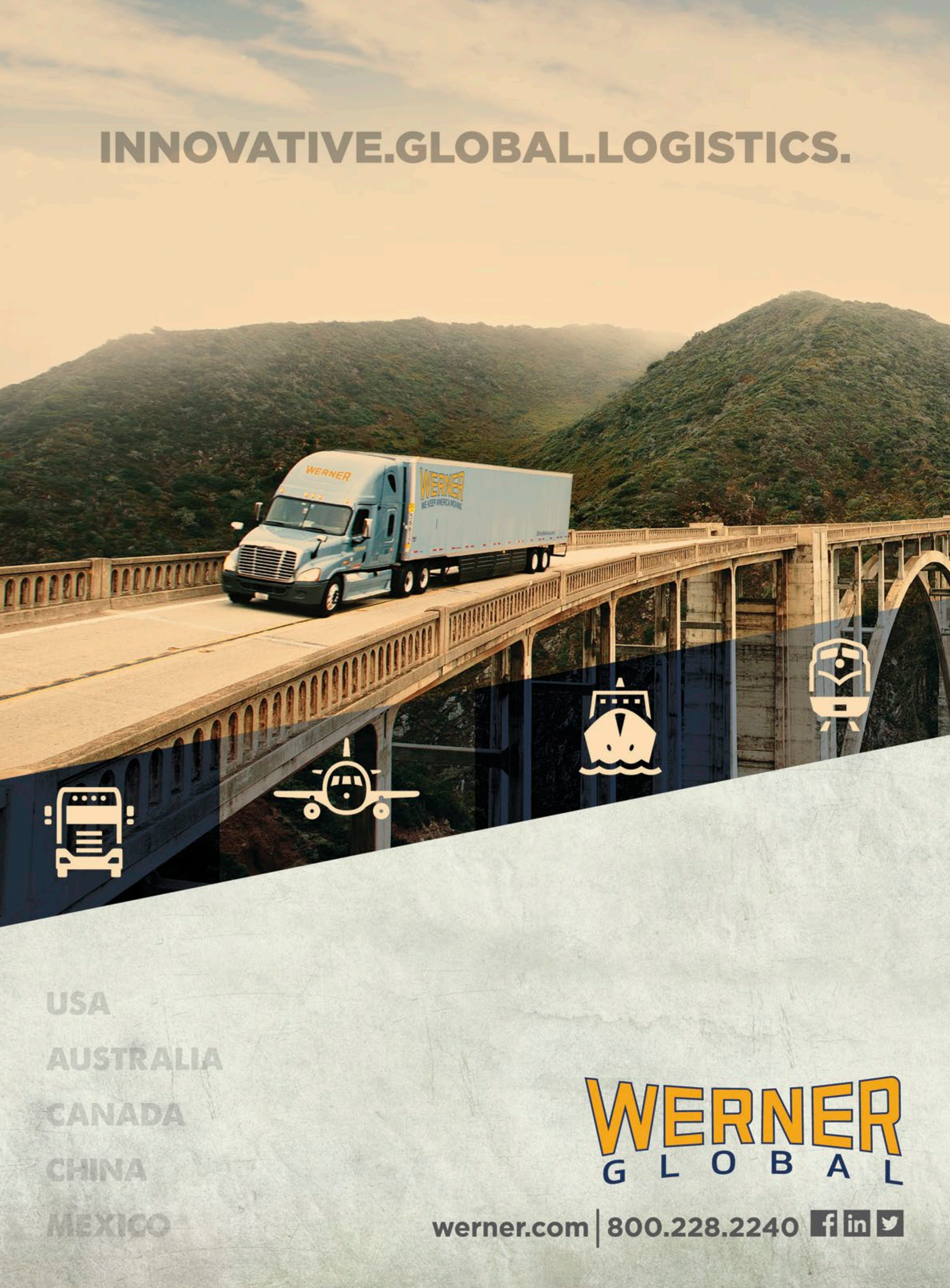

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WHAT A RIDE!

How Monster Moto—with help from UPS—moved product assembly from China to Louisiana, a strategy that was no child's play.

By Merrill Douglas

Say you're selling a quintessentially American product. Wouldn't it be great to produce it in the United States and strive to build it better than you could overseas—and at no greater cost?

It has been just a few years since officials at power sports company Monster Moto started asking how they might move their manufacturing from Asia to the United States. In 2016, they answered that question and met their goal, as mini bikes and go-carts started rolling off the company's new production line in Ruston, La.

Monster Moto has created new jobs in the United States without increasing its production costs and, in some cases, even reducing them. The company has also gained several business benefits to help accelerate its growth. Much of that success comes thanks to a major effort to design a new logistics strategy.

Founded in 2013 in Garland, Texas, Monster Moto produces high-quality, affordable mini bikes and go-carts for children. It sells them through multiple channels: big box stores, independent power sports dealers, its own e-commerce site, and Amazon, as well as through partnerships with conservation groups.

Monster Moto is still a small business, with only about 50 employees. But it's growing fast. It sold 20,000 units in 2014, and since then sales have been growing by about 70 percent per year. It has committed to creating a total of 287 jobs in Ruston over 10 years.

Originally, Monster Moto made all of its products in China. The logistics of that supply chain were simple. "Some of our retail customers would take FOB [freight on board] China orders straight from our facility in China, or from the port, in containers," says Alex Keechle, the company's chief executive officer. Monster Moto shipped the rest of its product to Garland, and then trucked it to retail customers or drop-shipped items to consumers.

Then came the idea to move production to the United States. The plan was to continue sourcing components in China, but to ship those parts to a domestic factory for assembly.

Three compelling arguments gave rise to this plan, Keechle says. First, onshoring would remove some risk and waste from the supply chain.

As Monster Moto expanded its product line, forecasting demand for specific models became increasingly difficult. "With a 30-day lead time [for manufacturing] and 30 days transit time on

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the water, you have to make large guesses about your demand," he says.

Assembling in the United States would cut the time between manufacture and sale, tying production to fresher market intelligence. "If we just ordered the components, we could build much more quickly on demand, and not be over- or under-inventoried on a particular SKU [stock-keeping unit]," Keechle says.

Second, while contract manufacturers in Asia are great at repeating the same process 100,000 times, they're not as good at making product modifications along the way. "If we wanted to make a small change, it was a Herculean effort," Keechle says. Domestic production offers greater flexibility.

The third argument was aspirational—the desire to make an iconic American product in the United States. Monster Moto can do that without increasing costs and, in some cases, actually saving money, Keechle says.

"American workers put on their thinking caps and say, 'If we did this slightly differently, we could enhance productivity,'" Keechle explains. "And guess what? They did it."

More efficient production explains in part how Monster Moto made onshoring pay. Other benefits grew out of Monster Moto's work with a partner—UPS—to redesign much of its logistics network.

Rick Sukkar, president and COO of Monster Moto, and Mark Modesti of UPS Customer Solutions discuss logistics at the new Monster Moto facility in Ruston, La.

A Visit and a Vision

UPS's role in the transformation started with a routine visit from Joseph Elenez, a new account executive. He came mainly to introduce himself and talk about UPS shipping rates. But then Keechle told Elenez about Monster Moto's vision—the onshoring plans, the need to ship components rather than finished product from Asia, and the company's targets for growth.

As he listened to the complex story, Elenez realized that Monster Moto's needs extended way beyond shipping rates. He asked for a chance to bring in a UPS team to analyze all of Monster Moto's logistics requirements and offer a set of solutions.

At the head of that team was Mark Modesti, a UPS customer solutions consultant. Modesti launched a process that began with an intensive whiteboarding session. Keechle and Rick Sukkar, Monster Moto's chief operations officer, joined Modesti in a room with several other UPS team members: a supply chain optimization expert, a marketing representative, an ocean and airfreight expert, and two meeting facilitators. The group dove into a highly detailed discovery session.

The process was exhausting. "We spent hours upon hours having the business dissected—our plans, thoughts, sales, channels, packaging, inbound," Keechle says.

According to Modesti, two major issues emerged during the whiteboard session: how to reduce the size of the packaging that Monster Moto used to ship finished products, and whether to add two new distribution centers (DCs) to the outbound network. But the conversation broadened way beyond those topics.

"UPS doesn't have a lot of preconceptions with a customer like Monster Moto until we get into the whiteboard sessions," Modesti says. "We talk about everything from reverse logistics to outbound, marketing, sales, inbound logistics. What are the goals? What's the current distribution process?"

That interrogation complete, the UPS team went away for about one month to cook up a series of recommendations. Then they came back with a list of proposals.

Although Monster Moto didn't follow through on every suggestion, it did engage UPS to help with several crucial items. One was the switch from importing finished product from two contract manufacturers to the much harder job of importing components, purchased from numerous overseas suppliers.

"UPS offers solutions that involve warehouses, so the freight gets shipped much more efficiently from Asia," Sukkar says. Monster Moto doesn't use UPS to consolidate all its freight before shipping. "But, incrementally, they have gotten some of that business," he adds.

UPS now also manages much of Monster Moto's inbound transportation, particularly by ocean. And UPS and its subsidiary, Coyote Logistics, move much of the finished product from Ruston to

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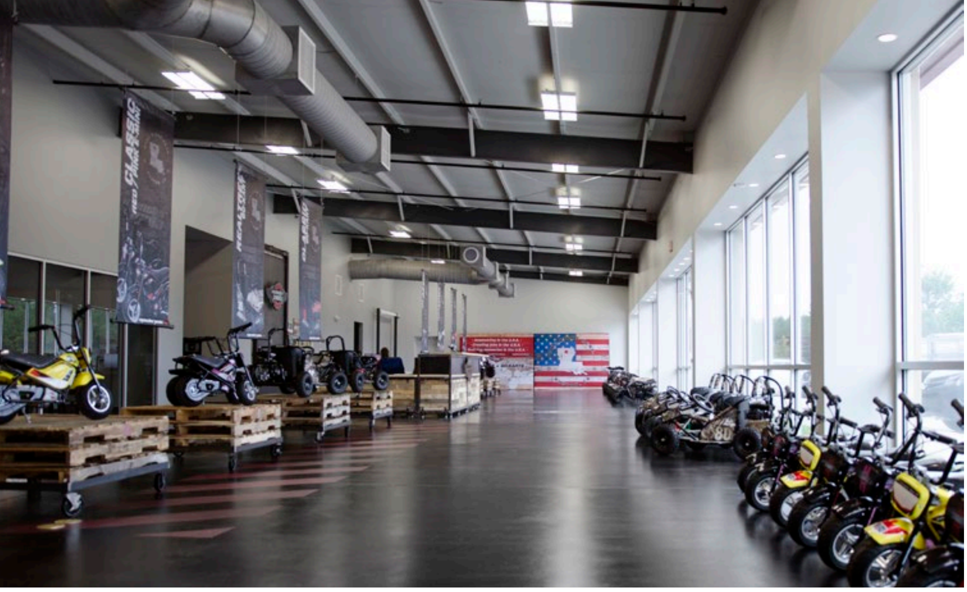

In 2015, Monster Moto brought production back to the United States. Its 100,000-square-foot campus in Ruston, La., includes corporate offices, a product showroom, warehouse space, and an assembly plant equipped to make all of the company's product lines.

end customers and dealers. "UPS handles a majority of that business because they've given us good rates," Sukkar says. "They want a relationship, and we want that, too."

While UPS plays a large role in Monster Moto's new supply chain, the manufacturer uses other carriers as well, and employs in-house personnel to oversee inbound and outbound logistics. Monster Moto has implemented UPS's WorldShip transportation management software to coordinate and monitor those moves.

Besides delivering several transportation solutions, UPS provided much-needed help with Monster Moto's packaging challenge.

The problem lay in the fact that a mini bike or go-cart must travel in a particularly sturdy box, to make sure it reaches the consumer without damage. "Monster Moto had packaging that originated in China that even included a little metal cage built around the vehicle," Modesti says. "That impacted the weight and it was too big."

The package was ever-so-slightly heavy and bulky enough to tip Monster Moto into a more expensive tier for shipping products sold through Amazon, Sukkar says.

Monster Moto worked with UPS's packaging lab—and also with a design team at Louisiana Tech University in Ruston—to develop smaller, lighter packaging that would still protect the product. "And we've done it; we've cracked the code," Sukkar says. "It will save us about $50 a box."

UPS also designed the packaging to better protect returned product. "Some of the returns came back in awful condition," says Modesti. Not many customers send product back to Monster Moto. "But they still needed to have packaging that would accommodate that return," he adds.

Another crucial piece of help from UPS paved the way for Monster Moto to expand its sales into Canada.

"As a result of that first discovery session, we brought up selling internationally, and they said, 'We don't have the bandwidth for that,'" Modesti says. "But by the end of the solution session, they said, 'Eighty percent of product buyers are outside the United States. We can't ignore that.'"

Canada represents a big market for power sports. But distributing product there from the United States is complicated; essentially, it requires working with a Canadian third-party logistics (3PL) provider. The first time Monster Moto received an order from north of the border, it started looking for a suitable partner. "But we couldn't promise the kind of volume that most of those companies required," Sukkar says.

UPS used its influence to locate a 3PL that would take on Monster Moto's business despite the initially low volume. "Now that we're in, we have a lot more options," Sukkar says. "But UPS was crucial in the beginning."

Monster Moto isn't sharing any plans it might have to expand into other international markets. But UPS has helped the company explore the possibilities. "We helped by analyzing their web traffic," Modesti says. "When we looked at the countries that were visiting their site, we talked about what it would be like to export to those countries. That helped inspire their thinking."

Warehouse Questions

And what of Monster Moto's other concern about adding two DCs to its outbound network? Originally, Keechle, Sukkar and their team were convinced that they needed new facilities—or capacity acquired through a 3PL—to reduce shipping distances and costs. But based on Monster Moto's current volumes, UPS advised the company to delay that move. It was a good idea, but not an immediate need.

Still, the day when Monster Moto will turn to UPS for help pre-positioning outbound product is probably not far off. "We've got a warehouse that's made for assembly, not for storage," Sukkar says. The facility in Ruston is already quite full, and as Monster Moto grows, it's bound to run out of space.

If Monster Moto stores finished goods in strategically located DCs, more of its shipments will qualify for UPS's single-zone shipping rates, reducing the cost to ship product to customers, Sukkar says.

The warehouse in Ruston could get a second look as well. Early in its engagement with Monster Moto, UPS sent an engineer to survey that facility. "He walked about 20 feet into the warehouse and said, 'Wait a minute. Why are we doing it this

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way?'" Modesti says. The farther he walked, the more suggestions he made.

Sukkar agrees that the Ruston warehouse isn't operating at top efficiency. "We opened in late May 2016, and will probably produce north of 10,000 units this year in Ruston—right off the bat," he says. With that kind of zero-to-sixty startup, it wasn't possible also to aim for maximum efficiency.

"This year is about proving things out," Sukkar says. "Once we prove out, next year is about optimization." That's when Monster Moto will bring UPS back to help improve operations in the warehouse.

Monster Moto is also looking for ways to squeeze more cost out of its inbound transportation. For instance, consider the frame of a go-cart. "That frame is a bulky item that is mostly air," Sukkar says. "Sending it on a ship from China is inefficient."

Sukkar says he's trying hard to figure out how to get the frame made in the United States. In the meantime, the company could save money by making better use of what is now empty space. "We're currently working on bundling vendors, getting the tire and wheel vendor to ship inside the frame, for example," he says. "That's just the beginning. There are many savings opportunities."

Monster Moto makes high quality mini bikes and go-karts for young riders.

It's not yet clear whether Monster Moto will embrace some other solutions that UPS has offered. One is a financial services tool that Monster Moto can use to determine the creditworthiness of retailers that want to carry its products. "And we guarantee the transaction," Modesti says.

The UPS team also proposed helping Monster Moto with environmental sustainability. "We have eco-responsible packaging, for example, and carbon-neutral shifting, where we mitigate the carbon footprint," Modesti adds.

Whatever comes next for Monster Moto, company officials are proud that they have been able to create American jobs while also revving up their power sports brand. "We moved production back to the United States because it made sense from a business perspective," Sukkar says. "There are many facets to that, with customer flexibility and nimbleness at the top of the list."

Monster Moto has a reputation for manufacturing excellent products, and their quality has improved even more since the move to the United States. So have speed to market, flexibility, and cost.

"Those were the three areas we modeled," Keechle says. "And what has come out has beaten the model." ■

Ruston Rides to the Top

Toward the end of a nationwide search for the right location, officials at Monster Moto had a hard time deciding whether to site a new assembly plant in South Carolina or Louisiana. One factor that tipped the decision was the availability of LED FastStart, a workforce development program offered by Louisiana Economic Development (LED).

"Imagine an outsourced human resources organization," says Alex Keechle, CEO of Monster Moto. FastStart held a job fair to recruit employees for Monster Moto, screened applicants, and developed training programs for the new hires. "We were the subject matter experts, but they interviewed us and took the pictures and videos to develop the curriculum to help our workers," he explains.

Employees of LED FastStart visited Monster Moto's headquarters to collect information on every task that employees would perform in the new factory, says Paul Helton, director of the Louisiana government program, based in Baton Rouge. They first used that information to create a pre-hiring program, letting the Monster Moto team see candidates perform tasks that employees would do on the job.

For candidates whom Monster Moto hired, LED FastStart provided an orientation program and training in specific tasks. "We actually took apart one of their mini bikes and 3D-modeled it, and we created assembly training based on that model," Helton says. The program encompassed all processes in the plant, including preparing the finished products for outbound shipping.

As Monster Moto expands and brings on new workers, LED FastStart will continue to provide training, Helton says.

Within Louisiana, Ruston emerged as the winning location in part because the city government there, led by Mayor Ronny Walker, offered a crucial piece of assistance. "The city guaranteed the lease of our building, which was key to attracting the capital required to build a new facility," says company COO Rick Sukkar. Without that vote of confidence, a small startup such as Monster Moto couldn't have obtained the necessary investment, he says.

Another big draw in Ruston was Louisiana Tech University. "Louisiana Tech is one of the best engineering/technical schools I've seen in the south," Keechle says. "These folks are tinkerers. They build stuff, they break stuff, they test stuff. And that is our intellectual pipeline for the future."

Louisiana Tech, including graduates of that school who go to work for Monster Moto, can help the company develop new products and improve its operations. "Having that talent pool there creates a unique opportunity to build a sustainable brand," Sukkar says.

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3PL Partnerships: You're In Good Company

As product demand continues to rise, companies of all industries are partnering with third-party logistics providers and sealing the deal with on-time and cost-effective delivery to customers. By Chris Lewis

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Regardless of a company's size or industry, supply chain management remains a complicated process that requires top-notch service from talented experts, whether companies are delivering products to or from a city near their headquarters or shipping them halfway around the world. And, as customer demand for timely deliveries continues to rise seemingly daily—while technology also advances at similar rates—some sort of supply chain assistance from an outside partner is virtually a necessity for most companies.

As a result, third-party logistics (3PL) companies across the United States are partnering with organizations to ensure they are able to exceed their customers' delivery expectations, in spite of constant changes in product shipment volumes, aptness, and capabilities. In turn, 3PLs are proving their value to their customers by providing 24/7 access, time and cost savings, and timely responses to shipment delays and inaccuracies, among other key offerings.

In recent years, the following four companies—a sporting goods and leisure activities provider, an automotive aftermarket product developer, a pharmaceutical maker, and a building materials distributor—have partnered with 3PLs to achieve a variety of objectives. Some 3PLs provide their customers a freight audit and payment software system that reduces audit costs and tracks expenditures, while others offer inventory management assistance that improves supply chain efficiency and optimizes routing and scheduling.

Other companies have also received lean and end-to-end supply chain solutions from their 3PLs. Lean supply chain solutions often increase productivity and empower employees, as they create a culture of continuous improvement, while the end-to-end solution decreases order to delivery times and streamlines inbound logistics throughout the world.

In every case, the results are evident. The benefits of partnering with 3PLs are wide ranging and long lasting—and available to companies of all areas of expertise as they strive to deliver products under budget and ahead of schedule.

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Escalade Sports: Game on

For more than 80 years, Evansville, Ind.-based Escalade Sports has been dedicated to providing sporting goods and leisure activities for homes, including table tennis and game tables, as well as Ping-Pong. To decrease its order-to-delivery times, reduce claims for North American home deliveries, and streamline its inbound logistics from Asia, Escalade Sports needed assistance from a 3PL.

Its product is typically oversized, resulting in significant merchandise damage, as well as extended transit times and missed delivery appointments. So Escalade Sports partnered with SEKO Logistics, a 3PL based in Itasca, Ill., for direct-to-consumer home deliveries within North America.

Through SEKO Logistics' commitment to providing Escalade Sports an end-to-end supply chain solution, it was able to generate a wide array of benefits for the sporting goods and leisure activities manufacturer, including reducing total landed costs, particularly through consolidation and supplier management services. In addition, Escalade Sports has reduced shipment claims—especially for all direct-to-consumer deliveries within North America.

Escalade Sports dramatically reduced claims for all direct-to-consumer deliveries within North America as a result of its partnership with SEKO Logistics.

Claim to Fame

"SEKO Logistics was a huge help in dramatically reducing our claims for home delivery in the United States, while also improving our order-to-delivery turnaround times," says Ken Vinson, purchasing manager, Escalade Sports. "SEKO also reduced our claims for direct-to-consumer deliveries by 60 percent and improved the consistency of our delivery times considerably.

"As a result, we asked SEKO to assist us with our inbound logistics from Asia," he adds. "Since then, they have been a tremendous help, as they have brought visibility and enhanced distribution services to our supply chain."

The inbound logistics program in Asia, including highly populated cities such as Hong Kong and Shanghai has provided Escalade Sports assistance with supply chain management. It also supports inbound 3PL services at strategic service centers, so that Escalade is able to consistently fulfill holiday rush orders to retail partners.

SEKO Logistics has also implemented supplier management services and training at Escalade Sports' China-based origin vendor locations, along with 3PL distribution services. Those services are strengthened primarily by MySEKO, a suite of applications and utilities that provides reporting in real time, including shipment information. Escalade has deployed the software for simplicity and visibility at various strategic service centers.

Since partnering with SEKO Logistics, Escalade Sports has enjoyed a successful relationship with the 3PL, especially with regards to its extensive reduction in claims for all direct-to-consumer deliveries in North America, as well as its decline in buyer's remorse and uptick in sales and customer service.

"SEKO Logistics' inbound consolidation program has also accomplished a decrease in transportation costs—with less frequent inbound shipments—as well as a better delivery performance from vendors in China," notes Brian Bourke, vice president, marketing, SEKO Logistics.

"In addition, the utilization of SEKO Logistics' key U.S. distribution locations has provided just-in-time delivery services, as well as a decrease in delivery costs, to significant Escalade Sports clients."

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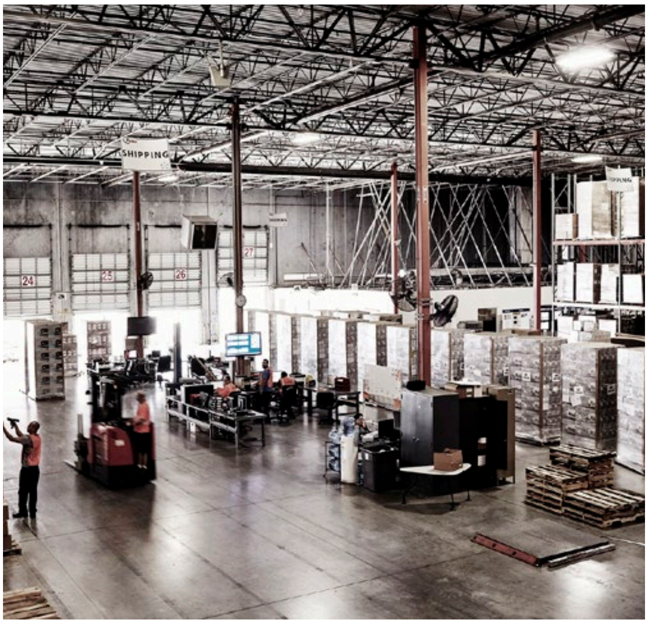

Part of Ryder's partnership with FRAM involves removing wasted time and energy from loading and shipping processes. As a result, FRAM's warehouse costs have seen a seven-figure savings year-over-year.

FRAM: Filtering Out Waste

In 2013, FRAM, an automotive aftermarket product developer based in Lake Forest, Ill., decided to partner with a 3PL—Miami-based Ryder—to implement a lean supply chain solution in its Hebron, Ky., distribution center. At the time, the 710,000-square-foot DC filled an average of 900 orders—about 30 truckload shipments—per day.

Among other key objectives, the lean supply chain solution was designed to create a culture of continuous improvement, engage and empower FRAM's workforce, and ensure the developer, particularly known for oil filters, would have a more effective distribution and operations process.

"As market churn for FRAM's products had decreased by nearly half of what it was historically, due to longer lasting products, we needed to capture more market share by being exceptionally customer-centric, and drive our diverse distribution channels to their optimum performance," says Steven Crowthers, director of distribution, FRAM. "This required more tools to perfect our distribution process—tools that would also help fill the potential profit gap on filtration products, which have even tighter margins."

In addition, omni-channel distribution had changed the landscape of FRAM's industry to the point where it needed transparency, as well as the ability to be more flexible. It also had to amp up innovation, a skill set that required a strategic partnership with a 3PL such as Ryder, which provides supply chain services to retailers in more than one dozen industries.

"A common theme is to 'focus on your expertise,'" says Steve Sensing, president, supply chain solutions, Ryder. "With our experience, we bring to the table best practices from a broad set of customers, which is a unique opportunity.

"This allows us to partner with companies, provide them the visibility to be able to respond to challenges, and create a positive experience with their customer base," he adds.

Uptick in Pick Accuracy

Since partnering with Ryder, FRAM has achieved 99.8-percent pick accuracy, as well as a 100-percent increase in productivity. It has also improved its units per man-hour (UPH) from 33 to 68, while reducing year-over-year supply chain costs by seven figures.

"Meeting the demands of consumers is becoming increasingly more difficult," notes Jimmy Fitzpatrick, group director, customer logistics, Ryder. "With more consumers shopping online, and many others still shopping at brick-and-mortar stores, delivering the products they want—when they want them—is vital to keeping loyal customers and turning profits.

"The way to deliver long-term customer value and outstanding business performance—quarter after quarter, year after year—is to nourish a lean culture where every step in every process adds value for the customer," he adds. "If it doesn't add value, it is eliminated."

FRAM's partnership with Ryder has been completely transparent, as the 3PL fully understands FRAM's customers' needs and is part of its strategic planning and budgeting both day to day and for the long term. Consequently, the partners are able to challenge each other as they pursue daily improvement in an environment of connectivity.

In addition, by outsourcing operations to Ryder, FRAM's representatives have been able to derive more value from their supply chains, as they have increased their focus on their core competencies. Customer service levels have also improved, along with flexibility, end-to-end visibility, and talent management, each a direct result of Ryder's and FRAM's collaborative nature.

"Ryder and FRAM are one unit; their goal is our goal," Crowthers says. "In our DC, you can't tell a Ryder employee from a FRAM employee."

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Hospira: Freight Audit Solution Cures Complexity

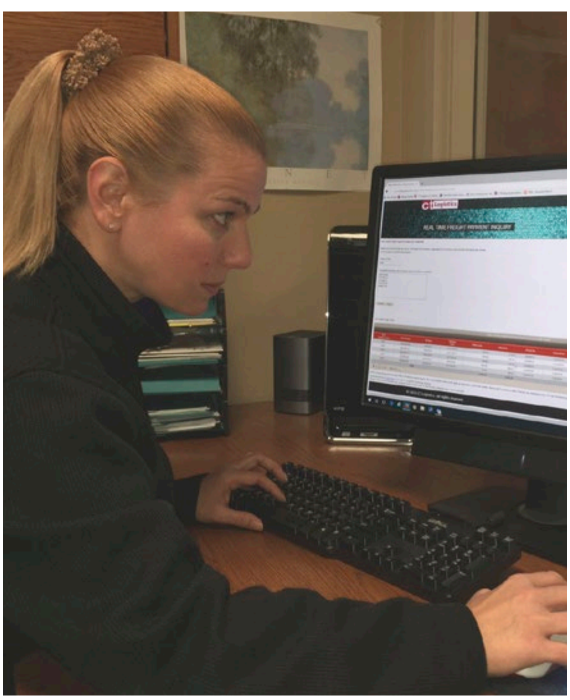
The Commercial Traffic Company–CT Logistics–celebrated its 90th anniversary in 2013.

"Some people think freight audit and payment is simple, but it's not," says Robert Sentz, manager of logistics planning and freight audit at Hospira, a Lake Forest, Ill.-based pharmaceutical maker that recently became a division of Pfizer. "We have very detailed contracts with carriers, especially regarding surcharges."

Hospira currently ships more than 2,000 different products annually to markets around the world. To better manage such complexity, Hospira has implemented a freight audit and payment software system from Cleveland-based CT Logistics. The 3PL modified the system specifically for Hospira, and enabled integration into its own servers, rather than installing the software on Hospira's hardware.

As a result, Hospira now saves more than $500,000 on audit costs each year, as it is able to use CT Logistics' software as a financial system that conducts accruals. Hospira employees are able to track exactly what the company spends and then compare its revenue with expenses. Likewise, Hospira employees can also review carriers' rates, which are featured in the system and constantly updated on the network.

CT Logistics' freight auditing technology also offers Hospira business intelligence capabilities that are very granular—to the point at which the pharmaceutical maker can determine the exact impact that even minor moves, such as relocating a distribution center, will have on costs. Hospira can conduct these types of what-if, ad hoc scenarios entirely by using the information it has acquired while processing payment information in its financial supply chain.



CT Logistics' freight auditing technology provides Hospira employees with valuable business intelligence capabilities.

Due to companies' various needs, budgets, and comfort levels with regards to operating freight audit and payment software in-house, CT Logistics currently offers its customers three options:

1. **Business Process as a Service (BPaaS).** In return for a monthly fee, end users receive 24/7 access to personal and secure software, as well as the latest information about rates and business rules, via CT Logistics' own servers. In addition, CT Logistics personnel perform most contract rate entry and audit functions, so that customers' employees have more time to focus on other responsibilities.
2. **Purchasing software.** Users can also choose to have CT Logistics' software package, known as FreitRater, installed at their offices. Often, customers will also receive subsequent software support from CT Logistics personnel after the software has been installed.
3. **Software as a Service (SaaS).** Customers' own technical staff members may also perform all contract rate entry and audit functions themselves—without any assistance from CT Logistics personnel—while also receiving secure, 24/7 access to the FreitRater service, via servers maintained by CT Logistics, for a monthly fee.

As evidenced by Hospira's shipments around the world, the demand for freight payment audit software is just as high outside the United States as it is within. In fact, CT Logistics' sales are now rising at double-digit rates in foreign markets.

To address this growing demand overseas, freight audit software available in the United States is becoming increasingly globalized in content and targeted at companies that conduct business across borders.

"By auditing bills in various currencies and languages, while also converting measurements in and out of the American and metric systems, the FreitRater software is able to help companies such as Hospira manage the complexity of their shipments as they continue to expand operations and services throughout the world," explains Allan J. Miner, president of CT Logistics.

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Winsupply: Building a Strategic Delivery Roadmap

To decrease the size of its shipments—while also increasing the speed of their delivery—Winsupply Inc., a nationwide distributor of building materials based in Moraine, Ohio, sought a 3PL partner to help scale its business operations to prepare for a changing marketplace. At the same time, it was also interested in maintaining its longstanding commitment to focusing on each of its individual locations across the United States, and empowering their financial success.

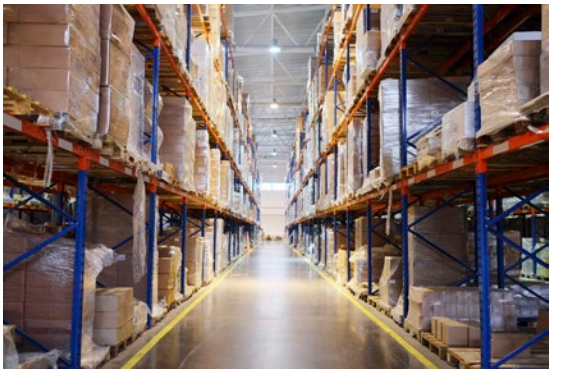
"Our goal was to create a best-in-class supply chain that allows our individual locations to more effectively utilize our distribution center network, while also shrinking the order-to-delivery timeline," says Rick McCann, vice president, supply chain for Winsupply.

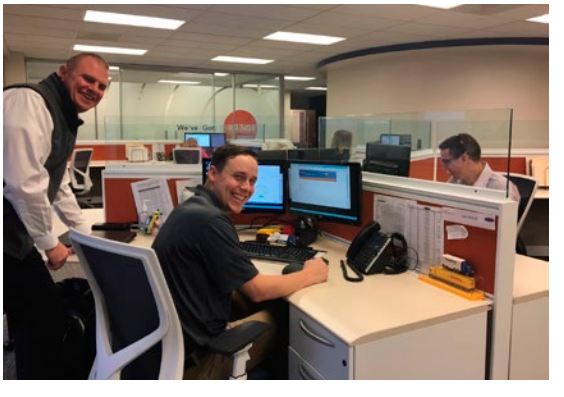
As Winsupply prepared to boost shipment delivery time, while also reducing shipment size, it encountered a variety of supply chain management challenges: managing inventory across approximately 600 locations, optimizing scheduling and routing on asset and non-asset transportation, and maintaining overall landed cost while increasing velocity.

Unique Network Design

Winsupply found a 3PL partner—Columbus, Ohio-based ODW Logistics—that was uniquely positioned to help it overcome supply chain management challenges and improve its shipment capabilities. Due to its infrastructure, which includes warehousing and asset-based trucking, non-asset transportation of all modes, freight planning and optimization, and engineering personnel, ODW Logistics was able to design a supply chain network specifically for Winsupply.

To prepare for this network design, ODW Logistics first needed to understand and replicate Winsupply's business activity—a nearly six-month process of onboarding, as well as the implementation of technology integration and online portals and processes, such as carrier score carding and in-transit exception





With its portfolio of transportation and warehousing solutions, the ODW Logistics team helps Winsupply streamline costs and operate more efficiently.

management. After this process was completed, an array of value-added phases followed, including distribution center location analysis modeling and redesign, increased trailer utilization, route design for reduced lead time, and truckload pool distribution.

"For a best-in-class supply chain, we needed to first determine the right number of distribution centers that would optimize service level and total logistics cost, with certain variable constraints," McCann explains. "ODW Logistics helped us form the strategy roadmap and deliver the dynamic modeling that guided us to the most appropriate short- and long-term outcomes."

As a result of ODW Logistics' assistance, Winsupply now maintains a more efficient and repeatable supply chain process that has improved its delivery speed without increasing its cost-to-serve. Since partnering with ODW Logistics, the relationship has continued to flourish—from the time in which it began to implement new online portals to its current strategic plan for long-term growth and cost reductions. That plan, according to ODW Logistics, is a value-driven service that is utilizing the strengths of both organizations for future success and growth.

"We are proud of the relationship we have had with Winsupply, as we have demonstrated our commitment to continuous improvement," says John Weber, vice president of sales, ODW Logistics. "Winsupply representatives have challenged us to provide a continued stream of solutions, and we have been able to exceed their expectations." ■

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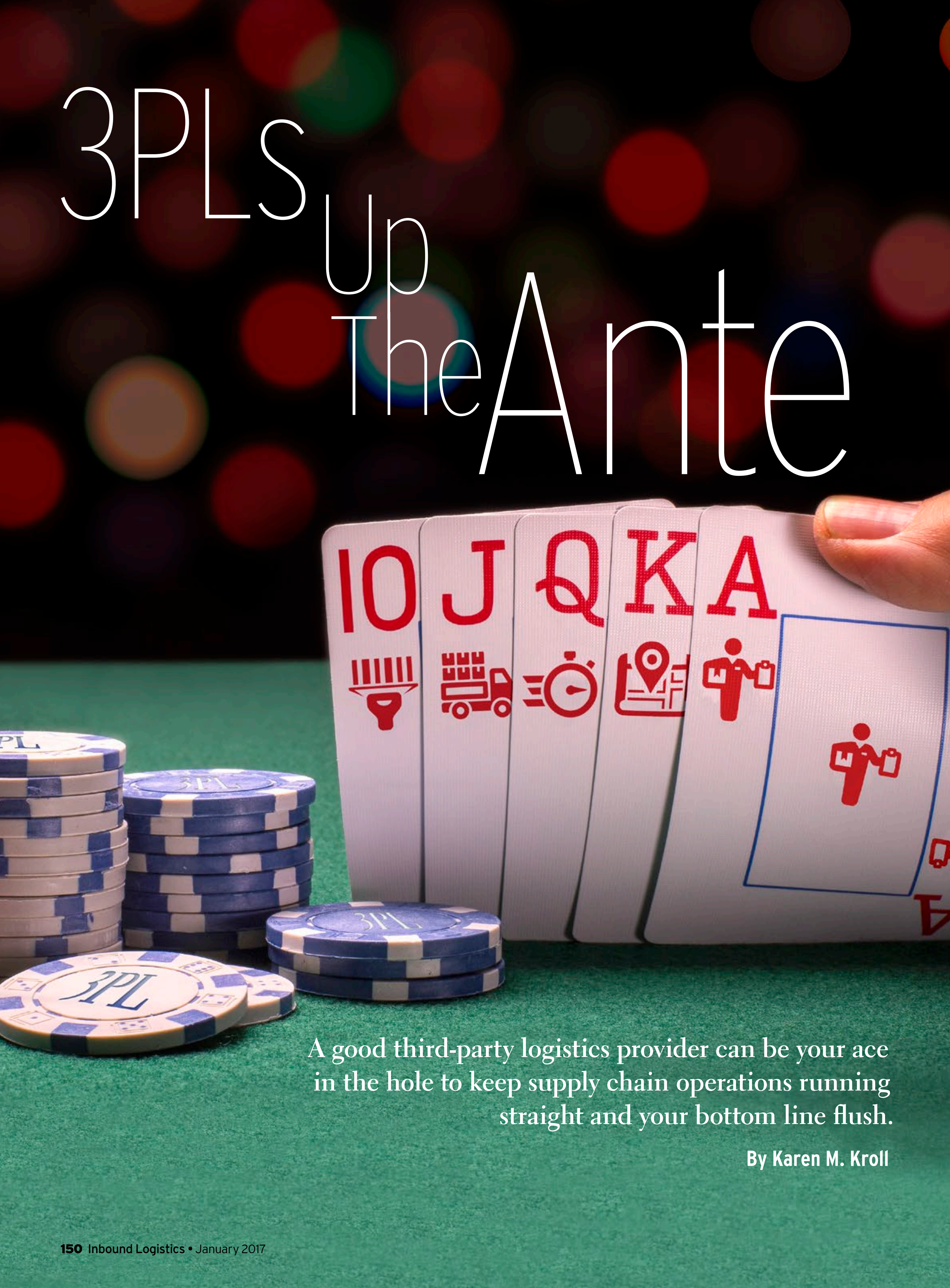

3PLs Up The Ante

A good third-party logistics provider can be your ace in the hole to keep supply chain operations running straight and your bottom line flush.

By Karen M. Kroll

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Thirty years ago, the value-add many third party logistics (3PLs) providers offered included simple warehousing and freight transportation services. "The services were rudimentary at best," says Judy McNeil, supply chain manager, customer operations and planning with Lang Pharma Nutrition, a manufacturer of nutraceutical food and beverages based in Newport, R.I.

Not any more. Today, many 3PLs essentially act as the supply chain arms of their clients. "Over the past five to 10 years, leading 3PLs have matured from providers of discrete services to highly integrated solution providers," says Frank Monte, principal, strategy and operations with Capgemini Consulting. Many shippers rely on their 3PLs for visibility, operational control, fulfillment support, supply chain data, and end-of-life product management, among other services.

When McNeil and her colleagues began talking with International Packaging and Distribution (IPD), a 3PL based in Fort Mill, S.C., they learned of the many services that could help manage Lang's complex supply chain, which includes both import and export, and multiple facets of vendor relationships.

The most valuable aspect has been IPD's "ability to seamlessly integrate with our systems and processes," McNeil says. Among other functions, IPD receives finished goods and warehouses intermediate products, and helps Lang consolidate shipments and gain freight efficiencies. It assembles finished products into kits, which allows Lang to support its customers' promotional initiatives.

Moreover, the partnership "allows my team to focus on what we're good at—sourcing and developing customer relationships," McNeil says.

Even from as recently as the 1990s, most shippers expected 3PLs to move their goods from Point A to Point B. Their main concerns were competitive prices, available capacity, and good service. The process wasn't integrated to any system. "Logistics was an afterthought," says Brian Winshell, executive vice president of business development with AFN, a logistics firm based in Niles, Ill.

From Back Room to Boardroom

Many 3PLs now offer complex solutions that help shippers achieve strategic goals. "Over the past 20 years, logistics and supply chain has gone from the back room to the boardroom," Winshall says.

3PL services can be classified into three categories: innovative, value-add, and commodity, says C. John Langley, Ph.D., professor of supply chain management at Penn State University. New services are, at first, innovative. Deliveries via drone, despite the many issues they raise, currently fall into that category. As services become accepted and stand the test of time, they become "value-add." Finally, customers expect certain services, and they become commodities.

Demand planning and forecasting, for instance, had been considered value-add. "What was considered value-add before is now standard practice because of the way companies are handing off the logistics and fulfillment aspects of their businesses," says Greg White, CEO with Blue Ridge Solutions, an Atlanta-based provider of supply chain planning technology. .

To provide the services their clients are requesting, many 3PLs have had to up the ante, especially in technology. Many now offer solutions that enable supply chain visibility or warehouse management.

This can be essential when 3PLs engage in kitting projects, as they're taking finished

Third-party logistics providers such as Saddle Creek offer added value to customers by handling kitting, specialized labeling, and other packaging services.

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goods—say, a bottle of shampoo and a bottle of conditioner—and moving them back into work-in-process as they're assembled into kits. Then, they return to finished goods as a new item—all being served from one inventory. "You have to conceptualize the process, then manage it through your warehouse management system," says Duane Sizemore, senior vice president, marketing and business development with Saddle Creek Logistics Services, Lakeland, Fla. "Use technology to drive efficiency and visibility."

Shippers have taken note. Three-quarters of those responding to Capgemini Consulting, Penn State University, and Penske Logistics' 2017 *Global State of Outsourcing* study say their use of 3PL services contributes to overall logistics cost reductions.

Moreover, while the most frequently outsourced activities continue to be transactional, operational, and repetitive, a growing number of shippers are turning to 3PLs for strategic, IT-intensive, or customer-facing functions, the study finds. For instance, 17 percent of respondents use IT services from their 3PLs, versus 11 percent in the previous year's study.

"Shippers are turning to 3PLs for value-added services in technology, global shipping, warehousing, and global fulfillment," Monte says. "They look at 3PLs as extensions of themselves."

Changing Business Models

One driver behind heightened 3PL expectations is a changing business environment. More companies that use 3PLs essentially are brands, storefronts, and merchandisers. They're focused on acquiring customers, and thus turn to 3PLs to take on greater roles in purchasing, demand planning and forecasting, and other functions. "They're handing off more backroom functions," White adds.

Having a 3PL handle some functions can rein in costs. Rather than ship products to a contract packager to build a display, a 3PL can handle the job at the warehouse where the products already are located "saving on transportation, and reducing product handling, which helps avoid errors and damage," says Sizemore.

As physical products become more commoditized, the companies that provide

Evans Distribution engineers and designs products and packages its clients ship.

Betting on the Right Price

As 3PLs provide more and different value-added services, they're developing a range of ways to price them. IPD often charges separately, based on the number of employees needed for a project, labor rates, material costs, and a reasonable margin. "Through experience and time, we know what we need to charge," says Tom Emery, chief financial officer.

Evans Distribution uses a subscription model for one customer for which it regularly provides kitting services, says Sean Mueller director of customer solutions.

Along with reasonable and easy-to-understand pricing, shippers increasingly want metrics, says Leslie Aljouny, vice president of business development for Evans. These summarize both the quantity and quality of the work completed, such as the number of SKUs shipped; the quality inspection pass/fail rate; and order accuracy.

them have to differentiate themselves. Service becomes that point of distinction. A case in point: Pegasus helps deliver ATMs to bank lobbies. Rolling them in on traditional dollies could ruin marble bank floors. Instead, they use "safe jacks," and put a protective covering on the floor.

Another shift is the greater demands many retailers impose on their suppliers. Merchants that used to create point-of-sale displays often now expect their suppliers to do so, says Miquel Ruiloba, vice president of sales and marketing with XB Logistics, Encino, Calif. In turn, some suppliers ask their 3PLs to handle these requests.

A decade ago, about 10 percent of IPD's clients requested assistance in complying with specific labeling requirements imposed by their customers, many of them retailers, says Tom Emery, chief financial officer with IPD. Today, about 90 percent do. Similarly, requests for custom and secondary packaging, such as kitting and pallet builds, also have increased, he adds.

The explosion of e-commerce also is changing the role of 3PLs. XB works with a business that typically shipped pallets of its kitchen utensils to big box retailers. It now has to drop-ship individual products as they're sold through those retailers' websites—an operation that quickly can grow complex. XB now handles this function.

Tactical to Strategic

As the relationships between many shippers and 3PLs continue to move from tactical and transactional to strategic and value-add, the effective integration of people, processes, and technology between the two firms also becomes more critical.

The technology integration between Lang Pharma Nutrition and IPD took about six to eight weeks to complete. IPD's IT department was onsite and worked with Lang's IT department to map how inventory information, among other things, would flow between the two companies. IPD also works with Lang's customers to request appropriate routing information and to consolidate deliveries where needed.

Some 3PLs are boosting their involvement earlier, by engineering and designing the products and packages their clients ship, says Leslie Ajlouny, vice president of business development with Evans Distribution, a logistics provider based in

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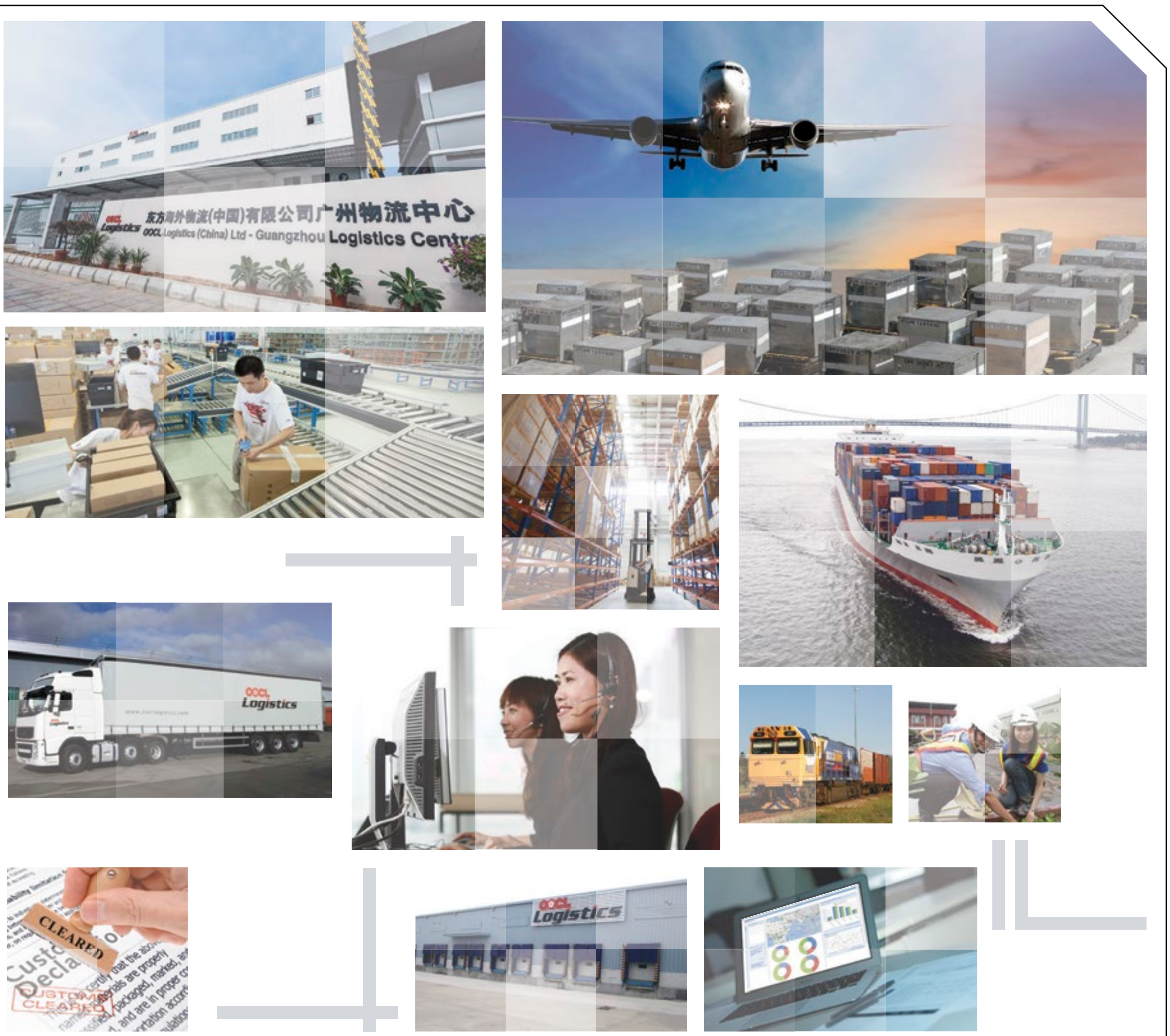

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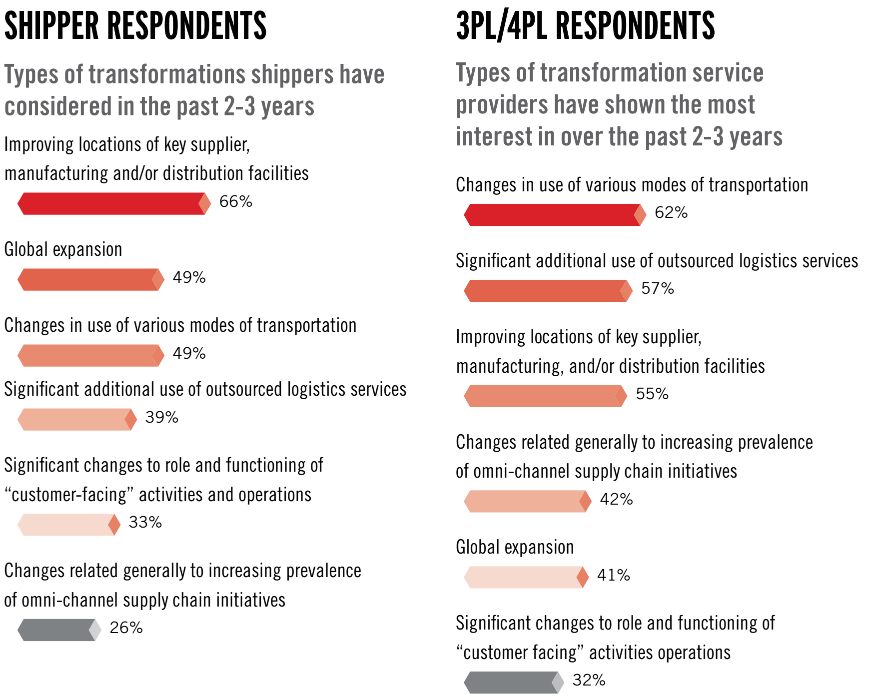
3PL Roles in Supply Chain Transformation



Source: *2017 Third-Party Logistics Study*, Capgemini Consulting, Penn State Smeal College of Business, Penske

Melvindale, Mich. For instance, they'll ask Evans what sort of packaging can both meet their requirements and ship economically. "We become a solutions development team," she says.

Moreover, the solutions 3PLs provide to help companies meet strategic goals, such as transportation management systems (TMS), now are available to mid-market clients, Winshall says. Indeed, they're often critical in helping these companies compete in today's tight market, he adds.

Packaging and Kitting

While 3PLs have long provided packaging and kitting services, they continue to raise the bar. "The marketing people think of wonderful ways to make products pretty. I work with them to make products affordable," says Keith McGinnas, distribution center manager with IPD.

That might mean making sure clients know that many major carriers charge based on dimensional weight, so they need to consider both the size and weight of the packages they're moving. "We make sure they're not overpacking, so they get the biggest bang for their buck," he says.

"We've become a tertiary packaging arm for our customers," Emery says. IPD works with customers to ensure the products they ship meet each retailer's specific requirements. It also can ensure that products convey "cachet and pizzazz," he says. That might mean wrapping products in tissue paper and a sturdy cardboard box, rather than bubble wrap.

Shippers increasingly expect 3PLs to help them meet the promises of exceptional service they've made to their customers. One computer maker promises customers it will fix and return malfunctioning devices overnight. To make that happen, customers box up their computers and drop them off with a parcel carrier. The computers are flown to an operations hub, where technicians unbox and work on them during the four-hour window before the planes make their return flights. "The service comes at a cost, but for the people who need it, it's invaluable," Monte says.

Such above-and-beyond service can occur with business customers, as well as consumers.

Pegagus works with a company making deliveries to a drugstore chain. Because the stores don't have docks, the deliveries typically required two people and special equipment. Pegasus found dollies that allowed one person to make deliveries. That saved the client about $500,000, and allowed them to keep the business, says Mike Mangini, vice president, East Region, with Pegasus.

Analytics and Transactions

A significant development in the value-added services 3PLs provide is the growing demand for reporting and analytics. "The use of analytics is at an innovative stage," Langley says, with everyone striving to better manage data.

Every shipment provides a rich source of data on transportation, warehousing, inventory, and customer demand, among other information, Langley says. Analyzing these details might reveal, for instance, that a customer placing a large number of small shipments could reduce costs by consolidating.

Of course, shippers need to be able to easily make sense of the data. "There's a heightened general expectation to have great dashboards," says Sean Mueller, director of customer solutions with Evans Distribution. For instance, shippers want to know that of the 100,000 pieces sorted in the past 24 hours, 1,000 had quality issues stemming from three specific reasons. Moreover, they want this information pushed to them via email or a web portal, rather than having to look it up.

"The reporting demands are more focused on the windshield than the rear-view mirror," says Dan Ryan, vice president of surface transportation with C.H. Robinson Worldwide, Inc., a 3PL based in Eden Prairie, Minn. That is, shippers want information they can use to prevent problems or streamline operations.

For instance, some shippers ask their 3PLs to analyze the origins and destinations of inbound goods, and the costs to ship them, among other data, Winshall says. Armed with this information, they can better identify the most effective locations for plants and distribution centers, based on costs, markets, and transportation options.

At least a few shippers ask 3PLs to handle transactions, as well as the movement of goods. Evans Distribution, for instance, works with a client for which it receives payments from the client's e-commerce transactions, (the payments go into a separate bank account), pays vendors, and generates invoice and payment reports.

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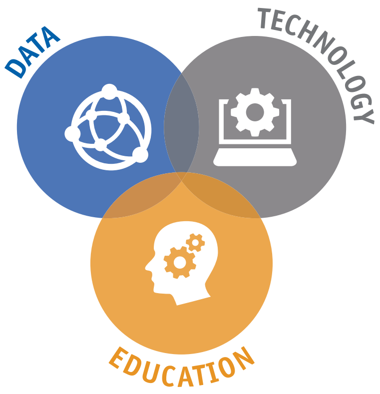

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"We manage goods through the supply chain," Aljouny says, "and now we're managing the funds also." For the client, this minimizes the task of reconciling the physical distribution of goods to its financial reports.

Keys to Success

Shippers looking to their 3PLs to provide value-added services will want to check several attributes. One is "an incredible amount of tech-savvy," White says. After all, the 3PL often will act as a supply chain, logistics, and technology arm of their own companies.

For a 3PL to become an effective extension of a company, it needs to "get" the company and its objectives, White says. If a company wants handwritten notes to accompany customers' purchases, the firm should have employees with neat handwriting. This may require training sessions between the companies, or even sharing employees. "It takes intimate working relationships to facilitate this customization," he says.

Because value-add services don't happen automatically, 3PLs that promise them should have a "structured process to identify problems faced by their customers and potentially innovative ways to solve them," Langley says.

To minimize wasted effort and redundant spending, shippers and 3PLs need to align people, processes, and technologies, Langley says. Employees at all levels of both companies should understand and work toward the shipper's goals. They also need a common understanding of the work to be done and how it will be done.

When it comes to technology, 3PLs have to be able to use various solutions. A 3PL managing a customer's distribution center should use the same warehouse management system as the shipper. This has become easier as more 3PLs have begun using commercially available software, rather than developing their own.

The initial agreement should define the operations to be performed, key performance indicators, quality checks, and the way in which charges will be applied, Monte says. Some include incentives that enable or even require the 3PL to steadily remove costs and increase service levels.

To be sure, shippers that ask their 3PLs to invest in the technology and processes needed to provide more sophisticated value-added services need to realize that the 3PLs will want some assurance of an ongoing commitment from them. "If we have a business partner with a unique need, we're willing to make an investment," Sizemore says. "In exchange, we want an appropriate term to work through the investment."

Many 3PLs appear to be developing effective solutions to help their customers. According to the *2017 Global State of Logistics* study, 73 percent of shippers say their 3PLs offer new and innovative ways to improve logistics effectiveness.

One reason is the technology in which many 3PLs have invested. In addition, more 3PLs are approaching innovation and value-added services as core competencies, rather than add-ons. "It's a part of every relationship," Aljouny says. "It's how we do business." ■

3PLs Rise to the Occasion

Many third-party logistics providers regularly support clients in ways that extend beyond arranging transportation and warehousing services. A few examples:

■ **A new direction:** A manufacturer of GPS navigational equipment asked XB Logistics to update software on 15,000 devices—within 10 days. The work required unpacking each GPS device, erasing the old software and loading the new, testing its quality, and then repackaging and shipping the devices. "We successfully completed the software upgrade and shipped the 15,000 devices on time," says Miguel Ruiloba, vice president of sales and marketing with XB Logistics.

■ **Cheers:** A producer of premium spirits has relied on Evans Distribution to help it develop, test, and inspect its holiday packages. Along with confirming the packaging's durability and consistency, Evans also tests co-pack items, such as light-up coasters. Those that fail are repaired, discarded, or returned to the company. This helps maintain the company's reputation as a purveyor of quality products.

■ **24-hour turnaround:** A producer of nutritional supplements needed International Packaging and Distribution to create, assemble, and ship a new endcap display within 24 hours, says Keith McGinnas, DC manager. The display was integral to a presentation the client was making to a large wholesale club in hopes of landing it as an account. "We had never made this display before so we had to Frankenstein one together from a couple of others we had made before," he says. The effort paid off, and helped the company win the account.

■ **Quick service:** A manufacturer of rapid cooking ovens struggled to achieve consistent, accurate deliveries to its customer, a chain of retail food establishments. Pegasus Logistics designed a delivery process that included specific instructions regarding product placement and debris removal, among other functions. The instructions, along with a thorough sign-off document, reduced service calls and boosted end user satisfaction.

■ **Cutting costs:** A producer of wireless transmission systems needed to reduce its overall landed cost while also boosting delivery quality. Reaching these goals was made more difficult by the company's numerous large projects across the country, most of which required short-term warehouse options. In addition, its supply base was scattered across the country and occasionally would fall behind in production.

Pegasus designed a flex warehouse and merge-in-transit model that reduced the company's need for on-hand inventory and enabled suppliers from across the country to ship directly to the client's warehouses.

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What's Eating The Health Food Supply Chain?

Healthful food—organic, vegan, non-GMO, local, sustainably or humanely raised, and allergen free, or any other variety—has whet consumers' appetites. Satisfying that growing demand, however, poses unique supply chain challenges.

By Karen Kroll

In 2003, Julie Tilt and her husband purchased Hummingbird Wholesale, an organic bulk foods distributor based in Eugene, Ore. Since then, revenue has grown 20 to 30 percent annually, as organic foods take up more room in more consumer shopping carts. "The organic market is growing, well, organically," Tilt says. "It will continue to grow as people learn more about health and nutrition."

At the same time, ensuring a viable organic food supply chain can be a challenge. The organic food market now tops $43 billion and accounts for nearly 5 percent of total food sales, yet just 1 percent of U.S. cropland is geared to organic agriculture, according to the Organic Trade Association. Moreover, farmers who want to convert from conventional to organic farming practices face a 3-year investment of time, energy, and money. Any land used to produce raw organic commodities can't have had prohibited substances, such as many pesticides, applied to it during these 36 months, and the farmers can't sell their products as organic. That means they're unable to capture the premium prices most organic foods command.

To respond to these challenges, Hummingbird contracts with farmers who grow organic grains, seeds, nuts, and other products, ensuring a steady market. The company started with a few hundred acres of organic production under contract, and now has about 10,000. "Farmers are savvy, and tuned in to what's happening in the market," Tilt says, adding they're willing to do what they can to meet demand.

Hummingbird also works with farmers making the shift to organic. It offers its products as "transitional," and tries to set prices that fall between conventional and organic.

Hummingbird's experience shows both the promise and the peril of the health food supply chain. Demand is rising, but meeting it requires managing a new, evolving supply chain.

Until about 2000, organic and health foods were sold mostly in small independent food stores and cooperatives. That was the year the final rule establishing the National Organic Program under the U.S. Department of Agriculture (USDA) was published. The program facilitates the marketing of organically produced food and assures consumers the products featuring the "USDA Organic" seal meet consistent, uniform standards. "Consumers look for the seal," notes Cathy Calfo, executive director and chief executive officer with California

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Certified Organic Farmers, a Santa Cruz, Calif.-based nonprofit.

Meeting consumers' desire for organic, local, and other types of healthful fare comes with challenges. Among the top challenges for organic farmers: finding new ways to manage the health of their soil and control weeds, and inaccessibility to commercial markets, according to Brise Tencer, executive director of The Organic Farming Research Foundation, a nonprofit based in Santa Cruz.

Organic Production Practices

Organic producers face the same challenges all farmers do, including unpredictable and uncontrollable weather, fickle consumer preferences, and a scarcity of labor in many rural areas. They also must follow organic production practices. They can't use any inputs that aren't approved for use in organic farming, including most insecticides, synthetic fertilizers, and most GMOs, says Catherine Greene, senior agricultural economist with the USDA.

Instead, many organic producers need to adopt different agronomy practices, such as crop rotation to reduce soil erosion and improve pest control. Conventional farming practices tend to be better known and require less labor and managerial expertise, says Atish Babu, principal with Agriculture Capital Management, San Francisco-based investors in sustainable farmland.

Even the distributors and processors for organic farmers can differ from those who work with conventionally grown products. A farmer using conventional practices to grow grain in Illinois may travel, say, 20 miles to find a processor, says Kellee James, chief executive officer with Mercaris, a market data service and trading platform for organic and non-GMO agricultural commodities based in Silver Spring, Md. The trip for a farmer of organic grain, on the other hand, may last several hundred miles.

Food manufacturers face a similar calculation. Doon Wintz, president of Wholly Wholesome, a producer of mostly organic and allergen-free products based in Chester, N.J., provides an example: His firm makes a dairy-free pumpkin pie, using soy puree in place of milk and eggs. He has to source the puree from the other side of the country, in Oregon. That means balancing the need to meet a minimum order quantity against the risk that ordering and producing more than the company needs, just to meet the minimum, can lead to products that expire unsold. "Do I support sales at a loss, or let products go dry on the shelf?" he asks.

Many organic farmers also lose some economies of scale, Babu says. Conventionally produced corn, for instance, typically will be shipped as part of a freight train of, say, 100 cars heading to a market. That's rarely the case with organic products. Not only are the quantities lower, but their crops also need to be segregated. That can make it even more difficult and costly to secure transportation.

Indeed, all members of the organic supply chain—including growers, truckers, processors, food manufacturers, and retailers—need to keep organic foods from co-mingling with conventionally processed foods.

"You have to ensure that what started as organic remains organic," says John Lischefka, director of business development with LINKFRESH Software Limited, a UK-based provider of supply chain solutions. The same machinery can be used, but only if it's properly cleaned.

Whether companies use the same machines for both organic and conventionally grown foods, and clean them before processing organic foods, or invest in separate equipment for their organic lines, they need to document their practices. "It adds a layer of administration in being able to track the products, and make sure there's no danger of co-mingling," Wintz says.

Just as organic farmers need to adhere to certain practices, so do distributors and others in the supply chain. For instance, rather than turn to pesticides to control pests, they'll use "structural pest management" to prevent as many problems as they can, says Harriet Behar, senior organic specialist with Midwest Organic & Sustainable Education Service. This can include tuck-pointing and caulking joints, and placing fine screens over ventilation fans to keep insects from flying into them.

Going Local

Organic foods aren't the only health foods enjoying greater demand. More consumers are looking for sustainable local foods. "People want to re-establish a connection with their food, whether it's urban farming or rooftop gardening," says William Powers, executive director with the Nebraska Sustainable Agricultural Society.

Retailers that want to source locally grown produce also face challenges. For instance, those sourcing lettuce, cabbage, and other spring greens within New Jersey are limited to about four or five weeks of supply each year. "Seasonality impacts supply at the local level," notes Richard VanVranken, professor with the Rutgers Cooperative Extension of Atlantic County.

Moreover, these producers are facing off against an entrenched, powerful system. Large suppliers from areas with longer growing seasons, who can ensure steady

Wholly Wholesome offers all-natural baked goods, including organic and gluten-free pie shells and crusts. The company must balance minimum orders for ingredients against the risk of manufacturing products that expire unsold.

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Hummingbird Wholesale does not have a shipping department; it uses bike couriers and other ecological methods to serve customers in its regional area.

deliveries of produce year-round, may tell retailers who want their goods in February, that they also need to make room for the items in June and July—exactly when local producers are ready to offer their wares.

Demand for healthful foods, while growing, remains volatile, says Vishy Visweswaran, chief technology officer with SCA Technologies LLC, which provides solutions to supply chain challenges in the food sector and consumer products manufacturing. The boundaries between restaurants, ready-to-eat, and food delivery companies are blurring, making it difficult to predict how any one product will perform, or how sustained a new trend will be.

In addition, many grocery chains and restaurants currently have tactical, arms-length relationships with their suppliers. "Now they have to go back to the farm, and understand the logistics, the costs, and what can be grown organically, and what can't," Visweswaran says.

While growth is, of course, desirable for everyone in the organic and health food sectors, it creates its own challenges. For instance, an organic producer that lands a contract to supply a large retailer often has limited time to fill the resulting influx of purchase orders. "They have a massive ramp-up," says Tim Bass, sales director with AFN Logistics, Niles, Ill. Newer producers with limited experience may struggle to manage the spike.

Down on the Farm

While the obstacles are real, it has become clear that the market for organic and healthful foods is experiencing sustained growth. Companies that can tackle the challenges can gain a competitive edge.

A few solutions start on the farm. Some farmers are working to expand their growing seasons in ways that still meet the criteria for organic. For instance, they're starting plants indoors and then placing larger, typically heartier plants outside earlier in season, VanVranken says. They might build "low-tunnels," using plastic film stretched over a series of wire hoops extending from the ground to create mini-greenhouses that protect seeds and small plants from the elements.

A "high tunnel" is similar, but can cover several rows, and is tall enough to allow some farm equipment underneath. However, farmers typically need to add insulation to the covers, VanVranken says.

While the tunnels can protect the crops, they aren't a panacea. In addition to the colder weather, crops placed outside in spring also don't gain access to the longer days of sunlight. As a result, the tunnels tend to work better with cool season crops, such as lettuce and other greens, VanVranken adds.

Technology also plays a critical role in helping companies overcome the challenges inherent in the health food sector. The volatility in supply and demand requires more rigorous planning, Visweswaran notes.

For instance, if a company can't obtain an organic ingredient from one supplier, it needs to know whether it will switch to another supplier, reformulate the product, or take some other step, taking into account costs and capacity. While most companies need to think through these "what-if" analyses, developing solutions can be tougher for those dealing in organic goods, given the limited supply and often higher transportation costs.

Tools that help companies manage information and provide visibility are key. Companies hoping to successfully manage this evolving supply chain need flexible, efficient, and real-time supply sourcing, planning, and logistics, and that requires tremendous collaboration among suppliers, farmers, and logistics providers. "Companies that are better at supply chain and logistics planning also are better at using technology to gain visibility," Visweswaran notes. "You can't do it with spreadsheets and phone conversations."

Good Things, Small Packages

Even advances in printing technology can aid the health food supply chain. Shorter printing runs, which may be appropriate for the typically smaller orders of health foods, often have been more expensive. That's changing, as new packaging equipment is more automated and can handle smaller runs more cost effectively. They also often require less lead time than is needed for larger runs, Wintz notes.

Technology also is helping organic food producers find new ways to ensure safety. One example is high pressure processing (HPP), a pasteurization method that kills most pathogens and extends food shelf life without the use of chemicals. "I hail this as the future of food processing," says Marwan Moheyeldien, founder of Maryland Packaging, a co-packer based in Elkridge, Md.

Advances in DNA sequencing mean companies can more cost-effectively test foods for pathogens, GMOs, gluten, allergens, and other substances than was possible in the past, says Mahni Ghorashi, co-founder of Clear Labs, a food technology and analytics company based in

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A full-service distributor, Hummingbird Wholesale chooses products carefully, considering the sustainability of farming practices, nutritional value, and special dietary needs. It buys local and directly from farmers whenever possible.

Menlo Park, Calif. In contrast to current tests, which typically require researchers to know what they're looking for—say, the presence of e.coli 0157 in beef—the new tests can screen for numerous items. "It's a bulletproof way of guaranteeing the claims," Ghorashi says. In some cases, the tests can be less expensive than legacy tests, he adds.

Getting Involved

While technology will be key to increasing and stabilizing the health food supply chain, many experts say companies, trade associations, and the government also have a role to play. CCOF, for instance, offers a program that works with farmers transitioning to organics, to make sure they remain in compliance, Calfo says.

As Hummingbird has done, some consumer brands are working with farmers to ensure a steady and growing supply and market for organic foods. In May 2016, Kashi introduced an initiative to purchase "transitional" crops grown by farmers shifting from conventional to organic farming practices. Kashi, based in Solano Beach, Calif., produces plant-based cereals, entrees and snacks.

Also in 2016, General Mills announced it would double the organic acreage from which it sources ingredients. "We're building strategic relationships directly with farmers for our products and are dedicated to working with growers to optimize production and quality, adopt standard practices, and accelerate supply," said John Church, executive vice president, in a statement.

The U.S. government is getting involved as well. The 2014 Farm Act includes $57.5 million to help organic producers and handlers cover the cost of organic certification, and $5 million to improve economic data on the organic sector, according to the USDA's Economic Research Service.

Crop insurance also is changing. Traditionally, organic producers could only insure their crops through the USDA for the prices, typically lower, that conventionally grown food would command. They now can insure many crops for organic prices. "The Risk Management Agency has tailored crop insurance to better fit the needs of organic producers," Greene says.

While much work remains to ensure the viability of the organic and health food supply chain, Tencer remains positive about the future. Consumers are demanding more organic options, and organic production offers environmental, economic, and health benefits. "Organic farming," she says, "is a real bright spot in the agricultural sector." ■

Ugly Juice Whittles its Waste

One San Francisco-based startup is developing a new use for fruits and vegetables, many of them organic, that otherwise would go to waste. Ugly Juice sources misshapen produce that otherwise would be thrown away and turns it into juice.

Every year, American consumers, businesses, and farmers spend $218 billion growing, processing, transporting, and disposing food that is never eaten, according to ReFED, a collaboration of business, nonprofit, foundation, and government leaders committed to reducing food waste in the United States.

One reason is consumers' perceived preference for Instagram-perfect fruit and vegetables. That means a lot of good, but less-attractive produce is thrown away. "We try to source those ugly, misshapen fruits and vegetables," says Slava Chupryna, the founder of Ugly Juice. The company then uses a cold press to wring every last nutrient from the produce and turn it into juice.

Chupryna located the company's kitchen five minutes from San Francisco's main wholesale market, and has developed relationships with many of the vendors, as well as management. He and his team make the rounds of the market each morning, picking up produce that is in good shape, but about to be thrown out, often because of the way it looks. This relieves farmers and growers of the need to dispose of the products. Ugly Juice employees make the juice each night, starting between 3 a.m. and 4 a.m. Several hours later, contract employees riding scooters deliver the juice to the many offices within San Francisco. The company initially tried to use a car to make deliveries, but racked up about $1,000 in parking tickets its first month in business. "Parking is impossible," Chupryna notes.

The juices are delivered in glass jars designed with flat tops, so they're stackable, and wide bodies, so they're easy to wash. "We try to be as efficient as possible in everything we do," Chupryna says. Ugly Juice picks up the jars the following day. The juices typically need to be consumed within a few days.

The firm doesn't take food headed to a food bank or other service, but focuses on products that otherwise would go to waste. The long-term goal is "to change the way food and produce is perceived in the United States," Chupryna says. Helping others realize the value of misshapen, less-than-perfect produce would cut waste, save money, help farmers, and encourage more nutritious eating.

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ALTERNATIVE PORT STRATEGIES:

Getting In With The CROWD (IN)

Inland ports offer new global trade strategies and relief from congestion and capacity issues facing deepwater ports. Let us fill you in on what the In crowd knows.

BY CHRIS LEWIS

As maritime seaports in North America reach capacity and seek expansion strategies, inland ports have emerged to provide a solution to increased demand on supply chain infrastructure. Though inland intermodal terminals are not a new logistics trend, the rise in the number of inland ports in the United States is providing new strategies in global trade, and relief from capacity headaches plaguing some North American deepwater container ports.

Paradigm shifts in globalization and intermodal logistics mold the evolution of supply chain networks. Globalization has given rise to expanded intermodal innovations. Global trade initiatives translate to increased containerization, which creates greater interconnectivity among seaports, railroads, importers, and shippers. Consider the double-stack rail cars that increase capacity and throughput from port to an inland yard, eliminating the need for the long-haul truck leg from port to consignee. The benefits of inland facilities extend far beyond container seaport overcapacity issues.

"Inland ports offer major economic benefits to inland regions," says David Bovet of Massachusetts-based supply chain research firm New Harbor Consulting.

What defines an inland port? When envisioning a traditional example of an inland port, a landlocked major inland gateway—such as Chicago, Kansas City, or Memphis—comes to mind. Indeed, these hub cities epitomize the classic prototype of an inland port. However, the inland port concept has expanded beyond the mentality of the U.S. heartland hubs.

Known as North America's largest inland port complex with a 6,500-acre footprint,

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Chicago's CenterPoint Intermodal Center kickstarted the early emergence of inland ports in the United States. Located just off Interstate 55, approximately 40 miles southwest of the Windy City, CenterPoint Intermodal Center incorporates two Class I railheads – BNSF and Union Pacific – and more than 10 million square feet of distribution space in a single logistics cluster.

In fact, CenterPoint's container volume stacks up to America's top seaport freight volumes. In 2015, Chicago's 18 intermodal facilities handled a total of 15.4 million TEUs, ranking just behind the Los Angeles and Long Beach ports in terms of container moves.

Located between the deepwater maritime ports in California, the Gulf, and the Atlantic region, Chicago's massive intermodal mecca represents the true definition of an inland port – with rail as the central force. Other mega-inland ports are clustered near major population centers. For example, Fort Worth's Alliance Global Logistics Hub is part of AllianceTexas, a mixed-use residential and distribution development that includes the world's first airport dedicated to industrial aviation.

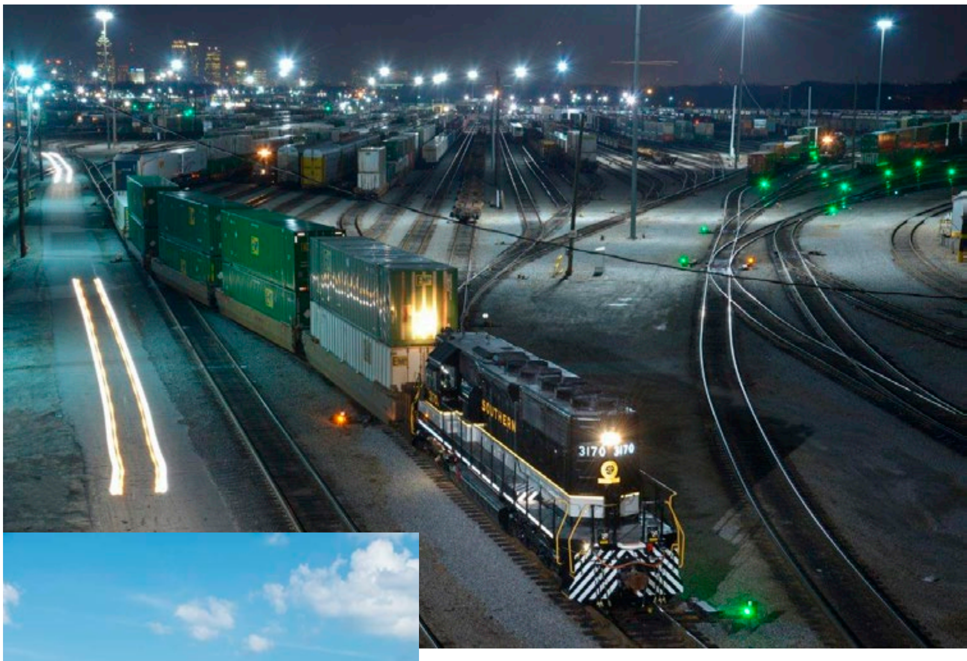
When it comes to rail, Kansas City may be the most advanced hub for intermodal infrastructure, with four Class I railroads. Identified as a true "logistics cluster", as defined by MIT professor and author Yossi Sheffi, the KC Smartport also supports foreign trade zone designations and surrounding industrial development to optimize intermodal transportation and warehouse distribution.

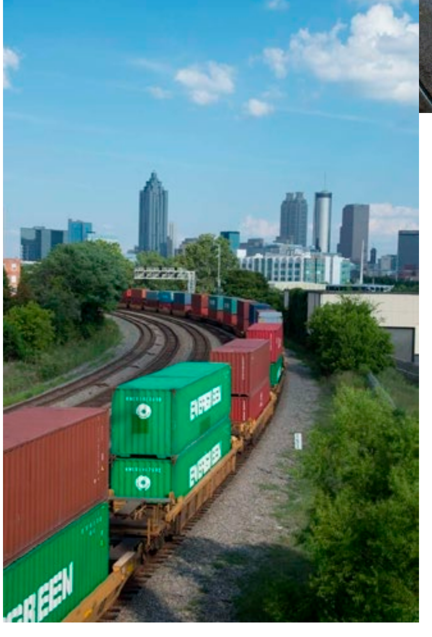
HISTORY IN THE MAKING

For all the press coverage newly announced inland port facilities (often referred to as dry ports, particularly in Europe) receive, they are not an overnight success. Inland ports have been around for the past 25 years, but only since the sun set on the Great Recession have they become a focal point of economic developers. One of the earliest inland port complexes was Pasha Group's redevelopment of George Air Force Base in Victorville, Calif., roughly 75 miles northeast of Los Angeles.

Originally named the Southern California Logistics Airport in 2002—before the term inland port was in vogue—the master-planned industrial development encompassed more than 5,000 acres for auto processing, air cargo, and intermodal transfers, along with development for distribution and manufacturing facilities.

Two inland facilities in the Southeast and launched in the 1980s were products of slow starts in intermodal volumes. North Carolina's Charlotte Intermodal Terminal and the Virginia Inland Port at Front Royal experienced low freight volumes for several years after their inception. On paper, Front Royal seemed to meet all the right metrics for success: proximity to Interstates 66 and 81, 220 miles inland from the Virginia Port, and 18,000 feet of Norfolk Southern rail track. However, it wasn't until the Front Royal Port teamed with local economic development officials one decade later to help recruit distribution centers to the area that the inland port concept began to burgeon.





Locating along the main track of a Class I rail system such as Norfolk Southern is a primary consideration when developing an inland port.

"Front Royal struggled for 10 years in its early stages because it didn't have an anchor client or shipper," says Bovet. "Despite the economic potential and area demographics, it took decades before the port came into its own."

CIT MAKES A COMEBACK

Opened in 1984, the Charlotte Intermodal Terminal (CIT) is considered the nation's first inland port. But freight volumes didn't support the rail traffic, so the port suspended rail service in the mid 1990s. As container volumes at the North Carolina ports have increased at a 17-percent compounded rate since the Great Recession, the CIT is now flourishing and talks have emerged about a second inland port in western North Carolina.

Traditionally, the presence of a major rail line has been the number one component of inland ports. Today, rail is still the top factor in identifying a viable inland

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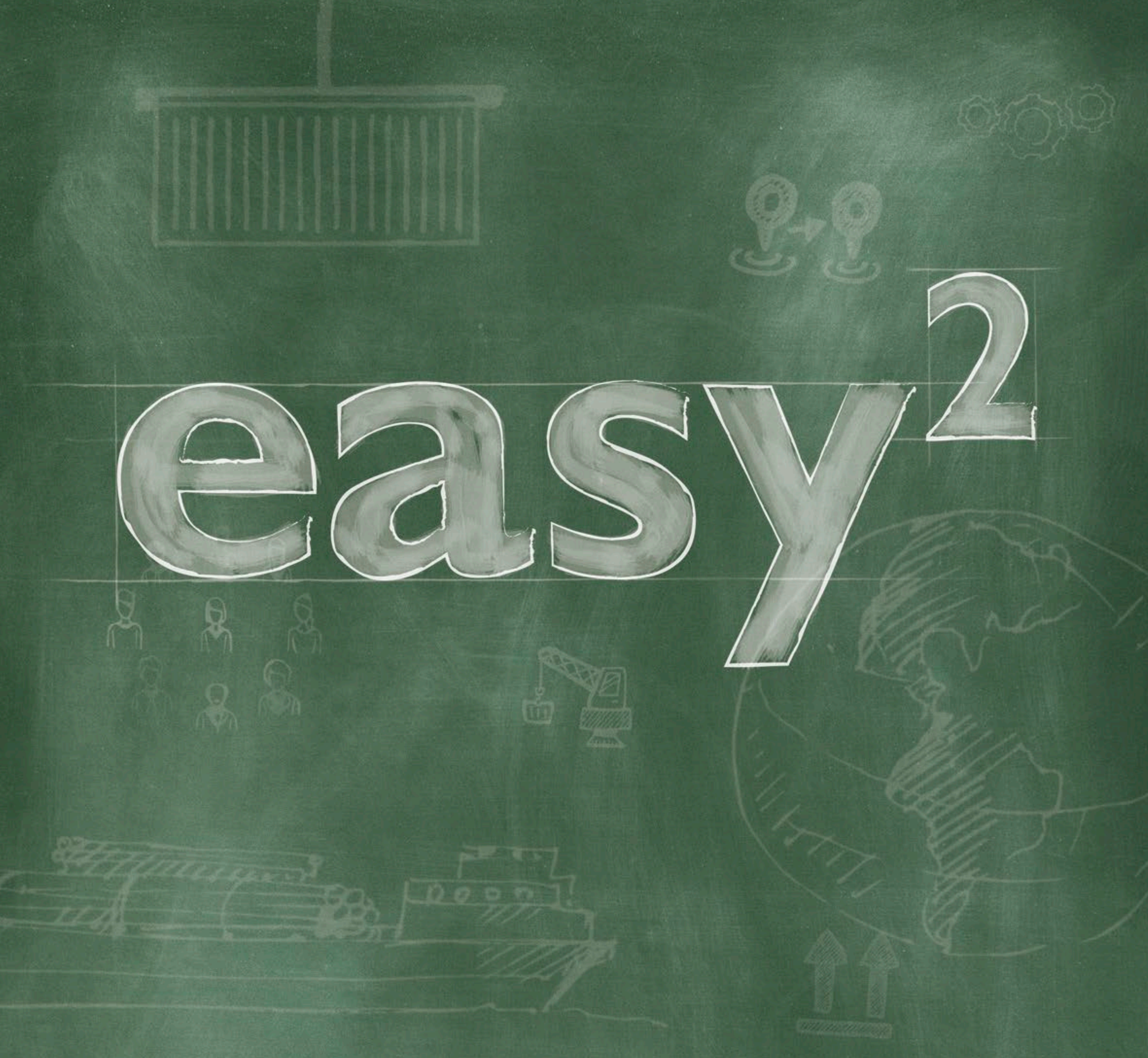

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port location, but other critical factors play into the decision. In addition to the Class I railroads, port authorities, shippers, commercial real estate developers, economic development professionals, and government officials support inland ports.

INTERMODAL TO THE RESCUE

As traditional rail commodity shipments—particularly coal—have diminished in the past decade due to alternative fuel options, Class I railroads are relying on intermodal logistics as a solution to supplement revenues. Carload volumes were down 6.6 percent in September 2016, compared to the same period in 2015, according to the Association of American Railroads.

While not as dramatic, intermodal shipments are slipping as well. Intermodal traffic was down 2.1 percent from 2015, according to a mid-year 2016 report from real estate firm Cushman Wakefield. Despite intermodal volume down-turns, the interest in developing inland port terminals in certain growth markets hasn't waned.

While the Class I railroads and commercial real estate developers were the first players to show interest in inland ports, port authorities are getting into the act by developing intermodal terminals that enhance container traffic flow in international commerce. Inland ports are not seen as competition to maritime ports, but as complementary solutions to relieve capacity for land-constrained port terminals.

Today, port authorities, railroads, and private industrial real estate developers are forming alliances to develop new inland port opportunities. "All four of our most recently opened inland ports were funded with some type of public-private partnership funds," says Jason Myers, operations manager of Virginia-based Norfolk Southern.

GETTING IN GREER

In early 2013, the South Carolina Port Authority developed the inland port at Greer, located upstate in the Piedmont area of the Palmetto State near the BMW automotive plant. Situated 212 miles from the Charleston port, Greer is recognized as a rising star among inland port peers in North America.

Southern California's Inland Empire region continues to flourish. A report released by the Southern California Association of Government anticipates steady growth in the key sectors that make up the inland region's economic base: logistics, construction, health care, and manufacturing.

Getting In With An Inland Port

Before developing an inland port, all parties involved must consider the following factors:

- **Collaboration.** Cooperation among the controlling municipality, government entity, railroad, port authority, local citizens, private developers, and economic development officials is critical to initiating a successful project.
- **Economic demand.** The amount of freight and existing industry in the area must substantiate the need for an inland intermodal terminal. Sustained industry, such as a nearby automotive plant, can play a significant role in where to locate an inland port.
- **Rail access.** Locating along the main track of a Class I rail system is a primary consideration. The number of potential lifts (container or trailer lifts from rail car to truck chassis or vice versa) can be a determining factor in validating freight volumes. Industry professionals recommend a minimum of 200 lifts per day to justify a full-scale, sustainable intermodal operation.
- **Location.** Similar to any real estate decision, location is a key factor in developing an intermodal terminal. Factors include: distance from a deep-water seaport, proximity to existing industry or distribution clusters, interstate or major highway access, and location within one hour of a major population center.
- **Funding agreements.** Like with any major development, funding is a critical element in establishing and operating a dry port terminal. Shared-fee arrangements between public and private entities can be complex, particularly if a number of stakeholders are involved.

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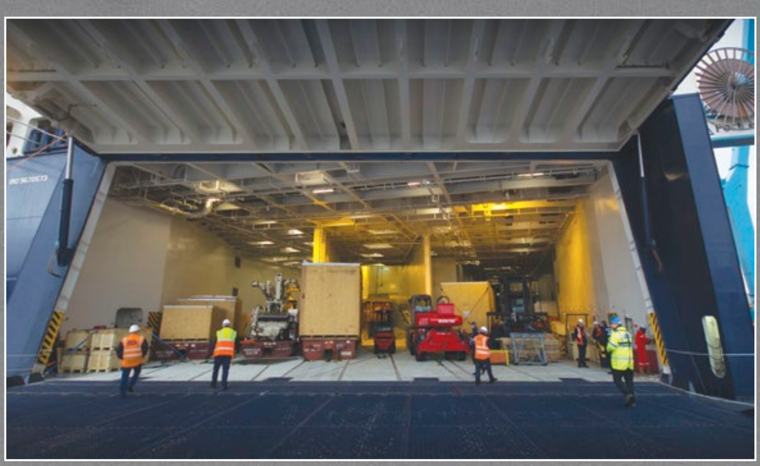

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Opened in October 2013, Inland Port Greer extends the Port of Charleston's reach 212 miles inland to Greer, S.C., and provides shippers with access to more than 95 million consumers within a one-day drive.

"Class I railroads see the potential of inland facilities, and now the more progressive port authorities and shippers are recognizing the economic benefits of intermodal," says Bovet. "Port authorities are active today in instigating inland port facilities, especially those who see intermodal as a key driver in economic development."

It's no surprise that dry ports have traditionally been developed near population centers in the hinterlands, such as Chicago or the Inland Empire. But the latest wave of inland ports is not locating just near major gateway cities or traditional logistics hubs. Industry and shipping volumes are also key variables in identifying viable inland port sites.

"When developing an inland port, the goal is to attract major shippers," says Jannine Miller, director of the Georgia Center of Innovation for Logistics. In coordination with the Georgia Ports Authority and CSX, the state of Georgia has unveiled two inland ports to facilitate exports with key shippers.

Location and population are focal considerations, but new inland port terminals are also emerging in second-tier locations. Besides traditional shippers, other industry groups can facilitate the need for inland terminals. For example, agri-business was the primary consideration for Georgia's most recently developed inland port in Cordele—a town centric to the state's traditional farm exports, which include cotton, peanuts, and forestry products.

SIZING IT UP

Inland ports come in all shapes and sizes. Traditionally, intermodal yards have been developed near primary gateway hubs, such as the Inland Empire in Southern California or at CenterPoint Intermodal Center in Chicago. The latest round of newly announced inland ports, however, is much smaller in scale – some as small as 40 acres. Unlike regional mega-hub locations, some new inland ports are locating in more remote areas, defying the idea that inland port terminals must be located in or near major population centers.

In fact, Georgia's two recently launched inland facilities are both approximately 40 acres in size and are located in smaller communities (Cordele: population 11,150 and Chatsworth: population 4,300). How does a city with a population of fewer than 4,500 residents support the minimum number of intermodal lifts to justify its existence? In the case of the Appalachian Regional Port in Chatsworth, the freight volumes come from the carpet manufacturing industry in northwest Georgia and Volkswagen's manufacturing plant in Chattanooga.

Automotive shippers are a major driver for inland ports. The South Carolina Ports Authority's (SCPA) inland terminal in Greer is a prime example of how the auto industry promotes the need for intermodal and dry ports. BMW's manufacturing facility in Spartanburg County was the catalyst for developing the Greer facility in 2013.

"The inland facility is important for BMW's import and export operation," says Steve Williams, a spokesman for BMW North America.

The Greer facility has exceeded projections and expectations, and is on track to handle 100,000 lifts in 2016 – a 23-percent increase over 2015. After only three years in operation, the success of the Greer port propelled the SCPA to search the South Carolina landscape for a second inland port location. The second inland terminal, located in Dillon, is slated to open in mid 2017.

AN UPLIFTING EXPERIENCE

To justify the development of a new inland terminal, several factors must align in order to achieve success. Potential freight volume is the key indicator for instigating an inland terminal, and the volumes are based on the frequency of the designated rail carrier's lifts – the number of containers and trailers the railroad moves or lifts on the terminal site. In the intermodal world, the number of lifts is synonymous with TEU tallies in maritime traffic calculations.

"Demand is a key component in the decision to open an inland port," says Bovet. "It is a business case. The minimum number of annual lifts should be 10,000, but 20,000 lifts is ideal to sustain an operating inland facility."

Distance from a major seaport is another

Major U.S. Inland Ports

- **Centerpoint Intermodal.** At 6,500 acres, the Chicago inland port is North America's largest.
- **Richenbaker Inland Port.** This Ohio inland port provides rail, air, and ground transportation options.
- **Inland Empire.** 70 percent of container traffic entering Los Angeles and Long Beach will be transported to the Inland Empire for U.S. distribution.
- **International Port of Memphis.** The only waterfront inland port in America.
- **Logistics Park Kansas City/KC SmartPort.** Measures 1,500 acres.
- **Alliance Global Logistics Hub.** At 18,000 acres, the hub is part of Alliance Texas' mixed-use development.

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overriding factor in the success of a dry port. To ensure that the rail component is competitive with motor carrier transportation, inland ports should ideally be located at least 200 miles from a deepwater port terminal.

Some inland locations are closer to seaports, however, to provide congestion relief. The Inland Empire, for example, serves as a logistics "barbell" to provide port congestion relief. The rail linkage serves as the "bar" portion of the barbell between the two freight clusters.

ENVIRONMENTAL EFFECT

While some citizen groups have fought locating an intermodal hub in an otherwise quiet community, one underlying objective of inland port development is to reduce vehicle emissions and remove truck traffic from highways. Intermodal transportation's positive impact on the environment is compelling when considering the fuel efficiencies in rail versus over-the-road transit.

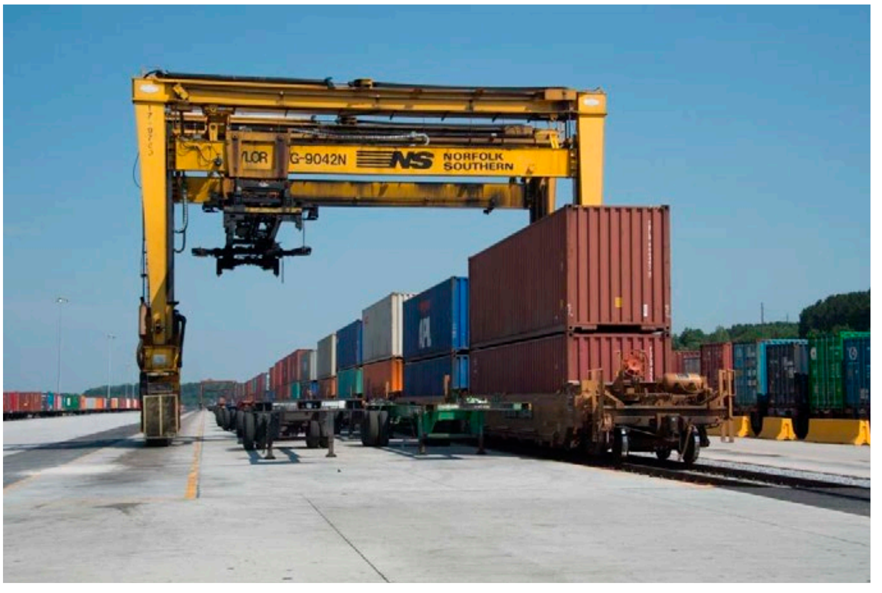
"One ton of freight can travel more than 410 miles on one gallon of fuel," says Jason Myers of Norfolk Southern. BNSF and the Intermodal Association of North America provide slightly higher calculations, promoting distances between 470 and 500 miles per freight ton on a single gallon of diesel. By any calculation, the argument for utilizing intermodal is compelling from a practical and environmental standpoint.

Moving freight by rail instead of truck reduces greenhouse gas emissions by 75 percent, according to the Association of American Railroads. One major objective of launching the Appalachian Regional Port (ARP), located 85 miles north of traffic-congested metro Atlanta, was to remove trucks from the road.

"Our projections show that the ARP will eliminate 40,000 trucks from Georgia highways in the first year of operation," says Griff Lynch, executive director of the Georgia Ports Authority. "These are trucks that would otherwise pass through metro Atlanta's congested highway system."

Intermodal terminals not only provide highway and port congestion relief, but inland port developments can offer additional sustainable solutions. Supporting more than 14 million square feet of distribution space as part of Chicago's inland megaport, RidgePort Logistics Center has initiated several green programs since its inception.

One-third of the RidgePort's total land area is set aside for natural habitat, which includes a sustainable tree farm. Wastewater is filtered for redistribution using green technology, and occupants in the industrial park are required to participate in a compost program that replenishes the park's landscaping. Solar and wind energy generation are also an integral part of RidgePort's sustainable initiatives.



The John W. Whitaker intermodal terminal at Austell, Ga., is part of Norfolk Southern's four-year, $380-million system-wide investment in intermodal transportation infrastructure. The truck-train transfer facility expedites the movement of containerized freight in the region.

With globalization and the proliferation of container traffic volumes, it makes logical sense that inland ports have become a popular topic in intermodal logistics. The merits of rail and intermodal transportation are economically and environmentally beneficial, as seaport capacity has created throughput inefficiencies and U.S. gateway cities are challenged with traffic congestion. Locating inland port facilities in key areas, which are supported with vibrant economic activity and shipper freight volumes, will continue to be a logistics trend, as long as global trade proceeds on its current trajectory.

Additionally, distribution centers that serve the booming e-commerce market will create additional demand for inland centers. "The next phase of inland ports includes intermediate distribution centers fueled by e-commerce demand," says David Egan, head of logistics research for global commercial real estate service provider CBRE.

A multitude of economic, practical, and operational factors support the trend of developing additional inland ports in North America. The pending driver shortage is also an issue that supports the compelling attributes of intermodal depots. As reliability and service have improved, rail is seen as a viable alternative to long- and medium-haul routes, particularly to and from seaports.

As the popularity of inland ports rises, diversity in size, location, and industry types will drive the expanse of intermodal opportunities in North America. Intermodal logistics is far more expansive and innovative today and not just linked to rail depots servicing central hubs in the hinterlands.

"Intermodal is no longer a fixed model," notes Bovet. "The potential expanse of inland ports is unlimited." ■

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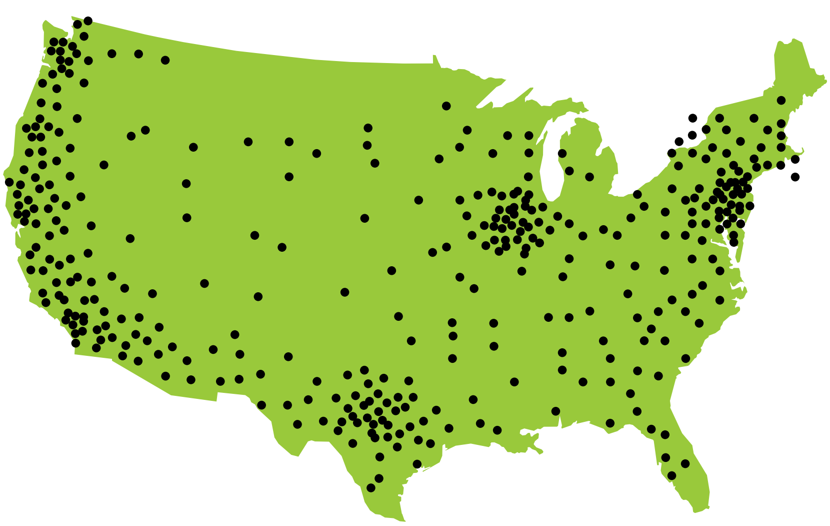

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Making a Run for the Border

By Sandra Beckwith

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Although the future of NAFTA is uncertain, and trade challenges remain, Mexico continues to attract foreign companies looking for easier access to the huge U.S. consumer base.

The Mexican peso's exchange rate fell 13 percent to a record low of 20 pesos to one U.S. dollar on Nov. 9, 2016, one day after Donald Trump was elected president. The drop came amid concerns about the impact of a Trump presidency on the North American Free Trade Agreement (NAFTA), which Trump described during his campaign as the "worst trade deal in history."

In addition to saying he wants to renegotiate trade terms, the president said before the election that he would consider a 35-percent tax on Mexican-made goods sold in the United States.

What actually happens with the new administration remains to be seen. And, while many involved in cross-border logistics say that the uncertainty has created problems, they believe NAFTA does need to be updated to reflect two decades of change.

"The rise of the Internet, environmental concerns, and dozens of other issues were not addressed when NAFTA was negotiated," says Jordan Dewart, president of third-party logistics provider Yusen Logistics Mexico. "We all need to agree to be pro-business. The factories are already in Mexico, and the supply chain has moved here, so where do we go now?"

The impact of any changes could be significant, considering Mexico is the United States' third-largest trading partner. Canada, the other NAFTA country, is first; China is second. In 2015, $531 billion in goods moved both ways between the United States and Mexico.

"One thing I hope doesn't get lost is how close our relationship is with Mexico," says Seth Stodder, assistant secretary for border, immigration, and trade policy in the U.S. Department of Homeland Security (DHS) during the Obama administration. He cites a Wilson Center study showing that nearly 5 million U.S. jobs depend on trade with Mexico.

Much of the U.S. trade and corresponding logistics are built around the vehicle, electrical machinery (including appliances), mineral fuels, and optical and medical instruments industries, according to the Office of the U.S. Trade Representative. Mexico is also the United States' second-largest supplier of agricultural products that include fruits and vegetables, wine and beer, and snack foods. In fact, 80 percent of Mexican exports go to the United States.

"We see automotive, appliances, light goods, electronics, and agricultural goods coming out of Mexico," says Troy Ryley, senior vice president, TM Services, Mexico, for Transplace, a third-party logistics provider based in Texas.

Much of that trade comes courtesy of foreign direct investment from global corporations seeking proximity to the massive U.S. consumer base – Mexico is the world's 10th-largest recipient, to the tune of $30-plus billion in 2015. The top three foreign investors in Mexico are the United States, Spain, and Canada. Mexican finance, automotive, electronics, and energy sectors are major recipients.

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While the trading volume between the United States and Mexico is significant—and not surprising, considering proximity—logistical challenges remain, caused by a number of factors that include trade imbalance, regulations, customs issues, and crime.

Trade imbalances and regulations are linked when it comes to the flow of tractor trailers to and from the two countries. More goods flowing from Mexico to the United States than vice versa creates a transportation equipment imbalance – northbound trucks unloading at the border or their final U.S. destination sometimes return empty because fewer goods are heading south.

In addition, many U.S. carriers are reluctant to send their empty trailers into Mexico for several reasons, including regulations that prohibit them from being hauled by U.S. tractors. Tractors on Mexican highways need to be owned and driven by Mexicans. Because of that, companies often crossdock in a border-free zone, moving goods from a trailer coming from Mexico to another that takes it north to its U.S. destination. More often than not, this happens in Laredo, Texas, the busiest inland port between the two countries, with more than $183 billion in imports and exports moving across the border there.

Working the Rails

Some companies use rail to reposition empties in central Mexico. "Shippers typically get a better rate when transporting empty containers by rail because there's less risk," says Mike Burkhart, director, Mexico region, at Minnesota-based 3PL C.H. Robinson. "Sometimes we can put together a package that works well for a shipper going north."

Transplace encourages companies to relieve some of the imbalance by using point-of-entry distribution programs instead.

"For example, one company we work with was moving freight from Mexico to Chicago, then sending it back down to Dallas. They should be distributing from Laredo, instead," says Ryley, who notes that Transplace has 600,000 square feet of warehouse space there. That space is at a premium because "Laredo is at 99 percent occupancy," he says.

It Takes Two

"The reality is that the majority of full truckload movements are actually two trailers doing the transportation," says Carlos Cubias, vice president of the UPS Center of Excellence. "The freight moves north to the U.S. border, where one trailer unloads onto another that takes it north into the United States. There are security issues, and goods can be damaged when they're offloaded, but U.S. carriers don't want their trailers going into Mexico."

The recent peso devaluation will only exacerbate this transportation-related imbalance. Because the peso is worth less in the United States, buying U.S. goods will require more pesos – making U.S. products even more unaffordable to both Mexican companies and consumers.

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"That product will cost a Mexican factory purchasing in dollars 20 pesos per dollar now instead of the 15 pesos it cost in the past few years," says Dewart. "They won't buy raw material from the United States anymore because they can't afford to. That means even less southbound movement when we need more."

Border Backup

One big issue for companies importing from Mexico into the United States is border delays caused by high volume, customs processes, and restricted crossing hours. "Managing through border complexity is the number-one headache for importers and exporters," Cubias says.

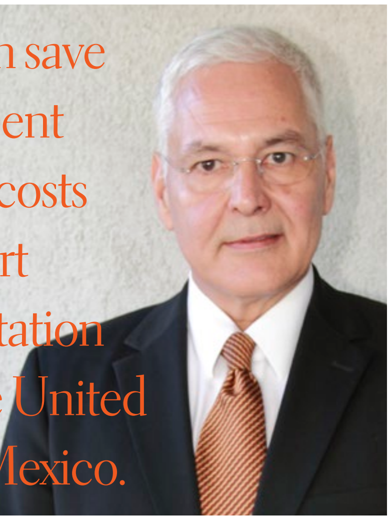
A significant difference between customs in Mexico and other countries such as the United States and Canada, he says, is that Mexican regulations place liability on Mexican brokers, not importers. As a result, Mexican customs brokers are extra cautious because they're liable for any issues uncovered later.

In addition, because Mexican customs brokers are limited to four ports each, a company importing through several ports might work with more than one broker. While 70 percent of the goods go through Laredo, there are also other land, air, and maritime ports. Regulations aren't always consistent among them, either.

"Within all of those ports, the brokers and port authorities sometimes have different requirements themselves," says Cubia. "The difference might be something simple, but it still creates issues because they have to know all the different processes in the port to manage them effectively."

Each broker also uses its own power of attorney; shippers must sign one for each broker involved. UPS recently leveraged its more than 25 years in Mexico by negotiating a new, single national power of attorney that covers 27 ports of entry. As a result, shippers using UPS have less paperwork and more efficient customs clearance into the country.

Mexico's manufacturing and transportation infrastructure have improved significantly, making the country an attractive home for foreign companies looking for quicker access to U.S. customers.



Shippers can save 15 to 20 percent on trucking costs by using short sea transportation between the United States and Mexico.

– **Raul Delgado,** Executive Vice President and Chief Commercial Officer, Port Tampa Bay

The volume at Laredo creates backups that could be alleviated by expanded hours at crossing points. "Commerce works 24/7, but borders work 9 to 5," Cubias says. "Allowing trucks to cross at different hours would be easier than building more bridges and crossings."

"A change is critical to operations going forward, especially with volumes expected to increase," agrees Alex Graniewicz, managing director of Mexico for Penske Logistics.

Stodder at DHS cites recent collaborations designed to help alleviate border congestion. The United States and Mexico are test-piloting cargo pre-inspection in two locations. One is for southbound air freight out of Laredo; the other is for northbound agricultural products in Mesa de Otay on the Mexican side of Baja, Calif. A third pilot location in San Jeronimo, Mexico, near border cities El Paso and Ciudad Juarez, will pre-inspect U.S.-bound shipments of electronic goods. DHL Express is also test-piloting a pre-clearance process for air freight in Mexico City.

In addition, DHS is working with the Mexican government to prioritize border infrastructure improvements designed to help facilitate flow.

Air and Sea Transport Offer Solutions

DHL Express advocates shipping by air so freight can literally fly over inland highway or border congestion. Air delivery also offers speed as an advantage, notes Antonio Arranz, DHL's country manager in Mexico. "DHL can deliver to many cities in Mexico in 24 hours," he says.

More use of marine transportation can help alleviate both the trailer shortage and customs backup, according to Raul Alfonso, executive vice president and chief commercial officer at Port Tampa Bay, Fla. He makes the case for more timely and less expensive transportation by sea between Mexico's east coast and Florida's west coast ports. To prepare, Port Tampa Bay has been

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DHL Express is test-piloting a pre-clearance process for air freight in Mexico City that's designed to help improve customs delays.

upgrading its facilities to support anticipated freight increases.

The port is constructing a 130,000-square-foot on-dock cold storage facility designed to attract more marine shippers. A recently completed direct expressway between the port and a major interstate that offers quick and easy access to the region's growing number of distribution centers is another significant improvement.

"Look at the possibilities for short sea transportation," Alfonso says. "By sea, it's about three days from Veracruz to Port Tampa Bay, and you reduce supply chain issues." In comparison, he says, over-the-road transport between Mexico City and Orlando takes four days plus border delays. He estimates that shippers could save 15 to 20 percent on trucking costs using this strategy instead.

Investing in Security

Security for both products and workers in Mexico is another concern. FreightWatch International reports 1,087 cargo theft incidents in the Mexican trucking industry in 2015, a 73-percent increase over 2014. Compare that to the United States, which reported just 754 incidents with significantly more goods traveling more miles.

Mexico's FEMSA Logistica invests in training and technology to keep both drivers and cargo safe, including ISO 39001 certification for road safety. "We average .126 accidents per million of kilometers driven; in the United States, that number is about .6. Our record could be considered as a top industry benchmark in Mexico," says Ramiro Delgado, FEMSA Logistica's operations director in Mexico.

And while many trailers incorporate GPS technology, FEMSA Logistica has integrated technology that enables the use of GPS on the trucks and/or GPRS by giving drivers smartphones with GPS tracking and more. A phone app allows the company to track driver and shipment location, and deliver information that can re-route around recently identified traffic or security problems. The software integrates with supply chain tracking systems.

Port Tampa Bay has been improving its facilities to support anticipated freight increases from shippers choosing marine transport to sidestep U.S.-Mexico border congestion.

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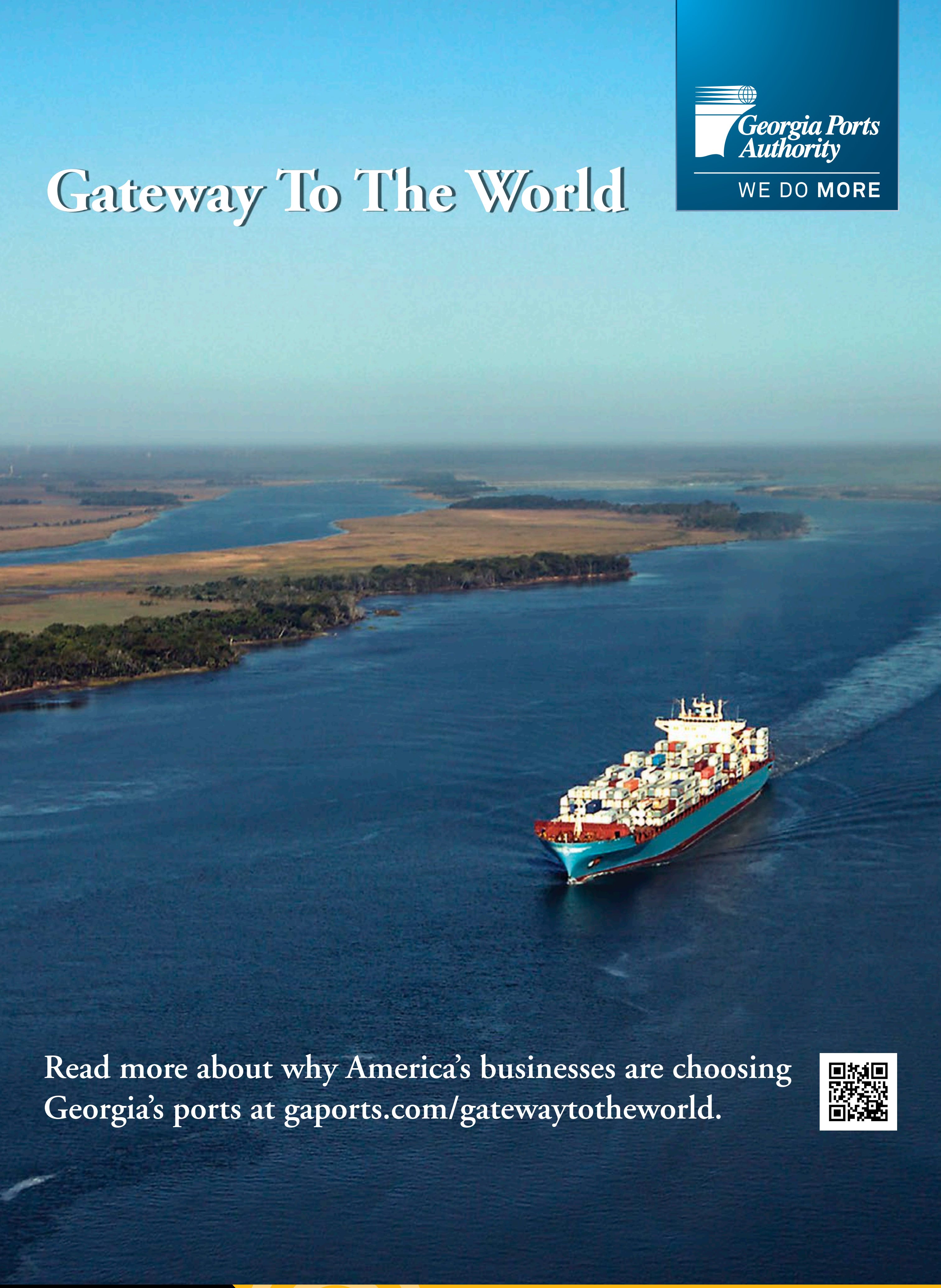

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Many analysts say that the progress in the 20-plus years NAFTA has been in effect outweighs some of the challenges. For example, the nation's manufacturing and transportation infrastructure have improved significantly, making Mexico an even more attractive home for foreign companies looking for quick access to U.S. customers.

A new $9-billion airport scheduled to open in logistics hub Mexico City in 2020 is a bright spot. Burkhart points out that roads are generally in good shape in manufacturing hubs such as Monterrey, Bajio, and Mexico City, but that doesn't apply nationwide. "Outside those clusters and into southern Mexico and the west coast between Acapulco and Mazatlan, it becomes rural territory and the growing areas for agricultural products," says Burkhart. "Those roads aren't at the same level as in other parts of the country." Security is worse there, too, he adds.

Rail plays a small, but important role in Mexico, particularly for automotive and appliance manufacturers. Even so, railroads are operating at 60 to 70 percent capacity, says Delgado.

People Power

It's no secret that many companies – particularly those in the United States – locate manufacturing in Mexico to take advantage of low-cost labor. But an educated and skilled workforce is another advantage the country offers for both production and logistics.

"We're encouraged by what we see from a talent perspective," says Burkhart. "Mexico's universities educate capable, English-speaking people who can run plants and manage strategy. We aggressively recruit that talent."

"The profile of the international logistics specialist and front-line employee in Mexico is someone who has traveled to the United States, speaks two to three languages, and holds a college degree," says Dewart. Every Yusen Logistics Mexico employee has a college degree, and all Yusen and C.H. Robinson employees are bilingual.

UPS expanded its services in Mexico to include express, expedited, and standard delivery options for all shipments, regardless of size.

Georgia Tech facilitates that talent with its Trade and Logistics Innovation Center in Mexico City. Established in 2011, the partnership with Tecnológico de Monterrey focuses on improving Mexico's logistics performance and increasing its trade competitiveness through education, research, and consulting services. The program includes opportunities for Mexican students to earn master's degrees in supply chain engineering or industrial engineering at Georgia Tech in the United States.

"The quality, service level, and commitment of the people are why companies—including German automakers—keep bringing new projects to Mexico," says Graniewicz.

U.S.-Mexico Trade Future

Logistics talent also makes it possible for service providers to commit to the region in significant ways. Yusen Logistics, for example, is building a 53,280-square-foot warehouse in an industrial park in the Bajio region, an auto assembly cluster. From there, the 3PL plans to offer automotive supply chain services to manufacturers and their Tier 1 and Tier 2 suppliers.

UPS has also expanded its services in the region by introducing express, expedited, and standard delivery options for all shipments regardless of size. The expansion makes the carrier the only one offering guaranteed delivery for LTL and package shipments.

The future of trade between the United States and Mexico continues to revolve around the nations' interdependency with each other and Canada. Industry leaders, though, know they must continue to be flexible.

"The biggest thing we're contending with is the lack of economic growth in the United States," says Burkhart. "If the GDP goes up even a couple of points, it will have a tremendous impact on Mexico. We've been in a dull market for such an extended period that when demand does increase, there will be limits on capacity. We'll have to be more creative than ever before to satisfy U.S. demands."

Many envision the three NAFTA countries as a unified trading bloc in much the same way as the European Union. There, goods flow across borders duty- and tariff-free. "Within NAFTA, we have the potential to be the largest trading bloc in the world, and we need an agreement that allows goods to flow more freely across the borders," says Dewart.

Stodder harkens back to the tone of the 2016 North American Leaders Summit attended by the Mexican and U.S. presidents and Canada's prime minister. "The vision of that summit addressed the opportunities that the close relationship between the three countries brings to our people," he says. "It's not only for security against terrorism and migration flow, but we should be looking at North America as an integrated opportunity."

"Mexico has become a manufacturing country," says Arranz. "That's creating a lot of noise in the United States, but the reality is that many items also come to Mexico from America. People need to understand how integrated the two countries are." ■

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Latin American Logistics: Knowing the Tricks of the Trades

Working with a specialist can remove the stumbling blocks that can impede trade between the United States and Central and South America.

By Sandra Beckwith

While the U.S. government continues to encourage trade with Latin America, and is expanding resources available to companies looking to do so, exports and imports to and from that region have declined in recent years.

The United States exported $90,247 million in goods to Central and South America in 2016 through the end of August, according to U.S. Census Bureau data. During that same eight-month period in 2015, it exported $104,485 million. Those eight months in 2014 saw $122,607 million in exported goods. Trends in imports to the United States from that region are similar, with the amount declining each year.

This is in spite of the Look South initiative launched by the U.S. Department of Commerce (DoC) in 2014 to increase trade with 11 Latin American countries where the United States has free trade agreements (*see sidebar, page 196*).

The decline is the result of several factors, including a drop in commodities prices, according to Laura Krishnan, international trade specialist with the International Trade Administration (ITA) at the DoC. "Latin America is still commodities-dependent, so the drop in prices has hit Latin American countries hard," she says.

In addition, with the strong U.S. dollar, the exchange rate with foreign currencies makes U.S. goods exported to this region look expensive to Latin American businesses and consumers. There are bright spots, though.

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Crowley provides shipping and logistics services between the United States and all key Central American countries, specializing in handling a wide range of goods, including produce.

"Our 11 free trade agreement countries have performed better than the rest of Latin America and the world at large," Krishnan says. "In 2015, U.S. goods exported to these countries dropped 4.6 percent over 2014, but global exported goods dropped 7.1 percent in the same period."

The Look South initiative is designed to support companies already doing business in the region and to help U.S. firms not exporting to any country identify expansion opportunities in Central and South America. This initiative may become more important given that the North American Free Trade Agreement (NAFTA) is currently being renegotiated. Both Mexico and Canada have stated that they would like to modernize the agreement based on calls from the Trump administration. Both Mexico and the United States have said that negotiations will include neither confrontation nor submission, and will be mutually beneficial, or they will quit NAFTA.

Other developments in recent years have also impacted trade logistics in the region, including a trend toward nearsourcing so retailers can reorder top-selling items more quickly. For example, JCPenney will cut production time by six weeks when it reorders best-sellers from factories in Central America rather than Bangladesh, according to the *Wall Street Journal*.

"Manufacturing might cost companies a little more in Central America, but it gets garments into distribution centers in three to five days instead of 30 to 45 days," says Frank Larkin, senior vice president and general manager of logistics and commercial services at Crowley Maritime Corporation. "They can get two or three turns of the inventory during a season now by making more of what's selling well." Crowley, based in Jacksonville, Fla., is a transportation and logistics company operating in Central America.

Because of certain tax advantages, U.S. manufacturers can send components such as fabrics, buttons, and zippers to Central America to be assembled into garments, and then ship the completed garments back to the United States, he adds.

Manufacturing in Central America might cost more, but it gets items into DCs in 3 days instead of 30.

Frank Larkin, Senior Vice President & General Manager of Logistics and Commercial Services, Crowley Maritime

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DHL Express offers logistics services for parcels and time-definite shipments in Latin America.

Although it's too soon to see significant changes, the June 2016 opening of the expanded Panama Canal is expected to have an impact on the logistics involved with goods moving from the Pacific Ocean to the east coasts of North and South America, as well. One expert sees this bringing a significant change to how the United States and other countries work in the Colon Free Trade Zone in Panama.

"When the Panama Canal could only handle small vessels, the large ships would discharge their goods on the west coast of Panama," says Ron Atapattu, founder and president of Overseas Cargo Inc. in Miami. "Those containers would be unloaded, repackaged, and reconfigured as needed in the free trade zone, then shipped from the country's east coast to North America or Europe.

"Now that large vessels can go through the canal, these containers don't require redistribution in Colon," he adds.

Miami deepened its port in anticipation of the larger ships. Similar projects in other Florida ports have been delayed.

E-Commerce Opportunities

A growth in e-commerce in Latin America has also presented opportunities for certain types of logistics service providers skilled in this area. While countries such as Colombia, Chile, Peru, and Argentina have well-developed e-commerce programs within their borders, companies are seeing opportunities to grow by selling online to consumers in other countries, as well. Doing so, though, involves more than just shipping products farther.

"For example, an e-commerce shopping cart typically offers only domestic delivery, so to make international delivery possible, you need to be able to estimate and collect duty and tax for the destination country," says Pablo Ciano, managing director of Central and South America for DHL Express. The company offers logistics for parcels and time-definite shipments in these regions.

Online order deliveries are also getting more sophisticated in the region since DHL expanded its On Demand delivery to Central and South America in early 2016. Like its U.S. counterpart, On Demand Delivery uses SMS/text messages on delivery day to let recipients select a preferred delivery option.

"It's unique in that market, so it's exciting for consumers. It also helps the online

> Some countries are open to trade with simple customs laws; others use customs as a barrier for controlling trade as well as a source of revenue.
>
> Pablo Ciano, Managing Director of Central & South America, DHL Express

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APL Logistics specializes in moving cargo in and out of Latin America, offering multi-country consolidation, deconsolidation, and contract logistics services in the region.

retailers by improving their customer satisfaction," says Ciano.

There's no question that there are trade opportunities to the south. The logistics are complicated, though. To move goods successfully from one region to another requires knowledge of the Latin American country's economic environment, political climate, transportation infrastructure, and regulations, among other things.

Customs Complications

Customs requirements can be particularly challenging. For example, Mexico doesn't use the same classification system as the United States, so a company exporting to Mexico needs to understand that country's approach and provide proper documentation. Fines for mistakes are expensive.

Mexican law requires a five-year partnership between a U.S. company and the Mexican customs broker it selects. And while a U.S. customs broker can file documentation remotely for any U.S. port, Mexican customs brokers are limited to four ports each. A U.S. exporter might need to work with multiple brokers to make sure it has all necessary locations covered.

"Because it's complicated, we've put a lot of emphasis on our Mexican customs brokerage operation," says Troy Ryley, senior vice president, TM Services, Mexico, for Transplace in Laredo, Texas.

"It's a complicated landscape," agrees Ciano. "Some countries are open to trade with simple customs laws that are easy to understand and execute. Others use customs as a barrier for controlling trade as well as a source of revenue. They continually apply new fees or penalties."

Each country's infrastructure impacts how goods get to their final destination, as well. It's a particular problem in Brazil, where shipments originating in Manaus, the largest city on the Amazon River, might have to leave by water. Or, shipments might start out on an eight-lane highway in Sao Paulo and end up on two-lane roads in the country's northeast.

"If there's a weather or construction issue, we can lose up to 10 hours in some of those areas," says Chris Brady, who lives in Brazil as director of South America at TMC, the managed services and transportation management system arm of C.H. Robinson.

Brazil's "huge consumer base" is attractive to companies in other countries, Brady says. But because the South American country has infrastructure, economic, and high transportation cost issues, it's not a place to just "dip your toe in."

"You need to commit to it, whether this means buying a company with infrastructure in place already or building out factories," he says. "Some barriers are so restrictive that you need to make an investment in the country to grow and get scale."

"Brazil has everything from high tariffs to bureaucracy, shifting regulations, and corruption," says Tony Donofrio, head of

Look for stability and ease of operation when selecting Latin American markets.

Tony Donofrio, Head of Supply Chain Practice, Argo Consulting

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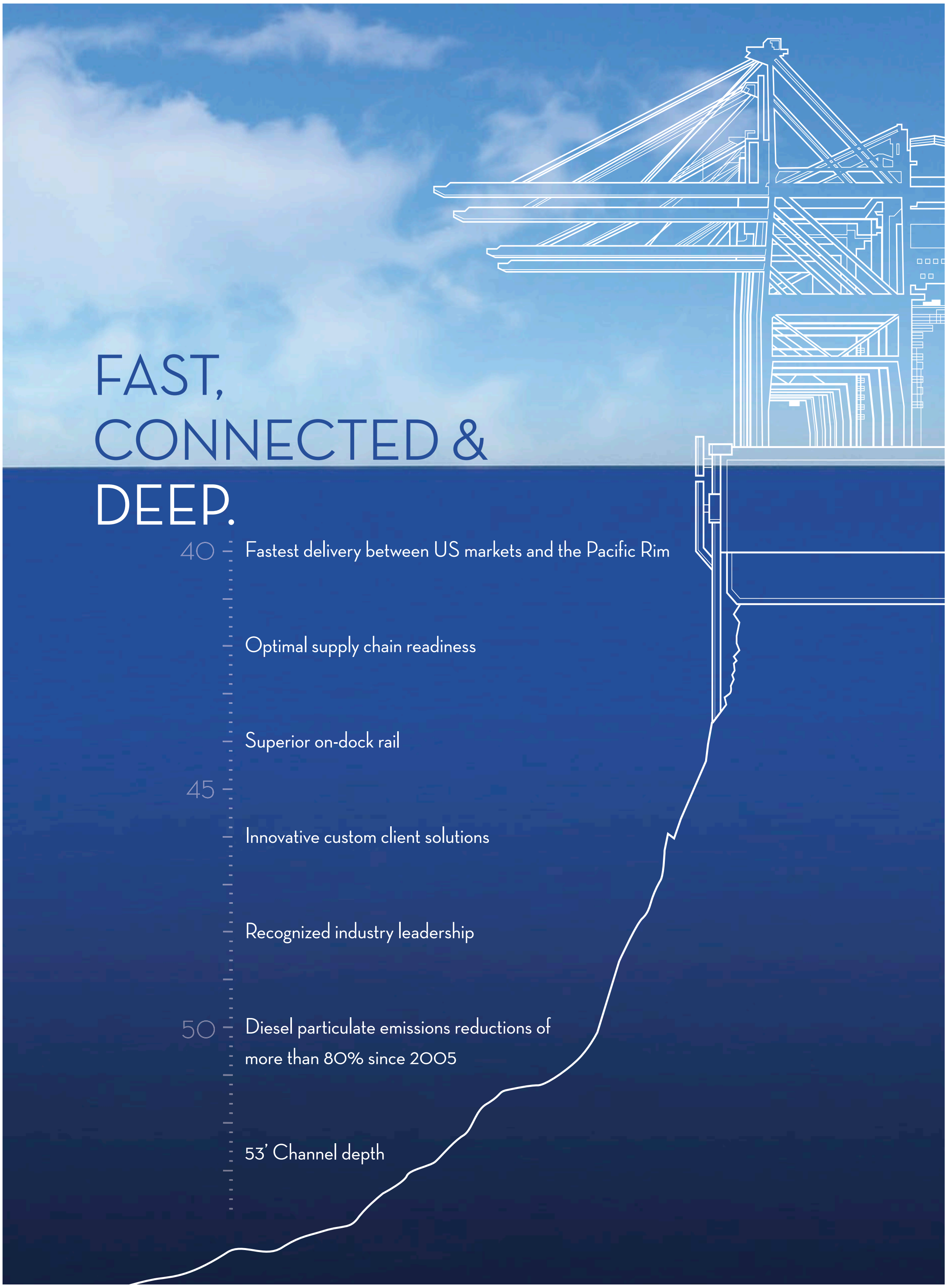

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When deciding to enter the Latin American market, many shippers turn to 3PLs to help expand warehouse operations or redefine distribution strategy.

supply chain practice at Argo Consulting, a Chicago-based global consulting firm.

Donofrio advises companies to look for stability and ease of operation when selecting Latin American markets. Secondary factors, he says, are infrastructure, the population's education in terms of providing a workforce, and business incentives.

"Chile is on the forefront," he adds. "It provides good education, encourages new business development, offers incentives, and has a stable environment."

"Peru is the most growing and stable economy in the region," adds Felix Riachi,

head of LATAM for APL Logistics, an Arizona-based logistics company.

No matter where goods are moving in the region, companies should expect problems.

"You always have to be prepared to manage a crisis," Riachi says. "Every day brings a new political, social, or economic challenge. You have to be able to predict this, prepare for it, and be flexible." Flexibility, he adds, is one of key success factors in the region.

That's why many experts recommend that U.S. companies doing business with Latin America work with a third-party logistics (3PL) provider or a fourth-party logistics (4PL) provider with employees working in each market.

"So many factors are beyond your control that you need to pick a partner with experience in the region to guide you,"

> In LATAM trade, every day brings a new political, social, or economic challenge. Flexibility is key to success.
>
> Felix Riachi, Head of LATAM, APL Logistics

Free Trade Agreement and Trans-Pacific Partnership Countries

Latin American free trade agreement countries:

- Chile
- Colombia
- Costa Rica
- Dominican Republic
- El Salvador
- Guatemala
- Honduras
- Mexico
- Nicaragua
- Panama
- Peru

Latin American Trans-Pacific Partnership countries:

- Mexico
- Peru
- Chile

says Larkin. Crowley has about 600 in-country employees in Latin America who facilitate logistics and monitor trends.

"When we see strikes or new regulations regarding fumigating containers in a certain port, we can re-route to a different port," he says. For example, when port congestion in Santo Tomas, Guatemala, became a problem in early 2016, Crowley switched the order of ports of call.

Visual Intelligence

While companies need supply chain visibility so they can be informed in a way that guides decision-making, they also need a visual intelligence mechanism that helps them stay abreast of regional developments, Riachi says. APL uses a visual intelligence platform that provides clients with data and information that can be used to adapt to changes quickly.

"The Mexican border can be a black hole," says Riley. "You need all the information on one platform so you can see how

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long customs brokers are taking to clear shipments, among other things."

Looking ahead, both Riachi and Larkin anticipate a consolidation among logistics service providers in the region. They agree that the process will be driven by a need to work with a 3PL that can take on a larger role for companies in the region.

"We expect fewer service providers because of the logistics complexity," says Riachi. "Sometimes, more than 500 3PLs, customs brokers, and others are involved, and importers and exporters look to reduce that number to gain better supply chain control."

Krishnan acknowledges the issues and challenges. "The geography is challenging," she says. "A lot of these countries have infrastructure deficits. Ports are at capacity. Moving products around can be difficult, but the countries are aware of it."

Still, considering that fewer than one percent of the 30 million companies in the United States export products, those looking to new markets for growth might do well to consider the potential that might come when they Look South. ■

Need Help? Look South

Look South, an initiative launched by the U.S. Department of Commerce in January 2014 to help increase trade in 11 Latin American countries where the United States has free trade agreements, offers services and programs that support companies already in that market or help others expand into the region. These programs include:

■ **Economic market intelligence** pulled from the U.S. Department of State reports compiled by economic focus officers are available on its website. The department also provides a newsletter featuring opportunities for businesses considering exporting or investing in the Western Hemisphere.

■ **The Next Market Tool** helps businesses identify their most attractive and appropriate market in the region. The tool is currently available only through counseling sessions at U.S. Export Assistance Centers; the organization hopes to make it available online as a self-serve resource in the future.

■ **Webinars** discussing the Trans-Pacific Partnership and how to leverage the trade agreement's advantages.

■ **Trade events** such as the Trade Americas-Business Opportunities in Central America Conference in Costa Rica in late March 2017.

For more information on Look South: http://2016.export.gov/tradeamericas/looksouth

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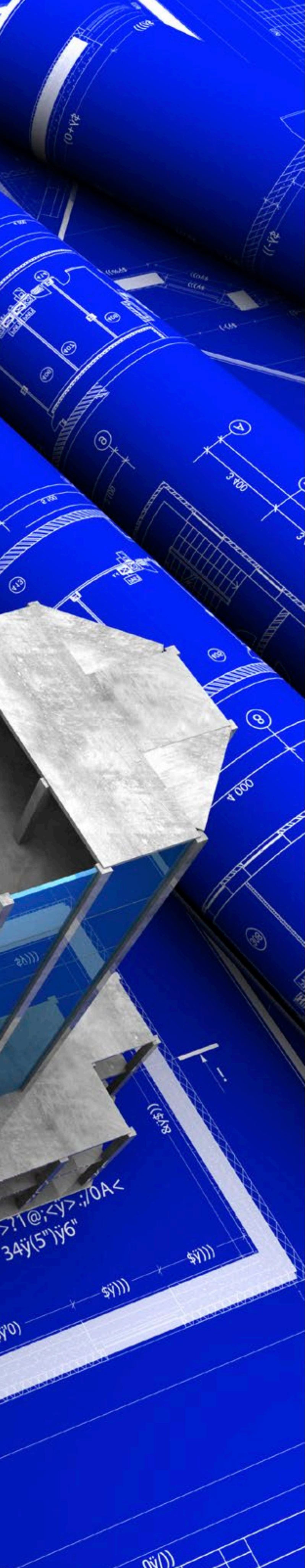

Construction Logistics:

Raise the Roof!

When building contractors converge on a site with their materials, equipment, and appliances, it takes planning, patience, and a good bit of luck to fit all the pieces together.

By Merrill Douglas

Let's talk about brick and mortar, but not the metaphorical materials that signify "retail store" when we describe sales channels. Let's talk about literal brick and mortar, plus concrete, lumber, steel beams, roofing, and all the other materials you might need to erect a building.

Moving those materials, plus heavy equipment, to a construction site at the right time, in the right order, demands intricate orchestration. Get the details wrong, and you'll see well-paid workers and expensive machines standing around with nothing to do.

How do the pros get construction logistics done the right way? We asked a few to build on the details.

Plan Early, Stay Flexible

Ryan Transportation Service, in Overland Park, Kansas, contracts with more than 20,000 trucking carriers to serve its construction industry customers. It arranges transportation for all kinds of construction materials, including bagged cement, precast concrete panels, concrete forms, insulation, heating and air conditioning systems, heavy machinery, and more. Ryan Transportation's customers include building product manufacturers, general contractors, subcontractors, and machinery suppliers.

Some 3PLs, such as Ryan Transportation, specialize in managing construction logistics.

One essential behind this kind of transportation is pre-planning. "If a big project is coming up, we reach out to a broad network of carriers," says Stephen Bird, senior director of business development at Ryan Transportation.

Price is important when the third-party logistics (3PL) provider seeks a truck to move construction materials. But the carrier must also be able to adhere to a strict schedule. A driver making a delivery might encounter other trucks hauling all manner of supplies to perhaps one dozen different subcontractors.

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Photo courtesy of Ryan Transportation

Logistics planning for construction projects is essential. Materials such as these concrete panels must be loaded on the truck in precise order to facilitate unloading for installation.

"There are a lot of moving parts, and it all has to work perfectly to avoid an accident or delay," Bird says. "Time is very expensive on those jobs." For a large project, the company might have to move several hundred truckloads, coordinating pickups at suppliers all over the United States, plus arrivals at the job.

Ryan Transportation uses both large trucking companies and small owner-operators to serve its customers. It qualifies each one carefully. "All our carriers have to pass a strict safety background check based on government safety scores," Bird says. "We make sure they have the correct insurance and that they understand where they're going, that they're taking the right route through downtown congested areas, that they have the right-sized equipment, and that the driver has the right personal protective equipment: hard hat, safety vest, boots, no shorts."

Moving According to Plan

Planning also is essential when it comes to loading a truck. Say, for example, a subcontractor hires Ryan Transportation to move pre-cast concrete panels from the vendor to the site where a large manufacturing plant is under construction. Those panels must go on the truck in just the right order, so the recipient can unload them correctly for installation.

"It's a puzzle," Bird says. "If number 24 shows up before number 23, you've got a problem." That's especially true at a crowded job site, where space is at a premium. "There's no place to put the truck while it waits for an earlier panel to arrive and be unloaded," he adds.

The problem becomes especially severe when a crane is waiting to unload the pre-cast panels and the delivery runs late. "That delay can cost several thousand dollars per hour with the crane and crew sitting there," Bird says. To avoid mistakes, truck drivers must check that the number on each panel matches the number they are supposed to be loading.

"If the panels need to be there at 9 a.m., and there's any issue, such as a weather delay, we've got to be in communication," he adds.

Drivers also need details about the freight so they'll be sure to arrive for pickup with the correct number of straps and other equipment for loading. "If you need 15 straps and you show up with eight, there's not much to do," Bird says. "We have to send that driver away, or back to get more straps, and it creates a delay."

Once drivers get to the site, they need precise instructions about where to go. For example, say a driver is delivering forms for pouring concrete at the site of a new sports stadium. That site will also be busy with trucks delivering materials to plumbers, electricians, carpenters, and others, plus forklifts moving items from place to place.

"Drivers have to know exactly where they're going and who they're supposed to meet to unload," Bird says. "If they get into the wrong spot, they can literally get the truck stuck where they can't turn around."

Surprise Attack

Despite all the careful advance planning, drivers making deliveries to construction sites often meet with surprises. "The schedule could change once or 20 times in one day," Bird says. Drivers must be patient, and both truckers and the 3PL need to be flexible.

"We might think we will haul 20 loads today, and then the wind could be too high for the crane to unload," he notes. In the face of that uncertainty, it takes strong communication to keep things running smoothly.

Ryan Transportation uses a transportation management system (TMS) for many functions, including routine data exchanges. But when exceptions arise, that technology isn't sufficient. "You can update the system and send that information, but if you rely on the carrier to check its technology, ultimately something is going to be messed up," Bird says. When a message needs to get through, the most reliable tool, he says, is "a good, old-fashioned phone call."

Photo courtesy of Ryan Transportation

Any delays in getting equipment to a construction site can cost several thousands of dollars in lost time.

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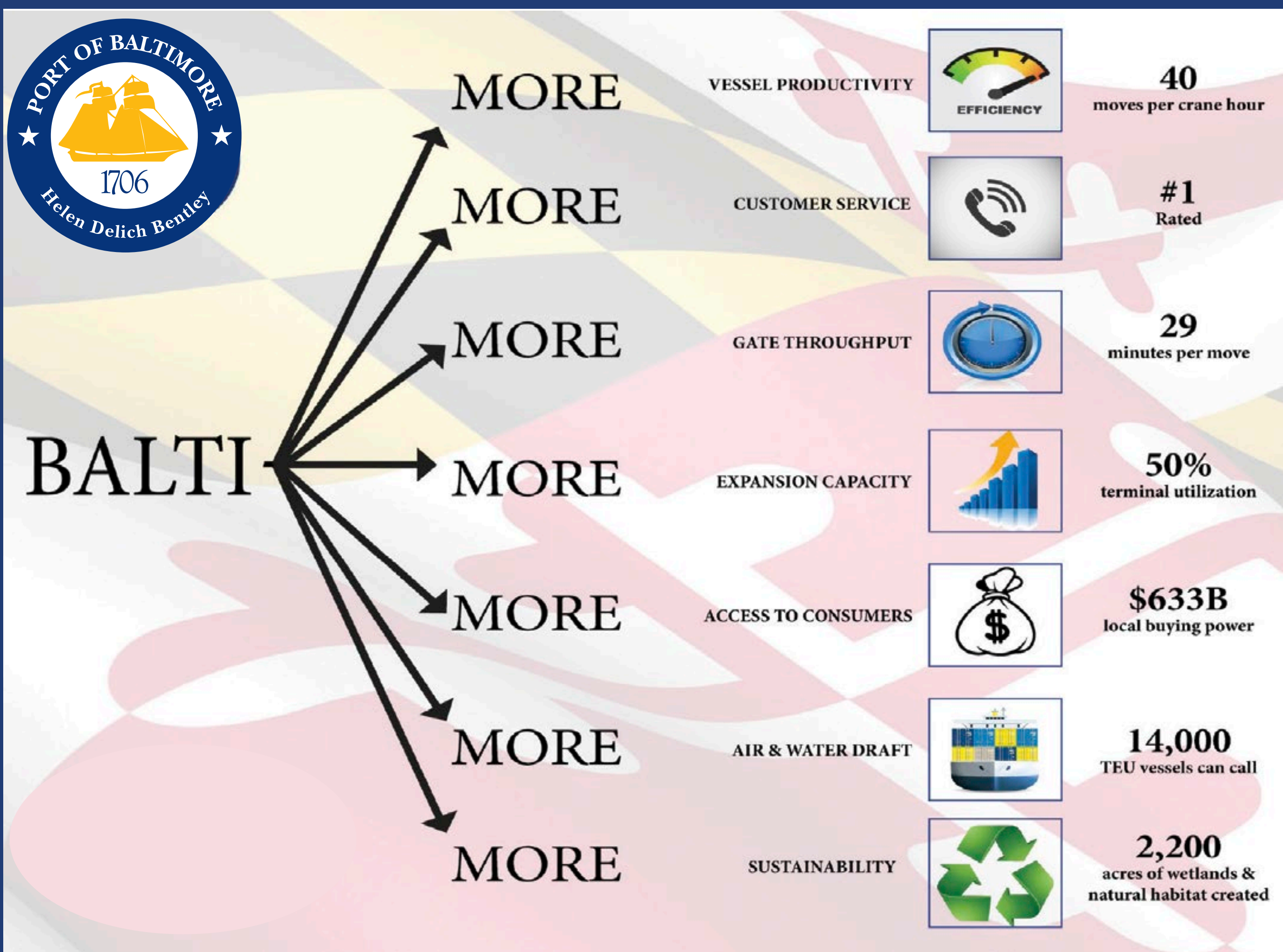

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The Philadelphia Story

In January 2017, Equinox Management and Construction wrapped up one of its latest projects, a building on a small side street in Philadelphia that houses nine market-rate rental units. Built in a tight space, with work by numerous subcontractors, this job posed many of the typical challenges that Equinox faces in its jobs, says Steve Steinbrook, the company's director of construction operations.

Based in Philadelphia, Equinox serves as the general contractor—and sometimes also as developer—on high-end, multi-family townhomes and condo complexes in the city and nearby suburbs. It usually subcontracts most of the construction—from digging foundations to installing sprinklers and security systems—to other companies. Equinox coordinates all that work and purchases many of the necessary materials.

The two main team members responsible for logistics on any project are the site supervisor and Bill Rullo, Equinox's purchasing coordinator.

"The superintendent builds a schedule for when all the trades [the subcontractors] are going to be there doing their part," Rullo says. "Then he works with our purchasing coordinator to make sure all the materials are arriving one or two days before the subcontractors are ready to start."

While some subcontractors supply their own materials, Equinox often does the purchasing to gain greater control over deliveries and costs. For example, the company will buy lumber for its framing subcontractor and arrange for the product to arrive in stages. Especially at sites in Philadelphia's Center City, there's not a great deal of space to store materials that won't be used soon.

Even when there is some storage space, how to store materials may require some thought. "Sometimes we have an inside delivery to a new home, where the tenants aren't in yet but the house is secure," says Rullo. But if construction isn't nearly complete, Equinox might have to build lockable storage boxes on site or—if the building has walls—install temporary locks. Otherwise, Rullo might need to put the delivery off. "It's a chess game, getting all the pieces lined up perfectly," he says.

Constructing this building on a small side street in Philadephia created many logistics challenges for Equinox Management and Construction.

The chess game gets especially tough when a supplier doesn't have enough product in stock. "We might get 90 percent of the plumbing or electrical fixtures, with a few on backorder," Steinbrook says. "Then it's a challenge to get those subcontractors back out."

Luckily, that doesn't happen often. When the building requires an unusual product—say, handmade light fixtures for use in a historical neighborhood—the company tries to place the order well in advance. Those items might wait in Equinox's small warehouse until they're needed on site.

Summers in the City

Beyond questions of storage, Center City projects also pose other challenges. Sometimes Equinox or one of its contractors needs to close off a street while workers unload a tractor trailer or move a crane into positon. That's a familiar scenario for John Summers, owner of Summers Quality Services, a contractor that installs heating, ventilation and air conditioning (HVAC), plumbing, and electrical systems. Summers provided and installed the HVAC for Equinox's nine-unit rental building project.

"It can be a headache to block off a street for 30 minutes to unload a truck," Summers says. "We try to coordinate an early morning delivery, before rush hour." Closing a street for a longer period—say, to bring in a crane to install a unit on a roof—requires approval from the police, who send a squad car to keep traffic away.

Summers recalls one project where the presence of a crane made coordination especially complex. The company had to lift a piece of equipment to the top of a four-story building, with high-tension wires in the way. Philadelphia Electric Company needed to put protective covers on those wires.

"We had to coordinate the utility, the crane, and the street closing," he says. "And they would only allow us to do it at 6 a.m., so it would have the least possible impact on residents." It took about 10 days to get everything lined up, but it all went well in the end, he says.

When Equinox puts up a building in one of Philadelphia's older sections, sometimes delivery trucks can't make it up the narrow streets at all. Then Rullo and the site superintendent might meet the driver in the parking lot of a big box store to transfer the freight to the company's local delivery truck. Because that truck is only 24 feet long, this isn't simple. "We unload as much as we can, take it to the site, unload, come back, and do it again," Rullo says.

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Kronos vs. The Crane

In late January 2014, W.F. Magann Corp. bought a 100-ton Manitowoc crawler crane, which it needed it for a job near its headquarters in Portsmouth, Va.

"We were using the crane as a rig to drive concrete piles into the ground," says Stan Magann, vice president at the concrete, heavy, and marine general contractor. The customer was Coastal Pre-Cast Systems, which was building a concrete runway for an overhead crane in its production facility.

Magann needed the crane quickly, but the equipment still had a way to go. Freshly arrived from Japan, it was waiting in Manitowoc's facility in Houston.

The job of getting the crane to Virginia fell to Next Exit Logistics, based in DeSoto, Texas. The 3PL, which specializes in heavy hauling services, had just five days to arrange the move. Next Exit needed five trucks to transport the crane—one for the massive power unit and four others to carry the counterweights and booms.

"We hired flatbed and step deck trailers and an eight-axle tractor-trailer," says Chandler Magann, president at Next Exit. (Stan and Chandler Magann are cousins, but their companies are not related.) "We put the upper works on the eight-axle tractor trailer, then we put crates of parts on the others."

To guide that work, Next Exit relied on a loadout plan—a packing list that provided the dimensions and weights of each piece of equipment. The company arranged to do all the loading on the same day.

Each driver involved in the move was an owner-operator working for a different carrier. Next Exit qualifies its trucking companies carefully. "We look at how long they've been in business, their reputation and safety record, the insurance they carry, and how long that owner-operator has been with that carrier," Chandler Magann says.

As Next Exit and its drivers started loading the trucks, they ran into their first big challenge. They needed to drive the upper works onto its trailer, but the crane wouldn't start. "Manitowoc had to get a battery from across town, which took hours," Magann says.

Why the delay? As Next Exit was getting

Next Exit Logistics had only 5 days to move this Manitowoc crane from Houston to Virginia during Winter Storm Kronos.

the trucks loaded, Winter Storm Kronos had descended on Houston, shutting down the city's roads. The weather also complicated the freight pickup. "We had issues with sleet forming on the decks of the trailers," says Chandler Magann. Once loaded onto their trailers, some of the crane parts kept sliding around.

Luckily, by the time the Manitowoc technician returned with the battery, the sun was out and the ice was melting. By afternoon, the wails of emergency vehicles on nearby highways died away, and traffic cleared. The trucks were ready to move.

Permits, Escorts, and Curfews

Of course, a truck hauling an oversized load such as a crane doesn't just hit the road. It needs permits and escorts, and it's subject to both state and local curfew laws. Permits dictate the route the truck must take. State curfews keep oversized loads off the roads after dark; municipal curfews keep them out of rush hour traffic.

"Curfew can catch people by surprise if they're not being proactive," says Chandler Magann. If it takes too long to load the truck, or an accident causes a traffic delay, a curfew could sideline a load.

Even oversized loads moving locally require special permits. "I currently have a crane on a job site that's 20 minutes from our yard," says Stan Magann. When W.F. Magann hired a local hauler to move that crane, it took about seven days to obtain the necessary permit.

For drivers hauling the Manitowoc crane, the excitement didn't end when they started rolling east. Winter Storm Kronos was headed the same way, and not as quickly. "One driver caught up with the same storm," says Chandler Magann. And then, as the trucks reached Virginia, they ran into a second storm, dubbed Leon.

Next Exit wasn't getting enough information to tell if the roads ahead were safe for the flatbed carrying the crane. So the escort drivers were deputized as scouts. They drove ahead, checked out conditions, and then drove back to report.

In the end, everyone reached Portsmouth safely. W.F. Magann used another crane at its site to unload the Manitowoc's parts. "The crane we were unloading came with the tracks on it," says Stan Magann. "So it walked right off the trailer; all we had to do was assemble the counterweights and booms."

In any construction job, timing—getting materials to arrive when you need them, getting permits approved before it's time to ship an oversized load—is a big logistics challenge. But at certain times of year, weather poses the biggest obstacle, and not just when it comes to transportation.

"We have to pick and choose our days," Stan Magann says. "We can pour concrete when it's 50 degrees out, but if it's 20 degrees, we can't."

Weather, timing, labor, materials, equipment, permits—with careful planning and attention to detail, all the elements of construction logistics build a product that's solid and strong. ■

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Cruise Control

A cruise ship like this Norwegian Cruise Line vessel is a floating hotel that isn't re-stocked until it docks at its destination. Then, logistics providers have just a few hours to load as much as one week's worth of supplies – food and beverages, hotel products, and marine items – before the ship sails.

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When it comes to cruise supplies, logistics personnel have to run a tight ship – or risk missing the boat.

By Sandra Beckwith

It was Artur Pankowski's worst nightmare. The director of global logistics for Royal Caribbean Cruises Ltd., had a cruise ship docking in South Korea, where it would pick up supplies. There had been a MERS virus outbreak in that country, though, and Chinese authorities didn't want their cruising citizens exposed to the virus. They asked the cruise line to dock elsewhere; the company accommodated the request.

"Elsewhere" in this case ended up being a port in Japan — not exactly a few miles up the coast from the original destination. "It was an extremely difficult situation because my supply center in the region was in the port that was removed from the itinerary," says Pankowski.

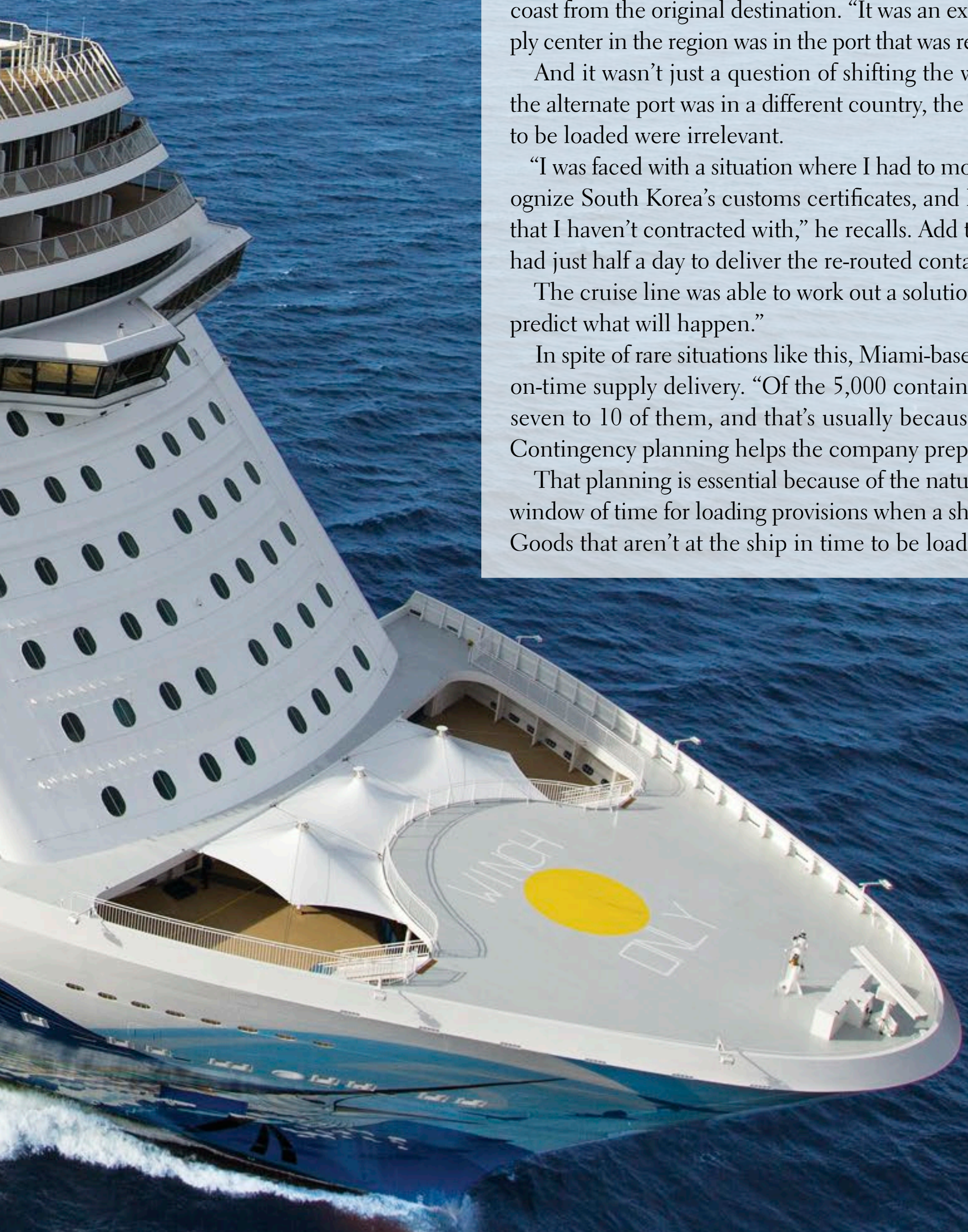
And it wasn't just a question of shifting the waiting supplies to another port. Because the alternate port was in a different country, the Korean customs documents for the goods to be loaded were irrelevant.

"I was faced with a situation where I had to move containers to a country that doesn't recognize South Korea's customs certificates, and I had to do this using local transportation that I haven't contracted with," he recalls. Add to that the timeline — the cruise company had just half a day to deliver the re-routed containers to the alternate port.

The cruise line was able to work out a solution, but as Pankowski points out, "You can't predict what will happen."

In spite of rare situations like this, Miami-based Royal Caribbean boasts a 99.96-percent on-time supply delivery. "Of the 5,000 containers we ship annually, we miss only about seven to 10 of them, and that's usually because of weather or a strike," Pankowski says. Contingency planning helps the company prepare for most potential problems.

That planning is essential because of the nature of cruise ship supplies: There is a small window of time for loading provisions when a ship docks in port — usually just a few hours. Goods that aren't at the ship in time to be loaded in the proper sequence might need to



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Once trailers with provisions arrive at the dock, they line up in a staging sequence determined by what needs to get loaded on the ship first.

be delivered at sea — and often at the vendor's expense.

"This is a unique industry where a hotel moves from pier to pier at a certain hour," Pankowski says. "The process is precise, organized, and well-planned so we don't miss the departure."

"This isn't like delivering to Walmart," agrees Jonathan Bales, director of global operations and product development at Miami-based Hellmann Worldwide Logistics, a Royal Caribbean partner. "If we don't make a delivery to Walmart by 5 p.m., Walmart will still be there the next day. But if we don't get the containers to the cruise ship by 3 p.m., that ship is gone."

On-time supply deliveries are crucial to the success of the cruise industry because the provisions are an essential part of the customer experience. Whether it's food and beverage products, hospitality supplies such as towels, or technical and marine products used to keep the ship working, they all contribute to a satisfactory passenger experience.

The industry couldn't experience the growth it enjoys if passengers were disappointed. Cruises in 2016 were expected to transport one million more passengers—24.2 million in total—than the previous year, according to trade organization Cruise Lines International Association. That adds up to an industry that delivers what's expected, in more ways than one.

With Royal Caribbean's *Oasis* class ships housing as many as 6,000 guests and a crew of 2,000 or more, each is a self-sufficient floating town while at sea. Those communities go through a lot of provisions, too. When the *Oasis of the Seas* leaves the dock in Fort Lauderdale, Fla., every week, it is re-stocked with a wide range of items that include:

- 1,899 pounds of coffee
- 7,397 pounds of cheese
- 1,000 new light bulbs
- 30 replacement TVs
- 10,272 rolls of toilet paper

What's the Forecast?

The process starts with accurate forecasting.

Carnival Cruise Line's English division, Carnival UK, uses LLamasoft's *Optimiza* demand and forecasting tool. The division has 11 ships under two brands, Cunard and P&O Cruises. The ships can accommodate up to 3,500 passengers.

As with most cruise lines, the provisions needed for each Carnival UK ship vary according to the brand's personality, the ship's itinerary and length of time at sea, and passenger profiles, as some cruises are geared to families, others to single travelers. Each ship has its own supply list, replenishing plan, and schedule.

Supply chain transparency enables Hellmann Worldwide Logistics to set delivery schedules for Royal Caribbean, says Jonathan Bales, director of global operations and product development for the 3PL.

"It's a complex mix of challenges to produce a good forecast," says Richard Forrest, vice president of planning at LLamasoft, a supply chain design software company in Ann Arbor, Mich.

Supply planning is done centrally at Carnival UK's Southampton office. Each evening, the ships feed the day's consumption data into the software's planning module. That actual consumption, combined with other data, is used to prepare supply forecasts that are reviewed and vetted before they are sent to the provisions program. From there, the replenishment system generates orders that will be delivered when the ship docks at the next port.

"The process starts with getting that demand plan right," says Forrest. "There's no use replenishing to an inaccurate demand plan." The forecast also feeds into each ship's Marine Exchange Program, which is software that many cruise lines use to manage onboard inventory.

Ships in Norwegian Cruise Line Holdings Ltd.'s three brands—Norwegian Cruise Line, Oceania Cruises, and Regent Seven Seas Cruises—order supplies individually.

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Workers use a forklift to load supplies onto a cruise ship while it's docked at a turn-around port. Merchandise is stored on steel pallets for sanitation reasons.

"Our system incorporates all the relevant statistics, including the number of passengers and crew, and the cruise length," says Jose Vazquez, senior director of global management and administration for Miami-based Norwegian. "The algorithms incorporated into the system can predict, for example, that a particular cruise will need 100 pounds of potatoes."

The system is highly regimented and monitored so that supplies get ordered within the timeframes needed to ensure delivery to the right port for loading. Vessels in Australia, for example, need to order further in advance because of the extra time required to get supplies to those ports.

Replenishing at Turn-around Ports

Ships are replenished at "turn-around" ports while they offload passengers and luggage from one trip and load both again for the next voyage. Local vendors supply produce and dairy products dockside while dry goods, frozen proteins (meat and seafood), hotel supplies, and "marine" products used to keep the ship functioning are delivered to and consolidated in nearby distribution centers.

Supplies for Norwegian's 24 ships are consolidated and organized in three locations. The main distribution hub is in Miami, while Barcelona's warehouse supplies the Southern Mediterranean. The Hamburg distribution center, located near shipbuilders, supplies materials needed for ship maintenance and repair.

Hellmann supports Royal Caribbean's provisioning from a 200,000-square-foot consolidation center near Fort Lauderdale's Port Everglades, one of the top three cruise ports in the world. Hellmann accepts vendor deliveries, consolidates them according to destination ship, and loads them onto trailers for delivery to ships in port.

"We have a lot of loose cargo coming in—anything from a small box to a big crate of repair parts," says Bales. "We don't have a set master list of different parts that get delivered regularly, so we need to be able to process anything that comes through the door." Supply chain transparency makes it possible for Hellmann to see orders and set delivery schedules.

Cruise ship logistics starts with planning, then more planning, notes Jose Vazquez, senior director of global management and administration, Norwegian Cruise Line.

Every shipment that's delivered to the distribution center has to be managed, consolidated, and shipped out on a tight schedule. Loose items are packaged on pallets with products from the same category—dry goods, hotel, or marine—because the three categories are stored in different spaces on the vessel. In addition, trailer space is optimized according to how goods will be off-loaded and to minimize the number of trailers used to help the cruise lines save on transportation costs.

Most of this happens for several ships at once. "We could be loading 10 ships at the same time, but we can't mix the shipments to the vessels, can't combine the product categories, and can't miss the date and arrival time," says Bales.

What's more, a percentage of those containers are traveling much farther than Fort Lauderdale—they're going to the other side of the world, in fact. Hellmann consolidates goods shipped to ports in countries as far away as Australia.

"If people on a cruise in another part of the world want corn flakes, they need to be able to get it—so we provide it," says Bales, adding that it's also a quality control mechanism for the cruise lines. "Someone who took a cruise in the Caribbean expects consistency from the cruise line when taking another of its cruises in the Mediterranean," he adds.

Technology and Teamwork

Cruise ship logistics is a sophisticated operation that relies on technology and a dedicated team that understands the consequences of a mistake or delay. Bales' team members can distinguish between a 20- and 25-pound bag of rice at a glance, all while handling, sorting, and labeling as many as 300 loose parcels daily and unloading truckloads of other foods, beverages, and commodities.

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"You can have the best technology in the world, and we do, but if you don't have a good team, it doesn't matter," Bales says.

Once trailers arrive at the dock, they line up in a staging sequence determined by what needs to get loaded on the ship first. Norwegian starts with the frozen items—"You don't want them sitting on the pier," Vazquez says. Frozen is followed by produce, dry goods, and technical or marine items. The four-hour process includes security inspections and drug-sniffing dogs.

Royal Caribbean follows process models created according to the vessel and its storage space. Offloading might be frozen first, followed by dry, or the reverse, depending on how storage space is configured. Internal logistics on a Royal Caribbean vessel sync with how galleys prepare food and the way food is picked from storage.

The cruise line's process involves two types of forklifts—one to move pallets off the truck and another with longer arms to transfer them onto the platform extending from the vessel. Ship storage is on steel pallets for sanitation reasons, so the process often involves "flipping" goods from wooden to steel pallets.

Cruise ship supplies require appropriate customs documentation that gets inspected before the provisions are loaded on the ship.

Cruise lines have just a few hours when in port to load provisions to stock dining rooms like this one on a Norwegian Cruise Line vessel.

Reverse logistics happens simultaneously—waste, for example, is removed from the ship and properly disposed of elsewhere.

Regulations and customs requirements in various destinations further complicate the process. "Cruise logistics is challenging to manage," says Christian Kathke, director of development for cruise and hotel logistics at Kuehne + Nagel, Inc., Royal Caribbean's Switzerland-based freight forwarder. "We deal with regulation requirements for a supply chain comprising 65,000 items coming from hundreds of countries and moving to more than 100 destinations."

The company has a "do not ship list" that's updated daily by employees in various countries. Regulations often require information on how foods are cooked, frozen, or produced—including what farm any beef came from in some instances. They also apply to pharmacological products used by on-board spas.

Monkeys and Goldfish

Managing cruise logistics is intense—but lighter moments do occur. For example, during a meeting with officials in one country to review food certifications, Kathke was asked about the meat certification for Ben & Jerry's *Chunky Monkey* ice cream. The official was confused because the documentation didn't reference... wait for it... monkey meat.

"We had the same problem with goldfish crackers," Kathke says.

Then there are the problems created during those rare occasions when a ship runs out of an essential item. If it's a food item, the galley staff often improvises by altering the menu. When an unscheduled delivery is required, though, the cruise lines pull out their contingency plans.

Royal Caribbean relies on its Fleet Services agents. Available all day, every day, these agents tap into a network of local suppliers who can provide emergency stock. "They can usually deliver sufficient quantities to carry us until the container arrives at the port with our regular provisions," says Pankowski.

Emergencies aren't common, though, because of the processes facilitated by technology and people.

"It all starts with planning. Then you do more planning, and then you plan some more," says Vazquez. "After that, it's the execution. We're very proud of our team and how we accomplish all of this."

Think of them the next time you take a cruise, but don't expect to take a picture of dock workers loading provisions onto your ship.

Says Pankowski: "We try to make the logistics invisible." ■

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Baseball Logistics

Hitting a Home Run Every Trip

Off the diamond, truckers and clubhouse staff work tirelessly to execute the logistics of Spring Training. Here's how they achieve this Haul of Fame accomplishment.

By Gary Wollenhaupt

Once the historic Game 7 of the 2016 World Series drew to a close, the clubhouse staff of the Chicago Cubs and Cleveland Indians began planning for the next milestone on the baseball calendar: the annual migration to spring training fields.

In February, most of the 30 Major League Baseball teams relocate to Florida or Arizona for about two months of spring training prior to the regular season. It's a logistical challenge that teams and their carriers have down to a science, and that expertise extends to supporting regular season games that span the nation. They pack up the baseballs, bats, uniforms, training tables, and exercise gear, load it on trailers, and head to less inclement weather.

Some teams, led by the Boston Red Sox, have created an event called Truck Day, when fans watch the teams load the trucks to hit the road for spring training.

In Boston, Truck Day—originally called Moving Day—started around 2000, says Kevin Carson, operations manager for New England Moving and Storage, when a few people came to watch the team load the truck for spring training. Today, about 1,500 fans, the occasional marching band, and media show up for the event, a bright spot in a dreary New England February. Driver Al Hartz has piloted the 53-foot truck for the 1,500-mile journey to Ft. Myers, Fla., for more than 15 years.

"I never knew there were so many people in Boston who wanted to watch a moving truck get loaded," Carson says. "It's essentially Boston's version of Groundhog Day, the first sign of spring."

In addition to the players' equipment, the truckload usually includes front-office items, kitchen and food supplies for the clubhouse, equipment for the medical and training staff, marketing and promotional materials, and audio/visual equipment needed for the scoreboard crew shoots. There may also be personal items such as bicycles, golf clubs, and video games.

With five people, the trailer can be loaded in three hours, Carson estimates. "Loading is one of the easiest jobs we have because the clubhouse staff is prepared for our arrival," he says. "You can't tell if we are moving a family or a baseball team."

Carson says his company also handles player personnel transfers during the season, moving personal effects for players leaving or joining the team.

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Every February, the N.Y. Mets' official freight carrier, Old Dominion Freight Line, hauls the team's balls, gloves, and uniforms from Citi Field to the spring training facility in Port St. Lucie, Fla.

The teams accumulate equipment during training, and the players load their personal effects on the trucks too, so in some cases two semis are required for the trip back north.

In New York, A-1 First Class Moving and Storage helped the Mets with spring training between 1987 and 2016, when Old Dominion Freight Line (ODFL) became the team's official freight provider. ODFL now ferries the Mets' gear from Citi Field in Flushing, N.Y., to the team's spring training facility in Port St. Lucie, Fla.

A-1 still handles the airport transfers for the Mets on road games, according to President Matt Schwartzberg. The company trucks the team's travel gear to the airport, where the clubhouse staff loads it in the baggage hold of the charter aircraft that carries the players and staff. When the team returns, a driver and truck meet the team at the airport, no matter the time of day or night. A-1 conducts about 25 away game moves each season.

"When the team returns to Los Angeles from a road trip, we may have a truck there at 1 a.m. waiting for them," Schwartzberg says. "That's a big part of what we do."

The Seattle Mariners also celebrate Truck Day before sending a semi truck on a three-day, 1,400-mile journey to their spring training facility in Peoria, Ariz.

Root, Root, Root For the Home Team

In Cleveland, Andrews Moving & Storage has carried the Cleveland Indians' gear to their stadium-away-from home in Goodyear, Ariz., since 2007. The company has decked out a trailer with "Official Mover of the Cleveland Indians" signage that they use all year round.

"On any given day, the truck could be parked in front of a residential customer's home," says Chris Palange, president of Andrews Moving. "Our customers get a kick out of seeing it. People take pictures, and we get some good chatter going on social media."

In February 2016, the load on the two Indians trucks bound to Arizona from Progressive Field included some 18,000 baseballs and 600 bats, bikes, golf clubs, workout equipment, pallets of bottled water, sunflower seeds, and even stadium mustard. Also on board was a black scooter that belongs to Indians Manager Terry Francona, who uses it to zip around the stadium complex.

While transporting the team's gear to spring training may have its challenges, the return trip is where it can get dicey depending on the game schedule, according to Palange.

"There may not be much time between camp breaking and the first game of the season," he says. "If the team starts the season on the road it's easier, but if they start at home we have to push to get there in time."

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Photos courtesy of Andrews Moving & Storage

(*TOP*): As the official mover of the Cleveland Indians, Andrews Moving & Storage painted a trailer with signage that they use all year round. (*BOTTOM*): Cleveland residents celebrate Truck Day, when crews load two semi-trucks and head to Arizona for pre-season training.

For nearby road games, such as Detroit, Andrews carries the gear by truck from Cleveland rather than loading it on the plane. The company regularly has a dedicated staffer, Scott Anderson, in the Indians clubhouse, and the driver, Ed Fisher, has handled the spring training run for years.

"Fisher has been doing this for so long he knows how to handle weather delays or other issues," Palange says. "One winter, for example, he missed a lot of bad weather by going down south through Texas instead of cutting across the Midwest."

For Cleveland's road games, Anderson parks a truck at the stadium several hours ahead of time so players can begin loading their personal baggage on board, and they make an early delivery to load the plane. At the end of the game, they take anything left over to make the trip.

It takes coordination on the return trip to ensure the truck is waiting at the airport. "That's usually in the wee hours of the morning," Palange says. "Getting coordinated and back to the ballpark can make for some difficult nights for the person handling it."

Many teams use a moving and storage company, often affiliated with Atlas or United, rather than an LTL carrier because spring training is more like a corporate move than a freight delivery. It takes white glove service to keep clubhouse staff and players happy.

"Just like our commercial moves, when companies have to be back to work on Monday morning so we need to get the office furniture and technology set up, we move players' personal items so they can go back to work the next day," Schwartzberg says. "I don't recall any damage in the past 28 years. We take tremendous pride in that."

Palange agrees that baseball logistics plays out more as a corporate move than a freight move. "Our drivers are used to moving people and handling household belongings with a lot of communication," he says. "That application works best for this kind of service."

But the pressure for on-time delivery is even higher than for a family waiting for their furniture, or a corporate office relocation. "We joke that we have all the baseballs and bats, so the Mets can't start the season without us," Schwartzberg says.

Home Team Advantage

Like the Florida teams, the Arizona Diamondbacks are in a unique situation because they are located where the other teams travel. Still, each season the Diamondbacks pack up for the 25-minute trek from Chase Field in downtown Phoenix to Salt River Fields in Scottsdale for their spring regimen.

Roger Riley, senior director of team travel and clubhouse for the Diamondbacks, says his staff handles the logistics in house, renting a box truck and making several trips back and forth to move everything they need. Each year, the players wear new workout attire, so it's delivered directly to the field.

"It's nice that we don't have to pack everything up," Riley says. "And if we forget

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something, we can go get it. It's a lot more low key than most of the other teams."

Moving back to the stadium for the start of the regular season usually takes a few more trips. "We keep the truck for about one week, moving the gear we accumulate during spring training," Riley says. "The trainers and strength staff each make a run with their equipment."

Fortunately for road games, the teams stock the visiting clubhouses with most items needed for a game. But still the Diamondbacks take about 8,000 pounds of gear on a trip, and another 4,500 pounds of luggage, especially if they have to take cold weather clothing as well.

7th Inning Stretch

For a road game, the clubhouse staff, assisted by their visiting clubhouse counterparts, starts packing up right after the first pitch. By the 7th inning, the truck is loaded and ready for the airport. Within one hour after the game ends, the team is on the charter bus headed for their flight.

About 30 minutes after arriving at the airport, the gear is stowed, the team boards, and the charter flight is ready to take off. The players and staff go through security screening at the stadium so they can step right on to the plane.

An extended road trip can take its toll on the team and clubhouse staff.

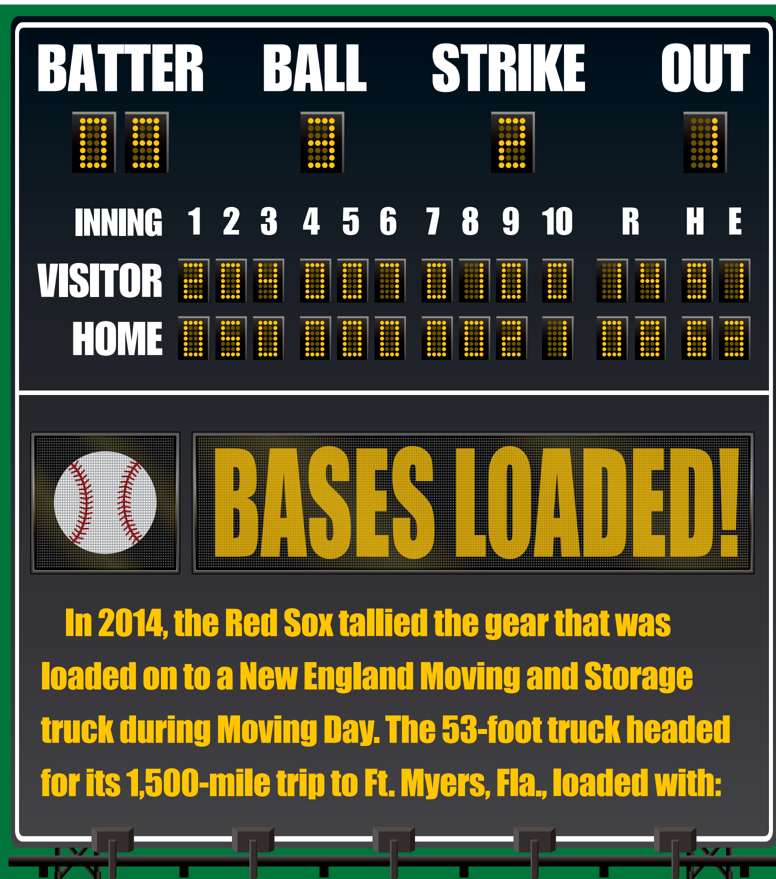
"Last season, we started in San Diego, flew to Baltimore and then bused to Washington D.C.," Riley says. "The team and staff were ready to go home."

After 35 years in the sport, 22 of them involved in travel and equipment, Riley has baseball logistics down to a science, but always tries to avoid surprises.

"We try to get the job done with as little fanfare as possible," he says. "We like to live unnoticed because that means we're doing our job right."

Sure, the trucking companies involved in baseball logistics enjoy the steady business. But they're also in it for the love of the game, proud to help the hometown team in any way they can.

"There are definitely perks, such as being in the clubhouse and getting close to the players," says Schwartzberg. "But waiting for that road trip from Kansas City at 3 a.m. can take its toll after a while. You have to love doing it." ■



- 20,400 baseballs
- 1,100 bats
- 200 batting gloves
- 200 batting helmets
- 320 batting practice tops
- 160 white game jerseys
- 300 pairs of pants
- 400 T-shirts
- 400 pairs of socks
- 20 cases of bubble gum
- 60 cases of sunflower seeds

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THE LOGISTICS OF
FRANCHISING

DELIVERING THE BASICS

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Fast food franchisees gain an appetite for supply chain success.

BY MICHAEL D. WHITE

There's an ages-old expression that, in life, love or business, nothing happens in a vacuum. And when building a new franchise operation, nothing–but nothing–happens in a hurry.

It takes most franchise operations an average of 7 to 10 months to become operational — an intense, hectic whirlwind that stretches from signing the contract with the franchisor through selecting a site, permitting, overseeing construction, training, and stocking before the cash register rings up the first sale.

"It's human nature to want everything now, but that's not how it works when rolling out a new franchise," says Michael Seid, director of franchise consultancy MSA Worldwide, based in West Hartford, Ct. "Franchisees want what they want – delivered yesterday, at a good price – and they want it hassle-free.

"Franchisees want their supply chain to be there without them actually noticing it," he adds. "They want to make certain that the cost of goods is reasonable, and that when they order something it's in stock so their business won't be seriously impacted."

Such expectations are legitimate as, with any business at any stage

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of the game, "they want to make certain that what they order is delivered on time at a price point that they can accept," Seid says. "If it's a calendar-driven, perishable product with a limited shelf life, they want it delivered on time in a way that doesn't interrupt the flow of business."

Many neophyte franchisees do not understand how critical the supply chain is to their long-term success. "Many new franchisees have no idea how to accept an order or what they need to do when a delivery truck comes in to make sure they receive everything they ordered," Seid notes.

HUNGRY TO LEARN

The whole process "is a learning experience, because it's new and it can be complicated," he adds. "It's as simple as learning if the driver dropped off all the cases on the order list. But learning how to place and receive an order, and knowing who the suppliers are, is beneficial and a good place to start."

The key is the relationship between the franchisor and the franchisee. "In some franchise relationships, a separate company operates the supply chain and there's always the issue of an exit strategy if the franchisor feels the supply chain manager isn't doing the job," says Seid, co-author of the book *Franchising for Dummies*.

"In some franchise systems—Burger King, for example—the franchisee cooperative owns the supply chain, so not every franchisor specifies the suppliers, though they do specify quality and other factors. Then there's the issue of franchisors that don't specify suppliers, only products, so the franchisee has great latitude as to what producers or distributors they can buy from."

Either way, the franchisor's primary goal is to make sure that its franchisees are provided with quality products that are priced reasonably, and that suppliers "consistently deliver and have back-up stock available in case of a product recall or sell out.

"In this age of multi-location franchising, most franchisors want to work with their franchisees to make sure that their bottom line improves and that the product they're selling is quality," Seid notes.

ROLLING IN DOUGH

Domino's Pizza operates more than 8,000 stores in the United States alone that generated $4.1 billion in sales in 2014. A full 97 percent of its total operations are franchised with about 840 independent franchise owners in the United States.

Since it began operations in June 1960, Domino's has maintained a modified, internal, single-source supply chain, currently operating 18 regional dough manufacturing and food supply chain centers in the United States, as well as a crust manufacturing center and a vegetable processing facility. It also runs a distribution center that supplies equipment and non-food products to certain domestic stores through a leased fleet of more than 500 trucks that completed more than 581,000 deliveries in 2015. That same year, Domino's supply chain segment accounted for $1.38 billion, or 62 percent, of its consolidated revenues.

DIRECT FROM THE SOURCE

Most of Domino's franchisees exercise the option to obtain food products, supplies, and equipment directly from the company because it provides them with profit-sharing that "generally offers participating franchisees and company-owned stores 50 percent of their regional supply chain center's pre-tax profits," according to the company's 2015 annual report. Company-owned stores and franchisees that operate a large number of locations can glean a higher percentage.

Currently, more than 90 percent of Domino's franchisees started their careers with the company as drivers, pizza makers, or hourly workers.

One of them is Todd Quinzi, who spent 28 years with Domino's Pizza, starting out as a delivery driver in high school and working his way up to vice president of the company's operations in Florida and Puerto Rico. He is also a multi-franchisee with 20 stores in the Tampa Bay area.

In 2008, after "considerable due diligence," he made the jump to Jersey Mike's, the New Jersey-based submarine sandwich franchise. He now serves as the company's Florida area director, overseeing 90-plus stores, and one of his own.

The supply chain contributes a lot of dough toward Domino's Pizza's total revenue. Domino's international master franchises have the right to operate a supply chain in their respective regions.

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Jersey Mike's integrated the *CrunchTime* restaurant management software with its proprietary point-of-sale system to monitor the supply chain and provide franchisees with purchasing compliance and contract price validation.

BECAUSE IT OUTSOURCES ITS SUPPLY CHAIN MANAGEMENT, JERSEY MIKE'S "DIDN'T LOSE A SINGLE LOAF OR MISS ONE DELIVERY" AFTER HURRICANE SANDY HIT IN 2012.

– **Mike Manzo,** COO, Jersey Mike's

Started in 1956, Jersey Mike's now has 1,500 restaurants open and under development nationwide. In 2015, for the second year in a row, the company was named the No. 1 fastest-growing chain in the *Nation's Restaurant News* Top 100.

One thing that convinced Quinzi to make the move from pizzas to submarine sandwiches was Jersey Mike's supply chain management system, which taps into the national network of food and product distribution centers operated by Houston-based Sysco Corporation, the largest institutional food distributor in the world.

IT'S CRUNCH TIME

The system allows Jersey Mike's franchisees to place an order with Sysco for food and non-food items—about 200 SKUs for a new franchise, including 85 private-label items, including everything from branded cups and napkins to disposable gloves and beverage straws—through *CrunchTime* restaurant management software, which monitors inventory, labor, and food costs for the franchise owner.

"A new franchise needs about 200 separate items to get up and running," Quinzi says. "Jersey Mike's has about 85 private-label items, and a number of proprietary items. We also have some off-the-shelf items, including disposable goods."

With his experience on both sides, Quinzi says there are pros and cons to managing the supply chain internally versus outsourcing the function.

"Operating an internal commissary makes it easier for franchisees to stay on top of quality control issues when the only goal is to deliver one brand and one product that is good every single time," he says. "Sysco has thousands of customers and thousands of products on their warehouse floor that they have to pack into trucks and get to where they're going."

On the other hand, "an internal system is expensive to create and maintain so that it's functioning seamlessly and profitably," he adds. "When you outsource to a company such as Sysco, you know what you're getting because they've been doing it well for so long."

"When we were growing the company, we had as many as five food service distributors operating on five different platforms under the terms of five different distribution agreements," recalls Mike Manzo, the COO of Jersey Mike's.

"At the time, the major problem was simply having enough slots in the warehouses," he notes. "When developing new territories, there weren't enough store openings to support inventory needs, so handling special orders was challenging."

The solution was to have the Jersey Mike's supply chain management staff organize crossdocking and special freight orders to the forwarding warehouse. The franchisor paid the bill for the extra freight and the supplier assisted in less-than-truckload (LTL) pricing. The staff would then analyze commitments and oversee the franchisee's use of the ordered items.

AN APPETITE FOR CUSTOMER SERVICE

The switch to Sysco "was never about pricing because we value service and technology more than price," says Manzo. "Of course, we monitor cost, but we found that Sysco has a strong technology infrastructure and is in a position to handle our growth. Currently, 51 Sysco distribution centers in 44 states carry our products."

What about the 'terrible what ifs' that keep new franchisees up at night—a delivery truck breaks down, a natural disaster strikes, a supplier goes belly-up?

"We have detailed back-up plans with product at more than 50 of Sysco's distribution centers," says Manzo. "For example, when a hurricane hit South Carolina a few years ago, the Sysco distribution center in Atlanta was able to deliver the goods."

And, when Hurricane Sandy slammed

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into the U.S. East Coast in 2012, bread normally baked in New Jersey was produced in Chicago "and we didn't lose a single loaf or miss a delivery," he recalls.

A few years prior, Jersey Mike's pork supplier's facility burned down. "We didn't short our affected franchisees a strip of bacon or a pound of ham because we were able to source from suppliers across the country," Manzo notes.

MANAGING THE HOLE SUPPLY CHAIN

Another supply chain scenario is a membership cooperative like Duluth, Ga.-based National DCP (NDCP), which provides supply chain management services to Dunkin' Donuts franchisees.

With a distribution network that links seven domestic U.S. distribution centers and 32 hubs, the cooperative ships an average of 100 million pounds of coffee, 112 million pounds of sugar, and 24 million gallons of milk along with nearly 2,000 other food, beverage, supplies, packaging, and equipment SKUs to more than 8,000 stores across the country.

Between 2012 and 2016, NDCP was credited with improving business processes, launching best practices, and cross-functional collaboration that saved Dunkin' Donuts' franchisees more than $114 million. In 2014 alone, the company saw a 22-percent increase in its perfect order service metric.

Whichever supply chain operation is in place, "at the start, new franchisees don't always understand how critical a smooth running supply chain is to their operation," Manzo says.

Like the background music to a movie, it's sometimes easy to forget how important an efficiently functioning supply chain is—until it isn't there.

"Supply chain management happens behind the stage and works so well," Manzo says. "When Jersey Mike's convenes its national procurement council, which brings franchisees together to go into the details of how the supply chain works, you actually see their 'aah' because they hadn't realized all the details that go into supplying them with what they need when they need it."

Everything balances on giving customers what they rightfully expect in terms of price, consistent quality, and professional service. That can only be accomplished by making sure all franchisees in the network get what they need, where they need it, when they need it, at a price point they can live with. "Anything less is unacceptable," Manzo says.

While some new franchisees may not be totally aware of the value of an efficient supply chain, "some corporate managers don't appreciate what it takes to keep a distribution system running efficiently and economically...until something goes wrong," Manzo says. "People don't care about the supply chain until they hear, 'Sorry, we just ran out of turkey.'" ■

Dunkin' Donuts' franchisees are served by National DCP, a $2-billion supply chain management company that leverages its sourcing, purchasing, and distribution expertise to provide food, beverages, supplies, packaging, and technology solutions to more than 8,900 restaurants in 51 countries.

TOP 20 FRANCHISES

Here are the top franchises of 2016, according to *Entrepreneur*'s Franchise 500 list.

1. **Jimmy John's Gourmet**
2. **Sandwiches**
   sandwiches
3. **Hampton by Hilton**
   mid-price hotels
4. **Supercuts**
   hair salons
5. **Servpro**
   insurance/disaster restoration
6. **Subway**
   subs & salads
7. **McDonald's**
   burgers, chicken, beverages
8. **7-Eleven**
   convenience stores
9. **Dunkin' Donuts**
   coffee, doughnuts, baked goods
10. **Denny's**
    family restaurants
11. **Anytime Fitness**
    fitness centers
12. **Pizza Hut**
    pizza, pasta, wings
13. **Hardee's**
    burgers, chicken, biscuits
14. **Jack in the Box**
    burgers
15. **Ace Hardware**
    hardware & home improvement
16. **GNC**
    vitamins & nutrition products
17. **Sport Clips**
    men's sports-themed hair salon
18. **The UPS Store**
    postal & business services
19. **Taco Bell**
    Mexican food
20. **Papa Murphy's**
    take-and-bake pizza
21. **Aaron's**
    furniture leasing & sales

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Global Trade *Changes Course*

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6 global trade rule changes you should know before you move your next import/export shipment.

By Karen M. Kroll

As a supply chain professional, you're responsible for staying ahead of the continually increasing and expanding rules and regulations that govern materials and goods moving within and across borders. "Regulations are changing more rapidly," says Renee Roe, director with BPE Global, a San Francisco-based trade compliance consultancy. "New trade compliance regulations are issued daily. It's a challenge for importers and exporters to keep up with ever-changing regulations and figure out how they will impact their specific situation."

While the rules and regulations related to trade and supply chains can fill volumes, the following six are particularly important right now.

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Shipments can be detained by customs because of an improper Harmonized System (HS) classification. Supply chain professionals need to assess which products are affected by recent HS changes so shipments, such as the one pictured at the Port of Los Angeles/Long Beach, pass smoothly through customs.

1) Changes to the Harmonized System

The World Customs Organization (WCO) maintains the Harmonized Commodity Description and Coding System, an "international product nomenclature" more commonly known as the Harmonized System (HS). More than 200 countries base their tariffs, assess anti-dumping duties, and collect data through the system.

"HS codes play an important role in establishing rules for cross-border shipping and proper duties and taxes," says Jamin Dick, senior vice president, supply chain and logistics, global e-commerce, with technology company Pitney Bowes. Just about every product companies ship across borders is classified under the HS.

On Jan. 1, 2017, more than 230 sets of changes to the system went into effect; such amendments occur every five years. A variety of factors can prompt changes, says Kristine Bols, director of global content with Amber Road, a provider of global trade management solutions based in East Rutherford, N.J. For instance, in an effort to boost public safety, the revised HS will provide a more detailed breakout of malaria-fighting tools. Concerns about resource management have led to changes that make it easier to track tropical woods, Bols says.

Supply chain professionals need to ensure they update their systems and databases to account for the changes. An improper classification can mean tariffs are applied incorrectly, or that shipments are detained.

"Practical knowledge and expertise in interpreting the regulations are key."

– **Renee Roe,** Director, BPE Global

The job isn't as straightforward as it might appear. For starters, many countries tweak the standard WCO codes to gather additional data. Thus, each code can vary slightly from one country to the next. Some countries prepare concordance tables that show their previous tariff numbers and the corresponding changes, but not all do. Moreover, even once the WCO issues the changes, member states are not obligated to implement them, Bols notes. Most countries do, but some follow a different time frame.

The upshot? "There's no fully automated way to reclassify" a company's products, Bols says. Supply chain professionals need to assess which products are affected and how the changes will impact their journeys through customs. They'll need to identify the systems that require updating, and decide who will handle these responsibilities. Finally, companies should develop a response plan and escalation process in case a shipment is delayed due to a classification problem, she adds.

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2) Streamlined hazardous waste export and import regulations

Revisions to the Hazardous Waste Export-Import Regulations went into effect Dec. 31, 2016. "The final rule improves and consolidates previous regulations so that one set of requirements—the Organization for Economic Cooperation and Development's (OECD) more stringent controlling transboundary movements of hazardous waste requirements—applies to all U.S. hazardous waste exports and imports," according to an Environmental Protection Agency (EPA) statement.

"The primary change is that the rule consolidated requirements that were spread about in different legal statutes," says Peggy Otum, a partner with Arnold & Porter, a law firm focused on environmental law. "The intent is to modernize import and export requirements, and consolidate them so they're easy to find." Pertinent information will be electronically reported to EPA, and from there, can be electronically linked to U.S. Customs and Border Protection, as well as to the individual states and the general public, she adds.

Hazardous waste shipment rules have been streamlined into one set of requirements.

While some electronic reporting will be required when the rule becomes effective, the full range of electronic reporting won't be mandatory until the electronic reporting functions are built and beta tested, the EPA said. A separate compliance date will be announced at that point.

Another significant change is the requirement that companies track international hazardous waste shipments from start to finish, Otum says. This should reduce the likelihood the waste is abandoned or shipped to facilities that don't have the resources to handle it safely.

The greater transparency resulting from the new electronic reporting requirements will make it easier for government agencies to monitor companies' compliance. That means enforcement is apt to increase. "It's incumbent on companies to prepare to be in compliance," Otum says.

3) Guidance on voluntary self-disclosures

In October 2016, the Department of Justice (DOJ) issued a document entitled "Guidance regarding voluntary self-disclosures, cooperation and remediation in export control and sanctions investigations involving business organizations."

While the title is a mouthful, the document is an effort by the DOJ to find more effective ways for companies to self-disclose potential violations of export regulations and laws. "The business world is becoming one world, but law enforcement still has jurisdictions," say Baruch Weiss, a partner with Arnold & Porter, and former acting deputy general counsel with the Department of Homeland Security.

"The guidance gives a lot more specificity about how to apply the general principles of corporate self-disclosure," Weiss says. For instance, it lists examples of "aggravating circumstances" the department will consider when deciding where on the spectrum of possible prosecutorial actions a particular case might fall. He gives an example: Two companies both disclose violations of roughly the same dollar value, and both adopt stricter internal compliance programs. However, one company exported farm tractors, and another, chemicals that could be used as weapons.

"Common sense tells you they won't treat the cases alike," Weiss says. One may receive a lower penalty or a deferred prosecution (that is, the criminal charges can be dismissed, so long as the company fulfills certain obligations) while the other likely will be charged with a felony. In either case, however, companies almost always are treated better if they self-disclose, Weiss adds.

> "Senior management has to make it clear to employees that trade compliance is important."
>
> – **Melvin Schwechter,** Partner, Baker Hostetler

The guidance generally relates to violations of export control laws and sanctions, rather than imports, says Melvin Schwechter, partner and co-chair of the international trade compliance practice with Baker Hostetler. The U.S. Department of Commerce, the Office of Foreign Assets Control (OFAC), or the State Department administers most export control regulations, all of which have rules regarding voluntary self-disclosures. In the past, if these regulators believed a company's conduct was more than an administrative mistake and amounted to a criminal violation of the regulations, they would refer a self-disclosure to the Justice Department.

"Now, the Justice Department is getting into the game," Schwechter says. "In effect, they're telling companies, 'if you think you

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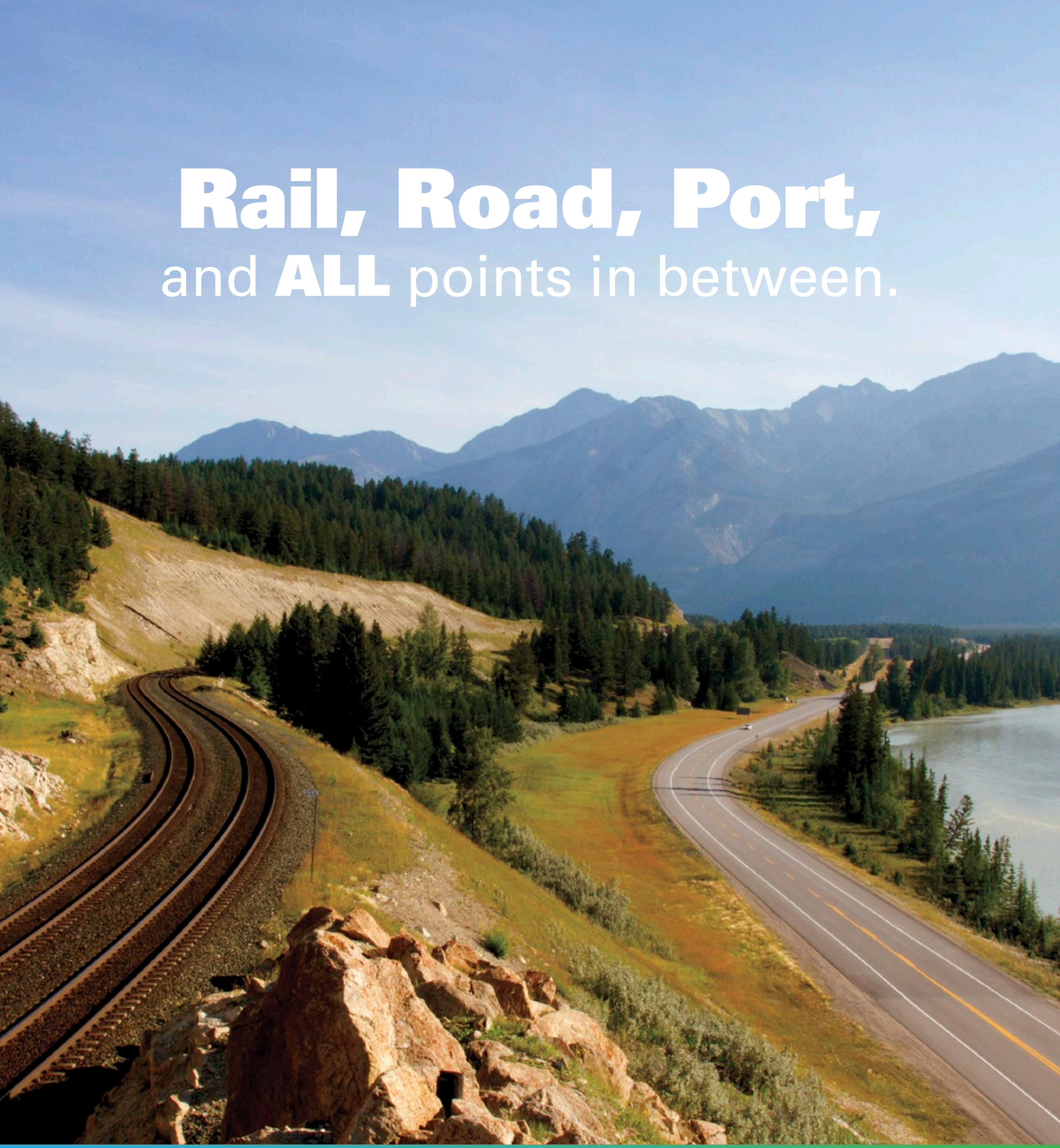

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have a willful, criminal violation, file a self-disclosure with us."

That leaves companies that uncover evidence of a violation of export regulations with several critical decisions: whether or not to disclose, and if they do disclose, to which agencies. "Disclosure to one agency doesn't constitute disclosure to all," Weiss notes.

"It's a pragmatic, practical decision," Weiss says. Management may decide any violation was inadvertent, and the company will tighten its control to ensure it doesn't happen again. Or, it may determine a whistleblower or competitor is apt to alert regulators to the violation, and if the company doesn't come forward, it will lose the benefits of voluntary disclosure.

Of course, the best course of action is to minimize the risk of violations by having implemented an effective export control and sanctions compliance program that's integrated throughout the company, Schwechter says. That reduces the risk the business units engage in questionable transactions the compliance department knows nothing about. "Senior management has to make it clear to employees that trade compliance is important to the company," he adds.

4) Changes to Cuba sanctions

With the passing of Fidel Castro in November 2016, and former President Obama's 2014 announcement of a change in the relationship between the United States and its island neighbor, it may seem like Cuba is open for business. Indeed, in October 2016, the Department of the Treasury's OFAC amended the Cuban Assets Control Regulations, which modified some trade-related authorizations, among other changes.

Many questions have yet to be answered, however. "What you see in the news is a little misleading," Roe notes. "Things are changing, but it always takes a while for regulations to reflect the actual impact of the announced intent to relax sanctions. Everyone is waiting to see where the political climate takes us in 2017." Despite the headlines, companies' ability to ship goods in and out of Cuba remains restricted.

While former president Obama took a number of executive actions that addressed various aspects of the embargo between the United States and Cuba, his ability to lift the sanctions were extraordinarily limited, Weiss says. Many sanctions involving Cuba originated through legislation, rather than regulation. "The President can't do away with them without going to Congress," he adds.

Still, shippers and supply chain professionals will want to pay attention to several changes. The re-import of goods previously exported to Cuba now is allowed in certain circumstances, says Robert Freeman, government relations principal with Cozen O'Connor. For instance, it may be possible to return the U.S. equipment previously exported to Cuba that now needs repairs that will be easier to handle stateside. In another change, certain contingent contracts—that is, contracts contingent on the embargo being lifted at some point down the road—also may be allowed.

The determination of which previously exported items will be allowed back into the United States, or which contingent contracts will be allowed, will come down to the details, Freeman says. "A general question of 'Can I negotiate a contingent contract to sell widgets in Cuba?' won't get an answer." Instead, OFAC will want to know where the widgets are made, how they'll be utilized, and if they'll travel through a third party, among other

Shipping goods in and out of Cuba from the United States remains restricted. However, in certain circumstances, companies can now re-import goods previously exported to Cuba.

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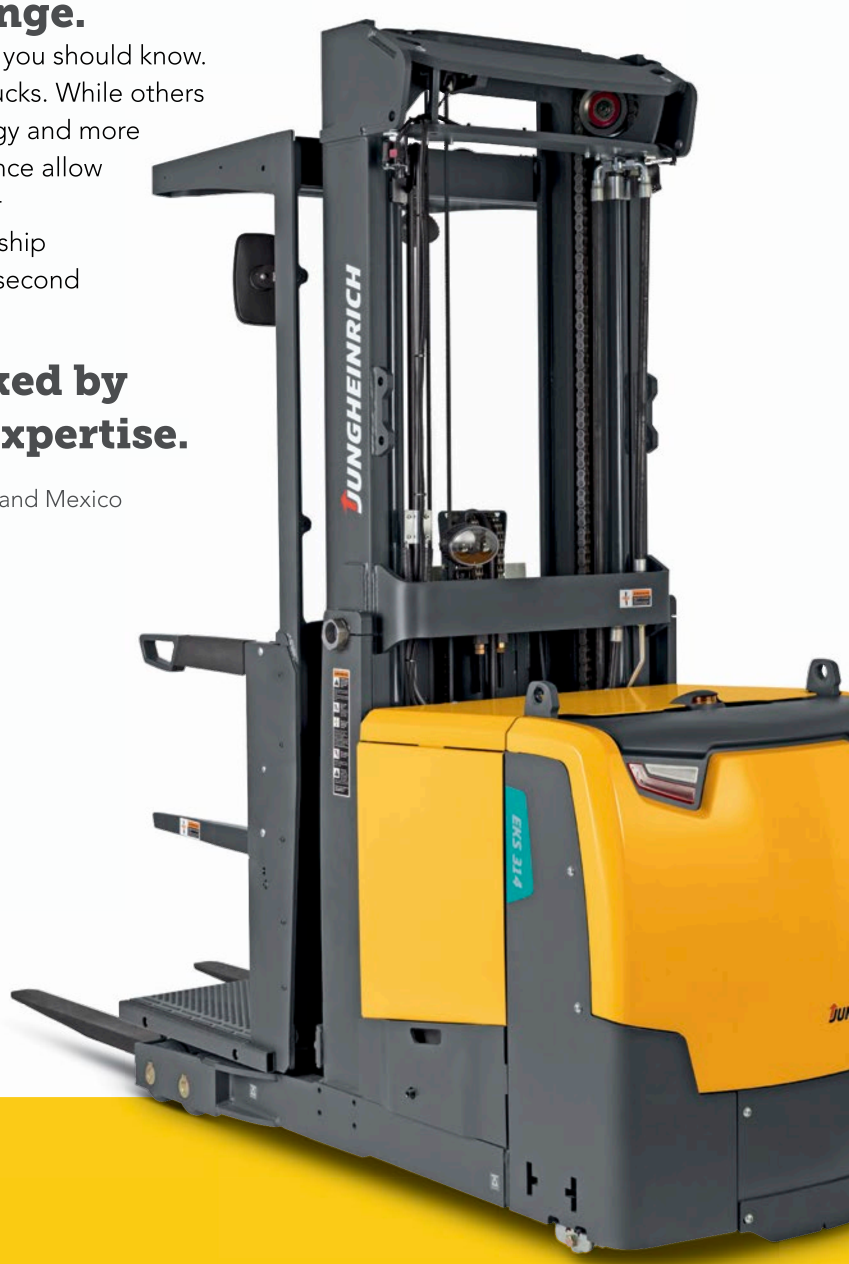

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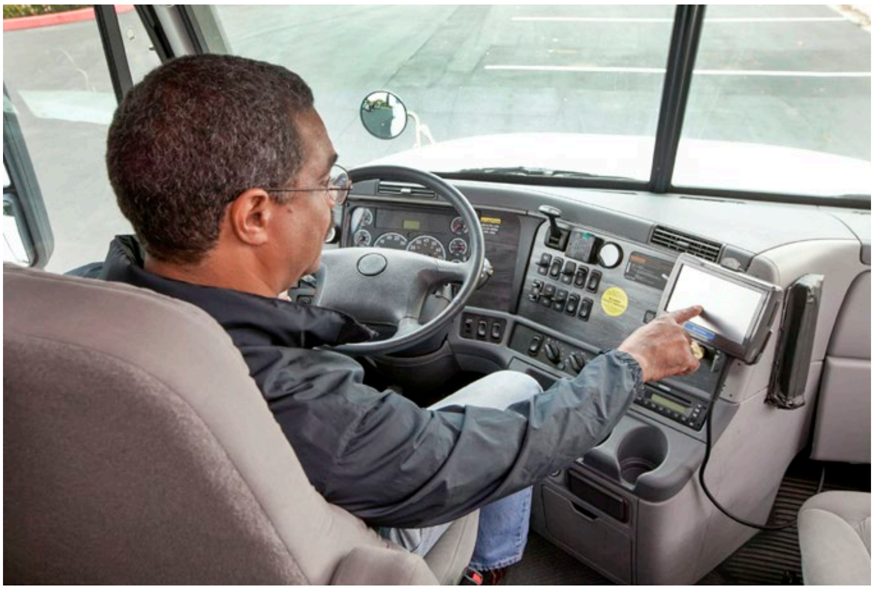


To help maintain records of duty, carriers will need to begin using electronic logging devices, or ELDs, starting in December 2017.

information. “It’s not go and do what you want,” he says.

Freeman advises businesses interested in doing business with Cuba to proceed carefully: “Engaging with regulators early and often is probably the best course of action.”

5) Electronic logging devices

Starting in December 2017, many carriers and truck drivers will need to begin using electronic logging devices, or ELDs. Carriers and drivers currently using paper logs or logging software must transition to ELDs no later than Dec. 18, 2017, while carriers and drivers who use automatic onboard recording devices (AOBRDs) have to either ensure these devices comply with the new rules, or shift to ELDs no later than Dec. 16, 2019. This stipulation applies to most drivers and carriers who are required to maintain records of duty status.

“Since hours-of-service regulations went into effect in the 1930s, the industry has been using pencil and paper to log hours,” says Sean McNally, spokesperson with the American Trucking Associations (ATA), whose members have indicated that shifting to electronic records boosts both safety and efficiency. “It will improve compliance with the hours-of-service rules,” he says. And moving to automated systems reduces the time drivers and carriers spend documenting compliance with regulations.

However, not all carriers are interested in making the switch. A very small percentage of drivers quit when their firms implement ELDs, says Bob Costello, chief economist with the ATA. While some have been able to find work with other firms that hadn’t yet implemented the devices, that option soon will evaporate. “What happens one year from now?” Costello asks. On top of that, a few smaller carrier firms may decide to close shop, rather than invest in ELDs. Even a drop of 1 or 2 percent in the number of available drivers will exacerbate the current shortage.

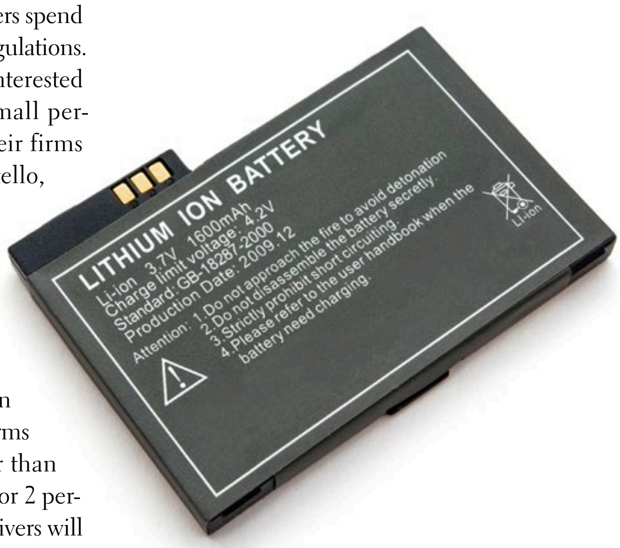
6) Lithium batteries regulations

The International Air Transport Association (IATA) changed its provisions for the transport of lithium batteries, effective in April 2016. Among other changes, it now requires that lithium ion cells and batteries be offered for transport at a state of charge (SoC) that doesn’t exceed 30 percent of their rated design capacity.

In addition, lithium batteries can’t be shipped as cargo on passenger aircraft. These changes impacted many shippers due to the inability to accurately track SoC as well as unclear enforcement of this regulation, Dick from Pitney Bowes says. Manufacturers are responsible for ensuring the batteries are at a state-of-charge of less than 30 percent, but few have communicated these details, he adds.

More changes are coming. FedEx Express, for instance, says it is imposing more stringent requirements on shipments of lithium batteries, including rules regarding their packaging and labeling. These became effective in January 2017.

Logistics professionals’ responsibilities today extend beyond moving products from Point A to Point B. “It now includes an expectation of reasonable care and knowledge of regulations,” Dick says.



Lithium ion batteries are now restricted from being transported as cargo on passenger aircraft.

Shippers need to either develop expertise internally, or engage outside experts. “While many of the agencies in more developed countries have a great deal of information online, that’s not the case everywhere,” Roe says. “Practical knowledge and expertise in interpreting the regulations are key to maintaining a compliant operation.” ■

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Expect the Best, Plan for the Worst & Prepare to Be Surprised

It's not *if* your supply chain will be disrupted, it's *when*. Risk assessment and advance planning will help minimize the impact on business.

By Sandra Beckwith

In late August 2016, Gap Inc. experienced the type of supply chain disruption that's hard to predict or prevent – a massive fire in its 990,000-square-foot Fishkill, N.Y., distribution center. The facility represents about 10 percent of the retailer's U.S. warehouse capacity. In its September sales report, Gap noted that the suspected arson "negatively impacted Gap Inc.'s September 2016 comparable sales by approximately 3 percentage points."

One year earlier, Costco was sued by a California woman for selling shrimp raised with feed—fish—collected by slave labor in Thailand's waters. She cited California's Transparency in Supply Chains Act of 2010, which is designed to fight slavery and human trafficking. It bars companies from making false claims about illegal conduct in their supply chains.

Costco had been alerted to the potential for slave labor one year earlier, and was investigating the situation, so the potential impact on its shrimp supply chain had already been triggered. But the negative impact on its reputational supply chain after the slave labor suit made national news? It has to be significant.

While fire is nearly always a risk at any storage facility, the possibility of slave labor involvement in a supply chain might seem remote to companies without global supply chains. Still, both show up in the supply chain disruption risk list in the *Supply Chain Resiliency Report 2016* recently released by The Business Continuity Institute (BCI). They rank 14th and 21st, respectively.

The BCI list, compiled from surveys of 526 people in 64 countries and 15 industries, includes the following top 10 supply chain disruption risks:

1. Unplanned IT or telecommunications outage
2. Loss of talent/skills
3. Cyber attack and data breach
4. Transport network disruption
5. Outsourcer failure
6. Adverse weather
7. Currency exchange rate volatility
8. New laws or regulations
9. Act of terrorism
10. Insolvency in the supply chain

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The report also details the economic impact of the disruptions. Of those surveyed, 70 percent experienced at least one supply chain disruption, while one-third reported cumulative losses of at least $1.2 million as a result. A single incident generated that loss level for 9 percent of respondents.

Getting Leadership Buy-in

How prepared are companies for that level of disruption? Not as prepared as you'd think, considering what's at stake. While nearly three-quarters report having business continuity arrangements in place for their supply chains, only about one-quarter say top management is committed to supply chain resilience. That's down from one-third in 2015.

That lack of leadership buy-in is a problem, says Nick Wildgoose, global supply chain product leader at Zurich Insurance Group, which provided financial support for the study.

"If you haven't got your C-suite on board with what you're doing, then it's very difficult for bottom-up initiatives to improve supply chain risk management," he says. "To make progress, you need resources. The only way to open up a sensible amount is to get senior management approval, and that's one of the biggest challenges."

Chicago consulting firm Crowe Horwath LLP is exploring the impact leadership risk has on supply chain issues. The firm takes clients through an exercise that explore risks by acknowledging that events in the supply chain are interrelated.

"If you mitigate leadership risk, does that significantly impact lead time risk? Maybe the company needs to allocate resources to leadership risk," says Mike Varney, a partner in the risk consulting practice.

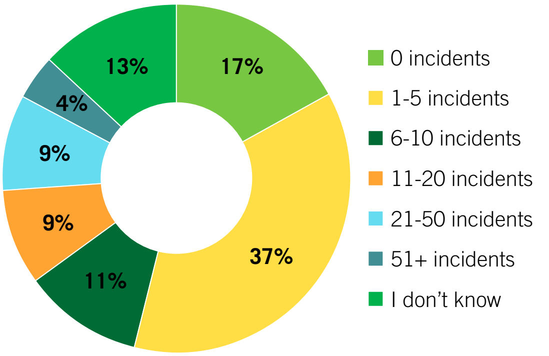
Wildgoose recommends identifying what's important in the supply chain—"critical nodes"—and studying the impact that node has on the most profitable product or service. What happens if there's a failure with that node?

"Calculate to the nearest $10 million, because the exposure is at that magnitude," he says. "The reaction we get from senior management when we do this is, 'What do we have to do to fix this?'"

He also recommends presenting case studies from the company's industry.

Supply Chain Disruption is Common

Supply chain disruption remains commonplace as 70% of organizations report at least one incident occurring in the previous 12 months. It is interesting to note that organizations reporting more than 20 incidents have significantly increased from 3% to 13%. This may be attributed to improved incident reporting or greater awareness within some organizations, which may cause recorded incidents to rise.



Source: BCI Supply Chain Resilience Report

There's a third option, too. "The most painful way to get support is to have a crisis that forces management to say, 'We have to do something about this,'" Wildgoose adds.

The BCI report also reveals that two-thirds of companies don't have full supply chain visibility, defined as firm-wide reporting of disruptions.

"There's clearly a gap in terms of awareness in managing their supply chain risks," says Patrick Alcantara, a senior research associate at BCI and the study's author. "When you know that 70 percent of the companies will experience supply chain disruption in the next 12 months, one of the best ways to be prepared is to have full supply chain visibility. Yet a similar percentage of organizations don't. It's like they're flying blind."

Risk at All Levels

According to the report, most disruptions—41 percent—occur with Tier 1 suppliers, but a growing proportion of incidents are occurring with Tier 2 and Tier 3 suppliers, as well. Those disruptions increased by 2 points to 31 percent in 2016. This reinforces the need to not only identify key suppliers, but to understand what's happening with them at all levels.

"Companies are asking how they can become more integrated from end to end in the supply chain so that their logistics are more visible and collaborative," says Yatish Desai, managing director and U.S. lead on distribution and logistics at KPMG LLP. He notes that they're sharing more information with third-party service providers and carriers, integrating them into business processes.

"This is where the innovation is taking place," he says.

As wise as that approach is, it isn't without risk, considering that hackers often break into a system through weaknesses in a supplier's connected network. Just one example from many in the headlines: The Target attack in 2013 that affected 70 million customers happened because hackers could take advantage of—"exploit"—a weakness in an HVAC vendor's network. Cyber attacks and data breaches rank third on BCI's list of risks, down from second the year before.

Protection from exploit attacks and other cyber risks is a priority at Yaskawa Motoman, an industrial robotics company, for exactly that reason.

"When you work with the government and auto manufacturers, security becomes a real focus," says Jeff Magnuson, IT architect at the Dayton, Ohio-based manufacturer.

Motoman uses Morphisec's *Advanced Threat Protection* solution to protect the company's IT systems from cyber risk and exploit software. Its protection is "the tiniest piece of software ever written in cyber security," says Omri Dotan, Morphisec's chief business officer, based in Israel.

Once installed, it continuously changes the system's memory in real time, creating new memories. Exploit software can't react quickly enough so when it attacks an "old" system memory, it's trapped.

Confusing the Hackers

"We change the predictability function so we're unpredictable, which confuses hackers," says Dotan. "When we move the target around, we leave behind a little decoy that looks like the original thing to make sure the attacker gets lured in. As soon as he opens that 'door,' we know he's a hacker because he shouldn't be there."

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Cyber Risks and Concerns

Respondents who say they worry a great deal or some about each cyber risk concerning their company, according to the *2016 Travelers Risk Index*.

	All businesses	Small businesses	Midsized businesses	Large businesses
Security breach: Someone hacking into computer system	**49%**	36%	56%	53%
Computers becoming damaged, going down	**48%**	45%	48%	51%
Someone gaining access to banking accounts or financial control systems	**46%**	42%	48%	48%
Employees putting information/systems at risk through unsafe computing practices or by using personal devices for business	**45%**	30%	48%	54%
Having the resources and know-how to recover from data-related breaches	**42%**	35%	53%	46%
Potential for theft or loss of control of customers or client records	**41%**	28%	45%	52%
Remote access or hacking into supervisory control systems or other business operational software systems	**40%**	27%	45%	49%
Shortage of skilled cyber security talent that can keep ahead of cyber threats	**36%**	24%	44%	49%
Using online cloud storage for data or information	**34%**	26%	39%	38%
Company being a victim of cyber extortion	**31%**	23%	31%	43%
Someone using email or other social engineering techniques to fool employees into transferring company funds erroneously	**31%**	19%	33%	44%

"We recently caught a few big ones," says Magnuson. "These exploits can pull information off the machine, and we're held liable for that confidential information. If anything's stolen from a customer or vendor, and people in the field find out about it, you may not be able to get the parts or supplies you need for your business anymore."

Weather Watch

Just as cyber threats make global headlines, so do natural disasters that include hurricanes, tornadoes, and earthquakes. In fact, half (51 percent) of businesses surveyed for the 2016 *Travelers Business Risk Index* believe that severe, damaging weather events have become more frequent in the United States.

One of the more recent was Hurricane Matthew in fall 2016. The impact was felt beyond businesses in the storm's path. The anticipated disruption in the Caribbean and southeastern United States also affected businesses elsewhere that depended on companies in the region for supplies and transportation.

Forklift manufacturer Hyster Company, itself affected at its Greenville, N.C., headquarters, knew that 32 of its Tier 1 suppliers were at risk, too. How? The company learned from its experience with the 2011 tsunami in Japan that it needed to be able to assess the risk to its supply chain more quickly.

The result is a software-based risk impact tool it created that lets the company identify Tier 1 suppliers by location, what products are connected to each supplier, and which customers buy products manufactured with parts from each of those suppliers.

"We build to order, so every truck that comes off the line has a unique customer purchase order attached to it," says Mark Champagne, director of supply chain for the Americas. "If the supply of a part is disrupted, I need to know which customer is affected."

Taking action on Hyster's tsunami lessons paid off during Hurricane Matthew, when the company was able to not only identify suppliers in the hurricane's path, but also contact them plus customers. And they did this while working remotely because much of the headquarter's region was flooded.

"Planners and procurement took their laptops home on Friday. When we couldn't get to work on Monday, we were on a conference call by 8:15 a.m., going through the list of suppliers that were probably affected," Champagne says. "Without this tool, we would have spent all of Monday and Tuesday just going through supplier databases and tracking down addresses."

On the other side of the country, Portland, Ore., operations and supply chain consultant Rick Pay has had to plan for supply chain disruptions caused by bad weather of a different kind—snow. When Pay, principal of The R. Pay Company, LLC, was vice president of operations at a technology manufacturer, the company bought a large quantity of parts from Los Angeles suppliers. Trucks carrying the parts were often delayed as much as one week when the highways were impassible because of mountain pass avalanches.

"We learned to bolster our parts inventory during the four months of avalanche season because one week can make a big difference in just-in-time systems," Pay says.

Risk Assessment is Key

These kinds of risks—whether they're related to cyber security, extreme weather, or dock strikes-can be identified and planned for in advance with a risk assessment that starts at the corporate level with business continuity planning and drills down to the supply chain specifically.

"Many companies tend to think of risk in terms of insurance, but there are many other mitigations for supply chain risk, so the perspective needs to be more holistic," Pay says.

Wildgoose at Zurich, which looks at 23 risk areas with clients, agrees. "Many

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Risk in the Transportation Sector

In terms of general risks, medical cost inflation, rising employee benefit costs, and legal liability (including the risk of the business being sued) are the top concerns for the transportation industry (71%, 62%, and 60% respectively), according to respondents to the *2016 Travelers Risk Index*.

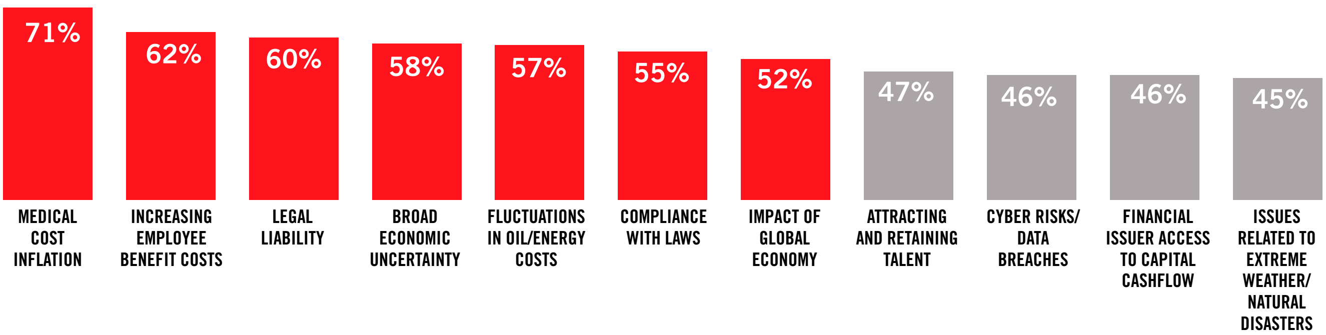
Other concerns specific to the transportation industry are:

- Rising workers compensation claim costs (52%)
- Company computers being damaged or going down (52%)
- Distracted driving as a cause of accidents (under employee safety risk) (52%)
- Ability to retain skilled/experienced employees in a competitive labor market (45%)

Emerging risks:
When asked about emerging trends, respondents list a changing workforce (52%) and the uncertain dynamics of the energy industry (51%) as main causes for concern.

Biggest General Risks in the Transportation Industry

Respondents to the *2016 Travelers Risk Index* worry a great deal or some about these threats to their business.



do financial due diligence on their logistics providers, especially after the Hanjin bankruptcy, and think that's risk management," he adds. "What about production, key ports, and suppliers' intellectual property situations?"

Ken Katz, property risk control director at Connecticut insurer The Travelers Companies Inc., helps companies reduce exposure to loss. That starts, he says, with a four-step planning process:

1. Risk assessment
2. Business impact analysis
3. Prevention mitigation and recovery
4. Implementing, testing, and improving the plan

"The goal is to identify what can be done better before it's necessary," Katz says.

"One of the best ways to plan for supply chain risk is through scenarios," adds Varney at Crowe Horwath. "It's the 'what if' approach. If you've got stronger supplier transparency as part of scenario planning, your preparedness is even stronger."

Incorporating suppliers in scenario planning also helps organizations anticipate and address supplier weaknesses they might not otherwise uncover, according to Brad Steger, senior vice president for supply chain management and vertical solutions at Atlanta software company Aptean.

"If you know you're going to ask a supplier for another 20 percent of inventory in a certain situation, and the vendor reassures you that it keeps 40 percent extra in inventory, what happens if another company needs an additional 20 percent, too?" he asks.

Addressing Common Risks

Risk assessment is only part of the planning, though. Companies need solutions for the supply chain disruption risks they identify. In addition to those already discussed, here are other ways organizations address common risks.

■ **Diversify suppliers geographically so one region doesn't dominate the supply chain.** When asked to choose supply chain risks with the greatest disruptive potential, the top choice—32 percent—for businesses of all sizes responding to the Travelers risk survey was the ability to get materials from suppliers.

Most of Pennsylvania-based Apprise Software Inc.'s customers import from China, where there are political risks to trade, so CEO Jeff Broadhurst encourages clients to diversify their supply sources as much as possible.

"If they can get some of their supplies from South America, they can mitigate multiple risks," he says, referring to natural or political disasters as well as dock strikes.

"The only thing that has shut down our business in the past decade is dock strikes in Los Angeles," Broadhurst adds.

■ **Keep your supply chain short.** The less transportation that's involved, the less risky it is, advises Pay. Ideally, he says, suppliers, designers, and production teams will be in neighboring time zones, too.

"When people can talk to each other because it's not morning for one and evening for the other, you shorten the communications supply chain as well," Pay says.

■ **Use dual sourcing.** Pay also encourages what he calls "dual-sourcing the technology and single-sourcing the part."

In other words, find more than one supplier for several related parts, and buy a single part from all of them, even though one might be able to provide all the parts needed. When one has a problem that interrupts the supply chain, order the part that's affected from another vendor the company is buying something else from already.

Hyster does this, dual-sourcing any large components it buys overseas.

■ **Advocate for supply chain transparency.** This is at the core of the Costco shrimp slavery issue.

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"Transparency can be a big problem and given the current environment, organizations are working to drive that intimacy across the supply chain," says Varney. "It's important to identify how you work with and engage with suppliers, as well as knowing what you can do to understand where potential issues can arise."

Start by prioritizing suppliers, Wildgoose advises. "You might have 10,000 suppliers, but you probably need to understand only the top 100," he says.

■ **Look to the cloud.** Cloud computing adds a level of risk mitigation to information and operations, says Broadhurst. He recommends working with a cloud specialist.

"If you're hosted on Amazon or Microsoft, you're working with a company that invests significantly to make sure your data is secure and that the infrastructure is constantly upgraded," he says.

Connecting with the cloud also makes it possible for businesses to continue when they are literally underwater, as Hyster was during Hurricane Matthew. Cloud computing allowed headquarters employees to work from home when the region was flooded.

■ **Eliminate functional silos.** Make sure that purchasing and logistics groups understand risk management and work with the risk management team to prevent problems and identify solutions before they're needed.

Wildgoose cites an example at one organization where the new chief financial officer extended supplier payments to 60 days. Less than two weeks later, a key supplier went out of business because the new policy created cash flow problems.

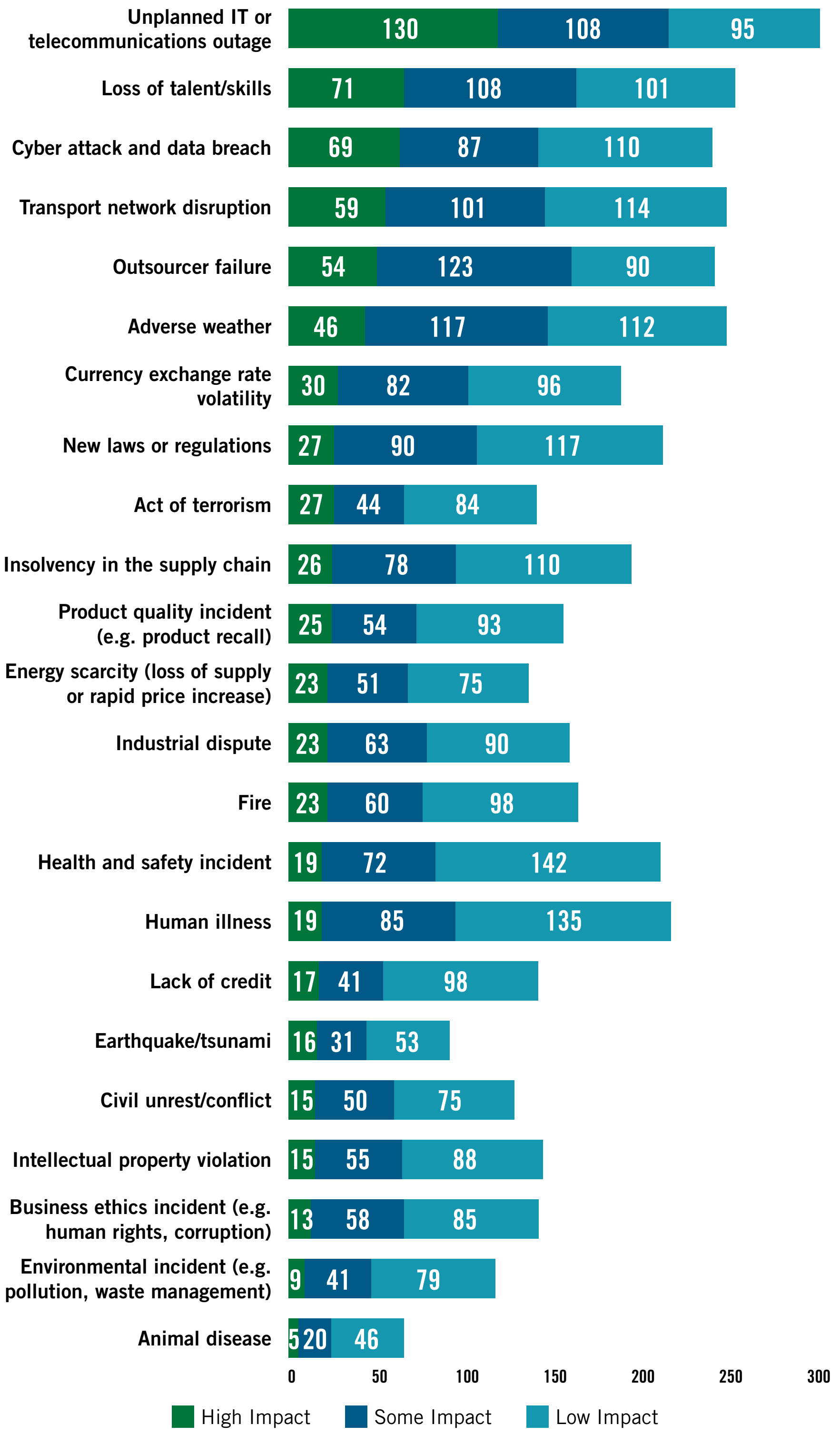
"They weren't thinking through the whole supply chain and talking to different teams," he says.

No matter what type of risk is keeping managers awake at night, vigilance is important. "You need to constantly evaluate and refresh your current knowledge of your supply chain," says Steger. "Your ability to react to these major events as they occur makes a big difference.

"If you can't serve a customer, somebody else can, and they will take that business and loyalty away from you quickly in today's world." ■

Causes of Supply Chain Disruption

In its report, BCI consistently tracks the impact of various disruptions to an organization's supply chains. Unplanned IT and telecommunications outages remain the top cause of supply chain disruption for the fifth consecutive year. The loss of talent and skills jumps three places from fifth in 2015 to second in 2016. Cyber attacks and data breach, meanwhile, drop one place from second in 2015 to third this year. Nonetheless, the percentage of respondents who say that cyber attacks and data breach had a "high impact" on their supply chains increased from 14% to 17%.



Note: responses to this question were voluntary, which explains the variance in the results.

Source: BCI Supply Chain Resilience Report

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SUPPLY CHAIN MANAGEMENT STUDENTS:

SCHOOL OF THOUGHT

Idealistic and pragmatic, today's college students find opportunities in supply chain management.

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By Tamara Chapman

Fortunately for the nation's logistics operations, today's logistics management students see the supply chain as a center of opportunity — for themselves, for their future employers, and especially for making the world a better place.

Their idealism has been duly noted by the college professors who teach them. "Students want to be 'sustainable people,'" says Gerard Burke, professor and chair of the Department of Logistics & Supply Chain Management at Georgia Southern University. In other words, they want to give as well as take.

They also want to learn by doing and to be challenged along the way. They want to use their life experiences — and not just their classroom learning — in their future careers. Just as important, they want to be great at their jobs.

IDEALISTIC AND READY TO CHANGE THE WORLD

Whether they're majoring in art history or supply chain management, students today subscribe to a roll-up-your-sleeves idealism, so much so that demographic experts have deemed their generation "the pragmatic idealists." They're "industrious, idealistic and in control," as thenextweb.com notes.

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Take Devan Dunneback, a December 2016 graduate of the top-ranked supply chain management program at Michigan State University and the 2016 recipient of the *Inbound Logistics*-APICS scholarship.

Armed with well-defined career goals and insights honed by classroom experiences, Dunneback collected his diploma one day and went back to work before his newly minted degree had time to collect dust. Thanks to an 18-month internship that turned into full-time employment, he has a job he loves in logistics and transportation at Nestle Purina PetCare. It's the first stop on a career he has already plotted.

"It seems I am on the path to reaching my goals, but my goals are not as shallow as getting a degree and getting a job. I'm looking for a job that makes a real difference in our world," he wrote in the essay accompanying his scholarship application.

WORKERS' ADVOCATE

The son of a General Motors machine repairman, Dunneback has scaled his ambitions to nosebleed heights. He wants to direct the supply chain for a major global company. In this role, he'll not only be able to stretch, he'll also be able to encourage socially responsible purchasing decisions. By doing so, he says, he'll help ensure productivity and profitability for his employer while doing some good for the folks working the assembly lines.

In U.S. factories, "there are a lot of measures in place to keep people safe. That's not a global phenomenon," Dunneback explains, noting that workers in too many out-of-the-way manufacturing centers routinely face alarming jobsite conditions.

"You should not have to go to work wondering if you are going to come back with all of your limbs," he adds. "I would like to get to the point where I can help make a safer world."

Meanwhile, at Brigham Young University in Utah, pragmatist and idealist Josh Wright has his sights fixed on a career that will allow him to harness the power of the supply chain on behalf of underdeveloped regions.

A sophomore pursuing studies in global supply chain management, he discovered the wonders of an efficient supply chain while just a teenager. Accompanying his parents to the Marshall Islands, where his father, a builder, was helping construct a house for someone in need, he saw first-hand how a flimsy supply chain can impede economic progress.

Armed with a supply chain management degree from Michigan State University, ***Devan Dunneback***'s goals include directing the supply chain for a major global company, and encouraging socially responsible purchasing decisions.

"With the building process, I realized something was up," he says. When, for example, their ersatz construction team needed additional lumber, a trip to the hardware store often proved futile.

"Store personnel would say, 'If the slow boat comes in this week, we'll have materials for you,'" Wright says. Should the boat fail to materialize on time, or within a reasonable window, prices would spike and progress would halt.

Disturbed by this reality, Wright started wondering what could be done to make the situation better. "That's how the supply chain found me," he says.

SEEKING CHALLENGES AND HARNESSING LIFE EXPERIENCES

Gregory Dutson, a military veteran and a senior at the University of Alaska at Anchorage (UAA), chose his double major in marketing and global logistics and supply chain management for multiple reasons.

"My first reason is that I wanted a business degree that had some differentiation and was 'forward facing' with more perceived opportunity than traditional fields such as accounting," he explains. "I wanted to enter a career field that hasn't necessarily been around for ages, so that I could

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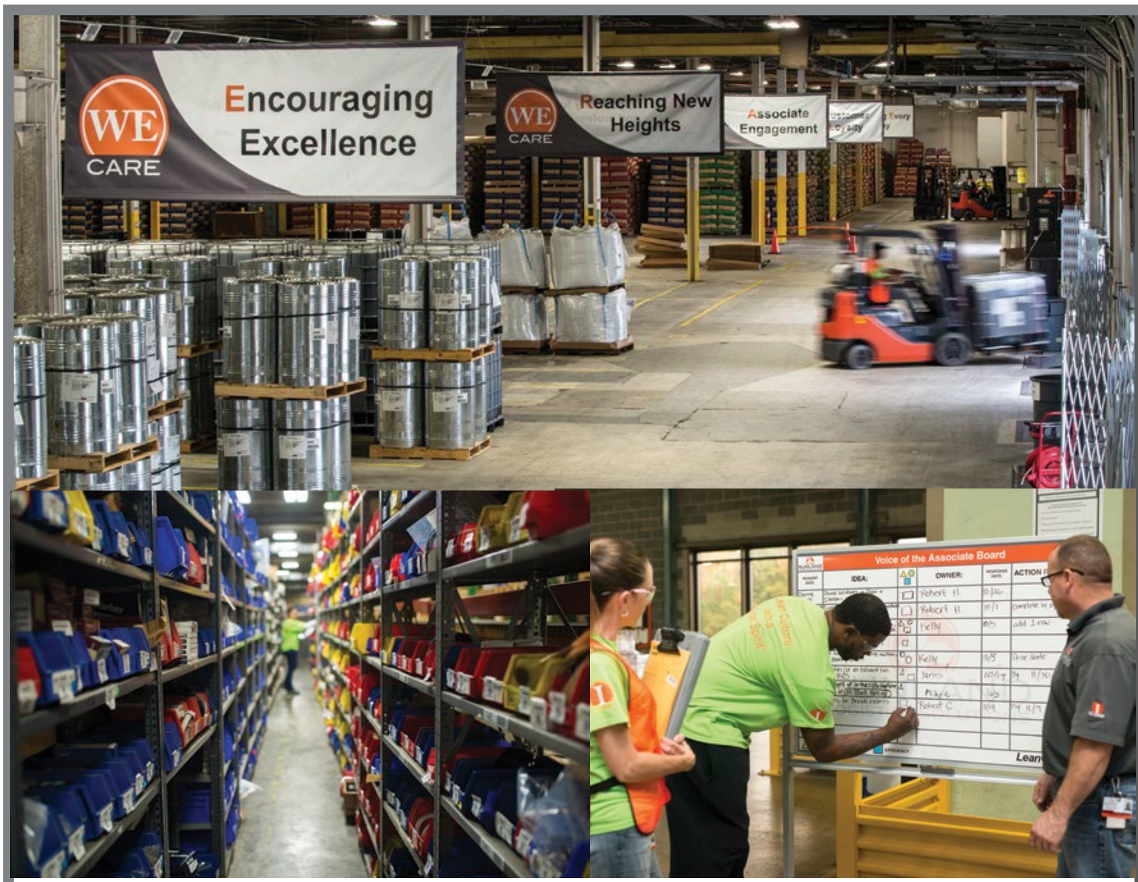

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"The second reason is that I love to travel, so learning more about transportation seemed interesting," Dutson says. "What better way to travel than with an airline or a marine shipping business you work for after learning about global logistics?

"The third reason is that I am a veteran, so logistics has a different connotation to me than to a lot of people," he notes. "Logistics was coined by the military to some extent, so it doesn't just mean 'making the pieces fit together for a birthday party,' like it seems to mean to many of my friends."

Dutson finds that his professors and the UAA curriculum have shone the spotlight on the growing significance of logistics and supply chain management in an increasingly global economy. He knows that joining the profession means he'll need to juggle, prioritize, and multitask—skills that don't come out of a textbook but can be cultivated through opportunities to work in teams, applying formulas and principles to real-life challenges while solving business problems on the fly.

"My education has set me up to be able to manage multiple tasks because of the different classes that require group projects," Dutson says. "Throughout the semester, I might have four or more group projects going on at once.

"At one point I had a transportation management project, a statistics project, a consumer behavior project, negotiations to prepare for, and an international marketing presentation all due at the same time," he says. "One professor also assigns projects where we have to present our understanding of a topic to the rest of the class.

"It's difficult at first to see how to effectively convey your understanding of large swaths of data like that, but that's why we go through these courses," Dutson notes.

DEADLINES AND DETAILS

Like Dutson, Taylor Cotter, a 2015 graduate of Pennsylvania's Bucknell University, finds value in courses and professors focused on imparting the skills and values employers demand. He uses these routinely in his job with an international construction company.

"Time management, a strong work ethic, and attention to detail are skills that my courses taught me," Cotter says. "Working on a deadline while handling complex data is certainly a challenge, and paying close attention to detail makes that challenge even tougher.

"Managing logistics is critical, and learning in my global supply chain management course about how to handle the details has translated to the real world, where I find myself working with individuals all over the world daily."

Bhavin Jindal, a student at Claremont McKenna College in California, plans to use his supply chain education to help foster growth in developing areas around the world.

Still other students—some of whom plan to use their logistics degrees in non-traditional ways—appreciate the big-picture thinking fostered not just by global logistics curricula but also by electives in other subjects. Put these different disciplines together, and you have the foundation for public and economic policies that help industries—and individuals—everywhere.

That's certainly on the mind of Bhavin Jindal, a student at Claremont McKenna College in California. He hopes to use his logistics education—as well as his extensive coursework in political science and economics—at an international organization such as the World Bank, the United Nations Development Programme, or even a consulting firm that works across all the time zones. He's not so much interested in running a supply chain as in fostering growth in developing areas.

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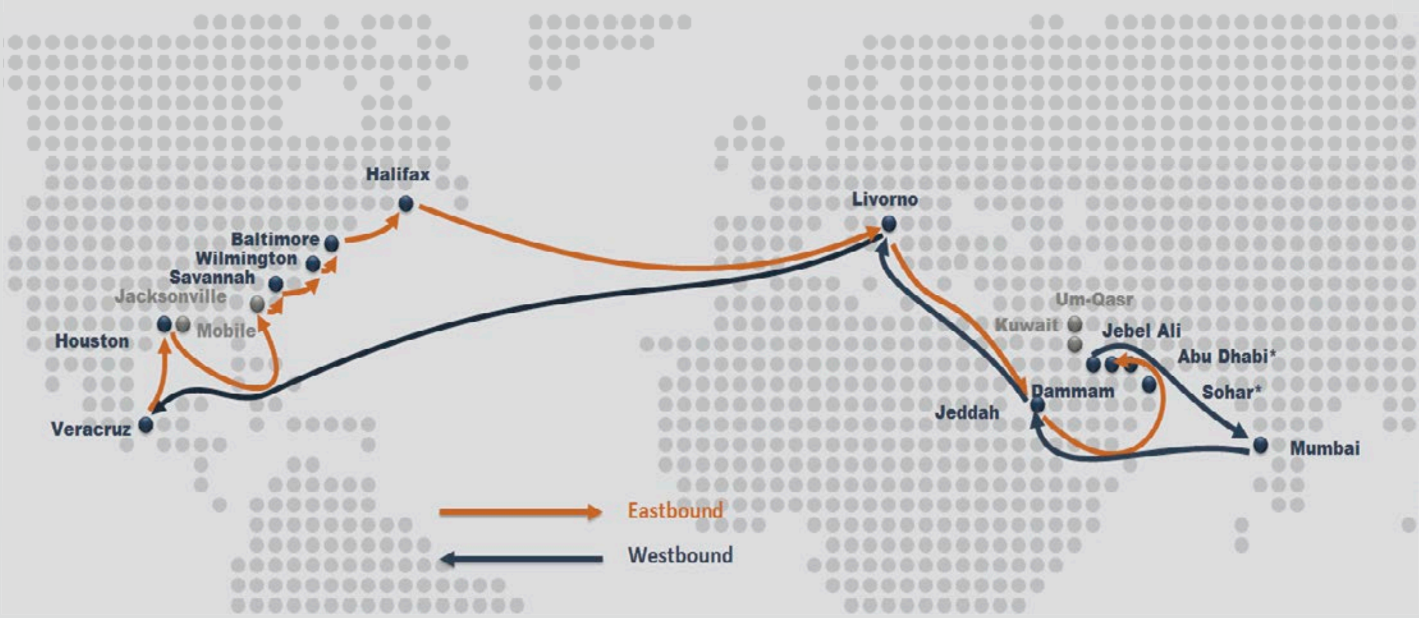

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"I look forward to contributing innovative ideas to modernize communities, optimizing existing infrastructure, and tackling specific challenges that inhibit economic and social growth in developing countries," Jindal wrote in his application essay for the *Inbound Logistics*-APICS scholarship.

"I chose a career in logistics and supply chain because I live in the 21st century," he wrote. "In the age of globalization, every aspect of our lives relies on the movement of information, ideas, products, and services. When more people are connected there is faster progress."

In his essay, Jindal highlighted the role logistics capabilities play in economic development. The supply chain, he explained, "is often overlooked in the process of developing local, national, and regional infrastructure. Many times, students and policy makers focus on the most obvious aspects of development, such as introducing technologies, reducing corruption, and establishing small businesses in communities. While these endeavors are worthy, there is too much emphasis on them compared to the results that they produce."

Jindal is itching to put his cross-disciplinary expertise to work helping revive post-conflict zones in Southeast Asia: "It is up to knowledgeable supply chain analysts to determine the relevant stakeholders and strategize where new infrastructure should be built," he said. "The thought of helping make these decisions is exciting."

***Brianne Nealon**, a junior at Rutgers University, switched her major from finance to supply chain management, attracted by the never-ending challenges and ever-changing demands.*

Brianne Nealon, a junior at Rutgers University, enrolled at the New Jersey school intending to study finance. But an introductory course in supply chain management convinced her the logistics field could satisfy her appetite for problem solving and her thirst for stimulation.

What grabbed her attention? The professor's dynamic presentation of all the moving parts that make up a supply chain.

"I love multitasking. I don't want to stay in one field; I want to move around," she says, adding that she has been romanced by the supply chain's promise of never-ending challenges and ever-changing demands. "It's about figuring out what works."

SOFT SKILLS, HARD BENEFITS

Nealon has also come to learn just how important soft skills are to successful supply chain management—skills, she says, that she possesses in abundance. They include communication, developing relationships, and listening.

As she builds her resume, enhanced by a summer 2015 internship at *Inbound Logistics*, Nealon thinks a lot about the reservoir of outside-the-classroom lessons she has to draw upon. A volunteer gig at a soccer tournament taught her to think on her feet when a referee failed to turn up for a match. Day-to-day life with six siblings prepped her for fierce negotiations. And as a member of a Rutgers club soccer team, she has learned a lot about leadership, about stepping up to opportunities, and about backing up the rest of the squad.

BYU's Wright also has found career-enhancing opportunities outside the classroom, opportunities he finds almost as valuable as assigned readings and projects. BYU students often participate in clubs aligned with academic majors. These, in turn, sponsor programming—case competitions, for example—that allow students to come together to address a real or hypothetical supply chain challenge.

Still another valuable experience came outside the business program, when Wright signed up for an extracurricular homecoming effort to assemble alumni on a mountainside for a traditional lighting of a giant Y affixed to the slope.

"It was a logistics issue with a lot of different moving parts," he recalls. With the university's reasonable but not extravagant budget, he and his peers organized a convoy of vans to shuttle participants to and from the site. It was their job to anticipate demand and supply accordingly—an experience that tested his ability to plan ahead, analyze options, and execute efficiently.

For Dunneback, his MSU classrooms have provided the backdrop for a number of gratifying "aha" moments.

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Before transferring to MSU, he was a debt-averse student at a community college, working nearly full time at Grand Rapids-based Pridgeon & Clay, a metal stamping and manufacturing company that supplies the automotive industry.

That experience confirmed a fascination with manufacturing first stoked by a factory tour he took as a schoolkid. Years later, while working 12-hour shifts at Pridgeon & Clay, "I would see the raw materials coming in," he says, and then, at the other end of the assembly line, see how "coordination with third-party logistics (3PL) providers got the product to its destination."

This seemed like seamless perfection to Dunneback, but it took lessons from a professor to help him realize just how critical optimized processes are to business success.

He took that awareness to his internship, where he was immersed in data analysis and the pursuit of continuous improvement. In the interests of continuous improvement, he filmed a number of manufacturing processes and assembled a team to study the results. The group watched the films repeatedly, "trying to save 20 seconds, five minutes, 10 minutes on a machine changeover," he says. "When the production line is not running, we are not making money."

SHARED SUCCESS

If it was satisfying to take classroom insights into the workplace, it was just as rewarding to bring workplace triumphs back to the classroom, to dissect them with other students and analyze them for larger truths. Best of all, Dunneback says, the other students—many with internships underway or recently completed—could add similar stories of their own.

"I sat next to classmates doing internships at Boeing or Cardinal Health," Dunneback says. "They shared their insight, so I was learning alongside some great minds."

Dutson also appreciates the opportunity to learn from great minds and old hands. With that kind of knowledge transfer in mind, UAA makes a point of organizing company tours and hosting presentations by industry experts, who not only demonstrate how basic principles play out when put to the test, but also introduce students to industry-specific priorities and terminology. "They come in with their own personal lingo, which is helpful," Dutson says.

Along with face-to-face meetings with industry pros, daily challenges in a workplace setting serve to make classroom concepts real. What's more, they demonstrate the role of creative problem solving.

That's especially true when it comes to learning how to use data to make business decisions. For example, in his MSU classes, Dunneback learned all about the importance of reliable numbers. But now that he's in an office running data, he's learning how to employ it strategically.

"I'm basically a data analyst right now, and I report to a supply chain manager," he says. "I'm learning how to turn numbers into insights and make recommendations and action items from them."

Josh Wright, sophomore at Brigham Young University, has his sights fixed on a career that will allow him to harness the power of the supply chain on behalf of underdeveloped regions.

THINKING OUT OF AND ALL AROUND THE BOX

Dutson, for his part, appreciates how his professors have emphasized all the factors that support problem solving.

"The UAA program takes a distinctly managerial approach to supply chain management and logistics with an economics flair," he says. "One professor continually appeals to us to think of issues in, out of, and all around the box, rather than getting fixated on single issues."

In addition, Dutson explains, "our exams are graded for understanding of content along with showing an ability to problem solve. We aren't being trained to just analyze supply chains or search through data. We are being trained to manage the complexities of entire operations and to rely on the people that we will be managing to know their jobs." ■

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The Back & Forth of REVERSE LOGISTICS

by Karen M. Kroll

Companies that have reverse logistics processes and systems in place to capture all the value possible can beat competitors coming and going.

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Consumers return some $260 billion of goods each year, or about 8 percent of the purchases they make in brick-and-mortar stores, reports the National Retail Federation. While figures for online purchase returns are harder to pin down, estimates run as high as 30 percent. That would add about $102 billion to the 2015 returns figure, based on U.S. Census e-commerce sales data.

These numbers illustrate why companies need processes and systems that capture all the value possible from the goods reverting to them. Supply chain managers who can leverage their reverse supply chains gain an edge over competitors. "Reverse logistics is becoming one of the most important factors to differentiate a company," says James Stock, professor of marketing, University of South Florida.

After all, consumers have grown increasingly comfortable returning goods, especially in e-commerce transactions. It's not unusual for customers to buy several similar products, perhaps in different sizes or colors, with the intent of returning a portion of the purchase. Many online shoppers check the company's return policies before even initiating a purchase, notes Paul Steiner, vice president of strategic analysis with consulting firm Spend Management Experts, based in Atlanta.

Not only do online retailers tend to have higher return rates, but they often carry more SKUs, from more vendors, than their brick-and-mortar counterparts. The result? "Returns are much more complicated than forward logistics," says Jerry Davis, managing director with the Reverse Logistics and Sustainability Council, a trade association.

Overstock.com, for instance, features more than 1 million products on its website. "Our network consists of thousands of drop-ship suppliers that range from mom-and-pop businesses to large corporations," says Carroll Morale, vice president of logistics and transportation for the online retailer.

The growing number of voluntary and mandatory product recalls also is boosting interest in reverse logistics, says Bob Iaria, general manager of reverse logistics with Eden Prairie, Minn.-based C.H. Robinson, a third-party logistics provider. The U.S. Department of Agriculture lists 150 recalls in 2015, compared to 70 in 2010, and 53 in 2005.

While some companies consider the reverse logistics function a necessary evil, those with well-managed programs can boost both their top and bottom lines. They find ways to resell more returned

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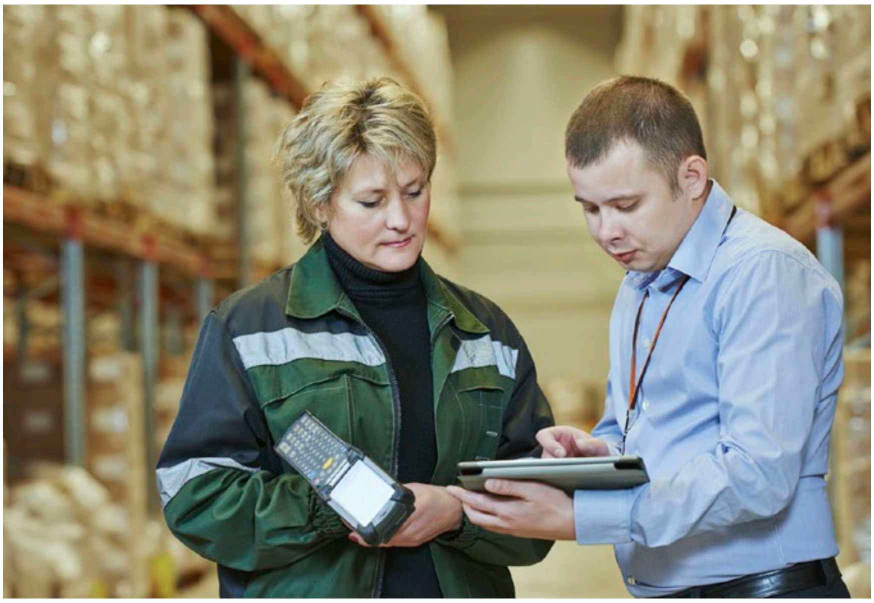

Photo Courtesy of IFS

Some companies manage returns through software that automates the end-to-end reverse logistics cycle, to help improve the customer experience and reduce costs.

products, and are able to dispose of those they can't resell more efficiently and with less harm to the environment. "It's a profit play," says John Benardino, vice president of supply chain operations with media and technology company Comcast.

Davis provides the example of a national retailer whose annual landfill bill totaled tens of millions of dollars. By implementing a reverse logistics program, the retailer slashed the landfill expense and sold the goods for approximately 40 percent of their retail value. "The profit was substantial," Davis adds.

A reverse logistics program that gathers data on the reasons for returns can help companies learn more about their products. The insight gained can inform future product development.

At Overstock.com, more effective analytic tools and better communication with the company's brand partners allow for more quickly improving a product's performance. "Previously, a quality issue may have led to the product's removal from the site," Morale says. "Now, we often reach resolution without losing sales."

Handling returned or excess merchandise in a way that helps the community and environment also can help companies maintain brand integrity. The nonprofit National Association for the Exchange of Industrial Resources (NAEIR) solicits donations of excess or returned office, maintenance, and industrial supplies, among other goods. It funnels these to qualified churches, nursing homes, and other qualifying groups. The suppliers gain a deduction for their contributions, avoid the costs associated with storing these goods, and don't have to worry the products will show up on eBay, says Gary Smith, NAEIR's president and chief executive officer.

These trends are converging to focus more attention on reverse logistics. "For years, companies did not place a lot of emphasis on reverse logistics," says Norman Brouillette, vice president and general manager of technology and healthcare with Miami-based 3PL Ryder System Inc. "Returns used to happen in a distribution center's back room. Now, they are a focal point."

Gary Smith, president and CEO of NAEIR tours the reverse logistics warehouse.

Challenges in Reverse

While reverse logistics enjoys a higher profile, it has also become more challenging. Leading companies want their return process to be customer friendly, but they don't want it so easy that people abuse it. "There's a subtleness required to identify the right balance," Benardino says.

The variety of products consumers return creates complexity. Overstock.com "learned early on how returning a sectional sofa, a 70-inch flat screen TV, or a hot tub is a much different experience than returning a book or a sweater," Morales says.

Returns of soft goods typically require a point-of-sale credit to a customer, and the ability to check the item back into inventory and possibly route it to a warehouse or distribution center, says Tom DeVroy, product evangelist, service management with IFS, an enterprise software provider. Some companies also need processes that support the resale of these items to a downstream channel.

"With hard goods, the challenges grow more complex," DeVroy says. The company may need to route and track the product itself, as well as any repairs or testing, and its shipment back to the consumer. It also may need to calculate and maintain optimal repair stock levels, ensure it meets any service agreements regarding turnaround time, and keep the customer informed of the item's status. Some product returns, including electronics and pharmaceuticals, need to comply with specific government regulations.

Consider a consumer's cable box. About 60 percent of the time, the box a consumer receives from the cable company has been used before. "We do our best to reuse it two or three times," Benardino says.

To initiate the return process, a customer can drop off a cable box at a UPS or Comcast store, or can have a technician pick it up. Once a box reaches the

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To make room for new products, many companies donate excess merchandise to NAEIR. They receive a tax deduction and NAEIR donates the items to schools, churches, and non-profits for free.

collection point, employees separate those that are reusable from those that aren't. Boxes that can't be reused are broken down to capture the value of the materials.

The boxes that can be reused are tested against factory standards. The information they contain, such as customers' TV preferences, is cleaned and refreshed. The box is brought up to the current factory standard, and any stickers or labeling are removed. The goal is get the boxes to look and perform like new, Benardino says.

Dealing With the Unknown

Across all types of returns, the inherent unknown creates challenges. "Returns come back hodgepodge," Benardino says. A returns processing center rarely knows what goods are coming back, what shape they'll be in, or how they'll be packaged. This makes it difficult to automate the process.

Royal Philips, the company behind Sonicare toothbrushes, Norelco shavers and other products, receives returns from its retail partners in a number of ways. Some retailers consolidate returns in a distribution center, while others send multiple shipments from each store.

"There's not one way of working," says Julie Brown, reverse supply chain manager for Royal Philips. "We have to accommodate the differences."

Also in contrast to forward logistics, reverse supply chain professionals typically have to decide between a variety of resale or disposal options for returned items. "Do we put it back on the shelf? Remanufacture it? Sell it for scrap? What if the customer returned a product they weren't supposed to?" says Steve Ludvigson, co-founder and president of Cerasis, a provider of transportation management solutions based in Eagan, Minn.

When an item purchased online is returned to a store, but typically not sold in the store, the retailer must weigh several additional options, says Ryan Kelly, vice president strategy and communications with FedEx Supply Chain, a Pittsburgh-based provider of supply chain solutions. The company can sell the product in the store as a one-off, perhaps at a lower price, or can return it to the fulfillment center. That increases handling costs, but also makes it more likely the item will be sold at full retail price.

On the positive side, customers who return online purchases to brick-and-mortar locations look for other items, potentially generating more sales, Kelly says. And the retailer can quickly place the returned product back in stock, again helping to drive additional sales.

Best Practices

Given the range of ways in which returned items can be handled, employees working on returns need to be skilled, says Paul Steiner, vice president of strategic analysis with Spend Management Experts. They should be able to determine why a product was returned and decide how best to handle it.

Of course, not all employees are hired with a background in reverse logistics. Training becomes key. Some firms have nearly 100 options for disposing of returned goods, each with a different return on investment. Employees need to understand the options and their benefits.

Donating returned or excess merchandise in a way that helps the community and environment also can help companies maintain brand integrity.

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For instance, apparel and other soft goods returned late in the season frequently are sold to discount merchants, rather than restocked. That's because the cost to return the items to store shelves may exceed the potential profit, especially if the item ends up on the sale rack.

Savvy return logistics professionals also leverage the data collected. Most retailers now ask customers to provide the reason why they return an item. "Use that answer to drive decision-making," Iaria suggests. If multiple returns indicate a product feature is hard to use, consider changing the feature or making the instruction manual clearer.

Also critical to an effective reverse logistics function is clear ownership of the process, which has been difficult to achieve in the past. Reverse logistics touches so many departments—transportation, customer service, finance, warehousing—that it has been hard to gain consensus or drive improvements.

This is changing, with more companies filling positions such as senior manager or director of reverse logistics. A quick LinkedIn search shows more than 120,000 individuals with "reverse logistics" in their titles or experience. "That wasn't the case even five years ago," Iaria says.

Along with frontline employees, management needs to pay attention to reverse logistics because it can affect financial performance, as well as customer relationships. "Reverse logistics is not a backroom issue; it's a boardroom issue," Davis says.

An open, honest partnership between retailers and vendors also benefits the reverse logistics function. Manufacturers need to recognize that some returns result from the way products are built or packaged. For example, a producer of bread-making machines experienced an abnormally large number of returns. Davis tested the machine and discovered it produced round loaves of bread, rather than the oblong ones pictured on the box. The manufacturer changed the packaging and return rates plummeted.

Returns of soft goods typically require the ability to check the item back into inventory and possibly route it to a warehouse or distribution center.

Lean methodologies and the practice of continuous improvement can benefit the reverse logistics function, just as they do other areas of an organization. Philips and Ryder have worked together to embrace Lean methodologies and drive a culture of continuous quality improvement within Philips' reverse logistics function.

Using Lean's common processes and measurement practices, communication between suppliers and customers became more focused. To drive change and increase productivity, Philips and Ryder evaluated cycle times, distances traveled, and wait times. The launch of a recent Kaizen initiative (the practice of continuous improvement) improved ground parcel processing by 50 percent and reduced operator handling time by more than 30 percent.

"With more than 2,500 pieces processed on this line per day, this reduced the FTE (Full-Time Equivalent—the number of equivalent employees working full time) requirement by half," Brown says.

Reverse Logistics: Co-Locate or Dedicated Facility?

Should a company's reverse logistics function have its own facility, or be housed with the forward supply chain? Both options can make sense.

Co-location, as it's sometimes known, allows companies to leverage "the synergy between the forward and reverse" supply chains, says Norman Brouillette, vice president and general manager of technology and healthcare with Ryder System Inc. They can optimize existing labor, systems, and space.

Royal Philips decided to integrate its return logistics function into the ERP system used in its warehouse; previously it handled returns on a different warehouse management system. "For inventory control, it's easier to have everything on one system," says Julie Brown, manager of reverse logistics.

At the same time, it's important that the returning merchandise be allocated sufficient space. Otherwise, returns and new merchandise are more likely to get mixed together, says Paul Steiner, vice president of strategic analysis with Spend Management Experts.

For companies with enough volume, a dedicated facility is optimal, says James Stock, professor of marketing with the University of South Florida and an expert on reverse logistics. Employees gain experience processing returns and deciding between disposition options, and any investment in systems or equipment can be applied across the larger volume of returns.

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Putting Technology to Work

Technology will play a critical role in most reverse logistics functions. Software can boost efficiency and enhance the customer experience.

When choosing reverse logistics software, consider several important attributes. On customer-facing software, user-friendliness is key. "Make it easy," Iaria says. The system should let consumers quickly initiate a return. It should receive and validate the returns, and then issue credits as soon as possible.

Interoperability also is critical. Most companies have multiple systems that will have to interact with the reverse logistics function.

The software also should track the product through the reverse logistics process. This could include the following capabilities:

- Match the UPC code to the stockkeeping unit (SKU).
- Maintain a database of proper disposal methods for each SKU. For instance, designer purses may revert to the designer, while others are sold in the secondary market.
- Identify the vendor and vendor return point, and the store from which the return originated.
- Calculate the credits to be applied to the store or billed to the vendor.

Mobile devices also can streamline the reverse logistics process. Iaria provides one example: a grocery store refuses a pallet of food because of a mistake on the purchase order. The delivery employee uses a mobile device to notify the manufacturer as soon as the refusal occurs. The company can decide right then what to do with the items.

"The old model was to ship it all back to the return center and then determine what to do," Iaria says. Making the decision earlier can cut transportation costs and potentially achieve more value for the goods in question.

As many companies are discovering, it no longer makes sense to consider reverse logistics a necessary evil. The organizations that dedicate resources to the function can reap benefits. "The firms that do reverse logistics well have the cultural mindset that these items are assets and are worth something," Stock says. ■

Outsourcing in Reverse

Some companies choose to outsource the return logistics function to providers such as DecisionOne Corporation, a Devon, Pa.-based technology support organization that offers reverse logistics, repairs, and advanced exchange services to a range of industries. Depending on the company, users can request a replacement unit—often, one DecisionOne previously repaired for the organization—and send a defective unit to DecisionOne for repair and future replacement within the organization.

Many of the non-functioning units require triage and parts replacement. If the device can't be repaired, DecisionOne handles disposal of the device through an environmentally friendly reclaim process.

The company uses an in-house designed warehouse management system called Reverse Logistics Platform (RLP) to track items. "We can track a product the moment it enters our facility and through the entire process," says Tim Yoakem, purchasing, logistics, facilities and security manager.

Here's an example of how the process can work: DecisionOne receives a shipment of laptops from a client. They're scanned into the RLP system by serial number. DecisionOne applies a unique license plate number, or LPN, to the entire shipment or skid. This is in addition to the serial number on each product. "The LPNs are used to move product from receiving to a designated staging location," Yoakem says.

DecisionOne has developed a multi-vendor, multi-platform reverse logistics solution that addresses day-to-day repair and distribution requirements, as well as long-term, strategic needs.

DecisionOne material handlers deliver the laptops to the appropriate department. Each department works on specific products, for a specific customer.

Once a product is in the repair process, it's tracked by serial number individually. The original LPN that started with a shipment of laptops is continually adjusted downward as laptops are moved from the LPN to the repair cells. And as soon as the products move from the repair area to the finished goods area, the original LPN that had identified the shipment or skid is no longer required, and is removed from the system.

Throughout the process, DecisionOne customers can view the status of their product through a customer portal, and decide whether to have DecisionOne continue repairing the product and put it in finished goods for future orders, to return the product to its original user, or to have the product scrapped and recycled. "As a vendor-agnostic partner, we help companies reduce operating costs, extend technology life, and optimize their technology infrastructure," Yoakem says.

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& WHY of Warehouse Wearables

Major technological gains in wearables and apps create intriguing new ways for workers to navigate the warehouse.

By Tom Gresham

Wearables and the apps that work with them have been readily available for years. But the increasing sophistication of wearable technology and its potential for improving warehouse operations is rapidly raising its profile. Cutting-edge wearable technology, such as smart glasses and augmented reality, seem poised to transform the modern warehouse, while more established wearables, such as voice headsets and activity-tracking bracelets, continue to make their own inroads in the field.

"When we talk about wearables today, we're talking about the new user interface for logistics software," explains Trever Ehrlich, creative solutions manager for Kenco, a privately held third-party logistics (3PL) provider based in Chattanooga, Tenn.

"Wearables are changing," he says. "They are no longer just about an app connected to a warehouse management system. Wearables today are full of smart sensors, connected to the web, location aware, and multipurpose. They can provide loads of information, and guide users to expedite tasks – receiving, stocking, sorting, shipping, navigating to items, even showing the user how to lift safely – and they can do all of this without workers having to take their eyes off their work.

"As these technologies become cheaper and more accessible, there has been a mad rush into research and prototyping, and using them for enterprise applications," he adds.

The newness of the emerging technology in apps and wearables, and its unproven nature, could slow widespread adoption in the near future, suggests Marco Nielsen, vice president of managed mobility services for Stratix Corp., an enterprise mobile management company based in Norcross, Ga. Companies often are particularly protective of warehouse costs and want to ensure the practicality of dramatic new technology. The warehouse industry has been slower than retail to adopt vanguard technology. "The warehouse just hasn't been as sexy," Nielsen says. The return on investment of emerging wearables will have to be more clear-cut "before there's mass consumption of it," he adds.

"Many companies still use legacy systems because they have worked well for a while," Nielsen says. "They don't think they need anything fancy."

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Workers pick items from the shelves at a Wyoming Liquor Division warehouse guided by hands-free voice solutions from Intelligrated.

It is important for companies with warehouse operations to be aware of emerging wearable technology whether they believe it will be a fit for them or not, according to Craig Mack, director at C.H. Robinson Worldwide, a third-party logistics and supply chain management provider based in Eden Prairie, Minn. Beware, however, of "impressive, shiny new objects," he warns.

"The worst thing you can do is put these emerging technologies into an operation in search of a problem," he says. "The emerging technologies provide significant value in high-volume e-commerce fulfillment pick and pack operations."

Kenco is exploring warehouse innovation through apps and wearables, even as it remains cognizant of the complexity of introducing them into that atmosphere on a large scale. Integrating apps and wearables, particularly ones based on emerging technology, "can cause significant headaches if it's not done well or carefully," says Kristi Montgomery, vice president of Kenco Innovation Labs.

For now, "it is hard to make the ROI work to support sweeping changes," says Ehrlich. "But we do see a newer generation of wearables creeping in around the edges."

Some larger organizations hesitate to adopt the technology "because of the stability factor that already exists," Montgomery says. That attitude might not hold, though.

"Adoption is slow right now, but it will ramp up in the next few years," he adds. "With large organizations, it takes time to bring change. But we are starting to see that change happen."

One of the more established realms of wearables is voice. Voice solutions in the warehouse can be traced to the 1990s, according to Intelligrated, a material handling automation and software engineering company based in Mason, Ohio, that recently became part of Honeywell.

Today, workers using voice in the warehouse typically employ a simple headset connected to a phone, which is strapped to a belt or placed in a pocket. Through the headset, workers receive directions for picking and putting items, and report their actions with their own voices. If their report does not match the directions, they are notified through their headphones so they can correct the error.

Intelligrated's voice solutions interface with a company's inventory system or warehouse management system to produce the worker directions. Because the solution is based on the mechanics of a phone call, a supervisor can tap into the line to interact with workers while they are on the floor.

"Essentially, workers are on an eight-hour phone call into the system, being directed where to go and verifying what they pick," says Michael Womeldorph, senior product manager for voice at Intelligrated Software.

Old Picking Process Sent Packing

When the Wyoming Liquor Division—a subsidiary agency of the Department of Revenue responsible for wholesale distribution of wine and spirits to state-licensed retailers—moved into a 145,000-square-foot facility in 2012, it turned to Intelligrated to update its picking process. In its previous warehouse, Wyoming Liquor Division used a manual, paper-based pick order fulfillment system that developed into a liability, particularly because customers increasingly opted for complex split-case orders rather than full cases or pallet loads. The Division hoped to improve picking efficiency in its new, larger facility and to identify a better way to manage its expanded inventory.

The Division opted for Intelligrated's voice solutions. Now, workers ride or walk through the warehouse wearing a headset that provides instructions for what to pick, where the item is located, and how many units to grab. Once workers secure the proper units, they speak the item and unit into the headset. A voice then directs them to the next item. The hands-free system allows them to steer and load without pausing to scan or record data, keeping them moving seamlessly from one item to the next.

With the new system, the Division saw a productivity increase of 15 percent over the manual pick order system, while maintaining a 99.9-percent order accuracy rate.

Finding Your Voice

As with any wearable technology, voice solutions must be tailored to the specific needs and processes of an individual warehouse operation. While voice solutions are sometimes sufficient for picking processes, additional resources may be necessary.

For instance, voice can be used without scanning technology when the warehouse work involves picking larger items, such as cases of beverages. With larger items, Womeldorph says, workers have time to manage data capture by voice, meaning they can say aloud the related digits of each item rather than needing to scan them.

In other operations, however, data capture by voice is impractical, such as when workers pick more items closer together. Voice would slow down the process and create inefficiency.

The voice solution can work in tandem with scanning technology, such as phones or mobile computing devices with scanning capabilities, or ring scanners that can connect to a telephony device via Bluetooth. Companies using Intelligrated solutions wear the scanning technology with an accessory that Intelligrated designed with one of its partners.

"We add different accessories for different use cases," Womeldorph says. "Companies get the eyes-up advantage of

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voice solutions, integrated with other solutions that fit their operation."

Another example is the Lydia Smart Watch, offered by topVox Voice Solutions, a manufacturer of voice-directed solutions with U.S. operations in Illinois. The watch serves as a supplementary device for its voice solution. The use of the Android watch varies greatly depending on the individual company, according to Ryan Absil, project manager at topVox, but the watch can commonly provide a picture of an item to help pick accuracy, all while maintaining a hands-free experience.

"When working with multiple products in a single warehouse location, voice applications typically rely on providing a product description or specific item code," Absil says. "The watch reduces those outputs and gives a visual cue."

Other possibilities for the watch include providing an order overview for a picker or listing potential voice commands if the worker does not know which ones to use. Information can appear on the watch with or without a voice command.

"One challenge is breaking the mental schema people can have about voice and vision technology combined," Absil says. "Some companies think they should use one or the other, and do not recognize the benefits that the combination can bring."

Fits Like a Glove

Sometimes, the piece that makes technology wearable is not the technological innovation itself. For instance, KoamTac, a Princeton, N.J.-based maker of Bluetooth barcode scanners and other mobile data collectors, offers finger-trigger gloves that transform its barcode scanners into wearables. Workers place a scanner in a pocket on the top of their gloves. The scanner is connected via a cord to a button at the index finger. Users simply point their hand at the appropriate item, and press the button with their finger to scan the barcode.

"The gloves are used in warehouses and package sorting facilities where individuals need to scan and maintain full use of their hands," says Alisha Hettinger, marketing manager for KoamTac. The gloves are helpful in settings where workers handle large or heavy items, she adds.

Another advantage is that a company can purchase more of the less expensive gloves for its workers, who can share the scanning tool that is inserted into the gloves. In this way, workers can pass the scanners to each other, from shift to shift, without having to share gloves.

Photo courtesy of KoamTac

KoamTac's Finger Trigger Glove enables workers to use a barcode scanner while keeping their hands free for picking and carrying.

A key piece of KoamTac's offerings is KoamTacON, which allows users to build their own web-based mobile enterprise app platform that works in tandem with the company's scanners. Customized wearable apps help ensure data is collected and processed based on users' specific needs.

"KoamTacON offers a full data collection ecosystem rather than just a scanner," Hettinger says. "And the technical expertise necessary to utilize the scanners and app for data collection is minimized because the system's drag-and-drop functionality does not require programming knowledge."

New Vision for Smart Glasses

The introduction of Google Glass smart glasses in 2012 marked an influential milestone for warehouse wearables – even though the technology was geared more to consumers. Today, no wearable generates more buzz than smart glasses.

"Google Glass got people comfortable with the idea of wearing smart glasses and understanding their benefits," Ehrlich says. "It got the idea of wearables on the radar, even though it was also before its time."

Today, Vuzix, a supplier of smart glasses, augmented reality, and virtual reality technologies with a U.S. base in Rochester, N.Y., is making crucial strides in the use of smart glasses for logistics applications. The glasses are user-friendly, easy to wear, and comfortable for the workforce to adopt.

Vuzix has been building smart glasses with logistics top of mind. "We never saw smart glasses as a consumer device," says Lance Anderson, vice president of enterprise sales. "We knew it was an industrial device and designed it accordingly."

The Reality of the Situation

Wearables, particularly smart glasses, provide an entry to the cutting-edge world of augmented reality (AR), which is a live view of a real setting whose elements are augmented by computer-generated sensory input, such as sound or visual elements. AR seems poised to have a widespread disruptive influence on logistics and supply chain management in the years ahead, particularly in the warehouse. SAP, Ubimax, DHL and Vuzix are among those companies ambitiously working on solutions.

Logistics company DHL has especially embraced augmented reality applications in the warehouse. In its 2014 white paper, *Augmented Reality in Logistics*, DHL cites research that the task of picking accounts for 55 to 65 percent of the total cost of the warehousing operation, while noting, "in logistics, the most tangible AR solutions are systems to optimize the picking process." Therefore, the warehouse offers a particularly fertile area for possible cost and efficiency gains, the white paper concludes.

In 2016, DHL rolled out an expanded pilot program for vision picking that incorporates AR. The company will implement the program, which will include multiple partners, in warehouses in the United States, Europe, and the United Kingdom.

Under the program, pickers are equipped with smart glasses that display each item that needs to be picked,

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including the quantity needed. The picker subsequently picks the item, and the glasses read the barcode, confirming that the right item was selected. The glasses then show the wearer where the picked item needs to be placed on the pick cart.

"The Vision Picking Program is DHL Supply Chain's first translation of what augmented reality solutions can look like for supply chains," said Markus Voss, CIO of supply chain at DHL, in a press release. "The potential of this technology for business is still largely untapped."

The ambitious effort follows in the wake of a three-week AR pilot program DHL managed with Ricoh in The Netherlands using Vuzix M100 smart glasses and Ubimax's vision picking X-Pick software solution. That project produced a 25-percent increase in efficiency, as well as reduced error rates and improved employee satisfaction. Products and processes have been refined since, including the development of Vuzix's new M300 smart glasses, which were designed based on lessons learned as companies spent three years testing the M100 in pilots, proof of concepts, and smaller rollouts.

As an example of the work being done on the software side, SAP is creating augmented reality mobile apps that work with smart glasses enabling workers to use visual enterprise 3-D models, voice recognition, and gesture control in the warehouse. The

Photo courtesy of Vuzix

The Vuzix M300 smart glasses are designed with warehouse usage in mind. The glasses' capabilities include enabling augmented reality solutions.

SAP AR Warehouse Picker mobile app connects smart glasses with a company's backend or gateway system.

AR can be incorporated with smart glasses in a straightforward way that avoids making workers' jobs more complex or confusing. In fact, the glasses' ease of use makes them ideal for temporary workers during busy periods, Anderson says.

It also helps with troubleshooting and maintenance. A supervisor can patch into a worker's glasses to see what they see and help solve problems on the floor. Items with missing barcodes can be entered into automated systems and affixed with a barcode with the help of image recognition. Remote technicians can help on-site workers with repairs without leaving their office.

Another new AR device that could prove influential in the supply chain, particularly in the warehouse, is the Microsoft HoloLens, the first self-contained holographic computer that will allow people to engage with their digital content and interact with holograms in the world around them. This could be another tool for hands-free, AR-enabled picking and workflow tracking and planning, Montgomery says.

Many companies want to wait and see how those leading the charge in wearables do with their efforts. With enough success, Nielsen says, the attitude will shift to, "We can do that now."

Starting small will be the best option for many organizations. "Doing things on the fringes of existing platforms is where you can start to see benefits," Montgomery says. Many companies have already started down that path.

The adjustment period is an important part of the process. It offers an opportunity for organizations to see what all the hype is about, and whether it makes sense to join the race. "Taking wearables in small pieces allows companies to get their feet wet, and to discover the benefits and pitfalls of the technology," Ehrlich says.

And like every emerging technology, there is still a lot to learn.

Wearables: What to Consider

Any operation, no matter how large or sophisticated, faces warehousing challenges, says Chris Mack, director at third-party logistics provider C.H. Robinson. Before companies adopt wearables and associated apps for their warehouses, they have to consider a number of related factors, including:

Expense and security. The newest wearables typically are not cheap, therefore they are valuable. It's important to implement security measures "to make sure the devices don't walk off," says Trever Ehrlich, creative solutions manager at Kenco. In addition, companies should heighten their attention to cybersecurity, Mack says, to make sure the data they process—including customer data—is protected.

Durability. Warehouse settings can be notoriously tough on wearable devices. For example, devices need to stand up to conditions in the temperature-controlled, refrigerated warehouses that 3PLs such as C.H. Robinson operate. It is also wise for organizations to insist on no-fault repair and replacement plans with quick turnarounds, Mack suggests.

User resistance. Organizations can face user resistance, particularly from older workers less than eager to employ the new technology in place of the legacy process they are comfortable with. The flow of tech-savvy millennials into the workforce could help. "That shift in the workforce could affect technology adoption," notes Marco Nielsen, vice president of managed mobility services for Stratix Corp.

IT management. Managing wearables from an IT standpoint can prove challenging and incur new costs that are not immediately apparent. "Managing the IT for new apps and wearables is not a core competency of most warehouse teams," Mack says. "As part of a consolidated strategy, companies have to ensure that they have the people, resources, and processes in place to effectively deploy, support, and repair these devices."

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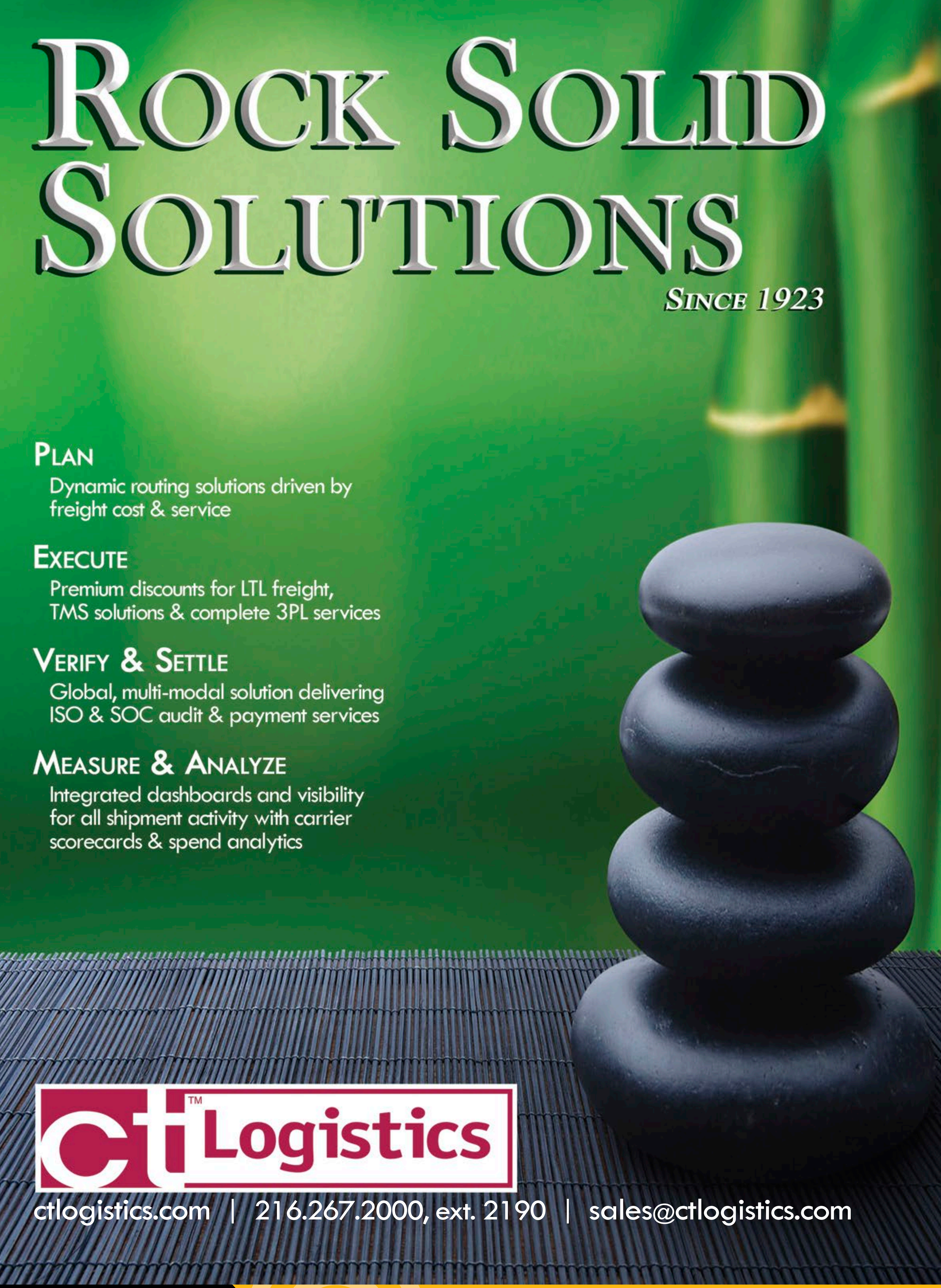

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INBOUND LOGISTICS

Winter READING GUIDE 2017

BY PAUL VACHON

Don't let winter put a deep freeze on your logistics learning. Keep your knowledge evergreen by cozying up to books on wide-ranging topics, from food logistics to procurement practices.

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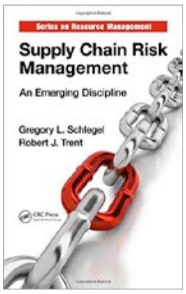
Supply Chain Risk Management—An Emerging Discipline

By Gregory L. Schlegel & Robert J. Trent



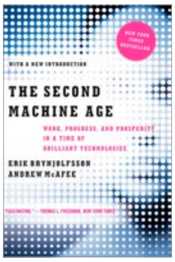
Various 21st century phenomena have added new dimensions of risk to the supply chain—the ubiquity of social media and the Internet; retailers' temptation to over-rely on technology, become overconfident and overpromise delivery times; and gaining acceptance for supply chain risk management from the bean counters. This book identifies and analyzes the root causes of these issues, and offers constructive solutions.

Highlights: Risk is a constant in business. Its steady expansion places new emphasis on the importance of risk management in a company's overall supply chain operations. "Strategic" risk—that which can affect an organization as a whole—is one of the most crucial types of risk to be reduced.

Quick Takeaway: Asset protection is one example of minimizing strategic risk, especially guarding intellectual property.

The Second Machine Age—Work, Progress and Prosperity in a Time of Brilliant Technologies

By Erik Brynjolfsson and Andrew McAfee



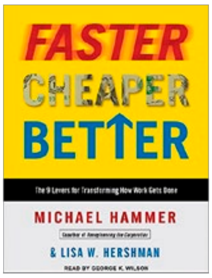
The authors outline how ongoing sophistication of digital technologies will usher in productivity changes as significant as the industrial revolution. But, they warn, these technologies must be ethically managed to "maximize the bounty while mitigating the spread"—the gap between the rich and the poor.

Highlights: While making the world smaller and ever more connected, technology also has the potential to exacerbate or reduce inequality, depending on how it's used. A world where everyone prospers is also one that is more profitable.

Quick Takeaway: In prioritizing human labor over machines, the authors propose a "made by humans" label on goods or to "award credits to companies that employ humans, like the carbon offsets that can now be purchased."

Faster Cheaper Better—The 9 Levers for Transforming How Work Gets Done

By Michael Hammer and Lisa W. Hershman



"Continuous improvement" is a touchstone of contemporary managerial thinking. The authors take this idea further by advocating for "process engineering." They describe nine levers that, if executed properly, will allow an organization to overcome its inbred obstacles and achieve "breakthrough performance" in all operations—product development, demand creation, order fulfillment and supply chain management.

Highlights: This book articulates concepts that are vitally important. In fact, the first three words of the title were the motto NASA used during the 1990s as its operative philosophy in achieving more frequent and more successful space flights.

Quick Takeaway: It's important to organize a company so that employees are encouraged to think holistically. Everyone should be familiar with the company's total processes and think creatively, rather than narrowly.

The Six Sigma Fieldbook

By Mikel Harry, PhD

This absorbing case study charts the progress of the DuPont Company as it sought to enter new fields and employed the Six Sigma strategy to monitor the efficiency and effectiveness of its transition. Virtually any industry or field, including supply chain management, can replicate the Six Sigma method.

Highlights: The final chapter, *The Science of Value Creation*, dispels myths about Six Sigma, and illustrates a four-phase takeaway that can prove helpful to supply chain managers.

Quick Takeaway: Six Sigma is based on the premise that the improvement of a product or service is an ongoing, never-ending task that, over time, will continue to yield additional benefits to the company that implements it.

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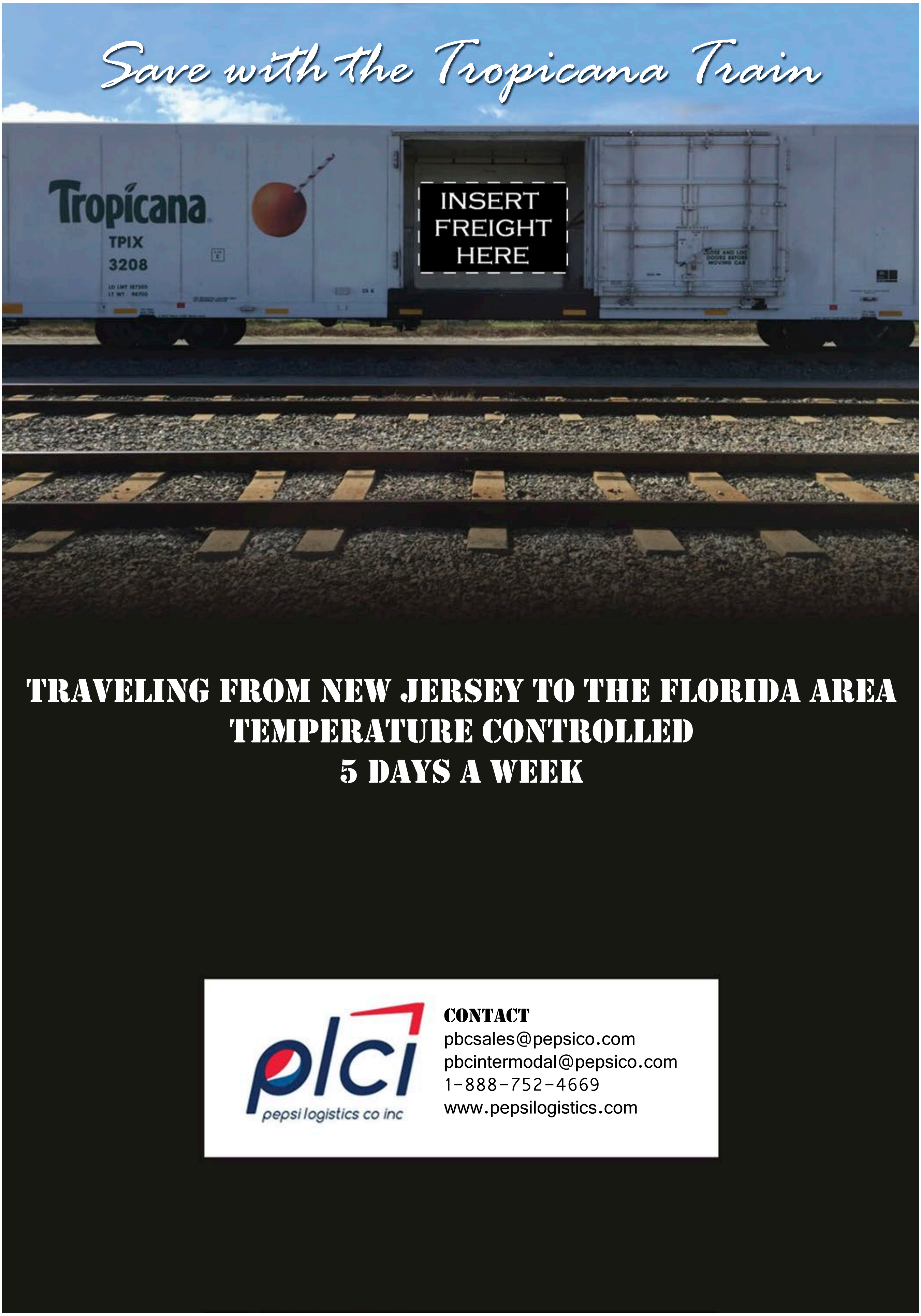

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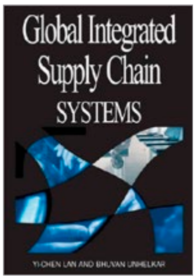
Global Integrated Supply Chain Management

By Yi-chen Lan and Bhuvan Unhelkar et. al., University of Western Sydney, Australia



This book is a collection of contributed academic essays that addresses the topic of global supply chains that are integrated by use of the Internet and other telecommunication methods. Various chapters focus on subtopics, such as supply chain management in specific countries, and how a supply chain that is "e-linked" can be continuously evaluated and improved.

Highlights: Chapter 27, *Enabling the Glass Pipeline*, is especially valuable. It discusses how mobile technology is becoming an ever-important tool in supply chain management.

Quick Takeaway: ICT (Internet and Communication Technologies) provides excellent opportunities to integrate the supply and customer side of business processes, and supply chains stand to benefit most from this integration.

Fueling the Online Trade Revolution: A New Customs Security Framework to Secure and Facilitate Small Business E-Commerce

By Kati Suominen for the Center for Strategic and International Studies

The 21st century has seen the exponential rise of online commerce, which can require shipment almost anywhere, and the heightened need for strong border security in a post 9/11 world. This essential handbook provides a concise reference tool for accommodating the former without compromising the latter.

Highlights: The book offers a helpful primer on customs security protocols for all US shippers and how these protocols will continue to evolve to accommodate international trade in the future.

Quick Takeaway: By enabling U.S. companies to export to a vaster market and U.S. consumers to access a wider variety of products at the lowest cost, digital trade enhances our productivity, economic growth and job creation.

Improving Ship Operational Design Through Teamwork

By The Nautical Institute

A supply chain can consist of any mode of transportation, such as ships. The efficiency, safety, and survivability of an ocean going vessel affects the overall success of the supply chain. Seasoned nautical experts wrote this book to promote and encourage quality ship design from naval architects.

Highlights: Comprehensive yet concise, this book provides informative background for supply chain professionals interested in learning new nautical terminology and procedures.

Quick Takeaway: The authors urge naval architects to consider various human factors, including ergonomics and "human centered" design—a multidisciplinary concept that prioritizes features in a way that maximizes human comfort and efficiency.

Negotiation for Procurement Professionals

By Jonathan O'Brien

The supply chain begins when a product or service is purchased. This book is unusual in that it's a negotiation manual aimed not at the seller, but the buyer. It covers a wide range of negotiating techniques—the role of power, personality, cultural differences, and even game theory.

Highlights: The benefits of effective negotiation, obtaining the lowest possible price and the greatest possible value, is where the supply chain originates, and is the foundation on which an organization's cost structure is built.

Quick Takeaway: Almost every principle the book covers is also illustrated by a table, chart, or graph. This is especially useful when dealing with abstract topics, such as personality and cultural analysis.

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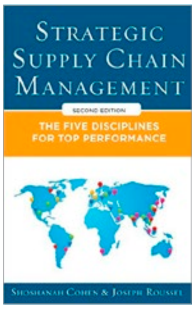
Strategic Supply Chain Management: The Five Disciplines for Top Performance

By Shoshanah Cohen and Joseph Roussel



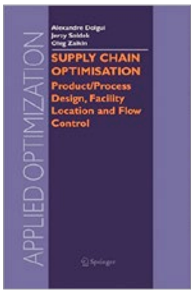
An exceptionally well-organized guide to success built around a series of symposia at major universities, this book articulates five essentials for success that professionals at any point along the supply chain can use. The authors encourage designing an organization that is collaborative, has short lines of communication, and works to continually improve itself.

Highlights: This book is about individual employees as much as their organization. It provides ideas for staff development, organizational "architecture" and the effective use of metrics.

Quick Takeaway: The case study on how General Motors reinvented itself illustrates how transformative thoughtful organizational change can be.

Supply Chain Optimization: Product/Process Design, Facility Location and Flow Control

By Alexandre Dolgui, Jerzy Soldek, Oleg Zaikin



This volume is a collection of highly technical essays on modeling, optimizing, and implementing several advanced supply chain concepts, including predicting consumer behavior, minimizing costs for a single location manufacturer, and advanced supply chain design. This is an excellent resource to use in a business/university partnership.

Highlights: Due to its technical nature, this book is aimed at supply chain management experts, and should be included on the shelf of an organization's senior logistics manager.

Quick Takeaway: Chapter 14 is the most interdisciplinary. It involves coordinating plans for sales with inventory management and operational resources. Included are mathematical models that seek to optimize this balance.

Applications of Supply Chain Management and E-Commerce Research

By Joseph Geunes, et. al.

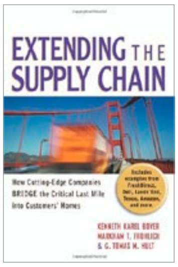
This book provides a series of applications and case studies, each of which utilizes best practices for supply chain management and e-commerce. The strategies presented are the result of multidisciplinary research at the University of Florida working with industry leaders

Highlights: Chapter 7 tackles the issue of trust in electronic commerce and offers advice on dealing with automated reputation systems to bridge the resulting "trust gap."

Quick Takeaway: Companies traditionally have built trust through interpersonal relationships developed in the brick-and-mortar world. Replicating these relationships in the world of e-commerce will become increasingly imperative as more transactions move online.

Extending the Supply Chain: How Cutting-Edge Companies Bridge the Critical Last Mile into Customers' Homes

By Kenneth Boyer, Markham T. Frohlich, G. Tomas Hult



This book is a direct response to the euphoria that surrounded the early days of the Internet. Most early e-commerce players understood the technology of the web, but not the new distribution challenges. The authors argue that home delivery of consumer goods, popular during the 1950s, can be revived by coupling technology with the proper distribution systems.

Highlights: The authors believe direct-to-consumer distribution is the wave of the future, and cite Dell, Office Depot, and Amazon as examples. Innovative companies can emulate their success.

Quick Takeaway: Chapter 8 is central to the book's theme, and discusses alternatives to order picking and delivery that maximize efficiency while providing a higher level of customer convenience.

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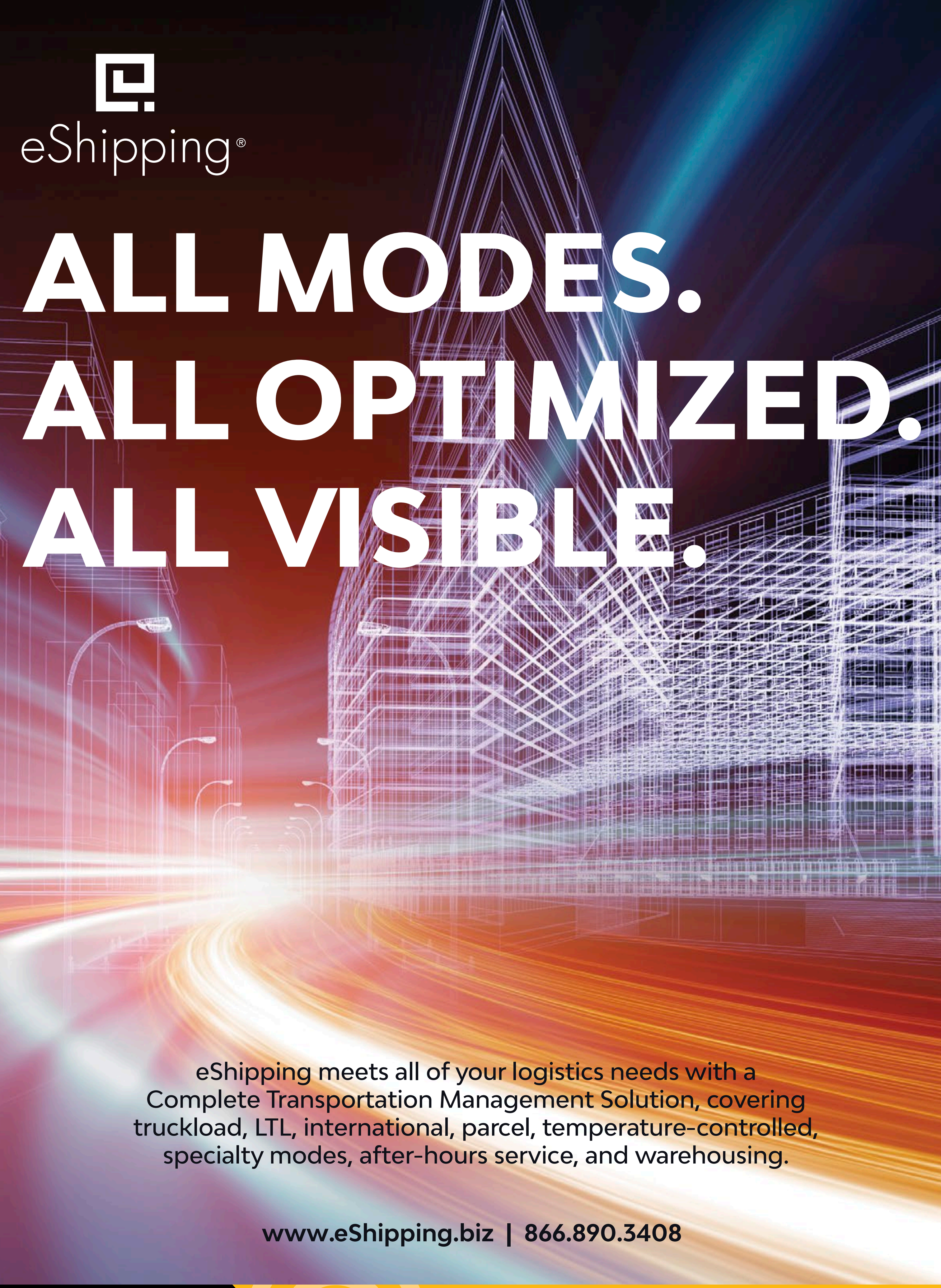

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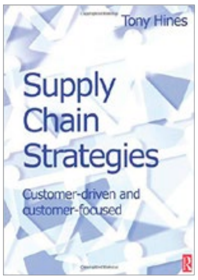
Supply Chain Strategies: Customer-Driven and Customer-Focused

By Tony Hines



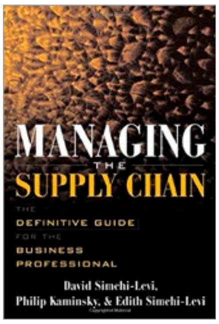
Originally written as a college textbook, this title provides a comprehensive summary of all aspects of supply chain management (including the meaning of the name itself) with an eye toward its terminus—the customer. The book includes information on how to operate a supply chain efficiently and profitably. While aimed at the supply chain novice, this book also serves as a refresher for the seasoned pro, while offering new information on globalization and e-business strategies.

Highlights: The description of globalization and its political underpinnings is especially noteworthy.

Quick Takeaway: The nature of supply chains in most industries is that they may be both global and local. Supplies are sourced from a variety of worldwide locations to meet demands of consumers who may be located locally or globally.

Managing the Supply Chain: The Definitive Guide for the Business Professional

By David Simchi-Levi, Philip Kaminsky, Edith Simchi-Levi



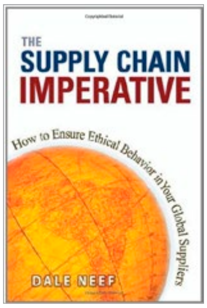
This book starts as an introduction to supply chain management, then discusses new problems and concerns in the supply chain world brought on by events such as the terrorist attack of September 11, 2001.

Highlights: The book's forward-looking content, such as the presentation of the "pull based" concept, introduces new ideas to the reader who may be several years removed from school.

Quick Takeaway: The book features two chapters on information—its value and its utilization. With technology evolving at breakneck speed, this material is especially valuable.

The Supply Chain Imperative

By Dale Neef



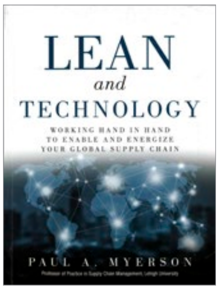
This insightful book makes the case that American companies involved in overseas manufacturing—either directly or through third parties—have both a legal and ethical obligation to eliminate exploitation of foreign workers and avoid environmental damage. The book outlines how to manage supply chains toward achieving these goals.

Highlights: The prevailing view, at home and abroad, is that exploiting workers or harming the environment are unacceptable in modern society. Managers who value their company's public reputation will want to keep abreast of this important issue.

Quick Takeaway: The handy sample checklists in the appendices offer readers a guide to introducing accountability in their own organizations.

Lean and Technology: Working Hand in Hand to Enable and Energize Your Global Supply Chain

By Paul Myerson



While lean has traditionally been considered a "pen and pencil" technique to identify and eliminate waste in business processes, this book makes the case that technology is, in fact, a key enabler of a lean supply chain and links lean thinking with available and affordable systems and technologies to get the most out of improved processes.

Highlights: The author discusses various tools, methodologies, best practices, examples, and cases of how, when, and where technology can be combined with a lean philosophy to "turbo charge" an organization's supply chain for a distinct competitive advantage.

Quick Takeaway: Like many other aspects of lean thinking in the supply chain, technology can be an enabler of an improved process, and can also help to retain and acquire new customers.

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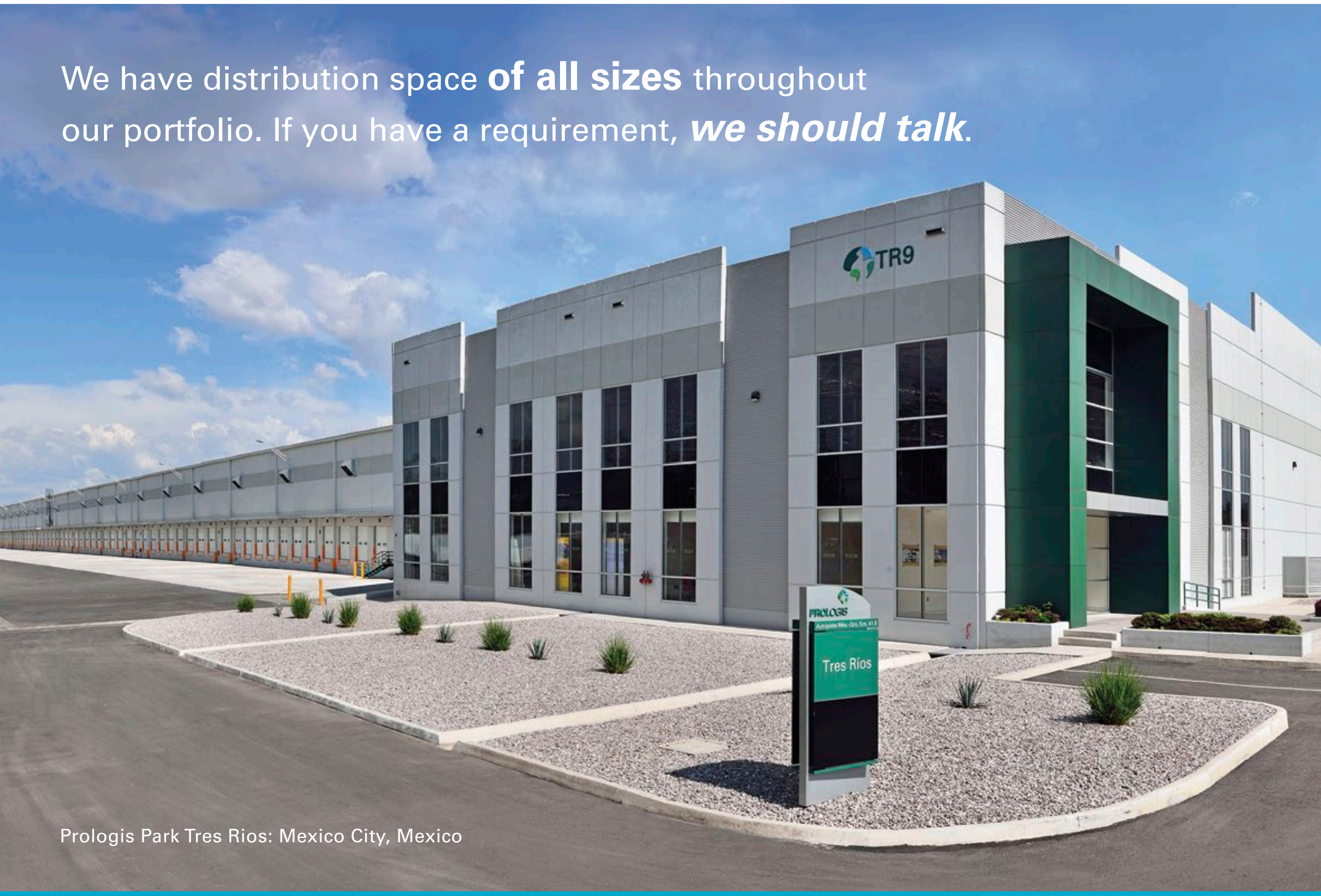

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General Session: Fireside Chat with Scott McWilliams, EVP Strategic Development, GEODIS

Scott McWilliams spent 27 years with OHL, now GEODIS, as site manager, vice president of operations, president, CEO, and chief customer officer. He has personal and professional stories to share. You won't want to miss this his unique insights.

General Session: PriceWaterhouse Coopers Presents Warehouse Economic Impact Report

The 3PL warehouse industry is a vital part of the U.S. and Canadian economies in the form of jobs, labor, income, GDP, and taxes. The total economic contribution of the industry extends beyond its own employment of direct, indirect and induced contributions. Explore the results of this IWLA-sponsored study of economic impact of the warehouse logistics industry at the national, state, and provincial levels.

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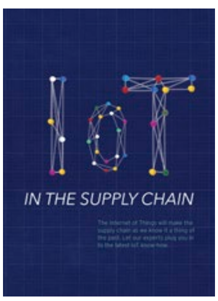
The 10 Most Read Articles of 2016

These articles on *Inbound Logistics'* website caught your attention and got you clicking. From unveiling the future warehouse to delving into supply chain disruptors, the following articles generated the buzz.



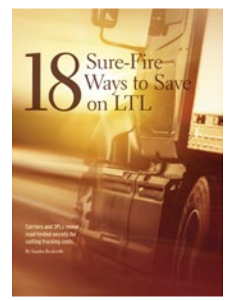
IoT in the Supply Chain

January 2016

As the world becomes increasingly connected via the Internet of Things, the amount of data being created and shared is skyrocketing. This will have a profound impact on the supply chain, making it hyperconnected, innovative, and extremely smart. Readers paid close attention to our experts for the latest IoT know-how.

bit.ly/SupplyChainIOT

18 Sure-Fire Ways to Save on LTL Shipments



September 2016

Inbound Logistics asked carriers and 3PL providers to share their secrets for cutting LTL shipment costs, and created this list of tips that will benefit shippers of all types and sizes. We grouped the tips by category to help you pinpoint those most relevant to your business.

bit.ly/SaveOnLTL

Supply Chain & Logistics Education: Ask the Professors

December 2016

We couldn't resist updating our popular *Ask the Professors* article, published in February 2012. In the latest and equally well-received 2016 edition, faculty members from some of the nation's leading logistics education programs share their thoughts on how higher education is preparing tomorrow's professionals for the challenges ahead.

bit.ly/AskProfessors2016

6 Technologies Guaranteed to Disrupt Your Supply Chain

July 2016

As innovative technological solutions continue to shake up logistics, managing the supply chain is no longer business as usual. Readers bookmarked this article, which explores six emerging technologies guaranteed to rewrite rules and redefine job descriptions. Supply chain executives explain why these six trends are most likely to prove widely disruptive in the coming years.

bit.ly/6Technologies

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Top 100 3PL Providers

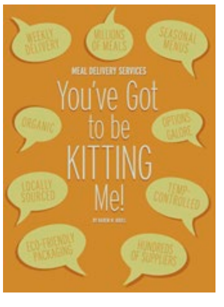
July 2016

Our annual list of top 3PL providers is a reader favorite again this year. It includes well-known companies, a smattering of 3PL niche providers, and newer companies offering specialized logistics services. This solutions-based resource conveys important information in an easy-to-read chart. You can also contact and request information from any or all of the listed companies with our 3PL Decision Support Tool (bit.ly/3PLDST).

bit.ly/Top1003PL_2016

Meal Delivery Services: You've Got to be Kitting Me!

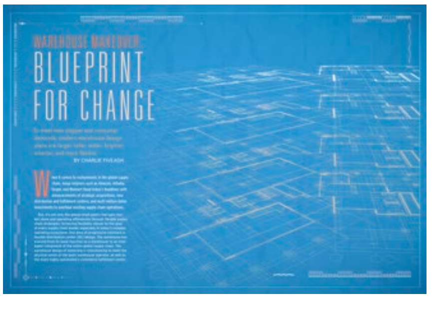
August 2016



The popularity of meal and meal kit delivery services whet the appetite of readers who wanted the dish on how to execute such a complex supply chain. As the sector continues to grow, so does the supply chain flexibility and agility meal kit delivery services demand.

bit.ly/MealDeliveryKits

Warehouse Makeover: Blueprint For Change

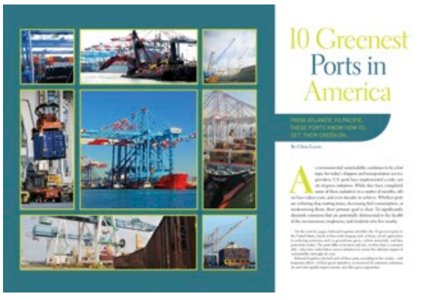


May 2016

The warehouse design of tomorrow is transitioning to meet the physical needs of the basic warehouse operator, as well as the more highly automated e-commerce fulfillment center. Technology applications, advanced automation, and progressive building design all add up to provide flexible support to the end-to-end supply chain.

bit.ly/WarehouseMakeover

10 Greenest Ports in America



June 2016

Whether ports are reducing ship waiting times, decreasing fuel consumption, or modernizing fleets, their primary goal is clear–to significantly diminish emissions that are potentially detrimental to the health of the environment, employees, and residents who live nearby. From Atlantic to Pacific, these ports know how to get their green on.

bit.ly/GreenestPorts

Returning to the Screen of the Crime

January 2016

Criminals are hijacking companies' proprietary information: correspondence, contracts, intellectual property, customer lists, vendor prices, warehouse CCTV videos, and trade secrets. The enemies are global, and motives range from theft to extortion to competitive spying to doing it just for fun. Readers hacked into this page to protect their cyber supply chain.

bit.ly/ScreenOfCrime

They Might Be Giants

March 2016

Like giant corporations, small and mid-sized businesses (SMBs) have to deliver outstanding products and services, stay ahead of the competition, and keep costs down. But in pursuing those goals, an SMB can't marshal the vast resources available to a General Motors or a Walmart. That's where e-commerce and logistics technology can help small and mid-size businesses compete like the big guys.

bit.ly/MightBeGiants

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IT Toolkit | by Gary Wollenhaupt

Routing Software Separates Losers from Weiners

Kowalski Sausage implements a new in-house routing and dispatching system to improve how the piggies get to market.

Since 1920, Kowalski Sausage Company has kept Michigan and surrounding states well fed by offering 55 types of locally made meat products, side dishes, and a new line of salad dressings. The company has been growing its menu of products by acquiring new companies, but its routing and delivery system couldn't cut the mustard.

The fourth-generation family-owned company operates a fleet of 10 trucks and drivers that directly service about 500 grocery chain stores, independent grocers, distributors, and warehouse clubs, with delivery windows that range from 30 minutes to six hours. Kowalski's raw and unprepared foods require refrigeration during transport, so on-time service from its three production locations is vital.

For years, Kowalski Sausage relied on route sales people and drivers to make daily sales and deliveries at the stores. Then, in 2010, the company changed its business model to separate sales and fulfillment staff, add a sales force and call center, and allow drivers to focus on long-standing delivery routes. The company typically delivers orders within two days, and maintains regular delivery schedules that receivers and drivers have come to live by. For instance, Tuesday is Kroger day.

As part of its business model shift, Kowalski signed a five-year contract with a routing and dispatching provider, which used its own dispatcher, took control of routing, and handled driver and service issues, such as missed delivery windows. It all looked good on paper, until standards started to slip.

"Drivers returned later, trucks broke down, and we missed service windows, yet we did not hold the provider accountable," recalls Crystal Towery, assistant controller for Kowalski Sausage.

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The office closes at 4 p.m., but unhappy drivers were returning from routes as late as 7 p.m., resulting in missed service windows and higher labor costs. "Some days, the drivers were out on the road for 12 hours and that was not good," she says.

The provider's Unix-based dispatching system presented a real obstacle to getting a handle on service levels and driver performance. "It was hard for anyone at Kowalski Sausage to even understand the system because we only had limited access to it," Towery says.

Kowalski assigned Towery the task of getting its logistics house back in order. She knew it needed a user-friendly, Windows-based dispatching and routing solution.

Getting These Piggies to Market

Towery researched four different logistics systems providers; two offered Unix-only systems, which took them out of the running immediately. After her due diligence, she decided to implement *Roadnet Anywhere* from fleet management solutions company Omnitracs.

Roadnet Anywhere is the Software-as-a-Service version of the *Roadnet* system, which launched in 1983. Omnitracs purchased it from UPS in 2013. Companies use *Roadnet* to manage private and for-hire fleets, from one truck up to 7,000 trucks, but the average user runs 65 to 75 trucks, says Cyndi Brandt, senior director of product marketing and strategic alliances for Omnitracs. More than 50,000 customers in 80 countries use the system in businesses as diverse as pork farmers, visiting nurses, and recycling trucks.

Towery valued the browser-based routing and dispatching software's ease of use. "Omnitracs was able to import and load our orders into *Roadnet*, and demonstrate how it works," Towery says. "I've never worked in shipping or dispatching, but after the demonstration, I felt that with a little assistance, I could run the entire dispatch system."

Towery was able to negotiate an exit for the existing outsourcing contract, and signed up with Omnitracs. The system provides a holistic view of truck fleets, consolidating routing, dispatching, proof of delivery, telematics, customer notifications, and business analytics in one place.

Since Kowalski Sausage implemented the *Roadnet Anywhere* platform in February 2015, the payoff has been steady. Routing expenses have dropped by more than an estimated 60 percent, due to several factors. For instance, dispatching is no longer an outsourced full-time job. Now, the warehouse manager takes care of it in about 30 minutes at the beginning of each day. The manager can make changes on the fly during the day, adjusting start times and routes, or adding an extra stop. "It's much easier to do this because it's all at our fingertips," Towery says.

During implementation, Towery met with drivers as they returned from routes. She asked for their input on designing routes, tapping into their years of experience with local traffic and customer relationships. Making deliveries to the same stores year after year, drivers get to know the store managers.

The drivers gave Towery invaluable insight. For example, one driver said, "I know it looks better on the map to send me to this place first, but the manager goes to lunch early. I'm better off going to the next place first, and then going back."

"Changing the route adds only 5 minutes to the schedule, and we don't make the receiver mad or miss a window," Towery says.

The drivers appreciated providing input to their schedules, which helped with buy-in during the transition to the new system. "Now the drivers are always back at the office before it closes," Towery says. "The drivers are happy and our customers are happy."

Hog Wild for Customization

Kowalski Sausage has honed its customer routes over the years; they are not necessarily the most efficient, but they are effective. For example, stores that order on Monday expect their Kowalski order on Wednesday. Delivery one day early can be as much of a problem as one day late. The company served major chain stores on Monday and Tuesday, and independents on Wednesday. Everyone knew the system. The warehouse crew picks items and loads trucks in descending stop order based on the routes.

Initially, the *Roadnet* system wanted to route the orders as efficiently as possible, without regard for the traditional structure. Towery worked with Omnitracs to build route templates, which kept the orders scheduled on their traditional days and captured the drivers' local knowledge.

Guided by *RoadNet Anywhere*, Kowalski Sausage Company drivers deliver local delicacies across the upper Midwest.

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Capturing that internal knowledge is one area where *Roadnet* shines, Brandt says. "It's not uncommon to walk into a distribution center and see Joe the router flipping invoices into stacks for each driver because he has all the information in his head," she says. "Our job is to pull the information out of his head and automate the routing process so it drops from a 6-hour process to one hour or less."

Even with Kowalski's daily standing orders, the routing system allows the warehouse manager to track drivers and update customers about any delays. It also takes much less time to create and change routes.

How the Sausage is Made

Roadnet uses algorithms based on the user's input on various factors such as receivers' operating hours, customer size and priority, cost of vehicle operation, and driver qualifications to create the most effective and cost-efficient routes.

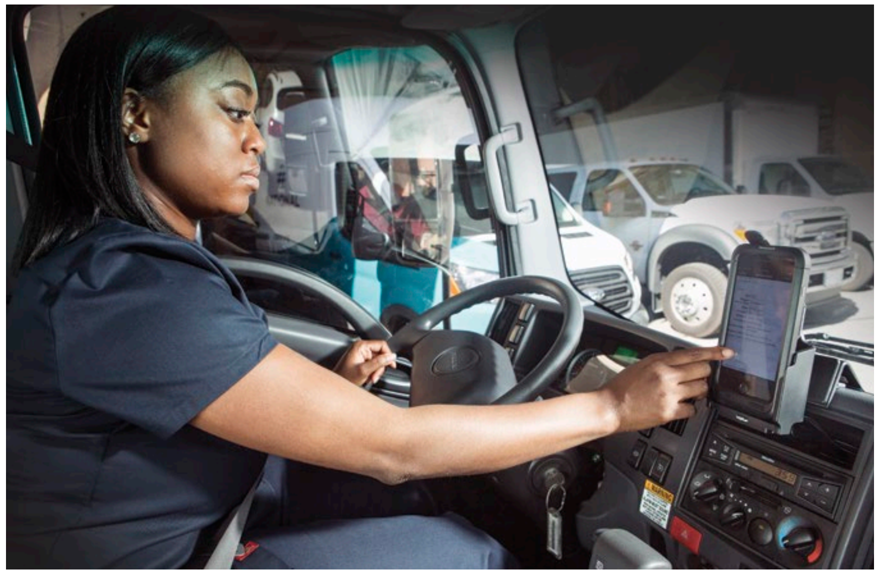
"Because Kowalski carries refrigerated food products, we set up the system to look at how long product is in the truck using different options such as how long the route should be, or the maximum number of stops," Brandt says.

During implementation, the only change Kowalski had to make was replacing outdated flip phones with smart phones that could display the routes and send data back to the system.

The added transparency from being able to track driver behavior has resulted in a few driver terminations and, ultimately, a higher performing fleet.

"We discovered that a few drivers were going home during the day, driving our big trucks on residential streets. That could have caused us a lot of trouble with the city," Towery says. "Terminating those drivers was an easy decision, and once word got out in the company, drivers began to meet their service windows every day."

Kowalski has also tested the additional features of *Roadnet Anywhere Mobile Premium*, which provides signature capture, picture notes, and auto arrive/depart. The company will stick with paperwork for now, instead of electronic proof of delivery and other high-tech solutions, because most of its large customers demand a paper trail.



Drivers can access *Roadnet Anywhere* via Android and iOS devices, receiving routing updates in real time.

Kowalski is expanding its offerings of signature sausages, lunchmeats, pierogies, and side dishes with a salad dressing line. The company plans to handle the increase in volume with its existing fleet, thanks to the efficiencies of the *Roadnet* system.

"Adding a salad dressing line will expand our sales, but we don't have to incur added transportation costs," Towery notes. "We can add an extra 15 to 20 cases of salad dressing on a truck because we're going to those stops anyway.

"Now that we utilize our trucks better, we won't have to add to the fleet." ■

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DC Solutions | by Dinah Wisenberg Brin

Hardware Upgrade Unwraps DC Improvements

Kelli's Gift Shop Suppliers gets a present: a mobile device that improves inventory control and boosts DC efficiency.

Kelli's Gift Shop Suppliers, a wholesale distributor specializing in hospital gift stores, handled picking and packing the old-fashioned way for more than one decade after its founding.

Workers carried pen and paper, making carbon copies of orders — one sheet used as the customer's packing slip, the other sent to Kelli's accounting department for invoicing.

The system was less than efficient, especially for a growing business.

"We employed an extremely manual process, and because of that, we were also not using real-time inventory," says Kelli's President Justin Cohen, whose parents, Mike and Lori Cohen, started the business in 1999 as a division of a hospital gift shop chain that they ran. The lack of real-time inventory tracking meant that pickers often were sent to empty bins, resulting in wasted labor.

Operations changed dramatically in 2013, when Kelli's, based outside Dallas in Carrollton, Texas, started using handheld XG105 computers from Janam Technologies LLC of Woodbury, N.Y. In 2015, the gift wholesaler upgraded to Janam's faster, lighter, and more powerful XG3 model, a gun-shaped mobile device with long battery life and the ability to withstand 6-foot drops to concrete.

Extreme Makeover: DC Edition

Deploying Janam's mobile computers "basically transformed" Kelli's distribution center operations, says Cohen. Workers now handle all functions — receiving, moving back stock into picking bins, picking orders, and replenishment — on the handheld devices.

The technology "greatly improved efficiencies and productivity. It also significantly improved accuracy," Cohen says. "Because we're a distributor, inventory is one of our biggest assets. The

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technology allowed us to have much better control over our inventory and provide better customer satisfaction."

In addition to hospital shops, Kelli's supplies mom-and-pop pharmacies, casinos, and other small gift retailers, and is breaking into the airport and hotel gift shop markets.

The company, which acquired the American Treats hospital gift shop division in 2015, sells more than 4,000 items from 700-plus vendors. Its employees scan approximately 20,000 items each day.

Lori and Mike Cohen, who in the early 1980s had started a hospital gift shop operation that became the nation's largest such chain, sold the business in 2001, breaking Kelli's off as a separate enterprise.

Working in Shifts

Today, Kelli's is the largest wholesale distributor in the nation specializing in sales to hospital gift shops. The operation employs 15 pickers who work from 7 a.m. to 3:30 p.m., and eight people who work on a receiving, replenishment, and put-away shift, from 4 p.m. to 12:30 a.m., in addition to several sales, customer service, and accounting employees.

Before 2013, Kelli's wasn't using mobile computers or radio frequency guns.

"We needed a way to improve on the processes and better track our inventory," Cohen says, noting the company sells "inexpensive little items" such as special occasion balloons, bubble-gum cigars, plush animals, gift pacifiers, and piggy banks.

Boosting Accuracy and Efficiency

When the company looked to add automation, it turned to local dealer Texas Barcode Systems. The dealer's salesman showed Cohen the XG105. "The devices were priced fairly compared to some of the competition," Cohen says.

Price wasn't the only consideration. A customer service-oriented business such as Kelli's, which promises next-business-day shipping, appreciated the same kind of attention from its hardware vendor.

"The customer service has been fabulous," Cohen says, noting that Janam sent developers down twice, at Janam's expense, to work through the initial process and issues.

"That was a big factor for us when comparing Janam with its competitors," he says. "They were extremely responsive to our needs and that was something we don't find with other vendors."

Kelli's started testing the Janam XG105 in 2013, and late that year adopted a customized warehouse management system (WMS) that was developed by one of the distributor's vendors.

Kelli's saw a 25-percent increase in overall warehouse productivity after adopting the XG105, according to Cohen's conservative estimates. Upgrading to the XG3 *(pictured, left)* has produced another 10-percent increase in productivity, he adds.

"The devices represent a huge technology change; they didn't just improve the way we manage the warehouse," he says. The mobile devices also improved accounting management, according to Cohen, who explains that an accounting employee previously had to key in the items that had been picked.

Workers now use an RF gun to scan in items. Product data is then sent to the WMS, resulting in considerable time savings. The solution supports more efficient warehouse activity.

"The technology allows us to have more efficiencies and economies of scale," Cohen says. "With every transaction we're talking to the system, so the faster radio allows the pickers to move between bins more rapidly."

Because of the ability to track inventory accurately by bin location, Kelli's has reduced the amount of replenishment that workers do for the next day's shipments by approximately 20 percent, as they concentrate labor only on the bins where items are needed. "Before the WMS, we would replenish based on visual inventory and may have spent time replenishing a bin where no commitments were present," Cohen says.

The Janam XG3 runs Microsoft Windows Embedded Handheld 6.5, and Kelli's WMS was built on a platform to run on Windows Handheld.

Find That Toy

The Janam device allows workers to scan and assign items to specific cartons and produce an itemized packing list. In addition to working faster than the XG105, the newer XG3's battery doesn't have to be swapped out as often. "We get a full eight-hour shift out of one battery," Cohen says.

Automation has helped Kelli's grow aggressively without adding much headcount, and the distributor's customers say automation has made their lives easier, too.

Customers can check on packages more easily than they could before the wholesaler purchased Janam devices because now they can find out specifically which carton in a shipment contains the plush bear or baby outfit that gift shop employees—typically older volunteers in hospital shops—can't find in their orders.

An average order contains at least 25 different items in multiple cartons. Previously, the company didn't indicate which items were in which boxes, Cohen says. Now, if a customer calls about a missing item, Kelli's can pinpoint which carton contains it.

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Kelli's Gift Shop Suppliers workers scan approximately 20,000 items daily. Using mobile devices in its DC dramatically improves inventory tracking.

More companies like Kelli's have reached the point where they see the widespread use of mobile devices and are ready to use it in their businesses, observes Doug Lloyd, Janam's vice president for sales operations.

"The growth market is in the small to mid-size enterprises," Lloyd notes. "The ubiquitous nature of applications is now transferring down further and deeper into this business market."

The longer lifecycle of the devices is a key consideration. "Business decision makers want to amortize that investment over years, not months," Lloyd notes. Users typically get about three years from the product, although some remain on Janam devices for eight or nine years, according to Lloyd.

While most Janam devices operate in warehouses, the company has 1,000 units in UK hospitals to help track blood and breast milk.

The company likely has a long-time customer in Kelli's Gift Shop Suppliers. The wholesaler reports improved processes in its distribution centers, and no immediate plans to upgrade its mobile devices. ■

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Casebook | by Jennifer Baljko

How Ariens Weathers Seasonal Demand

A 3PL partnership helps Ariens blow away logistics inefficiencies and mow down transportation costs.

When snow throwers and lawn mowers are the main products in your portfolio, seasonal order variability, uncertain weather changes, and the ability to ship bulky, odd-shaped equipment become important parts of your supply chain and logistics planning practices.

Outdoor equipment manufacturer Ariens Company can attest to that. It has firsthand experience in managing those complexities and the unpredictable elements layered upon them.

The private, family-owned Brillion, Wis.-based company faces the dilemma many others encounter: Balancing lean manufacturing practices while simultaneously optimizing inventory for inbound parts and outbound finished goods, and expanding the customer-facing distribution footprint to improve order fulfillment and time to delivery.

Tackling these common but significant issues led Ariens to seek help from a third-party logistics (3PL) provider that could automate some processes and smooth warehousing and transportation flows.

However, the company's initial choice did not work out, says James Merwin, vice president of supply chain for Ariens. The 3PL that Ariens started with was a big player in the freight business, and bundled Ariens' warehouse and transportation practices into one offering. The companies tried to work together, but it wasn't a match.

"We may be a smaller company but we still expect to have some things tailored for us," Merwin says. "We couldn't fit into the out-of-the-box solution the 3PL offered us. We needed a more customized mix of managed services and technology, and we weren't

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seeing any significant cost reductions."

Ariens and the 3PL split ways, and the company began the Request for Proposal process to find a new logistics partner.

The company then conducted a new RFP search, which resulted in its current strong relationship with Redwood Logistics. Chicago-based Redwood offers logistics services, data-driven network solutions, and a strategically integrated model that has allowed Ariens to achieve significant efficiency gains, improve inbound and outbound material and shipping visibility, and reduce costs.

"It was clear early on that the companies were a good fit," says Merwin. "We share a sense of partnership, and are finding ways we can help each other grow."

During their initial meetings, Redwood executives explained their available solutions, and how they could tailor them to meet the company's needs. "We went with Redwood, and it was one of the smoothest implementations I have been part of," Merwin notes. "We are about 18 months into the partnership and we continue to see improvements. Efficiency has increased and our overall freight costs have declined and continue to do so."

Defining the Necessities

Getting to this point, however, didn't happen overnight, but was several years in the making.

When Merwin joined Ariens in 2013, the company was in different stages of implementation and integration (or disintegration, as the case would be in one part of the operations) of several supply chain, logistics, operations, and manufacturing practices.

Ariens—which annually ships about 60,000 zero-turn lawn mowers and between 120,000 and 200,000 snow throwers depending on winter conditions in North America (its main market)—maintains a year-round production schedule, alternating seasonally. Snow blower production ramps up in the spring and summer, with sales starting to pick up in fall and going through the winter. Lawn mowers go through the factory in late fall and winter, and are out in the market during the spring and summer gardening and lawn-tending months.

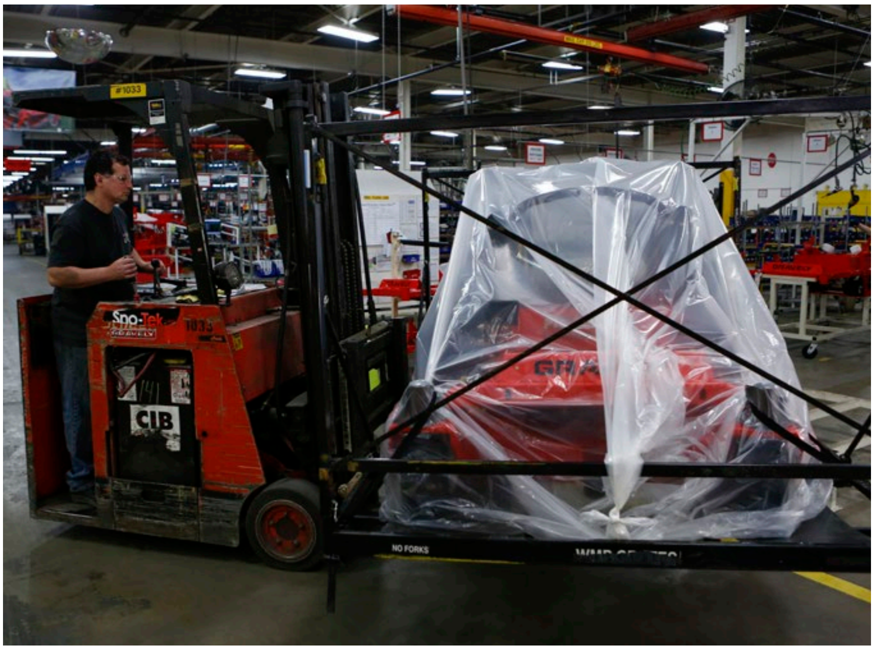
Photo: Ariens

Ariens turned to its 3PL to improve the way it shipped bulky, odd-shaped products, such as lawn mowers.

Typically, though, Ariens has to adjust its production run as the weather changes and orders and reorders fluctuate to accommodate an unexpected uptick in demand. A harsh, snowy winter in the United States, for instance, means an unpredictable number of snow blower reorders from Ariens' small and mid-size dealers and big-box retailers and hurry-up deliveries to snow-affected regions.

This makes forecasting tough. Although Ariens' customers send in preliminary orders three or four months before the seasons change, giving the team enough time to fill early-season demand, the mid-season reordering cycle and final delivery schedule runs on Mother Nature's time.

Getting additional snow blowers to the right part of the United States and Canada rapidly—say, within one or two days of when a snow storm hits and end users urgently need to shovel out—becomes a logistics challenge Ariens frequently has to work through. If the snow blowers are not on the shelves of their dealer's space-constrained shops, Ariens loses the sale of these spontaneous purchases because harried consumers grab a competitor's brand.

Complicating matters, Ariens migrated to lean manufacturing about 17 years ago, but until recently it struggled with gaps in its inbound and outbound inventory management strategy. Ariens operates two factories in Wisconsin and one in Nebraska to produce snow and lawn equipment and other machines such as log splitters, power brushes, and grass edgers. While implementing lean concepts made the factories more efficient overall, getting and pulling the right mix of incoming materials from about 250 suppliers on any given day, and putting enough finished goods into distribution warehouses, weren't always perfect calculations.

Meeting Performance Metrics

In reality, on-time delivery performance to customers suffered, says Merwin, because while Ariens is good at building to three- to six-month forecasts, its business model and products don't lend themselves to a quick-turn, build-to-order model.

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CAN EVERYONE ON YOUR TEAM SOLVE THIS?

$$ICC = \frac{C + T + I + W + X + (S - R1) + (O - R2)}{\text{Annual \$ Material Cost}}$$

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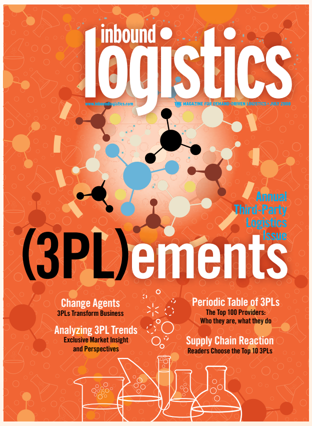

ICC=inventory carrying costs **C**=capital **T**=taxes **I**=insurance **W**=warehouse costs **X**=shrinkage **S**=scrap **O**=obsolescence costs **R**=recovery

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When the company evaluated one of its important performance metrics—getting product out within three days of receiving the order—it discovered it was hitting that goal less than 50 percent of the time.

Other logistics and transportation bumps also turned up. Small dealers account for about 85 percent of Ariens' revenue and about the same percentage of Ariens' outbound truck shipments. Big box retailers Home Depot and Lowe's round out the revenue side, but they schedule their own shipments and use their own trucking fleets.

"Most of our dealers are small single-point businesses, some may have two to four locations, but none of them have significant warehousing space," says Merwin.

"Many of their orders are for less than full truckload deliveries," he adds, noting the challenges and costs associated with moving partially filled trucks around big stretches of North America. "The big box retailers want full truckloads, but they schedule their own pickups and deliveries."

Because of these different kinds of shipment requirements, Ariens had to re-evaluate its distribution and warehouse footprint and find better ways to match production, inventory, and shipping needs.

Ups, Downs and Outsourcing

The combination of these ups and downs, and a recognition that managing freight was not Ariens' specialty, prompted the decision to outsource logistics operations.

Enter Redwood Logistics. The 3PL came to the table with innovative ideas for managing and fulfilling orders, and suggestions for multi-modal and cost-effective partial shipments. Redwood also helped Ariens better understand government regulations.

Importantly, Redwood was willing to work with Ariens' warehouse solution provider, Warehouse Specialists, LLC (WSI), which was brought back into the fold after the first 3PL relationship crumbled.

"When we began to talk with Ariens, we knew they wanted a best-of-breed transportation and warehouse management solution," says Steve Walton, Redwood's chief logistics officer. "Some of our competitors have a 'take it all' approach, but we knew early on we needed to create a place where different parts could co-exist."

"When transportation and warehouse management was bundled in one package, we started to lose control of those relationships; we weren't sure who was managing what," Merwin explains. "This time, we wanted to give the warehousing piece back to WSI and we wanted Redwood to manage the transportation.

Photo: Ariens

One of Ariens' challenges is managing mid-season reorders for snow blowers, a complex fulfillment practice hinged to unpredictable weather changes.

"It became clear to us that Redwood would be able to tailor their systems and build one solution that allowed information to flow back and forth, and tied all the pieces together," he adds.

Redwood did just that—it linked the enterprise resource planning, warehouse management system, and transportation management platforms together to create a one-world view.

One key outcome of having a connected view was a redesign of Ariens' distribution network. Instead of holding inventory and fulfilling orders from one or two main warehouses (which, for some time, was the back of one of Ariens' factories), Redwood helped Ariens move to a hub-and-spoke model.

In this scenario, finished goods are distributed to a few central hub sites and then routed to smaller facilities throughout the United States, allowing different regional customers to be better served with shorter travel distances. The domino effect of that setup creates more flexible delivery options, including partial shipments and multimodal transportation options. It also enables loading a truck full at one warehouse and making several short-distance stops to multiple dealers who always fell in the less-than-full truckload category.

"Once we were able to set up and

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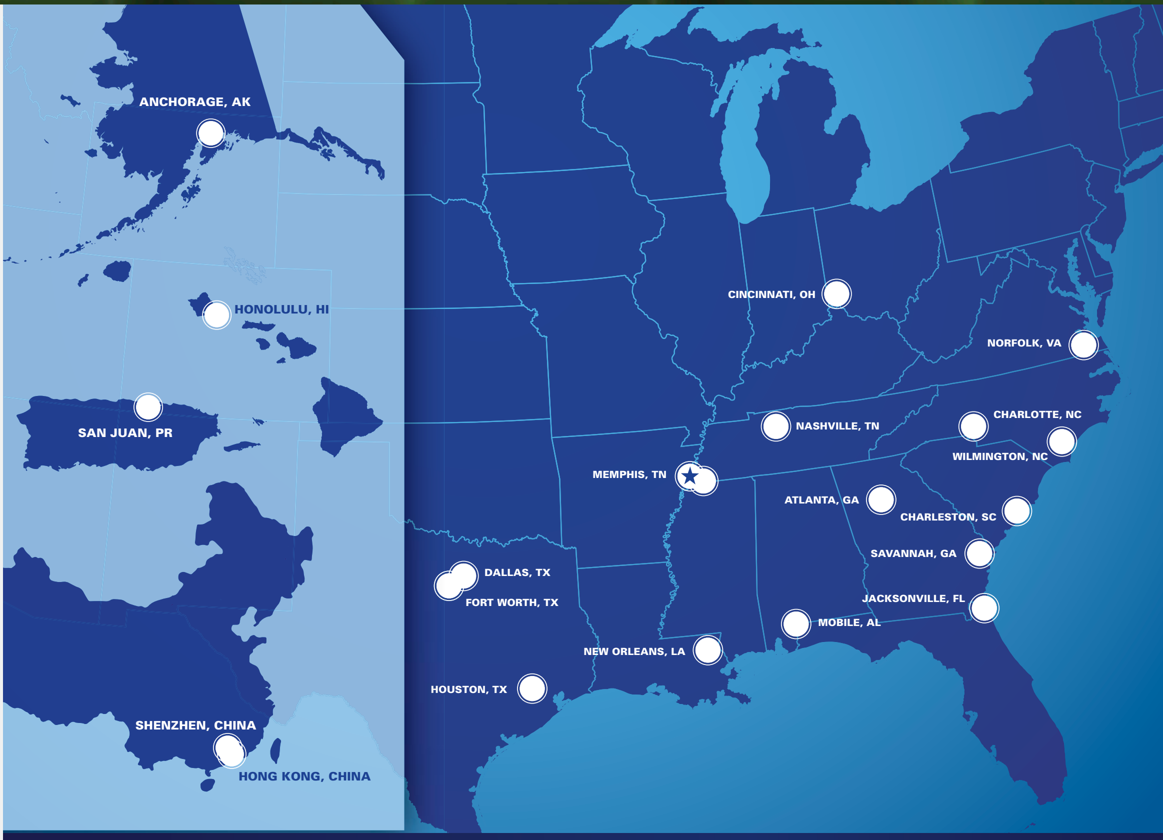

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integrate the right data flows, we could start looking at more granular data, such as order type, the business process being used, and performance metrics," says Walton. "From there, we could create repeatable and scalable use cases and capture even more information about the transportation and warehouse network."

Deep Dive Into Data

Drilling down other metrics such as cost per pound and cost per delivered pound also became possible. Having this knowledge, and aligning key performance indicators (KPIs), widened creative problem solving, says Walton.

For instance, Ariens now has a clearer picture of where it can break up or fill truckloads, reduce costs, delay shipments, or expedite delivery. By running different cost-per-pound scenarios, Ariens can optimize how it moves products in and out of the factory and throughout its distribution network.

"We spend $30 million annually on freight. If we can shave a few points off, it makes a big difference," adds Merwin. "Since partnering with Redwood, we have seen our freight costs decline and continue to do so at a steady rate."

Freight costs as a percent of sales were about 6 to 7 percent two or three years ago, Merwin notes. For the fiscal year ending June 2016, that metric dropped to less than 6 percent, and over the past few months has been trending lower than 5 percent. The goal is to get freight costs as a percentage of sales to 4 percent.

Merwin also expects to see a shift in Ariens' ability to fulfill customer orders faster and tap into a forward-looking view of its order fulfillment capabilities. Its target is to improve its performance rating for getting product out within three days of the order from 50 to 80 percent.

"Our goal is not to get to 90 or even 100 percent," Merwin explains. "We use 80 percent as our goal for that metric because we have to factor in frequent, weather-based seasonality fluctuations we can't predict.

"We also don't only want to know about yesterday's delivery performance," he adds. "We want to have an advanced view of where inbound orders and outbound delivery meet."

Merwin and Walton attribute the current results to combined teamwork among Ariens, Redwood Logistics, and WSI.

"It starts at the top with monthly reviews of what has happened, how the KPIs align, and how business processes can be automated," says Walton. "But, it's also the simple things that drive alignment. For example, we can adjust delivery times when dealers can't take a full truckload and reduce the pressure they feel for stockpiling finished goods. Or, when things get hectic, we can move people from one team to another to help deal with the fluctuations."

Macro Views to Micro Nuggets

Going forward, the companies plan to continue to find other ways to drive performance, reduce costs, and trim delivery times. It will also drill down from wider macro views of Ariens' warehouse and transportation landscape to micro nuggets that provide continual systematic improvements, such as examining carrier lines and routes, split shipments, average travel distances, and inventory-level tweaks.

"In the end," says Merwin, "we want the ability to make smarter decisions." ■

The Redwood Logistics team helps Ariens optimize its transportation and distribution strategy.

Photo: Redwood Logistics.

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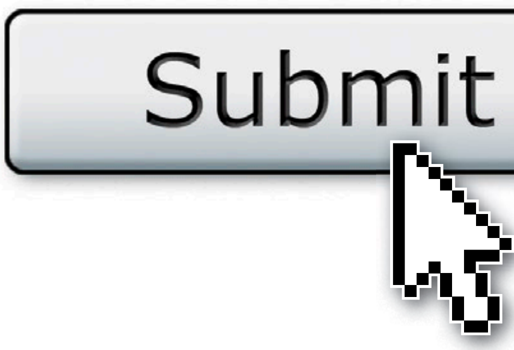

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White Paper Digest

Industry experts amass supply chain management best practices and skill sets, and invest in new research and evaluation tools. Now you can benefit. *Inbound Logistics* has selected this collection of whitepapers that will give you a jump on important supply chain issues. For more information on any of these whitepapers, visit the Web sites listed below.

Averitt

TITLE: ***The Retailer's Guide to Vendor Compliance and Reducing Chargebacks***

DOWNLOAD: *retail.averittexpress.com/whitepaper-retailers-guide-to-vendor-compliance-and-reducing-chargebacks*

SUMMARY: With increasing demands from retail buyers, this whitepaper is aimed at providing tips and best practices that shippers can utilize to help avoid delivery and compliance mishaps. You'll learn several key practices that you can put into action immediately to help boost your ability to meet your retail vendor's compliance requirements. From coordinating warehousing and production to knowing what to ask of your carrier, become empowered to ship retail without the worry of incurring costly chargebacks and fees.

SEKO Logistics

TITLE: ***Supply Chain Visibility—Software Tools for Those New to SaaS***

DOWNLOAD: *http://bit.ly/2ifV8Ht*

SUMMARY: The emergence of supply chain software providers in the cloud that span the entire supply chain is happening now. This shift will provide smaller hard goods manufacturers and distributors more efficient and collaborative supply chains, which ultimately reduce cost and increase profitability.

QubeVu

TITLE: ***Dimensioning Systems: Getting the Most from Your Investment***

DOWNLOAD: *http://bit.ly/2ifWIZX*

SUMMARY: As of Jan. 8, 2017, the cost of shipping most packages is based on their dimensions, not just their weight. Without the tools to dimension inbound and outbound parcels, many shippers and warehouses will find themselves at the mercy of their carriers—unable to predict or control costs, or even to audit their invoices. This whitepaper offers a crash course for people who need to begin thinking about dimensioning solutions and don't know where to start.

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HighJump

TITLE: ***5 Dirty Secrets of Warehouse Management Systems***

DOWNLOAD: *http://bit.ly/2ifWJwZ*

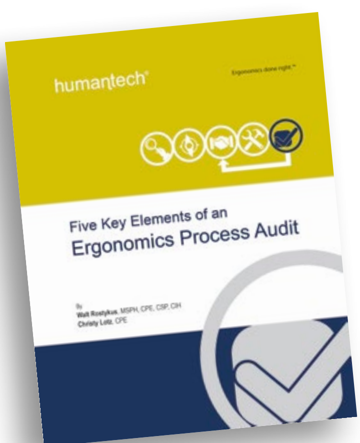
SUMMARY: It's a fact: most best-of-breed warehouse management system (WMS) providers force you to pay every time you require a system change. Uncover five more dirty secrets many warehouse management systems don't want you to know. Download this whitepaper to discover these hidden truths and gain valuable information on considerations for evaluating WMS vendors. Arm yourself with information that will enable you to select a system that will fulfill your requirements today and years from now as your company grows—all at a low total cost of ownership.

CTSI-Global

TITLE: ***Trust & Verify—Best Practices: Financial Due Diligence And the Outsourcing of Freight Bill Audit and Payment***

DOWNLOAD: *http://bit.ly/2ifP9SM*

SUMMARY: Billions of dollars are circulated globally for the movement of goods. Transportation costs can be higher than any other expense. It is critical that companies carefully choose their freight payment provider. Performing due diligence on the vendor's financials not only protects the company's funds, but also ensures they won't lose money and be indebted to any carrier. This whitepaper highlights a number of steps companies can take to ensure a successful relationship, and protect and minimize financial risk.



Humantech

TITLE: ***Five Key Elements of an Ergonomics Process Audit***

DOWNLOAD: *http://bit.ly/2ifPFAd*

SUMMARY: Here is Humantech's fifth e-book in its series about the steps required to build and sustain a successful ergonomics process. The previous e-books focused on the planning and doing phases of an ergonomics process. The purpose of this e-book is to check progress and determine if all elements are in place, and if the goals and measures are being met.

Purolator International

TITLE: ***Border Hassles That Can Put the Canadian Market Out of Reach: What Your Business Should Know***

DOWNLOAD: *http://bit.ly/2ifORvg*

SUMMARY: This whitepaper discusses regulatory and logistical hurdles U.S. businesses must be aware of when shipping across the U.S./Canadian border. Companies must understand and address these challenges as part of the cross-border experience. Transporting goods into Canada is complicated. Regulations and protocols are constantly changing and U.S. businesses must entrust their Canadian-bound shipments to a qualified logistics provider that ensures shipments are afforded every trade enhancement, priority clearance review, and duty/tax reduction to which they are entitled.

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InfinityQS

TITLE: ***Visibility Across the Manufacturing Enterprise***
DOWNLOAD: http://bit.ly/2ifHROY
SUMMARY: Despite recent advancements in manufacturing technology and data management, many manufacturers still use antiquated data systems that store quality data on site at individual plants. While these systems might help to make improvements at a local level, they create data silos, preventing manufacturers from looking across their operations to find opportunities for global improvement. In this whitepaper, InfinityQS advises manufacturers to unify plant-level quality data to attain enterprise visibility. Organizations can use strong quality software and apply new data collection practices and modern analytics to unify disparate data streams and drive sophisticated analyses and improvements across their whole enterprise.

Weber Logistics

TITLE: ***Logistics Primer for Importers: What to Do After Your Product Clears Customs***
DOWNLOAD: http://bit.ly/2ifSIcO
SUMMARY: If you import goods through the Ports of Los Angeles/Long Beach, the complexity of port and terminal procedures can slow down your cargo. It helps to know the ins and outs of terminal operations to quickly move products off port and into the hands of your retail customers. This whitepaper provides tips for distributing imported products—from port services to warehousing to final delivery.

Mettler Toledo

TITLE: ***Preventing Product Recalls With Proper Planning and Equipment***
DOWNLOAD: http://bit.ly/2ifSfX4
SUMMARY: This whitepaper informs manufacturers about the reasons and potential costs of product recalls. It details how they can avoid recalls, and offers guidance on choosing the best solutions to incorporate into product quality control programs. The whitepaper addresses five main questions: What does a recall cost? What are the main reasons for recalls? How do you control the controllable? What is the best practice to minimize recalls? What do you need to research?

Softeon

TITLE: ***Is Now the Time for Cloud WMS?***
DOWNLOAD: http://bit.ly/2ifPmpa
SUMMARY: Warehouse Management Systems (WMS) have been late to the cloud game, and suitable only for simple distribution center operations. The times have changed. Cloud-based supply chain solutions are rapidly gaining share, and will likely prove the dominant approach in just a few years. Download this whitepaper to learn how the barriers to warehouse management in the cloud are dropping, and why companies are taking advantage of its power right now.

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C.H. Robinson

TITLE: ***Strategies to Build a More Efficient Automotive Supply Chain in China***

DOWNLOAD: *http://bit.ly/2ig3gaL*

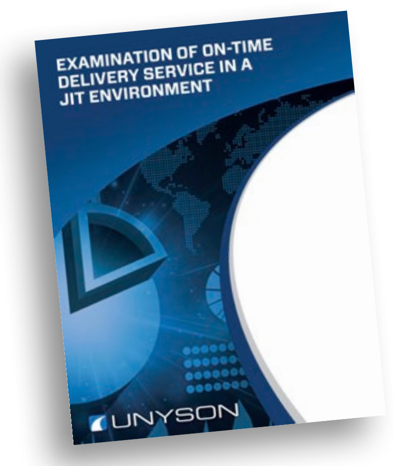
SUMMARY: China represents tremendous opportunities for automakers and the companies that serve them. There are specific qualities that companies should seek in a qualified logistics provider to grasp their best opportunities. This whitepaper explains the top logistics challenges for the automotive industry in China, and how logistics providers can support automotive companies in China.

C3 Solutions

TITLE: ***The Internet of Things and the Modern Supply Chain***

DOWNLOAD: *http://bit.ly/1QvdkUb*

SUMMARY: You have probably heard the term Internet of Things (IoT) quite a bit in the past year. It is frequently mentioned in the same breath as supply chain, with the common observation that it will significantly impact supply chain operations. This whitepaper clarifies what is meant by the IoT, and identifies some ways in which it is expected to, or already is, transforming supply chain operations. It also offers some suggestions on how to best leverage IoT opportunities in your business.



Unyson

TITLE: ***Examination of On-time Delivery Service in a JIT Environment***

DOWNLOAD: *http://bit.ly/2ifLJzD*

SUMMARY: Adopting just-in-time (JIT) inventory principles has enhanced production operational efficiency, cost effectiveness, and customer responsiveness for many organizations. But the real key to success is providing a solution that applies JIT principles to the specifics of each client's industry and accurately tracks and delivers on-time performance, regardless of industry conditions, leading to the greatest competitive advantage.

Crown Equipment

TITLE: ***The True Cost of Ownership for Counterbalance Forklifts: Understanding the Impact of Hidden Costs***

DOWNLOAD: *http://bit.ly/1WzKANg*

SUMMARY: Counterbalance forklift owners seeking to best manage their industrial equipment investment will find this new whitepaper very helpful. It explores how performance and durability, service and maintenance, and ergonomics can impact overall expenses; and illustrates how important it is to take a more comprehensive approach to understanding the true cost of ownership for counterbalance forklifts.

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LOGISTICS EVENTS 2017

WHERE TO GO WHAT TO SEE

Offering insightful perspectives and thought-provoking discussion, these events are the year's go-to places for supply chain professionals.

FEB 12-15, 2017
Orlando, Fla.
Retail Supply Chain Conference 2017

Retail Industry Leaders Association (RILA)
bit.ly/RILAconference

The conference explores the pressing issues facing the retail supply chain. Offering sessions on supply chain talent solutions and optimizing inventory, the event provides the expertise of leading retailers. From transportation, distribution, international logistics and sourcing, to omni-channel strategies, the conference explores the elements of retail supply chain success.

MAR 7-9, 2017
Austin, Texas
LogiMed 2017

Worldwide Business Research
bit.ly/LogiMed2017

LogiMed brings together medical device supply chain executives to share best practices for both building and maturing their operations. Through case study examples, small group discussions, and networking activities, the event spotlights best practices to improve the end-to-end supply chain and minimize cost in today's healthcare environment. *IL* readers get a 25-percent discount to attend with code LM17INLO.

MAR 14-15, 2017
Atlanta, Ga.
Home Delivery World 2017

Terrapinn
www.terrapinn.com/homedelivery

The event brings decision-making retailers together to discuss strategies for supply chain excellence and building a sustainable logistics network. Shippers in attendance identify new ways to improve customer experience and retention through fulfillment, delivery, and reverse logistics programs.

MAR 19-21, 2017
Palm Springs, Calif.
2017 IWLA Convention & Expo

International Warehouse Logistics Association (IWLA)
www.iwla.com

The IWLA Convention & Expo highlights warehousing innovation and features educational sessions on warehouse logistics and its economic impact. The theme of the event is "leadership that inspires," and sessions and events focus on giving attendees new ideas to motivate employees for continued growth. Sessions delve into transportation law and domestic and international fulfillment opportunities.

MAR 20-22, 2017
Henderson, Nev.
43rd Annual Conference: Education for Transportation Professionals

Transportation & Logistics Council
www.tlcouncil.org

General sessions explore the critical issues facing the transportation and logistics industry—including infrastructure funding, supply chain security, and loss prevention. Workshops also cover timely topics such as the challenges of food and drug shipments and the status and impact of recent federal laws.

MAR 28-30, 2017
Dallas, Texas
ECA MarketPlace

Express Carriers Association (ECA)
bit.ly/ECAmarketplace

The event provides an opportunity for shippers and carriers to network and exchange information to form logistics partnerships. Shippers find regional and specialized carriers that can provide a viable supply chain alternative. The exhibition showcases new technologies and various transportation services.

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APR 3-6, 2017
Chicago, Ill.
ProMat 2017
MHI
www.promatshow.com

Attendees get hands-on demonstrations of the latest manufacturing, distribution, and supply chain equipment and systems from more than 850 providers. In keynotes and more than 100 seminars, ProMat also explores the latest ideas driving productivity including autonomous vehicles and sustainable facility solutions.

APR 9-12, 2017
Orlando, Fla.
Shippers Conference & Transportation Expo
National Shippers Strategic Transportation Council (NASSTRAC)
bit.ly/shippersexpo

Offering attendees a unique perspective, NFL Oakland Raider linebacker and Superbowl champion Phil Villapiano, now vice president of sales at Odyssey Logistics & Technology, reveals the lessons he learned on the field and how he has harnessed them for his career in logistics. In addition, the expo hosts panel discussions on economic, trucking, and transportation updates and their impact.

APR 30–MAY 3, 2017
Fort Worth, Texas
WERC 2017: 40th Annual Conference for Logistics Professionals
Warehousing Education and Research Council
www.werc.org/2017

The conference offers actionable takeaways for logistics and warehousing professionals. Sessions cover varied topics including the value of women in the supply chain, extending the life of a legacy WMS, five rules to transform supplier relationships, and reducing shipping costs with carton optimization.

MAY 16-17, 2017
Atlanta, Ga.
Georgia Logistics Summit
Georgia Center of Innovation for Logistics
bit.ly/GAlogisticssummit

The summit offers first-hand supply chain insights from industry executives. For the second year, participants discuss their logistics success stories in roundtables. Expanded sessions cover Georgia's logistics technology, what's new and next around the state, current logistics regulations, and a transportation update.

MAY 21-24, 2017
Orlando, Fla.
ISM 2017 Annual Conference
Institute for Supply Management
ism2017.org

Sessions include building transformational supplier relationships and identifying supply base optimization actions to drive supply performance. The conference tackles global supply chain challenges and provides attendees with actionable ideas, standards, and best practices for their company and career.

MAY 23-25, 2017
Phoenix, Ariz.
Gartner Supply Chain Executive Conference
Gartner
www.gartner.com/events/na/supply-chain

Participants learn to create transformational strategies to exceed supply chain performance expectations. The conference also explores hot-button topics such as developing a patient-centered supply chain, creating value through customer collaboration, and building an inclusive and diverse supply chain organization.

SEPT 17-19, 2017
Long Beach, Calif.
Intermodal Expo 2017
Intermodal Association of North America
www.intermodalexpo.com

The event delves into the key challenges facing the intermodal supply chain. Members of the intermodal freight community attend presentations on the technologies impacting intermodal and how to strengthen shipper/drayage partnerships. Discussions also cover recent trucking regulations and funding—and their intermodal implications.

SEPT 24-27, 2017
Atlanta, Ga.
CSCMP Annual Conference
Council of Supply Chain Management Professionals
www.cscmpconference.org

More than 100 sessions explore strategies that industry leaders have implemented to transform their company's supply chain. Aside from innovation solutions, industry leaders also discuss personal experiences and provide valuable career insights. An exhibition showcases the latest equipment, systems, and technologies providing solutions to various supply chain challenges.

OCT 15-17, 2017
San Antonio, Texas
APICS 2017
American Production and Inventory Control Society
www.apics.org/annual-conference

The APICS conference explores best practices to drive supply chain innovation. It delves into key strategies to create more sustainable, strategic, and value-driven supply chains. Aside from organizational insights, participants also come away with career takeaways and network with professionals shaping the future of supply chain, logistics, and operations management.

NOV 1-3, 2017
Miami, Fla.
Air & Sea Cargo Americas
World Trade Center Miami
www.seacargoamericas.com

Executives from the aviation, maritime, and logistics sectors exchange insights and ideas on how to enhance the growth of the cargo industry in the Western Hemisphere. Topics include security, regional consolidation, manufacturer and shipper needs in high growth cargo, trade facilitation, improving productivity, speed, and service quality, and controlling costs while streamlining customer service.

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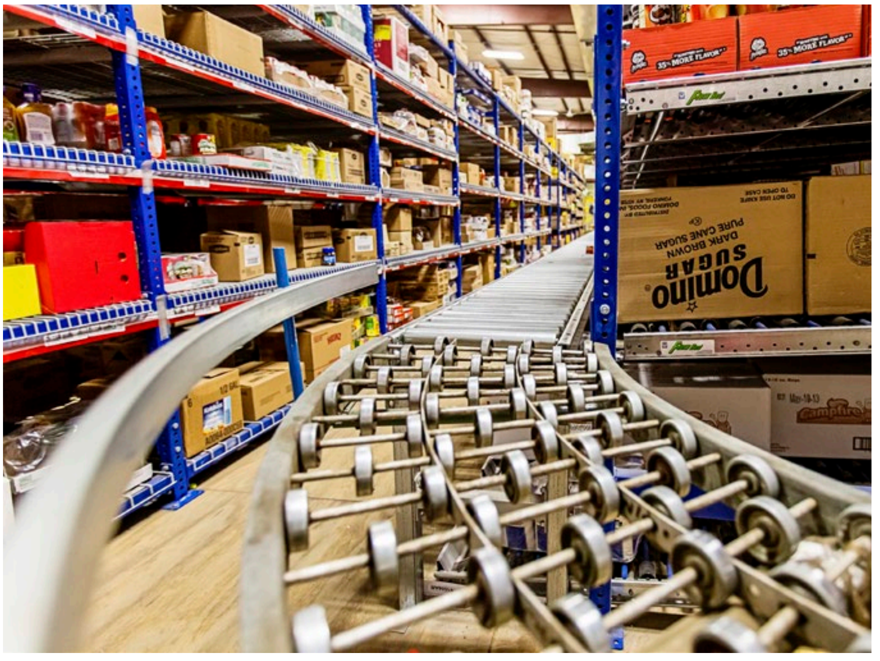
PRODUCTSPOTLIGHT

CONVEYOR AND SORTATION SYSTEMS

UNEX Gravity Conveyor: UNEX manufactures gravity conveyor side channels to the inch, allowing companies to order precisely what they need. This eliminates the need to saw cut sections to length. The UNEX gravity conveyor comes with multiple options, from full-width rollers with ball bearings for maximum carton support to ball transfers that allow multidirectional materials handling. Along with positioning materials precisely, ball transfers are useful for making tight turns.



Dematic Multishuttle Flex: This automated inventory staging buffer is designed to accommodate cartons and totes. The Multishuttle Flex uses a flexible load handling device to store and retrieve variable load sizes and formats, without the use of trays. The load handling device "flexes" to adjust to the dimensions of the load to be handled, and accommodates carton/tote sizes of varying lengths and widths. The system can be configured to fit existing building layouts to optimize density and minimize floor space.

Wynright AS-30 Sliding Shoe Sorter: Wynright, a subsidiary of Daifuku North America Holding Company, makes the AS-30 Sliding Shoe Sorter, a high-speed, positive divert sorter designed to accurately track and gently sort cartons of various sizes and configurations. Its high-speed divert station handles high product volumes. It has no moving parts, reducing wear and tear. Operating at speeds up to 541 feet per minute, the sorter can process as many as 13,500 pieces per hour for a 17.7-inch load length.

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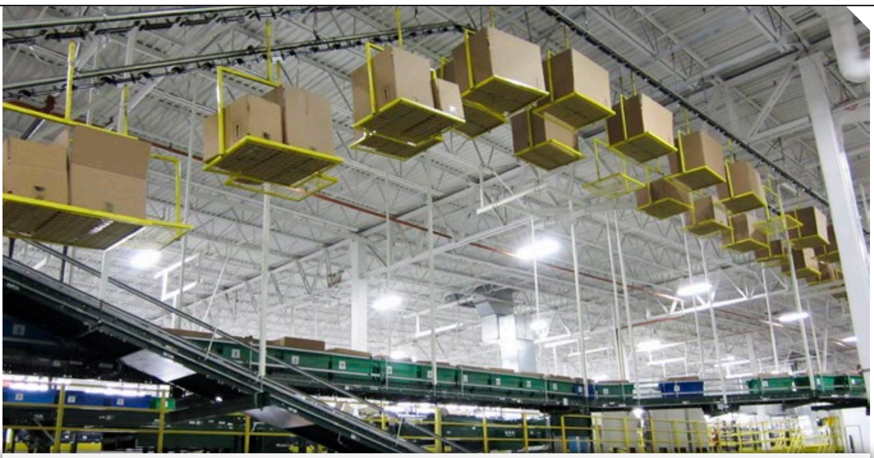
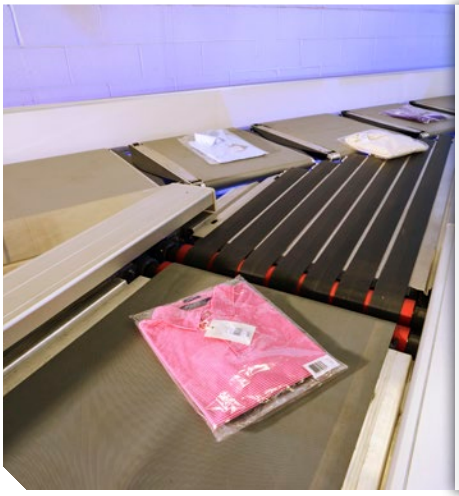


PACLINE Empty Carton Conveyors: These overhead conveyors increase the efficiency of split case or less than full carton picking areas, where the man-hours consumed per order are often the highest in the entire warehouse. Combined with a centralized carton building area, the system lets order pickers concentrate on picking. The carton delivery system can be located directly over picking conveyors. The overhead conveyors are available with a variety of incline angles ranging from 15 to 45 degrees.

Intelligrated IntelliQ ZoneFlex: This belt-driven, zero-pressure accumulation conveyor operates quietly with minimal maintenance. It slows the movement of products before accumulation to minimize damage. Monitoring and automatically responding to accumulation conditions, the system can handle product flow of varied package sizes and weights.

Bastian Solutions OptiSort System: The OptiSort is designed for sorting a large range of different products from garments, shoes, accessories, multimedia, cartons, and jiffy bags. The tray and pusher design smoothly handles and diverts products into a chute, roll container, carton, or tote. Applications include order fulfillment, returns, e-commerce, and goods receiving.



Mantissa Corporation Cross Belt: This solution uses an electrically controlled divert mechanism to accurately discharge a wide range of products from the sorter. Its streamlined design requires less moving parts and minimizes maintenance needs. The system can be integrated into the company's Scorpion Sortation solution, which can be built to sort a wide variety of items.

Dorner 2200 Series Modular Belt Conveyor: The redesigned 2200 Series Modular Belt Conveyor comes with different belt options, an open frame design, and a universal T-slot that is compatible with industry standard hardware. The T-slot simplifies attaching accessories and guiding. The optional high-speed nose bar transfer option allows for transfers of small parts at speeds up to 175 feet per minute. Its narrow profile allows it to be positioned under machinery and in other tight spaces as needed.

BEUMER Tilt Tray Sorter: The Tilt Tray Sorter, with mechanically controlled tipping elements, is a sortation system for items of multiple sizes—from small bags to large, heavy boxes. It transports parcels and packages safely and discharges them with accuracy. The tipping element allows a guided discharge of items to both sides. Besides the lateral tipping movement of the tray, the tipping axle is also lowered vertically so the item gently slides off the tray.

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INBRIEF NEW SERVICES & SOLUTIONS

General, breakbulk, heavy lift, and project cargo transporter **BBC Chartering** launched a monthly service between Thailand and Australia/New Zealand in mid-December 2016. Shippers with trading requirements from Thailand can contact BBC Chartering's office in Singapore to book space for cargo.

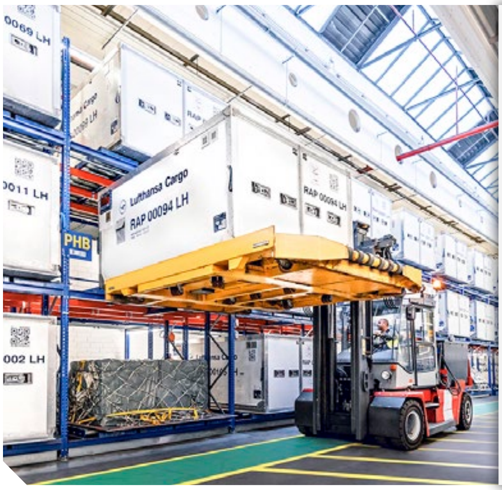
// Services //

APL Logistics' customs brokerage division **Carmichael International Service** expanded its offerings to Mexico through an agreement with Mexico's CARMI Logistics. In Mexico, Carmichael provides cross-border customs brokerage, inland transfer, and consolidation. Shippers can use these services for U.S.-Mexico border crossings or in conjunction with Carmichael's other U.S. and Canadian services.

Florida's **Port Manatee** is expanding its fuel operations by increasing capacity and inking a long-term contract extension expected to further boost liquid bulk cargo volumes at the port. An 80,000-barrel tank is slated to re-enter service in mid-2017, to bring total active capacity of terminaling and transportation company **TransMontaigne Partners** at Port Manatee to 1.5 million barrels. In addition, TransMontaigne's light oil contract at Port Manatee has been extended for five years.

UPS broke ground on a 375,000-square-foot expansion of its Columbus, Ohio, ground package hub. When completed in fall 2018, the facility will be able to process more than 63,000 packages per hour—double its current capability.

The **Port of Wilmington Cold Storage** facility at Port of Wilmington is the first in-port cold storage facility in North Carolina. The warehouse features 101,000 square feet for use by food, pharmaceutical, and floral



Lufthansa Cargo plans to expand its Cargo Cool Center at its home hub in Frankfurt, Germany. It will increase the temperature-sensitive cargo facility's footprint from 48,000 square feet to more than 86,000 square feet, and will upgrade existing cooling infrastructure. The changes will be completed in summer 2017.

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Third-party logistics firm Bolloré Logistics opened a new facility in Charleston, S.C. The new location expands Bolloré's presence in the Southeast and helps aerospace, automotive, manufacturing, and retail companies move cargo through the Port of Charleston.

shippers, as well as other industries with temperature-controlled requirements.

Transportation and logistics company **Gebrüder Weiss** expanded its location in Memmingen, Germany by more than 53,000 square feet, increasing the size of its handling area and building two new, fully insulated warehouses. The facilities can be fitted with high shelves and accommodate bulky goods.

Less-than-truckload (LTL) carrier **Old Dominion Freight Line** upgraded its facilities in Oklahoma City, Okla., Shreveport, La., and Parsons, Kansas, to increase shipping capabilities in the South and Midwest. The Kansas project includes a 24-acre facility located near the intersection of two main corridors for southern and eastern Kansas: Highway 400 and 59.

3PL **KTS Logistics** added a cartage/pickup and delivery service in the Greater Toronto Area and will soon offer shipment tracking on its website. The pickup and delivery offering focuses on service to retail outlets.

Dupré Logistics expanded its brokerage and 3PL groups by adding branch offices in Dallas, Texas, and Buffalo, N.Y. The new locations bolster services in the Southwest and on the East Coast.

FedEx and drugstore chain **Walgreens** entered into a long-term agreement to offer consumers access to FedEx dropoff and pickup services at thousands of Walgreens locations across the United States. The expanded FedEx Ground and FedEx Express package shipment and dropoff options address increasing e-commerce requirements.

Transportation and logistics provider **Werner Enterprises** expanded its terminal in Laredo, Texas, to boost efficiency and driver satisfaction at the facility. The company developed 10 existing acres to accommodate a second entrance for Werner equipment, added 110 trailer parking spots, and doubled the number of inspection bays from four to eight to meet increased volumes in Laredo, a cross-border gateway to and from Mexico.

//Transportation//

American Airlines launched a Boeing 787-9 service between Dallas/Fort Worth and Madrid Barajas, Spain, offering

Etihad Cargo, the freight division of United Arab Emirates (UAE) airline Etihad Airways, began operating three new services. The routes, serviced by Boeing 777 freighters, connect the UAE with East Midlands and Stansted airports in the United Kingdom, and Copenhagen, Denmark.

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Enterprise mobility and data capture company Scandit launched Barcode Scanner Software Development Kit (SDK) 5.0. The new release lets retailers and manufacturers replace dedicated barcode scanners and mobile computers with mobile devices. Scandit Barcode Scanner SDK 5.0 can be used to develop apps on a variety of mobile devices. In addition to tablets, the platform is also compatible with Google Glass and Microsoft HoloLens, as well as drones and robots.

cargo customers space for 12 pallets or 36 LD3 foldable container positions. The airline also operates 787-9 routes from DFW to Sao Paulo, Brazil, DFW to Paris, and will add a DFW to Incheon, South Korea, route in February 2017.

LTL carrier **Consolidated Fastfrate** began offering cross-border service between Canada and the United States. The new service integrates the company's coast-to-coast Canadian network with those of several hand-picked U.S. partners, and focuses on dry good commodities of one to four skids.

CaroTrans, a global NVOCC and ocean freight consolidator, launched its first direct, weekly LCL service between Poland and New York. To offer this direct connection for imports into the United States, CaroTrans partnered with NVO **Euroconsol**, which has six container freight stations throughout Poland, located in Warsaw, Krakow, Katowice, Poznan, Gdynia, and Wroclaw. The transit time from Gdynia to New York is 22 days.

Logistics provider **Dachser USA Air & Sea Logistics** now provides shippers direct access to China with a new weekly LCL service to Shanghai. The LCL offering includes consolidation services for 36 states across the United States out of Dachser's Chicago location.

//Technology//

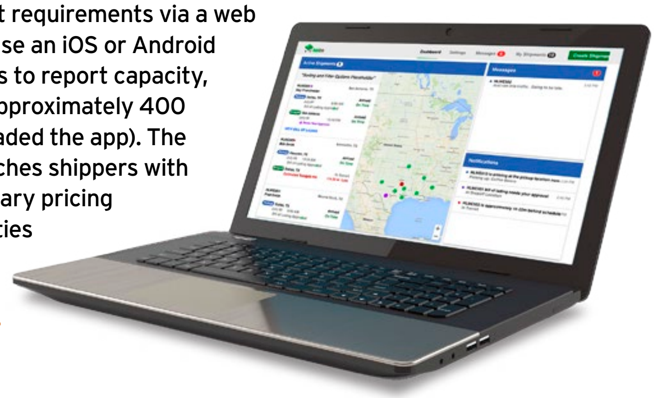
Grocery retailers can better support the customer e-commerce experience from online purchase through home delivery through a combined solution from SaaS solutions provider **Descartes Systems Group** and **MyWebGrocer**, a provider of e-commerce solutions to the grocery and CPG industries. With the system, grocers can offer customers optimized home delivery time windows during the purchase process, plan and execute routes, and engage customers with automated post-delivery surveys.

Logistics software provider **Aljex Software** partnered with financial solutions developer **BAM Worldwide** to provide an integrated cash management solution to users of Aljex's transportation management software. With the integration, shipment information automatically gets sent to BAM, which handles invoicing, accounts receivable, and accounts payable.

CarriersEdge, a provider of online driver training, launched a series of safety and compliance training tools. The courses can be used to enhance existing wellness programs or as a starting point for fleet managers to educate drivers about how to stay healthy on the road.

Software developer **NGC Software's** *Advanced Quality Module* replaces time-consuming, manual quality control processes, allowing manufacturers to conduct quality audits at manufacturing facilities. As a result, users can identify problems sooner and fix them at the factory, reducing the risk of cancellations or chargebacks.

Online transportation marketplace haulme offers a digital freight matching solution that lets shippers find and transact with truckers with available capacity. Shippers input their freight requirements via a web portal while truckers can use an iOS or Android app on their mobile devices to report capacity, routes, and travel dates (approximately 400 truck drivers have downloaded the app). The system automatically matches shippers with truckers. It uses a proprietary pricing algorithm to give both parties market-competitive rates upfront.



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The Port of Los Angeles and **GE Transportation** are partnering to pilot a first-of-its-kind port information portal, giving supply chain stakeholders about two weeks advance visibility on an incoming ship. Cargo data used in the two-month pilot project includes filtered information from the U.S. Customs and Border Protection's Automated Commercial Environment (ACE) system. The pilot project is expected to enhance supply chain performance by delivering insights through a single portal to partners across the supply chain.

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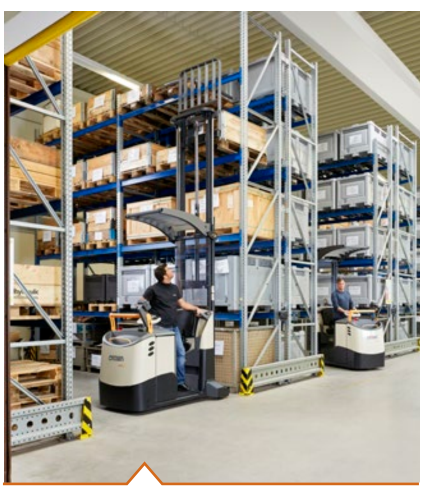
Materials handling company **J D Neuhaus** created a nickel-plated hoist for applications requiring high levels of cleanliness and hygiene, including the food, beverage, pharmaceutical, and chemical industries. The Profi hoists are suitable for handling food items such as salt, sugar, flour, and starch, as well as chemical and pharmaceutical products. Designed for clean operating environments, the hoists can be configured in their standard Profi TI series for 0.5 to 1 metric ton or big bag handling unit for 1 metric ton.

Bourque Logistics, a logistics software and services provider for industrial shippers, teamed up with railcar broker and storage services provider **eRail Commerce** to allow shippers to search railcars for their specific needs. The partnership lets customers access a database of new and used railcars available for sale or lease.

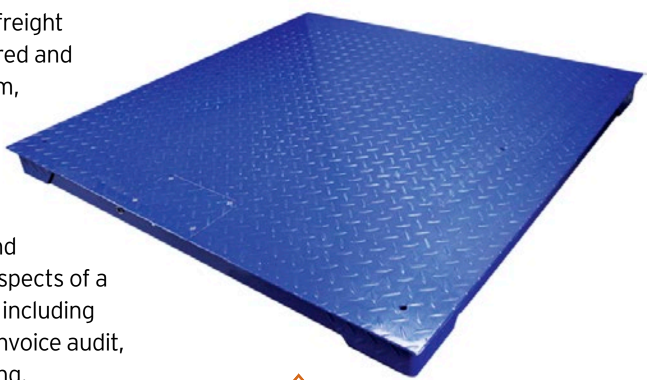
Tracking solutions provider **GateHouse Logistics** launched *ghSecure*, a cloud service that helps shippers prevent high-value road cargo theft. A new module in the company's telematics system *ghTrack*, *ghSecure* lets shippers define lanes and multiple associated secure routes. Each high-value transport can then be restricted to a secure lane. The system adds geofences around the routes and creates secure corridors and parking locations.



Materials handling company **Crown Equipment Corporation** introduced the Crown MPC 3000 Series order picker. The MPC Series has a high-lift mast that lets operators pick, stack, replenish, and transport pallets with the use of one lift truck. Operators can raise and lower the forks as they build pallets at a comfortable height, minimizing back strain and saving time.

Cargobase, an online platform for ad hoc freight, added ocean freight as a mode that can be procured and managed through its platform, which also offers aircraft charters, onboard couriers, next flight out, regular air freight, and road freight. The service helps shippers and providers manage multiple aspects of a spot-buy freight transaction, including quoting, approval, tracking, invoice audit, freight payment, and reporting.

Logistics company **ArcBest** launched a redesigned website–www.arcb.com–to improve transportation and logistics solutions for shippers. The website offers more quoting options, increased shipment visibility, and simplified reporting to give shippers insight into developing a more streamlined supply chain.



Adam Equipment, a manufacturer of industrial weighing equipment, added two new sizes, 39 inches and 59 inches, to its line of PT platform scales available in the United States. The PT is designed for factories, warehouses, shipyards, shipping and receiving docks, recycling facilities, and distribution centers. Its low-profile design simplifies loading and unloading pallets, crates, and other large containers.

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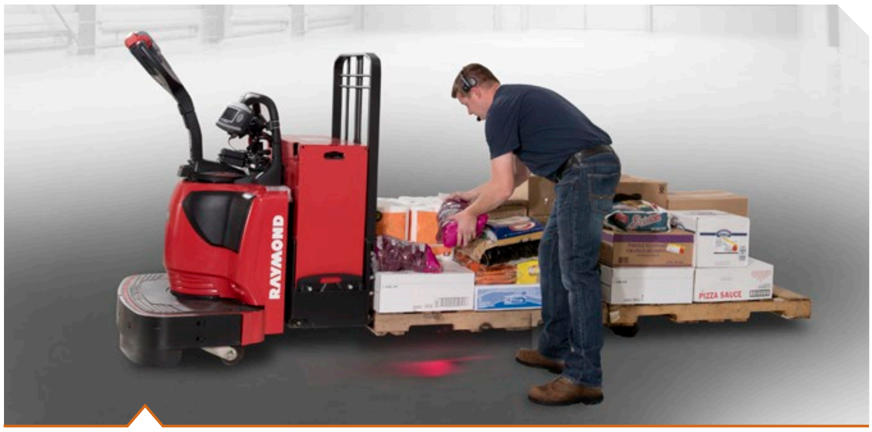
//Products//

The 110-Plus Pallet from plastic products manufacturer **Plasgad** can be used in a number of applications, including agriculture, pharmaceutical, and food industry. The nestable pallets can accommodate more than 3,900 pounds, are available in new or recycled materials, and remain fully recyclable at the end of their working life.

Laser Tools Co. introduced a laser-guided solution to backing trailers into tight loading spaces. The lasers project green lines down each side of the loading dock and down the side of the loading ramps to guide drivers.



Materials handling equipment manufacturer **The Raymond Corporation's** Pick2Pallet LED light system helps users improve productivity and reduce picking errors. The system shows operators where to place picked products through visual, colored light cues that work in tandem with voice-picking solutions.

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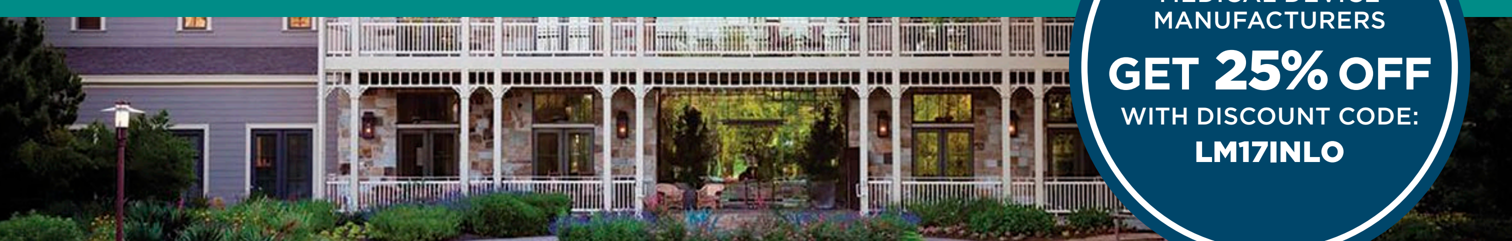

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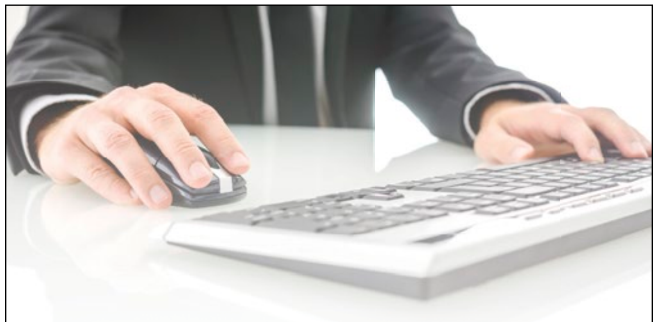

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