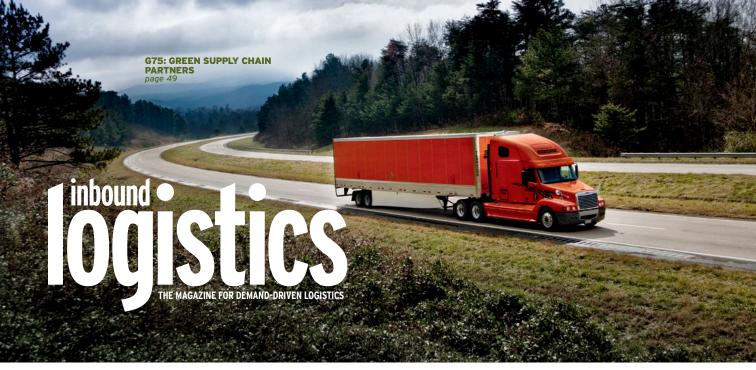




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For a wholesale distributor of electrical supplies, auto parts, and industrial products, the best delivery routes run through the cloud.

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The Inbound Logistics Planner App is your premier supply chain and logistics resource – including 3PLs, warehousing companies, technology providers, transportation providers, economic development companies, and more – that can help cut transportation and logistics costs, boost efficiency, and improve supply chain operations.

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Three Keys to Solving the Dimensional Weight Shipping Problem bit.ly/solvingDIM

Gregg Hague, Partner in the Supply Chain Practice, Sikich LLP

If you are ignoring the parcel carriers' dimensional weight pricing policies, your shipping costs will soon skyrocket. Fortunately, you can take steps to deal with dimensional weight pricing and grow more efficient overall.



How to Handle DOT and GHS Regulations bit.ly/DOTRegs

Brian Beetz, Regulatory Specialist, Labelmaster

U.S. chemical manufacturers and distributors must comply with two sets of regulations affecting chemical shipments. Here's how to stay compliant, efficient, and safe.



Optimizing the Industrial Purchasing Experience bit.ly/IndustrialPurchasing

Rob Honeycutt, Co-Founder, SafeRack

An instant selling and ordering procedure could be a differentiator for industrial companies looking to offer customers a seamless, easy, and quick buying experience.

TRUCKING RESOURCES

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Trucking Request for Proposal bit.ly/ILTruckingRFP

Looking for the perfect motor carrier can be an indomitable challenge. Use this Trucking RFP/RFI to simplify the tasks of creating a database of likely partners, building your knowledge base, and preparing your transportation Request for Proposal list.





CHECKINGI





Freshening Up

rganic, non-GMO, free range, locally sourced, sustainably sourced, antibiotic free, vegan, and artisanal food preferences are all the rage for a sizable minority seeking healthful eating choices. This trend is one of several convergent forces impacting the grocery business that will ultimately change the supply chain operations of successful players.

It's not just millennials or picky eaters driving the growth of the health food market. Conditioned by internet buying, no time to shop, and maturing millennial buying habits, I see another grocery growth trend in the making. I call it Farmto-Mouth, where food buyers skip traditional retail activity and turn instead to Blue Apron, FreshDirect, and Peapod, which deliver natural edibles right to your home or office almost instantly, given demand-driven logistics practices and the Uberization of last-mile delivery.

Noting the profitability of Trader Joe's, and the cachet of Whole Foods, traditional grocery chains and supermarkets such as H-E-B, Stop & Shop, Kroger, Wegmans, and Publix have accelerated their fresh, all-natural, and organic offerings. Those investments are paying off. Publix, for example, recently posted its best annual sales ever at \$32.4 billion.

Monsters such as Walmart and Amazon bring a Godzilla footprint to their health food offerings. Walmart To Go and Amazon Fresh can out-spend and out-invest to gain share in the fresh arena. What's more, they can bring to bear finely honed supply chain performance to outflank competitors. Neighborhood green grocers and local health food entrants will have to compete.

Competition like that has impacted Whole Foods sales slightly. But the food chain is determined to "be the hunter, not the hunted," says co-CEO Walter Robb. It introduced Whole Foods 365, promoted as a "chain for millennials." The new stores are one-third the size of traditional stores and use self-serve kiosks, electronic shelf labels, and robots to keep costs competitive. The company plans to open about 12 Whole Foods 365 stores in \$15/hour minimum wage California, with technology and automation reducing store labor needs by a projected 60 percent.

Peapod is also responding to the competition by upgrading warehouses, investing in technology, and expanding aggressively.

Competition among market players in this low-margin business is not the only headwind. Minimum wage warriors, government mandates (ObamaCare), increasing regulations, interest groups, and government lawsuits play an increasing role in cutting margins further. Who will survive? That is uncertain. But demand-driven logistics and supply chain excellence will play a pivotal role in their success.

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THE MAGAZINE FOR DEMAND-DRIVEN LOGISTICS

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Inbound Logistics welcomes comments and submissions. Email us at editorial@inboundlogistics.com; call (212) 629-1560; or mail 5 Penn Plaza, NY, NY 10001. For advertising or subscription information, call (212) 629-1560, or e-mail publisher@inboundlogistics.com. Inbound Logistics is distributed without cost to those qualified in North America Interested readers may subscribe online at bit.ly/il_sub. Subscription \$229. Single copy price: No. Amer. \$10, foreign \$19, back issues \$15.

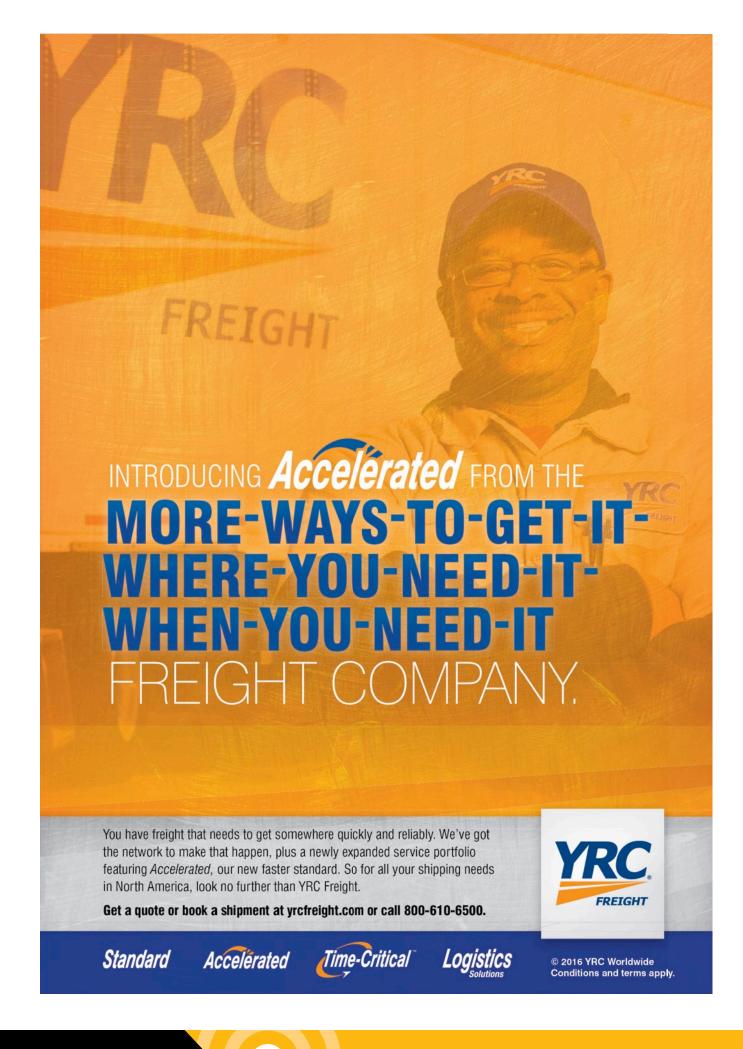














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SOUNDBITE

More than ever before, supply management is the critical cog in every high-performing organization. With approximately 85 percent of non-payroll spend being driven and managed by supply management, it stands to reason that this function is involved in every strategic and tactical decision made by the organization.

- TONY CONANT, COO, Institute for Supply Management

Is your organization prioritizing supply management? Tweet @ILMagazine or tell us at editorial@inboundlogistics.com.



READER EMAIL

You Are Never Too Cool for School bit.ly/nevertoocool

I was captivated by your February 2016 opinion piece. I am a grown woman and almost too cool for school, but need to return to the traditional or e-classroom to give myself a lift to find a good job.

I have a seven-year logistics background in computer science and enjoyed most of it. I would like to improve my skills based in the Netherlands, but have no idea where to start. Jobs call for SAP, which is way too broad. Would you share some advice?

Lost logistics woman in the Netherlands EKibalama

Editor's Note: We sent your query to supply chain professors. "Look for SAP university alliance partners to find a local school that offers SAP in its curriculum," says Samuel J. Chinnis, CPIM, CSCP, associate professor, Guilford Technical Community College. Others recommend distance learning programs; IL's guide (bit.ly/IL_edu_guide_2016) lists schools with such offerings. Third, certification bodies such as APICS are more than happy to help with distance learning. Finally, subscribe to IL to keep up to date with the latest supply chain education trends. bit.ly/get_il

HASH IT OUT

@ILMagazine

Good Question: What hobbies/ activities make you better at supply chain and logistics management? bit.ly/hobbiesforSCM

Millwood, Inc. @MillwoodInc

Love this article! Maybe we can use it as an excuse to take a few international trips...and maybe some cooking classes?

in **EXCHANGE**

Europe Raises the Compliance Bar. Is Your Supply Chain Prepared?

Sweeping regulatory changes in the European Union introduce new tensions along the world's supply chains. bit.ly/EUcompliance

Yogi Kulwant Singh

Electronic Industry Citizenship Coalition (EICC) has good open-source solutions for such compliance requirements.



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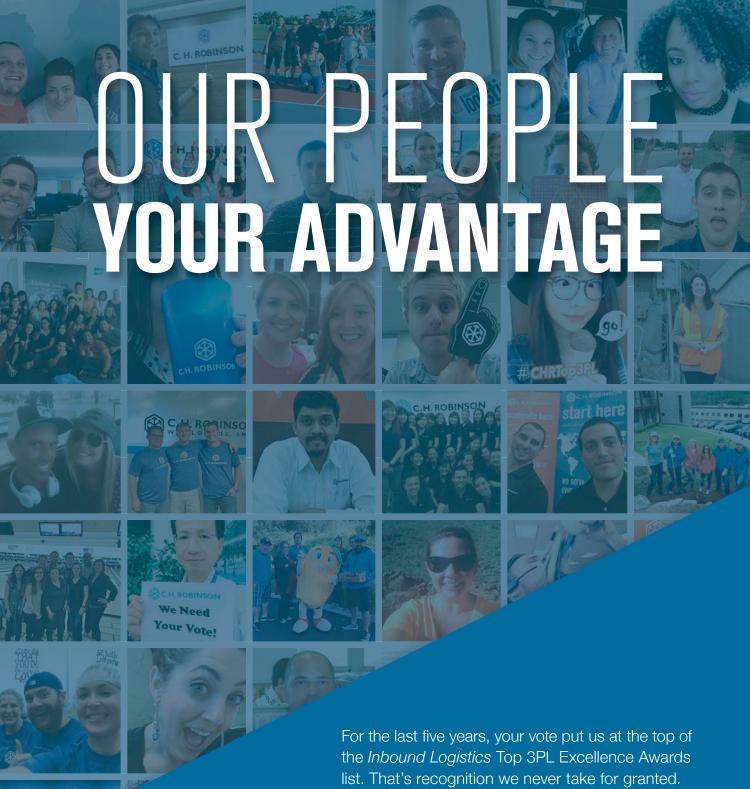
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Good Question...

READERS WEIGH IN

What are the characteristics of a great supply chain?

A great supply chain is collaborative planning across all functions. It's process first, then tools to accelerate and improve process and network. It's outcome focused, driving to the right metrics. And, it's engaging suppliers in common goals.

Steve Raetz

Director, Research & Market Intelligence C.H. Robinson

High-performance supply chains offer a vision of how they drive and support corporate strategy. Secondly, they provide an understanding of uncertainty and risk. Next, clarity and collaboration of key assets and partners. Finally, talent and agility to respond to ongoing change.

Abe Eshkenazi, CSCP, CPA, CAE CEO, APICS

If eyes are the window into the soul, then data is the window into a great supply chain. Data provides real-time visibility, the analytics for impact and flexibility to scale globally. Partners can help with tools, resources, and much more.

John Kruzan

Senior Director, Shipping Pitney Bowes Global Ecommerce

A great supply chain starts with the right people. A well-functioning operation needs employees who fit the team culture and managers who help them grow.

Tom Gimbel

Founder and CEO, LaSalle Network

The characteristics of a good supply chain are visibility, optimization, having the lowest cost possible, timeliness, and consistency.

Brandon Stallard CEO, TPS Logistics

Great supply chains integrate the expertise of multiple qualified suppliers who safely and consistently fulfill expectations; display quantifiable customer value with meaningful, accurate metrics; and actively support profitable, sustainable growth.

Preston Charles

Consultant

Worldwide Advancement Consulting

A great supply chain has senior-level sponsorship that enables success throughout the process; a collaborative mentality that flattens the buyer/supplier relationship into a mutual-win one; and agreement on measurable processes.

Ross Elliott

Executive Vice President and Chief Strategy Officer HighJump

A truly great supply chain balances rigidity and flexibility. Rigidity provides the backbone of service quality, predictability, resilience, and cost control. Flexibility allows you to anticipate and meet your changing client, vendor, and market needs.

Nick Foy

Director of Operations, ModusLink



A great supply chain moves like a prima ballerina on opening night-precise technique, relentless professionalism, and endless hours of preparation all come together seamlessly to make it look effortless.

Chloe Demrovsky Executive Director, Disaster Recovery Institute

(DRI) International

HAVE A GREAT ANSWER TO A GOOD QUESTION?

Be sure to participate next month. We want to know:

How would you describe your job to a five-year-old?

We'll publish some answers.
Tell us at editorial@inboundlogistics.com.





Making Your Distribution Data Work for You

onsumer shipping expectations are changing faster than ever, putting more pressure on omni-channel retailers. While retail giants spend seemingly endless resources catering to customer whims, many other retailers struggle to optimize shipping and distribution practices, increase customer loyalty, and maximize sales without wasting precious resources.

With technology permeating every aspect of e-commerce and shipping, retailers now have access to a huge and largely untapped resource—troves of valuable data. Jeremy Bodenhamer, CEO and co-founder of ShipHawk, suggests ways retailers can utilize data to stay ahead.

Share delivery data. Be transparent with consumers about their package's journey by offering an estimated delivery window or package location. This allows you to manage customer expectations and keep them engaged with your brand post-purchase.

Recognize quicker is not always better. The majority of consumers choose the least-expensive shipping option, regardless of delivery speed. Use local and regional carriers that offer lower price points for less expansive delivery areas.

Use customer data to improve internal systems. By analyzing delivery destinations and origins, purchasing traffic patterns, and selected delivery times and methods, retailers can learn about their customers. Since customer data is never static, it yields ongoing insight that can help evolve your logistics processes.

Use more effective targeting. Geolocating consumers based on delivery data can reduce costs and increase marketing ROI—allowing you to spend marketing dollars in the regions that drive the greatest profitability for your business.

Ship from the right location. By analyzing purchase data, brick-and-mortar stores can increasingly operate like mini warehouses to ensure they pick, pack, and ship items efficiently. Drop shipping can also become a viable option for retailers if inventory information is well managed, up to date, and integrated with the company's logistics systems.

Move stock to more appropriate locations. By studying consumer data, especially where individual items are ultimately delivered, retailers can anticipate demand and place the correct stock closer to customers.

Diversify delivery options. With the rise of services such as Uber, Sidecar, Deliv, and TaskRabbit, widening distribution options are changing the nature of on-demand delivery. Though these businesses are relatively new, test them and see what works for your business.

Customize delivery. While diverse delivery options are important, remember who your consumers are and what sort of options attract them specifically. For example, young professionals will probably be interested in different delivery methods than pensioners or stayathome parents because they are home at different times.

Offer optimal delivery options for each order. Software allows retailers to offer a plethora of shipping options, easily and efficiently. Once a logistical nightmare, this process can now be automated, allowing retailers to offer customers optimal delivery options.

Eliminate guessing. Instead of estimating shipping quotes or guessing which options best appeal to your customers, use data and technology to find the answers. Properly analyzing data affords huge insights into pricing strategies and supply chain optimization.



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Unstoppable Force

HEN SHE JOINED TRUCKING COMPANY FREIGHT Flow as a part-time billing clerk in the early 1990s, Angela Eliacostas was looking to augment her income as a young, single mother with four children. Then she rose through the ranks, eventually becoming general manager. In 2005, she launched a firm of her own.

Eliacostas formed All Girls Transportation and Logistics with a focus on the nuclear power industry. It soon expanded to serve other kinds of energy companies, and then other industries as well. Starting with revenues of \$18,000 in 2006, the company brought in more than \$2 million annually by 2008.

It has been growing ever since. Today, the firm is called AGT Global Logistics. Headquartered in Glen Ellyn, Ill., it provides a broad range of third-party logistics (3PL) services. "We're a one-stop shop, handling everything from small packages to 200,000-lb. transformers," Eliacostas says.

In a recent interview, Eliacostas provided a look at what it takes to steer an operation that can move just about anything.

IL: Can you provide an example of the special logistics challenges energy companies face? In 2015, we helped a nuclear power plant in Minnesota go into a 'planned outage.' That's when they take down a unit to make sure the equipment is in great operating order before summer, peak demand season. Because these plants are old, many of the replacement parts they need are obsolete. So they have to source them from other plants, which are often located in the middle of nowhere.

We asked our freight forwarder to fly a part from upstate New York to Minneapolis that morning. The forwarder said there was no way a courier could get it to the airport in time. But without that part, the customer would have lost \$1 million for every extra hour the plant stayed down.

Luckily, one of our sales reps was visiting a customer in Pennsylvania and was preparing to fly home to Minneapolis. I called in a favor, getting a connection in upstate New York to pick up the part and

AN EARLY START

While other children were playing with Tonka toys and Hess trucks, Angela Eliacostas had her eye on bigger things.

"My father always owned transportation companies; he was in the trucking industry before I was born, and I was intrigued by what he did," she says. She spent so much time hanging around his fleet of dump trucks, her dad finally decided to give her a job.

"He gave me \$2 a day to pump fuel into the fuel tanks," says Eliacostas. "I'll never forget it: 550 pumps produced 100 gallons of fuel for each tank."

She was nine when she started. A few years later, she learned to drive a truck to the back of the lot, wash it, and plug it into an engine block heater for the night. Later, her father taught her how to dump a load.

That's how Eliacostas first got an inkling that transportation lay in her future. "I figured it was going to be my destiny," she says.

meet the salesman halfway between their locations. The rep handdelivered the part to the customer.

IL: What growing pains has AGT gone through since you started it in 2005?

Our biggest challenge along the way has been hiring the right people. Each person who joins the company becomes part of a family. Sometimes a candidate has the right experience on paper but doesn't turn out to be the right fit.

Each of our clients needs a slightly different kind of treatment, so we try to match employee personalities to the clients they serve. Sometimes that's hard. But I couldn't be happier with the people we have working for us today.

IL: When you started the company, were you really 'All Girls'?

Yes! We were four women, and we worked together well. Our first male employee was a salesman. He was harassed constantly; people would ask, "Are they going to make you wear pink shirts and skirts?" But he used this to his advantage; he had a great sense of humor.

My father always told me that as a woman in this industry, I would face many challenges, but hard work knows no gender.

I sometimes encounter people who assume I'm just providing a front for the company, so we can earn woman-owned status. I smile, and they throw out question after question. By the time I'm done answering, I've gained their respect.

IL: How do you lead? What's your style?

I get into the day-to-day grind. It helps me stay in tune with what's going on in the industry, what's going on with my clients, and what my staff is experiencing. For example, if the phone rings when I'm walking past, and my people look busy or stressed, I grab it.

My employees and clients respect that I take a hands-on approach. But I also know how to surround myself with great people. My office runs like clockwork whether I'm sitting at my desk or I'm out of the country.

IL: What lessons from your early career helped to shape the leader you are today?

When I worked at Freight Flow, a co-worker named Tom trained me to eventually take over his job. When he retired to Florida, he gave me his number and said that if I needed help, even in 10 years, I shouldn't hesitate to call. One morning at 2 a.m., I got an emergency call from a client, and I needed advice. I called Tom, and he walked me through the situation just as if he'd been sitting in the office the day before. That was probably the greatest lesson I've received: If you tell somebody you'll be there for them, you'd better mean what you say.

IL: Who are your role models?

First, my grandfather. He's 96 years old, and he still goes to his zinc plating business three days a week. Second, my father. I remember thinking as a young girl that my dad was never sick. As I grew older, I realized he was sick plenty of days, but he never let that stop him. He was the sole breadwinner for our family, and he did whatever it took to keep the household running.

IL: What's new at AGT these days?

We recently completed the certification to become an indirect air carrier. That means the Transportation Safety Administration pre-approved us to give cargo directly to an air carrier, without working through a freight forwarder. I never want to be trapped by someone telling us we have no options, as our forwarder did when we needed to rush an emergency part to the nuclear plant. In the office we say, 'We have to keep our clients' worlds turning.' We are an unstoppable company, and there's nothing we can't do if we put our minds to it.

IL: How do you spend your time outside of work?

My husband and I have seven children between us, plus three grandkids and another two on the way. The entire family loves coming to our house for parties. Managing the logistics of a big Greek family and a big Italian family is my main focus outside work.

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PROFILE



Kendra Austin is director of supplier diversity with pharmacy benefit management services provider Express Scripts, St. Louis, Mo. She has held this position since November 2014.

RESPONSIBILITIES

Creating a supplier diversity program, defining the business case for it, and developing an internal infrastructure for engaging diverse sourcing participants.

EXPERIENCE

Supplier diversity executive, Ameren; procurement agent, Anheuser-Busch; financial analyst for contract strategies, BJC Healthcare; acting director, development and technical services, St. Louis Housing Authority.

EDUCATION

BS, business administration, Langston University; MBA, Webster University.

Kendra Austin: Dedicated to Diversity

in supply chain. The common thread? All organizations need the same things to operate, whether it's office supplies, insurance, or legal services. Supply chain is bigger than products and inventory, and encompasses everything required to run a business.

Once I started working in supply chain, I recognized it was what I wanted to do, whether through analytics, supplier diversity, or sourcing. All stay true to the idea that companies want the best service or product at the best price. I like negotiating and understanding how to get the best price for products and services. I also like building relationships.

Supplier diversity adds another facet to supply chain operations. Demographics are changing; more companies are run by people from diverse backgrounds. My job is to expand Express Scripts' supplier diversity program, and add value so we attract and secure the business of more companies.

There's a certain strategy that goes into supplier diversity. Say you're working on a \$50-million contract and no diverse vendor is available for it. You need to ask about second-tier opportunities. That is, if a vendor is going to use subcontractors, you can explore opportunities to use diverse vendors. We're incorporating this into RFPs.

A big part of my role is communicating the value of supplier diversity. Clients look for it, and we need to identify ways to meet their needs. Supplier diversity also increases competition and keeps everyone

The Big Questions

What's the best work-related advice you've received?

Accept change. It's one of the only things in life that's inevitable, and you're better off learning to embrace it.

What's one passion outside of work?

My parents, sister, and I started an organic farm. We turned a sunroom into a greenhouse and grow about 5,000 plants.

Who are your heroes?

My parents and sister. They were retired and wanted to start something healthy to help the community. We hope in a few years the farm will be big enough to be meaningful to the community.

If you could travel anywhere, where would you go?

To see each of the Seven Wonders of the World. I've seen the Pyramids, so I have six to go.



honest. In addition, engaging diverse vendors helps the community. So it's not just doing the right thing, but brings real monetary value.

Still, change is hard. You're changing the way people think about how they buy. Yet the more you talk about supplier diversity, the more everyone wants to be a part of it.

One project I'm proud of is our work with AlphaPointe, the third-largest employer of visually impaired individuals in the United States. Express Scripts had won a large government contract, and turned to AlphaPointe to manufacture medicine bottles. However, we first needed to work with them to secure equipment financing and to establish pricing. Because of the program requirements, it took more than one year to get the contract signed. It has been a huge win for everyone.

Going forward, I'll be working even more with my colleagues in sales and account management. We're also adding more reporting features to our supplier diversity program. This will make it easier to create goals for different business areas.

We also do a lot of outreach in the community, participating in three national shows and a number of regional shows each year. It's a great opportunity to interact with the community and do what we say we're going to do.

When you enjoy what you do and have conviction and passion, it can make the difference between doing a good job and a great job. I love what I do.



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NOTED

THE SUPPLY CHAIN IN BRIEF

GOOD WORKS



▲ After an earthquake hit Ecuador in April 2016 and impacted families across the region, **American Airlines Cargo** provided transportation to GlobalMedic, allowing the charity to send 560 family emergency kits to Quito from New York. The kits contained household water purification units, which can provide clean drinking water to a family for up to one year, as well as hygiene items such as soap, toothpaste, and toothbrushes.



FedEx acquired **TNT Express**, which delivers nearly one million shipments ranging from documents and parcels to palletized freight daily. The acquisition enables FedEx to leverage an extensive ground network in Europe, growing its presence in the burgeoning e-commerce market.

SEALED DEALS

Quad/Graphics, a provider of print and marketing services, chose three products from JDA Software Group to optimize transportation and logistics. The three programs within JDA Transportation Management–Transportation Manager, JDA Transportation Planner, and JDA Transportation Modeler—will help Quad/Graphics reduce transportation and logistics time and costs.

Barcoding, a systems integrator and supply chain solutions provider, deployed 2,500 handheld devices across North America for United Rentals, an equipment rental company. Barcoding's project management team led the rollout to help United Rentals minimize downtime and maximize the effectiveness of its mobile route optimization system.



▲ Nutrabolt, a nutritional life science company, selected Voyager Solutions from Logility, a provider of collaborative supply chain optimization and retail planning solutions, to help drive accurate forecasts, align inventory, and improve customer service. Nutrabolt chose Logility to synchronize production and inventory with market demand across multiple sales channels.

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GREEN SEEDS



▲ Wallenius Wilhelmsen

Logistics, a RoRo shipping and factory-to-dealer logistics company, launched a policy mandating that all vessels operate with fuel with less than 0.1 percent sulphur or equivalent at berth, in all ports across the globe. The stricter policy (it previously limited the average sulphur content to 1.5 percent) is in response to recent research that connects sulphur to respiratory and cardiac disease.

Ergonomic furniture maker **Humanscale** employed Pfister Energy to design, engineer, and construct a 750-KW solar array, new cool roofing system, daylighting system, and interactive high-bay LED lighting for its manufacturing and distribution facility in Piscataway, N.J. As a result of the project, Humanscale expects to save more than \$1.75 million over the life of the system, equivalent to energy for 61 homes each year for 25 years.

SHOVEL READY



■ South of downtown Los Angeles and north of the nation's two biggest ports, the **Brickyard South Bay** is a one-million-square-foot, two-building industrial development catering to the increasing need for same-day logistics. Owner Clarion Partners is transforming the 58-acre site, a former brick manufacturing facility, into an economic engine for Compton, Calif. The project is expected to be completed by August 2016.

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recognition

Walmart selected J.B. Hunt Transport Services as its 2015 Intermodal Carrier of the Year based on its demonstrated commitment to customer service, effective communication, and service improvements. J.B. Hunt has partnered with the retail giant for more than 30 years, providing a wide range of logistics services and solutions.

Harte Hanks, a multichannel marketing services company, named Lama Express its 2015 Carrier of the Year. Harte Hanks based its selection on number of loads, pickup and delivery performance, claims resolution, DOT safety ratings, and CarrierWatch ratings.

The Louisiana Motor Transport
Association, in cooperation with the
American Trucking Associations,
recognized **Dupré Logistics'** Site
Logistics Group with the **2015 Safety Award** for outstanding achievement in
highway safety in the 9-12 Million Mile
class. Transportation insurance provider
Great West Casualty sponsored the
award.

ATA Freight, a logistics service provider, received a John Deere Supplier Innovation Award for its new shipment management solution, MyWay. John Deere bases the awards on four factors-creativity, feasibility, collaboration, and bottom-line impact-and presents them to suppliers who have demonstrated innovation in a product or service they provide to the manufacturer.

Textiles manufacturer Knoll honored Penske Logistics with its 2015 Operational Excellence Award, to recognize the 3PL provider's cost, quality, and service performance. Penske provides Knoll with transportation management, fleet management, and warehouse operation services in the United States and Canada.



Five of the many ways we're reducing our environmental impact

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TRENDS

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The Name's the Same, But It's a Different Game

here's a new player in the electric vehicle market. By its name, Nikola Motor Company may seem a carbon copy of rival Tesla Motors (both are named after engineer, physicist, and inventor Nikola Tesla), but the vehicles Nikola wants to make are bigger in scope. Literally.

by Jason McDowell

Nikola wants to produce the first electric big rig. The company claims its 2,000-horse-power class 8 semi-truck will have a range of 1,200 miles and will never need to charge because a compressed natural gas (CNG) turbine will charge the battery while the vehicle is in motion.

Critics are skeptical of more than the

company's name. Nikola is taking \$1,500 pre-orders for its \$375,000 Nikola One semi, and \$750 deposits for a smaller, 520-horse-power off-road vehicle called the Nikola Zero. Detractors say these deposits won't provide enough starting capital to successfully manufacture the vehicles.

If the trucks become a reality, however, fuel

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INFOCUS TRENDS

savings might enable owner-operators to compete with larger fleets.

"We want to even the playing field and income inequalities seen between owner operators and fleets for the first time in recent trucking history," says Trevor Milton, founder and CEO of Nikola Motor Company. "This is just the beginning of what's ahead for America, our company, and the electric vehicle market."

While some believe that Nikola may be overreaching, the increase in the number of operating CNG-powered fleets in the United States over the past five years bodes well as it shows a clear demand for a cleaner class 8 vehicle. Nikola also wants to establish a nationwide network to support its cleaner truck.

"The fuel will be delivered through Nikola's own gas wells and fueling stations in every state when trucks enter service," Milton says. "We will be the first manufacturer of class 8 trucks that is vertically integrated from well to wheel."

With customers demanding more sustainability, and supply chains becoming increasingly transparent, getting Nikola's design on the road could go a long way toward shrinking a whole lot of carbon footprints.

Life in the FASTLANE

n 2016, the U.S. Department of Transportation (USDOT) received 212 applications, totaling more than \$9.8 billion in funding requests, for FASTLANE grants. FASTLANE (Fostering Advancements in Shipping and Transportation for the Long-term Achievement of National Efficiencies) grants fall under the Fixing America's Surface Transportation (FAST) Act, which approved only \$800 million for transportation projects during fiscal 2016.

The grants, authorized by the FAST Act's Nationally Significant Freight and Highway Projects (NSFHP) program, will fund projects of varying degrees. Large

Over the FAST Act's five years, the program will provide \$4.5 billion in grants for transportation projects.

projects are eligible for a minimum award of \$25 million, and small projects are eligible for a minimum award of \$5 million. Total dollar amount and various federal and state statutory requirements determine project size.

USDOT will give special consideration to projects aimed at reducing congestion on the nation's highways, and multimodal projects that will increase freight movement efficiency.

"Our nation needs a

strong multimodal freight system to both compete in the global economy and meet the needs of consumers and industry," said U.S. Transportation Secretary Anthony Foxx in a press statement. "We now have an opportunity to fund high-impact projects that address key challenges affecting the movement of people and freight."

The NSFHP program is authorized to spend \$4.5 billion on infrastructure projects through 2020.

Carriers Face Challenges Down The Road

espite solid financial gains driven largely by a robust rate environment, truckload carriers faced declining utilization while other transportation service providers noted mixed results over the most recent 12-month reporting period of TMW System's *Transportation & Logistics Study*.

The TMW performance benchmarking study incorporates detailed information covering rates, utilization, driver wages and retention, maintenance cost management, diversification plans, and other insights collected in 2015 from more than 150 transportation enterprises.

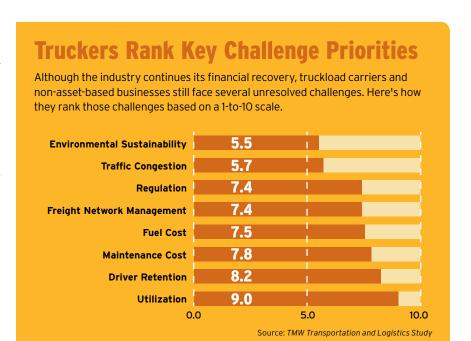
Although most truckload irregular and dedicated fleets significantly improved financial performance — with twice the number of irregular and nearly three times as many dedicated carriers reporting healthier operating ratios — those gains were driven almost exclusively by rate increases. Utilization, another fundamental contributor to profitability, declined for many fleets over the same period.

Among the insights the survey addresses:

- **Driver retention.** Fleets posting increased driver miles per week generally experienced lower turnover, with additional factors wages, fleet size, average length of haul, and tractor-to-fleet-manager ratio continuing to affect both driver turnover and, by extension, asset utilization.
- **Asset utilization.** Hours-of-Service rules and, increasingly, fleets catering to driver preferences, such as increased home time, continue to impact daily working percentages.
- **Dedicated services adopting more flexibility.** Data points to a trend replacing some traditional dedicated contract freight services with hybrid blends of dedicated and regular service that come with more flexible pricing and adaptive service levels on select lanes.

- **Service expansion.** A growing number of carriers with plans to diversify are targeting the brokerage and third-party logistics segments, while fewer intend to expand into dedicated carriage and warehousing.
- **Fuel cost management.** While lower fuel prices in general benefit all fleets, respondents nonetheless continue to aggressively adopt idle reduction technologies such as auxiliary power units and in-cab heaters.

The leading transportation service providers will be those that identify and resolve operational inefficiencies through investments in technology, process optimization, and increased business intelligence, according to the TMW survey. These investments are best made now, when demand remains strong and interest rates are historically low.





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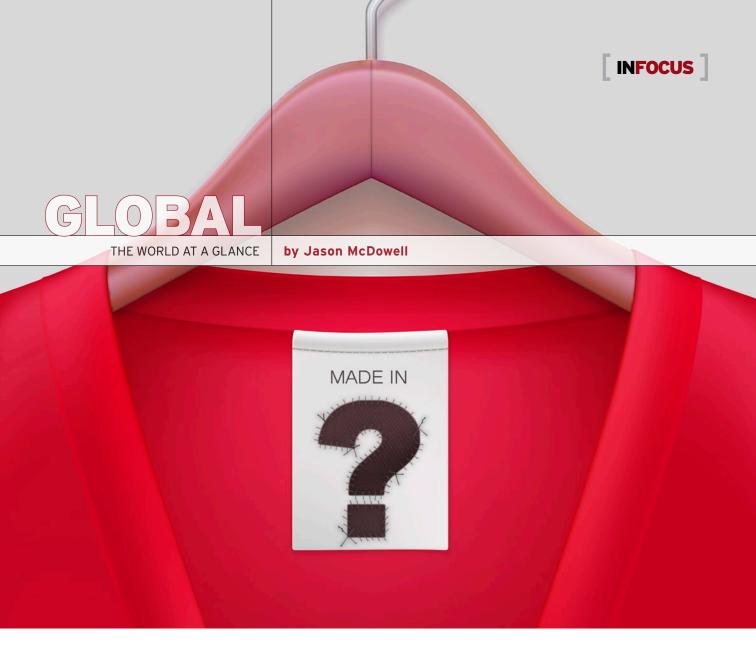




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Fashion Police: Who Are You Wearing?

Who made the clothes you're wearing? Where were they dyed? Where were they sewn? You may have no idea. As it turns out, there's a good chance the clothing manufacturer has no idea either.

Some companies have come a long way in terms of supply chain visibility since the April 2013 Bangladesh factory collapse, but some have a long way to go, according to the first annual Fashion Transparency Index, a research report released by Ethical Consumer magazine and Fashion Revolution, a global initiative to improve conditions in fashion supply chains.

The report surveyed 40 fashion brands (chosen as the world's largest by their

public financial information) and rated them based on their level of transparency and support of workers' rights, using survey answers and sustainability information made publicly available through corporate websites and other sources.

Levi Strauss & Co. rated the highest, with a 77-percent transparency rating. Chanel ranked lowest, with a mere 10 percent.

The study revealed some disturbing trends:

Only a few brands, including Adidas, H&M, Levi Strauss, and Nike, hold a publicly available list of all or the majority of their cut, make, and trim suppliers.

- 28 percent of the companies surveyed don't communicate about taking any special measures to monitor supply chain human rights violations.
- 40 percent of the surveyed companies don't have a system in place to monitor compliance with labor standards, while 38 percent show no evidence of incorporating labor standards into buying practices.
- 30 percent of companies surveyed don't provide supply chain workers with confidential complaint mechanisms.

In 2017, the report's sponsors plan to increase the scope of the survey to evaluate 100 global fashion brands and retailers.

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Five Currents Steer Global Maritime

Five evolving trends are influencing the global maritime industry, according to a new report from IHS Maritime and Trade.

1. China begins to restructure its **economy.** The world's second-largest economy attempts a change of direction, but how will shipping respond?

China's economic expansion has been slowing for years. Economic growth now depends on efficient raw materials import and finished goods export. However, an underlying trend in China's reform process cannot be monitored and measured through the maritime industry alone.

The impact on shipping is that the most significant source of dry bulk demand, and major contributor to the wet bulk and container sectors, is changing.

China's burgeoning economy significantly influenced the health of dry, wet, container, heavy lift and project cargo, and general cargo shipping. Less demand for shipping from China, combined with the industry's failure to react in time, forced many vessel operators, shippards, and related businesses to rebuild their future scenarios. It is not yet clear what kind of shipping a more internally focused Chinese economy will need; it will take years to finalize the transition.

2.Impact of low crude oil prices. Low prices have had a devastating impact on the offshore sector, but crude oil shipping is healthy.

A second trend is the collapse of crude oil prices, sparked by Saudi Arabia's refusal to continue its traditional role as global swing producer, especially when rival producers and exporters—U.S. shale oil, Russian oil and gas, and Iranian crude—threaten to increase their share of an already overcrowded market.

This has been good news for crude oil shipping. Freight rates are strong, the fleet of ships is able to handle rising demand,



Five big-picture trends are critical to improving the performance of the maritime industry over the next decade.

and newbuilding deliveries are entering the market steadily.

3. Charter market weakness drives consolidation. Survival in several sectors of the shipping business will depend on mergers and acquisitions.

The container shipping sector plans several high-profile mergers, including the most unlikely, although the most necessary, between the two South Korean lines: Hanjin Shipping and Hyundai Merchant Marine.

The dry bulk sector is far more fragmented than containers. A prolonged period of low freight rates is now weakening vessel owners' resolve. In Singapore, BW Group, riding high on oil and gas revenues, is openly in the market to snap up distressed assets as vessel values fall in tandem with dry market rates.

The tanker business is generating sufficient revenue to avoid the merger merry-go-round, but the offshore oil sector has suffered catastrophically since oil prices plunged in September 2014. This is a sector where acquisitions are expected when the upturn comes, and that will happen when the crude oil price rises—but there's no sign of that coming in 2016.

4. Mega containerships in the wider supply chain. As shipping absorbs everlarger vessels, supply chains are exploring the challenges.

With a limited number of ports and terminals able to receive them, megaships

are challenging the very supply chain they were ordered to serve.

The arrival of larger vessels has also stimulated investment in new terminals and equipment. This improves handling efficiency, but challenges logistics businesses at every stage of the supply chain.

5.Big data, small data, and security. Shipping came late to the Internet of Things party, but it's catching up fast.

Making sense of data and connecting its disparate pieces will enable shipping to gain actionable insight.

Shipping businesses need to assume a new role as maritime analytics leader, combining detailed quantitative experience with detailed industry expertise. Until that role is defined, "the industry will continue to make decisions on the basis that data flaws and discontinuities are routinely ignored, that the paucity of data is unfailingly accepted, and that the research and forecasts we cling to are biased and opinionated," says Patrick Thomson of the IHS advanced analytics team.

Shipping is becoming technology-intensive; besides new maritime analytics leaders, expect whole new digital businesses to be set up, with no assets under ownership but providing operational control.

Further, as ships become a system of systems, connected not only to each other but via satellite to a shore-based control center, the need to provide different levels of security protection becomes urgent. [1]

Follow the Brexit Sign

A pending referendum will decide if the United Kingdom remains part of the European Union (EU), or if it strikes out on its own again. Many Britons claim that this referendum is long overdue, considering the last national vote regarding EU membership took place in 1975.

There seems to be little doubt that Britain's exit, or Brexit as it has become known, would have a substantial impact on Europe's supply chain. Britain would lose the benefit of tax-free exports into Europe, and would have to renegotiate trade deals with Europe and the rest of the world because it would no longer be subject to the EU's trade agreements.

No two sources in the UK seem to be able to agree on the outcome of the referendum, or the consequences an exit from the EU might have on both sides. Polls are scattered, with some claiming a majority will vote to leave, and others claiming a majority will vote to stay.

So what can businesses do? The best answer is to be prepared for both scenarios. If the UK stays within the EU, things should mostly be business as usual. But if things go the other way, companies that source between the UK and Europe may want to secure back-up suppliers in Asia or the United States, where a British exit won't have such a dire effect on trade relations.



In addition, losing access to the EU's single market may result in a negative financial impact for British companies that depend on export revenue, at least in the short term. These companies should be prepared to take a temporary hit in the pocketbook.

As the people of Britain vote to define the future of their global identity, one thing is sure: Supply chain managers will be at the front of the line of those waiting impatiently for the referendum's results.





knowledgebase

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It's Chemistry: Globally Harmonized System Facilitates Trade

rior to December 1, 2015, a chemical material handler could approach a tank of a hazardous substance and see as many as three different hazard symbols, depending on the product's country of origin, transportation mode, and labeling agency. "Is the skull-and-crossbones image the symbol for acute toxicity?" he would think. "Or is it a carcinogenic substance?"

Now, nine separate container and workplace labels, including distinctive pictograms, clearly communicate what substance the worker is handling and its level of hazard. A slightly different set of symbols, found on chemical-transporting vehicles, communicate their corresponding substances' hazard levels in transit.

The clarification provided by the United States' recent implementation of the Globally Harmonized System of Classification and Labeling of Chemicals, GHS for short, allows material handlers, transportation workers and corporate entities to identify hazardous substances with ease. These substances include everything from common workplace chemicals like solvents to pharmaceuticals.

GHS Compliance

GHS is a concerted, global effort developed by the United Nations to harmonize all chemical hazard symbols and Safety Data Sheets, formerly known as Material Safety Data Sheets. The most significant changes are in the format of SDS documents. Previously, the U.S. Occupational Safety and Health Administration's Hazard Communication Standard MSDS documents were written in different languages, with different formats. Now, the GHS SDS documents mandate a formulaic structure, so each country's SDS pages appear the same in structure and consistently fulfill the same information requirements.

"These differences in hazard classifications, SDS, and labels impact both protection and trade," explains the Hazmat Global Harmonization System Updates guide. "In the area of trade, the need to comply with multiple regulations regarding hazard classification and labeling is costly and time-consuming. Some multinational companies have estimated that there are over 100 diverse hazard communication regulations for their products globally. For small and medium size enterprises, regulatory compliance is complex and costly, and it can act as a barrier to international trade in chemicals."

Most UN member countries have adopted legislation to implement GHS to standardize chemical hazard symbols in various phases, an effort to boost their countries' regulatory efficiencies, improve safety, and cut down on government costs of labeling

enforcement. As of December 1, 2015, all hazardous chemical manufacturers, distributors, and importers in the United States needed to comply with GHS labeling, providing a label that includes a signal word, pictogram, hazard statement, and precautionary statement for each hazard class and category, according to the OSHA HCS Final Rule. Not being in compliance with the OSHA HCS by June 1, 2016, can result in fines, penalties, halting of product shipments, and even recalls—serious barriers to trade for globally minded corporations.

For those companies that achieved full compliance as of December 1, 2015, their efforts almost certainly resulted in cost savings, since they no longer need to comply with multiple labeling systems. Simply put, encouraging other corporations, both domestic and international, to comply with the HCS and GHS regulations is good for trade. Specifically, according to OSHA's GHS guide, the regulations "facilitate international trade in chemicals whose hazards have been identified on an international basis."

These chemicals include cleaning products used for industrial applications; plastic pellets formulated for the creation of DVDs, compact discs, and other technology products; and chemical ingredients designed to be mixed with other stabilizers to create beauty emollients and makeup. Increased access to these chemicals on a global scale can strengthen cross-border relations, increase profits for multiple countries, and even improve the overall health of various countries' citizens.

Benefits of the GHS Program

The GHS program reaches another milestone this summer. June 1, 2016, was the deadline to update alternative workplace labelling and hazard communication programs, and provide additional employee training for newly identified physical or health hazards. Now, the onus is once again on employers to update their programming and ensure their employees have the "right to understand" the hazardous chemicals that can inhabit their workplaces. WSI, one of the largest privately held third-party logistics firms in the United States, updated these guidelines and programming in 2015 to educate both its warehouse-based and office-based employees. A separate program prepares WSI material handlers for new pictogram and labeling expectations. Ultimately, as the GHS pictograms, SDS documents, and labeling become more prevalent in chemical trade around the world, the logistics industry—its employees and its end users—will reap the benefits of increased, streamlined trade.

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eis began a project with logistics technology provider Kuebix to help Weis gain better visibility of its supply chain and control the process flow, financials and cost of goods. Prior to the project, the majority of Weis shipments were vendor controlled, leading

to process inefficiencies and higher cost of goods. Kuebix proposed a technology-based solution that included Kuebix TMS to manage Weis inbound shipments and Kuebix Managed Services to partially outsource transportation

management. Kuebix TMS is a SaaS transportation management system built on the latest cloud technology with a wide variety of engines to streamline every aspect of logistics management. The managed service package that Kuebix developed for Weis includes a unique vendor compliance program offered exclusively

through Kuebix TMS. The Vendor Compliance Program is designed to hold vendors and carriers accountable for behavior that drives inefficiency and cost into a company's supply chain.

With the Kuebix Vendor Compliance Program in place, Weis has been able to smooth its inbound flow and reduce waste. The program has motivated

Kuebix has become the foundation of our Managed Transportation Services program for all inbound shipments. Kuebix has provided Weis the necessary information for all stakeholders to operate at the highest level of efficiency.

- Wayne Bailey, SVP of Supply Chain and Logistics, Weis Markets

behavioral changes throughout the supply chain that have led to increased efficiency.

Overall, this project has enabled Weis to convert 35% (to date) of shipments to Weis controlled, reduce its landed cost of goods, and break apart costing components to increase its bottom line.





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Internet of Things on Your TMS

Q: The Internet of Things has been discussed in detail in the supply chain world. Does this have an impact in transportation?

A: The Internet of Things (IoT) is the physical network of vehicles, buildings, devices, and other items that are increasingly connected. I also consider people, as well as legacy applications like ERP and WMS, part of the IoT. Transportation Management Systems (TMS) represent applications that control freight movements.

TMS has been around for a few decades and has always been cross-company platforms, exchanging information with your carriers, vendors, and customers. If you think about it, your TMS is the natural rallying location for supply chain IoT data, not only for analysis but to also improve daily decisions, if done properly.

to take data in any format, quickly and easily. Nobody wants integration projects, so data exchange has to be so simple that integration takes just a few hours to turn on.

Much of a TMS project is figuring out how to get data from everyone, and building what you can't get. You start with basic data transfers and work toward automating. For a TMS using the IoT, you have to be able to take information from all methods such as:

- Manual: voice, email, text
- Self-service portals
- Classic EDI and API integration
- Web services

For every business, what's important to you is unique. This is where you need to impart your own company's secret sauce, and design a solution that is unique to your own success. Your TMS needs to be able to accept and use this information, and be flexible.

Q: What impact will IoT have in transportation and the broader supply chain?

A: There are real cost savings and service improvement benefits from IoT data. Look at the varied data that is out there: current status, location, warehouse stage, transit times, costs, temperature, delivery information, POD documentation, and more. Note, I'm not talking big data. I'm talking about bringing in information to assist in the thousands of daily real-time decisions a TMS needs to make.

Better data access allows automation of functions, and provides better operations and visibility while capturing data for historical analytics. The data helps you dynamically make better real-time decisions such



WIGGINS

Vice President of Logistics

Q: What players in the supply chain network would contribute?

A: Everybody has data to share: vendors, distributors, cross-docks, carriers, warehouses, retailers, and 3PLs. The trick is, they all have varying levels of technology, from rigid ERPs with fixed communications, to open web service. Sometimes there are standards that help, but often there are not—the key is to meet them where they are. I can't stress how important it is to be able

as which carrier goes to which customers, best level of service for this order, using additional modes like pool distribution, and better responding to disruptions.

Getting to the details and dynamically using them in your daily routing is how to improve service and save money. That makes your TMS the perfect place to start making sense of the IoT—giving you the ability to make smarter decisions faster.

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Addressing Vendor Management And Shifting Global Trade Currents

Q: What are the most important aspects of good vendor management?

A: Fairness is the first element that always comes to mind when this subject arises. Both parties need to be satisfied and gain benefits in each deal that is agreed upon. If not, deals tend to end faster than planned and turn into a waste of time for all stakeholders. I would estimate that 50 percent of my time is spent with our carrier negotiations that involve both our print and 3PL sides of our platform. As LTL is the majority of our spend on the faster growing 3PL side of our business, I have learned that transparency with core providers has become rather critical in both our blanket and account-specific pricing agreements.

Lastly, a key and beneficial gentlemen's agreement we employ is simply giving our carriers the option to opt out of handling any type of shipment(s) or freight that does not work for them. This surgical approach allows LTL carriers in particular to maintain healthy operating ratios by removing business that does not operate well in their respective systems networks. We can generally remove any business from a particular carriers' hierarchy within 24 hours; some of our best providers at identifying freight movements that don't work for them include FDX, R&L, Saia, Estes, Roadrunner, and YRC.



Q: How can today's manufacturers deal with increasing regulations, security concerns, and shifting global trade currents?

A: One way a manufacturer can mitigate the effects of regulations, security, and volatility is by working with a third-party logistics provider with a leveraged platform. When a 3PL has a leveraged platform, it employs the same best practices to manage its own supply chain needs as it does for its client base.

A leveraged platform is likely to have a global transportation partner network that adjusts to the changing global trade lanes, and meets supply chain security concerns by voluntarily participating in the Customs-Trade Partnership (C-TPAT) program managed by U.S. Customs and Border Protection (CBP). The C-TPAT program ensures a high standard of operating procedures for the partners in the import supply chain, and is validated regularly by CBP. The results for clients are fewer delays at the points of entry into the United States, and less cost as goods move more quickly and efficiently to the end user.

Q: You've mentioned leveraged platform again. What is the difference between a leveraged platform and a 3PL?

A: A leveraged platform is the reference I use to differentiate our platform, which employs RR Donnelley's 150+year presence as a large shipper. Our logistics offerings, with over 130 local-based Station Agents, differ greatly from the usual large call centers that only employ a typical 3PL brokerage model. Domestically, we have been able to minimize higher priced LTL by co-loading customer's freight with our print and mail tonnage that must move on a timely basis. Internationally, we have employed the same practice from Shenzhen, China, by combining our client's retail goods with our books on regular import schedules.

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GRIFFIN

President





BY CHRIS COTTER

Partner, Roetzel & Andress, LPA ccotter@ralaw.com | 330-849-6756

Lifting the Fog on Extreme Caution Driving

nclement weather such as rain, snow, and fog is a constant feature of motor vehicle travel. During poor conditions, commercial truck drivers and their dispatchers must use discretion when deciding whether travel should continue and in what manner.

Federal Motor Carrier Safety Regulations (49 C.F.R. § 392.14) specifically address driving in adverse weather conditions and require commercial drivers to exercise extreme caution. How to interpret extreme caution is subject to debate. The regulation states the driver shall reduce speed when adverse weather conditions are present and cease operations when conditions become sufficiently dangerous.

However, some courts have interpreted extreme caution as placing a heightened standard of care on the commercial driver, requiring greater vigilance and attentiveness than a passenger car driver.

Exercising Vigilance

The regulation is triggered when "hazardous conditions, such as those caused by snow, ice, sleet, fog, mist, rain, dust, or smoke, adversely affect visibility or traction." While the list of weather conditions is meant to be broad, extreme caution is not required unless those conditions "affect visibility or traction."

For instance, if a commercial driver

encounters a wall of fog upon rounding a curve on a mountainous highway, Part 392.14 would not be triggered until the moment the driver can reasonably observe the fog.

Once the regulation is triggered, what must the commercial driver do to use caution? The regulation instructs that "speed shall be reduced" when such conditions exist and, if conditions become sufficiently dangerous, the vehicle's operation "shall be discontinued and shall not be resumed until the commercial motor vehicle can be safely operated."

These portions of the regulation are intentionally imprecise and open ended because evaluating the severity of weather conditions and deciding the appropriate response are best left to the driver's discretion.

The Federal Motor Carrier Safety Administration (FMCSA) acknowledges this view in its official guidance, and it comports with the notion that the driver is the "captain of the ship", a view many motor carriers adapt regarding a driver's decision-making authority while on the road.

Travel does not need to cease because adverse weather conditions are present. Part 392.14 requires the driver to stop not simply when visibility or traction affect travel, but when the impairment of visibility or traction is sufficiently dangerous.

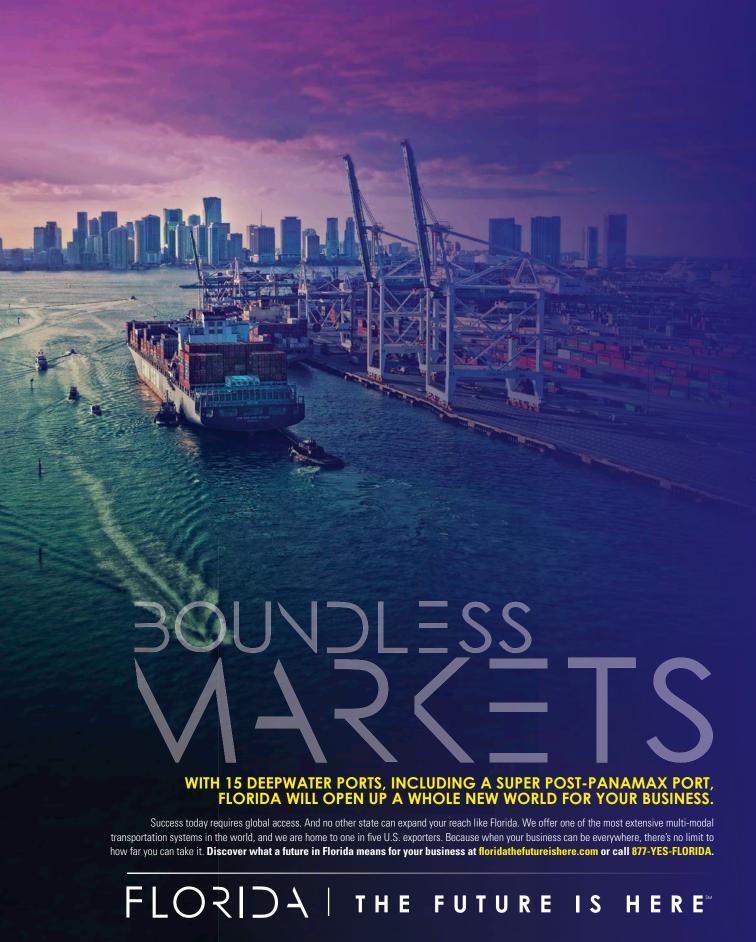
Determining Liability

There is disagreement over whether extreme caution imposes a heightened standard of care on commercial drivers, above and beyond the typical standard of care for the operation of motor vehicles, known as the reasonable care standard. The issue arises when an accident occurs in inclement weather and the injured party brings a lawsuit against the motor carrier and commercial driver. The difference between a heightened standard and a reasonable care standard can have a drastic effect on whether the carrier is liable for causing the accident.

Part 392.14 does not state extreme caution is a heightened standard. Further, the FMCSA has not taken that position. Yet, some courts have determined that Part 392.14 holds commercial motor vehicle drivers to a higher standard of care any time adverse weather conditions affect visibility or traction.

The good news is that many courts decline to impose the heightened standard of care when applying the extreme caution regulation.





ENTERPRISE FLORIDA



SMART MOVES

BY ML PECK

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Is Your Company Millennial Friendly?

hen it comes to attracting millennial job candidates, the supply management sector has a decided advantage. College students say they're attracted to our profession because of the number of different disciplines within it, the breadth of responsibility, and its impact on sustainability and the global footprint.

We may have an easier time drawing in millennials, but can we retain them? Here are three actions I recommend to keep millennials in your workforce.

1. Assign meaningful projects that have a direct impact on your bottom line. This particular generation craves responsibility for projects and decisions that make a difference. Consider Leah Elders, team leader inventory analysis, ConAgra Foods in St. Louis, and a ThomasNet.com and ISM 2015 30 Under 30 Rising Supply Chain Star.

Only four years into her supply chain career, Elders has tackled increasingly challenging roles. Currently, she's responsible for executing a new process of inventory obsolescence management, handling millions of dollars of at-risk inventory and working with a cross-functional team to find the root cause. She directly saved \$1.4 million of inventory in her year on the team.

2. Give millennials the opportunity to learn, improve, and grow. Whether it's a lateral move to a new department, rotations from the headquarters office to a warehouse or a call center, or a transfer

to a different geographic location, millennials are eager for the "opportunity to move around under the same roof," says Grayson Mitchell, area sales manager, Fiat Chrysler Automobiles and a 2012 recipient of the prestigious R. Gene Richter Scholarship.

Danielle Amico, a contract administrator at Princeton University, N.J., and 30 Under 30 Supply Chain Star embraced procurement after starting her career in human resources and has never looked back. Recently, Amico played a key role in developing Princeton's first design-build construction template that was used on a \$6.7-million renovation project, a contract she negotiated and administered.

3. Maintain a millennial-friendly environment. Baby boomers may think millennials don't share their work ethic, but nothing could be further from the truth. Millennials are effective; they just work much differently than the previous generation.

Fluke Electronics discovered that truth about Amy Georgi, their program manager of supply chain acquisition and integrations and the 2015 30 Under 30 Megawatt Star.

After joining Fluke right out of college, Georgi was assigned to a sixmonth-old factory and quickly organized its supply base into a highly effective operation. Impressed, management asked her to lead a complex, three-phase move of a plant being divided into two facilities, a job she skillfully handled.

In the midst of another plant move, Georgi had to relocate for her husband's education. Fluke did not have any remote employees but Georgi was so valuable to corporate procurement it lobbied for a policy change. She has worked remotely for the past four years.

Millennials want to work for authentic and trustworthy companies. They're looking for companies that make a positive difference in the world, protect the environment, and treat people as individuals, not tools to accomplish a task.

"We take pride in new challenges, but if we are not being challenged, we tend to look elsewhere," says Mitchell. "As we get five, 10, and 15 years into the future, millennials will represent a large portion of the workplace. If companies have not been preparing for this, they should start today."

Editor's Note: See page 92 for more coverage of the 30 Under 30 Rising Supply Chain Stars program.





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IT MATTERS

BY GARY HANIFAN

Managing Director, Strategy - Operations, Accenture gary.l.hanifan@accenture.com | 703-947-1838

Goodbye, Linear Supply Chain. Hello, Digital Supply Network

eady or not, the death of the linear supply chain is upon us. Supply chains built to deliver reliable, cost-effective results are no longer fit for purpose in today's digitally driven world. Enter the digital supply network (DSN).

DSNs intertwine, even harmonize, four supply chains—physical, information, talent, and financial—that businesses have operated separately for decades. The result: A cohesive network that makes sourcing, production, and product delivery more efficient and profitable as it delivers a customer-pleasing order fulfillment experience.

More than that, DSNs give management end-to-end visibility into the supply chain, with control towers that analyze supply, production, distribution, and sales data collected along the way. That valuable information can warn of a problem, or can offer insights about new ways of working and enable execution of a broader digital business strategy.

DSNs allow companies to shorten processes, potentially eliminate functions, and identify ways to be more competitive with new services and products. For instance, companies may not need purchase orders because sensors embedded in products could enable an auto-receipt function upon delivery, and trigger a transfer of funds for payments.

In fact, we know that the value of the DSN to your business is not to import or replicate your existing supply chain into new networks. Rather, it is to reimagine and redesign the value of your business through a DSN lens.

Digital technologies contributing to the Industrial Internet of Things are creating new vistas of opportunity, and companies need these DSNs to help them be more competitive.

Moving Together

Companies have traditionally created separate management structures for supply chain components such as human resources, information, products, and financial transactions. It is the physical supply chain that transports goods, which people equate with a supply chain. This narrow view is an anchor that can weigh down companies, and prevent them from making a paradigm shift.

A DSN connects the physical supply chain with the talent, financial, and information supply chains, creating visibility across the spectrum. So as companies begin to redesign operating footprints, they reimagine processes and consider how they can access different suppliers and markets. Done correctly, the DSN operates at the speed companies need to create value.

One Size Does Not Fit All

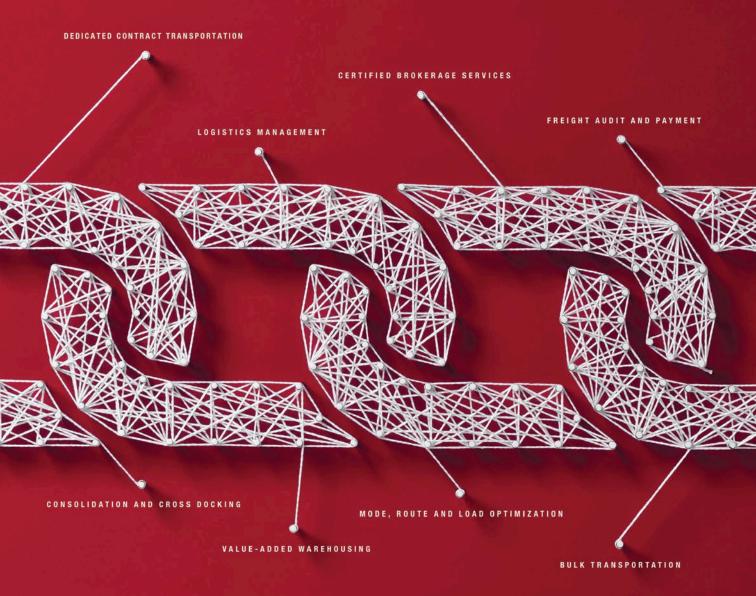
The DSN is a modern strategic approach that deconstructs and restructures supply chain strategies to deliver value. With it, a company can realize its strategic vision as it begins to see new business opportunities—new ways of working.

As such, a company's DSN adoption will be inherently fit for purpose, tailored to that company's needs and future proof. No two DSNs are the same, but they all should exhibit four key characteristics: connected, intelligent, scalable, and rapid. DSNs deliver real-time data, enable real-time decisions, and provide end-to-end supply chain visibility.

Built from modern digital technologies, and bringing all four supply chains into harmony, the DSN of tomorrow is ready to be deployed today. Companies holding on to the dying linear supply chain are closing themselves off from a strategy that operates at a lower price point while doing more to enable growth.







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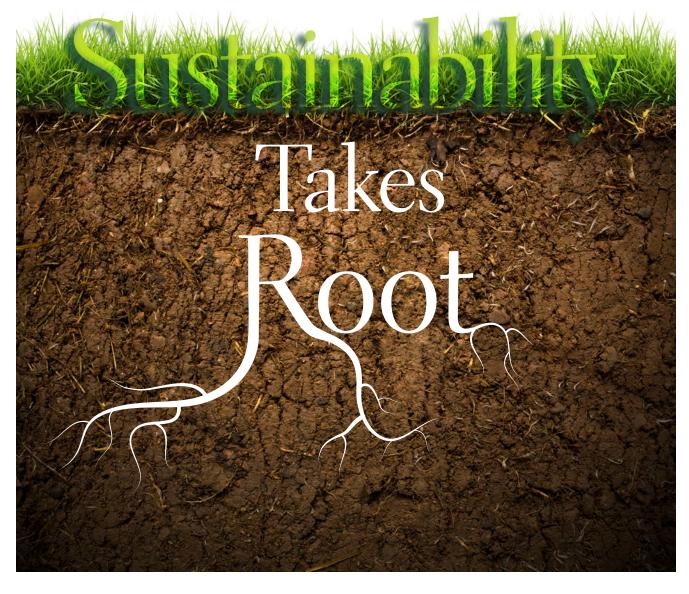
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Supply Chain



WHETHER THE MOTIVE IS SAVING THE ENVIRONMENT OR SAVING MONEY, COMPANIES ARE EMBRACING SUPPLY CHAIN SUSTAINABILITY FROM THE GROUND UP.

by Sandra Beckwith

ustainability is rising. Born out of global concern over climate change, on April 22, 2016, a record 175 countries signed the Paris climate agreement, voluntarily pledging to cut greenhouse gas emissions.

Businesses are paying attention. A 2014 McKinsey & Company survey asked respondents about the actions their companies are taking to address environmental issues, and practices they use to manage sustainability. CEOs were twice as likely as they were two years before to see sustainability as a top priority, according to survey results. Their stated motivation in 2014 was aligning sustainability with the organization's goals; two years prior, cost cutting was the primary motivation.

When it comes to green and sustainable supply chains, though, cost cutting is still the driving force.

"Sustasinability is not always to help the environment," says Patrick Penfield, professor of practice, supply chain management, at Syracuse University's Martin J. Whitman School of Management in Syracuse, N.Y. "Every dollar saved through supply chain sustainability efforts is a dollar for profitability."

Whether companies are embracing lean, green, and sustainable supply chains to save money, protect the environment, or because customers and employees want them to, there is no question that technology makes it possible to implement changes large and small that have a positive environmental impact.

Green opportunities abound. From reducing energy consumption and carbon emissions to using less

packaging and more environmentally friendly materials, businesses are making significant and often innovative changes that offer a win-win: reducing carbon footprints while often saving money.

At Dean's Natural Food Market, a small New Jerseybased organic food store chain, sustainability, not savings, is the motivation. The second sentence of Dean's employee handbook states that the company emphasizes "community before profits."

As one example, Dean Nelson, founder and owner of the four-store chain, refused to respond to shopper demands to carry the popular Keurig K-cup coffee pods until the beverage company offered a recyclable option.

"We're about raising consciousness, developing staff, and educating customers," Nelson says.

Dean's also demonstrates its commitment to sustainability by using eco-friendly boxes, flatware, and coffee cups at its hot bar. It plans to begin offering reusable glasses at its juice bar, so customers can get a smoothie using their own glassware, with saving incentives.

Nelson notes that verifying sustainable practices among food suppliers is particularly challenging. Samarth Sarthi, CEO at SCA Technologies, a Pittsburgh-based category sourcing and cost management solutions provider, agrees.







Dean's Natural Food Market's commitment to supply chain sustainability involves choosing paper over plastic, reducing food waste, and transporting products in bulk.

"Supermarkets often buy through aggregators so they don't know who or where the products come from," says Sarthi, whose company provides supply chain software to restaurant chains.

Add the challenge of not knowing enough about your supplier's suppliers and how that impacts your supply chain.

"While a number of companies are starting to address this, many still don't realize the full impact of how a disruption at that end of the chain can affect them, and where they might be susceptible," says Toby Brzoznowski, executive vice president of LLamasoft, a supply chain design software company in Ann Arbor, Mich.

Getting Down With Supply Chain Transparency

When Celebriducks owner Craig Wolfe wanted to create a baby-friendly rubber duck made from non-PVC material, he brought manufacturing back to the United States from China so that he could retain tight control over materials sourcing.

"I wanted full supply chain transparency and didn't want to leave anything to chance," says Wolfe, founder and president of the California company.

He collaborated with PolyOne, an Ohio global plastics compounder, to develop an end product made of material approved for food contact and medical application.

Like Wolfe, many companies are focusing on supply chain elements they have more control over, including transportation. This is where technology is having a significant impact, as any transportation management system (TMS) provider will explain. By using sophisticated software, shippers can optimize modes and loads—shifting from over-the-road only to intermodal, or changing trucking equipment, for example.

Some companies are getting innovative, too. For example, Texas-based logistics services provider Transplace helps shippers save money and reduce the number of shipments with its co-shipping service, TransMATCH. A specific initiative that delivers products from Mexico to the United States by matching heavy cargo, which prevents trailers from being fully loaded because of weight restrictions, with lightweight cargo that fills the empty space above the heavy products, TransMATCH was recognized with a Supply Chain Innovation Award from the Council of Supply Chain Management Professionals.

"With this service, we combine heavy products such as tile or home appliances with much lighter ones—ladders and plastic cups—in rail cars and trucks," explains Ben Cubitt, senior vice president, consulting and engineering for Transplace.

The company is seeing more collaboration like this among shippers. Cubitt cites a situation where three consumer products companies with Atlanta distribution centers were delivering to the same customer in another part of the country. By combining their shipments, rather than shipping separately, they were able to use fewer trucks and save money.

This has a positive impact on their shared customer, as well. "If I reduce the number of deliveries that customer has to handle per day by cutting the number of deliveries by 40, that's 40 fewer unloads the customer has to handle," he says.

Sherwin Williams of Cleveland, the nation's largest specialty retailer of paint and painting supplies, leverages





Transplace's resources to support its fleet backhaul program. The paint company's Contract Transportation Systems Co. (CTS) subsidiary is a private fleet that runs 60 million miles annually, delivering products from company distribution centers in six regions to 4,100 stores all over the country. Rather than bring those trucks back to the distribution center empty, a dedicated sales team finds loads to pick up near destination stores and deliver on the way back to each truck's home base.

"Our sales team goals are aligned with the company's to reduce our carbon footprint," says Russ Beeg, regional director of sales, west fleet, for CTS. "In addition to working to make sure our trucks don't run empty, we recently purchased 450 tractors with cutting-edge technology that will help reduce fuel consumption."

Building to Spec

AFN Logistics, an Illinois-based thirdparty logistics provider, recently used a simulated supply chain to help a beverage manufacturer save 13.8 percent on transportation hard costs related to shipping to its largest retail customer. After a data dump that went through a quantitative and qualitative assessment, AFN built a two-stage simulated transportation solution with the manufacturer's and customer's existing requirements.

When the manufacturer implemented the simulated recommendations, it cut 6.5 percent in hard costs during the first phase, according to Brian Winshall, AFN's executive vice president. When it adjusted the customer's must-arrive-by date in the second phase, it generated another 7.8 percent savings on top of previous cuts. The beverage manufacturer also increased on-time delivery, eliminated chargebacks for late deliveries, and reduced the number of shipping days from seven to three - and then again down to two.

In addition to reducing energy consumption on the road, some companies are reducing it within the operation. Dean's Natural Food Market, for example, spent nearly \$60,000 to completely convert one store to LED lighting one year ago. The project, which encompassed the sales floor, stockrooms, refrigerated cases, and walkin coolers and freezers, saves nearly 60,000

How to Go Green

Here is some expert advice for creating a lean, green, and sustainable supply chain:

- Get executive buy-in that includes a champion or sponsor who can help break down internal barriers.
- Start by mapping the current state of your supply chain. That will help identify silos that will, in turn, help find ways to improve communication and collaboration companywide, says Brian Winshall of AFN Logistics.
- Take a data-driven, project management approach. "The most successful programs treat sustainability as a project, make a commitment to it, assess for opportunities and prioritize them, and implement," says Ben Cubitt of Transplace.
- Investigate new technology, whether it comes via software, lighter trucks, or packaging materials.
- Be willing to innovate. According to the State of Green Business Report 2016, published by GreenBiz.com, the logistics of getting finished products to their markets "has become a particularly active breeding ground for innovation."

"The beverage manufacturer thought it was doing a good job before working with us and it was, but there's always a point where you can do a little better, especially when you're not addressing a core competency in the organization," says Winshall.

> Transportation changes such as using lighter trucking equipment for heavy goods that include bottled water and canned goods can also reduce carbon emissions, Cubitt points out. With that approach, the shipper can add more products before reaching the legal weight load, thereby reducing the number of shipments.

"Shippers want to reduce the number of loads," Cubitt says. "It translates to direct savings and it's better for the environment. There's also a ripple effect through the supply chain when you use fewer trucks that eventually become obsolete and have to be disposed of."

kilowatt hours and \$13,000 in energy costs annually. The company's fourth store, opening soon, will also be all-LED.

Avnet, Inc., a global Fortune 500 technology distributor based in Phoenix, is also switching from incandescent to LED lighting in facilities as they're refreshed. In addition, the company is partnering with Mother Nature to generate some of its own power.

The solar parking canopies it has installed in its Phoenix distribution center parking lot and an office building in Tempe, Ariz., serve two purposes. First, they minimize the impact the region's brutal sunlight has on vehicle interiors, making them significantly more comfortable at the end of the work day. Second, solar panels installed on the canopy tops generate power that is used by the facility or returned to the grid for a utility credit.

At the Tempe location, the 3,724 solar panels installed on the parking canopies

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When Celebriducks created its rubber duck with non-PVC

control and transparency.

material, the owner sourced that

material in the United States to retain



Avnet flipped the switch on a 1,000-kilowatt, 3,724-panel solar project that provides approximately 60 to 65 percent of the energy for its headquarters in Tempe, Ariz.

as well as the roof generate more than 1.7 million kilowatt hours of electricity per year - about 60 to 65 percent of the facility's energy load. The project saved Avnet approximately \$130,000 in utility costs during its first year; utility savings are expected to exceed \$5.8 million over the next 25 years. The Tempe solar panels also reduce the company's carbon emissions by 996 metric tons annually (the equivalent of removing 210 cars from the road each year).

Riders on the Stormwater

At New York City-based commercial real estate services company Cushman & Wakefield, Ben Conwell is seeing more companies working to minimize their facility's environmental impact not only by harnessing solar power, as Avnet does, but by addressing stormwater runoff, as well.

Conwell, senior management director of the company's e-commerce and electronic fulfillment specialty practice group, says that distribution centers and warehouses often have "a tremendous amount of impervious surfaces"—roofs, driveways, and employee and trailer parking lots, for example. Today, many facility designers are working to handle runoff in a more environmentally friendly way.

"Stormwater runoff is often managed by directing it into a huge pond that takes up real estate and releases it to the ground or public stormwater system," Conwell says. "Smart designers now use pervious surfaces that allow rainwater to percolate through the surface and dissipate under the driveway or parking lot."

This is possible because new materials eliminate long-term, expensive maintenance issues with earlier potential solutions, including surfaces cracking under heavy weight.

Roof runoff can also be collected to irrigate landscaping. "A one-millionsquare-foot distribution center has about 25 acres of roof," he explains. "Instead of wasting the runoff by sending it into the stormwater system, environmentally conscious companies are recycling it for irrigation."

Shippers are also looking for ways to create a greener, more sustainable supply chain through packaging changes - using less, recycling more. Glass House Shirt Makers, a Brooklyn-based contemporary menswear manufacturer,

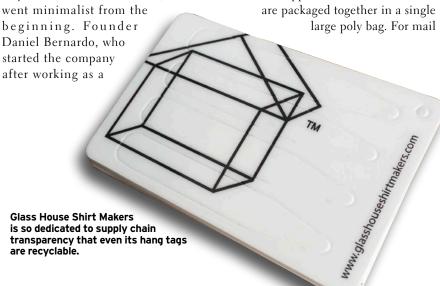
sustainable development consultant, even selected a business name linked to sustainability.

"Glass communicates our goal of transparency as a company from crop to finished garment," he says.

Glass House reduces packaging when shirts are shipped from the contract manufacturer in Chicago to the Brooklyn headquarters and again to retailers.

The traditional packaging approach from manufacturer to warehouse puts shirts in individual poly bags, but Glass House requires that they be hung on reusable hangers and packed in re-usable wardrobe boxes. After a quality inspection, shirts are re-packaged for store delivery or mail order without the traditional cardboard stays, tissue paper, pins, and poly bags typically used for men's shirts.

When shipped to stores, folded shirts



order, each shirt is individually bagged and shipped in a reusable padded mailer.

"Even the hang tags are made of a recyclable polymer base that biodegrades in a landfill in six months," Bernardo says.

Avnet has also invested in more ecofriendly packaging changes, starting with re-engineered cardboard shipping packages that take advantage of technology, allowing the same level of product protection but with a lighter cardboard. A new design combined with thinner cardboard has made a significant impact.

"We save thousands of pounds of cardboard and reduce emissions because we transport less bulk and weight," says Mike Buseman, Avnet's chief global logistics and operations officer.

In addition, when circumstances permit, Avnet returns certain packaging used with products delivered to its distribution centers — pallets, totes, and larger-form packaging that can be broken down and later re-assembled — back to the supplier for re-use.

"This only works when the supplier is close enough to make it feasible from a fuel and carbon emissions standpoint," Buseman adds.

Going Forward on Reverse

Product returns—reverse logistics—are also a factor in a green and sustainable supply chain. According to Optoro, a Washington, D.C., software company that provides retailers with cloud-based, multi-channel selling technology, the environmental impact of the 3.5 million products that consumers return every year is 4 billion pounds of waste and 11 million metric tons of carbon emissions.

"Most stores, including the large retailers with old systems and a lot of storefronts, don't have the capacity to manage this in a way that's financially substantial or environmentally friendly," says Ann Calamai, Optoro's director of sustainability.

Returned merchandise usually goes back into inventory, gets liquidated, or is donated or thrown out, she says. In addition, inefficient returns systems contribute to energy waste and pollution. Optoro's systems that help find new homes for returns include a direct-to-consumer retail site, Blinq.com, and a liquidation sales site, Bulq.com.





"Most stores don't have the capacity to manage product returns in an environmentally friendly way."

- Ann Calamai Director of Sustainability, Optoro

When Groupon implemented Optoro's returns management system, the mobile and online commerce company experienced improvements in three significant areas:

- **1.** Decreasing waste by 60 percent by relying less on liquidators.
 - 2. Reducing fuel use by 30 percent and

To help retailers and manufacturers leverage their returned and excess inventory, Optoro recently expanded its Lanham, Md., warehouse.

cutting emissions by 27 percent by eliminating extra steps involved in selling to wholesalers or liquidators and selling directly to consumers instead.

3. Shifting from disposing or recycling 21 percent of goods to re-selling 91 percent of the returned or excess inventory directly to consumers.

Software plays a major role in creating a more sustainable supply chain, whether it's in managing returns, identifying optimal transportation options, or designing a digital supply chain that helps a company identify and prioritize opportunities. But people are important, too.

"We've found that when we just optimize through technology, we miss little pieces," says Winshall of AFN Logistics. "But when we combine technology and people, we have the best output for customers."

And whether the shift to sustainability is motivated by a concern for the environment, customer requirements, reputation management, employee satisfaction, or cost savings, the Paris Agreement foreshadows the reality that improving supply chain sustainability might not be optional in the future.

"The good news," says Cubitt, "is that a high percentage of the initiatives that drive sustainability will also drive process improvements and cost savings."



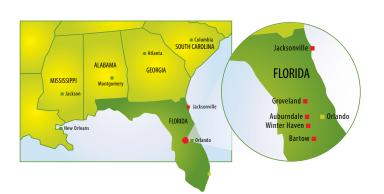


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From employing goats to clear land to updating fleets with the latest technology for miles-per-gallon gains, these 75 Green Supply Chain Partners constantly innovate to help you grow greener.

IL editors combed through submissions from companies with impressive green credentials, and ultimately chose the G75 based on four benchmarks: measurable green results, sustainability innovation, continuous improvement, and industry recognition. Our annual G75 list showcases the sustainability best practices these companies employ in their supply chain, logistics, and transportation operations. It details the green strides they have made and how they can help environmental initiatives take root in your operations as well.

A. Duie Pyle

To reduce fossil fuel consumption, Pyle's fleet is composed of trucks with 11L and 13L engines for higher fuel efficiency. The carrier also utilizes engine idle limiters, tire inflation monitor systems, oil reclamation, and automatic transmissions in heavy-duty over-the-road vehicles. Pyle's facilities employ green initiatives through paperless docks, radiant heated flooring, and motion-activated lighting. The carrier's Parkesburg, Pa., warehouse currently features a one-megawatt solar installation that supplies 100 percent of the building's electricity needs.

ABF Freight

For 40 years, ABF Freight has been conserving fuel and reducing emissions by voluntarily limiting the maximum speed of its trucks. The carrier specifies all new trucks to include computerized engine shut-offs to automatically reduce idling, further cutting fuel consumption and limiting emissions. As a partner in the EPA's SmartWay Transport Partnership, the carrier earned a SmartWay Excellence Award. ABF Freight advocates sustainability through its participation in the American Trucking Associations' "Trucks Deliver a Cleaner Tomorrow" program and is a member of the ATA Sustainability Task Force.

Americold

Maintaining cold temperatures is an energy-heavy activity, but Americold employs energy-saving solutions. By using real-time energy consumption monitoring; retrofitting motion-sensing LEDs; placing solar arrays on buildings and gas turbines; and through effective energy management, Americold has saved more than 220 million kWh of electricity since 2010—enough to power more than 20,000 homes for one year. That number translates to approximately 180 million pounds of CO_2 equivalents. In addition, the company's automatic storage and retrieval systems incorporate regenerative energy.



AAA Cooper

AAA Cooper focuses on green initiatives to enhance MPG and reduce emissions through the use of wide base tires in all positions; automated manual transmissions engineered with specific drivetrain modifications; enhanced and full aerodynamic fairing packages; conversion of oil to lighter-weight synthetic; and modernized tire pressure and monitoring systems. The carrier operates a 100-percent fully skirted pup trailer fleet. Its sleeper fleet is equipped with the latest APU systems, as well as a plug-in system, to allow operation without any fuel burn when parked.



Alliance Shippers

As an active SmartWay partner with annual CDP assessments, Alliance Shippers Inc. participates in many green solutions. In 2016, Alliance added 200 energy-efficient refrigerated trailers to increase its fleet to nearly 2,100 CARB-compliant trailers. Alliance also uses U.S. rail intermodal for the line-haul portion of service to provide shippers with a green alternative. Its green initiatives extend to its Keasbey, N.J., warehouse, which produces the majority of its power supply from solar arrays.



75 GREEN SUPPLY CHAIN PARTNERS G75

APU Auxiliary Power Unit

CDP Carbon Disclosure Project

CNG Compressed Natural Gas
EPA Environmental Protection Agency

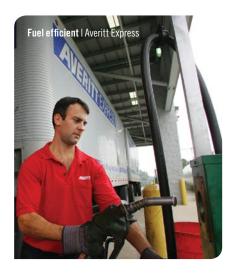
kWhr Kilowatts Per Hour
LED Light-Emitting Diode
LNG Liquid Natural Gas

MPG Miles Per Gallon
NGV Natural Gas Vehicle
NO_v Nitrogen Oxide

SmartWay EPA's SmartWay Transport Partnership

APL Logistics

Using its carbon footprint calculator and green supply chain analysis, APL Logistics' engineers identify sustainable practices, including operation savings, for shippers. The 3PL's analysis tools estimate the amount of greenhouse gases produced by using fossil fuels for electricity, heat, and transportation at each warehouse. Simulation tools help explore warehouse configurations to reduce movements and double handling. APL Logistics also optimizes shipment routes and the overall logistics network to help reduce carbon footprints.



Averitt Express

Averitt Express employs many environmentally friendly practices such as increasing fuel efficiency with fleet speed limits; using low-viscosity lubricants and engine oils; utilizing software to plan efficient routes; and equipping tractors with auxiliary power units. The company recycles all used oil and oil filters, captures and recycles freon when servicing tractors' air conditioning units, and, when possible, reuses tractor antifreeze. Averitt Express also provides incentives to reward staff for conservation efforts, including improved MPG rating and reduced energy usage.



Avnet

To ensure sustainable and responsible business practices, Avnet created a corporate social responsibility council comprising global representation. Global activities focus on six areas: supply chain, environment, labor practices, human rights, anti-corruption, and community. Per DFGE — Institute for Energy, Ecology, and Economy, Avnet achieved a carbon footprint reduction in 2015. Avnet operates 19 ISO 14001-registered facilities that monitor electricity, gas, and water consumption; participate in landfill diversion programs; and operate LED lighting and solar panels.



Responsible labor practices | Avnet

BDP International

BDP International is focused on decreasing its carbon footprint through its sustainability program. Main achievements since 2015 include: distributing the first annual Green Leaf Award to its Netherlands office for sustainability innovation; the BDP green, safety, and wellness teams collaborating to form a global environment, health, and safety group; and hosting web-based conferences to reduce paper usage. As a steering committee member of the Clean Cargo Working Group, the 3PL works with industry peers, measures carbon emissions, and accesses carrier environmental data.





Reduced-water car washes | BLG Logistics

BLG Logistics

As a logistics service provider for the automotive industry, BLG reduced freshwater requirements per car wash by 85 percent, employing smart systems that provide energy only when needed. The company focuses on smart technology to recover and restore energy, and has won awards for measurable improvements from green logistics initiatives. BLG makes green investments in facilities, equipment, technology, and the skills and capabilities of its team. In its offices around the world, BLG takes responsibility for sustainability of local operations and their effect on regional market environments.

C.H. Robinson

C.H. Robinson is committed to preventing deterioration of the environment and minimizing the impact of its operations on land, air, and water. C.H. Robinson helps shippers reduce carbon emissions and improve sustainability, and helps carriers leverage backhaul capacity to reduce empty miles. The 3PL provides load and mode optimization in both consultative analysis and real-time operations environment, which helps reduce miles and utilize transportation equipment effectively.

BNSF Logistics

Through multi-modal capabilities, BNSF Logistics evaluates all modes to determine which is the most effective and cost efficient to meet shippers' service and environmental goals. The SmartWay partner converts many over-the-road shippers to rail, enabling lower costs while contributing to energy efficiency and emissions reductions. BNSFL demonstrates a year-over-year reduction in ${\rm CO_2}$ grams/mile output through the use of contract carriers and mode conversion, leading to a reduction in GHG emissions. The company services the renewable energy sector and is focused on creating solutions for the wind energy market.

Cardinal Logistics Management

As a SmartWay partner and to ensure safe, environmentally friendly operations, Cardinal operates new, lower-emissions equipment to reduce fuel consumption; governs speed; installs APUs; implements automatic idle shutdown to increase MPG; and tests renewable fuels, including CNG trucks. The 3PL also trains its team on proper maintenance and driving habits, and offers incentives for high MPG rates. Cardinal monitors for efficient performance and uses technology to help lower the fleet's emissions by reducing miles.



75 GREEN SUPPLY CHAIN PARTNERS G75

APU Auxiliary Power Unit

CDP Carbon Disclosure Project

CNG Compressed Natural Gas

EPA Environmental Protection Agency

kWhr Kilowatts Per Hour
LED Light-Emitting Diode
LNG Liquid Natural Gas

MPG Miles Per Gallon NGV Natural Gas Vehicle

NO_x Nitrogen Oxide SmartWav EPA's SmartWav Transport Partnership

Cargo Transporters

A SmartWay-certified carrier, Cargo Transporters uses renewable source auxiliary air conditioning for the cab, wide-base single tires, automated transmissions, a cab aerodynamic package, limited idle time based on ambient air temperature, and tire pressure monitoring. Trailers feature wide-base tires, aerodynamic skirting, and smooth wall trailer sides. In operations facilities and shops, the carrier converted all lighting to LED. Its Claremont terminal has 21 shorepower parking spots where trucks can plug in to heat or cool the cab while waiting for service or loads.

CaseStack

CaseStack's efforts to reduce waste reflect its commitment to efficiency and sustainability. The company's retail consolidation programs help conserve natural resources by reducing dock congestion, improving warehouse efficiencies, and decreasing the number of trucks on highways. The resulting supply chain consumes less energy and produces fewer carbon emissions. CaseStack cut emissions by $10.8\,$ million pounds of $\mathrm{CO_2}$ and reduced $1,800\,$ pounds of $\mathrm{CO_2}$ per truck. CaseStack has been recognized and certified by SmartWay.

CHEP

CHEP achieves sustainable goals and makes its consumer packaged goods customer companies more sustainable through its Better Planet initiative. With its 2015 and 2020 sustainability targets, CHEP is moving toward becoming a zero deforestation, zero emissions, and zero waste company. In addition, CHEP's Value Stream Mapping Solution saved pallet users \$13 million with efficient, sustainable solutions since June 2015, eliminated 4.5 million empty truck miles, and reduced CO₂ by 23.6 million pounds.



Celadon

In addition to being awarded the SmartWay Excellence Award regularly, Celadon constantly updates its fleet. With an average tractor age of less than two years, the trucking company uses the latest technology to reduce emissions and fuel consumption. Celadon installed speed limiters on its tractors and trailers, and equipped them with skirting. Cabs have APUs to eliminate the need for engine idle to heat or cool the interior. Regular maintenance ensures tractors run at peak efficiency.





Commercial Warehousing

Commercial Warehousing implements green measures at all cold storage sites. Cool roof installations with added insulation and reflective membrane roof reduce kWhr usage by approximately 15 percent. The company also operates a full recycling program at repack where it bundles, picks up, and sends all excess materials to the recycler. Commercial Warehousing uses electric forklifts; runs a full pallet recycling program for damaged pallets and loose wood; uses recycled materials for promotional items; and has a formal recycling program with CCNA.

Covenant Transportation Group

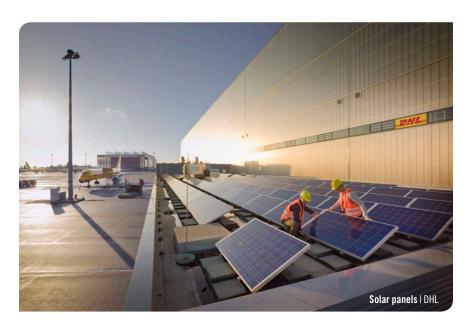
With an average age of 17 months, SmartWay-certified Covenant Transportation Group's tractor engines contain strict emissions controls and are Clean-Idle certified. Inside the tractor, Covenant employs various technologies, such as Espar bunk heaters and APU units, that help reduce engine idling. At its Chattanooga, Tenn., terminal, drivers can hook their tractor up to a docking station to access heat/air, internet, satellite TV, and power without running their engine.

CSX

CSX understands that improving energy efficiency and maximizing clean domestic energy resources are crucial. To help reduce the environmental footprint of its operations, CSX transports goods in a manner that minimizes community and environmental impacts; reduces fuel, energy, water, and other resources needed to move each ton-mile of freight; increases recycling and reuse efforts through minimizing waste; and considers environmental effects and good governance when managing the supply chain.

DHL

DHL actively finds ways to minimize its environmental impact. The company's group-wide environmental protection program, GoGreen, focuses on improving carbon efficiency and reducing air and noise pollution—including direct fleet emissions and indirect emissions from its transportation subcontractors. DHL's goal is to reduce GHG emissions by 30 percent by 2020. To meet the goal, the company develops and implements measures to improve efficiency, optimize networks and routes, and improve energy efficiency in its buildings.



DSC Logistics

At DSC Logistics, a sustainability steering committee manages sustainability efforts. The committee oversees initiatives in a three-pronged approach focused on opportunities in warehousing, transportation, and network redesign. Working with reps from each logistics center, the committee provides support for pilot projects and network-wide rollouts, sustainability education through the organization, and metrics and benchmarking efforts. It sets yearly goals for reducing electricity, natural gas, and water consumption, as well as propane and waste tonnage.



Fuel conservation | Dupré Logistics

Dupré Logistics

Dupré's fleet has fuel-efficient specifications, a top speed of 62 mph, and utilizes fuel-saving tires as part of an overall conservation and emissions reduction strategy. Dupré boosts fuel economy and environmental performance to improve supply chain efficiency and support safe service. The company utilizes technologies to monitor safety and fuel economy, supporting continuous improvement. It participates in the Trucking Alliance, ATA, and NTTC. In 2015, the EPA recognized Dupré with a SmartWay Excellence Award.

75 GREEN SUPPLY CHAIN PARTNERS G75

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EPA Environmental Protection Agency

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NO_v Nitrogen Oxide

SmartWay EPA's SmartWay Transport Partnership



Energy-efficient lighting | ECW

East Coast Warehouse

East Coast Warehouse (ECW) operates the largest solar-powered warehouse in the Northeast, producing more than 810,748 kWhr of clean, renewable energy each year. ECW uses motion-sensing technology to provide energy-saving controls across its facilities. Additionally, it installed 1,425 T-5 and T-8 high-energy, high-pressure sodium light fixtures and movement sensors. When customers permit it, ECW utilizes third-party companies to destroy product and recycle components. ECW also repairs or takes apart all broken wood pallets to build new ones.

Florida East Coast Railway

Florida East Coast Railway (FECR) purchased 24 new 4400 HP Tier 3 emissions-compliant locomotives for conversion to LNG, replacing the rail carrier's entire mainline thruhaul fleet operating from Jacksonville to Miami. Providing efficiency benefits, FECR's locomotives feature technology such as the Trip Optimizer, which minimizes fuel usage, and an automatic start/stop idle reduction system that cuts fuel consumption. FECR will be the first North American railroad to convert its mainline locomotive fleet to LNG, a cleaner and more efficient fuel source, reducing GHG emissions.



Tier 3 locomotive | FECR

FedEx

FedEx integrates environmental practices into its daily operations, and works to increase efficiencies and reduce waste and emissions. The company operates 118 all-electric trucks and 364 commercial hybrid trucks, and is adding 87 all-electric trucks, bringing its all-electric global vehicle count to 130. The company has set the following goals to reduce its footprint: reduce aircraft emissions 30 percent by 2020; increase FedEx Express vehicle efficiency by 30 percent by 2020; get 30 percent of its jet fuel from alternative fuels by 2030; and expand on-site renewable energy generation and procurement of renewable energy credits.



Electric vehicle | FedEx

GENCO, A FedEx Company

At GENCO, A FedEx Company, continuous improvement is a culture and an attitude with all teammates involved. Across GENCO's network of 130+ operations, programs to reduce costs and increase productivity begin from the ground up. A key area of continuous improvement is its "Reduce, Reuse, Recycle" program. In 2015, GENCO successfully implemented 35 green projects that resulted in cost savings.

GEODIS

GEODIS continually develops initiatives to reduce fuel consumption and provide carbon footprint transparency in the supply chain. Recently, GEODIS launched a low-carbon Europe-Asia road and rail solution to help shippers reduce GHG emissions. In addition, the company initiated green projects in Paris, Mexico, and Shanghai to provide eco-friendly services, increase the number of electric vehicles in its fleet, and explore options for the use of alternative fuels. An emissions reporting program that provides effective trade lane-related emission data helps shippers measure CO₂ in the supply chain.

Efficient fleet | GEODIS



Hub Group

Hub Group has been a member of SmartWay since 2004 and has received multiple SmartWay Environmental Excellence Awards. By converting shipments from over-the-road to intermodal, Hub Group helps shippers significantly reduce fuel consumption and CO₂ emissions. Hub Group Trucking encourages the use of day cab tractors, which save approximately 4,056 gallons of diesel fuel per day cab annually. The company's corporate offices received LEED Gold status through features such as natural habitat landscaping, energy-efficient lighting, electric vehicle charging stations, and rainwater harvesting.



iGPS

A recent independent lifecycle analysis examined the environmental impact of the three common pallet types: the pooled multi-use wood pallet, the single-use wood pallet, and iGPS' pooled all-plastic pallet. According to this analysis, plastic pallets had up to 70 percent less impact on global warming, and 92 percent less impact on ozone layer depletion. iGPS plastic pallets are also 35-percent lighter than multi-use wood pallets, requiring less fuel for transport, thus reducing pollution and GHG emissions.



Georgia Ports Authority

The Georgia Ports Authority is committed to conducting port operations in an efficient and environmentally respectful manner. It continually improves operations and facilities with these goals in mind. For example, the port saves 1.9 gallons of fuel annually by electrifying ship-to-shore cranes, and converted all 27 of its ship-to-shore cranes from diesel to electric power. In addition, the port used 20,000 tons of recycled crushed concrete to construct a cross-terminal roadway, and a single-stream recycling program allows for a variety of recyclables, keeping products out of landfills.

75 GREEN SUPPLY CHAIN PARTNERS G75

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SmartWav EPA's SmartWay Transport Partnership

Inmar

Through 29 facilities nationwide, Inmar's remarketing services keep 134 million pounds of material out of landfills annually. Inmar's Rx returns program reduces carbon footprint by eliminating redundant touchpoints and unnecessary transportation of returned product. It consolidates destruction, reduces repackaging requirements, and facilitates recovery and recycling of packaging, saving hundreds of tons of CO_2 equivalent and more than 107,000 boxes annually. The company's donation programs provided more than five million food boxes in 2014 that would have been waste.

J.B. Hunt Transport

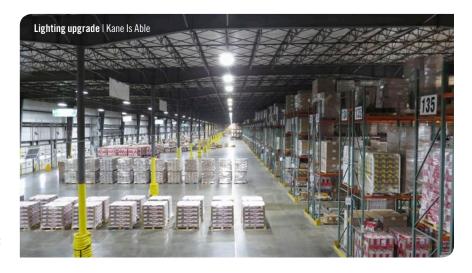
J.B. Hunt converts over-the-road truckload freight to more energy-efficient intermodal. In 2015, intermodal conversion resulted in the carbon reduction equivalent of removing more than 560,000 passenger cars from U.S. highways for one year. Other green initiatives that J.B. Hunt utilizes include LTL consolidation and network optimization, MPG tracking and improvement maintenance, lightweight and aerodynamic equipment, driver training, and alternative fuel options such as natural gas and biodiesel. J.B. Hunt has won the SmartWay Excellence Award every year since 2008.

Kenco

In 2015, Kenco completed lighting upgrades at its facilities in Allenton, Pa., Portage, Mich., and Chattanooga, Tenn. The 3PL anticipates the lighting systems to produce an annual savings of \$227,000. Kenco also has employed new sustainability dashboards that track usage of electricity, natural gas, and water; they also monitor labor costs and measure the output of both landfill waste and recyclable materials. The company monitors baseline data on each metric to set goals toward lowering costs, reducing energy use, and producing less waste in the warehouses it manages for customers.

Kane Is Able

KANE's project to install new lighting at select DCs should save more than 2 million kWh and eliminate 2.7 million pounds of GHG each year. KANE also expects a recent update of its fleet to save \$1.3 million and 343,000 gallons of diesel annually. The 3PL has invested in CNG-powered trucks, which produce up to 20 percent fewer GHG. Re-use is a way of life in all KANE DCs. No material is landfilled if it has potential for recycling. In 2015, KANE recycled 4.35 tons of paper, 42 tons of plastic/stretch wrap, 3,399 tons of cardboard, and 1 ton of cans/bottles. KANE has been a SmartWay member since 2006.



Lufthansa

The Lufthansa Group's corporate management practices emphasize a sense of responsibility for the climate and environment. By implementing a wide range of measures, Lufthansa and its group companies continuously work to increase their ecological efficiency in flight operations over the long term. Aside from billion-euro investments in a state-of-the-art, low-emissions fleet, this also includes implementing the latest technologies in aircraft maintenance and examining all processes that influence weight.





Lynden

Lynden was the first Alaska-based transportation company to be recognized by SmartWay and the first trucking company to earn the Green Star Award for Alaskan businesses. The transportation company focuses its people, equipment, processes, and technology on the efficient use of resources and sustainable operations. Lynden's environmental commitment is based on a common-sense desire to be efficient and to do things right, and its culture of innovation and efficiency complements its commitment to protect the environment.



Murphy Warehouse Company

Through a comprehensive environmental management system, Murphy Warehouse has made significant investments to upgrade its logistics campuses in a sustainable manner that includes energy savings and power generation, pollution abatement, and resource management. Average Energy Star ratings of 97 and LEED Gold certified buildings highlight Murphy's sustainable efforts. The 3PL uses an annual Corporate Sustainability Report, which follows Global Reporting Initiative standards, to track and publish its sustainable initiatives every year.



Maersk Line

Maersk Line constantly seeks out innovative and commercially viable ways to reduce its environmental impacts, be it CO_2 and other air emissions, ballast water, or the materials it uses to build vessels. Since the launch of a 60-percent CO_2 reduction target in 2014, the ocean freight carrier has been accelerating efforts to reduce its carbon footprint. Maersk also works with shippers to transport their products across the globe with the lowest possible environmental footprint.

Matson

In 1993, Matson's Zero Solid Waste Discharge policy, developed with Ocean Conservancy, set the industry standard for environmental protection at sea. Its Greentainer program uses a revenue slot on every sailing to collect all solid waste for transfer to recycling and waste-to-energy facilities on shore. Matson recently installed engine exhaust cleaning systems on its Alaska fleet and will outfit its two new Aloha Class vessels, currently under construction, with dual-fuel, LNG-capable engines.



Alternative marine power | Matson

NFI

NFI has partnered with customers to implement natural gas fleets across the country and advocate for natural gas fueling stations. NFI also integrates new technology to improve aerodynamics and fuel efficiency. Trucks across its 2,300+ dedicated fleet utilize AirTabs, trailer skirts, battery-powered APUs, and speed limiters to improve fuel usage. NFI has also outfitted its headquarters and several warehouses to operate on solar power. NFI won the SmartWay Excellence award three times, and recently received the Advanced Clean Transportation Expo Fleet Award for Shippers & Carriers.

INBOUND LOGISTICS' **75 GREEN SUPPLY CHAIN PARTNERS**

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kWhr Kilowatts Per Hour **LED** Light-Emitting Diode

Liquid Natural Gas

NGV Natural Gas Vehicle

NO_v Nitrogen Oxide SmartWav EPA's SmartWay Transport Partnership

Norfolk Southern

In 2015, Norfolk Southern (NS) began deploying its Eco switcher locomotives, part of an in-house rebuild program that recycles older locomotives and equips them with new low-emission engines. Eco units are at NS yards in Atlanta and Chicago as part of public-private partnerships to reduce diesel emissions. The railroad also rolled out the Sleeper, a custom plug-in engine heater system that, during winter, helps eliminate unnecessary locomotive idling and reduces fuel burn and emissions. NS scored in the top 10 percent for carbon disclosure on CDP's S&P Climate Disclosure Leadership Index.



PECO continually repairs, reuses, and recycles its wood block pallets. Built from responsibly forested timber, no harmful chemicals are ever used on PECO pallets, and all materials are reused or recycled; nothing goes to the landfill. PECO's block pallets offer structural rigidity, eliminating the need for customer-supplied slip sheets or tie sheets to maintain product integrity. True four-way block pallets can also be stacked and transported more efficiently than conventional notched stringer pallets. By efficiently managing a controlled pallet pool, PECO turns its pallets an average of four times per year.



Recycled pallets | PECO Pallet



Penske Logistics

Penske incorporates advanced technologies—real-time GPS tracking, trailer temperature monitoring and insulated trailers; barcode inventory tracking; and RFID devices—to drive sustainability. The 3PL continues to add CNG vehicles to its fleet and committed to fuel a fleet of CNG tractors at a proposed CNG fueling facility in Pennsylania. As a SmartWay partner since 2008, Penske has reduced emissions and improved the MPG performance of its fleet. Specifically, Penske has improved fuel economy by 5 percent, reduced idle time by 16 percent, and reduced CO₂ emissions on a gram/ton-mile basis by 24 percent.

Old Dominion Freight Line

Old Dominion Freight Line values sustainability initiatives throughout all aspects of the company. The carrier equips every new service center with LED lights, and is retrofitting many existing service centers with LEDs. Other green initiatives include adding skirts to every trailer, along with fully equipped technology-such as onboard computers—that track MPG. Solar panels cover the warehouse at the company's newly renovated corporate office in Thomasville, N.C. Old Dominion is SmartWay certified.



Improved MPG | ODFL

Performance Team

Performance Team continues to undertake green initiatives. The 3PL is growing its transload operations—a 3:2 trailer compression reduces carbon footprint by 30 percent. PT updated its entire fleet to SmartWay-approved tires, and uses trailer skirts and under trays to improve fuel efficiency. On-demand packaging equipment and software reduce carbon footprints and waste from corrugate and filler material. Innovative recycling programs allow PT to pick up and dispose of recycled materials during daily routes. PT has been a SmartWay partner since 2008, and is a Coalition for Responsible Transportation member.



Port of Los Angeles

The Port of Los Angeles works toward the best interests of the community, environment, and economy through integral sustainability considerations during planning, design and construction, and throughout operations and maintenance of facilities and structures. As the port conducts the initial phases of a planned 10-year capital improvement program, it will use sustainable practices for the benefit of the projects and to maintain consistency with the city's mission and goals. Improvements include container terminal redevelopment and transportation infrastructure improvements.

Container terminal redevelopment | Port of Los Angeles



Port of Portland

The Port of Portland aims to reduce carbon emissions by 15 percent below 1990 levels by 2020. It developed a carbon footprint reduction and energy management strategy to identify projects that can lead to significant reductions in energy use. The port relies on renewable power for 100 percent of its purchased electricity. In addition, its fleet includes CNG shuttle buses, and hybrid and electric cars, and uses cleaner-burning biodiesel or lower-sulfur diesel in other vehicles and equipment. The port has also reduced emissions by installing infrastructure that minimizes idling and congestion.



Port of Baltimore

The Maryland Port Administration's (MPA)
Environmental Strategy includes establishing programs to evaluate emission control technologies for its ports, reviewing and updating existing water quality programs, and reducing energy consumption and diesel fuel use. The MPA also continues to support dray truck replacements. This program requires older trucks to be scrapped and helps applicants purchase newer vehicles with engines that meet stricter emissions standards. The goal is to reduce air pollution and greenhouse gases associated with transporting goods to and from the Port of Baltimore.

Port of Long Beach

The Port of Long Beach holds a 20-year record of environmental protection programs. The Green Port Policy, which the port adopted in 2005, is an aggressive, comprehensive, and coordinated approach to reduce the negative impacts of port operations. Some examples of sustainable practices at the port include the development of a Sustainability Task Force, an environmental management system to establish sustainable stormwater practices during construction projects, and a wastepaper and container recycling program conducted in partnership with the Conservation Corps Long Beach.

Port of Oakland

The Port of Oakland carefully studies all the impacts of a thriving economy to mitigate unintended negative impacts, including pollution (air, water, noise) and infrastructure wear and tear. As a result, dozens of innovative programs have emerged that work to identify, quantify, and meet these challenges. The port has several green initiatives and programs in place, including a sanitary sewer management plan, several clean air programs, a seaport air emissions inventory, habitat restoration, clean water programs, and a materials management program.

INBOUND LOGISTICS' **75 GREEN SUPPLY CHAIN PART**

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Carbon Disclosure Project

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kWhr Kilowatts Per Hour Light-Emitting Diode NGV Natural Gas Vehicle NO_v Nitrogen Oxide

SmartWav EPA's SmartWay Transport Partnership

Port of San Diego

The Port of San Diego's environmental sustainability program targets water, energy, air, waste management, sustainable development, and business practices. The port partnered with San Diego Gas & Electric to enhance energy efficiency throughout the tidelands, setting a goal to reduce operational energy use by 170,000 kilowatt hours per year. Its waste management program aims to divert four tons of waste from the landfill through material reuse, recycling, and composting. The port also works with tenants, local environmental groups, and other organizations around San Diego Bay on the Green Port Program.



Solar installation in Japan | Prologis

Prologis

In 2015, 45 of Prologis' new development projects totaling 15 million square feet across 15 countries received sustainable building certifications, bringing its total certified projects to 68 million square feet globally since 2006. Prologis upgraded approximately 73 percent of its operating portfolio with energy-efficient lighting. Prologis also developed more than 149 megawatts of rooftop solar energy installations in nine countries since 2007. In addition, the company partners with colleagues to reduce the energy, water, and waste of its operations; collaborates with community organizations to support educational, environmental, and social causes; and engages with suppliers around its Supplier Code of Conduct.



Restoring habitat | Port of Tacoma

Port of Tacoma

The Port of Tacoma cleaned up legacy contamination to return more than 420 acres of property back into industrial use and restored more than 175 acres of high-quality habitat. The port pioneered low-impact industrial stormwater treatment systems in terminals and log and rail yards that have dramatically reduced pollutants; retrofitted a marine cargo terminal to allow ships to plug into electrical shore power to reduce diesel and GHG emissions; and developed a Clean Truck Program to meet the stringent goals of the Northwest Ports Clean Air Strategy, in partnership with the ports of Seattle and Vancouver, to reduce port-related emissions.

Propak Logistics

Since 1999, Propak has conserved fuel and reduced emissions by limiting the maximum speed of its trucks. Since 2010, all trucks include automatic engine shut-off technology to reduce idling, improving fuel consumption and limiting emissions. After joining the SmartWay program in 2010, Propak increased its total SmartWay miles by 21 percent. Its efforts have cut CO₂ emissions by 18 percent, NO, by 21 percent, and particulate emissions by 39 percent. In 2015, Propak installed wood waste compactors, which have reduced the number of trucks needed by more than 35 percent. Propak recycles 95 percent of operational wood waste and more than nine tons of steel daily.

Raymond Corporation

The Raymond Corporation supports sustainability efforts with materials handling solutions that contribute to reduced energy costs, more efficient space utilization, and higher productivity. Through its Eco-Performance design philosophy. Raymond develops lift trucks that reduce energy consumption while offering longer run-times for greater productivity. RadioShuttle, a semi-automated pallet storage and retrieval system, reduces the need for new warehouse construction by allowing customers to maximize their current warehouse space. And, iWAREHOUSE, Raymond's telematics system, offers fleet and facility managers the ability to track key performance metrics, correct inefficiencies, and identify opportunities to operate more sustainably.

Ruan Transportation Management Systems

Ruan services shippers with CNG and renewable NG fleets, producing up to 80 percent fewer nitrogen oxide emissions than diesel and virtually no particulate emissions. Ruan's Fair Oaks Farms operation displaces 1.8 million gallons of diesel annually. It improves fuel economy across operations by utilizing lightweight trucks, aerodynamic solutions, auto-inflation tire systems, onboard monitoring, and auto-shift power units. Ruan is a member of the National Clean Fleets Partnership, a public-private initiative with the Department of Energy's Clean Cities program to help large fleets eliminate petroleum. Ruan is also an official SmartWay partner and a three-time SmartWay Excellence Award recipient.



Saia LTL Freight continues to train drivers on more fuel-efficient behavior. For example, more than 75 percent of Saia drivers make 85 percent of shifts in the optimal range. Five years into its progressive shifting program, Saia's fleet increased to 6.9 MPG, which reduces the volume of diesel fuel consumed by more than 775,000 gallons. In addition, it enforces a no-idling policy, installs trailer skirts, and aggressively maintains truck equipment.



Ryder

Ryder provides NGV and maintenance solutions with more than 60 million miles of NGV experience, 6,000 NG trained techs, 21 NG maintenance facilities, and two fueling stations. In 2016, Ryder provided Shell Oil with a lease agreement for 15 liquefied NGVs to support its oil & gas logistics operations in Louisiana and Texas. Ryder worked with Shell to develop a customized truck specification that is weight-sensitive to maximize freight revenue. Ryder also partnered with Clean Energy Fuels to offer renewable NG at its NG fueling stations in California. Ryder has reduced greenhouse gas emissions by 6,300 metric tons annually, the equivalent of removing approximately 1,319 passenger cars from the road each year.



Saddle Creek Logistics Services

Saddle Creek expanded its CNG fleet by nearly 400 percent in about four years. The fleet of nearly 200 trucks handles all freight with nearzero emissions and less noise than diesel vehicles. Each CNG truck saves approximately 120,000 pounds of carbon each year, a total of more than 21 million pounds annually. The eco-friendly fleet has traveled more than 55 million miles on CNG to date. In addition, Saddle Creek expanded CNG operations to include Jacksonville, Fla.; Atlanta and Valdosta, Ga.; and Fort Worth, Texas. The company recently invested \$1.5 million to upgrade its Lakeland, Fla., fueling facility, bringing its infrastructure investment to \$3.7 million.

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Schneider

Schneider operates an energy-efficient fleet. Its testing program has resulted in significant energy savings and emissions reductions, improving fuel efficiency by 11.9 percent since 2008 and reducing fuel consumption by 5.7 million gallons between 2013 and 2014. Emission reductions (from 2014 SmartWay Report Card) include a 22-percent reduction in CO_2 year over year (YoY); CO_2 year over year (YoY); CO_2 year over year (YoY), CO_3 y



Schenker

Schenker entered into carrier agreements with defined carbon reduction targets from 2015 to 2020. It has targeted a 20-percent reduction in ${\rm CO_2}$ emissions to achieve Eco Pioneer status by 2020. To accomplish this, the company is improving the capacity utilization of its transportation modes, modernizing equipment and facilities, using a low-emission fleet, and teaching drivers energy-saving driving techniques. Schenker is also increasing its recycling rate by implementing in-house recycling programs and a reusable packaging system. From 2014 to 2015, the company saved nearly 41,000 pounds of paper by reducing paper purchases.

South Carolina Ports Authority

SCPA plans to install rooftop solar panels at two terminals to generate approximately 3.7 MW. In 2015, it donated \$5 million to a local conservation organization to support wildlife/land conservation. In 2013 and 2014, it enforced a truck replacement incentive program and requires all trucks entering the terminals to have a 1994 or newer engine. With fully electrified ship-to-shore cranes and RTG cranes that meet/exceed Tier 3 engine standards, it reduced gate turn times, idling, and fuel consumption. SCPA is a member of the Charleston, Waccamaw, and Upstate Air Quality Coalitions; Southeastern Diesel Collaborative; Coalition for Responsible Transportation; and the Southeastern Wind Coalition.

TransGroup Worldwide Logistics

TransGroup works to mitigate the environmental impact of its customers' as well as its own internal operations. Its external and internal sustainability activities are encompassed in its Green Program called TransNeutral. TransGroup has been a member of SmartWay since 2007. Its initiatives include GHG-limiting warehousing and distribution options, asset recovery, reverse logistics, and end-of-product lifecycle disposition. Internal company sustainability initiatives include energy conservation, recycling, waste reduction, and paperless programs.

Toyota Industrial Equipment

Toyota operates under a global earth charter that promotes environmental responsibility. The majority of forklifts sold in North America are produced at Toyota Industrial Equipment Mfg. Inc. (TIEM), a zero-landfill manufacturing facility in Columbus, Ind. During the manufacturing process, Toyota analyzes and minimizes the environmental impact of every product at every stage. The company requests suppliers use environmentally friendly materials and processes, and the top 65 suppliers, who account for more than 85 percent of the materials purchased locally, to be ISO 14001 certified or have an equivalent environmental management system.

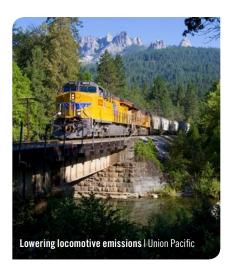


Zero-landfill facility | Toyota



Transplace

As a non-asset-based 3PL, Transplace's primary means to reduce emissions and save on fuel is determined by the transportation service providers and modes it chooses. Transplace utilizes proprietary technology that allows it to search for SmartWay carriers as a selection criterion. In addition, Transplace continually looks at opportunities to convert truckload freight to rail/intermodal. Transplace also employs technology that enables shippers to consolidate orders into environmentally conscious routings, mode selections, and carrier assignments. The company works with dedicated fleet operations and other private fleets to increase backhauls and reduce the number of trucks on the road.



Union Pacific Railroad

Union Pacific Railroad's 2015 *Building America Report* documents its progress in the social, environmental, and economic areas of sustainability. Most notably, Union Pacific strengthened its commitment to improve fuel and environmental performance by investing in 100 Tier 4 locomotives, which reduce particulate emissions by up to 90 percent and nitrogen oxides by up to 80 percent. The company also added its first Tier 4 Generator-Set (GENSET) switching locomotives to the fleet, reducing railyard emissions. Union Pacific helped shippers using rail instead of truck transportation eliminate an estimated 32.9 million metric tons of GHG emissions in 2015.

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Transportation Insight

Transportation Insight (TI) supports green initiatives by reducing logistics-related costs on inbound and outbound shipments; aggregating small shipments to reduce costs and fuel; and using routes and carriers with the shortest transit times to reduce fuel consumption and lower CO₂ emissions. TI performs what-if analysis to determine optimal transportation modes; analyzes supply chain networks to optimize locations of DCs and warehouses to reduce last-mile deliveries; automates bills of lading and freight payment processes to reduce paper use; and reduces waste from end-to-end to lower energy usage, cut carbon emissions, and diminish secondary packaging.

U.S. Xpress

U.S. Xpress continues to strengthen its policies on environmental sustainability. It is a SmartWay partner carrier with emissions performance scores in the top 20 percent of the industry. Additionally, the carrier is in the midst of multi-year CAPEX initiatives that include recapitalizing its truck and trailing asset fleets with new, efficient and safe equipment that meets all federal and state regulations for GHG emission reductions. Additionally, the company is improving maintenance processes to increase equipment efficiencies and reduce waste.

UPS

Since 2000, UPS has driven 505 million miles in its alternative fuel and advanced technology vehicles, and is on pace to achieve its goal of 1 billion miles by 2017. Since 2012, UPS and its environmental partners have planted 5 million+ trees in 46 countries and will fund the planting of 15 million trees by 2020. In 2015, UPS scored among the top marks for voluntary carbon disclosure by the Climate Disclosure Leadership Index S&P 500. The Dow Jones Sustainability World Index selected UPS as a constituent for the third year in a row and included UPS on the North America Index for the 11th year in a row. The EPA recognized UPS with the 2015 SmartWay Excellence Award for leadership in environmental and energy efficiency.



75 GREEN SUPPLY CHAIN PARTNERS G75

APU Auxiliary Power Unit

CDP Carbon Disclosure Project

CNG Compressed Natural Gas

EPA Environmental Protection Agency

kWhr Kilowatts Per Hour
LED Light-Emitting Diode

Liquid Natural Gas

NGV Natural Gas Vehicle

NO_x Nitrogen Oxide SmartWay EPA's SmartWay Transport Partnership

Werner Enterprises

Werner improves MPG and reduces emissions through sustainability initiatives and investments. Since 2007, the carrier has conserved more than 150 million gallons of fuel and reduced its carbon footprint by more than 1.7 million tons, based on MPG improvements. In 2015, Werner received a SmartWay Excellence Award for the third consecutive year. Werner uses industry-leading sustainability technologies such as diesel-fired heating systems, aerodynamic trucks, trailer skirts, tire inflation systems, and the latest diesel technology. Werner also maintains a small fleet of compressed natural gas trucks.



WSI recycles cardboard and dunnage, manufactures products from used wood, uses energy-efficient lighting, and increasingly employs electric lifts. Green landscaping outside WSI warehouses reduces runoff and eliminates lawn mowing. WSI recycles, reuses, or repurposes nearly 100 percent of its three largest facilities' recyclable waste. WSI reuses nearly 100 percent of wooden pallets at its high-volume Chicago and Central Wisconsin facilities. It also recycles all office paper. In 2015, WSI recycled a large paper customer's tissue product, saving 70 tons of landfill space. WSI is an EPA SmartWay partner.

Yale Materials Handling Corporation

Yale offers forklift users alternative options including hydrogen fuel cells and the first commercially available UL-recognized lithiumion battery pack in the lift truck industry. Both technologies produce zero emissions. Using hydrogen to power lift trucks produces only water and heat as byproducts, and with onsite hydrogen generation capabilities, operations can reduce GHG emissions by 33 percent compared to lead-acid battery systems. The Yale maintenance-free lithium-ion option contains no acid, which eliminates the need to dispose of hazardous materials, and lasts up to five times longer than lead-acid batteries.



XPO Logistics

XPO Logistics drives energy efficiency through technologies such as an LTL line-haul simulation that builds nightly runs to maximize fleet productivity. It uses SmartWay-certified LTL and TL fleets and deploys Freightliner Cascadia fuel-efficient tractors. In addition, it uses AMT transmissions; reduced-weight engine oils; low-rolling-resistance tires; and aerodynamic wind farings and trailer skirts. Freight Optimizer technology matches truck and route to the load, reducing empty miles. XPO Logistics also recycles 2,000 tons of paper, cardboard, and plastic each year, as well as electronic components and batteries. It installed low-energy lighting, motion sensors, and programmable thermostats.



Sally helps clear brush I Yusen Logistics

Yusen Logistics (Americas)

Yusen Logistics (Americas) Inc. is committed to reducing its carbon footprint and finding environmentally friendly ways to run its operations. For example, the company recently employed a herd of 120 goats to clear three acres of brush around its Sumner, Wash., warehouse. The goats cleared the land in 20 days, eating eight pounds of brush each day. Goats offer a quiet and green alternative to gas-consuming heavy machinery, without fuel and noxious fumes. Natural climbers, they can go where land-clearing equipment can't and eliminate the need for hauling debris offsite. Yusen Logistics partnered with Rent-a-Ruminant, a firm that uses rescued goats to clear land for commercial properties.





















10 Greenest Ports in America

FROM ATLANTIC TO PACIFIC, THESE PORTS KNOW HOW TO GET THEIR GREEN ON.

By Chris Lewis

s environmental sustainability continues to be a hot topic for today's shippers and transportation service providers, U.S. ports have implemented a wide variety of green initiatives. While they have completed some of these initiatives in a matter of months, others have taken years, and even decades to achieve. 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.

On the next few pages, *Inbound Logistics* identifies the 10 greenest ports in the United States, based on their wide-ranging (and, at times, novel) approaches to reducing emissions such as greenhouse gases, carbon monoxide, and fine particulate matter. The ports differ in location and size, yet they share a commonality—they have undertaken various initiatives to ensure the ultimate impact of sustainability outweighs its costs.

Inbound Logistics selected each of these ports according to the variety—and long-term effect—of their green initiatives, as measured by emissions reduction, air and water quality improvements, and other green ingenuities.



GEORGIA PORTS AUTHORITY

In recent years, the Georgia Ports Authority (GPA), which currently oversees the Ports of Brunswick and Savannah, has announced a variety of initiatives that share one central purpose—emissions reduction. Among those initiatives, the GPA has begun to transition its rubber-tired gantry cranes (RTGs) from diesel to electric power. Because the electric RTGs only use diesel power when they move between container rows, they operate on electric power more than 90 percent of the time.

The GPA has also installed 104 electrified refrigerated container racks. Because they do not require the use of diesel generators, the racks currently save 5.6 million gallons of fuel annually. In addition, the GPA uses electrified ship-to-shore cranes, which capture energy—enough to power themselves for 18 minutes of each operating hour—as they lower container boxes.

Other green initiatives:

- Installed new computer-controlled, photosensitive lights at the 1,200-acre Garden City Terminal, reducing 3,569 metric tons of CO, emissions annually.
- Launched a truck rebate and finance program that assists owners and operators as they replace their diesel trucks with container hauling trucks equipped with 2010 (or newer) engines.
 - Preserved 312 acres of wetlands.

Reducing emissions: By retrofitting 20 RTGs with electric power, the GPA reduced emissions by roughly 1,800 tons. The GPA also retrofitted 11 locomotives with automatic engine stop-start devices, ultimately leading to an annual emissions decline of 18 tons.

At what cost: To date, the RTG retrofitting project alone has cost \$20.6 million.

What's ahead: The GPA predicts that the Garden City Terminal's new photosensitive lights, which phase on and off according to the number of daylight hours in a given season, will reduce energy costs by \$4.9 million over the next 10 years.

PORT OF BALTIMORE

Continuing its commitment to environmental stewardship, the Port of Baltimore currently offers a Dray Truck Replacement Program that allows truck owners and operators to trade in their old model trucks for newer models that reduce air emissions. Since the port enacted the program in 2012, nearly 135 trucks have been replaced. As a result, emissions have steadily declined, as truck turn times were reduced by 6.6 percent in 2014 alone.

In addition, the port strives to improve the water quality and energy conservation of its facilities. For example, it installed a variety of vaults that treat stormwater, and upgraded its lighting and mounted solar panels on a cruise terminal and transit shed. These projects not only increased environmental sustainability, but also improved the productivity of port operations.

Other green initiatives:

- Retrofitted, replaced, and repowered more than 100 pieces of equipment that service terminals.
 - Planted 35 acres of trees.
- Installed the Inner Harbor Water Wheel, a solar- and waterpowered device that removes trash from Baltimore's waterfront.

Reducing emissions: Thus far, the Dray Truck Replacement Program has diminished 2,076 tons of nitrogen oxides, 81 tons of fine particulate matter, and 520 tons of carbon monoxide. Equipment operators saved thousands of dollars thanks to the truck replacement program, which has also decreased fuel by 502,065 gallons of diesel over the lifetime of the truck that has been replaced.

What's ahead: Due to the Dray Truck Replacement Program's success, the Port of Baltimore is currently promoting a similar program to replace older cargo handling equipment with newer models.



Located at the Port of Baltimore's Dundalk Marine Terminal, this algal turf scrubber takes up nutrients from the water, thus minimizing the major cause of water pollution in the Chesapeake Bay region.

PORT OF LONG BEACH

In 2005, to decrease the Port of Long Beach's ecological footprint long term, the Long Beach Board of Harbor Commissioners ratified an investment in cleaner air, soil, and harbor water, known officially as the Green Port Policy. Adhering to this policy, the port seeks to improve its air quality through various initiatives of the San Pedro Bay Ports Clean Air Action Plan. Enacted in 2006, the plan is being updated for a second time, as the port seeks new strategies to reduce emissions.

In 2015, the Port of Long Beach constructed four new buildings on a recently redeveloped marine terminal located at the 170-acre Middle Harbor. The buildings, which conserve energy and water, have received a gold level certification from the Leadership in Energy and Environmental Design (LEED). Of equal importance, the terminal itself is also environmentally friendly. Its cranes and cargo moves run on electricity, resulting in nearly zero emissions compared to traditional terminals.

Other green initiatives:

- Introduced the Clean Trucks Program—since 2008, all trucks entering the port's terminals must be equipped with engines that were manufactured in 2007 or later.
- Began a transition to renewable power sources and self-generation systems.



Ship-to-shore gantry cranes arrive at Long Beach's Middle Harbor. The new Pier E terminal, scheduled to open to full operations in 2016, will dramatically reduce air pollution emissions.

Reducing emissions: From 2005 to 2014, diesel particulate emissions, nitrogen oxides, sulfur oxides, and greenhouse gases declined—by 85, 50, 97, and 21 percent, respectively. The port will release 2015 emissions data in late 2016.

At what cost: Since 2005, the port has spent approximately \$500 million to implement the Green Port Policy; it spent about 40 percent of this total on shore power.

What's ahead: The port anticipates one of its primary initiatives—10 LEED-certified buildings—will reduce water and energy costs a minimum of 20 and 10 percent, respectively.

PORT OF LOS ANGELES

In 2004, the Port of Los Angeles pioneered a process that captures emissions as ships plug into shore power—while they're at berth. Shortly after implementation, the process, known as the Alternative Maritime Power program, resulted in the decline of 14 tons of diesel particulate matter, as well as 123 tons of nitrogen oxide emissions. Buoyed by this early success, on Jan. 1, 2014, the State of California established a new regulation that requires

container and refrigerated ship fleets to plug into shore-side power.

Since 2006, the Port of Los Angeles has invested more than \$180 million in shore power infrastructure, which includes shore-power capable berths at the port's eight marine container terminals, as well as its cruise passenger and ferry terminals. As a result, the port currently has more shore-power capable berths than any other port in the world.



In 2004, the Port of Los Angeles became the first port to use shore-side power to capture emissions from containerships. Today, ports throughout the world employ this practice.

Other green initiatives:

- Established a new system that uses a bonnet to capture emissions as they emerge from a ship's stacks. The system was developed at a Port of Los Angeles terminal and approved by the State of California as an alternative to compliance with the shore power rule. This bonnet system is the first of its kind anywhere.
- Focused on the Pasha Terminal, which may become the world's first terminal to generate power onsite via a renewable energy source that, with a 2.6-MW battery storage system, could potentially allow it to operate off the local energy grid while using zero emissions yard equipment and drayage trucks.

Reducing emissions: From 2005 to 2014, ocean-going vessels' diesel particulate matter, fine particles, nitrogen oxides, and sulfur oxides declined by 87, 85, 31, and 97 percent, respectively.

At what cost: In the past 10 years, the port has spent more than \$350 million on environmental initiatives.

What's ahead: As a result of its initiatives, the port expects local environmental and health risk to decrease by 85 percent by 2020.

PORT OF OAKLAND

With nearly 19 miles of waterfront on the San Francisco Bay, the Port of Oakland is committed to protecting its surrounding wild-life from the transmission of harmful pollutants. To help diminish air pollution from mobile and stationary on-, near-, and off-shore areas, the port has created a Maritime Air Quality Improvement Plan (MAQIP). Among other goals, the plan's key objective is to reduce diesel particulate matter emissions by 85 percent by 2020, when compared to 2005 levels.

In response, the port's maritime area offers shore power to ships so they can plug into electric grids while they are docked. Through an electric grid connection, the docked vessels help the port achieve another sustainability goal: the State of California Air Resources Board's requirement to reduce the aggregate of air pollutants emitted from ships by 80 percent by 2020.

Other green initiatives:

- Sought funding for zero-emission container handling and truck technology.
- Introduced two smartphone applications so truckers can calculate their turn times, optimize their arrival, and decrease their idling time and, in turn, fuel and emissions.

Reducing emissions: From 2005 to 2012, the port reduced diesel particulate matter, carbon monoxide, nitrogen oxides, and sulfur oxides by 70, 33, 15, and 80 percent, respectively; it will measure emissions inventory again in 2016.

At what cost: Among other expenses, the port has spent about \$60 million on its shore power project.

What's ahead: Considering the steady success of its previous initiatives, which resulted in a 70-percent reduction of diesel particulate matter as early as 2012, the port is expected to either meet or exceed its MAQIP diesel emissions goals three to four years before its original 2020 target date.



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The Port of Portland has set a multi-year target to reduce portwide energy consumption by 20 percent from the 2011 baseline by 2020.

PORT OF PORTLAND

With a goal to reduce greenhouse gases by 15 percent by 2020 in comparison to 1990 levels, and diesel particulate matter by 75 percent by 2020 when compared to 2000 levels, the Port of Portland has implemented an array of sustainability initiatives. In 2012, the port began to replace the Oregon's (a dredge that it owns and operates) 1960s-era engine with a modern, more efficient engine; it completed the project in 2013. Since then, the vessel's diesel particulate emissions have declined by 88 percent.

The Port of Portland has also purchased certified Renewable Energy Credits for 100 percent of its electricity consumption, and invested in new energy-efficient LED lighting for its maintenance facilities, marine terminals, and roadways, along with the Portland International Airport's parking lots. It will complete the two-year project in 2017.

In addition, the Port of Portland installed 35 acres of porous pavement at one of its terminals. Aside from increasing vehicle storage space, the pavement also infiltrates 100 percent of stormwater into the site's subsurface to naturally break down pollutants.

Other green initiatives:

- Installed shore power at Terminal 6 for all tugs that are moored, so that they can plug into an electric grid.
 - Installed meters to track energy cost savings.
- Monitored aquatic invasive species, such as zebra mussels, in the Columbia River, through a partnership with state agencies and the Oregon Invasive Species Council.

Reducing emissions: Since 2009, the port has decreased greenhouse gas and diesel particulate matter by 67 and 73 percent, respectively.

At what cost: The port has invested \$3.5 million toward energy efficiency improvements port-wide; it has also spent \$5.1 million on the Oregon's engine replacement.

What's ahead: The port intends to develop a monitoring plan for the Pacific lamprey species that live near its terminals and may be affected by dredging projects. It will also evaluate the potential contribution of zinc (from galvanized metals) to stormwater and review probable source control measures.

PORT OF SAN DIEGO

In 2013, the Port of San Diego's Board of Port Commissions created a seven-year and 22-year Climate Action Guide. With a focus on long-term environmental sustainability, the port established two main objectives—to reduce greenhouse gases by 10 percent by 2020 and 25 percent by 2035, using 2006 statistics as a reference point. To achieve these goals, the board also outlined six emission reduction strategies, including water and energy conservation.

Although the port has reduced water usage by 47 percent since 2008, it will continue to implement new tactics for further conservation, including discontinuing repetitive power washing and decreasing irrigation. The port has also installed 10 public electric vehicle-charging stations around port tidelands, so that vessels can receive shore power and plug into electric grids while they are docked.

Other green initiatives:

- Replaced 296 street, parking, and walkway lights with LEDs, leading to an annual decline of 270,000 kilowatt hours—enough energy to power 17 homes for one year.
- Removed 29 tons of trash and invasive vegetation during recent port-sponsored cleanup events.

Reduction of emissions: Since 2008, the port has reduced greenhouse gas emissions by approximately 24 percent.

At what cost: Within the past 10 years, the port's environmental fund committed \$8.5 million to support 75 projects.

What's ahead: In fewer than 10 years, the port has saved \$3.4 million in utility costs, primarily as a result of energy and water conservation; these savings are expected to steadily rise throughout the next decade.





To reduce emissions, the Port of Charleston invested in fully electrified ship-to-shore and rubber-tired gantry cranes.

SOUTH CAROLINA PORT AUTHORITY

Committed to the safety of its employees, nearby residents, and environment, the South Carolina Port Authority (SCPA), which operates terminals in Charleston, Georgetown, and Greer, has introduced various sustainability initiatives in recent years. For example, to reduce emissions, the SCPA has replaced traditional diesel conveyors with electrified ones, and upgraded its terminal equipment, including fully electrified ship-to-shore and rubbertired gantry cranes.

In March 2016, the SCPA publicized plans to install solar panels on the warehouse rooftops of two of its terminals, resulting in the generation of 3.7 megawatts of electricity. Furthermore, the SCPA has dedicated \$5 million to the conservation of the Cooper River Corridor's Francis Marion National Forest, in Huger, S.C.

Other green initiatives:

■ Introduced the Clean Truck Program. Since January 2014, all trucks serving the SCPA's container terminals must have engines that were manufactured in 1994 or later; to date, more than 80 trucks have been replaced.

Reducing emissions: Since 2005, truck emissions have declined by more than 50 percent, as a result of local, state, and federal regulatory programs supported by the SCPA. Ocean-going vessel emissions of particulate matter have decreased by 80 percent since 2011.

At what cost: The SCPA, along with its local, state, and federal partners, has spent more than \$20 million on environmental protection and emission reduction efforts.

What's ahead: The SCPA intends to expand its solar energy program, while also undertaking a comprehensive environmental restoration of the uninhabited Drum Island, located near Charleston.





The goal of the Northwest Ports Clean Air Strategy is to reduce diesel and greenhouse gas emissions in advance of, and complementary to, applicable regulations.

THE NORTHWEST SEAPORT ALLIANCE

To unify the management of their marine cargo terminals and achieve their goals of emission reduction more efficiently, the ports of Seattle and Tacoma formed a partnership known as The Northwest Seaport Alliance. The alliance is committed to ensuring sustainable growth that will not only protect the environment, but also the public health of each port's surrounding communities.

Prior to this alliance, the two ports had already joined forces in 2008, collaborating with Port Metro Vancouver, British Columbia,

to develop a variety of short- and long-term emission reduction goals, via a policy known as the Northwest Ports Clean Air Strategy. Among other key goals, the strategy, which was updated in 2013, is particularly focused on reducing two emissions by 2020: Diesel particulate matter emissions per ton of cargo by 80 percent and greenhouse gas emissions per ton of cargo by 15 percent.

Other green initiatives:

- Installed bio-filtration stormwater treatment systems at Seattle's and Tacoma's log and container terminals, as well as Tacoma's rail yards.
- Introduced a Clean Truck Program that requires drayage trucks to have model-year 2007 or newer engines by Jan. 1, 2018.

Reducing emissions: Maritime-related air pollution in the Puget Sound region has decreased by upwards of 40 percent since 2005.

At what cost: Although expenditures have not yet been measured, the alliance's budget allocates \$1.7 million for its air quality and sustainable practices program in 2016.

What's ahead: To further reduce pollutants, The Northwest Seaport Alliance will revise its Clean Air Strategy's air emissions inventory, evaluate new technologies that may improve truck efficiencies, and incorporate advanced, state-of-the-art stormwater systems into its modernization plans for transportation systems such as Tacoma's North Lead rail tracks.

PORT AUTHORITY OF NEW YORK AND NEW JERSEY

The Port Authority of New York and New Jersey has undertaken a variety of initiatives to improve air, land, and water quality. For example, since 2001, the Port Authority acquired nearly 400 acres of property within the Hudson-Raritan Estuary to preserve open space for conservation and ecological development.

Additionally, it restored several Jamaica Bay marsh islands, using the clean dredge material it acquired by deepening its harbor by 50 feet, an accommodation for larger, deeper-draft vessels.

The Port Authority has also introduced a Clean Air Strategy, a set of voluntary actions that will reduce emissions through initiatives such as installing shore power capability at the Brooklyn Cruise Terminal, modernizing cargo handling equipment, and replacing old trucks. In doing so, the Port Authority is committed to annually decreasing criteria air pollutants and greenhouse gases by 3 and 5 percent, respectively, resulting in an eventual 80-percent decline in greenhouse gases by 2050.

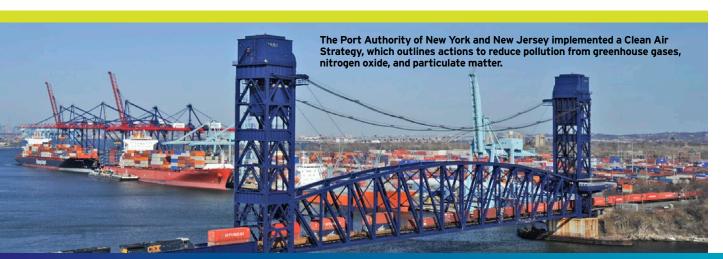
Other green initiatives:

- Implemented a cargo handling fleet modernization program, which reduces emissions by replacing old equipment with new units
- Introduced a Truck Replacement Program that awards truck owners a financial incentive if they replace older trucks with newer vehicles.

Reducing emissions: From 2006 to 2014, the Port Authority's Criteria Air Pollutant emissions decreased by 41.5 percent.

At what cost: Since 2006, the Port Authority spent approximately \$42 million on air emission reduction initiatives.

What's ahead: The Port Authority of New York and New Jersey intends to spend another \$18 million on air quality initiatives over the next several years.





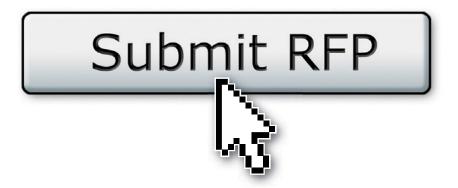
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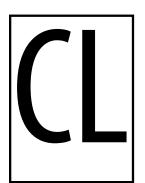
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Chemical Logistics: Formula for Success

As the chemical industry continues to grow, shippers and their service partners work hard to keep product moving, trouble-free.

ake the 859 million tons of chemicals that U.S. companies shipped in 2014, load that volume onto rail cars, and you'd fill enough cars to circle the globe three times, says the American Chemistry Council (ACC). The \$801-billion U.S. chemical industry represents 15 percent of the world's chemical production, according to the industry organization. And the chemical business is set to expand in the next few years.

U.S. chemical production will grow by 2.9 percent in 2016 and 4.4 percent in 2017, predicts the ACC in its report, *Year-End 2015 Chemical Industry Situation and Outlook*. That rise corresponds with an increase in manufacturing capacity: Since 2010, companies have announced more than 261 new chemical production

projects worth a total of \$158 billion, reports the ACC.

An industry of such magnitude makes a major impact on logistics.

Logistics services for chemical companies will grow by five to six percent by 2019, according to a 2015 report by London-based Technavio Research. "We expect this market to reach between \$450 billion and \$500 billion by 2019," says Sharan Raj, lead analyst with Technavio's transportation and logistics team. That's up from an estimated \$350 billion in 2014.

Of that total, North America's share is \$50 billion to \$70 billion and is set to grow by 3 percent, Raj says.

Chemical producers increasingly outsource logistics functions to third-party logistics (3PL) providers. They make that choice, in part, because

they want to leave logistics functions to companies with the expertise and infrastructure.

"Chemicals are a complex supply chain," Raj observes. "Each region, state, and country has different rules and regulations regarding chemical goods transport." Outsourcing is the best way to gain efficiencies.

Logistics outsourcing is on the rise, agrees Christopher Wright, vice president, sales and marketing at Rinchem Company, a global, asset-based chemical 3PL with head-quarters in Albuquerque. "Large chemical manufacturers are merging or purchasing other large chemical firms," he says. "As a result, many firms are acquiring businesses with highly regulated, complex chemical supply chains."

After consolidation, a chemical company might find itself shipping and storing products that it has never handled before. It would take years to develop the in-house logistics expertise those products require, "so it ends up outsourcing to an experienced partner," Wright says.

As they form relationships with 3PLs, chemical shippers bargain hard on price. "There is a sustained pressure from the customer to keep





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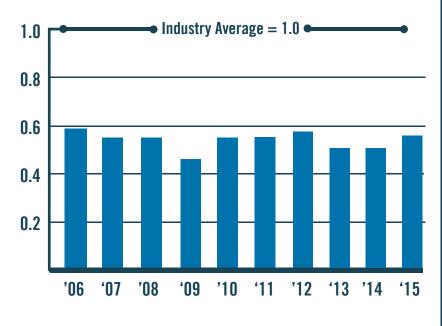


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DUPRÉ LOGISTICS, LLC • 201 Energy Parkway, Suite 500 • Lafayette, LA 70508 • 866.686.5478 • www.duprelogistics.com For forward thinking about logistics, visit blog.duprelogistics.com. prices low," Raj says. "And shippers demand value-added services at no additional cost."

Handling Hazmat

Companies that produce, distribute, and transport chemicals deal with many of the same logistics concerns — transportation capacity, government regulation, safety — that affect their colleagues in other industries. But for chemical firms, those issues have their own special flavor.

Among them, safety concerns are paramount. "The majority of our

freight is hazardous," notes John Adams, director of logistics and business analytics at Hydrite Chemical Company. Based in Brookfield, Wis., Hydrite started life as a chemical distributor, but over the past decade it has added manufacturing facilities in the Midwest and California. Using both a private fleet and common carriers, Hydrite ships products to customers in industrial production; agriculture; biofuels; food processing; graphic arts; oil and gas; paints, coatings, inks, and adhesives; and pulp and paper.

A business that deals in

hazardous materials (hazmat) can't take transportation lightly. "We have to vet our carriers a little more," Adams says. "There aren't a lot of 'call and haul' situations; there are a lot of long-term relationships."

Hydrite has developed an audit process to monitor whether its transportation partners uphold the necessary safety standards. "A compliance manager in our facility works with carriers to make sure they're up to date on their hazmat and other requirements, along with insurance," Adams says.

"To keep the world safe and

A&R Takes Resin-able Measures

ome of the best-known chemical logistics challenges apply to hazardous liquids—but chemicals take other forms as well. A&R Logistics in Louisville, Ky., specializes in the transportation of plastic resin, a dry bulk material used to make all sorts of familiar products, from water bottles to recycling bins.

As a carrier, A&R operates approximately 800 trucks and 1,200 trailers to move loads of resin pellets to manufacturing plants. As a 3PL, A&R combines its own transportation capacity with services from other carriers. "We also have a large network of rail sidings and transloading facilities," says Mark Holden, A&R's CEO. In addition, the company operates about 2 million square feet of warehousing and packaging space throughout the United States.

While not hazardous, plastic resin still requires careful handling, especially when being transferred among rail cars, truck trailers, and storage siloes. "The pressure has to be managed closely so we don't get too much friction in the transfer, or else the resin pellets will begin to melt," Holden says. "We also have to guard against contamination. The slightest speck of dirt or foreign material can contaminate the whole load."

The first line of defense against impurities is to make sure all hoses used to load and unload are attached correctly and all seals are secured. "In addition, between loads, we do what we call a full conversion wash, from head to toe, to make sure the trailer is absolutely clean and odor-free," Holden adds. Washing also



A&R Logistics specializes in transporting plastic resin, which is used to make products such as water bottles and recycling bins.

prevents cross-contact between different, incompatible resins.

Unlike their dry van trucking colleagues, drivers who handle dry bulk chemicals are responsible for loading and unloading their product. That process takes as long as two hours on either end of the trip. In 2017, when all trucking companies in the United States must start using electronic logging devices (ELDs), that requirement will have a special impact on companies such as A&R because the automatic record will need to account for loading and unloading time, as well as time on the road.

A&R has been using ELDs since 2013. "That has had quite an impact on our capacity," Holden says. "But it's in the interest of safety."

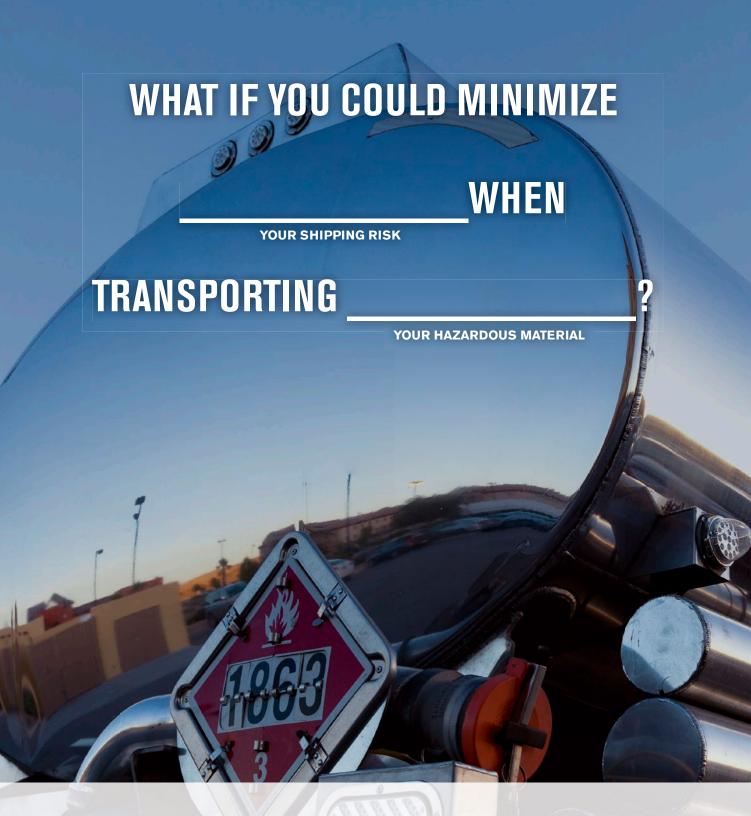
One special issue emerging in dry bulk chemicals arises from a recent, ongoing expansion in U.S. production. "With

all this new capacity coming on line over the next five to 10 years, where will all this product go?" Holden asks. "It's still a great mystery, even to many of our customers."

Much of the new demand will come from overseas markets, but shippers aren't sure which regions of the world will buy the most product—and, therefore, which marine ports will play key roles in their logistics strategies. "Our customers are trying to develop flexibility in their supply chains, to accommodate changes in end market demand, quickly and efficiently," Holden says.

A&R is lining up resources to help those customers get their product to market, wherever those markets turn out to be.





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protect the environment, governments have developed strict laws and regulations related to the transport, handling, storage, and segregation of dangerous goods," says Wright. "Rinchem views these regulations as a necessary part of global logistics, and we take pride in compliance."

Exceeding Expectations

Regulations pertaining to chemical safety can vary from country to country, and sometimes even from community to community. For example, local fire departments might interpret applicable laws differently. Rinchem meets these challenges by often exceeding expectations. "We

adopt a high global standard, and apply it everywhere," Wright says.

Countries in the Asia Pacific region have tightened and refined their regulations for handling chemicals over the past 18 months, following accidents in Tianjin China, Singapore, and South Korea.

"At the end of 2015, China sent a delegation to meet with Rinchem's executive team and benchmark industry best practices," says Wright. Regulations are bound to evolve even further in that region. "When accidents of a significant scale occur, legislation is sure to follow," he adds.

Whatever the regulations require, Rinchem wants to develop the safest supply chains in the world. "Any workplace injury or accident is unacceptable," Wright says. Rinchem meets the challenge through training and developing a culture focused on safety, he adds.

Rinchem specializes in handling high-purity, prepackaged chemicals and gases for the semiconductor and electronics, specialty chemical, specialty gas, life sciences, paints and coatings, and personal care industries. It manages many supply chains that contain dangerous goods requiring careful climate control.

On top of safety, chemical shippers and their service partners must also consider the integrity of the

ACBL Barges in to Meet Logistics Needs

leader in inland barge transportation, American Commercial Barge Line (ACBL) provides complete logistics solutions for shippers of liquid cargoes by barge.

For more than 100 years, ACBL has been transporting the products used to build and power our nation. Today, ACBL is one of the largest and most diversified carriers on the inland waterways, covering some 7,200 miles, with a significant portion of its operations dedicated to moving liquid cargoes including petroleum, refined products, petrochemicals, and edible oils.

Tim Allen, vice president liquid sales, and Jerry Torok, senior director, safety and regulatory compliance with ACBL, recently sat down with *Inbound Logistics* to discuss the unique challenges of transporting chemical logistics.

Q: What services does ACBL provide to customers in the chemical industry?

TA: ACBL's highly trained tankermen and ship supervisors work in conjunction to safely load and unload various liquid cargoes to and from customers' ships. This process, called ship lightering, saves time and money by reducing the number of ports of call for vessels.

ACBL's shoreside tankermen can load/unload barges carrying most Subchapter D and O cargoes, includ-



Tim Allen

ing liquefied gas. Upon request, ACBL can provide tank barges that can be loaded in tandem, as well as the tankermen who have experience in this type of loading. In addition to the tankermen's load and unload duties, they can also perform minor repairs to barges.

The company's liquids customers include most major oil and chemical companies located in the United States.

Q: How is the practice of chemical logistics different than the logistics of other products?

JT: The biggest difference is that shippers of liquid cargoes take into consideration the marine environment and understand the consequences of any spill to the water. Therefore, shippers of liquid cargoes are sensitive to the safety statistics of any liquid carrier.

Q: Are there advantages to transporting chemicals via barges? What about safety considerations?

JT: ACBL is committed to developing and implementing new technology and products that increase the safety, efficiency, and reliability of our equipment and reduce the risk of spills and injuries. Barges are the safest, most cost effective and environmentally friendly way to transport liquid cargoes.

ACBL's tank barges are equipped with the latest engineering innovations, which significantly reduce



Jerry Torok

the risk of spills and increase the efficiency of cargo transfers. Innovations include alarms that alert of mechanical seal failures in pumps; solar-powered alarms that provide overfill protection without power from a shore connection; spring starter systems to replace hydraulic systems on pump engines; and spill pans containing potential cargo leaks from valve packing. In addition, a one-inch increase in cargo pump size on 10k barrel tank barges has resulted in a 25 percent increase in load/unload efficiency.



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info@rinchem.com www.rinchem.com/inbound.aspx chemicals. "Humidity and temperature control affect yield and shelf life," Wright says.

Measures to prevent accidents and protect chemical products include employee training, facility design, equipment choice, and technology deployment.

"Rinchem's warehouses and transportation fleet are temperature- and climate-controlled, and real-time monitoring allows us, the manufacturer, and the end user to ensure that all materials remain within specifications at all times," says John Fitzsimons, the 3PL's vice president, operations.

"Rinchem's new facilities are designed so that the building acts as its own containment in the event of a spill, and nothing is released into the environment," he notes. Forklifts, lighting, and other equipment in company facilities are "intrinsically safe"—designed not to emit energy that could ignite volatile chemicals.

Safety First

Safety is also a primary concern at C.H. Robinson, which handles bulk chemicals, plus other liquid bulk commodities, through its ChemSolutions business.

Safety was paramount from the time ChemSolutions became a distinct business unit. "We understood that we needed to focus on safety above and beyond what we do for other verticals," says Nathan Buelt, general manager of ChemSolutions and coordinator of its Responsible Care programs.

While safety is important in all logistics operations, "there's a difference between loading chemicals onto a truck or into a tank, or loading cardboard boxes," Buelt notes.

Because safety is so critical, many carriers, 3PLs, and shippers that work with chemicals participate in Responsible Care, a program developed by the ACC, whose



CLX Logistics' cost-effective BulkTainer Service uses a combination of truck and rail to deliver shipments via ISO tank.

Security Moves to the Front

he practice of logistics in the chemical industry is different from logistics involving other kinds of products because of the special emphasis on safety, security, and regulatory compliance. Naturally, security has gained greater focus in the years since the Sept. 11, 2001, terrorist attacks.

Many chemical manufacturers used to call their safety departments "HSE"—for Health, Safety, and Environment. "But many of them have changed the names of those departments to 'HSES,' with the second 'S' standing for Security," says Glenn Riggs, senior vice president, corporate logistics operations and strategy at Odyssey Logistics & Technology in Danbury, Conn.

Although Odyssey serves a broad range of customers, it started in the chemical industry and offers several services aimed particularly at chemical shippers. They include longhaul intermodal service using ISO tank containers, a tank truck-specific 3PL service called Odyssey Overland, and a fulfillment service for manufacturers that need to send chemical samples to their customers. Chemical companies also use Odyssey's general-purpose logistics and technology services.

Chemical plants have added new layers of protection, including more fencing and security cameras, Riggs says. Plants and refineries, as well as ports that handle chemicals, have also beefed up their access control procedures, requiring drivers to carry a Transportation Worker Identification Credential (TWIC) card. A hazmat endorsement on a commercial driver's license—which requires a background check—is no longer enough to allay security concerns. "They won't be able to get into some of these facilities unless they have this additional credential," Riggs says.

Under current hazmat regulation, chemical companies must collaborate on security planning with logistics providers and other supply chain partners. Those plans have forced carriers to change some of their day-to-day practices. For example, a driver may no longer park a tank truck in the spacious lot outside a big box store, then walk down the street to grab a burger from a fast food restaurant. "Today, those tanks are never left anywhere," Riggs says.

As a member of the American Chemistry Council's Responsible Care program, one of Odyssey's further mandates is to protect the data it collects about customers who ship hazardous materials. "We have a lot of data security protocols in place," Riggs says. "No one can get into our records and see where the shipping patterns are, and then take action based on that information."







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guidance includes the Responsible Care Management System, the Security Code, the Process Safety Code, and the Product Safety Code.

The Product Safety Code is of special interest to logistics professionals because it focuses on sharing information with partners all along the supply chain, says Debra Phillips, the ACC's vice president of Responsible Care.

For example, Element 9 of the 11-section code addresses communications, cooperation, and outreach. "It covers customers, contract manufacturers, carriers, distributors, and 3PLs cooperating to share and manage information about the health, safety, security, and environmental performance of chemical products," Phillips says.

Working with Customers

Many chemical manufacturers qualify their carriers, distributors, and customers based on their ability to manage chemical products safely. Sometimes, a manufacturer learns through an audit that a customer lacks adequate systems for managing a particular hazmat product.

"Most companies will try to train the customer and provide additional support," Phillips says. "But if the customer still doesn't manage that product properly, they'll discontinue business."

The ACC started implementing the Product Safety Code in 2014, when members were required to put the first three elements in place. Elements 4-7 went into effect in 2015, and by the end of 2016, ACC members must attest that they have implemented the entire list. Periodically, a chemical firm must bring in a third-party auditor to confirm that it abides by the terms of the Product Safety Code, along with the other elements of Responsible Care.

ChemSolutions maintains Responsible Care certification and also goes above and beyond those principles to guarantee safety, Buelt says. For example, it has built controls into its transportation management system (TMS) to ensure that employees don't work with certain shipments unless they've had the proper training.

Some C.H. Robinson employees take training called HSSE (Health, Safety, Security, and Environment) awareness, and then take an assessment to show they've absorbed the information. "A completed assessment links directly to our TMS to flag the employee as having accurate



Rinchem safely operates a network of temperature-controlled, hazardous materials-compliant warehouses.

knowledge of shipments associated with Responsible Care," Buelt says.

Certain ChemSolutions employees also go through a Certified Users program. Graduates know how to communicate correctly with clients and carriers about chemical shipments, and how to spot discrepancies that might cause safety problems.

Trained employees also know which chemical commodities ChemSolutions will or won't accept, based on the risk they pose. "We have excluded some commodities from our transportation offerings," Buelt says. "We make sure employees know whether we can or cannot ship a particular product, and that the carriers they want to contract have the authority to ship that product."

Another organization in the chemical industry that has developed safety standards is the National Association of Chemical Distributors (NACD). Members of NACD must take part in its Responsible Distribution program, which outlines a mandatory set of safety measures.

The NACD and the ACC have shared codes and practices to make sure that their safety programs mirror one another closely. "It benefits the entire supply chain if their requirements line up with ours," says the ACC's Phillips.

Training for Safety and Security

Adhering to the industry's health, safety, and environmental standards is important, but it isn't easy, says Jeff Martin, president of HORN, a specialty chemicals distributor in La Mirada, Calif.

"We have a full-time regulatory person who handles health and safety issues, and the paperwork documenting our steps in those areas," Martin says. "It's expensive, and hazmat training takes people away from their jobs. But it would be irresponsible not to do this."

HORN distributes chemicals to end users through three divisions: Industrial, Human Nutrition, and Specialties; it also does some manufacturing. It operates 12 warehouses and distribution centers, with a manufacturing plant in La Mirada and another opening in Dallas.

Much of the safety program at EMCO Chemical Distributors in Pleasant Prairie, Wis., focuses on drivers who operate the company's private fleet. "They learn how to handle chemicals and emergency





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response," says President and CEO Edward Polen. "They learn what to do if there's a drum leak in a truck, and how to load and unload bulk trucks."

EMCO distributes industrial and specialty chemicals for customers that make products such as paints, personal care items, printing inks, adhesives, and household cleaners. It also blends and packages products for customers. Its fleet includes 30 power units, 25 bulk tank trailers, and about 50 box trailers. EMCO supplements that capacity with common carriers as needed.

The safety program includes collaboration with public safety agencies. "We conduct joint training with the local fire departments near our facilities," Polen says. "But you never know where a hazmat incident might occur."

If EMCO doesn't already have a relationship with first responders on site, the bonds tend to form quickly. "They're looking for as much help as they can get, just as our team is always looking for as much help as we can get," Polen adds.

EMCO provides assistance that includes the services of an in-house hazmat team, which rushes to the scene of any accident to alleviate problems related to the chemical load.

Sense of Security

Besides averting potential hazards in the everyday transport, storage, and use of chemicals, companies engaged in chemical logistics are concerned about keeping dangerous products out of the wrong hands. In the United States, for instance, companies must comply with requirements in the 2014 Protecting and Securing Chemical Facilities from Terrorist Attacks Act.

At EMCO, much of the responsibility for security rests on the trained employees who drive the

company's private fleet. "They're at the truck when the delivery is being made, and at the emergency shutoff switch in case something goes wrong on a bulk load," Polen says. "When they deliver drums, they park at the dock. They go inside, unload the drums with the receiving people, get back in their trucks and leave. They have to have a view of their vehicles at all times."

Hydrite ensures security by forging long-term relationships with carriers that have proper measures in place, and enforcing commonsense measures of its own. "When the truck leaves the facility, we make sure it has a proper seal, so it can't be tampered with," Adams says.

Competing for Space

After safety and security, another pressing issue for chemical shippers is capacity. Truck drivers who transport hazardous chemical freight

Chemicals and the 'Amazon Experience'

part from safety concerns, one of the big logistical differences between chemicals and other products is that chemicals have much more complex handling requirements. For example, a chemical might require careful temperature control.

"In winter, if a chemical gets to its destination after moving through the cold part of the country, it has to go to a separate location to be steamed for as long as one day to bring the temperature up so it can be offloaded," explains Mike Challman, vice president, North American operations at CLX Logistics.

Based in Blue Bell, Pa., CLX serves chemical manufacturers with a broad range of domestic and international 3PL services, and with financial services such as freight bill audit and payment. It also provides technology, such as transportation management and rail management solutions and tools for network design and transportation procurement.

The complexity of chemical logistics adds a special twist to one challenge facing everyone who sells tangible goods today, Challman says—the "Amazon experience." E-commerce vendors have raised consumer expectations for fast delivery and sophisticated shipment tracking. "People bring that thought process to work," he says. These days, business-to-business customers demand the same level of speed and transparency.

"A lot of industrial manufacturers, and particularly chemical companies, are trying to figure out how they can respond to those

customers' expectations without making the response so expensive that it becomes uncompetitive," Challman says.

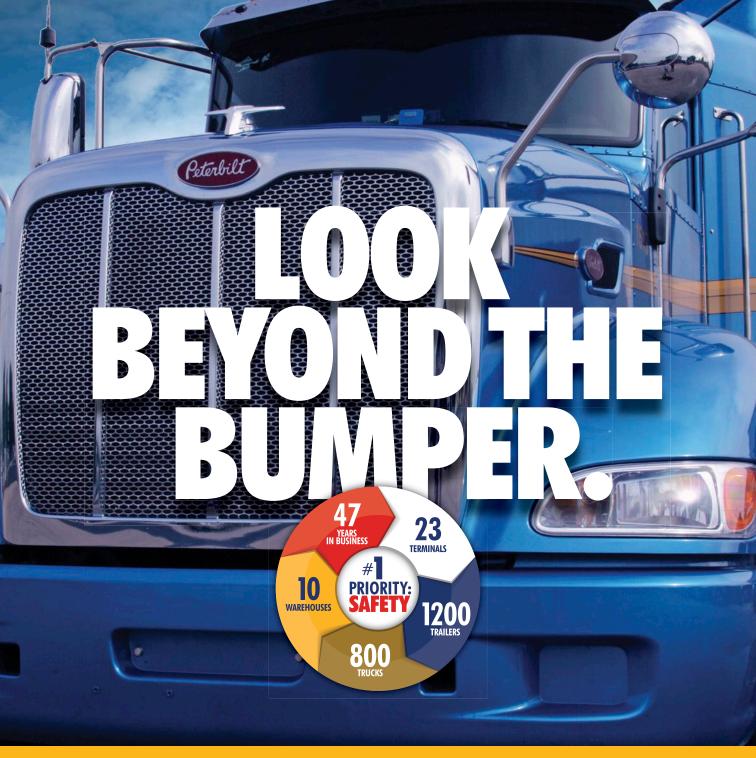
Unlike consumer goods companies, which can easily add warehouse locations to reduce shipping distances, chemical companies can't always position inventory close to customers. "If you have a liquid chemical with certain storage requirements, and maybe certain environmental requirements, it becomes more complex," Challman says. "It can be done, but it's harder and more expensive."

For some chemical shippers, visibility takes the place of ubiquity, especially when a customer urgently needs a certain product.

For example, CLX recently helped one customer outfit its private fleet of tank trucks with a real-time fleet tracking system. When—as often happens—a customer places a rush order, the shipper now can draw from inventory on the move as well as inventory in storage. "They have visibility into where a truck is on the road at any time," Challman says. "So if they need to divert a load, they can make sure they divert the right one."

Chemical companies are generally slow to embrace new trends, including advanced technologies, Challman says. But, faced with rising customer expectations, these companies have become more interested in solutions that provide a better view of what's moving through the supply chain.





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must maintain a hazmat endorsement on their commercial driver's license. That makes it hard to secure transportation for chemical loads in a tight market.

While capacity has been a challenge for all shippers in recent years, the need for certified hazmat drivers creates special problems for chemical shippers. "We have only about 10 carriers to pick from that play in our region," says Adams.

The high value of some of the chemicals that Hydrite ships—products bound for electronics manufacturers—also requires careful carrier choices, he adds.

The certification requirement sometimes causes problems for HORN's inbound shipments from suppliers. Many suppliers specify that the distributor must choose from a short list of approved carriers when picking up product bound for HORN's distribution centers. "When things got tight, there weren't enough drivers or units on the road," says Martin. With less available capacity, HORN had to wait four weeks to receive products that used to arrive in two.

"The suppliers inadvertently put longer lead times in play, and that forced us to carry more inventory," Martin says. "That continues today."

Attracting New Drivers

Thanks to the hazmat certification requirement, drivers who haul chemical products tend to be older, on average, than the driver population in general, says Reggie Dupré, founder and CEO of Dupré Logistics in Lafayette, La. Fewer new drivers entering the industry are interested in handling hazmat, and "that will present some challenges going forward," he notes.

Why the reluctance? Hauling hazardous and liquid commodities is simply harder than hauling other products, Dupré observes. "And the other jobs typically have shorter hauls," he adds. "Adding up all the things that chemical drivers must do presents challenges for people getting into that line of work."

Dupré Logistics focuses its services largely on the chemical and energy industries. On the chemical side, it helps producers of commodity and specialty chemicals with two categories of service—dedicated capacity, using its own fleet, and managed services, using its own and other carriers' fleets.

Three other pieces of federal regulation could also put the squeeze on capacity, according to Dupré. By December 2017, trucking companies must implement electronic logging devices (ELDs) to keep track of drivers' hours of service. The U.S.



Dupré focuses its services largely on the chemical and energy industries.

Department of Transportation has also proposed new rules that will require trucking companies to install speed limiters on their trucks, and establish a database of drivers with commercial drivers licenses who have failed or refused a drug test.

Dupré already uses ELDs and speed limiters, and it avoids problems with drug and alcohol, thanks to pre-hiring and post-accident screenings. But these new measures, as valuable as they are, could challenge other carriers they compete with for the best employees. "The effect will be a decrease in the

number of drivers," Dupré says.

For an asset-based 3PL serving the chemical industry, the key to the capacity puzzle is keeping enough qualified drivers on staff. That's Rinchem's strategy. "Rinchem offers above-average pay, great benefits, and a work-life balance that appeals to many drivers, allowing us to maintain our fleet," says Fitzsimons.

At Dupré Logistics, the key to maintaining hazmat capacity includes a training program for drivers who currently haul petroleum or other commodities for the company. "We school drivers for anywhere from four to eight weeks," says Dupré. "Then we oversee their work in shorthaul movements, to prepare them to go out on long hauls."

The company also has a program aimed at drivers who work for Dupré's partner carriers. "We bring in a few drivers who have worked over the road and teach them how to haul liquid chemicals," Dupré says.

The pool of available drivers isn't the only factor that makes capacity a challenge for chemical shippers. The need for specific equipment, such as tank trucks, hopper trucks, and specialized rail cars, also poses a challenge, says Glenn Riggs, senior vice president, corporate logistics operations and strategy at Odyssey Logistics & Technology, in Danbury, Conn. When the load calls for temperature control, finding an appropriate trailer can be tough.

"There's good capacity in refrigerated transport," Riggs says. "But you can never commingle hazardous materials with food. A hazardous material that needs to stay cold has to move in hazardous-acceptable refrigerated equipment to match it." Shippers and their partners get the job done, but it's not always easy.

Actually, the capacity crunch for chemical shippers has eased up a bit, now that a softening energy market has reduced deliveries into the oil fields. "We've seen a number



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of drivers come back from oil and gas into chemicals," says Buelt.
Optimistic growth forecasts, such as the one from the ACC, are also attracting drivers back to the chemical industry.

"It may not provide the revenue they made when they were in the oil fields," he says. "But it's consistent, and more likely to get them home."

The transportation tug-of-war between the energy and chemical industries could shift one way or another after the November 2016 elections, depending on how the new president and Congress feel about building energy pipelines. A bigger pipeline network means less

competition for space in liquid bulk rail cars. "Then that rail capacity may come back to the chemicals," says Buelt.

While the capacity crunch might have eased for now, the factors behind it—such as the aging driver population—haven't gone away, says Mike Challman, vice president, North American operations at CLX Logistics in Blue Bell, Pa. Chemical shippers still need to consider alternative ways to move their freight.

"Put shipments on rail when you can," he tells customers. "Consolidate loads so you need one truck instead of two. Those challenges will exist for a long time."

As they deal with safety, security, and capacity challenges, chemical shippers are getting a boost from new technologies. For example, TMS tied to telematics such as GPS devices, provide visibility into the progress of shipments. "We know when the truck enters the customer's facility and when it leaves," says Adams.

GPS technology and mobile phones help EMCO better manage its private fleet. "We keep in touch with drivers in case we want to change what they're doing, or if they encounter a problem," Polen says.

Benefits of ELDs

Because they include GPS devices and wireless communications, ELDs provide distinct operational and customer service advantages, along with their safety benefits, says Mike Forbes, senior vice president, logistics solutions at Kenan Advantage Group (KAG).

An asset-based transportation and logistics solutions company based in North Canton, Ohio, KAG started implementing ELDs about 12 years ago, "basically for safety and hours of service compliance," Forbes says.

Then the company started integrating data from the ELDs into its dispatching and customer service operations. "The key is turning that tremendous volume of data into information to help you become more efficient within your own business, and help your customers become more efficient."

TMS prices are dropping, putting them within reach of smaller chemical shippers such as HORN. The company's own TMS helps it find the most appropriate carriers for its commodities in particular lanes.

With the volume of chemical shipments on the rise, handling the product safely, securely, and efficiently will be more important than ever in the coming years.

Have it Your Way

Chemical logistics demands a great deal of customization. "A one-size solution does not fit all," says Mike Forbes, senior vice president, logistics solutions at Kenan Advantage Group (KAG) in North Canton, Ohio.

For one thing, different chemical products require different transportation equipment. Some bulk liquids must be maintained at specific temperatures. Some can't travel in ordinary stainless steel tank trailers, but instead need tanks with rubber lining. "You have to do a lot of vetting, based on equipment types," he adds.

KAG serves chemical companies, as well as companies shipping food grade liquids, through its Specialty Products business. It offers chemical transport (a common carrier service), dedicated contract carriage, and value-added services through its KAG Logistics group. KAG also offers support services, including tank leasing and tank washing.

Because liquid chemicals come with such particular transportation needs, dispatching a chemical shipment involves much more than just finding an available truck. "There's a lot of upfront work just to get a load planned with the right equipment, the right driver, and the right commodity vetting," Forbes says. The need for customization extends far beyond matching loads to equipment, as many chemical shippers have special requirements of their own.

"Special requirements may have to do with safety procedures at pickup," Forbes says.
"Or they could involve restricted access to facilities." Some customers require the driver to undergo special training in order to haul its products.

Shipper requirements often involve procedures for washing a tanker trailer between loads. "Different customers require their own preparation procedures when you wash, if you're going to pick up their load," Forbes says. "The wash station has to be certified in their prep to wash a tanker." Each special requirement comes with its own paperwork.

In addition, chemical shippers at times require transportation and logistics partners to observe unique safety procedures—perhaps even the kinds of uniforms employees wear. Often, the requirements depend on the type of chemical the company ships.

Given the varied and specific demands chemical shippers have for different products, it makes sense to develop a multi-faceted logistics solution. "KAG offers dedicated contract carriage, with the option to utilize chemical transport for another portion of the shipment," Forbes says. "And our KAG Logistics services supplement the overall solution set."



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Meet the 2015 30 Under 30 Rising Supply Chain Stars

nce characterized as entitled and protected, millennials are becoming firmly established in today's workforce, where they are making their mark with their talent, technological prowess, and can-do attitude. Nowhere is that more evident than in the supply management profes-

sion, where young professionals are working with practitioners from several other generations to help tackle the ever-changing supply chain challenges facing global companies.

With its focus on building relationships, continuous improvement, and data analytics, the supply management profession is a perfect fit for millennials, who often are team-oriented collaborators, tech savvy, and welcome the challenge of tackling new projects. To showcase the young professionals in supply management, the Institute for Supply Management (ISM) and ThomasNet recognize 30 professionals 30 years or younger through the 30 Under 30 Rising Supply Chain Stars program.

The program, which debuted in 2014, highlights the accomplishments of rising supply management professionals who are nominated for their outstanding achievements — both

RISING SUPPLY CHAIN STARS: DEFINING A NEW GENERATION

Inbound Logistics, ISM, and ThomasNet honor 30 professionals who are 30 or younger, and already making their mark in supply chain and purchasing management.

by Mary Siegfried

professionally and personally — by managers, mentors, or co-workers. Today's workplace is distinct, as five generations — ranging from the traditional generation born before 1945 to Gen Z, born 1996 or after — work together. While this interesting mix of generations can be challenging, many believe it offers professionals of all ages the opportunity to shares skills and knowledge unique to each generation.

Clearly, the rising stars honored in the 30 Under 30 program highlight the contributions young professionals are making in supply chain organizations around the globe. Some came to the profession by chance, while others claim a lifelong curiosity about how products move through the supply chain. The common denominator among the group is a passion for the profession and commitment to making a difference in their companies and communities.

As the generational landscape of the business world evolves, millennials may be supply management's greatest asset because of their commitment to mentoring and sharing their passion for the profession. Many of the program's rising stars mentor college students and young people coming into their organizations. They proudly tell other aspiring professionals that supply management is "the heartbeat of a company," and in a supply chain organization, "there will never be a dull moment."

Judging from the early accomplishments of these 30 stars, we believe you will realize that the future of the supply management profession is in good hands.



Program Manager, Supply Chain Acquisitions and Integrations, Fluke Electronics, a Danaher Company, York, Pennsylvania Nominated by Jami Bliss, Director, Program Management, Global Procurement. Teva Pharmaceuticals

IN HER OWN WORDS

"The most difficult part of my job is that I work in acquisitions and integration. It is difficult to work closely with individuals for months or years and then be called on to support a restructuring project and say goodbye."

Amy Georgi

Originally, Georgi was going to be an accountant like her father — until she spent a summer at his firm. When her daily highlight became talking to the UPS driver for a few precious minutes of human interaction, she concluded that perhaps accounting wasn't for her. Surveying majors at Arizona State University, she discovered supply chain management. As junior class president in high school, Georgi planned the prom. The public school has to comply with government purchasing practices, and she loved the process — evaluating bids, negotiating with vendors, and writing a persuasive proposal to use a better, yet slightly costlier, site. That's when the proverbial light bulb went off: "Wait! People get paid to do this?" she laughs. Georgi excelled in her studies, was a 2006 recipient of the prestigious R. Gene Richter Scholarship, and graduated from ASU's Supply Chain Management program in 2007.

Holding a Master Black Belt in Danaher Material Processes, Georgi is a firm proponent of the kaizen continuous improvement philosophy. She has hosted numerous kaizen events and cultivated quite a following while spreading the "Danaher way."

One of Georgi's most impressive accomplishments was her creation of standardized templates for procurement and supply chain activities for new acquisitions. The templates are scalable, regardless of organization size. This has ensured that training is consistent, policies are clearly communicated, and savings and synergies occur at an unprecedented pace. In a recent integration, she re-sourced 91 percent of the components to Fluke's preferred suppliers within 90 days of acquisition (without causing disruptions to manufacturing), a new company record.

When it's time to relax with her family, Georgi says her passion is geocaching, an outdoor activity using GPS coordinates to hide and find items, a big hit with her 2-year-old daughter who considers it a treasure hunt. She jokes that her other pastime is trying to coach up her anatomist husband's negotiating skills to get him better deals on his lab equipment.





Senior Buyer, Zimmer Biomet, Warsaw, Indiana Nominated by Andrea Grable, Director of Global Sourcing, Real Estate, Sourcing Processes, and Compliance, Zimmer Biomet

IN HIS OWN WORDS

"To succeed, you need to learn, adapt, and be flexible for whatever task is thrown at you. Don't worry if you're nervous; it's because it's stretching you, and that's a good thing."

Kyle Alcorn

While attending college in Warsaw, Ind., the "Orthopedic Capital of the World," Kyle Alcorn saw a big opportunity for a successful career in the orthopedics industry. After taking a temporary position with Biomet, a leading orthopedic company, his passion for understanding the big picture and determination to find process solutions rather than going for the quick fix impressed his superiors. Alcorn quickly earned a permanent buyer position and has been exceeding expectations ever since.

Alcorn's role in eSourcing has allowed him to achieve significant savings for the company, and he now holds a prominent role in its eAuctions. To date, his efforts have resulted in savings of \$10.1 million — an average of 22 percent savings on everything auctioned. He is now in the process of training four others globally to run auctions.

Outside the office, mountain biking plays a big part in Alcorn's life, and he sits on the board of 2nd Mile Adventures, an adventure ministry group. However, a new and even bigger passion for him and his wife is their 7-month-old daughter and they look forward to getting her on two wheels as soon as she is ready.

Danielle Amico

Starting her career in human resources, Amico spotted an entrylevel position as a junior contract administrator for Princeton University, thought the requirements suited her skills, and took the plunge. Even though she had no experience in procurement, she embraced the challenges before her, quickly mastered the required knowledge, and has continued to tackle increasingly complex assignments.

In her current role as a contract administrator, Amico co-led two highly effective process improvement initiatives. One involved developing and documenting a process for working with internal clients to establish ordering agreements for design and construction services. She also contributed significantly to the rollout of the Sourcing Director electronic bidding system by developing the process, RFx templates, and document libraries for her office.

Amico works hard to cultivate trusting relationships with clients (her project managers). "My challenge is to help them see me as a partner rather than an adversary," she says. "When someone seeks me out for advice, I know that I've done my job."



Contract Administrator, Princeton University, Princeton, New Jersey Nominated by Michael Karl, Assistant Director-Facilities Procurement Office, Princeton University

IN HER OWN WORDS

"If I could start over, I would still choose this profession. I love how every day is different. I enjoy working with my clients to help them get the best value for the services they need. I enjoy interacting with my suppliers and having a mutually beneficial relationship."



Seth Blaustein

You know the stars are aligned when your childhood hobby leads to your dream career. So it was for Seth Blaustein, who, at age 12, began bidding for items on eBay for resale, something he did for the next 10 years. In college, he learned supply chain hands-on in a co-op program, and from there, it was only natural that he would end up at B-Stock Solutions, a startup that specializes in online liquidation auctions.

One of Blaustein's biggest accomplishments is his contribution to creating, growing, and sustaining B-Stock Supply, the company's branded B2B marketplace where hundreds of retailers, ranging from Fortune 500 organizations to small businesses, can efficiently sell excess inventory using an online auction platform. In one case, he significantly improved a Fortune 100 client's recovery by determining which merchandise category groupings would have the greatest success.

Emblematic of Blaustein's determination to put 100 percent into everything he does was a decision he made on a whim to run in a half-marathon while in San Francisco. The amazing part—he'd never run in a race before and didn't train for it, yet finished in 95 minutes, far quicker than the two-hour average for males for a 13.1-mile race.



Manager of Marketplace Development, B-Stock Solutions, Redwood City, California Nominated by Melissa Gieringer, Communications Manager, B-Stock Solutions

IN HIS OWN WORDS

"I feel that what I do has a significant impact on the business. I'm able to use what I've learned from my first few years to contribute to process improvements, product enhancements, and overall marketplace strategy."



Senior Project Manager, Source One Management Services, Willow Grove, Pennsylvania Nominated by Carole Boyle, Marketing Content Strategist, Source One Management Services

IN HIS OWN WORDS

"I would recommend a career in supply management because it's a field where you can really succeed. You get the opportunity to look at all areas of a business, see how it operates, and take control of a piece of it. I find it very rewarding."

Michael Croasdale

Michael Croasdale got his first taste of supply chainrelated activities while working in a warehouse during college. Being strategically minded and a people person, he undertook an internship at a consulting firm that specialized in strategic sourcing, eventually accepted a fulltime position, and has been charging hard ever since.

One of Croasdale's big wins involved a large subcontractor construction firm that had not actively engaged in strategic sourcing and had only recently created a centralized procurement department. For one project, he took it upon himself to source concrete and aggregate materials, and pushed suppliers to think not on a per-project price, but to consider pricing as a preferred vendor. It was a difficult task, he says, as "most people selling rocks do not look at the big picture."

The oldest of seven, Croasdale acts as a mentor to his brothers. In addition to attending movies and concerts, he enjoys hiking, camping, and fishing. You can also find him relaxing with an easel drawing or painting. But his ultimate stress reliever? Gardening—he's reputed to have quite the green thumb.







Contract Administrator, Princeton University, Princeton, New Jersey Nominated by Michael Karl, Assistant Director-Facilities Procurement Office, Princeton University

IN HIS OWN WORDS

"Being able to see design construction projects at completion is the most rewarding part of my role at Princeton University. Each project transforms from an idea through concept design and construction, all the way through completion."

Robert Dennis

After receiving a degree in finance, and working as the manager of a running store for two years, Dennis sought new career opportunities. A close family friend needed to fill an entry-level position in facilities procurement at Princeton, and Dennis turned out to be a natural fit.

In his current role as a contract administrator, Dennis led a highly visible process improvement initiative and contributed significantly to the rollout of the Sourcing Director electronic bidding system. Working with his clients in the Office of Design & Construction and Housing & Real Estate Services, he developed a category management strategy for Princeton's residential housing program. The result was a detailed plan to expand the qualified suppliers' pool to ensure the university receives the most competitive pricing without compromising quality.

When Dennis takes a breather from career demands, he enjoys spending time outdoors with his fiancée. During the summer, you're apt to find him hiking and backpacking, but when the snow starts to hit the ground, skiing is his go-to outdoor activity. Along with his CPSD certification studies, his impending graduation, and an approaching marathon in New Jersey, Dennis is also getting married in July 2016.



Corporate Procurement Manager, FXI, Media, Pennsylvania Nominated by Christopher Robert, Director of Procurement, FXI

IN HER OWN WORDS

"My job has a significant impact on the organization.

Managing supplier relationships and implementing cost savings initiatives impact the business' ability to operate and grow efficiently."

Megan Donoghue

Megan Donoghue's decision to go into supply management was relatively easy. She was confident she would find success because the field offers countless opportunities and spans many different industries, and the skills she learned would allow her to transition easily between them.

FXI does business across many different industries, involving the home, health care, electronics, industrial, personal care and automotive markets. When the company decided which of its mattress covers to source externally, Donoghue played a significant role. She put in place a detailed supply management plan that combined sales forecasts, historical inventory levels and vendor lead times by SKU into one easy-to-use model. In addition to implementing material requirements planning for more than 1,000 SKUs, the model reduced the risk of stockouts by taking into account sales promotions and other short-term events likely to impact sales forecasts. Another project that secured highly favorable payment terms for FXI resulted in Donoghue and her team receiving the company's coveted Diamond Award.

Recently married, Donoghue is contemplating getting her MBA. She's also a huge supporter of Penn State's THON, the world's largest student-run philanthropy committed to enhancing the lives of children battling cancer.



Leah Elders

Leah Elders views supply management as a puzzle—one that allows her to not only see how the pieces of a business fit together, but also to work on helping improve the company and its supply chain. During her four years in supply chain, she has tackled increasingly challenging roles in areas such as production supervision, focused improvement, continuous improvement, material planning and inventory analysis.

In her current role, Elders is responsible for executing a new process of inventory obsolescence management, and has to manage millions of dollars of at-risk inventory, working with a cross-functional group to find the root cause. Working with cross-functional teams has taught her that no matter the circumstance, you have to control your attitude. "It is better to be the thermostat than the thermometer," she says. "As a leader, you should set the temperature in the room, not just react to the temperature or the environment."

When she is not working, Elders like to exercise and spend time with her husband, family, and friends. She is actively involved in her church and the Big Brothers/Big Sisters program.



Team Lead Inventory Analyst, ConAgra Foods, St. Louis, Missouri Nominated by Natalie Andrasko, Supply Planning Manager, ConAgra Foods

IN HER OWN WORDS

"The most rewarding part of my job is the depth and breadth of people I get to interact with daily. I learn so much from having a cross-functional team of partners to work on projects with. I learn their roles and how they are affected by, and how they affect, the next 'customer' in our company's supply chain."

Logan Ferguson

As a freshman at Ohio State, Logan Ferguson got a taste of his future career at a private lunch-and-learn with a senior majoring in operations management and a professional in the field. Liking what he heard, he jumped in with both feet, joined the Buckeye Operations Management Society, and eventually received the Pace Setter Award, an accolade the college of business bestows on its top 2 percent. A problem solver with exceptional data analytics skills, Ferguson chose to work at DuPont, impressed with its strong Six Sigma culture.

He generated significant savings as the key buyer for the construction of a world-class facility. As an improvement leader, Ferguson has been involved in many critical projects, including heading two Six Sigma projects to optimize logistics and supply chain processes.

A soccer fanatic in the most positive sense, Ferguson sometimes plays in two leagues at one time. As a teen, he visited Old Trafford, the hallowed stadium of Manchester United, fervently supporting the team since. Newly married, he and his wife are active members of their church and helped disadvantaged families celebrate the holidays.



Improvement Leader, DuPont, Wilmington, Delaware Nominated by Ann Farrell, Manager, DuPont

IN HIS OWN WORDS

"When you start your career, it's good to say yes to a lot of different things. That allows you to learn what you like and what you don't like. It also helps you to build a broader reputation within the organization rather than being a superstar who is unknown outside your small area."





Logistics Support Supervisor, Avnet Inc., Chandler, Arizona
Nominated by Marianne McDonald, Vice President
Global Traffic & Transportation, Avnet Inc.

IN HIS OWN WORDS

"I didn't consider myself as being involved in the supply chain, but now I understand how vital transportation is to the success of Avnet's supply chain."

Christian Goehring

Christian Goehring began working at Avnet Inc. as a technology consultant. However, his attention quickly shifted to the logistics organization when he realized that transportation is core to his company, one of the largest global technology distributors. He readily admits that when he joined the global transportation team, he wasn't aware he was working in a supply chain function. With a master's degree in information management from Arizona State University in Tempe, Goehring combines technology and his analytical skills to leverage big data to provide the best shipment solutions to Avnet's customers.

"Christian was able to profile the impact of transportation decisions and recommend actionable opportunities to reduce total transportation costs and improve supply chain efficiencies," explains his manager, Marianne McDonald. His work led to savings of more than seven figures, she adds. Goehring says his strong analytical skills have helped him not only find the best solutions for customers, but also search out cost savings for the company.

"The most rewarding and satisfying part of my job is being able to see the impact my decisions and contributions have on Avnet's financials," Goehring says. "Working on the transportation side of the supply chain, I have a direct impact on Avnet's profitability, as reductions in freight expense contribute directly to bottom-line dollars."



Category Analyst, Johnson & Johnson, Raritan, New Jersey
Nominated by John Perez, Senior Category
Manager, Johnson & Johnson

IN HER OWN WORDS

"I would tell those thinking about supply management as a career that there is a tremendous amount of opportunity in the field. I learn new things every day. Sometimes you just have to take the leap because every role is what you make it."

Sarah Harse

A background in science and passion for seeking ways to work better, faster, and more efficiently led Sarah Harse to a job that is the perfect fit for her—working as the primary procurement liaison to the Johnson & Johnson epidemiology team. She has developed a category strategy for work in support of the team, a previously unmanaged area within Johnson & Johnson, says her manager, John Perez.

Harse says one of her biggest challenges — and proudest moments — was working on remediating a supplier's performance. "The business did not want to work with the supplier any longer," she explains. "I knew I had to work with everyone involved to figure out what was not working, where the supplier was falling short, and what we could do differently to help them be more successful." In the end, Harse helped the supplier turn around and get a new contract in place.

Harse believes her time management skills and drive to make procurement processes and procedures more efficient have helped her achieve success at Johnson & Johnson, where she has been for more than one year. With an interest in health and wellness, Harse enjoys running and other outdoor activities, as well as traveling.





Assistant Operations Manager, Iowa State University, Ames, Iowa Nominated by Paul Wedemeyer, Colleague

IN HIS OWN WORDS

"Over the next 10 years, I would like to make one significant contribution to the supply chain field, either in the civilian sector or the government/military sector."

Daniel Kelly

Daniel Kelly wanted to be a problem solver, so when he arrived at Iowa State University to study business, focusing on supply chain management and operations seemed like the ideal course of action. After accepting a job at Iowa State, he has worked his way up the ladder.

Kelly also took his skills to the Army National Guard, where he is a platoon leader in the 1133rd Transportation Company. A top graduate of his training class at the United States Army Logistics University, Kelly led his unit on missions across 16 states in 2015.

In his current role as an assistant operations manager at Iowa State, Kelly has had a significant impact on the performance of the dining department's warehousing and distribution system, resulting in radically decreased costs. His initiatives produced impressive results: On-hand inventory dropped by 64.3 percent, inventory footprint waste was cut by 44.3 percent, departmental expenses dropped by 5.7 percent, and paper retention decreased by 60 percent. The department also removed about 30 tons of excess equipment and supplies from several storage nodes.

Kelly attributes his successes to a willingness to tackle projects and tasks. He says he takes his cue from a college friend's philosophy: "Yes. Hell, yes! Or maybe we should talk about it."

Aisha Khan

With a degree in finance and economics from Rutgers University, Khan went to work on Wall Street during the Great Recession—a challenging time to enter the financial world. She left to start her own business before returning to graduate school, where she rounded out her skill set studying supply chain management and marketing. Taking a position with Johnson & Johnson, Khan began her procurement career as a sourcing lead responsible for global digital category strategy and business engagement.

As a member of the Procurement Leadership Development Program, Khan exceeded expectations and delivered significant results. With procurement's role in digital marketing still developing, the rapid pace of change creates complexity. New to the space, Khan was not intimidated, and employed her intellectual curiosity to quickly become a subject matter expert. Nominator Stuart Sueltman says she established credibility and developed strong relationships with her digital marketing business partners.

Khan is also a free spirit and a mold-breaker. Her passion for traveling led her to take up motorcycle riding, and she loves it. When the weather warms up, you'll find her touring the countryside on her Honda Rebel, looking for scenic hiking spots.



Global Change Management & Communications Lead, Spend Management Strategy, Johnson & Johnson, New Brunswick, New Jersey Nominated by Stuart Sueltman, Associate Director-Global Agencies & Digital Procurement, Johnson & Johnson

IN HER OWN WORDS

"I care about women's leadership and promoting young women around the world to pursue education in technical fields. As a member of Johnson & Johnson's Procurement Women's Leadership Initiative, I have had the opportunity to promote awareness of this topic."





Director, Global Logistics, Distribution & Customer Service, Baker Hughes Inc., Houston, Texas Nominated by Lynn Fox, Director, Global Completions Manufacturing, Baker Hughes Inc.

IN HIS OWN WORDS

"A young person considering a career in supply management needs to be a connector and start networking from day one — your network is your net worth and will determine your future. You don't know who is looking for you and you don't know what other people have to offer unless you make those connections and opportunities."

Amrish Lobo

Having earned a mechanical engineering degree in Chennai, India, Amrish Lobo thought he would follow his father into the automotive industry. Introduced to supply chain management while pursuing a master's degree in industrial engineering at Purdue, his plans soon changed. He accepted a job in oil and gas, and has skyrocketed to success.

At 29 years old, Lobo is one of his company's youngest directors, and heads the combined international logistics, distribution, and customer service organization within global supply chain. He manages an organization of hundreds across the Fortune 120 company's global locations, and is accountable for hundreds of millions of dollars in spend. Lobo co-led the development and implementation of the company's global distribution model, leading to new efficiencies and millions in savings, while also managing its Dubai center. The company has also sent him to Europe, Asia, and Latin America to manage projects.

"I'm not a very fun person outside the office," jokes Lobo. Apart from catching up on his reading, or taking in a movie or occasional tennis game, he spends considerable time drawing out ideas that focus on step-level changes in business transformation. These ideas form the foundation of what his teams will work on during the following week. A firm believer in the efficacy of networking, Lobo is also working diligently on his golf game.



Buyer III, Johnson Controls Inc., Norman, Oklahoma Nominated by Raul Gerhardus, Senior Procurement Manager, Johnson Controls Inc.

IN HIS OWN WORDS

"The most satisfying part of my job is the comfort of having trust in the company's leadership. In today's environment, changes can occur quickly, and at times, it is difficult to understand them. These changes make work more interesting — there aren't many dull moments in this job. I trust leadership's decision-making for both the company and my personal growth."

Leonardo Lopez

While at an open house at the College of Business at Marquette University, Leonardo Lopez heard a presentation about the supply chain management program. "I learned that supply management is an engaging and involved field that interacts with many other business functions," he says. Lopez decided to join the program, and "I've never regretted it," he adds.

He landed an internship with Johnson Controls Inc., then was hired by the company as an associate buyer. Over the past five years, Lopez has worked his way up through the procurement organization. His early accomplishments include streamlining suppliers and improving working capital for temporary labor in the United States and Canada.

Lopez currently is working in direct procurement at the Norman, Okla., plant, a move that allowed him to gain operational experience and a clear understanding of how various products are produced. At the plant, he worked on a complex e-auction project that resulted in savings of more than \$700,000.

His short-term goals include finishing his MBA and obtaining his Certified Professional in Supply Management certification. Longer-term goals include managing global commodities at Johnson Controls, focusing on leadership development, and taking an assignment abroad.



Jessica Mayhew

Jessica Mayhew has worn many hats during her time in supply chain, starting as a planner and swiftly rising to her current role as division sourcing manager, where she has excelled.

She recently drove significant savings through launching creative commodity strategies using best-cost countries and new technology. Mayhew helped locate and develop a new grey and ductile iron foundry in Mexico to support Parker Hannifin's long-term sourcing strategies. She also exceeded savings expectations on complex castings by championing an alternate casting technology.

Unlike many peers, Mayhew actively planned for a career in supply chain management since high school. She had an uncle in the field and, after he explained his job to her, she was hooked.

Alan Miner, Mayhew's nominator and former manager at Parker, is impressed with how she displays great leadership through all levels in the organization. Others gravitate to her, even from outside her division, he says.

Recognizing global opportunities early, Mayhew minored in Mandarin in college. After graduation, she worked with a local tutor to gain fluency, a skill that has proven to be a powerful advantage in localization efforts and negotiations.



Sourcing Manager, Parker Hannifin, Cleveland, Ohio Nominated by Alan Miner, Division Supply Chain Manager, Parker Hannifin

IN HER OWN WORDS

"I want to keep developing my career at Parker. I want to help find ways to make our supply chain part of the strategic advantage of our company and continue to learn new things and face new challenges."



Area Sales Manager, Fiat Chrysler Automobiles, Irvine, California Nominated by Shelley Stewart, Jr., Vice President and CPO, DuPont

IN HIS OWN WORDS

"I would tell those considering a career in supply management that although the discipline is broad, it is literally the heartbeat of companies around the world. If you want to enter a field that is never boring, never repetitive, and challenges you daily, supply management is it."

Grayson Mitchell

Like many up-and-coming supply management professionals, Grayson Mitchell believes his passion to learn and grow are the secrets to his success. But the Howard University graduate and 2012 Richter Scholar takes that mantra one step further, focusing on his drive to learn and develop within a team. "Many people focus solely on themselves — which is great for personal development," he says. "However, I think it's best to focus on aggressively developing with others. No individual alone is stronger than the entire team."

Recently accepting a new position as area sales manager for southern California, Mitchell works with area dealerships to ensure adequate product supply and to help increase sales to end customers. He led the implementation of complexity reduction procedures for year-over-year model configurations, increasing plant build efficiency, and managed the optimization of the rail loading process for a manufacturing plant, resulting in ongoing cost savings.

Mitchell considers himself a sports fanatic, as a spectator and competitor. "I have been playing team sports since I was three," he says. "The very nature of athletic competition has increased my competitive spirit and my ability to find success while working as a team."





Master's in Supply Chain Management Candidate, Texas Christian University, Fort Worth, Texas Nominated by Mary Buenrostro, Member of Board of Directors, ISM-Dallas affiliate

IN HIS OWN WORDS

"In the next 10 years, I'd like to help organize and oversee a world-class supply chain team. One thing that gives me the greatest satisfaction is remolding something that is undervalued and making it into something powerful."

Jeff Monroe

Jeff Monroe is never satisfied with the status quo, which explains how, in three years, he consolidated all procurement activities into one department for his former employer, Southern Botanical Inc. of Dallas. Hired as an estimating intern in 2012, Monroe worked from the ground up to create comprehensive RFPs, develop an approved supplier list, and create a solid supplier relationship with a 3PL provider to reduce costs by 10 percent.

Mary Buenrostro, who serves with Monroe on the board of directors of the ISM-Dallas affiliate, says after he consolidated purchasing into one department, company profitability was greater in the following year than in the previous seven years combined. After Monroe was promoted to senior purchaser, he directed a purchasing team to achieve KPIs, and organized a support team focused on reducing loading/unloading time, resulting in labor cost savings forecast at \$50,000 annually.

Monroe says he is proud he was able to initiate and oversee several supply management projects that saved the company millions of dollars. Taking the time to find a company that is the right fit, he's focused on finishing his master's program and is studying for the second and third parts of ISM's Certified Professional in Supply Management® certification.

In addition to spending time with family and volunteering at his church, Monroe enjoys the outdoors, especially hiking and fishing.

Cara Navarre

While studying international business in college, Cara Navarre interned at Northrop Grumman and, after graduation, took a full-time position as a subcontracts administrator. Her natural ability to lead and develop relationships with suppliers quickly emerged.

Northrop sent her to Australia three times in one year to work with the Australian Defence Material Organisation, assessing its supply field to determine which companies would be capable of participating in projects abroad, including in the United States.

After two years outside supply chain, Navarre returned as a sector subcontracts administrator and had a significant win. She was responsible for managing the process of vetting international suppliers, which would sometimes require up to 14 approvals. She adopted a scaled approach based on the supplier's risk level, reducing the average number of approvals to four, then trained the entire sector supply chain and contracts organization.

Recently, Navarre's supply chain skills helped her secure the position of operations manager for the Office of the Sector President after an extremely competitive interview process.

Outside the office, Navarre has a passion for running, particularly in races, and has completed a full marathon.



Operations Manager, Northrop Grumman, McLean, Virginia Nominated by John Jordan, Director of Supply Chain, Civil Division

IN HER OWN WORDS

"One of the biggest misconceptions about millennials is that we aren't loyal to companies and only stay for a couple of years. I think the key is finding new opportunities within the same company so millennials don't get bored."



Chinedum Nweze

Highly inquisitive and a perfectionist by nature, Chinedum Nweze entered Michigan State as a finance major. Taking a required supply chain course, he enjoyed the subject and had a moment of clarity—it just made so much sense to him—so he eventually switched his major to supply chain management and logistics. He interned at John Deere and, after graduation, accepted a position with the company, where he is midway through a three-year rotational program.

One of his biggest challenges is identifying opportunities to reduce cost without compromising quality. His manager, Larry Anderson, points to three significant projects where Nweze played a key role. He created improvements in John Deere's Small Diverse Supplier spend, driving it up in several classifications and getting buyers to consider small diverse suppliers for capital projects. For another project, he performed a root cause analysis to eliminate invoice errors and developed a process that was adopted as a best practice across the company. In the third project, Nweze developed an e-catalog for service providers, even though other buyers had stated it was impossible.

When he's not working, you can probably find Nweze traveling, either in the United States or abroad; he likes to see how people do things differently and how he can learn from them.



Supply Management Specialist, John Deere, Davenport, Iowa Nominated by Larry Anderson, Manager, Central East Regional Procurement Center, John Deere

IN HIS OWN WORDS

"I would recommend a career in supply management to someone under 30 because it offers the opportunity to have a direct impact on your organization's bottom line. You are challenged to think outside the box and critically analyze data in order to arrive at the most efficient and effective solutions."

Caitlin O'Toole

Caitlin O'Toole has been recognized for the key role she played on a product launch team, as well as several projects that resulted in substantial cost savings during her 4.5 years in supply management at Stryker. But if you ask her about her proudest accomplishment, she will tell you it's one that doesn't relate to her day-to-day work.

Clearly a "people person," O'Toole takes great pride in an intern she mentored one summer. "It was amazing to watch her grow," O'Toole says. "She had a great experience that summer. And at the end of her senior year, she accepted a full-time job at Stryker and now runs the shipping team as a supervisor—a role I previously held."

As an associate sourcing manager, O'Toole saved Stryker more than \$1.2 million in cost avoidance, and she continues to negotiate and create innovative supplier opportunities for additional project cost savings. O'Toole is a member of the Stryker Women's Network Planning Committee and completed the Stryker Future Leader Program.

Outside of work, O'Toole likes spending time with family and friends, and especially enjoys sports, cooking, baking, reading, and traveling.



Associate Commodity Manager, Stryker, San Jose, California Nominated by Danielle Hansen, Senior Global Sourcing Manager, Stryker

IN HER OWN WORDS

"I believe that what I do has a significant impact on the business. Fostering and maintaining supplier relationships and conducting supplier business reviews ensure that we continue to partner in creating innovative, high-quality medical devices and technology. Negotiating and implementing supply contracts ensures we are sourcing medical equipment our customers need most."





Director of U.S. Operations, Haven, San Francisco, California Nominated by Renee DiResta, Vice President of Business Development, Haven

IN HIS OWN WORDS

"Over the next 10 years, I plan to help grow Haven into the largest marketplace for transacting shipments.

Because we're working to bring transparency and improve the speed of transactions rather than trying to extract a margin from shippers, Haven will help to fundamentally transform the way that organizations ship their goods."

Max Pike

Max Pike says he has always been fascinated with how things move within cities and around the world. He studied public transportation in college and expanded into the world of logistics while working at a consulting firm after graduation. As the head of U.S. operations for Haven, a technology startup in the freight market, he is working to change how business is conducted in the shipping industry.

Pike has identified opportunities to automate processes to help shippers move products more effectively, and provide carriers and shippers with better pricing data and shipment booking. "He has reduced response time for Haven's customer base by more than 80 percent, leading to a better operational process," says colleague Renee DiResta. "His dedication also has resulted in dramatic growth in the U.S. customer base over the past year."

When encouraging young people to consider supply management as a career, Pike emphasizes that it's a dynamic, challenging, and exciting profession. "When the discussion focuses on taking manufacturing overseas or looking at inventory issues, getting it right or wrong rests with logistics," he explains. "Customers who can't get orders when they want them, or companies with too much money tied up in inventory are supply management and logistics concerns."

Michael Raezler

The Postal Service is renowned for its dependability, and the same can be said of Michael Raezler, one of the youngest team leaders in its supply management organization.

A graduate of Michigan State University's top-ranked supply chain management program, Raezler initially planned to be an accountant, a job for which he showed great promise. But the idea of staring at numbers all day seemed mind-numbing. After excelling in a supply chain management class, he found his true calling.

Raezler negotiated a five-year, enterprise-wide software licensing agreement that saved the Postal Service \$30 million. Another significant win came shortly after his promotion to team lead, when he negotiated and finalized a settlement agreement with a vendor, potentially avoiding millions in contract claims. He also quickly performed a total cost of ownership analysis to select the best-qualified supplier as a replacement. He received a Vice President's Award from the Postal Service's vice president of supply management for this project.

A true Michigan State fan, Raezler enjoys playing sports in addition to watching the Spartans on the gridiron and hardwood. He participates in several softball leagues, and can see the Washington Monument from his favorite field.



Purchasing and Supply Management Specialist, U.S. Postal Service, Washington, D.C. Nominated by Mark A. Guilfoil, Manager, Mail and Operational Equipment, U.S. Postal Service

IN HIS OWN WORDS

"The most rewarding part of working for the Postal Service is knowing that my work has a direct impact on the services our organization provides to the American public."



Ross Scott

"Ross Scott, at just 28 years old, has more supply chain skills and experiences than many seasoned professionals," says nominator Jeff Green. Scott is an integral part of Sandvik, a world leader in industrial tool manufacturing, making significant contributions both individually and as a team member.

Scott's performance record at Sandvik, and his ability to solve complex problems, means he is called on to lead critical projects. He has been tasked with improving a complex supply chain for a new oil/gas product that has suffered from late deliveries and quality issues. His team is identifying broken processes and root causes, then prioritizing and implementing solutions.

An alumnus of Michigan State University, Scott graduated with an engineering degree, but interned in supply chain at Caterpillar and Boeing and knew that was where his career was heading. After returning to Michigan State for graduate school, he obtained his master's degree in supply chain management, all while juggling a young family and his career at Sandvik. He graduated with a 4.0 GPA.

When it's time to unwind, Scott looks forward to spending time with his wife and young ones, 2-year-old Charlotte and 4-monthold Andrew. His main hobby involves staying on two wheels as much as possible, whether it is racing a dirt bike, cruising on his Harley, or hitting the trails with his mountain bike.



Supply Chain Solutions Manager, Sandvik, Auburn Hills, Michigan Nominated by Jeff Green, Vice President Supply Chain Management, Sandvik

IN HIS OWN WORDS

"Being a mentor has been a positive experience for me. It has allowed me to help another young professional develop and advance in his career while helping me refine my teaching and interpersonal skills."



Strategic Sourcing Manager, Anthem Inc., Thousand Oaks, California Nominated by Greg Antoniono, Director of Strategic Sourcing, Anthem Inc.

IN HER OWN WORDS

"In my four years of sourcing, I have never experienced two days that were the same, never managed two identical projects. There is always something new, which makes sourcing an incredibly exciting field."

Kayla Six

When asked to offer advice to other young supply management professionals, Kayla Six is quick to respond: "Don't be afraid to be bold and go outside your comfort zone. And ask questions so you can learn from those around you." The strategic sourcing manager at Anthem Inc. takes that advice to heart.

During her four years in procurement, Six has been the enterprise-wide strategic sourcing lead for multiple business areas and spend categories simultaneously. "Kayla's ability to gain mastery of technically complex areas of sourcing, manage demanding internal clients and still drive innovation and great results — 37 percent savings in a mature category is just one example — is extraordinary," says her manager, Greg Antoniono.

She is most proud of negotiating an integrated voice-response contract, which had to be coordinated and collaborated with more than 40 business owners to implement consolidation and create a joint-governance model between Anthem and the supplier. "It was one of the first projects that I led," Six says. "There were several stakeholders and competing priorities. But it was a chance for me to get my name out there and to know that I can take a major project from start to finish."

She also enjoys hiking and other activities with her husband and young son.





Subcontracts Program Manager, Northrop Grumman Aerospace Systems, Rancho Bernardo, California Nominated by Christopher Herbers, Subcontracts Program Manager, Northrop Grumman Aerospace Systems

IN HIS OWN WORDS

"I enjoy mentoring other employees. I also mentor a student-athlete from the University of San Diego. I welcome the opportunity to offer guidance on college, as well as life in the work force, as the mentoring I have received has been instrumental to my success."

Conrad Smith

As a young boy, Conrad Smith enjoyed going with his father to watch the huge containerships pulling into the busy ports of Long Beach and Los Angeles. "I always wondered where they were going or where they came from," he recalls. That early curiosity sparked an interest in supply management that led Smith to his position as a subcontracts program manager at Northrop Grumman Aerospace Systems in Rancho Bernardo, Calif. It also prompted him to attain a master's degree in supply chain management from the University of San Diego.

In his position with Northrop Grumman, Smith is responsible for managing the subcontracts team for Unmanned Air Vehicle programs and working cross-functionally with the respective program managers. "He is willing to tackle challenging tasks that aren't typically part of subcontracts' responsibilities and has excelled in all of them," says his manager, Christopher Herbers.

Smith, who was an offensive lineman at the University of San Diego during his undergraduate years, credits his success in supply management to solid time management skills and a willingness to accept a challenge. "When you work in supply management, you deal with a number of different tasks every day, and time management skills are critical," he says. "I always welcome the opportunity to take on a new challenge in supply management, and it has opened many doors for me."

Andrew Tasselmyer

With only three years of supply management experience, Andrew Tasselmyer already has played a key role in several major team projects at DuPont, from streamlining its corporate card program to facilitating the knowledge transfer from a third-party consultancy.

Tasselmyer says his interest in supply chain stems from the "passion and enthusiasm" of his supply management professor during his freshman year at the University of Maryland. Tasselmyer planned to major in marketing, but the professor's interest in supply management rubbed off, and he graduated with dual degrees—marketing and supply management.

Today, he has no regrets about his choice. He talks with enthusiasm about leading a comprehensive RFI and RFP process to identify a single card issuer capable of consolidating DuPont's T&E and purchasing card programs. "It was a complex landscape, with 16 different banks providing cards to employees all over the world," he says. The team identified one supplier to cover the company's global needs, and Tasselmyer was then asked to help implement the program.

When he's not working, Tasselmyer writes and records his own music, which he says is therapeutic and a great stress reliever.



Improvement Leader,
DuPont, Wilmington, Delaware
Nominated by Ann Farrell, Sourcing & Logistics Manager, DuPont

IN HIS OWN WORDS

"I would like to be known as someone who did more than just affect numbers or improve business operations. I would like to have developed deep connections with the people I work with and the community I live in, and to be known as a friend, mentor, and advocate who made a positive difference in the lives of people."



Leandra Taylor

"I've wanted to be in procurement since I was 19 years old," says Leandra Taylor, "mainly because it fits my personality so well!" A born wheeler and dealer, Taylor is "The Deal Maker" to her family and friends. Taylor was two weeks into her first supply chain class in college when her professor explained its purpose: to save money and find ways to be more efficient. That was all she needed to hear. One week later, she declared her major.

"Leandra relentlessly seeks opportunities to deliver additional value to Shell," says Kathryn Conrad, Taylor's nominator. That was evident when she recognized the need to revamp the bid-evaluation process for tank construction services. With limited data and time, Taylor initiated a total cost of ownership analysis, and her efforts reduced total cost of tank procurement by 50 percent.

Taylor believes firmly in helping others to succeed both personally and professionally. Though comparatively young herself, she feels accountable for developing the next generation of leaders. On a personal level, she spends time mentoring three first-generation university students from disadvantaged backgrounds. Also, she contributes her time and finances to two international organizations to support the education and protection of disadvantaged children in India and Indonesia.



Contracting and Procurement, Deepwater Projects, Shell Offshore Inc., Houston, Texas Nominated by Kathryn Conrad, Geismar Refinery Contracting and Procurement Lead, Shell Chemical Company

IN HER OWN WORDS

"The most rewarding and gratifying part of my job is when I'm able to instill a commercial mindset within my business stakeholders."



Director of Warehouse Operations, IDLife, Dallas, Texas
Nominated by Robert Cassin, Mentor

IN HIS OWN WORDS

"I think it's important for young people entering the supply chain field to take the reins of their own development. Many opportunities will present themselves, but many more will need to be sought out."

Michael Tomaro

A graduate of Purdue University's nationally ranked Top 10 engineering school, and former professional with Halliburton's prestigious Supply Chain Management Program, Michael Tomaro uses his strategic mindset and critical thinking ability to drive results that connect to the bigger picture. He believes that supply chain management was the perfect place for him to leverage both his technical engineering and business knowledge to optimize processes that significantly impact the organization as a whole.

Tomaro is a dynamic leader who is skilled at developing individual relationships and acknowledging ideas, opinions, and contributions. In early 2015, he was chosen to head a crossfunctional team tasked with transforming a manufacturing facility into a plant designed for remanufacturing used assemblies and components. Under his leadership, the team developed and deployed the new process with a projected financial benefit of \$3.17 million in the first year.

Having raced rally cars for a while, Tomaro decided he needed a new hobby. With a natural inclination to explore, he took up overlanding, a pastime that involves off-road travel to remote destinations in a purpose-built vehicle.





Strategic Sourcing Manager, Global Manufacturing Operations, Cisco Systems Inc., San Jose, California Nominated by Akwasi Peprah, Vice President, Procurement Services, LevaData Inc.

IN HER OWN WORDS

"I'm very grateful for how things have played out so far, but I think the proudest moment of my career is definitely yet to come. Every time I think I've hit my peak, the passion and fascination I have for the field of supply chain reminds me that there is more to aspire to and a higher route to climb."

Debbi Wan

Most kids just play with toys, but Debbi Wan wanted answers: How were the toys made? How did they get to the store? Watching distributors come and go in her parents' small grocery store further stoked her curiosity. It was only natural that she would study supply chain in college as part of a triple major, with marketing and sustainability.

Joining her new group as an analyst, Wan noticed the sourcing team used offline documents for tracking, an inefficient practice because only one manager at a time could update the file. Going beyond her original assignment, she leveraged a contact from a previous position to design and develop a robust web-based tool to solve the issue. Still not content, she led the charge to develop an efficient way to view sourcing analytics that provided greater visibility and improved collaboration.

Wan's crucial contribution to the development and manufacturing partner selection of a product within Cisco's solution portfolio highlights her unique approach as a sourcing manager. Wan partnered with the lab team to assist in product assembly and packaging, gaining a 360-degree perspective critical to sourcing efforts in the final stages.

Outside the office, Wan enjoys cooking, hiking and slacklining—an extreme pursuit that involves securing herself to a rope and scaling a sheer rock face.

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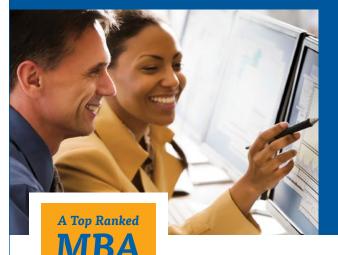




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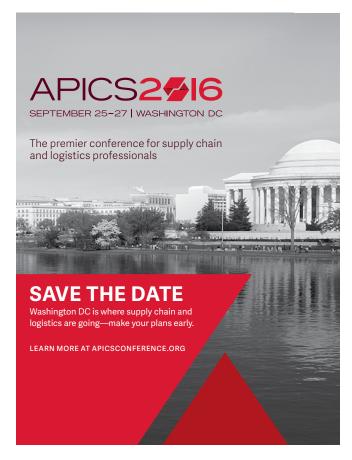
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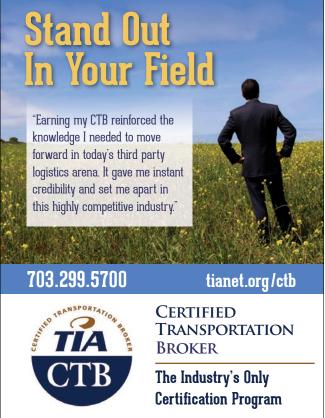
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IT Toolkit by Vicki Speed

Cloud-Based Route Planning? That Would Be Ideal!

hird-generation, family-run Ideal Supply, a wholesale distributor of electrical supplies, auto parts, and industrial products, is no stranger to innovation. Based in Listowel, Ontario, Canada, the company was one of the first in its market segment to transition to a technology-enabled route planning system with mobile capabilities more than one decade ago when mobile adoption was more of a dream than a reality.

For a wholesale distributor of electrical supplies, auto parts, and industrial products, the best delivery routes run through the cloud.

Today, Ideal Supply is pioneering another technology shift in its industry by adopting cloud-based logistics management. This shift enables real-time visibility, drives economies of scale, and delivers unprecedented customer service.

Economies of Scale

In business since 1926, Ideal Supply has grown to become one of the largest privately owned wholesale distributors of automotive, electrical, and industrial products and services in Canada. In fact, the company is Canada's largest NAPA Auto Parts distributor. Currently, Ideal Supply operates 30 branch locations in southwestern Ontario, has

450 employees, and maintains a 75,000-square-foot distribution center.

The company relies on seven dispatch areas located within its geographic service zone. Dispatchers at these locations plan and optimize routes in a predominantly rural region for a delivery fleet of more than 100 vehicles, ranging from a smart car to a 53-foot tractor-trailer.

In 2004, Ideal Supply initiated its first technology-enabled route planning system when it adopted Roadshow from logistics technology provider The Descartes Systems Group Inc., based in Ontario. The program added mobile capabilities to business processes.





"At the time, our manual systems weren't cutting it," recalls Chris Moon, director of information technology for Ideal Supply. "We didn't have systems in place to monitor driver performance, and we used manual processes to facilitate routing.

"We wanted to offer multiple waves of delivery and add same-day delivery services, which our existing system could not handle," he adds. "In short, we were looking for a way to bring our paper-and-pen-driven logistics into the current era."

In July 2005, the company implemented Descartes' legacy route planning and execution system. "Roadshow was also our introduction to the benefits of mobile applications, which, at the time, were fairly new to transportation and logistics," Moon says.

"The benefits were immediately visible," he adds. "We were able to facilitate paperless dispatch with handheld cellphones, which were not nearly as sophisticated as today's smartphones. Roadshow taught us about the best practices and processes to manage road schedules and customer service."

Moon recalls one particular practice that changed after implementing *Roadshow*: "We used to delay a truck's departure if a customer called in 15 minutes past the order deadline," he says. "We thought we were providing good service, when, in fact, we were providing good service only to one customer and bad service to the other 15 customers waiting for their orders. *Roadshow* provided a more disciplined approach to logistics."

At the time, Ideal Supply was able to deliver between 1,900 and 2,000 orders every day with the new software and improved process efficiencies. Today, one decade later, the wholesale market has evolved—and so have customer demands.

In Search of Real-Time Response

"Meeting customer expectations requires greater visibility," Moon says. "Wholesale is a funny business. Customer service is not necessarily exclusively about service, it is also about economies of scale and efficiency; so logistics is a competitive differentiator."

Today, Ideal Supply makes between 2,100 and 2,200 deliveries daily in a service area that covers a large geographic footprint spanning from Stratford in the south to Huntsville in the north—an area of approximately 8,700 square miles, most of which is rural.

Dispatchers must consider the distance between stops, infrastructure, and inter-connectivity with other nodes—and real-time data visibility is vital to operational efficiency and customer service.

"The cost of missing a connection is

significantly higher in our rural environment than in an urban area," Moon says. "If drivers take an inefficient route in downtown Toronto, it might cost them a few minutes or a couple of blocks of travel time. But if they do that on a dirt road in midwestern Ontario, they could lose 30 minutes or more, and drive an additional 30 miles."

In search of real-time visibility into products in the delivery cycle from the warehouse to the customer, as well as customizable tools to connect its unique processes and practices, Ideal Supply looked at cloud-based route planning systems. It sought

a solution that would be easy to implement and use.

"When we evaluate technology and process solutions, we explore the end user experience," Moon explains. "It does no good to implement the fanciest Enterprise Resource Planning (ERP) package with all the bells and whistles if users can't achieve tangible, value-add experiences. We looked at the user interface to data structure and use, reporting functionality, feedback evaluations, and continuous improvement."

The team considered a number of technology solutions, ranging from small and purpose-built packages to large players. "The big differentiator for us was integration through standardized techniques such

as Application Programming Interfaces (APIs)," Moon says.

Moon and his team wanted a cloudbased route planning system that would seamlessly share data with its ERP and other platforms, such as *IdealLINK*, its internal e-commerce solution.

"We knew the cloud would allow us to leverage a single repository, and thereby improve visibility within our organization and to our customers," Moon adds. "Along with visibility, we wanted electronic proof of delivery. We have that capability inter-



Family-run distributor Ideal Supply is optimizing delivery routes through a cloud-based route planning system.

nally, but not to our delivery customers.

"For instance, we want our customers to be able to sign a smart device and see the proof of delivery within minutes. Those are big drivers in today's environment."

With those improvements in mind, Ideal Supply opted to adopt Descartes *Route Planner On-demand*, a comprehensive, cloud-based delivery route planning, execution, and mobile solution.

Optimized for the Cloud

Descartes Route Planner On-demand provides rapid time-to-value and an easy-to-use solution for automatically planning driver routes, according to the developers.

"In terms of technology advances, this

solution emphasizes consolidation and the cloud," says Andrew Roszko, senior vice president at Descartes. "Traditionally, distributors had one tool for road planning, another for GPS mobile tracking, then a third to track idle time, routing, and telematics. Now, it's an all-in-one solution."

In addition, cloud capabilities are fairly new to route optimization and mobile tracking.

"A natural adoption of the cloud is taking place," Roszko continues. "In the past, the cloud wasn't fast enough for route optimization. That has changed. During the past few years, with advances in internet speed, the cloud now supports this level of optimization. But, distributors such as Ideal Supply need reliability."

"Not that long ago, the cloud's reliability and stability were concerns," Moon adds. "We wanted to see those areas better developed into a mature model and solution before we migrated from our reliable client-server solution.

"That has all happened and we are poised to take advantage of the technology," he notes. "The cloud will help us extract data in real time, a capability that was problematic with the client-server model."

Roszko also believes that the barriers to entry for cloud-based tools have come down substantially, as has the speed of implementation. "Cloud-based solutions such as *On-demand* don't require large capital expenditures," he notes. "There's no barrier to adoption other than priority in the organization."

Purpose-Built and Customized

With Descartes Route Planner On-demand, Ideal Supply planners and dispatchers benefit from better visibility and control over daily routes with a drag-and-drop visual planning user interface to make edits and monitor delivery status throughout the day.

The solution offers advanced capabilities—including optimizing static and dynamic routes by taking into account geographic zones, time windows, and other physical constraints—at an affordable cost. The solution's mobile component

provides real-time GPS-based tracking and driver performance monitoring, and can electronically capture proof-of-delivery (POD) information.

Moon and his team are approximately 90 percent through implementation of the Descartes *Route Planner On-demand* solution—and already see value.

"We've set our technology expectations very high for this implementation," he says. "We want to take advantage of advanced algorithms, such as automated alerts about delivery windows, and customize the system to meet our unique business processes."

One algorithm that the team is particularly excited about is the "at-risk delivery window."

The route planning system predicts estimated arrival times and accounts for customer requirements such as delivery windows. Therefore, if something happens along the route to delay a delivery, such as bad weather or an accident, the system proactively alerts Ideal Supply's dispatcher or customer directly without manual intervention. A traditional system would also note the issue, but the dispatcher would have to identify the problem and initiate action.

Ideal Supply is also customizing some parts of the route planning application to fit its needs. customize the application turns prepackaged software into a purpose-built solution."

For instance, the team configured a customized delivery reconciliation process that manages packages from the time they are scanned to the driver's package list. With the automated package list, Ideal Supply drivers can see their entire scheduled run at the order level, and scan it onto their delivery vehicles like a checklist.

"This was important to us, because multiple orders could be required for a single stop, particularly for our automotive customers," Moon says. "The reconciliation capability greatly reduces the chance of missing something."

Other benefits expected along the way include improved administrative efficiency for processes ranging from accounts receivable collection (faster posting and reconciliation of PODs) to the dispatch process itself.

"Longer term, we expect to use the data and discipline this new software brings to the table to create new internal processes and tools that keep us changing and adapting to the business environment faster than our competitors," Moon concludes.

Ideal Supply expects to have the Descartes *Route Planner On-demand* solution fully implemented during summer 2016.



3PLs



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Industrial Technology and Management (INTM) at Illinois Institute of Technology (IIT) offers Bachelor and Masters degrees, with specializations in Supply Chain Management, Industrial Facilities, Industrial Sustainability, and Manufacturing Technology. The Bachelor (BINTM) is a transfer degree, requiring an Associates degree or equivalent college credits in a technical field. The Master of Industrial Operations (MITO) prepares students for management positions in industrial companies. Evening and online courses allow flexibility for working adults.



bit.ly/IL_wcc

Education - Retail Logistics



University of San Diego • www.sandiego.edu/msscm

The University of San Diego's ISM-approved Master of Science in Supply Chain Management is delivered via e-learning with only a few on-campus sessions per year. Through relevant curriculum with applied learning, you'll develop leadership competencies that will enable you to initiate change and drive improvements across increasingly complex supply chain networks. Join us now for two years that will change your life!

FORKLIFTS

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GLOBAL LOGISTICS



NFI Industries • www.nfiindustries.com

Founded in 1932, NFI offers a variety of integrated supply chain services to help businesses manage, grow, and succeed in today's marketplace. The company is one of the largest privately held third-party logistics providers in North America. NFI divisions include Warehousing and Distribution, Logistics, Transportation, Intermodal, Canada, Real Estate, Contract Packaging, Transportation Brokerage, Trailer Leasing and Storage, Solar, Global and Consulting services. NFI is an EPA SmartWay Transport and WasteWise Partner.

RETAIL LOGISTICS

Performance Team • www.performanceteam.net

Performance Team is the only thing that should come between your products and your customers. For nearly 25 years, Performance Team has been offering its expertise to the retail and manufacturing industries with a broad range of supply chain services including trucking, distribution, logistics, and fulfillment. Through 11 domestic hubs, over 5.1 million square feet of warehouse space, and a fleet of more than 400 trucks, Performance Team's skilled team of employees processes approximately \$100 billion in wholesale goods. See why Performance Team continuously earns a reputation as the premiere trucking, consolidation, and distribution company in the United States; log on to www.performanceteam.net.



SIGNAGE AND MARKINGS



ASG Services ● www.asgservices.com

ASG Services is a warehouse identification and marking specialist. We manufacture custom warehouse labels and warehouse signs in Atlanta, Ga., while providing fully managed installation services and warehouse striping solutions throughout the United States, controlled centrally from our head office.

SUSTAINABILITY

C.H. Robinson Worldwide, Inc. • www.chrobinson.com

Founded in 1905, C.H. Robinson Worldwide, Inc. is one of the largest third-party logistics companies in the world, providing multimodal transportation, fresh produce sourcing, and information services to more than 32,000 customers globally, ranging from Fortune 500 companies to small businesses in a variety of industries. For more information about our company, visit our website at www.chrobinson.com.





DSC Logistics • www.dsclogistics.com

With experience, knowledge, and IT - as well as supply chain capabilities that are adaptable, versatile, and focused on changing customer needs - DSC Logistics helps companies reach their business goals. DSC provides supply chain analysis and design, strategic solutions-based consulting, systems integration, process improvement, and management of logistics operations such as warehousing, transportation, packaging, and fulfillment. In today's business environment, filled with rapid and unpredictable change, DSC manages change and information in the supply chain by using a strategy called sense-and-respond and by being ready for anything!

Lynden ● www.lynden.com

Over land, on the water, in the air—or in any combination—Lynden has been helping customers solve transportation problems for almost a century. Operating in such challenging areas as Alaska, Western Canada and Russia, as well as other areas around the globe, Lynden has built a reputation of superior service to diverse industries.





RR Donnelley • www.rrdonnelley.com/logistics

Experience the benefits that only come from working with a major, global shipper that is also a top-ranked 3PL. We offer multiple transportation modes, an established multi-carrier network, volume-leveraged rates and service levels, along with technology-enabled systems and processes. Visit our website and contact us today to see why customers have relied on us for nearly 150 years.

YRC Freight • www.yrcfreight.com

If you are looking for seamless transportation throughout Canada, Mexico, and the United States, look to YRC Freight. The carrier's reliable two-day, three-day, and coast-to-coast service connects key markets with guaranteed delivery windows. YRC Freight also offers dedicated protective services for a single shipment or entire trailer; special project and logistics management; and transportation and logistics for import and export shipments. Find out more about YRC Freight by visiting the website.



TMS



3Gtms • www.3gtms.com

3Gtms is a developer of transportation software for LSPs and shippers. This third generation of TMS-delivered on a single cloud or on-premise platform—is designed for transportation professionals by the experts who invented TMS, and have now reinvented it offering an easy-to-use solution that simplifies inbound and outbound transportation planning and execution.

TMW Systems • www.tmwsystems.com

TMS solutions from the company that drives ground transportation in North America. Extensible, enterprise-ready software for companies that manage or provide transportation services – from shippers and logistics service providers to private and dedicated fleets to bulk carriers, LTLs, truckload carriers, and pure, non-asset-based freight brokerage. It's not dispatch software, it's Enterprise Transportation Software, from TMW Systems.





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Energy, Growth, Expansion

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Port of Houston

Get your cargo on its way quickly and efficiently through the Port of Houston, and gain access to waterways, highways, and intermodal rail. Discover the host of business opportunities offered by the fastest growing port city in the United States.



Fast FAQs

bit.ly/CW3PLvideo

Commercial Warehousing

Question: Who covers all the 3PL bases, from on-the-spot temp-controlled warehousing, and on-demand contract packaging to on-time global distribution, and state-of-the-art technology? Find the answer in this video.





Find the Secret to Your Success

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SEKO

At the end of the day, says SEKO, it's all about the customer. Find out how SEKO can help you succeed by turning your supply chain into a competitive differentiator.

Discover Hidden Savings in Your Transport Network

bit.ly/UltraSHIPvideo

UltraShipTMS

Check out this quick demo of the UltraShipTMS executive dashboard to see how easy it is to improve efficiencies in your inbound and outbound transportation.



Applying a customer centric philosophy.

All the Right Moves

bit.ly/OOCLvideo

OOCL Logistics

Tap into innovative logistics and supply chain solutions through OOCL Logistics' strategic global network. See how the 3PL applies decades of supply chain experience to design and implement customized solutions that maximize the value of your supply chain.

Retail Ready

bit.ly/PLGvideo

Port Logistics Group

When customers receive their online order, they want to open the box to an item that's folded and presented professionally. Check out how Port Logistics Group makes it happen, supporting retailers and ensuring happy customers.



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Terry Bradshaw Talks Outsourcing

bit.ly/MDLvideo

MD Logistics

Hosted by Terry Bradshaw, this look at 3PL services profiles MD Logistics, which specializes in customized supply chain solutions. See how the MD Logistics team works hard so you don't have to.





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.



C3 Solutions

TITLE: The Internet of Things and the Modern Supply Chain

DOWNLOAD: http://bit.ly/1QvdkUb

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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.

Rvder

TITLE: Mexico: The New Industrial 'Nearshore' Special Report

DOWNLOAD: http://bit.ly/1UfXzGI

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SUMMARY: For more than a generation, China was the destination of choice for offshore industrial manufacturing due to an abundant, low-cost labor pool, cheap oil, and low production costs. But that has changed. Rising wages and real estate costs in China, increases in oil prices, the delays inherent to transpacific shipping, and even shutdowns and logjams at U.S. seaports forced some manufacturers to look elsewhere. They turned to Mexico, a market that is the third-largest U.S. trade partner.



TITLE: Five Ways a TMS Solution Adds Value to Any Shipping Organization

DOWNLOAD: http://bit.ly/1UfYpTN

SUMMARY: The business case for supply chain logistics software is compelling to every stakeholder if properly communicated. Download this

to every stakeholder if properly communicated. Download this complimentary eBook, which provides five iron-clad arguments in favor of implementing a TMS platform with optimizer tools and private fleet management capabilities. Use these simple, yet effective arguments to build a winning business case for TMS in your organization.



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3PL Central

TITLE: The Five Ways Your 3PL Can Set Itself Apart From the Competition

DOWNLOAD: http://bit.ly/1UfXwKY

SUMMARY: Today's 3PL industry is one of the fastest-growing – and most

competitive – sectors of the global economy. To ensure your business is positioned to grab its share of this lucrative opportunity, download 3PL Central's latest free whitepaper, *The Five Ways Your 3PL Can Set Itself*

Apart From the Competition, today.

Fortigo

TITLE: Collaboration³

DOWNLOAD: http://bit.ly/1UfYPte

SUMMARY: Significant efficiencies can be realized across the supply chain when

all stakeholders (enterprise, vendors, carriers) can collaborate in real time through a standardized logistics execution platform. This type of interaction is also known as Collaborative Logistics. The cornerstone of Collaborative Logistics is timely visibility. Data about orders, inventory, transportation, and spend needs to funnel into a common denominator big data repository and be readily accessible. Download this whitepaper

to discover how you can realize the benefits of collaboration.

Evans Distribution Systems

TITLE: Should Your E-Commerce Website Offer Free Shipping?

DOWNLOAD: http://bit.ly/1UfXWB8

SUMMARY: As much as people enjoy the convenience of being able to shop

online, most don't want to wait long or spend much to get their goods delivered. Amazon and other big box retailers have created an environment where free, quick shipping is now the norm. Shipping is a factor for any online retailer, and approaching it in the wrong way may

end up costing you.

CLX Logistics

TITLE: Divestitures and the Threat to Supply Chain Performance

DOWNLOAD: http://bit.ly/1UfY7MD

SUMMARY: Today's volatile marketplace conditions make it nearly impossible

for a newly divested company to succeed without the expertise of a third-party logistics (3PL) provider. This whitepaper discusses increased regulations, unstable market conditions, and capacity concerns affecting today's shippers, and how the uptick in mergers and acquisitions is impacting 3PLs. It also covers key supply chain performance challenges caused by divestitures, the critical role of a 3PL in capturing full divestiture value, and a 3PL's guide to a successful

divestiture rollout.

Loftware

TITLE: Barcode Labeling is Changing. Are you Ready? Top 5 Trends.

DOWNLOAD: http://bit.ly/1UfXDWN

SUMMARY: As customer labeling demands increase, are you keeping pace? As label

regulations evolve, do you have a strategy? Deployment models are changing, is your labeling ready? This report outlines shifts in barcode

labeling that impact global supply chains.

NEW SERVICES & SOLUTIONS



//Services//

CargoSmart Limited, a shipment management software provider, now offers free solutions to help shippers provide carriers the verified gross mass (VGM) of their cargo to comply with the new SOLAS requirements. The integrated platform lets shippers make bookings, submit required documentation, receive status alerts, and review status updates on dashboards.

Digi International, a technology provider of M2M/IoT connectivity solutions, introduced a food temperature-monitoring service for companies in the perishable food industry. Comprised of handheld probes, wireless sensors, and software, the Digi Honeycomb service wirelessly monitors the temperature of perishable goods and alerts shippers if the proper temperature is not maintained, preventing spoilage and loss.

Lineage Logistics, a warehousing and logistics company, opened a 180,000-square-foot cold storage distribution center in Charleston County, S.C. The new facility offers immediate access to the Port of Charleston and I-26, with regular rail service through Norfolk Southern, providing shippers an efficient solution for exporting products and expediting domestic access to imported products.



Customs brokerage, trade compliance, and consulting company **Carmichael International Service**, a division of APL Logistics, expanded its services into Canada, covering all major entry points. With this move, Carmichael offers customs brokerage and trade compliance assistance to importers throughout the United States and Canada.

Regal Logistics opened a new 350,000-square-foot distribution center in Charleston, S.C. Located near Port of Charleston terminals, Regal's newest warehouse has 85 shipping doors and is designed for high-volume, retail-compliant, quick-turnaround shipping with 30-foot clear height and 50-inch by 52-inch column spacing.



DHL Global Forwarding, the air and ocean freight specialist within Deutsche Post DHL Group, launched a green service that allows shippers to opt for carbon-efficient ocean freight. The Green Danmar service—offered through Danmar Lines, DHL's NVOCC—enables customers to select a carrier for full container shipping, which is more carbon efficient than the industry average.



Logistics provider **C.H. Robinson** opened a new warehouse in Atlanta, increasing its usable warehouse space by more than 40 percent. The new facility serves as a retail consolidation center supporting C.H. Robinson's freight consolidation program, which helps shippers improve service and optimize their freight through predictable processes and full shipment visibility and reporting.

//Products//

Industrial safety specialist **Castell** launched an updated version of its Salvo loading dock safety system, designed for companies that lease warehouses. The latest Salvo SMLEI system has a small footprint and provides a high level of dock safety. The equipment mounts to either the door or post on the inside of the dock, and comes with auxiliary contacts to connect with traffic lights or existing power dock levelers.

CYBRA, a developer of barcode labels, RFID tags, and RFID software, released the latest product in its Lock & EnCode

line of RFID seals. The new electronic tamper-sensing seals secure shipping containers, bulk carriers, and trailers to protect high-value assets such as IT and laboratory equipment.

Lifdek, a developer of corrugated pallets and skids, introduced corrugated paper skids that weigh less than 7 lbs. yet support more than 8,000 lbs. Site assembled by shippers without the use of glue or staples, they are available in various sizes: standard, custom, airfreight, and fractional pallet for retail displays.



INBRIEF

//Technology//

UPS launched Follow My Delivery, an enhancement to the UPS My Choice service that increases flexibility, convenience, and visibility on the day of delivery. More than 22 million UPS My Choice members in the United States utilizing their mobile devices or computers can now monitor the progress of their urgent UPS Air and UPS Worldwide Express packages on a live map.

Technology company Pitney Bowes expanded its Global Trade Solutions to facilitate cross-border trade. The web-based technology of the Global Trade Solutions portal now manages Guaranteed Delivered Duty Paid shipments, calculates import duty and taxes, and looks up full-digit Harmonized System commodity codes and restrictions.

Kewill, a supply chain execution software provider, teamed with **INTTRA**, an ocean shipping electronic marketplace, to deliver freight forwarding software that helps shippers and forwarders comply with the new SOLAS container weight verification requirement. By combining Kewill



Unit load and packaging systems maker Millwood debuted its Liberty Technologies branded Series 800 stretch wrap system, which wraps more than 100 loads per hour. It comes equipped with Force Anticipation Stretch Technology, a film feed system that precisely delivers stretch film based on load dimensions.

Global Forwarding and INTTRA's eVGM Solution, the program lets shippers and forwarders validate the verified gross mass of their containers and transmit that data electronically to their carriers.

to provide a clear picture of the

supply chain.

MercuryGate International, a global provider of cloud-based transportation management solutions, has made available MercuryProcure, a freight sourcing and procurement program that lets shippers manage RFPs for all transportation modes with a single system. Available for a monthly subscription, *MercuryProcure* integrates with other MercuryGate products.

eBay Enterprise and Innotrac joined forces to become Radial, which offers retailers a platform to minimize omnichannel risk and complexity, making customer experiences seamless. Radial's technology and operations integrate with any mobile app, web store, or purchase point to boost supply chain flexibility.



//Transportation//

CaroTrans, a global NVOCC and ocean freight consolidator, started a weekly LCL service between Busan and Atlanta. The direct, all-water service eliminates the extra handling associated with cargo routing via Los Angeles and New York. Transit time is 27 days.

The **2M Alliance**, comprised of Maersk Line and Mediterranean Shipping Co., launched the Lone Star Express service between Asia and the U.S. Gulf and East Coasts, which includes a weekly rotation at PortMiami. The Lone Star Express uses container vessels with a capacity of approximately 4,500 to 5,000 TEUs.

The string includes the ports of Qingdao, Ningbo, Shanghai, Xiamen, Yantian, Busan, Cristobal, Houston, Mobile, Miami, Balboa, and Busan.

Roadrunner Transportation Systems

expanded its LTL service to include expedited freight service to Los Angeles, Atlanta, and Dallas metro from Chicago. The added offering cuts transit times by one to two days over standard delivery.

Averitt Express added import solutions from China with two weekly ocean freight services to Memphis and Charleston.

The new LCL departures from the Port

of Yantian in the Guangdong Province expand the company's Asia-Memphis Express, which utilizes a combination of ocean and rail service to cut processing times by as many as 10 days.

The cargo division of **Cathay Pacific Airways** and **Lufthansa Cargo** entered into a cooperation to strengthen the trade lane between Hong Kong, the world's busiest air cargo hub, and Europe. Benefits for shippers include increased shipment options, faster transit times, and additional service enhancements, such as one point for export drop off and import delivery.



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PARCEL Media; Customized Logistics and Delivery Association

PARCEL Forum '16

www.parcelforum.com/conference | Dallas, Texas | Sept 12-14

AUDIENCE: Distribution, logistics, supply chain, and warehouse managers; small-package supply chain stakeholders **Focus:** Advancements in technology (SaaS, voice recognition), operations/facilities (site location, automation, materials handling, DC optimization), packaging (void fill, on-demand), and distribution/transportation (omni-channel, same-day)

CONFERENCES

AUG 31-SEPT 1, 2016 San Diego, Calif. Terrapinn

Home Delivery World West 2016

bit.ly/2016homedelivery

AUDIENCE: Retailers, etailers, and grocers **FOCUS:** Challenges and trends in delivery operations; omni-channel returns process optimization; crowdsourcing trends; customer experience improvements; next-gen technologies to enhance final mile delivery

SEPT 1–2, 2016 Miami, Fla. ClaroTime

Ports & Commodities Americas 2016

bit.ly/ports_commodities

AUDIENCE: Latin American and U.S. port operators, railway operators, and commodity traders

Focus: Terminal operations, technology, and logistics management; importers/ exporters' opportunities and challenges

SEPT 18–20, 2016 Houston, Texas Intermodal Association of North America

Intermodal Expo 2016

www.intermodalexpo.com

AUDIENCE: Supply chain and transportation professionals, intermodal shippers and stakeholders Focus: Technologies impacting intermodal; how to strengthen shipper/drayage partnerships; recent trucking regulations and funding—and their implications on intermodal; intermodal solutions exhibition

SEPT 20–22, 2016 Detroit, Mich. Automotive Logistics

Global Conference

bit.ly/ALglobalconference

AUDIENCE: Professionals in the automotive logistics sector including car manufacturers, tier suppliers, logistics providers, infrastructure operators, and technology solutions suppliers **FOCUS:** Automotive logistics strategy; taking a holistic approach to global automotive supply chains; building supply chain flexibility to meet changing consumer demands and vehicle preferences

SEPT 20–22, 2016 Princeton, N.J. Worldwide Business Research

LogiPharma 2016

www.logipharmaus.wbresearch.com

AUDIENCE: Pharmaceutical supply chain stakeholders

Focus: Customer-centric supply chain management; innovating the cold chain; managing network complexity; creating a healthcare value chain map; the future of life sciences logistics; utilizing serialization and traceability data

SEPT 25-27, 2016 Washington, D.C.

American Production and Inventory Control Society

APICS 2016

www.apics.org/annual-conference

AUDIENCE: Supply chain and logistics professionals

Focus: Best practices to create more sustainable, resilient, strategic, and value-driven supply chains; strategies for remaining agile amid instability and unpredictability

SEPT 25-28, 2016 Kissimmee, Fla.

Council of Supply Chain Management Professionals (CSCMP)

CSCMP's 2016 Annual Conference

www.cscmp.org/annual-conference

AUDIENCE: Supply chain, logistics, and transportation professionals **FOCUS:** Latest supply chain management insight, research, and industry developments; supply chain best practices; strategies for transforming supply chains

SEPT 26-30, 2016 Boston, Mass.

IQPC (International Quality & Productivity Center) and Cold Chain IQ

14th Cold Chain GDP & Temperature Management Logistics Global Forum

www.coldchainglobalforum.com

AUDIENCE: Stakeholders in temperaturecontrolled life science supply chains **Focus:** Exceeding supply chain expectations; cold chain trends; optimizing global supply chain networks; cost reduction, and risk and data management; supply chain security

OCT 11–12, 2016 Long Beach, Calif. Informa Exhibitions

Cargo Logistics America

www.cargologisticsamerica.com

AUDIENCE: Supply chain stakeholders such as beneficial cargo owners, logistics providers, multimodal transportation providers, and port authorities **FOCUS:** Products, services, technologies, and equipment designed to optimize the entire supply chain; multimodal case studies showcasing best practices

SEMINARS & WORKSHOPS

JUL 21–22, 2016 Cambridge, Mass. MIT Sloan Executive Education

Supply Chain Strategy and Management

executive.mit.edu

AUDIENCE: Logistics and supply chain professionals

Focus: Trends in supply chain strategy; guidelines for making strategic sourcing and make-buy decisions; integrating e-business thinking into supply chain strategy and management



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LOGISTICS GOES TO THE DOGS

Inbound Logistics sniffs out the supply chain impact of man's best friend.





\$60.28 billion total spending by U.S. pet owners

total spending by U.S. pet owners on their animal friends in 2015

Source: American Pet Products Association (APPA)

More than **1,500**

canine Teams comprise the CBP Canine Program, the largest and most diverse law enforcement canine program in the United States

Source: U.S. Customs and Border Protection

\$330

estimated annual expense per household on food and treats for pet dogs in the United States

> Source: 2015-2016 APPA National Pet Owners Survey



70%

vessel import market share of China, the largest supplier of dog and cat food to the United States

Source: Pet Food Industry

million
dogs living in U.S.
households in 2015

Source: APPA

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7.8

average number of times pet owners purchased dog food online within the past 12 months

Source: APPA

6,549

on-duty mail carriers were bitten by dogs in 2015, up from approx. 5,800 in 2014

Source: U.S. Postal Service







3G: Making TMS a Differentiator!

"I've been involved in implementing and managing TMS systems for 30 years. In that time, I have not seen a system that was built on as rich of an architecture as 3G-TM to allow easy integration to other platforms, allowing our business to business communication to become much more efficient and lowers our transactional cost".

Bill Grannis, Director of Information Technology at ODW Logistics







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