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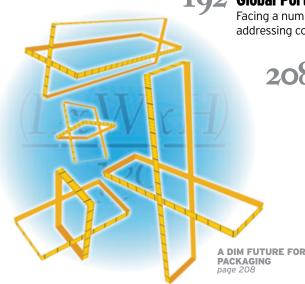
Big data is a big deal, but what is it? *Inbound Logistics* asks four industry experts to file their report on big data and its benefits.

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 $275\,$ Winter Reading Guide 2015

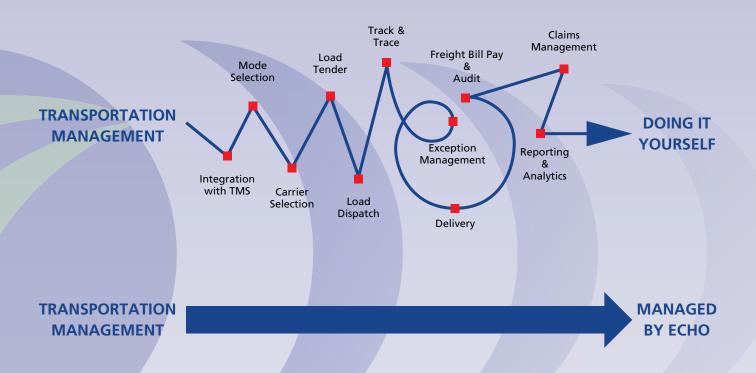
Inclement weather and capacity problems giving your supply chain the winter woes? Chill out! Here are some good reads to keep you up to date on supply chain, logistics, and transportation best practices.

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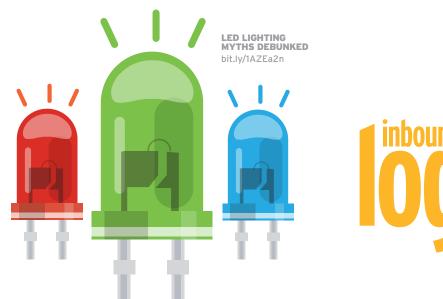
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Roy Burton, President and CEO, Dialight Corporation

In an effort to run greener, many companies have considered making the switch to LED lighting in their industrial and hazardous facilities. This article sheds light on the five most common misconceptions about LED lighting to help you decide if LED is on or off for your facility.



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Sonal Sinha, Associate Vice President, MetricStream

Logistics managers can help protect their company's reputation, and keep customers satisfied, by effectively mitigating and managing vendor risk, not only during the holiday season, but all year long. These tips will keep your brand intact, and have customers coming back for more.



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Thomas Heitman, Manager, Solutions Consulting, Peak-Ryzex Inc.

When selecting a bar-coding system, it is important to take the time to conduct all the necessary research, and form an implementation plan that works for your specific requirements. Scan this article for the steps to follow before you invest in any bar-coding solution.

3PL RESOURCES

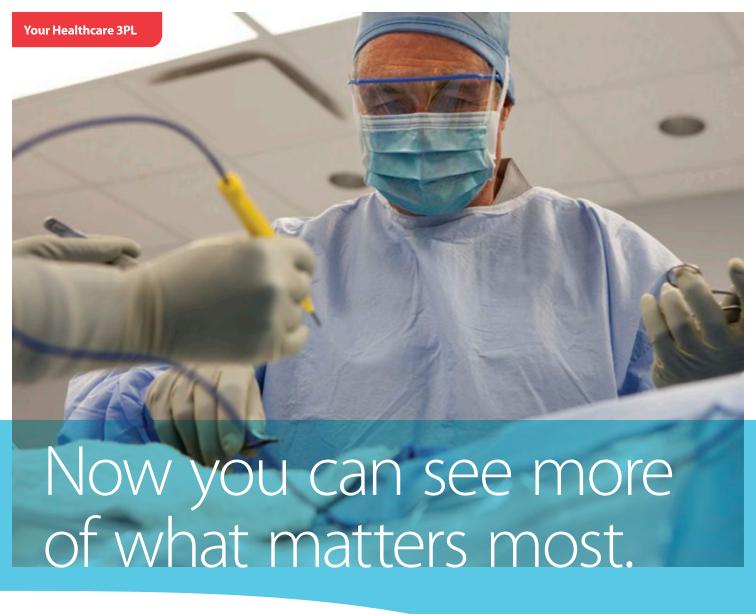
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CHECKINGIN

by Keith Biondo | **Publisher**



Talent Gap: How Did We Get Here?

ow did we get here? By "here" I mean the supply chain talent gap that many companies are struggling to fill. On the next page, the editor lauds the 30 Under 30 Rising Supply Chain Stars who represent the bright future of our practice. But, as you'll see in the article and chart on page 231, 83 percent of these Rising Stars *did not* select supply chain management (SCM) as a career. Why not? Certain events created a demand, and a concurrent lack of supply of needed logistics professionals. Let's take a look back and see.

The 30 young professionals profiled in this issue were not even born when *Inbound Logistics* began in 1981. Then-President Carter pronounced a malaise had taken hold of our economy: stagflation—negative economic "growth" coupled with runaway inflation (mortgage rates topped out at 18.5 percent).

The U.S. manufacturing sector was hard hit by this malaise. Back then, U.S. business was organized in a strictly hierarchical way, structured and managed from the top down and arranged in functional silos. Each function – purchasing, transportation, operations, and finance – was mostly limited to optimizing and managing its own internal processes. Traffic secured the best transport rates, and purchasing negotiated the best unit cost, usually without advance coordination or input from sales, customer service, or warehousing. Cross-functional cooperation was a rarity, and strategic cooperation across functions did not exist for many enterprises. Business professionals managed transportation, not logistics. The link between demand signals and supply, if it existed, was tenuous. The term supply chain management did not exist either.

Don't get me wrong. This structure grew organically from the dawn of our industrial age, and most companies were run well

and produced astounding economic gains and job growth.

But U.S. business began to be challenged by a new kind of offshore competitor – emerging markets that, in most cases, paid labor rates one-tenth of what U.S. workers were paid. The emergence of these economies created a looming competitive blind spot. Businesses were driven to look for hidden efficiencies to survive; cutting logistics costs was an obvious place to start.

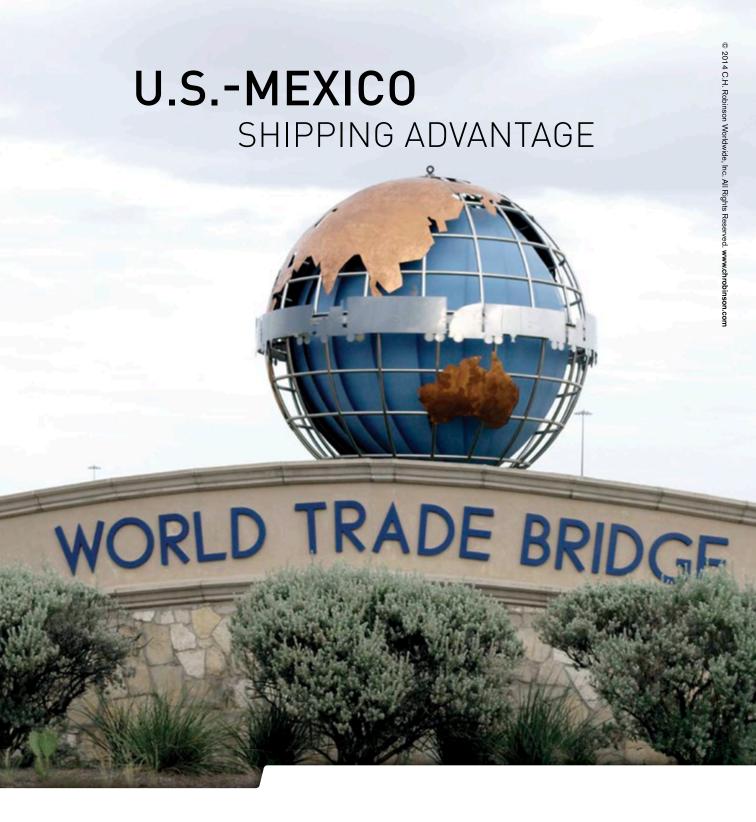
But cutting logistics costs alone could not do the job. To be a true global competitor, inventory must flow fast, and with reduced touches. That can only be done with strategic change. When purchasing, transport, and logistics functions work in tandem instead of in silos, enterprise operations are optimized. Demand-driven logistics rapidly evolved into supply chain management, which created a demand for a new type of professional: supply chain manager. *Demand, more*.

This was also the beginning of a trend where high schools, colleges, and universities de-emphasized the importance of gray collar or practical discipline careers, encouraging less-technical career paths. This career guidance policy would choke the supply of skilled transportation professionals precisely when demand spiked sharply up. That misalignment helped create the talent gap in SCM and other technical professions. Thankfully, that trend has been reversed, with high schools, associate colleges, and universities all now encouraging a career path in supply chain management. *Supply, more*.

That brings us to today. To sustain our success, we need a new crop of young supply chain management stars to continue driving excellence in the practice. Yes, we've come a long way, but there is still more to do.

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CHECKINGIN







am always pleased when the annual Logistics Planner issue publishes, but this year I'm doubly excited. This issue marks a new milestone as we introduce and celebrate the 30 best and brightest supply chain practitioners under the age of 30—a group of individuals who are familiar with producing extraordinary results in a short period of time.

As the publisher says on the previous page, global demand for supply chain professionals does not match supply. We have documented to an nth degree the talent gap that is one of the most important challenges we face today. Even as technology and innovation guide new 21st-century pathways, industry is ultimately dependent on people. Companies need to continuously invest in and develop human capital to gain competitive advantage.

This talent gap directly correlates with a generational transition. Today's college graduates enter the workforce with a wealth of digital intuition and business process "tuition." Where predecessors earned credit through sweat equity and on-the-job experience, millennials are earning theirs through established supply chain degree programs. They bring an integrated, flexible skillset to the market. That's a good thing, and their companies, colleagues, and customers recognize that.

It's also why the 30 Under 30 program resonates. It salutes supply chain practitioners who not only serve as role models to their peers—both young and old—but also help raise the profile of *your* profession. We know how important supply chain is to sustaining U.S. competitive advantage. It's time to spread the word.

That's where we come in. To produce the 30 Under 30 Rising Supply Chain Stars recognition program, *Inbound Logistics* joined forces with sister company ThomasNet and the Institute for Supply Management (ISM). Beginning in 2014, ThomasNet and ISM began soliciting nominations for 30 Under 30. From more than 200 entries, the selection committee pared down the list of finalists by prioritizing notable accomplishments as well as demonstrable excellence in initiative, collaboration, innovation, leadership, and driving real savings.

The 30 honorees represent a cross-section of industries from energy and CPG to government, including companies such as CBS Corporation, Caterpillar, DuPont, Halliburton, Johnson & Johnson, and ConAgra.

I'm proud to introduce you to the next generation of supply chain stars; read their stories beginning on page 227. I promise you'll be dazzled. ■

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THE MAGAZINE FOR DEMAND-DRIVEN LOGISTICS

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8 JAN 2015

10 Quick Tips for Reducing Freight Costs bit.ly/16NIwi5

Group Transportation Services

As always, great insights from *Inbound Logistics*.

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Understanding Capacity
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12 DEC 2014

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Choosing a Route Planning System

ime is money, and a route planning system can drastically reduce the time it takes to plan your transportation schedule. Not only do route planning systems lower mileage, they also help cut fuel usage, decrease carbon emissions, improve asset utilization, and increase customer service. William Salter, CEO and president of Paragon Software Systems, recommends choosing a route planning software system that offers the following capabilities.

Schedules and routes trucks daily. If order quantities vary daily or weekly, choose a system that automatically calculates efficient truck routes and multistop schedules every day. This will reduce overall miles, fleet costs, and daily planning efforts.

Enhances fixed routes and schedules. To manage a transportation operation with regular order dates and quantities, select a system that calculates optimized routes and schedules while meeting required customer delivery windows, truck capacities, driver hours, and other transportation restrictions.

Optimizes deliveries continually.
As new orders are added, a system that continually re-optimizes schedules

will maximize efficiency by taking into account delivery areas, available resources, and existing deliveries already confirmed.

Supports clients. Advanced support services are key to the success of any route planning project. An allocated support consultant, who helps ensure successful software implementation and quick delivery of benefits, can be instrumental in the route optimization project. An off-hours hotline service can also help.

Links with live vehicle tracking. Live vehicle tracking allows managers to detect anomalies in route times and distances so they can act immediately to control costs. Comparing planned to actual routes ensures drivers are following the plan. If any deviation occurs, customers can be alerted to delays.

Considers "what-if" scenarios.
Using historic data to prepare for vehicle size changes, shifting driver hours, and alternative delivery locations for distribution networks will improve transport efficiency.

Uses multi-period planning. Multiperiod planning decides the best delivery patterns for each customer, ensuring multiple deliveries to the same customer are sufficiently spread out across the planning period, while also combining deliveries geographically and balancing workload across the period. Allocating delivery profiles in this way ensures you meet customer delivery requirements, while also minimizing transportation costs.

Creates software development plans. Clear software development plans for the future are important. A strong supplier should be evolving its product regularly, taking advantage of new technologies and creating solutions that meet the needs of today's transportation operators.

Combines central scheduling. Combining central scheduling of all fleet movements gives transportation planners the ability to plan nationally or regionally. Inter-depot trucking movements, supplier collections, and packaging disposal can be incorporated to drastically reduce costs and create significant efficiencies.

Pays attention to reporting. Key performance indicators and business intelligence reporting allows companies to detect operational trends, predict cost implications, and identify possible preventive measures.

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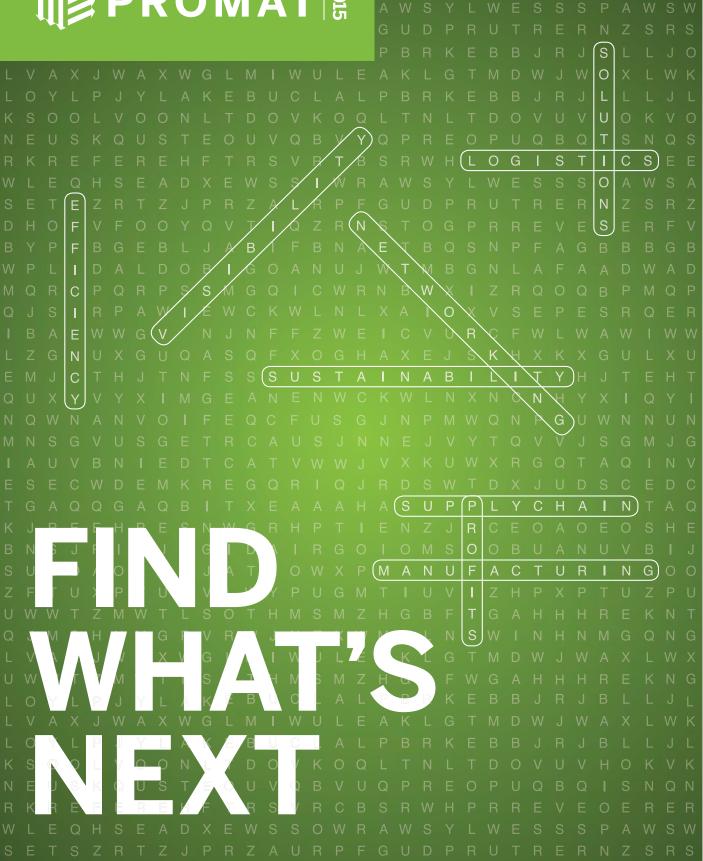


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Monday, March 23 8:45 AM - 9:45 AM Director of the Android and Chrome Global Business, will reveal ways to ensure your speed of manufacturing keeps up with the speed of innovation.



JOHN MACKEY -

Tuesday, March 24 8:45 AM - 9:45

Co-Founder & CEO. Whole Foods Market. will discuss conscious capitalism and building successful businesses that benefit all stakeholders.



GEORGE PREST & -SCOTT SOPHER

Wednesday, March 25 8:45 AM - 9:45 AM

George Prest, CEO of MHI, and Scott Sopher, Principal Consultant at Deloitte, will present the MHI Annual Industry Report, putting the latest trends and insights in your hands.





STEVE WOZNIAK -

Wednesday, March 25 1:00 PM - 2:00 PM

Co-Founder of Apple, will share his key insights on the state of technology and risk in the US and offer up some bold predictions.



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PROFILE



Eelco de Graaf is vice president, supply chain operations at Lewis-Goetz and Company's corporate headquarters in Pittsburgh. He has held this position since August 2014.

RESPONSIBILITIES

Purchasing, shipping, manufacturing, and operational excellence.

EXPERIENCE

Management trainee, Fortis Financial Group; distribution channel manager, Fortis Investments; key account manager, Fortis ASR; assistant to chairman, executive board of directors, SHV Holdings; buyer/product manager-purchasing department, store manager, Makro Malaysia; store manager, regional sales, and operations manager, Makro Indonesia; regional sales and operations director, Makro Brazil; sales and operations director, chief operating officer, Makro Colombia

EDUCATION

Masters, law, University of Utrecht, 1998; Post Masters, sales management, Erasmus University Rotterdam, 2001.

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Eelco de Graaf: Four-Continent Career

HAVE WORKED FOR THE SAME PARENT CORPORATION, SHV Holdings Company based in the Netherlands, since 2004. After serving one year in the head office, I joined one of its divisions, Makro—a chain of warehouse clubs with branches on several continents. That job took me to Malaysia, Indonesia, Brazil, and Colombia.

In 2014, I joined the North American company Lewis-Goetz, owned by Netherlands-based ERIKS, which is part of SHV. Lewis-Goetz distributes hoses, conveyor belts, sealing products, and valve products used by industrial customers.

You'd think this would be a big change from my work in retail. But the two supply chains are not all that different. Selling a hose or conveyor belt is not like selling shampoo or rice, but the distribution flow from vendor to the point of sale is similar. So is the way we do business with suppliers, whether we're talking to Unilever in Indonesia or to Goodyear in the United States.

As head of supply chain operations, I oversee our purchasing and shipping groups. My team works with the marketing department to make sure we're providing the products our customers want.

I'm also responsible for implementing a uniform set of best practices at our 90 branches across North America. At Lewis-Goetz, a branch is the facility that houses local warehouse and sales operations. Branches range in size from 5,000 to around 75,000 square feet. Each

The Big Questions

With whom would you like to change places with for a day?

Sidney Crosby of the Pittsburgh Penguins. Hockey is the coolest sport in the United States. I've gone to some games in Pittsburgh, and it's nice to experience the atmosphere in the stadium.

What book have you read lately that you would recommend to others?

Islands of Profit in a Sea of Red Ink by Jonathan Byrnes. The book offers a structured process for analyzing and increasing profitability. It's a comprehensive guide to growing a business and improving all parts of an organization.

What advice would you offer to people pursuing a career in supply chain?

If you really want to understand a business, work on both sides — in the purchasing group and in the field, in operations or sales. facility uses a private fleet to deliver product to customers.

Because Lewis-Goetz has grown largely through acquisitions, different branches or clusters of branches have been operating independently. One current project is to combine the buying power of all those locations to improve pricing and product consistency. We're also implementing a single bar-code system for all locations.

In 2015, we'll start redesigning our distribution network. We plan to concentrate stock in larger, regional warehouses,

complemented by smaller satellite facilities. Because each regional facility will serve a bigger area with more inventory, it will be easier to guarantee stock for customers. In addition, we'll open new warehouses to be closer to customers.

One of the biggest challenges Lewis-Goetz faces is finding reliable suppliers. We source product from Asia, but we can't always find suppliers there that offer consistent quality and deliver on time. We would like to work with more American suppliers, but it's hard to find strong domestic sources

for all the products we need to buy.

Among other achievements, I'm glad that my career has given me a chance to implement sustainability practices that make solid business sense. There are many ways to improve supply chain sustainability—using lighter packaging to cut truck fuel usage, combining deliveries to reduce trips, and installing new systems to conserve water and electricity. We accomplished those processes at Makro in South America, and we're starting to implement them at Lewis-Goetz as well.



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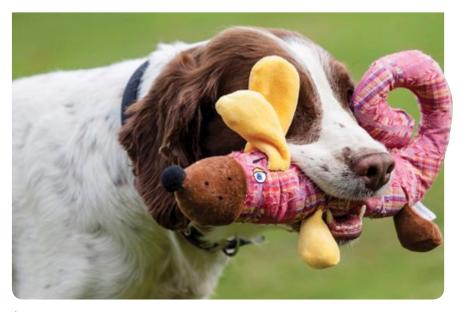


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NOTED

THE SUPPLY CHAIN IN BRIEF

SEALED DEALS



▲ Rosewood Pets, a United Kingdom-based supplier of pet accessories, chose third party logistics (3PL) provider **Kerry Logistics** to help manage imports from China. Kerry's virtual buying office provides Rosewood with purchase order management, vendor performance management, production status tracking, and quality control.

Supply chain management provider **CEVA Logistics** signed a contract to operate a
national distribution center in the United
Kingdom for **Finning**, a Caterpillar
dealership. The contracted facility
replaces five separate Finning in-house
locations.

Handcrafted furniture maker **Simply Amish Furniture** selected **SYSPRO's**enterprise resource planning software
to enhance operational efficiencies. The
solution provides Simply Amish with a
consolidated single data source, improves
processes, eliminates data redundancy,
streamlines order processing, and
enables easy access to key operational
information.

I.D. Systems, a wireless asset management systems company, provided its PowerFleet vehicle management system to 700 additional vehicles across more than 20 facilities in **Nestle's** North American operations. Now, more than 2,000 vehicles serving about 60 Nestle's sites are equipped with the system.

Shred-it, an information security and document destruction services company, expanded its use of **Descartes'** Route Planner to improve fleet productivity across more than 2,000 vehicles. The software allows Shred-it to centrally manage operations and have a single view of enterprise activity.

FedEx Corp. signed an agreement to buy GENCO, a third-party logistics provider. GENCO's portfolio of supply chain services expands FedEx's existing retail and e-commerce offerings, particularly in the area of reverse logistics.

Third-party logistics provider **ABF Logistics** acquired Oklahoma-based truckload brokerage firm **Smart Lines Transportation Group**. The purchase supports ABF's expansion into the Oklahoma City market.

UP THE CHAIN



✓ Kevin Mitchell
 was appointed
 vice president of
 global supply
 chain for
 Northrop
 Grumman
 Corporation's

aerospace systems sector. Mitchell is responsible for developing and maintaining a strong supply base for the company's aerospace systems products.

Agility, a global logistics provider, appointed Soren Poulsen as CEO for the Greater China Area. In this role, Poulsen leads Agility's Global Integrated Logistics business in China, Hong Kong, and Taiwan.

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▲ Jewelry manufacturer PANDORA implemented TXT Retail's TXT Retail Planning solution. The software helps PANDORA improve planning accuracy while integrating the merchandising process from strategy to end customer.

Logistics management firm TRIOSE began providing freight services to Novation, a healthcare services company. The new agreement includes freight management, large cargo handling, and courier management solutions for the more than 100,000

hospitals and healthcare systems that Novation serves.

Elevation solutions manufacturer Will-Burt Company contracted transportation management company Jarrett Logistics Services (JLS) to manage all domestic and international shipping. JLS dedicated a team to provide transportation solutions for all Will-Burt facilities.

Hybrid farmer Owyhee Produce selected Locus Traxx Worldwide's SmartTraxx system to provide customers with real-time load temperature and location. The solution helps Owyhee ensure that perishable shipments reach their destinations in optimal condition.

French children's clothing designer and retailer **iD Group** implemented Centric Software's product lifecycle management solution to enhance visibility, and increase efficiency throughout the product development

Business solutions provider Epicor **Software** bought ShopVisible, a provider of cloud retail order management and digital commerce solutions. Integrating ShopVisible's omni-channel software expands Epicor's retail solutions offering.

UPS signed an agreement with Polish investment fund ORTIE to purchase its logistics company, **Poltraf**. The purchase adds three facilities, full quality assurance services, and an experienced workforce to UPS's existing European healthcare network.

Freight forwarder Manitoulin Global Forwarding purchased logistics provider **Canfleet** Logistics, improving Manitoulin's access to high-growth Asian markets.

Warehousing and logistics company Lineage Logistics acquired thirdparty logistics firm Columbia **Colstor**. The purchase doubles Lineage Logistics' presence in the Pacific Northwest to 11 locations.

Wallenius Wilhelmsen Logistics (WWL) bought integrated logistics provider Carlogistics. The expansion adds two facilities and nearly 100 employees to WWL's auto logistics network in Mexico.

recogni

Honeywell Scanning & Mobility named mobile workforce solutions provider Peak-Ryzex a Partner of the Year. Peak-Ryzex was measured on innovation, year-over-year business growth, and the ability to integrate new technologies into solutions.

American Trucking Associations' Safety Management Council awarded Crete Carrier Corporation and Shaffer Trucking a 2014 Safety Award in the General Commodities Truckload/Line-Haul Division, Over 250 Million Miles category. Carriers are judged on safety records relative to others in their class.

The Automation Group of manufacturing ERP software developer IQMS received a 2014 Technology Department of the Year award from the Best in Biz Awards. IQMS was selected from more than 550 nominations for the honor.

▼ Transportation and logistics provider **USA Truck** received a **Patriot Award** from the Arkansas Employer Support of the Guard and Reserve for its commitment to recruiting and hiring military veterans, and for its continued support of employees who serve in the National Guard and Reserve.



BP Lubricants USA recognized Dupré **Logistics** for meeting its driving standards. The BP Driving Safety Awards recognize logistics providers who commit to the company's driving safety policy.



Meet customer demands across the globe According to the 4th annual UPS Change in the (Supply) Chain survey, less than half of high-tech companies feel knowledgeable when it comes to expanding into international markets.

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GREEN SEEDS



▲ Express delivery company TNT began offering CO₂-neutral delivery of all express domestic consignments in Germany at no additional charge. The company implemented the initiative to help shippers mitigate their environmental impact.

Crown Materials
Handling Corporation reached
zero-landfill status at its
Lexington, Ky., facility. Employees
sort aluminum, batteries, nonrecyclable waste, paper, cardboard,
plastics, and wood to keep it out of
landfills.

Supply chain solutions provider **Panalpina** improved its Carbon

Disclosure Project score, receiving a rating of 85/100 for its efforts to reduce overall greenhouse gas emissions. Panalpina has improved its score year-over-year since it began reporting to the Carbon Disclosure Project in 2009.

of America recognized 89
Crowley Maritime Corporation vessels with Certificates of
Environmental Achievement.
Crowley received the award for each vessel that worked at least two consecutive years without an environmental incident. The

vessels have logged a combined

total of 968 years of service

without an incident.

The Chamber of Shipping

UP THE CHAIN

Ruan Transportation promoted Ben McLean to chief executive officer. McLean was previously president and chief operating officer for Ruan, and has been groomed for his new position by former CEO Steve Chapman for the past two years. Contract manufacturer MC
Assembly named Alex Sanchez its vice president, supply chain. In his new role, Sanchez is responsible for integrating inventory management and replenishment, imports, strategic sourcing, transportation, and logistics for the company.

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recognition

Logistics provider M33 Integrated Solutions named YRC Worldwide subsidiary **Holland** its **LTL Carrier of the Year**. Holland was evaluated on client volume growth, on-time service, and low claims frequency.

Hamburg Süd won the Electrolux Supplier Award 2014. Hamburg Süd was selected after appliance manufacturer Electrolux rated its suppliers on quality of service, on-time delivery, performance, cost competitiveness, and sustainability practices.

The Massport Maritime Security division of Massachusetts Port Authority received a Rear Admiral Richard E.

Bennis Award from the United States Coast Guard. The award recognizes organizations that demonstrate outstanding achievements and contributions related to maritime security.

▼ The Consumer Electronics Association named Rand McNally a CES Innovation Award honoree for 2015 for its IntelliRoute TND 730 truck GPS, and its electronic HD 100 electronic logging device. The product pair helps carriers comply with pending mandates that will require truckers to log hours of service electronically.





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GOOD WORKS



▲ Through an affiliation with East Carolina University (ECU) athletics, NACCO Materials Handling Group donated \$55,000 to the United Way of Pitt County based on the number of ECU touchdowns scored during the 2014 football season.

3PL **Choptank Transport** awarded its 2014-15 Choptank Transport Scholarship to **Carley Scott**, a student at University of Maryland's Smith School of Business. The annual scholarship is available to students pursuing any business major.

Through its annual Greater Giving Campaign, **Ryder** raised and donated \$700,000 for **The United Way**. Money raised through the annual campaign funds programs and initiatives that prepare youth for success in school and life, help people achieve financial stability, and offer medical resources to the underprivileged.

Freight brokerage firm Total Quality Logistics donated \$1,000 each to the United Service Organization and the Conductive Education Center of Orlando through its Moves that Matter program. Moves That Matter benefits non-profit organizations that use truckload transportation to move items that will help those suffering or in need.

International mover **Arpin Group** donated an 18,000-square-foot warehouse, valued at \$260,000, to the Hardin County Habitat for Humanity organization in Radcliff, Ky. The space now houses inventory for Habitat for Humanity's retail store, which the charity uses to raise funds to build homes for needy families.

recognition

3PL **Transportation Insight** was named to the *Charlotte Business Journal's* **Fast 50**, which recognizes private companies in the Charlotte, N.C., metropolitan region with the fastest revenue growth.

David Congdon, president and CEO of Old Dominion Freight Line, to its **2015 All-America Executive Team**. Congdon is listed as one of the top three executives in the transportation and logistics sector.

Port Everglades won a **2014 Project of the Year** award from Infrastructure Inc., for its 20-Year Master/Vision Plan, which includes \$1.6 billion in infrastructure improvements, creating 7,000 regional jobs, and 135,000 statewide jobs by 2033.

AAA Cooper Transportation was named 2014 Platinum Partner of the Year by third-party logistics company Unishippers. Carriers were evaluated on service quality, loss and damage events, claims resolution, and customer service.



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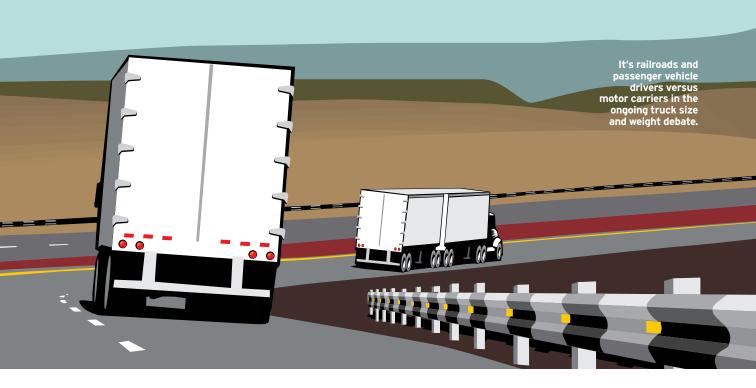
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Truck Sizes and Weight: The Long and the Short of It

ruck size and weight has long been a sensitive and divisive issue, pitting railroads and the motoring public against a trucking industry already beset by the full heft of regulatory burden.

by Joseph O'Reilly

Proponents favor increasing the scale and scope of what trucks and trailers can pull on interstate highways as a means to increase economy, reduce carbon emissions, and mitigate capacity shortages. Those who disapprove cite safety concerns and the rising costs of maintaining and upgrading already crumbling infrastructure.

The U.S. Department of Transportation's

Federal Highway Administration (FHWA) is currently bogged down with an impact study mandated by President Obama's MAP-21, Moving Ahead for Progress in the 21st Century Act. The research will evaluate and compare the differences between trucks loaded at or below current federal truck size and weight limits to those operating in excess of those limits. A report was due to Congress in 2014.

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That deadline has now been pushed back, making it unlikely any information will be available in time for the next round of surface transportation funding discussions later in 2015.

The railroad industry concensus is that the study will have little impact deciding the truck size and weight issue one way or the other. At the November 2014 RailTrends conference in New York City, Chuck Baker, president of the National Railroad Construction and Maintenance Association, and partner in the Chambers, Conlon & Hartwell government relations firm, noted that the 2012 congressional debate about truck size and weight ended in a convincing 33-22 vote. Legislators decided to kick the tire down the road, and study the issue some more. That's what the FHWA is currently doing.

What will be the outcome of the FHWA's research? "I feel safe in predicting that it will not be definitive," says Baker. He believes both sides will find talking points to walk away with. The impasse is likely to continue.

But federal inertia isn't stopping states from looking at the issue. Speaking at RailTrends, Joni Casey, president and CEO of the Intermodal Association of North America, suggested that eastern states would likely follow Ohio's direction in terms of debating truck size and weight. In 2013, Ohio tinkered with increasing its gross vehicle weight (GVW) limit from 80,000 pounds—the national standard—to 90,000 pounds. After gaining some initial traction, the effort was eventually tabled.

But truck size and weight is still a hot topic, especially in states where agriculture, forest products, and mining industries are major economic drivers. The city of Duluth, Minn., for example, is raising alarm over government efforts to increase GVW allowances. A recent article in the Duluth Tribune outlines the argument:

"The four states that border Minnesota all have higher limits than the 80,000 pounds generally allowed on Minnesota highways," writes reporter Peter Passi. "In contrast, Wisconsin allows trucks to top out at 90,000 pounds. The limit in Iowa is 96,000 pounds. Meanwhile, North Dakota allows 105,500 pounds, and its neighbor to the south permits truck weights of up to 129,000 pounds."

That's competitive pressure. Shippers ferrying product such as timber and aggregates in those states have to apply

Inside SETA

The U.S. federal weight limit on loaded trucks has been set at 80,000 pounds since 1982. Many shippers meet the limit with space left in their trailers, and must use more truckloads and fuel—while increasing emissions—when traversing interstates.

The bi-partisan Safe and Efficient Transportation Act (SETA), H.R. 612, gives each state the option to set interstate weight limits of up to 97,000 pounds. This higher weight limit, however, only applies to trucks equipped with safer six axles instead of the typical five. Without making the truck any larger, the additional axle maintains safety specifications—including stopping and handling capabilities, and current weight per tire.

By allowing shippers to better utilize space in each truck, and use fewer trucks to meet demand, SETA would make roads safer—especially as the U.S. economy and population grows.

Source: The Coalition for Transportation Productivity

for special permits if weights exceed the national standard. And they still can't transport heavy loads on U.S. interstates. That pushes trucks onto state and county roads, which raises other issues—one of which is a perceived increase in safety hazards.

But empirical data also suggests moving heavier trucks off local roads onto interstates is actually a safer alternative. The Coalition for Transportation Productivity (CTP), a DC lobby that represents a coalition of 200 shippers in favor of increasing the federal vehicle weight limit, supports such an argument. Touting a recent report that fatalities on Maine's roads reached their lowest levels in 70 years in 2014, CTP attributes that success to allowing heavier trucks on its interstates.

Maine provides a good test case, given its dependence on the timber trade. The state's forest products industry directly contributes nearly \$2 billion annually to the economy.

There were 130 fatalities on Maine roads in 2014—the fewest since 1944, according to the Maine Department of Public Safety. In particular, commercial vehicle-related fatalities dropped to 10 in 2014.

It's also worth noting that Senator Susan Collins (R-ME) brokered a special congressional provision in 2011, after an initial pilot phase, that allows six-axle trucks weighing up to 100,000 pounds on all interstate highways in Maine for the next 20 years.

"The experience in Maine proves that targeted, sensible truck weight reform will not only make highways more efficient, but it will save lives," says John Runyan, executive director of CTP. "Many interstate highways are safer and better engineered for heavy traffic, and allowing properly equipped heavier trucks to access the interstate will provide a more efficient route while helping to avoid traffic lights, crosswalks, school crossings, and other potential hazards."

If Congress empowers other states to increase interstate GVW limits, Runyan argues, they will benefit from similar safety improvements.

"More than 40 states allow heavier trucks on state roads, and under the Safe and Efficient Transportation Act of 2013 (see sidebar, left) currently pending in Congress, they would be given the option to transition heavier trucks equipped with safe six axles to the interstate," he notes.

Increasing truck sizes and weights

will increase costs for motor freight carriers—which is why industry is pushing for a resolution sooner rather than later. Carriers would have to invest in trailers that can accommodate an additional axle.

Maine's success, as well as the trials and tribulations of Minnesota, Ohio, and their neighbors, will likely hasten debate in other state legislatures. Federal action ultimately depends on the FHWA's report, then congressional support.

Twenty-two of the 55 congressional delegates who voted on the issue in 2012 are now gone, Baker notes. That leaves railroad and trucking industry lobbies with new quarries to court and cull.

But don't expect conclusive evidence from the congressional report that will tip the balance of opinion. "There will not be any action," says IANA's Casey. "The FHWA report is going to have something for everyone and nothing for everybody."

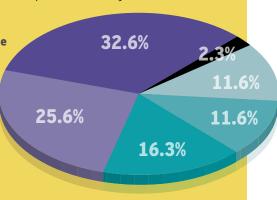
TMS: Freight Savings Are What Matter

Transportation management systems (TMS) offer a strong ROI, primarily by helping companies save money by reducing freight spend. Respondents to an ARC Advisory Group study indicate freight savings of about six percent with the use of a TMS. They attribute these freight savings to lower-cost mode selections, improved routing, and better procurement negotiations.

What percentage of freight savings were consumed by the cost of TMS?

Absorbed 10% of Savings

- Absorbed 10-25% of Savings
- Absorbed 25-50% of Savings
- Absorbed over 50% of Savings
- More than Savings
- About the Same as Savings



Source: ARC Advisory Group



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The Electronics Supply Chain: Tossing and Turning

The explosion of electronic device production and consumption over the past decade has been a boon for both manufacturers and retailers. But it also raises a new challenge: how do companies and consumers properly dispose of used product?

A recent survey conducted by Ingram

Micro Mobility asked 1,000 U.S. consumers about their general awareness of how to properly recycle used devices, what incentives would increase the likelihood of recycling devices, and their interest in purchasing used devices.

"The study reveals a gap between device

recycling and shorter mobile device lifespans," says Bashar Nejdawi, president, North America, Ingram Micro Mobility. "While the survey shows a challenging landscape for the mobile industry in terms of consumer understanding about properly disposing used electronic devices, there are opportunities to educate consumers on incentives and the value of device recycling programs."

The report offers an interesting glimpse

One-Hour Delivery: Not Just for Pizza

hen it comes to innovation, Amazon consistently leads the pack. At the start of 2015, that's still the case. The online retailer's launch of a new service in midtown Manhattan didn't disappoint.

Amazon's Prime Now laughs in the face of same-day delivery, providing one-hour delivery by bicycle messenger on thousands of items to Amazon Prime customers within the delivery radius of the company's fulfillment center in Manhattan, near the Empire State Building. One-hour delivery costs \$7.99, while more flexible or patient customers can get two- to three-hour delivery for free.



Amazon continues to raise the bar on delivery speed. It now offers one-hour delivery by bicycle messenger for Manhattan's Amazon Prime customers.

This sort of ultra-fast delivery service isn't feasible in rural areas where the nearest distribution center can be hours away, but it's an exciting prospect for city dwellers. Amazon plans to roll out Prime Now service in additional U.S. cities throughout 2015.

Prime Now's bike messengers might be a low-tech alternative to the drones that Amazon hoped to have in

the air in the near future—before the Federal Aviation Administration (FAA) stepped in the way, that is. But the retailer hasn't given up its dream of flying robots that can deliver online orders in 30 minutes or fewer.

Amazon is currently awaiting a response from the FAA for permission to begin testing drones on private property, far from any sort of airport or related operation, because testing and prototyping has gone about as far as it can indoors. Anything that flies outdoors falls under the FAA's jurisdiction, so typically this type of research and development is performed at government testing facilities. But Amazon wants the freedom that a rapid prototyping R&D team will require to make fast progress, rather than jumping through regulatory hoops with each new version of its delivery drone.

Meanwhile, the FAA is working on writing regulations for commercial drones operating within U.S. airspace, but those regulations aren't expected to be done until September 2015. Amazon wants to open the skies, at least over its own private testing grounds, earlier than that.

But Amazon won't sit on its hands forever. The company already had some success testing drones outdoors in the United Kingdom and other countries with more friendly regulatory environments.

"It is our continued desire to also pursue fast-paced innovation in the United States, which would include the creation of high-quality jobs and significant investment in the local community," wrote Paul Misener, Amazon's vice president of global policy, in a December 2014 letter to the FAA. But it remains to be seen how much longer the retailer will allow the FAA to hold back drone development before it takes those jobs elsewhere permanently.

We may not see drones dropping small packages on our doorstep for several years. And yet, whether packages arrive within one hour by air or by bike, Amazon has once again set a new bar for retail delivery, and left competitors scrambling to keep up.

-Jason McDowell

into consumer behavior and how demanddriven manufacturers, retailers, and logistics service providers need to adapt and segment supply chains to better meet future demand, from product lifecycle management to secondary resale.

Here are some survey highlights:

Why "new" and "age" matter

- Sixty-four percent of respondents say they are "unlikely" to purchase a certified-used electronic device compared to a new product.
- Nearly half of millennials—consumers ages 18 to 34—report they would be "likely" to purchase a certified-used electronic device, compared to only 12 percent of seniors (65 and older).

Why recycling isn't habit-forming

■ Fifty-five percent of respondents indicate concerns about clearing data and



Educating consumers about recycling and disposing of used mobile devices will help manufacturers better meet future demand.

identity theft as barriers to recycling devices, followed by a lack of knowledge about where to turn in devices (45 percent), and a preference to keep devices (43 percent).

■ Among those surveyed, millennials and seniors are least concerned with data theft as a barrier to turning in a used device, while two-thirds of adults ages 45 to 54 say this is the biggest barrier to turning in old electronics.

Why altruism is a good marketing ploy

- Nearly two-thirds of surveyed consumers say that knowing a device would go to a person in need, or to a developing country, would be enough of a motivating factor to turn in old devices. Interestingly, millennials (74 percent) and 45- to 54-year olds (71 percent) are slightly more likely to say that altruistic incentives would help them recycle.
- Consumers indicate that a "free upgrade or discount on a new device" (63 percent) and a "cash incentive or gift card" (62 percent) are motivating incentives for recycling devices.



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Shopping for Big Data

hippers are turning over stones looking to find capacity and reduce costs. When they start digging, they invariably uncover data. Then more data. Eventually they find big data.

Collecting information has become a matter of formality for many companies. It's not hard. Machines hoard information, then send it to other machines. Consumers willingly share likes and dislikes through social media. The challenge is making sure information is accurate, then making it actionable.

Cris Kibbee, vice president and general manager of U.S. travel and transportation industry at HP Enterprise Services, knows



his way around big data. *Inbound Logistics* sought his counsel to help make sense of this thing.

IL: How do you define big data?

Kibbee: We define big data using the 3 V's: high volumes of data; data generated at a high velocity; and data with a variety of structures. At the center of our approach is a 4th V—value.

We interpret value not just in terms of top- and bottom-line growth, but also that which is gained from the transformation of business, people, and key business processes that create sustaining strategic advantage. The amount of data bombarding freight and logistics companies requires

more comprehensive real-time data collection and analytics to stay competitive and to innovate. Businesses need to embark on big data with both eyes wide open.

IL: Are there any misconceptions?

Kibbee: Yes. One is the notion that big data should be treated as any other new technology. Not so. It's a technology that is changing almost as fast as data is exponentially growing. Today's big data technology will be nearly obsolete in one to two years.

Another misconception is that big data represents the whole of the challenge. A company's biggest asset—its people—can't adopt a new process overnight, nor will processes automatically change to

incorporate predictive models resulting from big data.

IL: What is the numberone problem that freight shippers face when managing big data?

Kibbee: The omni-consumer. They are empowered, digital, and derive value from price and experience. They incorporate everything into their buying decisions. Their shopping habits are the opposite of linear—they look more like a flight pattern toggling between mobile searches, online comparisons, and social

crowdsourcing. They will purchase from anywhere, at any time, day or night.

Luckily, the new omni-consumer also generates data. This expanded layer of the value chain enables companies to grow.

IL: Capacity has become a hot-button issue in today's market. How can shippers and carriers use technology and information to create more capacity?

Kibbee: Improving capacity, whether it's drivers or more efficiently utilizing revenue-generating assets, is a matter of improving productivity. Technology can play an important role, especially with load optimization, route planning, and revenue management.

Case in point: Leveraging geospatial data, and applying analytics to that data, reduces terminal dwell time and improves warehouse throughput. This minimizes the time a driver spends in queue at the gate, the warehouse office, and the bay.

Shippers can also leverage real-time geospatial data to optimize routings when they encounter traffic or weather delays. An empty mile is an unproductive mile. When revenue management solutions are integrated with asset management and load optimization tools—all powered through an analytics engine—they can minimize empty miles, particularly in high density, imbalanced corridors. It's a technology-based solution that has transformed the passenger airline, and holds a great deal of promise in the logistics sector as well.

IL: What is the next big data revolution?

Kibbee: With so much information—realtime and archived—flowing across the supply chain, big data provides the visibility necessary for making crucial decisions. It improves day-to-day operations and processes such as maintenance management, route optimization, storage capacity, fleet utilization, and inbound/outbound shipping. Given the rise of mobile phones, tablets, and the Internet of Things in the workplace, we will collect even more data that needs to be filtered so it can be transparent and usable.

Social media is another area. It will allow freight and logistics organizations to reach out to customers, suppliers, manufacturers, and partners more efficiently, and strengthen those relationships in the process.

As supply chains grow more global, social media becomes an organization's eyes and ears. Information flows through these channels much faster than traditional outlets, allowing a company to react faster in the event of natural disasters or other disruptions. This creates a more resilient supply chain. Companies can also analyze social media using big data to predict customer demand patterns and partnership satisfaction.

Demand Planning a Must in 2015

redicting future
behavior is no small
task. Throw in the
caprice of global
trade and fickle consumer
demand, and it's a no-win
situation—unless companies
invest in technology and
improve their ability to
forecast demand.

Demand planning has reached a performance ceiling, with forecast value-added analysis (FVA) declining for a second year in a row, reveals Terra Technologies' Forecasting Benchmark Study. FVA is a lean metric used to measure

the performance of each step, and each participant, in the forecasting process.

Specifically, the study analyzes demand-planning performance for 13 multinational consumer products companies, which encompasses almost \$200 billion in annual sales from North American and European businesses.

"While driverless cars and drone deliveries are getting much of the press coverage, supply chain planning is finally starting to evolve," says Robert Byrne, CEO of Terra Technology. "Our study confirms demand sensing as an enabling technology to break through the demand planning performance ceiling."

Among the survey's key findings:

- Network complexity is increasing at a rapid pace. The number of items for sale has increased by 30 percent since 2009. During the same period, shipments have grown by two percent, causing average sales per item to fall by 22 percent.
- The rate of new product introductions is considerably higher, with more than

twice as many new items introduced over five years compared to 2009; 85 percent of those items have been discontinued.

- The long tail, or the large number of products that sell in small quantities, continues to be a challenge for consumer products companies. The slowest-moving 50 percent of items contribute only one percent of sales, while the fastest-moving 10 percent of items generate 75 percent of sales.
- Demand planning is essentially stuck, with error rates around 50 percent.



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Waiting is the Hardest Part

arehouse shift changes are a tale of two mindsets-workers excited to get home and those steeling themselves for eight hours of toil. Delaying the inevitable, at the workers' expense, is bound to create problems-especially in DCs that store high-value inventory and require security checks going in and out.

Case in point: Amazon is embroiled in a lawsuit filed on behalf of two former employees who worked for a staffing agency that supplied the e-tailer with temporary warehouse labor. The plaintiffs contend that the time they spend waiting in line for security checks at the Amazon DC is part of the job, therefore they should be compensated for back pay.

The Supreme Court is currently hearing arguments on behalf of both labor and business. At issue is when the working day begins and ends for hourly employees. A lot will depend on how the Court interprets the longdebated Portal-to-Portal Act of 1947, which stipulates that employers are not liable for costs incurred before or after the workday. Employees are only due compensation for time that is deemed an "integral and indispensable part of the principal activities.'

Apart from the financial implications of potential class-action suits and settlements, the Supreme Court decision will likely have a reverberating impact on how companies secure facilities and compensate workers in the U.S. supply chain.

Texas: Truck Congestion's Biggest Loser

verything is big in Texas—including truck traffic. The state placed three locations—two in Houston and one in Austin—in the top 10 of the American Transportation Research Institute's (ATRI) annual ranking of truck traffic bottlenecks.

ATRI's Congestion Impact Analysis of Freight-Significant Highway Locations assesses the level of truck-oriented congestion at 250 locations on the national highway system. That data is also used in conjunction with the Federal Highway Administration-sponsored Freight Performance Measures (FPM) initiative.

While Texas wins on points, the top U.S. chokepoint is the George Washington Bridge, which spans the Hudson River connecting New Jersey with New York City. In 2014, it surpassed perennial front-runner Chicago's Circle Interchange. ATRI's analysis points to construction on the top deck of the George Washington Bridge that created significant delays for trucks in 2013.

"Identifying congestion impacts at freightsignificant locations is a critical tool in the transportation planning toolbox," says Matt Hart, president of the Illinois Trucking Association and member of ATRI's Research Advisory Committee. "Better-informed

TOP 10 CONGESTION CHOKEPOINTS

1	Fort Lee, NJ	I-95 at SR 4
2	Chicago	I-290 at I-90/I-94
3	Atlanta	I-285 at I-85 (North)
4	Cincinnati	I-71 at I-75
5	Houston	I-45 at US 59
6	Houston	I-610 at US 290
7	St. Louis	I-70 at I-64 (West)
8	Los Angeles	SR 60 at SR 57
9	Louisville, KY	I-65 at I-64/I-71
10	Austin, TX	I-35

Source: ATRI

decisions mean more targeted infrastructure investment at critical freight nodes.

"Illinois is seeing firsthand how ATRI's identification of the Circle Interchange as the number-one freight bottleneck in previous studies led to a significant state investment to fix the chokepoint," he adds.

For Texas, congestion is a concern, especially given the state's population growth—it ranks number two in the United States after North Dakota. It's also an important north-south corridor for cross-border trade with Mexico, as well as oil and gas business through its Gulf Coast ports.



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To Hart's point in Illinois, transportation funding has been a hot legislative item for Texas officials as well. November 2014's midterm elections revealed overwhelming support for Proposition 1, which allows state lawmakers to take oil and gas production tax revenue and help match a \$5-billion transportation budget shortfall in the Texas Department of Transportation. Unfortunately, falling oil prices are reducing that expected windfall, which raises new concerns for how the state will be able to address these infrastructure concerns in the future.

Truck Drivers in Wage War

he U.S. truck driver shortage is starting to create some significant ripples in transportation and logistics. As capacity tightens and trucking costs rise—despite dropping oil prices—shippers and consumers will inevitably pick up the tab.

A new report from Transport Capital Partners (TCP) indicates carriers are unwilling to add capacity because of fewer qualified drivers. Recruitment far outpaces new tractor orders, which translates into higher labor costs.

TCP's latest survey reports that 90 percent of polled carriers expect to pay drivers more. One-third of respondents anticipate

pay increases in the range of six to 10 percent—double what was reported six months ago.

"Carriers see potential applicants going to other sectors, such as construction, where there is more predictable home time, and extra pay is not limited by federal Hours-of-Service regulations," says Steven Dutro, TCP partner. "The end result is that revenue from rate increases will go into purchasing new equipment, driver wages, rising maintenance costs, and regulatory costs—and not as much into the carrier's pockets in 2015."

Recruiting truck drivers younger than 21 years of age, with proper training, is one solution that has been pitched to address the current shortage. Eighty-four percent of surveyed carriers are in favor of that option, according to the TCP survey. That said, only 33 percent of trucking companies are actually hiring younger drivers.

"It is likely that the shift to hiring more inexperienced drivers will continue, albeit slowly—64 percent of carriers surveyed indicate they would be interested in hiring less-experienced drivers," explains Richard Mikes, a TCP partner. "Larger companies are twice as likely to hire inexperienced drivers as smaller companies, perhaps because they have the staff and resources to invest in training facilities and co-drivers."





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PortMiami: No Tradeoffs

Inbound Logistics recently toured PortMiami, then sat down with Port Director Juan Kuryla for an update on port developments and his vision for the future.

IL: There has been a lot of port news in the media lately - some good, and some not so good. How are operations at PortMiami?

KURYLA: Luckily, PortMiami doesn't face the same issues that other ports are dealing with. For example, we don't have a congestion problem, and our relationships with our labor force and the community are solid. Waterside congestion or landside congestion hurts not just the shippers, liners, and ports, it also hurts the economic health of the larger community and region.

I recently attended a meeting with other South Atlantic port directors from Savannah, Charleston, Port Everglades, and Jacksonville. Port congestion and its impact on operations was a crucial topic of discussion. At this meeting, we also had a chance to speak with a Federal Maritime Commission (FMC) commissioner who was on hand to learn how the FMC could assist all ports in furthering their initiatives and infrastructure projects to improve operations.

It's important for ports to build strong partnerships with federal, state, and local governments, and PortMiami has been a huge beneficiary of that kind of cooperation. For example, traffic now comes into our port via the new Miami tunnel, which connects PortMiami directly to the U.S. interstate highway system, without traveling through downtown Miami. This infrastructure investment was made possible by cooperation with government, and it has decreased truck traffic congestion in and around the port, ensuring that shipments flow through the port more quickly, thus cutting costs.

The tunnel has been an incredible success not just for shippers, but also for trucking companies, shipping lines, drivers, and port workers. They all can spend more hours on productive work rather than waiting.

IL: Some ports in other areas are stressed by relations with their local communities. What has been Miami's reaction to the new tunnel?

Kuryla: The cruise lines, ground transportation people, bus operators, drivers in their personal vehicles, and downtown Miami all love the new tunnel. Look out over the port at 2 p.m. any day, and you'll see very few trucks waiting. The ratio of trucks going through the tunnel versus those going over the bridge is currently about 10 to 1. That project has been a



Want to get Port Director Juan Kuryla angry? Tell him PortMiami employees are not giving the customer their best service.

success, and it could not have been done without consensus among all involved that cooperation was important. A public-private partnership deal was structured, and the Department of Transportation, the county, the city, the state, and the general community all lived up to their commitments to move the project forward.

To me, every half hour—even every 15 minutes—out of a logistics chain counts. The Miami tunnel has expedited the delivery of an average box from about 50 minutes to 30 minutes. That's worth a lot of money.

Approximately 16,000 vehicles enter and exit the port each weekday; truck traffic makes up 28 percent of this travel. Recognizing that trucking companies and drivers are vital partners in transporting containers to and from PortMiami, the Miami-Dade Expressway Authority (MDX) provides a frequency discount of up to 50 percent for multi-axle vehicles on all five MDX expressways. Now the trucks move faster and drivers are happier.

I always say, if the truckers are happy, the port is happy. I commend MDX for its collaboration in keeping our port and our industry competitive.

IL: So public-private partnerships, and the support of the larger community, can make port operations more efficient and therefore more competitive?

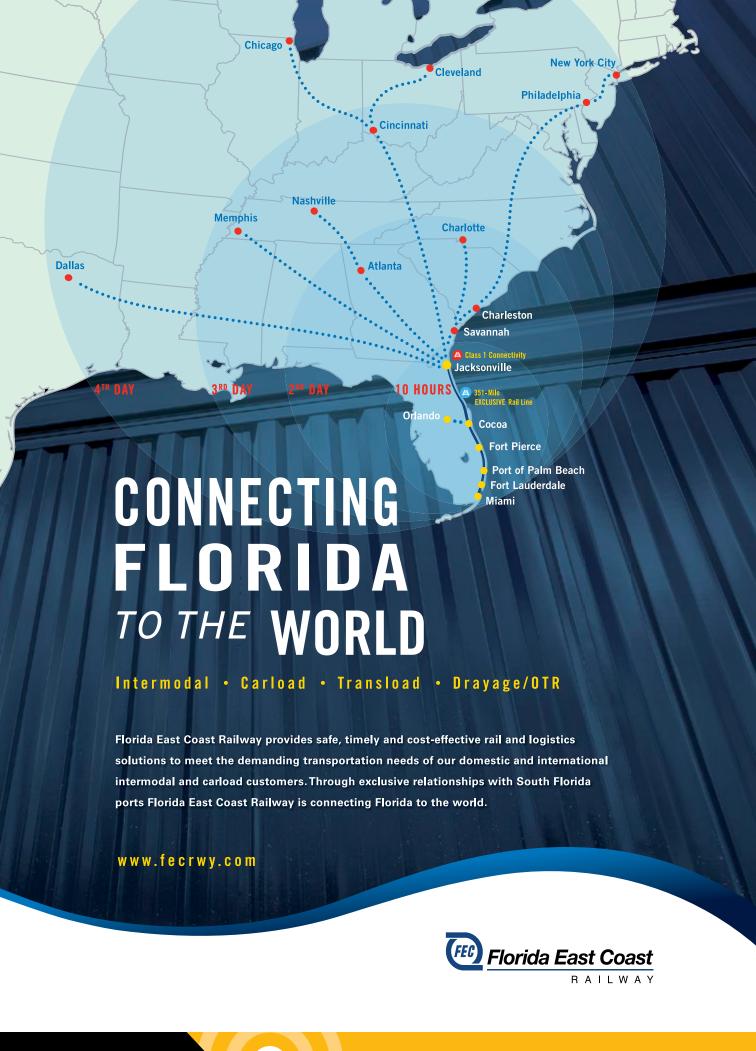
Kuryla: That's exactly what I'm saying. If there had not been great cooperation and communication between the federal government and private entities, this kind of progress would be difficult. Consider the rail expansion in and around the port, which will have a huge impact on throughput. It's a win-win for the port and the greater Miami region.

Not only does it create direct jobs, it also creates indirect jobs. The domino effect is huge. PortMiami's impact on local and regional economies is more than 200,000 direct and indirect jobs, and \$27 billion in revenue, between our cruise and cargo industry.

IL: Tell us about the port's rail expansion.

Kuryla: In our efforts to gear up for the Panama Canal expansion, we created the Sunshine Gateway Service together with Florida East Coast Railway (FECR). This expansion provides seamless ship-to-rail transfer, including fast on-dock intermodal rail capabilities. It allows PortMiami to handle additional volume, and move shipments more quickly and efficiently with the potential of reaching 70 percent of the U.S. population in four days or fewer.

The port's infrastructure investment and collaboration with innovative providers such as FECR ensure that





we're well-positioned for the Panama Canal expansion.

Another way we're getting ready for the Canal expansion is our 50-foot deep dredge project, enabling the port to handle larger vessels. That was not a public-private partnership effort, but it did require the federal government's cooperation to get the project authorized. It also required funding from the state, which invested \$112.3 million. Miami Dade County and the port also invested. These are all different components of our growth strategy, but cooperation is the common thread.

IL: Is proximity to Latin America a factor?

Kuryla: Every port will tell you it is ideally positioned. Every port will tell you it is in the best location, whether it's the east/ west or north/south trade. In many cases, it's true for a group of customers.

We also like to say that we're in a good spot geographically for both east/west and north/south trade. Over the years, we have seen impressive growth in some regional economies in our hemisphere. Colombia, Peru, Chile, and up until a few years ago, Brazil, enjoyed flourishing economies. That trade kept volumes at the port steady, even during the recession. When most ports on the West Coast and in the north were down by double-digits, we maintained within two points of where we were in 2007. That is primarily due to our balance of trade, and the fact that our top 10 trading countries are in South America, Central America, the Caribbean, Europe, and Asia.

We're currently at 50 percent trade within the hemisphere. We're looking at growing that, but still mindful of what's going on in China and Southeast Asia. Right now we are in the north/south trade, the trans-Pacific trade, and the northern Europe trade. We're reaching out, beyond Latin America, too. We want to continue to grow, and feel that our location and infrastructure improvements enable us to do so.

IL: Speaking of location, in the United States, the migration from northern states continues. How will these new residents be served by PortMiami?



PortMiami expects to increase cargo traffic as new infrastructure improvements come online.

Kuryla: In the United States, the southern region is growing too, with more population and consumer spending. Florida is currently the third-largest state by population, surpassing New York. The state has 19 million residents, as well as nearly100 million tourists each year. This demographic shift is a huge help. Cargo follows consumers, and this migration will continue.

All these improvements—the 50 feet of water, the on-dock rail, Super Post-Panamax cranes, and direct access from the interstate system—put us in a good position to gain additional business and be able to *work* the additional business. You

can have a great road system, but if you cannot bring the vessel in, you don't need such a great road system. You can have great depth, but if you cannot discharge the vessel, you will have a bottleneck at the port and on the terminal. You can have both, but if you don't have gantry cranes that can go nine containers high above deck, and 22 containers across all the way to the last part of the beam, then you can have great water and great access, but you cannot work the vessel.

Same with the rail. Once we start loading or unloading 2,000 or 3,000 boxes from one ship once the larger vessels start calling Miami, you need on-dock rail to unload the containers quickly, and get the cargo off the port and back inland. All these projects complement one another.

IL: Final thoughts?

Kuryla: PortMiami is not just about providing great infrastructure at competitive rates. Another piece of the puzzle is customer service. I constantly remind our employees that their salary comes from the revenue generated by those ships, from that tenant who's paying open ground rent, from the stevedore who's paying permit fees, and from the shippers who trust us to handle their business to the highest standards. If you want to get me angry, do not give the customer your best service.

Notable Developments at PortMiami

Super Post-

Panamax cranes: Six supersized gantry cranes at PortMiami accommodate the newest megaships the expanded Panama Canal can handle.

Direct highway access via new Miami tunnel:
A new access tunnel connects PortMiami directly to the U.S. interstate highway system, decreasing

vehicle congestion in and around the port, and increasing port throughput.

■ 50-foot-deep channel: PortMiami's newly dredged harbor will be able to berth the massive post-Panamax vessels deepening its harbor from 44 feet to 50-52 feet, and widening part of its shipping channel.

on-dock intermodal rail service: More than \$50 million has been invested in the on-port rail connection between PortMiami and the expanded Florida East Coast Railway network, speeding portside operations and slashing hours off shipment times.



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GLOBAL

THE WORLD AT A GLANCE

by Joseph O'Reilly



Uber Hails Hong Kong Cargo Pilot

While analysts continue to speculate about how the "Uber model" will translate to parcel and small shipment movements, especially in densely populated areas, the San Francisco-based taxi/technology company has begun testing its platform in Hong Kong.

Its latest incarnation, UberCARGO, promises to deliver the same cashless convenience that has captured the attention—and credit cards—of passengers on the go.

"With UberCARGO, a van arrives wherever you want it to be in minutes," according to the company's blog. "You can load your items in the back of the van yourself, or request the driver's assistance if you need an extra hand. Deliveries can be tracked in real time through the app, the item's location can be shared with the recipient, and you can ride along with your goods so you'll have ease of mind that your items are safe."

Rates are calculated based on time and distance. Base fares in Hong Kong begin at \$2.58, then escalate 20 cents per minute and/or 60 cents per kilometer.

Hong Kong's population density, which ranks fourth in the

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world, makes it an ideal location for testing the viability of such a model—especially as same-day delivery demands and capacity constraints converge in congested urban areas. A cottage industry that supports the technology side of crowdsourcing local deliveries is already emerging in the United States.

It's still tough sledding in most countries; Hong Kong is an exception. China recently banned private cars from using ride-hailing apps, which arguably would be a target market for Uber's growth. Its Ministry of Transport decided only licensed taxis could use the technology. There's also an established domestic market for such services.

Similar roadblocks are preventing traction in countries such as South Korea, India, and Germany, especially where government is looking to tame a relatively "lawless" industry that has an unfair advantage over existing, and regulated, taxi industries.

Mexican Truckers to Run North of the Border

The U.S. Department of Transportation (DOT) is ready to enforce a provision that was initially included in the 1993 North American Free Trade Agreement (NAFTA). After a three-year pilot program, the agency decided to open U.S. roads to Mexican trucking companies—provided they apply and are granted permission to make long-haul cross-border runs into the United States. DOT has yet to announce when the application process will begin.

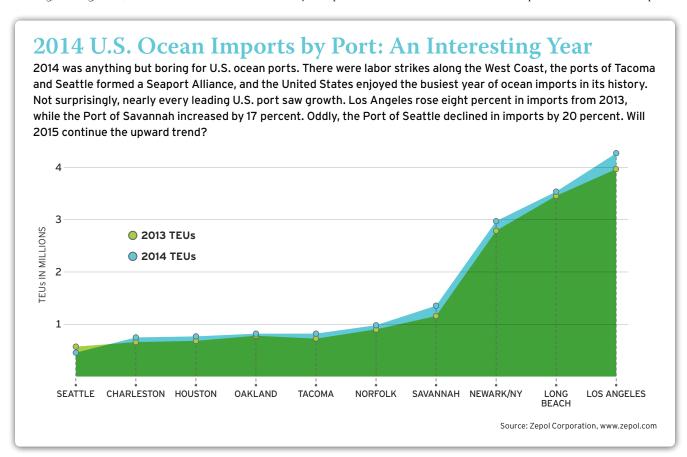
Fifteen trucking companies from Mexico enrolled in the pilot that concluded in October 2014. They crossed the border 28,000 times, travelled more than 1.5 million miles, and underwent 5,500 safety inspections by American officials.

"Data from the pilot program and additional analysis...proved that Mexican

carriers demonstrate a level of safety at least as high as their American and Canadian counterparts," says U.S. DOT Secretary Anthony Foxx.

The announcement closes a forgettable chapter in a decades-old drama between the two countries. Mexico, which had imposed more than \$2 billion in annual tariffs on certain U.S. exports, waived the surcharges when the U.S. DOT announced the pilot program in 2011. American trucking companies, by contrast, have been able to apply and operate long haul south of the border in accordance with NAFTA since 2007.

Reactions to the DOT's announcement have been expectedly mixed. The American Trucking Associations supports the effort, as long as Mexican carriers meet the same requirements as their U.S. peers.





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Opponents, who believe that such reform will erode jobs and expose the United States to more security risks, claim the pilot program did not go far enough.

"This DOT policy change flies in the face of common sense, and ignores the statutory and regulatory requirements of a pilot program," says Jim Hoffa, general president of the Teamsters. "Allowing untested Mexican trucks to travel our highways is a mistake of the highest order, and it's the driving public that will be put at risk by the DOT's rash decision."

Todd Spencer, executive vice president of the Owner-Operator Independent Drivers Association, was equally dismissive. "The FMCSA is clearly doing an endaround, and playing with numbers to try and justify opening the border to long-haul trucks from Mexico," he says. "It's clear from the lack of participation that Mexicobased motor carriers are not interested in hauling beyond the commercial zone, if it means complying with the same regulations as U.S. truckers."

Turkey, Iran Wrapped in Truck Fee Fiasco

Situated at the nexus between Europe and Asia along the Silk Road trade, Turkey's rising star as a MINT (Mexico, Indonesia, Nigeria, and Turkey) economy is well-documented. Location is a strength. But conflict also comes with the territory—especially with a neighbor like Iran.

The two countries are engaged in a tit-for-tat standoff over transit fees for overland transport. The divergence in fuel costs between Iran and other countries in the region is the source of the friction.

Tehran, the capital of Iran, increased fees at the Turkish border partly to offset cheaper gas prices elsewhere. The country went so far as to charge trucks for gas that remained in a fuel tank when crossing

India Raises Flag on New Rail Service

India's reputation for poor road infrastructure has long been a pain point for the country of 1.2 billion people, raising total logistics costs and making its hinterland a less attractive offshore manufacturing location. In lieu of reliable long-haul truck/road transport, the country has had to rely on a vestige of British colonialism - the railroad.

Still, creating a responsive, rail-driven supply chain is no small task. In the latest example of necessity-driven invention, APL Logistics VASCOR Automotive did just that. The Delhi-based joint venture successfully launched



The AutoLinx rail-based service offers India's automotive shippers a truckload alternative.

its AutoLinx rail service, which runs every two weeks between Chennai and New Delhi. The door-to-door service covers the entire 1,300-mile supply chain for its customers, delivering finished vehicles from the assembly line to the dealership floor.

"AutoLinx helps OEMs reduce the environmental impact of their supply chains and eases the pressure on India's road infrastructure by moving freight via rail," explains Bill Garrett, CEO of the joint venture.

Trial runs were conducted in close collaboration with four automotive OEMs: Ford, Honda, Hyundai, and Renault-Nissan. The trials began in September 2014,

focusing on the service corridor between Chennai and Delhi, and involving the handling, movement, and delivery of more than 1,100 finished vehicles.

As the service gains traction, APL-VASCOR expects to increase its frequency and add new destinations.

the border. Turkey retaliated by hiking its fees. Consequently, the impasse has created lengthy delays at the borders.

Turkish transportation companies are looking to fix the problem by circumventing Iran altogether. As an alternate to transporting freight overland to Central Asia, they are proposing a route that goes through Georgia and Azerbaijan using roll-on, roll-off vessels and ferries to cover the 200-mile leg across the Caspian Sea.

The plan aims to carry 25,000 trucks annually over the Caspian Sea intermodal land bridge from Azerbaijan's newly constructed Alat port to Turkmenbashi in Turkmenistan. The alternative routing is also expected to greatly improve transport times and reduce costs.





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Retail Ready



Global Airfreight Demand Steady

The airfreight industry is showing signs of sustained growth, a good indicator that the global economy is on the move. News that UPS is expanding its Worldwide Express Freight service, which serves urgent, time-sensitive international heavy-weight movements, is testament to positive shipper demand. Recent data from the International Air Transport Association (IATA) supports continued growth.

IATA's November 2014 data reports demand, measured in freight tonne kilometers (FTK), grew 4.2 percent compared to November 2013. Capacity increased by 3.3 percent over the same period.

"More goods are being traded internationally, fueling the growth in air freight," says Tony Tyler, director general and CEO of IATA.

IATA expects airfreight markets to expand



Shipper demand drove UPS to expand its Worldwide Express Freight service, a good sign that the global economy is improving.

by 4.5 percent in 2015, outpacing projected growth in world trade (four percent). Although Tyler cautions that "macro-economic and political risks" always threaten to impact trade flows, performance across global regions is mostly positive:

Asia-Pacific carriers report a 5.9-percent increase in FTKs with a four-percent capacity increase. Although business confidence in China has weakened, government policies to encourage

consumption are having a positive impact. Elsewhere, emerging Asian economies have seen a sharp rise in imports over the past six months.

- European carriers saw a small 0.9-percent rise in FTKs, while capacity expanded by 2.6 percent. The Eurozone economy continues to flat-line, affected by renewed concerns over the euro and Russian sanctions.
- North American carriers recorded a FTK decline of 0.3-percent and a drop in capacity of 2.6 percent—despite a ports strike on the West Coast that shifted some demand from sea to air. Underlying indicators for the U.S. economy remain sound, which should support a return to growth.
- Middle Eastern carriers continue their strong performance, with FTK growth of 12.9 percent and a 17.1-percent capacity increase. The region's efficient hubs provide a strong platform for connecting long-haul freight shipments.
- Latin American carriers saw FTKs fall by 0.7 percent, reflecting economic weaknesses across the continent, but particularly in Brazil and Argentina. Capacity was reduced 0.5 percent.

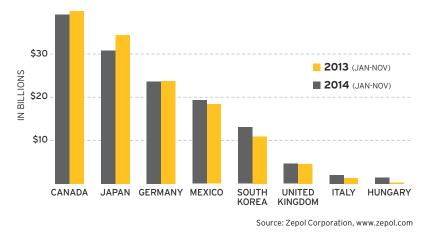
All Aboard LATAM Rail Investment

Latin America's poor rail freight record has long been a fundamental transportation problem, especially for commodity-intensive trades that dominate the continent. This deficiency is exacerbated by fragmented port infrastructure, which fails to capitalize on freight densities and flows. Years of neglect, and now rapid growth, have bottlenecked potential economies and efficiencies.

A new Frost & Sullivan report, Strategic Analysis of the Latin American Rail Freight Market, indicates Latin American countries are finally looking to invest in and develop rail freight transport. The San Antonio-based consultant expects more than \$47 billion in rail transportation investments by 2020.

U.S. Passenger Car Imports Stagnant

Foreign car imports have been growing exponentially since 2009, but 2014 flat-lined. Declining imports from Canada, Japan, and Germany were to blame. Japan's car exports to the United States dropped by 10 percent from 2013, nearly a \$4-billion decrease. Not all Asian automakers suffered last year, however. U.S. imports of vehicles from South Korea rose 20 percent.



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The impetus for change is almost unavoidable. The gross domestic product of Argentina, Brazil, Colombia, Chile, and Peru has grown at 5.2 percent over the past five years, and is expected to continue on a similar trajectory in the near term. Economic growth supports further investment in infrastructure and equipment necessary to develop rail freight communication and logistics systems, says the report.

"With the average age of LATAM's locomotive fleet exceeding 40 years old, and a few models in active service for more than 50 years, rail companies have little option but to purchase new locomotives or refurbish old models to improve fleet availability and assurance of motive power," explains

Shyam Raman, automotive and transportation research analyst of Frost & Sullivan.

One concern that could dampen investment is sustained inflation. Rail projects are often long term and capital intensive. That could be problematic. But increasing freight volumes, political stability, and new foreign investment are likely to deflate price concerns.

"Regulatory changes that promote foreign investment through public-private partnerships, in particular, support market expansion," explains Raman. "Foreign participants have begun entering joint ventures to minimize the risk of investment and penetrate the previously stagnant rail freight transport market."

Panama Canal Tweaks Toll System

A well-publicized labor dispute in 2014 between Grupo Unidos por el Canal, the European consortium contracted to build a third set of locks, and the Panama Canal Authority (ACP) delayed construction activity while the two sides wrangled over budget overruns. The expansion project was initially projected to cost \$5.25 billion. Now the total may exceed \$7 billion.



To retain and grow traffic, the Panama Canal Authority is proposing a new toll structure and a customer loyalty program.

When complete, the new lock system will accommodate vessels three times the size of what currently passes through the Canal, which is a considerable improvement as far as economy of scale. But the ACP is also taking necessary measures to tweak its toll system and ensure it retains current traffic while clawing back lost

market share from the Suez trade.

In late December 2014, the authority floated a new toll structure and is now seeking formal comments on the proposal.

"The proposal, in its current form, safeguards the competitiveness of the waterway, charges a fair price for the value of the route, and facilitates the Canal's goal of providing impeccable service to the global

shipping and maritime community," says Jorge Luis Quijano, administrator for the Panama Canal.

The restructuring will price cargo segments by units of measurement, while aligning with customers' needs and modifying pricing for all Canal segments. For example, containers will be measured and priced on TEUs and dry bulk will be based on deadweight tonnage capacity and metric tons of cargo.

ACP is also planning a customerloyalty program for its container business. Frequent customers will receive premium prices once a particular TEU threshold is reached. The proposed tolls include significant reductions in the capacity-based charge, and price differentiation based on vessel sizes. Accordingly, the authority will share the risks associated with fluctuating

Lithuania's Competitive Switching Brouhaha

Competitive switching is a hot topic in the U.S. rail market—a veritable third rail between captive shippers and Class I railroads. In Lithuania, a similar narrative is playing out across its border with Latvia.

The European Commission is looking into claims that Lithuania's state-owned rail operator Lietuvos Gelezinkeliai (LG) removed a railway track that connected with Latvia, thereby restricting shippers from using other rail freight operators in the two countries. If confirmed, such action would violate the European Union's antitrust rules.

LG suspended traffic on a corridor running between Lithuania and Latvia in 2008. It eventually dismantled the track. The European Commission opened an inquiry when a rail shipper filed a complaint. LG faces a fine of up to 10 percent of its annual revenue if found guilty of infringing on shippers' rights.

On a positive note, Lithuania became the latest European Union country to adopt the euro as of Jan. 1, 2015—joining the 19-strong Eurozone bloc. The move is expected to help insulate the former Soviet republic from increasing geo-political pressure in the region.

Adopting the euro further separates the country from Russia and re-enforces its identity as a EU member state.





economic conditions and lower-utilization return voyages.

Equally notable, the expanded lock system will now allow the Panama Canal to accommodate non-traditional traffic such as Liquefied Natural Gas (LNG) shipments. LNG vessels currently cannot transit through the waterway due to beam dimensions.

The proposed unit of measurement for LNG vessels is the cubic meter, which is widely used in LNG shipping, and will make it easier to calculate tolls for new customers to the Panama Canal. The revised toll structure also provides incentive for new LNG customers. Shippers that use the same vessel for a round-trip voyage through the Canal will have the option of receiving a special ballast fee, as long as the transit in ballast is made within 60 days after the laden transit was completed.

The Netherlands: Innovator in Logistics & Transportation Safety

Inbound Logistics recently participated in an international media tour of the Netherlands, home to Europe's highest concentration of logistics service providers. Here's a look at how this nation's rich IT assets are advancing global research and applied applications in the logistics sector.

Driverless trucks. TNO, the government's applied research institute, is a partner in the new private-public "automated driving" program. The first phase will allow hundreds of self-driving trucks to zoom around Rotterdam, Europe's busiest commercial port, and on key highways linking to the port. Once safety kinks are worked out, Dutch leaders expect driverless cars will be a reality sooner rather than

later. TNO is also intently studying how 3D printing—the "third industrial revolution"—will fundamentally change the future for manufacturing, transport, and logistics practices worldwide.

Cybersecurity cluster. Thwarting cybercrime is a major operational activity in all industries, including logistics and transportation. The uberwired Netherlands, known as the "digital



and secure gateway to Europe," is a leader in cybersecurity. A prized asset is the Hague Security Delta (HSD), the continent's largest security cluster. More than 400 security firms, employing 13,000 people, work with government and research entities to develop radically new cybersecurity, big data, and related tech projects. Exciting developments are expected from the HSD Campus, a new national security innovation center that opened February 2014 in The Hague.

Logistics safety. The STC-Group, an international educational institute for navigation, transportation, and port-related industries, serves more than 10,000 degree-seeking students and private-company employees annually through its schools and training facilities. The organization operates centers scattered around the Netherlands, and has branches on other continents. STC created the world's largest "park" of simulators. These technological marvels improve reallife performance and safety metrics by bringing education and training modules to life. The firm is also known for its advanced crane simulators, which use realistic visuals, movements, and sounds to teach all aspects of handling and storing cargo. STC's two Transport Chain simulators, with linked workstations and sophisticated proprietary software, show how disparate logistics roles must work together to move cargo quickly and efficiently.

Maritime safety research. Funded by 110 million euros, COMMIT/ is a six-year national public-private IT research initiative created to solve scientific and societal problems. One project in development is an automatic risk assessment system designed to increase the security of large maritime areas. The artificial intelligence-driven program will help law enforcement and military personnel find criminal or terrorist vessels easily, and predict the intent of any suspicious maritime activities.

With all this activity, the Netherlands continues to hold its enviable position as an innovator in worldwide logistics services.

-Lisa A. Bastian

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Leverage Data to Navigate Uncertain Times

A Strategic Enterprise Partner Can Deliver the Vision You Need through Logistics.

- f you're tracking the Producer Price Index, consumer spending surveys and driver shortage statistics, you know that the economy and the global supply chain are becoming more and more complicated. Increasing volatility in operating costs, capacity, consumer demands, technology evolution and government regulations are producing a blinding effect on many shippers. To restore insight and understanding, there has been a surge in North American companies seeking a fresh perspective on their investments, infrastructure and, in particular, their supply chains. From the board room to the shipping docks, companies are seeking data for understanding, and strategic enterprise partners are providing the needed information to them through logistics. Here are some examples of what the market is saying:
- Financial executives are reporting their logistics-related costs are rising an average of 10 percent.
- Operations executives say that their gains are limited by external factors, as they try to improve internal productivity. Supply chain networks are becoming increasingly complex, and serving the customer is becoming more challenging.
- Logistics managers are having difficulty finding trucks on a reliable basis to cover all of their loads as the driver shortage, more stringent hours of service (HOS) rules and the expanding economy are tightening capacity. Managers are calling more carriers for spot quotes and breaking truckload shipments into less-than-truckload (LTL) shipments just to get product out the door. They do not always have time or the option to ensure they're getting the best rates.
- Companies collect data, but need the expertise, time and technology to transform that data into useful business intelligence.

Research shows more businesses are partnering with third-party logistics (3PL) providers to secure enterprise data through financial and operational technology solutions, providing a basis for more advanced business insight. Whether in growth or survival mode, companies must carefully navigate the changing marketplace to deliver on their customer promises, stay ahead of their competition, accurately measure past performance and properly prepare for the future. More companies are seeking a 3PL partner which understands their business and does the following:

- Drives much deeper into transportation data to find the root cause of logistics-related cost increases.
 - Possesses an excellent reputation among an expansive

- carrier network to deliver the reliable, on-time capacity that companies require to meet customer demand now and in the future.
- Brings the expertise to leverage cutting-edge Supply Chain Analytics tools and a LEAN continuous improvement mindset to generate a network model that efficiently blends new and existing production and distribution networks.
- Helps companies determine when and where they should consider a shift in production or distribution locations to accommodate additions or subtractions in manufacturing and transportation costs, as well as customer delivery demands.
- Integrates deep data analysis with the creation of a Value Stream Map of the extended supply chain to identify, loosen and in some cases remove the pinch points in a company's supply chain.
- Provides a Big Data solution that integrates supply chain data with any number of other data sources critical to a company's operation.
- Works under a consultative business model that leaves decision-making control in the client's hands. Clients are able to maintain their supplier, carrier and customer relationships in the manner that is best for their business.

Transportation Insight, consultative in its approach, is an Enterprise Logistics Provider that drives enterprise value through insight. The 3PL/4PL blends its Extended LEAN® methodology of supply chain continuous improvement with Co-managed Logistics® solutions to help companies of all sizes reduce logisticsrelated costs, alleviate capacity constraints, improve customer satisfaction and accurately measure and analyze results. To support its industry-leading service offering, Transportation Insight also delivers next-level Supply Chain Analytics and interactive business intelligence through Insight Fusion®, its proprietary cloud-based Big Data application. This unsurpassed suite of services, along with deep expertise and unmatched flexibility, helps Transportation Insight's clients leave one less thing to the unknown – the supply chain.

Transportation Insight delivers LEAN Enterprise Logistics solutions to North American manufacturers, distributors and retailers. Laura Easley is Transportation Insight's Chief Operating Officer. Easley has over 25 years of industry experience blending her operational logistics expertise with the facilitation of complex, value-added solutions for clients with the goal of achieving enterprise excellence.



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Supply-chain Visibility: Why it Still Leaves Decision Makers in the Dark

veryone who manages logistics operations or relies upon logistics information wants better supply-chain visibility. The phrase "supply-chain visibility" means many things. To some, it means knowing where in-transit goods are. To others, it means understanding how much an organization spends for logistics services – by business unit, department, product line, etc. To still others, it means understanding the operational performance of both inbound and outbound supply chains – by lane, customer, supplier (of goods and logistics services), product line, or product. All would agree that the goal of visibility is to provide insights that improve supply-chain operations and to provide reliable information to dependent groups, such as product managers or sales people, who make decisions intended to optimize margins.

Most parties who use current visibility and analytics "solutions" would also agree they leave much to be desired for quality, completeness, and timeliness. Current solutions still can't consistently provide the scope and reliability of information needed to drive better global logistics operations and improved margin management.

The benefits of logistics visibility and analytics are real and substantial. Why are they so hard to achieve? The challenge arises mainly from two factors: process complexity and the low quality of data flowing through logistics processes.

Process complexity is inherent to the logistics industry. In logistics, more than most industries, many parties participate in each transaction. The parties may include consignors, consignees, 3PLs, freight forwarders, performing carriers of record, actual performing carriers, and others. Each party uses multiple information systems, ranging from the completely manual to the fully automated, to accept and pass on data for a transaction. They communicate in multiple media and formats, with varying degrees of timeliness.

The diversity of data sources produces data of low quality. Each party may unknowingly introduce errors, omissions, or inconsistencies in data due to the requirements or limitations of its own operational systems. Or a downstream party may unknowingly pass along bad data it receives from an upstream party. An error as seemingly unimportant as a misspelled city name can negatively affect rating, cost allocation, and supplychain network analysis.

To improve the reliability of logistics visibility, it's not enough to implement more sophisticated windows to the data. These "solutions" won't fix the underlying problem. The industry must also improve the quality of the data – its completeness, consistency and accuracy. But how can it do so? Few individual companies can justify the high cost of technologies and operations they'd need to keep their logistics data reliable.

That's where third-party organizations known as data refineries come in. A logistics data refinery receives data from the numerous, disparate sources across the supply chain. It converts the data to a common, standard structure. It then uses correlation and other Big Data techniques to normalize, correct, and enhance the data for specific use cases. Finally, it evaluates the level of trust and confidence associated with each data element, considering each use case.

With logistics data that's standardized, normalized, and correlated to specific use cases, companies can:

- Gain reliable visibility into their global supply-chain operations.
 - Tie actual costs to specific services, clients, and products.
- Provide insights about the performance of logistics operations and the effects of expenditures on margin optimization.
- Give greater confidence that analytics and predictive modeling provide valid insights.

For more information on how a logistics data refinery can improve your supply-chain visibility and analytics, visit Trax Tech. com/Data Refinery.



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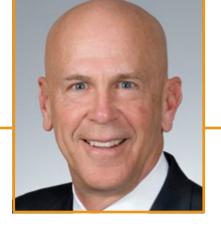
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Traditional Supply Chain Models Will be Extinct in 2025, Thanks to These 10 Disruptors

hen 2025 rolls around, traditional supply chain models will be extinct, according to the 100-plus thought leaders and partners behind the U.S. Roadmap for Material Handling & Logistics. This open community spearheaded by MHI includes material handling and logistics practitioners, suppliers, academia, associations, publications and government. Each has a stake in the future of the \$1.3 trillion material handling, logistics and supply chain field.

The report and action plan identifies 10 different disruptors prompting this transformational change. Some are well underway and evolving toward maturity. Others are in early stages of development. All will have a decisive impact on the industry's future. They include:

E-commerce and omni-channel distribution: Online purchases will be a full 10% of all retail sales by 2017. This is due both to increasing use of mobile devices and retailers willingness to invest in omnichannel distribution centers—consolidating multiple facilities used to address three different sales channels (retail stores, resellers, and individual customers) into one location.

Urbanization: Today more than 50% of the world's population lives in cities, challenging current last-mile distribution operations to develop new methods for goods delivery.

Mobile and wearable technology: Nearly 60% of Americans owning and using a smart phone to shop and track purchases. The embedded global positioning system (GPS) capability in the devices could be leveraged to enhance deliveries.

Robotics and automation: Autonomous control, driverless vehicles, and wearable computing—integrating these into coordinated systems will produce for revolutionary change in the industry by removing the potential for human error or performing tedious or dangerous tasks humans don't want to do.

Sensors and the Internet of Things: The proliferation of embedded sensors that communicate in real-time via the Internet without human intervention supports the Internet of Things. Among the opportunities: sensors in manufacturing could warn of problems and offer instructions for corrective action; packages and transport containers could be continuously tracked via GPS for optimized routing and delivery.

Big Data: Managing and leveraging the massive amounts of information companies collect and store about operations, sales, and customers requires advanced computing power to analyze and visualize the data. Organizations no longer have to look back to

reconstruct what happened; they can apply sophisticated algorithms that perform predictive analytics to anticipate and prepare for future scenarios, thereby mitigating risk.

Workforce: The supply chain has an image problem. Although warehouses of the past no longer resemble those of today, as baby boomers retire the industry is challenged to attract, train, and keep an adequate workforce. Projections anticipate more than 270,000 new jobs will be created annually in the field over the next five years, meaning the industry must find new ways to appeal to a very different workforce: women, veterans, people under the age of 35, and differently-abled persons.

Sustainability: Societal pressure for corporate responsibility dictates that the industry must address the environmental impact of supply chain operations in order to mitigate its effect on local wildlife, solid waste generation, and polluting emissions.

Total supply chain visibility: Thanks to GPS, the Internet of Things, and Big Data, precise location services will make all shipments trackable in real-time by suppliers, manufacturers, shippers, and receivers—from the instant of order to the instant of delivery.

Collaboration: Existing technologies can significantly reduce the inherent cost associated with supply chains by leveraging the data held by each party. To truly reap the benefits, however, trading partners will have to establish trust in order to collaborate. For example, competitors might share trailers to eliminate empty truck miles, thereby reducing transportation costs.

How can you prepare to meet the challenges of the next decade? By fully embracing the changes driven by these 10 disruptors. Simply investing in infrastructure, technology or human resources is not enough. Companies must formulate a strategic plan that includes core competencies and future business objectives, and is in step with the customer and the changing marketplace. You can learn more about the Roadmap at mhlroadmap.org.

As the Industry That Makes Supply Chains Work, MHI pledges to be lockstep with these developments. That's why MHI and our members provide industry resources and best-in-class equipment and systems to help you deliver on the promise of supply chain efficiency, costs savings and speed to market that your customers are demanding.

As MHI begins its 70th year of delivering these solutions, I invite you to find tools to enhance your strategic plan at MHI.org and to attend ProMat 2015, March 23-26 in Chicago's McCormick Place. You can learn more at ProMatShow.com.

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Capacity Crunch

o, capacity crunch is not a cereal. It's what almost every third-party logistics company (3PL) is dealing with today. It's a shortage of trucks.

Why are trucks in short supply? Let's start with the

Why are trucks in short supply? Let's start with the economy. It's pretty good right now. When the economy is good, it's good for truckers. There are lots of goods to ship.

This truck shortage is even more pronounced. During the Great Recession, many carriers went out of business and a lot of older drivers retired or found other careers. Then there are CSA scores. If a driver has a valid license but has recent traffic tickets, it can drag down a company's CSA score. So carriers have to let them go. There just aren't enough violation-free drivers to go around.

To make things worse, the driver pool is old and getting older. Not enough young people are choosing driving a truck as a career choice. And why would anyone with options choose driving? Truck drivers are generally treated poorly and paid poorly. If that's not enough, the roads are crowded; many are in very rough shape, while others are endlessly under construction. After that, you have governments that pad their budgets by issuing as many tickets to carriers as they can.

Interestingly, there is an unexpected solution coming and it's coming sooner than most people realize. Driverless trucks could be on the road in as little as 10 years. They are already being commercially used in mining and other off road uses. Maybe the next generation of driverless trucks will be confined to the interstates, but that will be enough to change the industry. Having drivers just having to make pickups and deliveries will be much more cost efficient than having to pay for them to drive long distances.

Google already has self-driving cars and they work pretty well.

Currently Google reports that they have less than one 'incident' every 5000 miles. An incident isn't necessarily an accident; it's just something that Google deems a 'bug'. In comparison, three years ago, Google was reporting one incident every 500 miles. Google expects that when the incidents get reduced to every 50,000 miles, driverless cars should be as safe as cars with drivers. That is estimated to happen in 2018. So by 2025 driverless cars (and trucks) will be much safer than cars and trucks that humans drive. This technology has the potential to lower freight rates, make the roads safer, speed deliveries, and even reduce traffic at peak times

What can a do about the truck shortage in the meantime? Here are some ideas:

Partner with your existing carriers: If a carrier does a good job, find out what else he does that you need. Build a relationship; ask your new carriers what lanes they need help with. Build an electronic profile so you can help them when your business matches their needs. Keep asking your regular carriers too. Things change. If you are helping a carrier by getting them loads out of a tough area, they are much more likely to want to help you with other less than perfect freight.

Use technology: You can make it a lot easier for your carriers to know about your company and the freight you have that is available. Use targeted email load offers, broad-based email blasts. Draw carriers to your web site with contests or prizes.

Respect the carrier's time: To a carrier, Time is money. Every minute a driver is delayed, it's a mile of revenue that wasn't earned. Make it your #1 priority to get their trucks moving.

Faster payment: Everyone likes to be paid fast. The faster the better. Many companies charge for quick-pay. If you want to stand out from the crowd, offer faster terms at no discount.

Pay more: Carriers want what you would want: Higher pay.

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Changing Regulations Regarding Shipping Lithium Batteries Present Unique Hazards for Shippers, Carriers and Receivers

he world of Dangerous Goods (DG) shipping is complex and ever-changing. Take for example the changing regulations regarding shipping lithium batteries. While lithium batteries have delivered superior performance and reliability in an endless array of applications, the same technology that makes them so useful also presents unique hazards for shippers, carriers and receivers.

Several significant incidents involving fires in both cargo and passenger aircraft have been attributed to shipments of lithium batteries. As a result, regulations in the U.S. and around the world are being revised to enhance the safe transportation of lithium batteries. The added complexity of the regulations could result in an increase of undeclared and noncompliant cargo. Education, outreach and enforcement of existing regulations are key elements to reducing risk and the likelihood of incidents.

Before PHMSA published the final rule on lithium batteries, with mandatory compliance on February 6, 2015, the regulations for shipping lithium batteries were pretty lenient with regard to shipping by road and by air because they offered broad exceptions to the labeling, packaging and documentation requirements for smaller shipments. So, there were a lot of companies that could "fly under the radar" with excepted packages. Now, the regulations have been aligned for road, sea and air. While that means more regulations for U.S. shippers to navigate, it simplifies things, really, especially with international shipments. Companies don't need two ways of doing things, and they don't have to maintain two training programs.

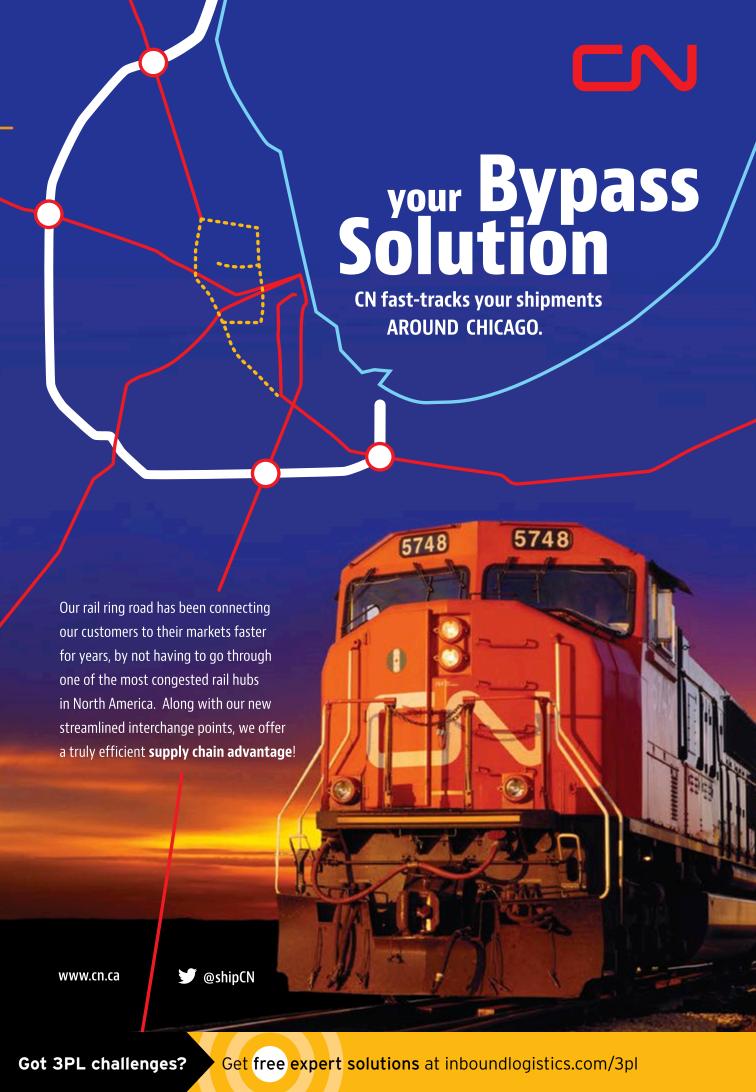
The biggest single change is the elimination of the exception for packages with no more than 12 lithium batteries or 24 lithium cells. Previously, if a package contained no more than 12 batteries or 24 cells, no hazard mark or documentation was required – except that packages containing lithium metal batteries required the PROHIBITED ON PASSENGER AIRCRAFT

mark, and packages of "medium" cells and batteries required the PROHIBITED ON AIRCRAFT AND VESSEL mark. The new regulations no longer include this 12 battery/24 cell relief.

These regulations affect just about any company, not just those that ship lithium batteries as a commodity. Lithium batteries are all around us – cell phones, laptops, tablets, toys, medical devices, cameras – they're everywhere. Companies that were shipping excepted quantities are going to need to reclassify their products, train their employees and put new operating procedures in place to comply. Even companies that simply need to ship new cell phones or laptops to field agents will need guidance on packaging, labeling and documenting these shipments now.

Reverse logistics are also affected by these changes. If the consumer has to return something containing a lithium battery to a supplier, manufacturer or retailer, that's hard to control, and a company is not liable if the consumer ships something back improperly. Ideally, the product packaging should be compliant for returning the item and contain the necessary labeling and documentation, but companies should at least give consumers a warning that they're shipping something with a lithium battery, and that requires extra attention.

The regulations are constantly changing, and they'll continue to change in the years to come. Right now, PHMSA is working on rules, which would further harmonize lithium battery requirements with international standards beyond what was recently adopted. The UN Committee of Experts on the Transport of Dangerous Goods recently adopted significant changes to the requirements for shipping lithium batteries including revising hazard communication (e.g. multimodal lithium battery handling label and revised Class 9 label) that will come into force from January 2017. Shippers, carriers, manufacturers – everyone in the business of shipping DG needs to stay up to date on what's going on in the industry.







BY TOM PATTERSON

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Six Secrets to Controlling Supply Chain Costs Without Sacrificing Service

t's Monday morning. Your boss knocks on your office door to tell you to cut five percent of your supply chain costs in the next six months, while improving performance on customer service scorecards by three percent. This balancing act between cost and service is becoming more common as companies seek ways to do more with less.

When pressured to reduce costs, you may be tempted to focus exclusively on price without considering service impacts. But take a look at the big picture. How can you best achieve an optimal balance between cost and service? Here are six secrets to success:

- 1. Make planning a priority. Never underestimate the value of careful forecasting and how it can impact storage, labor, systems, and transportation costs. Take time to look ahead. Predictability often drives more efficiency than increased volume. Anticipating one-time events or seasonal spikes allows you to better manage labor and space requirements—giving you better cost control.
- **2. Target lowest overall cost.** The lowest price may not result in the best long-term value. Analyze all variables contributing to your total cost to identify potential savings opportunities. Consider where you can make the most impact while upholding your customer service standards. If that seems

overwhelming, rank your expenses and focus on the biggest piece of the pie first. Whether it's optimizing cubic footage for shipments or pooling buying power for dunnage, small initiatives can pay big dividends.

- **3. Don't over-serve customers.** Some companies go overboard to satisfy customers. Learn what is important to them and align your service solutions with their priorities. For example, don't send all shipments by express or next-day air if some of your customer base would be satisfied with two-day ground.
- 4. Make every dollar count. Any capital investment should meet or exceed considerations for return on investment, growth, and flexibility. Before building a distribution center, or committing to a long-term lease, it may be wise to utilize a third-party logistics (3PL) solution until you are sure of your needs. The same advice applies to technology investments. Explore all options and make sure that your technology

spend will effectively serve your business needs.

- 5. Build flexibility into your network.
- When evaluating distribution, consider what changes might occur in the foreseeable future. What if business grows or shrinks dramatically? What if e-commerce becomes a priority? What if you require packaging or fulfillment capabilities? Seek out distribution partners who can evolve with you—even if the frontend cost is slightly higher.
- **6. Keep communicating.** Help inhouse associates and logistics partners understand your business goals and clearly outline service expectations. Keep them up to speed as your business changes. They must understand your priorities so they can make effective recommendations for continuous improvements and cost savings.

Thinking Outside the Walls

As you strive to balance cost and service, an experienced 3PL can sometimes be a valuable ally. A partner can provide resources, economies of scale, new ideas, and best practices when you don't have them in-house. With a little help from your partners, and these six supply chain secrets, you'll have a head start on meeting the challenge when you get that Monday morning knock on the door.



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VIEWPOINT

BY JAMES MIN

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Customs Compliance: Small Mistakes Can Lead to Big Problems

iverse, evolving global trade regulations require companies to implement systems and procedures that ensure strict adherence. Large businesses have in-house compliance staff, but those responsibilities might hold a more vague spot in small enterprises. With stiff penalties at stake—penalties that could put some organizations out of business—small companies must take an aggressive stance on compliance.

With technology and the globalization of trade easing entry into the international trade arena, complying with international trade laws requires review.

Ultimately, each global shipper is responsible for ensuring full compliance with customs requirements and trade regulations around the world. Software programs and resources that organize and outline imports and exports can help companies with compliance.

Whether large or small, shippers should ensure they have proper updated procedures in place, and understand the key areas of compliance risk, including:

■ **Destination risk.** When trading with countries embargoed by the United Nations and the United States, understand the specific restrictions. If you do business in regions such as Iran, Syria, Sudan, North Korea, and Cuba, get familiar with the types of shipments

allowed and prohibited, along with any rules that apply.

- Product risk. For security and foreign policy reasons, the U.S. government closely controls the export of certain materials and equipment, including software and technology, that may have dual use. Other countries have similar restrictions when shipping to the United States. Global traders must understand the nature of their product relative to existing regulations. For example, certain items require licenses to export. Using a product's Export Control Classification Number helps to identify these items, and the agency that can provide the necessary license.
- Customer risk. Companies must know who is placing orders and receiving shipments. Shipping to and from well-known overseas companies presents a lower risk, while fulfilling orders through freight forwarders should raise

red flags, because shippers are liable for the ultimate end recipient of their products. A number of online tools from government agencies and private companies are available to help verify the identities of overseas customers.

■ Shipping risk. The United States is open to trade. By contrast, many other nations are strict when it comes to shipping violations, and may use significant resources to pursue misidentified shipments brought into their borders. Some countries consider it a criminal violation to undervalue goods, and companies that do so may face severe penalties and delays. Strictly following shipping disclosures and requirements can save companies significant time and money.

Different Sizes, Equal Punishments

Unfortunately, the law doesn't differentiate between small and large businesses, so small enterprises that have a misstep can suffer large consequences.

Trade laws and regulations are complex and constantly changing. Companies that don't understand or follow these laws and regulations can face serious consequences. Compliance should head the priority list of every business seeking to expand into the international marketplace.



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SMART MOVES

BY REX BECK

Associate Professor, Logistics Management, Norco College rex.beck@norcocollege.edu | 951-372-7068

The Human Factor: What is Technology Without Leadership?

s its cost declines, supply chain technology continues to improve. Technology implementation depends upon it being economically feasible compared to other solutions, such as deploying equipment or increasing labor. Technology will likely be increasingly used in place of both solutions.

This leaves many envisioning a future driven almost exclusively by technology, but nothing could be further from the truth. The human factor—strong leadership—will always play a critical role in supply chain and logistics.

Technology will not improve performance in companies that lack organizational focus. "A computer lets you make more mistakes faster than any invention in human history, with the possible exceptions of handguns and tequila," wrote Mitch Ratcliffe. He may have overstated the point, but without mission-committed leadership, supply chain technology is just a solution in search of a problem.

Tough Decisions

A technology solution may be more cost effective in a stable environment, but increasing automation decreases flexibility. So how do we factor in the value of being flexible? Even if we can quantify this factor, and work it into a technology solution, unquantifiable

decisions ultimately still need to be made somewhere down the line. In the end, numbers don't make decisions. Leaders do.

Reach Out and Touch Someone

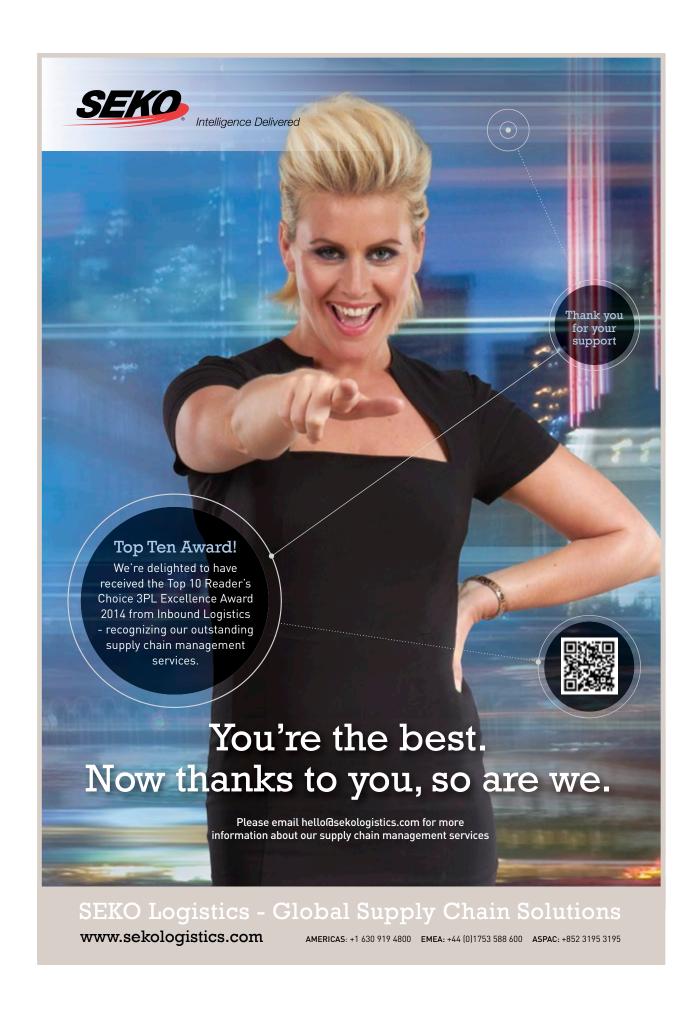
Links in the supply chain are increasingly bound together virtually. To function long-term, virtual organizations must earn each other's trust. Company leaders have to reach out to other members of the supply chain and develop human-to-human relationships. Without personal interactions, supply chain partners often develop ineffective and adversarial arms-length relationships.

Logistics managers are often driven to minimize cost, and supply chain technology can be a good way to reduce overall expenses. But effective leaders understand that it may not be possible to operate at a minimum cost, and actually win and keep new customers. A company might need a higher performance level, driven by a more reasonable optimal cost, to keep customers satisfied. This conundrum offers no fixed solution. Only an informed and knowledgeable leadership that is sensitive to customer needs can make the final determinations necessary.

Once a company selects a specific technology, leadership becomes even more critical. Technology implementation often creates change beyond what many are prepared to accept. Strong leaders are the only ones who can head off the fear of change that exists in many companies, and generate excitement about the organization's future. The overall attitude employees have toward a technology can make or break project implementations, so the positive attitude has to start from the top.

If Ratcliffe's quote is an overstatement, General George Patton may have come closer. He said: "A good solution applied with vigor now is better than a perfect solution applied 10 minutes later." To paraphrase, good technology applied with employee commitment is better than leading-edge technology applied without inspirational leadership.

Be swift when implementing future supply chain technology as it becomes practical and economical to do so. But also remember that skilled leadership is necessary to arrive at your intended destination.





CARRIERS CORNER

BY JOHN LLOYD

Director of Cargo, Virgin Atlantic welovecargo@fly.virgin.com | 800-828-6822

How to Close the Supply Chain Talent Gap

career in logistics is a career working at the heart of world trade. Most of us could not get through a single day of our lives without relying on some aspect of the supply chain.

Products move between manufacturers and retailers, or growers and consumers, 24 hours a day, seven days a week, 365 days a year. The air cargo sector alone transports goods worth in excess of \$6.4 trillion annually, approximately 35 percent of world trade by value. This movement is as vital to world trade as it is to consumers. The fact is, without a timely, efficient, and seamless supply chain, the world would quickly grind to a halt.

As such a vital industry, all facets of the supply chain sector must continually recruit and develop the next generation of industry managers and leaders. That means overcoming one of the supply chain's greatest weaknesses: promoting itself.

The Next Generation

An array of industry sectors tries to attract the best talent graduating from universities. If the logistics sector is to compete, it needs to ensure that it communicates the importance of the

supply chain and its career opportunities in a way that grabs the attention of younger generations.

Traditionally, a high percentage of new recruits follow in the footsteps of other family members. This is still an important employment route, but it isn't sufficient on its own. Logistics must compete shoulder-to-shoulder with other sectors such as technology, energy, and finance, which young people typically consider more attractive.

Making Supply Chain Careers Cool

We need to make the next generation aware of the positive impact the supply chain has on their lives, and we need to communicate it in a way that makes sense to them. We have to show them why logistics is so vital to major brands in sectors such as telecommunications, technology, and fashion, and they need to get excited about the supply chain. Every employer has a responsibility to generate this excitement.

Virgin Atlantic, for example, promotes careers in the freight and logistics sectors through its continued sponsorship of the British International Freight Association's Young Freight Forwarder of the Year award. And Inbound Logistics partners with the American Society of Transportation and Logistics to offer a scholarship that helps worthy young students continue their transport-related studies each year. These types of programs are real, positive action that helps to raise awareness about our industry.

But attracting new talent is only step one. Step two involves making sure any new talent stays in the industry and develops a successful, long-term career. If more companies take a lead in shouting about what we do as an industry, and how vital this role is to world trade, it helps to ensure we'll never face another talent gap.

Many companies are building momentum toward this end, and it is already producing positive results. Increasingly, young people are becoming better informed about the supply chain, and see the industry as a serious and exciting career option that offers the chance for fast progression and international job opportunities.



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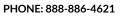


















IT MATTERS

BY RICH BECKS

General Manager, Industry Value Chains, E2open rich.becks@e2open.com | 650-645-650

Supply Chain Resilience: Turning Risk Into Opportunity

n today's global economy, risk is unavoidable. But it also provides opportunity, as a company's ability to adapt in difficult circumstances is a true source of competitive advantage and precisely defines a winning approach to risk responsiveness.

Is your business prepared to mitigate the effects of operational risks, such as Mother Nature throwing a curveball your way, or a sudden demand spike? Managing supply chain risk means recognizing that things won't always go according to plan, and having the right infrastructure in place to succeed even through the unexpected.

Shoring Up Your Supply Chain

Highly resilient supply chains should have these three qualities:

1. Multi-tier visibility. Successful programs function end-to-end. Having data visibility across your extended supply chain network at every tier enables early warnings about disruptions across the extended trading network. An early warning allows you to mitigate supply disruptions before operations and performance are negatively impacted.

Enabling real-time visibility and alerts across multiple tiers requires the right technologies, expertise, and commitment from senior management. The right level of visibility lets companies and partners see information simultaneously, moving decision-making into the network.

2. Real-time collaboration. External collaboration helps manage the response when the unthinkable happens. Without collaborating outside the four walls of the enterprise, contingency plans are isolated from key suppliers and distributors, prolonging recovery efforts and disappointing customers.

Real-time collaboration in the event of large-scale shutdowns or inventory losses enables companies to switch among alternate suppliers, and match short-term demands with order information. Knowing the options and acting immediately makes all the difference in market share as the industry recovers.

3. A flexible response plan. Supply chain disruptions cannot always be predicted, so evaluating potential outcomes well before they actually occur can make or break a response plan.

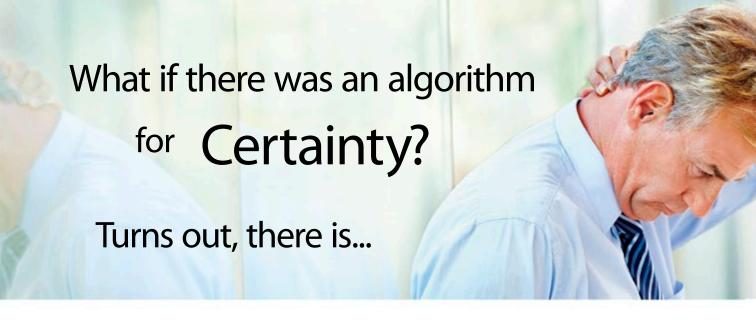
Risk management processes provide the information and communication platform needed to assess and manage situations as they occur. Teams must be able to quickly determine which supply is affected, the products containing those components, the location of inventory within the whole network, and options for alternate supply.

A unified view of data empowers partners to expedite, transfer, or reroute existing assets wherever demand occurs. This means fewer parts shortages, stockouts, and delayed deliveries—and improved service levels to match, ensuring high levels of customer satisfaction.

Ready for Anything

Natural disasters and other large-scale disruptions leave no time to re-plan, so supply chains must be poised to shift direction instantaneously. This quick response depends on a company's ability to identify risk probabilities, prepare recovery scenarios, adjust plans based on unexpected demand surges or shortfalls, and change supplier capabilities when the unexpected happens.

This delicate balance between planning and response is fueled by data-rich technology that affords the right levels of visibility and collaboration throughout the supply chain, and ultimately positions organizations to turn an unforeseen challenge into a gamechanging opportunity.



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GREEN LANDSCAPE Sustainability in the Supply Chain

BY CHRIS MIGET

CEO, EnviroPAK info@enviropak.com | 314-739-1202

Reimagining Molded Pulp Packaging: It's Not Just For Eggs Anymore

s the world becomes more environmentally conscious, industry leaders continually find ways to make operations more sustainable. This can mean anything from recycling more around the office to adopting Lean principles. Some companies are even thinking green when it comes to packaging.

Years of using plastics and foam packing peanuts have made it necessary for companies to reconsider how they package products to reduce their carbon footprint. Plastic is costly to produce, and often ends up in a landfill when the consumer ultimately throws it away.

Packaging for products is an obvious necessity, but companies are learning that they can still be environmentally friendly and not raise materials cost. For both environmental and economic reasons, many companies have turned to paper-based molded pulp to meet their packaging needs.

What is Molded Pulp?

Molded pulp is created from 100-percent recycled newspaper, a renewable raw material—in contrast to expanded polystyrene (EPS), which is mostly petroleum based. Molded pulp was first used as a packaging material for

eggs. It has been more than 100 years since the molded pulp egg carton came into regular use, but now the material is finally being employed in a wide variety of applications.

Consumers are seeing molded pulp implemented into packaging across a number of industries, including electronics, medical devices, and consumer packaged goods. And because the material is paper-based, it offers a cost-efficient, sustainable solution that is completely biodegradable and easy for the end user to recycle. In contrast, curbside residential recycling programs often do not accept foam packing peanuts or EPS.

Saving Space Means Saving Dollars

In logistics applications such as warehouses or distribution centers, molded pulp packaging can help maximize the use of space. It can be custom designed to nest and stack together, allowing for greater quantities on pallets. For example, a product packaged with EPS or a similar material could instead be packaged with a molded pulp endcap or tray, reducing the space requirements and potentially adding room for an additional layer. Saving more space per truckload means extra products can be included in each shipment, providing a direct impact on the bottom line.

And because molded pulp is made from mostly post-industrial raw material, costs for manufacturers remain relatively stable. Molded pulp can lower overall costs by as much as 70 percent compared to other packaging types. The material also provides equal or better protection against vibration and the effects of shock than similar packing materials.

As consumer and retailer demand for sustainability increases, many manufacturers and distributors are embracing the idea of change, and rethinking the way they package their goods. Strangely enough, that change means shifting to a form of packaging first used more than one century ago.



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BY LAKE RAY

President, First Coast Manufacturers Association; Member of the Florida House of Representatives information@fcmaweb.com | 904-296-9664

How to Choose a Business-Friendly Site

he U.S. manufacturing resurgence can largely be attributed to companies reshoring operations. With its low-cost, abundant energy resources, the United States has once again become a cost-effective siting option for energy-intensive manufacturers.

As the energy boom brings companies back to the United States, they must decide where to locate. A number of factors make a region business-friendly. Companies should evaluate the following factors when choosing a prospective site:

- **Taxes.** All companies love a business-friendly tax environment. For example, businesses in Northeast Florida are exempt from state sales tax when purchasing manufacturing equipment, which drives down costs, and enables expansion.
- Labor. The U.S. workforce is one of the most productive in the world, manufacturing products that are reliable and durable. But to create these products, an available, skilled workforce is essential for manufacturers especially at a time when a noticeable skills gap in the industry is making headlines. When siting new facilities, manufacturing companies should examine statistics for the local labor force.
- Location and Infrastructure. As the old saying goes, choosing a new site

is all about "location, location, location." An area's existing infrastructure and logistical strengths are crucial to manufacturing growth.

To illustrate, Northeast Florida's connection with all four pillars of logistics—rail, air, maritime, and highway—contributes to continued manufacturing growth in the region. Three major railroads use Jacksonville as a hub/interchange; the region has three major interstates, I-95, I-10, and I-75; and JAXPORT serves as a portal for goods and products bound for the southeastern United States.

Ports and rail hubs act as major economic engines for a region's manufacturing industry, because creating products is only one part of the process. Any area hoping to attract new business must offer those companies the means to transport manufactured goods.

Community and government. Regional leaders have to show that they value the local impact of manufacturing. City and community leaders in Northeast Florida work closely with

local companies to provide an attractive manufacturing environment.

The First Coast Manufacturers Association, a professional association of manufacturers and logistics providers in Florida, showcases the importance of giving regional manufacturing an effective voice in local politics. It works to ensure that manufacturing concerns are heard on legislative issues, and helps local schools and industry stakeholders align workforce training with manufacturing jobs, foster networking and business relationships, and utilize the collective strength of member companies.

And the government itself should work from within to help businesses. The Florida House of Representatives champions efforts to grow the state's manufacturing, trade, and logistics economic development activities. This type of support is attractive to companies when considering where to locate.

Come One, Come All

The trend of companies bringing operations back to the United States can only benefit Northeast Florida and other regions that provide a business-friendly environment. Such areas offer ample opportunities for manufacturers to grow and operate profitably.



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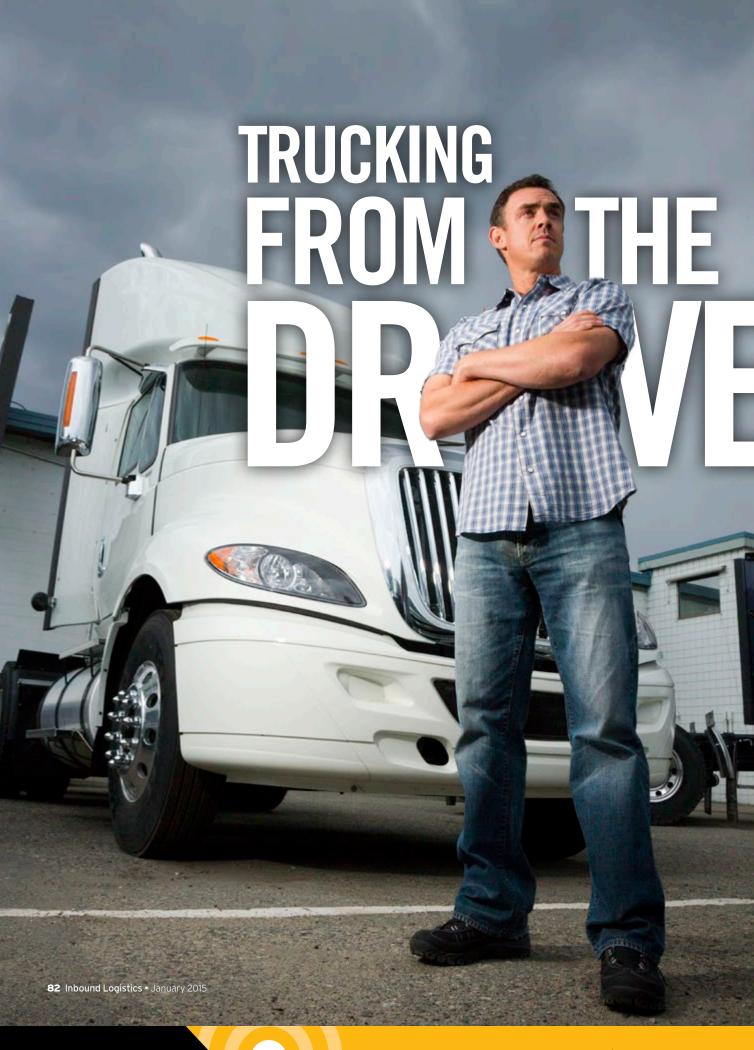
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SEAT

From first mile to last mile, and every mile in between, truck drivers are the lifeblood of your supply chain. Meet some of these dedicated professionals.

by Lisa Terry

n the day-to-day business of managing your supply chain, it's easy to forget that behind the routing software, network models, and demand forecasts are real people doing the demanding work of driving the trucks—a critical role in nearly every supply chain. Trucks are the backbone of the U.S. transportation system, and without the right people behind the wheel, all this hyper-charged supply chain activity would come to a screeching halt.

Luckily, the industry employs people such as Ron Fuller of Central Freight Lines, who is approaching five million miles of driving without a single accident. Sharp increases in traffic volume, and a motoring public uneducated on the physics of a fully loaded tractor-trailer moving at highway speeds, mean Fuller and his colleagues must stay extra vigilant to avoid danger. Fuller says he averages eight to 10 close calls every night. "Drivers have to constantly pay attention to what's around them," he says. "What I would describe as a normal day would probably scare the average person."

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Navigating crowded roadways is not the only challenge drivers face. They must know their equipment, and perform constant safety checks, in addition to complying with stringent regulations, meeting exacting schedules, waiting in long lines to load and unload, and coping with weather uncertainties.

Despite these challenges, many drivers embrace the opportunity to be out from behind a desk, interact with different types of people, and see the country. "Truck drivers are the original social media," notes Norita Taylor, spokesperson for the Owner-Operator Independent Driver's Association. "They were

communicating with one another a long time ago, using CB radios. They help each other."

The driving job takes many forms—from long-haul truckers who spend most days of the month away from home to drayage drivers working out of a local port. Drivers might work exclusively in areas such as hazmat, border crossings, reefers, flatbeds, fleet, or dedicated contract carriage, or every job may be different.

Ride along with *Inbound Logistics* as we celebrate a few veterans of the road.

CURREC Cents Wacco DRIVIN drives trucks. Texas and we Year I HOW TF and no oil less kills. of dri hope help;

YEARS ON THE ROAD O O O O

CURRENT JOB: Line less-than-truckload (LTL) driver for Central Freight Lines (CFL), a regional carrier based in Waco, Texas.

DRIVING EXPERIENCE: Bobtail, step van, tractor-trailer. Fuller drives one of CFL's 114 compressed natural gas (CPG) trucks, part of a clean air initiative. Fuller was named the Texas Trucking Association Driver of the Year in 2012, and went on to be chosen as the National Driver of the Year by the American Trucking Associations.

HOW TRUCKS HAVE CHANGED: Fuller has gone from gas to diesel and now CPG trucks, and saw the welcome addition of power steering, monitors and sensors, air conditioning, and other improvements. Early on, drivers had to check oil levels and spark plugs manually, and maintain repair skills. "If you had a breakdown during a long stretch of driving, and you couldn't fix the truck, you had to hope the next driver who came along would stop and help," he recalls. Paperwork was completed manually

and carried on board, and losing it was a huge problem. Today, sensors monitor equipment conditions and recommend how to get the best fuel mileage, and communication is much improved. "Drivers have to be much more educated now because they have to understand the equipment they're operating," says Fuller. "These days, we use more brain than brawn."

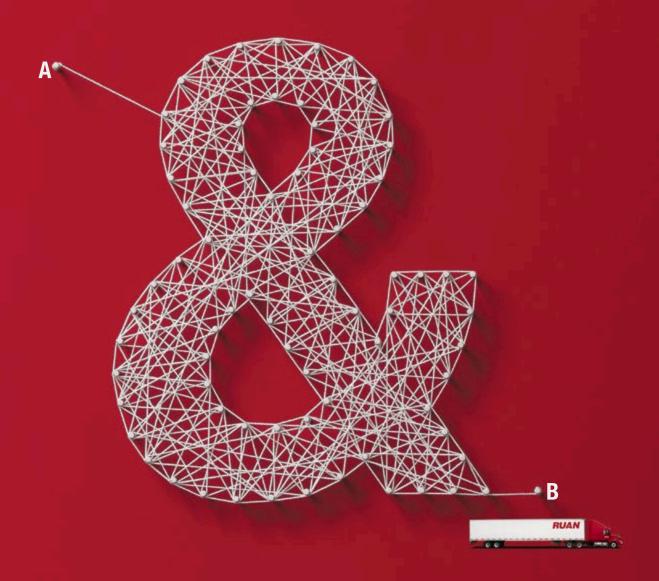
WHAT HE ENJOYS: Fuller has put himself on call as a mentor to new drivers. "The only way we can keep people in this

industry is to be willing to nurture them," he says.

MEMORABLE MOMENT: Fuller has saved a few lives while out on the road. In one instance, many years ago, the driver of a passenger vehicle stopped near him as he pulled off for a safety check. "I realized she was in distress," Fuller recalls. Unwilling to leave the woman alone, he flagged down help to get her to a hospital.

WHAT SUPPLY CHAIN MANAGERS NEED TO UNDERSTAND: Truck driving is a profession that deserves respect. "Drivers need to be dedicated to the profession; we're the lifeblood," Fuller says. "People hear you're a truck driver and expect you to have a certain appearance, but drivers could wear a three-piece suit because they do not touch the delivery." Fuller says he saw a change in how people regarded him only after he won the National Driver of the Year title.





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CURRENT JOB: K&J Trucking, a specialized refrigerated carrier in Sioux Falls, S.D. **DRIVING EXPERIENCE:** Reefers, flatbeds, dedicated, tankers, double- and tripletrailers—"everything but cattle," Hall says.

HOW SHE GOT STARTED: Hall liked riding in the heavy equipment at her father's construction business, so he suggested she try driving. She attended driving school, then rode along with an experienced driver for three weeks. BEST ADVICE SHE HAS EVER RECEIVED: Her

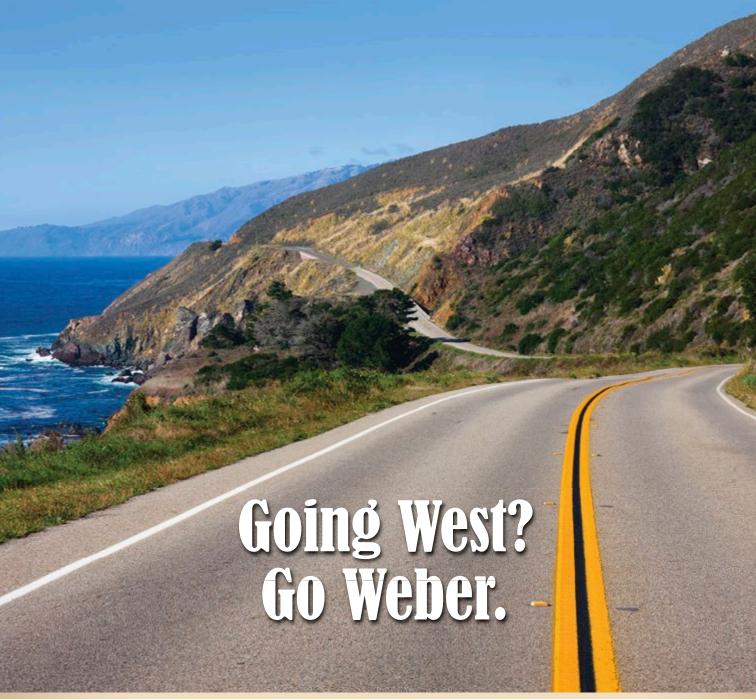
training driver taught her three things: never go downhill faster than you went up; be respectful of the name on the truck; and the job is not trial and error. An error can be devastating.

WHAT HAS CHANGED THE MOST: "When I first started, I wanted to hang out at the truck stop or casino, then push to get to my destination," says Hall. "That's not fun.

Now I take enough time, and it's less stressful." A hidden bonus is to arrive early because a receiving dock will often take delivery as much as one hour early, which can avoid a long wait when other trucks arrive.

BEING A WOMAN IN TRUCKING: There weren't many female drivers when Hall started in 1989. "At first I wasn't received well," she recalls. "Other drivers would say, 'let me back that truck into the dock for you,' or 'have your husband come in here.' They could not comprehend that a female could do this job alone in a truck." Today, most drivers are unfazed, she says.

JOB HIGHLIGHTS: Seeing the country and enjoying four seasons—her South Dakota neighbors experience only winter and summer. She also enjoys the variety. "Every day is different," Hall says. "I was a paralegal for 18 months, and it drove me bonkers." WHAT SUPPLY CHAIN MANAGERS NEED TO UNDERSTAND: The driver shortage has rushed people into the job, and training is sometimes compromised, Hall says. "It's not safe for the general public," she adds. "Drivers have to know how much weight they're carrying, and the wind speed. They need to figure out that if they have 31,000 pounds of freight on the truck, with a 50 mile-per-hour wind, they need to drive at 61 mph," Hall says.



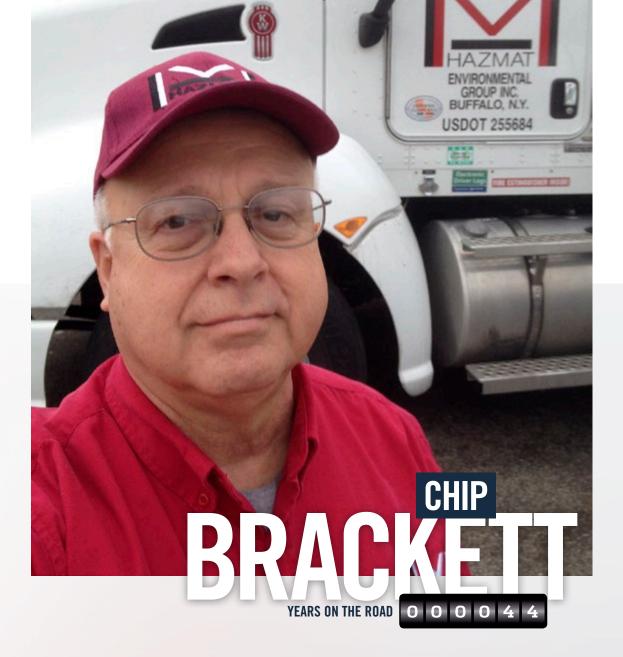
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CURRENT JOB: Long haul hazmat for HazMat
Environmental Group, a chemical products and
by-products carrier based in Buffalo, N.Y.
DRIVING EXPERIENCE: Low boy, heavy haul, flatbed,
and hazmat. Brackett enjoys working for HazMat
Environmental because he feels the company puts
safety before profits. He avoids jobs west of the Rockies
because of strict enforcement practices in California,
Nevada, and Oregon. "We always pass," Brackett says,
"but it takes a lot of time."

HOW HAZMAT IS DIFFERENT: Salaries—hazmat generally pays more—and status. "People respect drivers more when they display four, five, or six different hazard categories," he says. "I see a difference in how I'm treated by Department of Transportation inspectors versus how they treat the average driver."

HOW HAZMAT HAS CHANGED: In 1973, Brackett picked up a load in Chicago and the shipper handed him a

"respirator"—actually a paper face mask—and shared

these instructions: "If you have an accident, run into the wind." The shipper offered little regulation, or information. Beckett decided to take a six-month chemistry course to educate himself. Today, hazmat hauling requires initial and annual training. Hazmat regulations are changing to align with international requirements, so drivers need to keep up to date.

MATERIAL HE AVOIDS: Brackett hauls many different hazardous materials. He avoids temperature-controlled, full-strength organic peroxide. "It's highly unstable at higher than 45 degrees," he explains. "If the refrigeration quits, drivers only have a few hours to get it fixed or get dry ice before it creates a big hole in the ground. I've seen it."

WHAT SUPPLY CHAIN MANAGERS NEED TO UNDERSTAND: The implications of Hours-of-Service regulations. Like other drivers, Brackett says the 14-hour clock prevents him from stopping to take a break, contrary to the law's intent to make driving safer.

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CURRENT JOB: Dedicated contract carriage driver for Nussbaum Transportation in Hudson, Ill. Miller carries goods for a large consumer electronics company. He sleeps in his vehicle five nights a week, and makes it home on weekends.

DRIVING EXPERIENCE: Long haul, dedicated.
WHY DEDICATED?: "Over-the-road drivers are at the mercy of everybody else," says Miller. "But as a dedicated driver, I know where I will be at any given point each day, and can plan my life accordingly. I can stop at the same truck stops, know what time the lines form at the shower, and see the same people. It's less stressful and easier to get quality sleep." Dedicated jobs are

coveted, and earned by those who demonstrate professionalism and accountability.

HOW DRIVING HAS CHANGED: Equipment is modernized, more comfortable, and more reliable. Miller recalls when he had to scrape ice off the truck's inside windows to get going in winter, and the cab getting so hot one summer that soda cans exploded.

WHAT HE ENJOYS: Meeting new people and the opportunity to counsel new drivers.

WHAT SUPPLY CHAIN MANAGERS NEED TO UNDERSTAND:

"Dedicated transport scheduling is tighter because you only have so many hours to get the job done," he says. "That time doesn't factor in traffic jams or breakdowns. The roads are more crowded, but efficiency is tighter."











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CURRENT JOB: Intermodal driver, safety trainer, and investigator for Schneider, a truckload, logistics, and intermodal services provider based in Green Bay, Wis.

DRIVING EXPERIENCE: Dedicated long haul and intermodal. Switching to intermodal allowed Ceccacci to stay local in Atlanta, where intermodal drivers move goods to and from three major railheads.

what MAKES INTERMODAL DIFFERENT: Intermodal trucks move non-stop, with containers being transported around yards, or live loaded, dropped, and retrieved from shippers. Containers are top-heavy and drivers must check locking pins constantly; skipping safety checks is not an option. "It's a busy working environment, with many moving parts, particularly on the ramp," Ceccacci says. "It's not like on the road; the trains don't blow horns. You have to keep your wits about you."

what has changed the most: Safety. "Schneider gained thousands of chassis, so we can pre-trip our own equipment," Ceccacci says. The alternative is a chassis pool, which tends to get more wear and tear, and drivers know less about how equipment has been maintained. "Safety has been greatly improved," he says. "GPS and computer systems provide much more information and efficiency than we had 10 or 15 years ago."

what he likes: Being outdoors, seeing sunrises and sunsets, and enjoying a sense of accomplishment. "Driving is still a relatively new industry, and it's constantly changing," Ceccacci says. "That makes it exciting. You never know what's around the next curve."

WHAT SUPPLY CHAIN MANAGERS NEED TO UNDERSTAND:

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CURRENT JOB: Driving a 650-mile daily route for UPS towing twin 28-foot trailers from Orlando, Fla., to Unadilla, Ga., and back. Odom recently hit four million miles without an accident, the first female UPS driver to do so.

DRIVING EXPERIENCE: Delivery trucks and tractor-trailers. HOW SHE GOT STARTED: Odom grew up on a farm in Rutledge, Tenn., and mastered the clutch on a John Deere tractor when she was 12 years old. She applied to UPS while working in a boat store in Orlando. After nine years maintaining the hectic pace of delivery driving, Odom switched to tractor-trailers.

BEST PART OF THE JOB: "I love to drive and I love being outdoors," Odom says. "I would go crazy in an office." She also likes the camaraderie among fellow drivers, and their willingness to

help one another. One example: recently, Odom noticed another UPS driver's rear brake light malfunctioned, so she trailed him to help minimize the danger.

what has changed: Behavior on the roads, particularly since the emergence of cellphones. "Drivers are so involved with their phones and where they're going that they don't notice when a truck is in front of or behind them," she says. Odom recalls a close call she had the day after hitting the four-million-mile mark, when a car cut her off. She also doesn't like cars that cruise in the middle lane, because it's the only option for a truck when passing.

what supply chain managers need to understand: "Every day is a challenge," Odom says. "Truck drivers must drive for everyone else, and remain vigilant when others are not."





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From produce truck driver to president emeritus of Salt Lake City-based C.R. England, one of North America's largest transportation companies and temperature-controlled carriers, Gene England continues to thrive at age 95. He never fully retired. After turning over C.R. England's leadership to his sons, Gene and his brother Bill founded G.B. Leasing, which provides vehicle lease options to employees, drivers, and independent contractors of C.R. England and its affiliates.

England's father started up the C.R. England business by trucking the produce his neighbors grew. Gene enlisted in the U.S. Army during World War II, where he received the Bronze Star. He earned extra money by selling his cigarette rations, then used it to purchase a truck to help grow his father's business. Following the war, Gene and Bill returned to work with their father, and expanded the company nationally. C.R. England became the first trucking company in the nation to offer 72-hour coast-to-coast delivery service, and Gene initially worked there as a driver.

That driving job has changed considerably since

those early days, England says. "In 1946, it was a privilege to be able to drive a truck," he notes. "A driver was recognized as a man who could handle a big unit, and there weren't too many around."

All the work was manual—steering and transmission—and the driver typically did all the loading and unloading. Today, he says, drivers don't get the same respect. Some shippers won't even allow drivers to use their restrooms.

The roads were much different, too.

"When C.R. England started service to the East Coast, there were two lanes from Los Angeles to Chicago, then we'd take the Turnpike east," England recalls. That improved with the development of the Interstate Highway System in the 1950s, and truck stops began to proliferate. "Highways are vastly improved today," he adds. "The volume of cars and trucks on the highways, however, makes it harder for drivers all the time."

Despite the challenges, driving is a job many people love to do, England says. "They enjoy traveling and seeing the beauty of the country."

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REGULATORY UPDATE PLAYING BY THE RULES

Mark our words: Legislative and regulatory resolutions could spell trouble for shippers and carriers in 2015.

BY JOSEPH O'REILLY

"ALMOST ANYTHING WOULD LOOK LIKE ACTION COMPARED TO 2014," SAYS BRUCE Carlton, president and CEO of the National Industrial Transportation League (NITL), an Arlington, Va.-based pro-shipper lobby.

Given November 2014's electoral outcome, and Republican control of both the Senate and House of Representatives, 2015 should be a referendum on what Americans want—better still, what America needs. The problem is, it takes time.

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Consider current circumstances:

- President Obama's 2011 Food Safety and Modernization Act—the first such piece of food safety legislation in more than 70 years—remains roiled in rulemaking. A resolution is mandated for 2015.
- December 2014's omnibus package rolled back the Federal Motor Carrier Safety Administration's (FMCA) 34-hour restart provision in the much-maligned Hours-of-Service (HOS) rule.
- The Surface Transportation Board (STB) has been laboring for nearly four years over NITL's Ex Parte 711 resolution regarding competitive rail switching. The STB is waiting to decide on whether it should decide.

Such are the vagaries of legislative meanderings and regulatory pomp. Circumstance is usually an afterthought. And the transportation and logistics sector is always the first to pay.

"Transportation is an 'ol-timey' business," explains Randy Mullett, vice president, government relations and public affairs for Ann Arbor, Mich.-based transportation company Con-way. "It doesn't get the same kind of research and development credits that high-tech or newer industries receive. The transportation sector pays the established corporate tax rate, so anything that reduces that rate is a huge benefit."

Debate over tax reform will shade many of the hot topics in transportation and logistics, Mullett contends. But he's unsure whether 2015 will actually bring more action.

"Tax reform might be more visible because the press will play it up as Republicans wanting to change something, and President Obama wanting to get something done in his last two years," Mullett says. "Many of these rulemakings have been in flight for a while. Government is just working hard to get them out now."

Case in point: At the end of 2014, The National Labor Relations Board (NLRB) was busy pumping out a series of different complaints and rules pertaining to ease of organization, access to employee emails, and exempt employee status, among other things. The board has five members, three of whom always represent the President's party. But one of those three Democratic appointees expires in December.

"I guarantee Republicans won't approve

another appointee in 2015, so it leaves the board deadlocked at 2-2," Mullett says. "Looking at a situation where it might not be able to take action for another two years, the NLRB was trying to push action through at the tail end of 2014. Many of those rules will take place in 2015."

Then there is the Keystone XL pipeline conundrum, which will likely be the first bill that comes across President Obama's desk in 2015. The bill has major implications not only for U.S. energy development, but for transportation as well. When crude oil inevitably moves off the rails—how much remains to be seen—it creates extra bandwidth elsewhere in the system.

So much of U.S. regulatory policy has an impact across industry and transport modes, which makes the consequences that much more compelling.

HIGHWAY TRUST FUND

The biggest issue on the docket for transportation and logistics players is the Highway Trust fund. Everyone agrees that infrastructure need is acute, but consensus remains fleeting on how to fund projects.

"The Highway Trust Fund is one of the most important, long-term issues for carriers," says Tom Vandenberg, general counsel for Green Bay, Wis.-based truckload carrier Schneider. "It's funded through the fuel tax, which was last increased in 1993. Schneider supports a user-pays-user benefits approach to highway funding."

The authorization expires at the end of May 2015. For Carlton, only one question is on the table: "How will America pay for infrastructure investment moving forward? It's not free, so the money has to come from somewhere. Congress makes that decision.

"We're all looking up to the Hill," he adds. "But we can't predict whether Congress will come up with a sustainable way to pay for it, or kick it down the road again."

Over the years, Highway Trust Fund expenditures have progressively expanded to include concerns beyond road construction and maintenance. In today's world, public transit, bike paths, sidewalks, recreational trails, landscaping, and historic preservation count as infrastructure enhancements, therefore straining resources.

Transportation funding was a focal point at the state level during November 2014's mid-term elections. Wisconsin and Maryland voters notably voted in favor of allocating transportation revenues

HOURS-OF-SERVICE RESTART

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Congress' decision to rollback the Hours-of-Service (HOS) "34-hour restart" provision in the December 2014 omnibus bill is good news for shippers and carriers. The law now reverts to the rules that existed before the HOS regulations went into effect, pending a mandated study of the restart directive's overall impact, which was a condition in the MAP-21 legislation to begin with.

Drivers are again permitted to restart their weekly hours by taking at least 34 consecutive hours off-duty, regardless of whether or not it includes two periods of time between 1 a.m. and 5 a.m.

"The rollback of the restart rules has the potential to increase productivity in the long-haul, irregular-route truckload industry by about five percent," says Randy Mullett, vice president, government relations and public affairs for Con-way. "So we will regain some of the capacity that we've been worried about."

While the rollback is a welcome reprieve for the transportation industry, HOS has become a moving target. Carriers and shippers have already made efforts to address aspects of the new provisions, adding costs while reducing productivity.





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specifically for transportation-related projects rather than as part of a general fund.

While lingering acrimony over the Affordable Care Act will likely fuel Congressional business in early 2015, the highway bill and conversations on how to fund it is expected to dominate conversation. "If fuel taxes go up, the cost of fuel increases and shippers' fuel surcharges escalate," Mullett says.

As oil prices drop, a fuel tax increase might be the only realistic measure to help fund and sustain U.S. infrastructure needs.

"Our analysis suggests a 15- to 20-centper-gallon increase is necessary to maintain haulers are hoping for 97,000-pound weight limits for six-axle equipment. Both initiatives offer economy and environmental benefits.

NITL fully supports efforts to give states the right to increase weight limits with six-axle vehicles, as well as extend trailer lengths.

"Heavier and longer both make sense where states determine it works best," says Carlton. "That will not work on Fifth Avenue in New York City, but it will on cross-country moves. It's efficient, reduces trips, and benefits the environment. And we see negative safety implications."

Smaller trucking companies and owner operators are concerned about perception. Any forced compliance that adds cost, however beneficial, runs the risk of alienating those on the margins. And as FMCSA hits the reset button on Hours-of-Service rules, there's no shortage of inquiries.

"The bigger question for shippers is whether ELDs will have an impact on capacity," says Carlton. "Will they disaffect drivers, and cause more to leave the business than otherwise expected?

"In the non-regulatory, non-legislative world, a dark cloud hangs over the whole capacity issue—both in truck and rail," he adds.

Mullett doesn't anticipate the new ELD implementation rules will take effect until 2017 or 2018—so an impact won't be felt for a while. However, FMCSA is ready to move on enforcing speed limiters on trucks, and creating a 65-mile-per-hour national speed limit.

FMCSA's Compliance, Safety, and Accountability (CSA) scorecard program has similarly constrained driver recruitment. But compared to HOS, there has been far less outcry within the industry. It's hard to outwardly criticize any measure that properly vets drivers and carriers, and emphasizes safety.

DRUG TESTING: JUST SAY YES

But that may not be enough. FMCSA is also proposing a national drug and alcoholtesting clearinghouse that could diminish an already vanishing driver talent pool even further. Current federal regulations require employers to conduct mandatory pre-employment screening of commercial driver's license (CDL) qualifications based upon a person's record.

To date, no federal repository records positive drug and alcohol tests by CDL holders.

"The trucking industry is required to perform urine drug tests in three scenarios—pre-employment, at random, and post-accident," explains Vandenberg. "Schneider and some other carriers are now testing hair samples for the presence of drugs. It's expensive. But the positive hit rate for hair testing on pre-employment is 3.5 percent, compared to .003 for urine testing. If drivers stay clean for a few days, they may be able to beat the urine test."



Congress' decision to roll back the Hours-of-Service "34-hour restart" provision was good news for both shippers and carriers. Truck driver productivity could potentially increase, which would help alleviate capacity concerns.

current transport infrastructure performance," says Vandenberg. "In the long term, we see a vehicle mileage tax. But that's not ready for prime time right now."

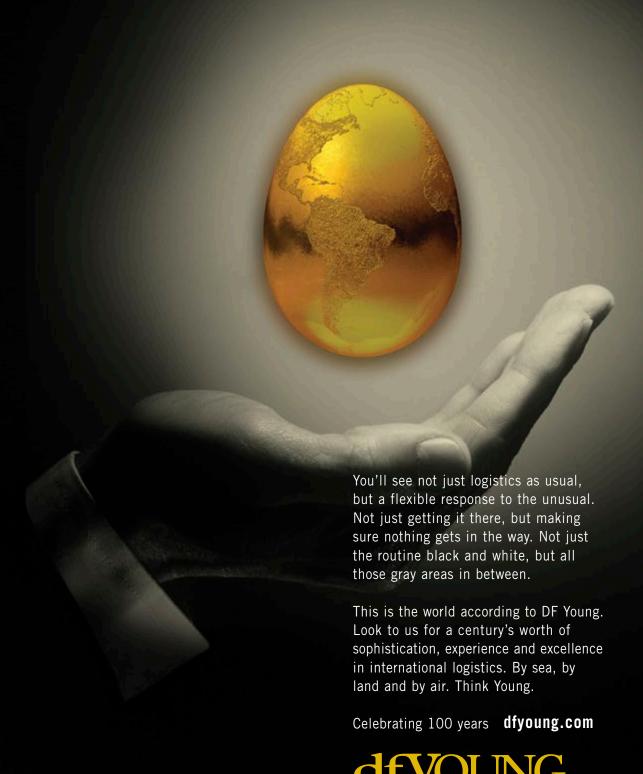
ON THE ROAD

Truck size and weight is another area of contention legislators will have to tackle in a MAP-21 Surface Transportation bill extension, pitting railroads and the public against over-the-road carriers. It's a public relations struggle the trucking industry will never win—regardless of reason. Carriers want double 33-foot trailers to replace twin 28-footers where they can run them. On the truckload side, heavy commodity

Trucking companies are also dealing with the rollout of mandatory electronic logging devices (ELDs)—on-board recorders in pre-MAP-21 verbiage. ELDs are a front-and-center concern on carriers' regulatory dashboards. Many larger trucking companies—Schneider for example—have already made necessary investments in such technology.

"Electronic logging will be significant in 2015," says Vandenberg. "The recent omnibus bill pressed the Federal Motor Carrier Safety Administration to finish its rulemaking by June 15, 2015, which pushes the deadline forward by three months. It likely won't be fully implemented for two years."

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FMCSA's proposed rule would create a database for collecting and storing this kind of data. It would require employers to conduct pre-employment searches for all new CDL drivers, as well as annual searches on current drivers.

Driver employment is also a focal point in FexEx Ground's ongoing legal wrangling with the NLRB regarding independent contractors—an issue that resonates for many in the transportation space. The heart of the matter is whether subcontracted truck drivers are independent or full-time employees - and therefore entitled to healthcare insurance and other benefits.

Such precedence could extend well beyond the parcel business. As capacity tightens, and same-day delivery demands challenge traditional delivery paradigms, contractor-subcontractor relationships are becoming more important.

"The contractor issue is not just a FedEx issue," says Mullett. "It impacts all drayage companies and a lot of long-haul carriers as well."

FOOD FOR THOUGHT

The Food Safety and Modernization Act (FSMA) has been languishing in review and rulemaking for the past few years but for good reason. The original draft was flawed in many ways. Pat O'Connor, counsel for the International Warehouse Logistics Association (IWLA), previously raised concerns that lawmakers were drafting rules that impacted third-party logistics (3PL) providers—not knowing what a 3PL is.

"It's mandated that FSMA's final rulemaking happens in 2015," says Mullett. "Congressional timelines for agencies have a tendency to slip, but this act has a lot of people frozen in place. It's important that it gets done."

The food supply chain will feel a cost impact. Many large players are already compliant with track-and-trace provisions and process protocol that will eventually be required. But for smaller businesses, the impact could be far greater.

Some companies have been hesitant to get out in front of the government on something that is still not 100-percent certain. "It's difficult to out-guess a rule," notes Mullett. "Making a big investment

and guessing wrong puts a company at a big competitive disadvantage. There's little benefit to leading with your chin unless a number of large customers want you to act, and are willing to pay for it."

IWLA, which represents a number of large public warehouses and 3PLs, has also been proactive in lobbying for legislation that codifies 3PL or warehouse responsibilities and liabilities—or lack thereof—when moving controlled substances through the

larger players that have the means to actually meet these new mandates. While that's not the intent, ultimately it's what will likely happen," Mullett adds.

A number of legislative items in the railroad industry threaten to derail progress at a time when business is booming. Reciprocal switching has been a contentious issue between Class I and captive rail shippers for several years. NITL is the voice for many of these rail customers, and

IWLA'S SAY

The International Warehouse and Logistics Association (IWLA) is the voice of the warehouse and 3PL industry, lobbying on behalf of

> its constituents in Washington, D.C. Pat O'Connor, partner at Kent & O'Connor and legal counsel for the IWLA, shares the group's hot docket items for 2015:

Food Safety Modernization Act. The Food & Drug Administration (FDA) is under a court order to finalize several of the regulations in 2015.

Drug Supply Chain Security Act. This act establishes a national tracing system for prescription drugs effective Jan. 1, 2015. In addition, by November 2015, FDA is to issue national licensing standards for 3PLs that warehouse prescription drugs.

Medical devices. IWLA is in the early stages of a legislative proposal to establish national licensing standards for 3PLs that warehouse medical devices.

National Hiring Standards legislation. This proposal would clarify and standardize industry best practices for hiring safe

Affordable Care Act (ACA). As the employer mandate enters into force, ACA presents problems with regards to health insurance for temporary employees.

Employment Discrimination, Diversity, Harassment, Gender, and Labor Issues (EEOC). Current guidance limits the use of criminal and financial background checks.

Truck size and weight. IWLA supports legislation that increases truck length and reduces weight.

supply chain. Who owns the products? Who's responsible for reporting? What kind of background checks do companies need for employees? What level of security is required for facilities?

These are important considerations, especially when a company is working in a shared warehouse environment where requirements vary.

"Because the FSMA regulations are more onerous—as are FDA drug rules the de facto effect will concentrate among its Ex Parte 711 initiative on competitive switching has become a rallying cry.

The issue is simple in theory, but difficult to execute. Rail shippers don't want to be held captive to one Class I carrier. They want railroads to be responsible for switching carloads to other Class I carriers within 30 miles of a terminal, creating more competition.

Railroads counter that the time and cost associated with reciprocal switching would have a deleterious impact on



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service—at a time when the industry faces increasing scrutiny over winter 2014's operational delays.

"Currently, all we're asking STB to do is make a decision on whether to move forward with a rulemaking," says Carlton. "We're not asking for it to decide on the merits of the argument right now; rather to give the shipper community and railroads an opportunity to comment formally on a new rule."

As divisive as reciprocal switching has become, it has taken a legislative back seat since the 2013 *Lac Mégantic* derailment in Quebec, Canada. The accident put a public face on the safety and security of growing crude-by-rail traffic—as well as North America's energy boom and the lack of adequate pipeline infrastructure necessary to match demand.

Specifically, *Lac Mégantic* has raised concerns about the DOT-111 tank cars that are currently used to transport crude oil. Starting in Canada, and now the United States, consensus is building that equipment needs to be upgraded.

"We're awaiting the new tank car rule from the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration, which is expected to come out in late winter or early spring 2015," says Carlton. "This has huge implications for any company moving hazardous materials."

Shippers have billions of dollars at stake because they generally own and lease tank cars. Regardless of how the final rule takes shape in terms of mandated retrofits, and the construction standards for new car buildings, costs will increase significantly.

"The new rule will be expensive," says Carlton. "The questions remain: Will the timelines be rational for both retrofits and the delivery of new cars? And is it doable?"

REVENUE CHALLENGE

Another important issue that NITL and its rail shipper constituents are keeping an eye on is STB's assessment of the railroads' revenue adequacy regime — Ex Parte 722. Shippers want the STB to examine the methodology for determining revenue

adequacy and how it should be used in judging the rationality of shipper-challenged freight rates. Many believe it's out of date

"Elements of the methodology are meaningless to the investor community, which does its Wall Street MBA analysis on Class I performance," explains Carlton. "Some have asked the board to recognize that, and to re-write or re-invent the methodology for dealing with captive rates on captive shippers.

"The captive shipper, by law, has the right to go to the board and argue it's paying too much," he adds. "The process that is wrapped around that simple right is broken. We want the STB to move forward on that as well."

Finally, as pressure on Capitol Hill builds to better appropriate funding for necessary transportation infrastructure investment, it will be interesting to see how high-speed rail and transit projects fare.

"If infrastructure investment continues, it increases the flexibility and capacity of the freight rail system. I anticipate that might



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be a significant outcome, given the change in Congress," says Mullett.

As North America's oil and shale gas boom continues unabated, cheaper energy prices portend a manufacturing renaissance. There are clear signs that reshoring is already becoming a reality in some industries.

FUELING NEW DIRECTIVES

The drop in diesel fuel prices changes the economics of alternative fuels. A Republican-led Congress might very well play with the U.S. Environmental Protection Agency's existing renewable fuel directives.

Regardless, heavy-duty vehicle fuel economy standards are changing. The first iteration of newer engines is coming out in 2016.

"We anticipate that, like any other EPAmandated engine change, the price of a truck will increase \$5,000 to \$7,000," says Mullett. "The more we think we're getting a break on fuel costs, the more other factors offset that." One "sleeper reg" in the works could have a major impact on the U.S. logistics sector, according to Mullett. The Environmental Protection Agency (EPA) has proposed lowering ozone standards for the United States as a whole. That could place a large portion of the country in "non-attainment"—areas that are considered to have air quality worse than the National Ambient Air Quality Standards as defined in the Clean Air Act Amendments of 1970.

"Whether you agree with the EPA or not, the proposal has a practical impact," notes Mullett. "Companies in a non-attainment zone, which accounts for 65 percent of the country, won't be able to take any action that increases greenhouse gases.

"Suddenly, companies can't site a warehouse where they want to, or expand a distribution center, because it creates more truck trips or rail car moves," he adds. "Ultimately it comes down to choice, capacity, and cost—the three factors that matter most in warehousing and logistics."

One legislative initiative could have

a significant impact in the airfreight industry. The House Transportation Committee has been bandying about the idea of privatizing the U.S. air traffic control system as part of the Federal Aviation Administration reauthorization bill. The consensus is airlines will fare better by separating from the Federal Airline Administration (FAA).

"Everything in the airfreight sector will revolve around the NextGen air traffic control program," says Mullett.

NextGen is the FAA's multi-billion-dollar project to switch from a ground-based radar system to a satellite-based control network.

"The switch has huge implications for increasing air space in major metropolitan areas," adds Mullett. "Theoretically, it allows carriers to move flights closer together more quickly. It will provide greater flexibility to the airline industry, both for passengers and freight."

Regardless, FAA direction is likely to come under more scrutiny as the privatization play runs its course.



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The best way to learn is to ask questions. So we did. Listen in on our interviews with supply chain leaders in various industries and learn how they tackle and solve complex industry challenges.

By Joseph O'Reilly



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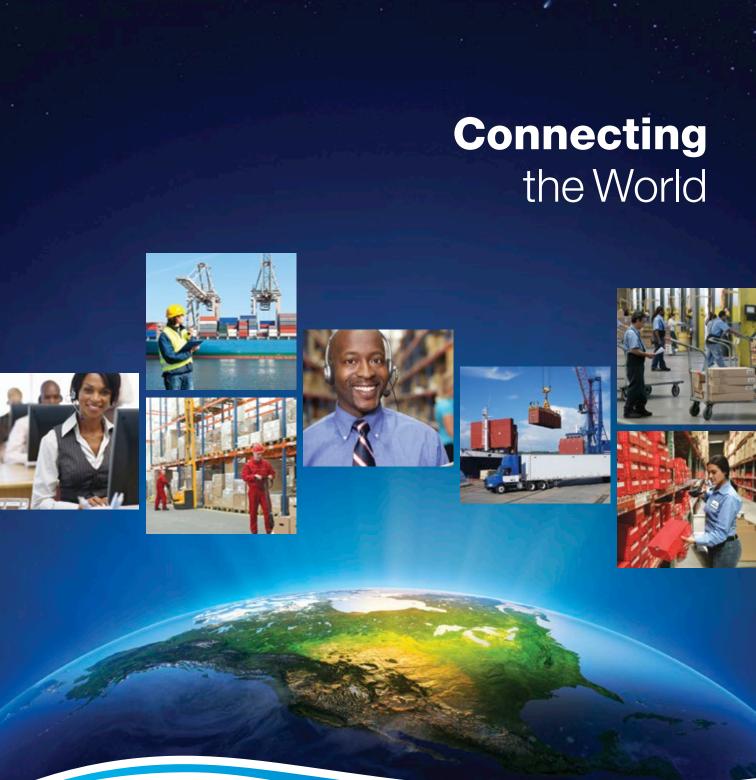
Clothes Encounters: The Logistics of a Revolving Closet

With its subscriptionbased clothing rental model, Gwynnie Bee is tailoring the rules of e-commerce to make fashion fulfillment a perfect fit. igh-end women's fashion is a fickle thing. Fads fade, styles come and go, and tastes turn with every new season. It's an industry where clothing companies create demand—designing new fashions, generating hype, and selling to that. It's all about the push, not the pull. While demand responsiveness is still important, manufacturers and retailers place greater emphasis on mining sales data and divining consumer likes and dislikes.

The fashion industry is also unique because e-commerce doesn't come easy. While virtual storefronts present another channel to deliver Fifth Avenue window displays through a Windows browser, one critical challenge remains—making sight-unseen shopping less risky.

In this regard, brick-and-mortar retailers will always have an edge when it comes to customer service. Women's couture, in particular, depends as much on the experience of touching and feeling garments as it does swiping a credit card.

That's why New York City start-up Gwynnie Bee is creating a buzz in the e-commerce fashion world with its Netflix-like business model. The subscription-based clothing company, which set





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Returns are central to Gwynnie Bee's supply chain. The company receives and processes about 5,000 returned garments daily.

up shop less than three years ago, is bringing the showroom effect into the home. Gwynnie Bee caters to plus-size women's clothing—sizes 10 to 32—providing clientele with a virtual wardrobe that lets them mix and match outfits with an option to buy.

Inbound Logistics recently caught up with Robert Escobar, vice president of operations at Gwynnie Bee, for a behind-the-scenes look at an e-commerce company that is rewriting the rules of fashion fulfillment.

What's the story behind Gwynnie Bee?

OUR CEO CHRISTINE HUNSICKER FELT women weren't excited to go shopping anymore. She was aware that e-commerce options weren't readily available to them, limiting their ability to experiment with different types of styles, fabrics, and colors.

When we started Gwynnie Bee, we wanted to identify the space that would give us the fastest traction. It was obvious: The plus-sized market, which is severely underserved in both retail and online.

Hunsicker believed women did not have enough flexibility and variety in their closet—so she came up with the idea of a subscription-based clothing rental service. Even in today's new "share" economy, Gwynnie Bee is still unique. It is the only subscription-based company that allows women to sign up for different plans—they can receive between one and 10 items—with unlimited exchanges and free shipping.

How customers revolve garments is entirely up to them. Some are savvy—as soon as they receive the clothes, they wear them, then send them back. Those customers turn the virtual closet quickly, and derive a high degree of value from the service. If customers like an item, they have the option to buy it. We offer the added comfort of a try-and-buy service. It's flexible, allowing women to experiment with clothes.

Given the option to buy, is there a time constraint on how long a customer can hold on to an item?

NO. ONE BENEFIT OF THE SERVICE IS ITS flexibility. Let's say a customer rents a dress and wears it a few times, but still isn't sure she wants to buy it. She can hold on to the dress for one month, then buy it. We already have the customer's credit card in our system, so it's an easy one-click transaction

Few women wear a garment more than three times, because then they have to wash it. We don't encourage customers to wash our garments because we have our own cleaning process internally. But, if someone wants to wash and wear a garment again, that's fine. We want to give the consumer freedom and flexibility to enjoy that item.

From a logistics perspective, I love the fact that we don't have to pay for shipping when we sell an item. We can sell customers a product that they already have.

What would dissuade a customer from not returning an item?

ALGORITHMS IN OUR SYSTEM ISSUE AN automatic e-mail to customers who hold a garment for more than three months. We let them know that they can buy the garment if they want to. The same process works if someone cancels their subscription and still has our clothing. We give customers the benefit of the doubt. Many just forget to return the items, and 90 percent of late returners comply once we remind them.

We're not naive, and we will have to look at non-returners more closely as we grow our customer base. But currently, Gwynnie Bee is a close community—we call it social commerce. Our customers do a great job



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policing one another. They rate garments on our website, and provide a lot of feedback. That's big data that we take back to our manufacturers and brands.

Take a step back, and describe Gwynnie Bee's supply chain from a sourcing and transportation perspective.

BETWEEN DESIGNER BRANDS AND private labels, we source from hundreds of suppliers. Most of our product comes from domestic wholesalers, but we buy outside the United States as well. If we plan things right, our shipments go on a boat. If we're running tight, they go on a plane. We're conscious of our air spend because it generally indicates poor planning.

who can expedite shipments to the home. As the company grows, we want to build out a network where we can guarantee one-to two-day deliveries to customers.

Talk about the logistics challenges you face with this subscription-based rental model.

I'VE BEEN DOING SUPPLY CHAIN, distribution, and logistics my entire career, and Gwynnie Bee is, hands-down, the most complex model I've gotten myself involved in. But it's exciting.

We launch new fashion collections as many as four times each week. We display the new fashions on our website and Facebook page, and send e-mail blasts

"The majority of our product is on the move, and that's what we want. We don't want inventory sitting in the warehouse."

As product comes in periodically throughout the week, we process it and stage deliveries. There's a structure to how we launch new items. Product has to be aligned with the season and current trends, so we're constantly in touch with our buying department.

We use several less-than-truckload carriers, as well as UPS and FedEx. Outbound shipments move exclusively through the U.S. Postal Service. That will fundamentally change over time, because we want to start optimizing shipping zones. For example, we will explore finding a lower-service product that still delivers in two to three days.

As a startup, Gwynnie Bee is focused on getting product to customers as quickly as possible. We won't compromise on delivery. We're aiming for four to five days from the time customers book an order to the time they receive it at their door.

We're also thinking about opening another distribution center on the West Coast to take advantage of regional carriers to get customers excited about these new items. That's a small percent of our total inventory.

Reverse logistics, which focuses on returns coming back into our distribution center, is central to our supply chain. We just opened a new DC in Columbus, Ohio. Our consultants were scratching their heads when we designed the facility because we wanted to locate returns in the middle of the building. But once they understood our business, they knew why.

Returns feed our machine; we receive up to 5,000 garments each day. Our average return shipment is about 1.7 garments.

It's important to recognize that we don't generally sell inventory. It's not a traditional e-commerce sales transaction; it's more like a transfer in a warehouse management system. We move inventory from one location to another, even if it's from the warehouse to a home. Our IT system is homegrown, so it gives us flexibility to work this way.

Returns transfer back into our DC inventory, then go through a number of different stages. We have to rigorously inspect all garments to make sure the buttons are in place, and that nothing is ripped or stained. Then the clothes are sorted by dry cleaning or laundry, and sent out to our cleaning partners.

We're in the process of insourcing cleaning—it's a multi-year project because of the investment. But we currently send all garments out for cleaning the same day we get them. Return shipments come in around 7 a.m. We process returns by 10 a.m., then deliver to our cleaners, who need to send garments back in less than 24 hours. The garments are re-inspected after they come back from the cleaners, then stocked and picked in the afternoon.

Our service level agreement is 24 hours, but the churn is usually faster than that. The name of the game is speed because we want to utilize that inventory as many times as we can within reason. Clothing can start to look a little worn after 10 or 11 turns. We take product out of inventory daily to ensure quality.

How do you keep track of inventory within your system?

EVERYTHING IS BAR-CODED AND ITEMS are scanned in and out as they move through the system. We are striving to use RFID, but it's not conducive to our current business operations.

We also have to be sensitive to the stigma around renting clothes. Even though customers know their garments are rentals, we don't want to continually remind them with a big old bar code inside a dress. It removes the romance. We want to make sure we preserve a positive experience.

We use a 2D bar code that measures one quarter of an inch by half an inch—the size of a fingernail. It's embedded inside a garment's care or designer label so that it's not obvious to the customer, but our people know where to look for it.

As garments flow in and out of various





areas, that bar code is constantly scanned. For example, if we want to run a cycle count, or take a snapshot of where inventory is, we know there should be 6,000 garments staged for cleaning, or that cleaners have 5,000 items.

Admittedly, it is a tedious process. Fumbling through a garment to find a label is time-consuming. Gwynnie Bee's focus is to provide a positive customer experience. If we have to spend more money in labor and touchpoints, but we still get that result, so be it. We're building a brand, and a loyal customer base.

From an operational standpoint, we

cleaning process will save us a lot of money. But consider how much water and electricity we would use, and the capital cost of machines. The real payoff with insourcing is bringing a 24-hour cycle time down to less than four hours. That would enable us to turn inventory faster.

The majority of our product is on the move. That's what we want. We don't want inventory sitting in the warehouse. Our buying and merchandising teams in New York are constantly looking at data and inventory in one of two ways—finding product that isn't being used (maybe we bought a style that nobody likes) and

a fluid business, it's almost impossible to go back and order another 200 units from the manufacturer, who has already moved on to the next season.

One of our biggest investments is building out our data analytics department. It's probably a no-brainer when you think about this business, but we believe this is a strategic area. We need to anticipate certain trends and behaviors, and become better buyers to optimize our inventory. If we have the data, it makes the decisions a lot easier.

Because logistics is core to your business, and you've created this subscription-based model, would you consider expanding the kind of product you rent or sell?

YES, THE OPPORTUNITY IS TREMENDOUS. First, we are selling some clothing to customers after they rent it. But if we can offer them the whole look, customers will jump at it. We're just getting started, but our ambition is to become a full e-commerce business.

We feel like we have an edge in leveraging the subscription piece. I call it the free ride. Consider this as an example: A woman rents a dress. Does she know her dress goes well with a certain pair of boots or that gold bracelet? We have an upsell opportunity. The customer clicks on the boots and the bracelet, and the transaction goes through.

With the way our fulfillment system works, we can match that purchase with what the customer just rented—so the whole outfit is shipped at once. Other businesses might charge the customer separately for that. But in today's world, everyone is trying to move toward free shipping or at least lower-cost shipping. So we get that added benefit.

Everything that drives logistics ultimately drives a positive experience with the customer. You cannot survive in e-commerce today if you're not thinking about logistics.



Inventory that's constantly in motion, tight order cycle times, and fast deliveries drive Gwynnie Bee's success as a subscription-based clothing rental business.

want to reduce time. That's why we want to look closely at implementing RFID technology.

Gwynnie Bee's inventory is constantly moving. What challenges or opportunities does that present?

WE LOOK AT INVENTORY IN A HOLISTIC way. Ask me how much product Gwynnie Bee has, and I'll say more than 100,000 garments. If we stop the music and take a snapshot, about 35 to 40 percent of inventory is sitting in the warehouse in various stages. The rest is with our customers. Utilizing inventory heavily is our thing.

There's a perception that insourcing the

taking it out of the system; or conversely, identifying when we didn't buy enough of a certain product.

Let's say we bought 75 units of a popular dress in size 10, but 450 customers want that dress. Even if each person holds on to that garment for one week, we're way under demand. On occasion, we take a SKU out of the system to smooth demand simply because we want people to have a good experience.

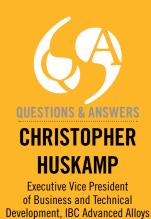
We're starting to test sending data-driven e-mails to customers who have one dress on order that recommend similar dresses that are in stock. We're only confined by what inventory we have. Because it's such



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A New Die is Cast: Digging Into the Rare Metals Supply Chain

IBC Advanced Alloys puts a pedal to the metals to manage the logistics of complex manufacturing. hen you get into complex manufacturing, the idea of a supply chain is misleading. Networks are anything but linear. The depth and breadth of the supply base alone more closely resembles a chain link fence.

As you dig deeper into the origins of certain products, such as metals and alloys that bring "things" to life, lead times inevitably grow. End-user demand changes trigger swings in inventory upstream, which creates bullwhip flux that is difficult to modulate. Then factor in the challenges of sourcing from geographically constrained supply sources; shipping high-value, bulk materials; and dealing with regulatory bureaucracy.

Welcome to the world of rare earth metals such as beryllium—a difficult to find, yet increasingly relevant material in the aerospace, defense, oil and gas, and consumer electronics industries.

IBC Advanced Alloys, a Vancouver, British Columbia-based beryllium and copper alloy manufacturer and distributor, occupies a unique niche in this emerging space. The company operates





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IBC Advanced Alloys' unique process produces die cast parts that are three times stiffer and 22 percent lighter than aluminum.

four production facilities across the United States: a copper processing and forging plant in Franklin, Ind.; two casting facilities in Rohrsburg, Pa., and New Madrid, Mo., respectively; and an engineered materials division that performs investment casting for specific alloys based in Wilmington, Mass.

"When we started the company, it was common for processors to turn rare metals into powder," explains Christopher Huskamp, executive vice president of business and technical development for IBC Advanced Alloys. "For example, they would take aluminum and beryllium powder, mix them together, and squeeze it through hot isostatic pressing to form a block. Then they'd put that block into a machine and whittle out a component.

"But that's poor utilization of high-value material; essentially you're turning it into a bunch of chips," Huskamp adds. "What IBC has done, and what we bring to market, is technology based on investment casting and the ability to create net shapes."

Net shape manufacturing is a process that creates components closer to the finished size and shape, thereby reducing post-production machining. That's a huge advantage when making specialized beryllium alloy components for the aerospace industry.

"Sometimes the buy-to-fly ratio is as great as 30 to 1," Huskamp says. "In other words,

a 10-pound part may require a 300-pound material buy. With our manufacturing approach, we can create components with 98-percent material utilization. And we can recycle material from the casting process 100 percent."

Beyond that, IBC's Engineered Materials division is creating new alloys that deliver more compelling characteristics to manufacturers. For example, its Beralcast product—65 percent beryllium and 35 percent aluminum—is three times stiffer than aluminum with 22 percent less weight.

Beryllium is a unique metal in terms of its chemical makeup, as well as the means necessary to bring it to market. The competitive landscape is pitted with limited sources, long lead times, big blocks of material, and poor utilization. A business model and process that literally melds supply to demand, and empowers customers to buy what they need, moves the needle in a big way.

Inbound Logistics recently met with Huskamp to talk about IBC's business model and the unique challenges of the rare metals supply chain.

What is beryllium?

BERYLLIUM IS THE SECOND LIGHTEST metal after lithium. The difference is lithium explodes when exposed to air. It's also as stiff as steel. So a beryllium aluminum alloy is both light and stiff.

Beryllium has excellent thermal conductivity properties, which makes it a great transmitter of heat. It has a very low coefficient of thermal expansion. So, when beryllium is used in a manufacturing application, for example, there is less expansion of the parts and fewer temperature stresses.

How did IBC Advanced Alloys get started?

WE ORIGINALLY BEGAN WITH THE IDEA of being a vertically integrated company primarily working on the exploration side—bringing beryllium from the mine to finished goods.

When we first looked at the business, we thought we had to control the source, but we discovered that we needed to control the consumption/buyer piece first, then work back up the chain incrementally and forge strategic partnerships. That avoided large infrastructure costs.

The exploration properties didn't pan out, so we focused on manufacturing, which brings us to where we are today.

What vertical industries does IBC Advanced Alloys serve?

THE IMMEDIATE, SHORT-TERM BUSINESS primarily serves the U.S. Department of Defense (DoD), optics, and aerospace industries. The commercial side of the business provides offshore applications within the semiconductor world. We produce wire ball bondings that connect chips to substrates for phones and nearly every other product on the planet. They all require high-precision, stiff materials, especially for vibration dampening.

How does the DoD business compare with your commercial applications?

THE BUSINESSES ARE COMPLEMENTARY. The copper side of the business is an organic model. It's clicking along at 15 percent growth year over year. The lottery, or big bang opportunity, comes out of our Beralcast product—IBC's innovative beryllium-aluminum alloy.

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We have more explosive growth potential on the Beralcast side in terms of capitalizing on markets with a material monopoly. There's a huge opportunity to reduce the end user's costs. Then, because you can reduce the cost structure, you can also compete on a wider scale and against other materials.

Copper is a more established market. There are many ways to slice that apple.

What about IBC's penetration in the oil and gas industry?

COPPER IS OUR PRIMARY AREA FOR OIL and gas. It's used in making downhole-drilling tools and components that require high wear resistance, thermal conductivity, and non-sparking characteristics. Berylcast alloys aren't purposed for oil and gas.

Materion is essentially a competitor so we prefer not to buy from them. If we do, terms are less than favorable. We've also gone through the process to become an approved buyer of the DoD stockpiles. The DoD doesn't always sell its stockpiles, but when it does, we are permitted to buy. That's a major coup for a small company such as IBC.

The electronics industry is rife with concerns regarding conflict minerals. Are there similar transparency and regulatory issues in transporting beryllium?

DESPITE THE FACT THAT KAZAKHSTAN IS a former Soviet republic, the source is already fully documented and North American suppliers have been using it for many years. It's a transparent chain.

"With our manufacturing approach, we can create components with 98-percent material utilization. And we can recycle material from the casting process 100 percent."

Beryllium is IBC's bread and butter. Where does it come from?

RARE METALS OFTEN AREN'T RARE, THEY are ubiquitous. It's a matter of whether you can find them in an economic quantity. But the supply source isn't the issue. Processing is what matters. Whoever controls the processing controls the market.

Today, there are only two beryllium processors in the world: Materion in North America and Ulba in Kazakhstan. Materion takes raw materials out of the ground in Utah and processes it at a plant in Ohio; Ulba is working off materials coming out of Cold War stockpiles. Technically there's a third source in China, but it is not even a consideration for DoD product.

IBC's agreement is with Ulba, while

Beryllium is not a conflict mineral because it's not being pulled out of Africa or any area with large conflicts and exploitation issues. But it is an International Traffic in Arms Regulations (ITAR) restricted material. ITAR is a U.S. governmental policy that restricts transfer of technical information, goods, and services that would allow or enable countries on watch lists to control the flow of materials used for arms. That creates some logistics challenges.

With our commercial products, we have to go to the State Department and ask for a license to be able to ship to certain areas around the world. Paperwork goes along with that. Being able to track our product in use is important as well.

How do you move beryllium from Kazakhstan to the United States?

WHEN THE SOVIET COLD WAR MACHINE was pumping out uranium for weapons, they left big stockpiles of refuse. Beryllium coexists with uranium, and it comes from these stockpile tailings.

We procure beryllium as lump metal, and it comes to us from Kazakhstan in metallic chunks. It's bagged within a barrel within a container, and for safety and health reasons it has to be watertight.

We deal with typical container transit times; there's no such thing as expedited. Shipments have to be held at Customs and inspected. These are high-value containers so we need control and visibility.

We have to be in control of transportation using freight forwarders. We manage the transportation directly instead of through a third party. Those are important aspects of having control.

Containers are delivered to our Rohrsburg facility. Product is individually barreled in lot quantities of 50 pounds. We receive singular, batched shipments several times every year. The problem, from a logistics perspective, is that we have a surplus, then wind that down—over and over.

Just-in-time isn't an option. We want to have a stockpile, and there's money tied up in that. That could change in the future if we have the opportunity to work with a domestic source—where we don't need State Department clearance to procure material.

That's interesting, because most industries and manufacturers that use beryllium alloys are just-in-time driven.

IN EFFECT, WE BECOME THEIR BUFFER. At any given time, we look at how much beryllium we have on hand because it's a cash investment. That's significant. We can't talk about the exact cost because of our agreement with Ulba. But I can tell you, it's more than \$100 per pound. So it's expensive, especially if you have to carry a lot of inventory.

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Can beryllium be processed or shipped differently?

YOU CAN PULL UP A FEW DIFFERENT minerals, one of which is bertrandite. That can be refined into beryllium hydroxide—a white, flaky powder. But it's susceptible to water, and breaks down when it gets wet. Transporting that versus lump metal? We've opted for the latter. Cleanup becomes a health and safety issue.

With the way supply is dictated today, we think this approach works best. As we grow demand, we may have a different answer.

What happens when beryllium shipments enter the U.S. supply chain?

WHEN PRODUCT COMES INTO THE country, it's verified and tested. We reanalyze the chemical makeup. We're looking for high purity material; we don't want any contamination because it degrades our product quality down the line. If we're not careful, it can quickly turn into a negative spiral.

After product is graded and validated at our Rohrsburg location, it is distributed to our other facilities based on the quality.

We have two processing ranges—aerospace grade and commercial grade. We have a tolerance with commercial grade and have tested to validate this. We can actually use a lower grade of beryllium than we've ever received from Ulba for commercial purposes.

We can get various levels and qualities of materials that can be purposed differently. For example, a copper-beryllium alloy has virtually no beryllium, but what it does have makes all the difference in the world. It makes the copper extremely hard.

What lead times do you work with on the manufacturing side?

LEAD TIMES ON CAST PRODUCT CAN BE as short as four weeks from delivery of CAD model to shipping. Unless you happen to have that stock on hand in the specific size you want, there can be a long dwell, sometimes more than 12 months.

We can handle lead times associated with casting in one or two ways. If it's a simple part, we can use a wax injection mold. We can also use a prototype, which shortens our supply chain time by about four weeks.

Using additive and prototyping technologies changes the paradigm. The problem is, we get so fast that the machine shop becomes the long lead on. So post-processing work—whether it's machining to fine detail specification, powder coating, or painting—are the downstream processes that ironically become the long poles in the tent.

Do you have to deal with supply chain bullwhip fluctuations?

THE RISK THERE IS YOU DON'T HAVE enough stockpile and you have to go back. It's not a quick turn process. So we need a good picture of business development activities. We have to be cognizant of these pop-up demands.

The nice thing is, we have a developing technology. It takes time to get to market. If there's a pop-up demand, the response is typically low volume. So we can respond to it from our stockpile and the overages that we maintain.

IBC's innovative alloys are a hot commodity in DoD and aerospace applications. What other opportunities do you see on the commercial side?

INTERCONNECTED DEVICES—THE Internet of Things—is on the move. The challenge is getting enough chips to support all these integrated processors.

We don't know what chip will drive everything. The Internet of Things will be important because you have to make these products smart. That means they will need chips in order to process. It's not just an onoff switch. Consumers want functionality.

Your lamp will talk to your air conditioner. That change in demand is a step function, and then some. The semiconductor industry is already ramping up its sources. We're seeing evidence of that in a variety of places.

When consumer electronics ramp up, they kill every other industry. They're thinking now of what they will be doing in the next two to five years to meet those demands.

How is this "step function change" impacting what you do?

CHANGE IS FORCING US TO CONSIDER other alloys. It's a difficult process to obtain a commercial license for export. We know the boundaries, and we've tailored alloys that come in under those requirements. We can still streamline downstream processes and meet performance standards.

Our engineered materials division in Wilmington capitalizes on our unique expertise in vacuum casting and producing net shape components in a high-purity environment. We know how these materials work together with other materials from a metallurgy perspective.

For example, we provide a standard copper product to one customer in Asia. But its application is an erosive environment, so we developed a new material, a technical solution to accommodate these working parameters. That type of agility and innovation gives us a leg up on our competitors. They are either too big, or they are distributors without the capability to make the material.

It's not that we're cutting distributors out. There is good reason to have them, especially on the copper side of the business. Someone has to hopper the material and have it on hand.

But in some particular cases, we can come in and solve a technical challenge. We'll ride that wave for a while until it becomes more of a commodity type product. Then we'll step back and let the distributor come in.

That type of responsiveness is key to addressing a variety of markets, and ultimately gives IBC Advanced Alloys a useful competitive edge.

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Diving into Data: A Lean Six Sigma Journey

Six Sigma helps electronic products company Jabil run like a lean, green manufacturing machine. upply chain has welcomed big data with open arms. Collecting information and crunching numbers have always been cornerstones of transportation and logistics optimization. Greater emphasis on data creates a constant stream of inquiries, which feeds the continuous improvement churn.

Consider how today's smartphones gather information, assess and validate importance, then alert users with a beep — all in at moment's notice. The way people and businesses share and communicate information is revolutionizing the supply chain, from manufacturer to consumer. It's creating new platforms for deep dive analysis.

The big data revolution is breathing new life into Lean principles and Six Sigma standards. In effect, it provides back-door entry into a data-rich realm of reasoning that can unlock infinite efficiencies and savings when approached in the right way.

But the sheer scope and breadth of data management across global supply chains also presents some obvious hurdles. Gathering and harmonizing information is one thing. Taking this data and

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using it to develop, test, validate, and share best practices across 90 different facilities in 23 countries is no small task.

Such is the challenge that Jabil faces. The St. Petersburg, Fla.-based electronic products company provides comprehensive services from electronics design and manufacturing to supply chain. It serves a host of industries including automotive, aerospace and defense, telecommunications, healthcare, and consumer lifestyle.

The company has been on a Lean journey for the past five years. Recently, Jabil initiated a manufacturing process optimization program at its Shanghai, China, facility to showcase how lean manufacturing can reduce costs, save time, and improve worker efficiency and morale.

Walter Garvin, vice president, Lean Six Sigma at Jabil's Shanghai plant, and some of the facility's team members (see sidebar, page 132) offer a behind-thescenes perspective on the company's Lean transformation, diving into the differences between Lean and Six Sigma, and illuminating the importance of human engagement in continuous improvement strategies.

Kaizen, or continuous improvement, is at the core of any lean manufacturing transformation. Although traditionally targeted at manufacturing processes, it can also extend to other areas of the enterprise including supply chain and even administrative offices.

Jabil's 16-month manufacturing

optimization project included 700 individual employees working across nine different departments, providing exposure to a wide range of tasks and procedures — often through direct observation of other work processes. This cross-functional approach showed employees what their peers do every day, creating a richer understanding of their social work environment.

Lean and Six Sigma are often used interchangeably – or paired together. How do you differentiate between these two standards?

IT'S INTERESTING BECAUSE MANY companies say they are Lean, but start talking Six Sigma language. It makes me wonder how much they understand it.



A manufacturing process optimization program at its Shanghai, China, facility enables electronic products company Jabil to showcase how embracing Lean principles can cut costs, save time, and boost worker morale and efficiency.



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About five years ago, Jabil made a conscious decision that it wanted to be a lean company and focus on opportunities that stretched across the entire enterprise. Lean is the best way to do that because it's about removing waste, and viewing value through the eyes of the customer. Therefore, it improves flow and provides greater opportunity to get closer to the customer.

Six Sigma can help facilitate that as well. It can solve extraordinarily complex problems and issues. But it may or may not be focused on things that add value to the customer. In other words, it may not improve process flow.

That's what differentiates Lean from Six Sigma. The textbook difference is Lean is about improving flow and eliminating waste. Six Sigma is about reducing variation. They're both valuable.

Six Sigma should be applied to support the Lean program. Sometimes that detail is lost on people. If you view everything in terms of value stream management, you'll work on Six Sigma-type projects that inhibit flow.

What role does big data play in pushing Lean Six Sigma initiatives?

IN TODAY'S ENVIRONMENT, WE ARE DATA rich, but we don't do a great job with those analytics. I'm excited about the focus around big data and analytics at the academic level, and its progression within the industry. The information collected, and evolution of technology over the past few decades, presents a huge opportunity. It can help us home in on probing questions that can be easily analyzed.

Does Jabil have a structure for taking this project to another level? Not just observing, but being able to execute beyond the Shanghai plant?

WE'VE BEEN STUDYING THIS FOR SOME time. How do you take a project or best practice — not every project is a best practice — and disseminate it across the enterprise? We've seen studies that say only

five percent of organizations are successful at replicating and sharing best practices. It's not comforting to know you're in the majority for that metric.

It generally takes 27 months to share best practices across the enterprise. Invariably, roadblocks come up that inhibit this. We're trying to find the secret sauce to overcome these roadblocks.

Jabil has strived to share these projects since the inception of our Lean program. One way is through hosting an annual best practice sharing competition that generates a great deal of excitement and enthusiasm across the company. Last year, we had 952 submissions.

We also developed an in-house eKaizen project database. More than 92,000 projects were entered into the database in 2013. It's similar to big data. We have all these projects, but how do you find what you need?

As part of the eKaizen project, we're developing search functionality that can filter by customer, metric, or process. We're hoping this more simplified search function will help searchers find the projects they want.

We also have site-specific best practice sharing programs, competitions, and visual communications.

Employees access the eKaizen project database via Jabil's corporate intra

THAT'S RIGHT. IT'S ADDITIVE. WE DON'T want this database to become a graveyard of good ideas that never see the light of day again. We want to make these projects accessible so people can move forward with these best practices.

Traditionally, the project database has been used on a pull basis. If someone has a need or a problem, they can search the database for available solutions that have already been tested. We need to do more of a push on this, and get it into the sunshine. We can't do it for everyone, but we try.

What else is Jabil doing to "shine the light" on best practices across its global network?

ON THE HORIZON FOR 2015 IS THE rollout of our revised Lean maturity assessments. We go to sites and provide an assessment of where they are in their lean maturity on a number of levels. Part of that is to find, create, and share best practices that can help the site move faster toward greater maturity. This program is in its infancy, but we hope it will enhance best practice sharing.

We're also looking to create a best practice community featuring cross-functional contributors and replication champions. We're not adding staff. This is just a network of people who can help facilitate getting better projects in front of decision-makers at the plant.

This dovetails with a best practice feature added to our eKaizen internal database, which connects problem solvers with best solutions from around the world. Let's say you go into the database and find a project you find particularly effective. Much like social media, a user can rate it by providing a thumbs-up. After a certain number of thumbs-up, the project is raised to a higher level of visibility within our eKaizen database.

These are opportunities that will help us with the eKaizen effort. It has been a learning experience, and we'll keep chipping away at it.

Are there any examples where you have successfully shared best practices across the enterprise?

YES. JUST BECAUSE WE ARE TRYING TO improve our best practice sharing doesn't mean we're devoid of them. It happens and we're excited when it does. Often the most successful examples are shepherded through because the impact is great.

Some supply chain projects that have gone well are those where we looked at adopting inventory reduction tactics. These have been replicated across multiple sites. Another example is how we've been

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able to develop and share different ways to improve the longevity and re-use of tools in Jabil's plastic injection molding facilities.

It's exciting when a plant discovers one of its projects is being replicated elsewhere. They've put in some sweat equity to come up with a solution. Finding out another plant has reached out, found the project or best practice, and is now applying it is highly motivating. Workers get excited their

labor and effort has gone beyond their own facility and is being recognized elsewhere.

Beyond the manufacturing optimization project at the Shanghai plant, are you proactively cross-training employees in different areas of the business?

WE DON'T HAVE A SPECIFIC cross-training program in place right now, but we certainly encourage cross-training.

We don't currently have a structure in place to uproot people and move them around in jobs.

Lean events, whether in supply chain or on the manufacturing floor, facilitate cross-functional teams coming together to solve a problem. Lean generally touches many different groups. As a consequence, employees get exposure to the entire breadth of that value stream.

BUILDING A LEAN TEAM

Team members at Jabil's Shanghai plant expanded their knowledge and skills by taking part in all five steps of the Lean DMAIC methodology – define, measure, analyze, improve, and control.

"Many members of the team, including myself, participated from the beginning and went through the whole DMAIC process, which was a great way to learn and grow in our positions. I was especially interested in the improvement phase because engineering is the owner of process design and maintenance, and a big part of my job," says Frank LuYing, plant industrial engineering manager at the Jabil Shanghai plant.

Specifically, LuYing and the industrial engineering automation team focused on designing and setting up an automatic guided vehicle system that moves around the warehouse to collect materials, as well as a milk run flow setup, which features a vehicle sent to each of the stop points through the routing line to pick up empty boxes.

The DMAIC methodology was one of several Lean Six Sigma applications that were employed in the project.

"We used the Fishbone Diagram, role playing, and other tools," explains Tan Huan, section planning manager at the Jabil Shanghai plant. "This hands-on experience will continue to help me and the rest of the team in future projects, and allow us to help others by passing on what we have learned."

Jabil's manufacturing optimization project has paid dividends in a number of different ways.

"Changes made during the project are having a positive impact on purchasing – all the way up the value chain – including buyer efficiency and vendor quality," explains Jessica Li, purchasing manager at the Shanghai plant. "The

entire purchasing team values our lean culture of continuous improvement because they can see its benefits every day."

More apparent, the facility has completely eliminated the use of paper, thanks to a new ePull system. This has greatly improved efficiency and accuracy while reducing human errors that inevitably plague manual processes.

Beyond that, employees have greater visibility and appreciation for the work their peers perform, and how Lean ties everything together.

"We needed to learn from the people doing the work and get their input on opportunities for improvement," adds Huan. "The best way to accomplish this was speaking with them directly, and allowing employees from all aspects of the process to play a part in this project. I learned a great deal about processes, such as how materials are prepared in the warehouse, by simply listening. Everyone seemed eager to share their views."

Many participants feel the manufacturing optimization project has ultimately strengthened their individual skillsets.

"This cross-functional initiative gave me valuable project management experience, especially in terms of communication," observes Jack Chen, Shanghai plant Lean Six Sigma manager and project leader. "I had the opportunity to help employees better understand the benefits of Lean and see the contribution of different functional areas in achieving shared goals.

"As a leader, I was responsible for finding resources, obtaining information, and guiding the pace of the project – especially during root cause analysis – to be sure we thoroughly evaluated all the data," Chen adds. "It taught me a lot about the power of effective teamwork."



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STREAMLINING THE HOSPITAL SUPPLY CHAIN UST Vhathe Corporation of the Hospital Supply Chain Ust Vhathe Chain Us

As hospitals begin transforming to adapt to new healthcare initiatives, they are easing the pain by restructuring and streamlining supply chain operations. By Beth Goodbaum

The hospital supply chain is in a transformative phase, as the Affordable Care Act (ACA) drives opportunity for cost savings and better collaboration to deliver quality patient care. Opportunities to restructure operations abound, and major challenges are underway. While the ACA is intended to drive down patient healthcare costs, supply chain analysts and association leaders are adamant that hospitals need a better balancing act when it comes to streamlining their processes.

With margins declining along the healthcare supply chain, providers are reevaluating operation models and best practices by integrating technologies ranging from RFIDs to bar coding, and working with management firms to refocus staffing structures. While the ACA has had a deep impact on the structure of supply chain operations, it is only one element of the overall transformation.

In 2013, the Health Industry Distributor's Association (HIDA) collaborated with global management consulting firm *McKinsey & Company* to publish the *Thought Leaders: Healthcare Supply Chain* 2015 report. Healthcare providers and executives across medical supply companies reflected on dramatic changes in their operations and efforts, due in part to the ACA and other key factors, including an impending nationwide physician shortage and increasing adoption of information technology.

Overall, the providers surveyed indicated that they plan

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to lean on manufacturers and distributors for partnerships to help them buffer key issues across their supply chain.

One such issue is gradual and steep hospital margin declines due to lower reimbursements. Drawing from dozens of interviews, HIDA revealed providers expect operating margin declines of up to 30 percent between 2011 to 2015, with one supply chain vice president noting, "Our entire margin is expected to evaporate starting in 2014 because of the lower reimbursement."

Prior to the ACA, hospitals were reimbursed based on volume, when patient intake, material consumption, and services determined payout. Now, hospital reimbursements are incentive- and performance-based. A key driver behind this

model shift is the ACA's Hospital Value-Based Purchasing Program, known as the Centers for Medicare and Medicaid services (CMS), which rewards acute care hospitals based on the quality of care provided to Medicare patients. CMS also rewards hospitals based on how closely they follow best clinical practices, and how well each hospital enhances patient stays.

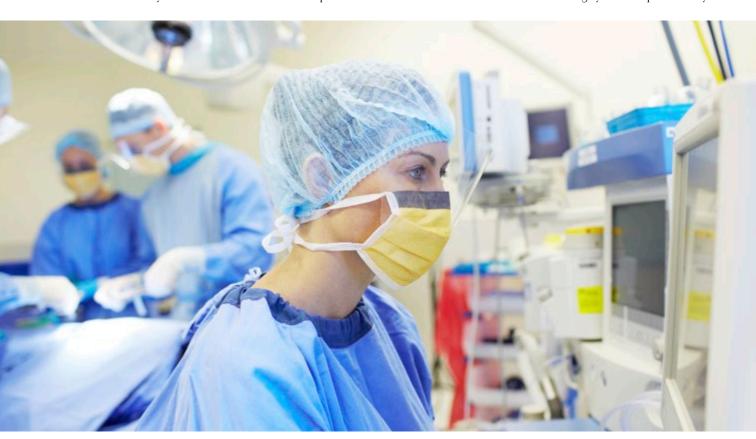
MEETING MEDICARE MARGINS

"With federal reimbursements cut yearover-year, hospitals have to look at different ways to operate within 'Medicare margins,'" says James Spann, global supply chain practice leader for healthcare management consulting firm Simpler Consulting. "They can do a few things to provide distinctive value for patients." The first step is through value analysis, by determining the best delivered value of products and services, Spann explains.

The HIDA report lists top recommendations to drive the next level of supply chain savings. Among them is addressing end-to-end supply chain costs and refocusing efforts on data standardization, which Spann emphasizes as one of his top solutions.

In order to universally adopt data standards, experts across organizations advise creating campaigns to promote data standardization, building a working team of experts across companies to discuss adoption processes and identify requirements, and demonstrate how data standards can lead to cost savings.

Standardizing systems is particularly



Healthcare providers face myriad challenges that can adversely impact the bottom line. In response, many hospitals are taking control of supply chain strategy, and analyzing how to build or enhance internal capabilities.

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helpful at a time when mergers and acquisitions are at a significant peak. In 2013, 98 hospital and health system combinations were announced, reflecting an uptick of three percent from the previous year, and 51-percent growth over 2010, according to analysis by Kaufman Hall.

"Our analysis confirms hospitals and health systems are continuing to pursue partnership arrangements as one approach to accessing the enhanced infrastructure necessary to provide care successfully in the changing environment," said Michael Finnerty, managing director of Kaufman Hall, in a statement release.

"The Affordable Care Act certainly created the incentives for value-based purchasing and consolidation," says Curtis Rooney, president of the Healthcare Supply Chain Association. "Consolidation has been ongoing, and mergers and acquisitions are huge. Predictions say in the next 10 years, 5,000 hospitals will turn into 500 health systems.

"I'm not sure if that will actually happen, but the driver will be the same for everyone: efficiency," he adds.

GETTING AHEAD OF THE GAME

From Rooney's perspective, the boost in mergers and acquisitions provides the greatest room for growth, especially as providers strategize for 2015 and beyond.

"For providers, the low-hanging fruit is a merger or hospital acquisition," he says. "If they can standardize systems on one platform, and collect data seamlessly, they're way ahead of the game.

"The healthcare system, particularly the supply chain, is filled with inefficiencies," he adds. "Think about it in terms of a barcode that starts from the warehouse door and moves all the way to the electronic health record at the patient's bedside. All those interactions and information exchanges along the way need to be captured and modified in a standardized way to allow for free flow of information."

"Hospitals have to look at how they manage what I call the 'profit curve' — as they move up over time, they want to increase profitability or reduce cost. They can do that through pricing programs, standardization, and consolidation," Spann says. "They start to be most effective when they evaluate how to utilize assets and capital."

Across health systems, supply chain leaders stress that hospitals need to address clinical-evidenced-based support.

"Physician engagement is a huge part of that strategy," notes Spann. "How hospitals help manage physician preference items, the items physicians order, and the sup-

Healthcare providers
can save five to
15 percent by
implementing strategies
that improve how they
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plies that they need to impact patient care is paramount. Hospitals need to integrate the physicians, and align them within the supply chain of the products and services they bring in to support patient care."

Statistics on the medical device side of the supply chain and the physician disconnect are telling. Few orthopedic surgeons know the dollar value of the devices they commonly implant in their patients, finds a 2014 study published in *Health Affairs*. In fact, 36 percent of physicians and 75 percent of residents rate their knowledge of device costs as "poor" or "below average," even though more than 80 percent of the same group indicate the cost should be

"moderately," "very," or "extremely" important in the device selection process.

There is work to be done to bridge the gap between the physician and medical device supply chain, as the study suggests. The research also reveals that of the 503 physicians who completed the survey, attending physicians only correctly estimate the cost of a device 21 percent of the time.

DOLLARS AND DEVICES

Despite this, medical device costs are rising, albeit slowly. In 2010, medical device spending totaled \$156.3 billion or six percent of total national health expenditures, according to the Advanced Medical Technology Association. Over the course of 22 years, from 1989 to 2010, national medical device spending has grown slightly as a percentage of National Health Expenditures, from 5.3 to six percent.

But Gartner Research underscores some good news amid the rising costs along the supply chain. Its studies reveal that providers can save five to 15 percent by implementing better strategies to analyze and control goods and services purchases. For supply chain executives, such statistics and studies illustrate the need to move fast to structure their organizations for better access to—and understanding of—medical devices and other supplies among hospital staff, not just among physicians.

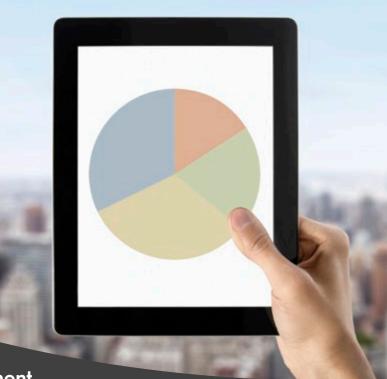
"If you leave purchasing up to the clinical staff, they will overstock to avoid not having a product to provide patient care," says Luis Martinez, who represents MD Buyline, a healthcare and hospital supply chain management solutions company. "While that's understandable, the supply chain manager's job is to have enough stock to avoid any supply issues."

One challenge is for those physicians to accept the idea or the concept of change in learning new supply chain methods. Another challenge is the general collaboration from suppliers. "They're typically all

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for profit, so keeping prices high and volume up is important to them," Martinez emphasizes. "Looking to collaborate strategically with hospitals and supply chain departments, however, is an ongoing challenge."

Other factors, including healthcare procedures, can also pose a challenge to better collaboration. "There's one major market shareholder in the trauma implants space," says Martinez. "Because it owns the market, and held it for so long, it doesn't move,

become a bigger player within hospitals because data is captured electronically. When it comes to lowering costs, using technology helps collect data, but better planning is simpler."

The emergence and growth of systems integrator businesses can also streamline supply chain data. Baltimore-based Barcoding Inc., for example, provides end-to-end automated data capture and mobile solutions for businesses ranging from manufacturing to healthcare. Company president

in these three areas can lead healthcare providers to overbuy assets to ensure product is available when patients or staff needs it. As a result, capital and operational spending increases.

"Or, if they do not overbuy, healthcare providers may not have the assets they need to provide adequate care for their patients," he adds. "Naturally, this negatively impacts customer satisfaction ratings."

Other AIDC asset management systems can directly impact the customer experience and satisfaction levels, including tracking patient valuables.

"Patients often come to the hospital with valuable items, such as jewelry and money," Snyder explains. "It then becomes the hospital's responsibility to remove, track, and safeguard these valuables. Traditionally, hospitals catalog and inventory valuables manually, or in a basic spreadsheet. Both methodologies are burdened with excessive labor, and are error prone. By leveraging AIDC technology, hospitals can provide the same cataloging and inventory process more efficiently and accurately."



Regulatory compliance and track-and-trace capabilities continue to be primary concerns in the pharmaceuticals supply chain.

change price, or consign. In that case, it's hard to convince physicians to use something different. And it's hard to convince the supplier to collaborate more strategically because it holds the leverage in negotiations."

To keep inventory low from an efficiency standpoint, hospitals are integrating technologies to help aggregate crucial supply chain data. "Inventory management has grown more sophisticated," Martinez explains. "Technologies such as bar coding Shane Snyder explains that while automatic identification and data capture (AIDC) is not the "core" solution for the supply chain, it can positively impact the healthcare provider's ability to manage the balancing act more proactively and effectively.

"First, AIDC technology reduces the amount of capital investment in clinical equipment needed to deliver services, and gives healthcare providers better control of their assets, current utilization rates, and location," Snyder explains. "Lack of control

MOVING TO THE CLOUD

Various healthcare technology companies, including Louisville, Colo.-based Global Health Exchange (GHX), help hospitals gain better visibility and transparency to the data they need to understand their costs through cloud technologies. In light of the many mergers and acquisitions within hospital systems, one big area for improvement is capturing data, specifically in disparate systems, explains Tina Vantanka Murphy, vice president of global markets at GHX, which was founded in 2000 by GE, Johnson & Johnson, Abbott, Baxter, and Medtronic.

"When a patient goes to an emergency room, the hospital collects all the information about that patient," she says. "But if the patient moves to a surgery center, or a different section in the hospital, suddenly that data is not transferred.





CVS: From Pharma Store to Medical Services Business



CVS Health's MinuteClinic locations rely on corporate procurement processes to ensure clinics always have the patient care supplies they need.

Over the span of 15 years, CVS Health has expanded its retail services offerings with walk-in treatment centers. Its MinuteClinic services range from weight loss management to smoking cessation. CVS maintains more than 960 MinuteClinic locations in the United States, and plans to expand, with 1,500 clinics forecast to operate by 2017.

"As more patients are enrolled with healthcare insurance providers, they are seeking options for receiving care, including retail clinics such as MinuteClinic," says Nancy Gagliano, MD, MinuteClinic chief medical officer.

Yet the Affordable Care Act (ACA) is not the only factor fueling the growth of these clinics. A nationwide primary physician shortage, an aging baby boomer population, an uptick in obesity and associated chronic disease, and poor patient medication adherence is also driving demand for more walk-in services. Gagliano notes.

On the supply chain side of operations, MinuteClinic utilizes CVS Health's corporate procurement processes



to focus on high-quality, low-cost supplies with rapid turnaround. "This allows MinuteClinic to assure that its clinics always have the supplies they need," Gagliano says "This approach to pricing allows us to pass these savings on to our patients."

While MinuteClinic currently operates with a proprietary electronic medical records system, it is making a technology transition to an Epic Care electronic medical record system in 2015.

"Epic is the most widely used electronic medical record in the United States with more than 274,000 physicians online," Gagliano explains. "More than 50 percent of Americans have a nationt record in Epic

"MinuteClinic is also looking to increase services that use rapid, point-of-care testing that can be administered in the clinics with results in five minutes or fewer," she adds. "Examples of current rapid, point-of-care tests administered at MinuteClinic include strep, A1C, and influenza."

"Interoperability between these hospital systems is a huge gap because what happens in the emergency room needs to be transferred throughout the supply chain to deliver the best patient care," says Murphy. "It's also a huge issue if a hospital is trying to understand its costs."

Murphy cites one example where GHX worked with a large Midwest health system. The hospital was buying 60 times each day from one supplier. "Just by providing visibility, the hospital was able to agree on a more reasonable order velocity, which cut costs significantly for both stakeholders," she says.

RATIONALIZING THE DATA

Cloud technology helps connect data sources, and allows hospitals to better rationalize that data. It also enables presenting information to the user efficiently. "The hospitals, distributors, and manufacturers need to be able to present data that has been accurately rationalized across all those stakeholders," Murphy explains.

"There is so much change related to products used in healthcare," says Karen Conway, director of industry relations at GHX. "Prices change depending on who's buying and selling the product. Contracts with group purchasing organizations can result in tens of thousands of changes, every day in some cases," she says.

Because there is no way such a multitude of organizations can hold that data on their systems, many are shifting to using the cloud. "The cloud is a place where data can be held virtually—a virtual item master—as opposed to trying to maintain it in systems that are onsite at the hospital, or at the supplier," Conway explains

But data can be detrimental to patient care, Murphy notes. "The data is critical if a healthcare provider is reimbursed based on the quality of care it delivers," she says. "They need that data to understand their total cost. Providers don't need to care only about the cost of the pacemaker; they need

to understand the outcome," Murphy says.

"When a doctor places that pacemaker in a patient, the hospital has to understand what percentage of the time the patient is readmitted, and account for infections because that's how it gets reimbursed," she says. "The data is great, but it's even more critical that hospitals have access to it."

Data capture through cloud-based technology ultimately helps hospitals synchronize price across their supply chain, where they have the ability to drive order, consolidation, and data and process standardization.

"Other industries, such as retail, were able to drive transformational change in the supply chain," says Smith. "Healthcare doesn't have that. The way healthcare has been driving transformation is through thought leaders who are putting the effort into encouraging collaboration and looking at different engagement models."

GOING INTO LABOR

Another strategy that involves better collaboration and cost savings is growing an organizational structure to manage hospital staff. In the HIDA healthcare leadership report, one vice president notes that when doctors are faced with cutting labor, capital, or supply costs, they will always choose supply. Other supply chain experts find real value in reevaluating hospital labor.

"We noticed that for a number of hospitals, the staff that supports the floors is significantly higher than we anticipated," says Brian Murphy, business development director of Menlo Worldwide Logistics, a third-party logistics provider based in San Francisco. "There's no consistency in any hospital. We're determining how to develop a defined process.

"Here's an example. One hospital we work with asked us to go to an existing distribution location it had acquired to model two hospitals that were using the same infrastructure and labor for seven," says Murphy. "We were able to drive improvements just by addressing the material flow and waste inside the hospital."

James Liter, senior principal at West Monroe partners, who heads the company's pharma supply chain and operations clients, reflects on the biggest changes within the pharmaceutical supply chain. "Regulatory compliance is a huge issue," he says. "For instance, it becomes more important to make sure the supply chain has been categorized to be appropriate than how critical it is to product safety."

TRACKING AND TRACING

The bigger movement in the supply chain is the continued vigilance of tracking and tracing capabilities in the life sciences space, which is broader than pharmaceuticals.

"A fair number of technologies have been implemented with bar-coding and RFID tags inside the whole life sciences supply chain," Liter says. "Track and trace is critical because it provides the ability to get to the root of any kind of detrimental product, and understand how to clean it out of the supply chain as quickly as possible."

While technology and organizational solutions are at the forefront to facilitate traceability within the supply chain, experts maintain that more work needs to be done when it comes to improving collaboration among all partners in the medical industry.

Reflecting on the Healthcare Supply Chain Association and Healthcare Industry Supply Chain Institute, which brought together educational programs for suppliers, GPOs, and executives, Rooney notes, "It was encouraging and horrifying at the same time. All parties are operating in a silo, and positioning themselves as the experts in UDI, drug serialization, and healthcare electronic medical records. But the silos haven't talked to each other yet."

Collaboration within his association, he says, is the next step for 2015.

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ING FIRE STARTER



Manufacturers feed on the flames of innovation, R&D, and operational efficiency. But when it comes to seeing beyond the plant, supply chain excellence can spark a world of change.

by Joseph O'Reilly

ne core foundation of Lean manufacturing and the Toyota Production System (TPS) is the Japanese concept of heijunka—leveling production by volume and mix to mediate variability. The objective is to create a smooth flow of raw materials and finished product while reducing labor, inventory, and defect waste. Production leveling is the reason why automotive manufacturers often assemble different car models in smaller batches; it allows them to build more low-volume product efficiently and economically.

Just-in-time manufacturing does incur costs, notably in the transportation of smaller, more frequent quantities. But better asset and time utilization, and greater standardization, can go a long way toward offsetting these other bleeds. More importantly, manufacturers that match production to demand reduce lead times, and can quickly react to change. That's a competitive differentiator in any market.

Production leveling is a strategy that makes sense beyond just cell manufacturing and the assembly line. Businesses of all stripes struggle with variability—seasonal or otherwise. Sudden, unexpected demand spikes or troughs present planning and execution challenges. When shippers have to scale up or down without warning, costs escalate.

This is especially relevant in today's world. Global consumerism has become so dynamic that suppliers, manufacturers,

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distributors, carriers, and retailers have to be flexible. A one-size-fits-all supply chain is too rigid to accommodate the kind of chaos e-commerce, omni-channel, and 3D printing spawn.

Manufacturers are still vulnerable to change even though they have become sophisticated at mass customization. The reasons are manifold. Global currency volatility, commodity prices and corollary bullwhip effects, and evolving sourcing/ selling paradigms give manufacturers and their supply chain partners every incentive to be hyper-reactive—better yet, predictive. They don't want to be on the tail end of change with no other recourse than to ride it out. Demand signals and supply disruptions consequently have greater sensitivity.

This point is driven home in a recent Accenture study—How Leading Manufacturers Thrive in a World of Ongoing Volatility and Uncertainty. The management consultant surveyed 250

and operational efficiency. They do well managing the things they can control. But when it comes to transportation and logistics, and seeing beyond the plant, third-party perspective can complement a world of change.

Whirlpool's Supply Chain Spin

In summer 2006, appliance manufacturer Whirlpool brought Reading, Pa.-based Penkse Logistics on board as lead logistics provider (LLP) for its North American supply chain—augmenting the 3PL's existing transportation responsibilities. The manufacturer's acquisition of Maytag one year earlier partly precipitated the move. Whirlpool wanted a more strategic partnership predicated on network visibility.

"The relationship with Penske started heavily on the inbound side; with Penske managing the transportation of components from our supply base to our



Appliance company Whirlpool's relationship with its LLP illustrates how a third-party perspective can help manufacturers implement efficiencies and cost savings beyond the plant, and into supply chain and transportation management.

executives from manufacturing companies around the world. Nearly nine in 10 U.S. respondents "agreed" or "strongly agreed" that the ability to flexibly and dynamically move production from one existing facility to another, or to change the product mix at an existing facility to match demand, is critical to achieving growth goals.

While there's consensus that flexibility is important, finding it is a whole other matter. Supply chain visibility becomes paramount. So does partnership. Manufacturers thrive on innovation, research and development,

manufacturers," explains Jim Thompson, senior manager of transportation for Whirlpool, based in Benton Harbor, Mich. "It then expanded into outbound distribution to support finished goods through our network."

By the late 2000s, as Whirlpool was expanding into Canada and Mexico, Penske's purview grew as well. It became accountable for inbound materials into all eight U.S. manufacturing facilities and five locations in Mexico, as well as outbound distribution for both U.S. and Canadian markets.

As a global manufacturer, Whirlpool has progressively moved toward regionalizing its supply chain, manufacturing closer to demand.

"Whirlpool builds and sells more than 80 percent of product in the United States," says Thompson. "We import a small volume from Mexico, but that production primarily supports the Mexico market. The same holds true around the world."

Because Whirlpool is heavily invested in the United States, it hasn't felt much of a nearshoring pull. "We never went offshore only to have to bring it back," Thompson adds.

Whirlpool's business is tied to the overall health and performance of the U.S. economy, especially the housing market. As consumer confidence and discretionary spending ebb and flow, so does the manufacturer's business.

Like other U.S. shippers, Whirlpool is challenged by domestic transportation dynamics. Dealing with driver and capacity constraints, and ancillary costs, presents a huge obstacle.

"Working with Penske over the last four to five years allowed us to diversify transport modes from boxcar to intermodal to overthe-road, and even small parcel where it makes sense," Thompson says.

An Outside-In Approach

Penske Logistics' role as LLP has marked the cornerstone of Whirlpool's North American supply chain transformation. The two companies have been working on building a Transportation Center of Excellence since 2006—in effect, creating an integrated and outsourced transportation management program to help Whirlpool reduce costs and improve service.

The manufacturer maintains control over capital assets—facilities, technology, and carrier contracts—while the 3PL oversees day-to-day transportation management and distribution center operations. Whirlpool has its own TPS-type model cast within the organization. Penske has become an extension of that system, all the way through distribution. It brings an "outside-in" approach to eliminate costs and standardize processes.

"If we were a manufacturer, we'd make data," says Bob Daymon, vice president



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of transportation management for Penske Logistics. "Our role as LLP is to figure out how to use that data to drive the network forward, tailored to Whirlpool's processes and desired outcomes."

The manufacturer similarly benefits from Penske's perspective. As an LLP, it works with myriad companies in automotive and other industries, which provides different insights and best practices that can be adopted and applied accordingly.

Control Tower Power

But the key is data. Increasingly, companies are pushing Lean and Six Sigma directives by paying closer attention to granular-level details.

For example, Accenture's manufacturing survey suggests that companies should implement a control tower to increase visibility, reduce variability, and provide better decision support. Such action yields four critical takeaways:

- **1.** Allows the manufacturer integrated visibility across all dimensions of its network, including demand, capacity (supplier, manufacturing, and distribution), inventory, orders/shipments in transit, and logistics partners.
- **2.** Helps the manufacturer conduct predictive analytics to make sense of the data it collects to trigger alerts, detect tipping points, run what-if analyses of scenarios to model the outcome of potential decisions, and ultimately initiate appropriate action.
- **3.** Empowers the manufacturer to monitor the execution of supply chain activities, and alert one part of the supply chain when it will be impacted by another—for example, predicting raw material shortages and reallocating production and inventory accordingly.
- **4.** Helps the manufacturer orchestrate the work of shared service centers—enabling a "super back office" to maximize business process, IT investment, and execution skills synergies across businesses and geographies.

In Whirlpool's example, Penske is that control tower for its North America operations. From the outset, both companies outlined key milestones they wanted to hit as the partnership progressed.

"When we began this relationship, our guiding principle was to use data to make decisions," Daymon explains. "By focusing on data accuracy, timeliness, and completeness, we're not driving the supply chain by looking through the rear view mirror."

Traditionally, shippers and service providers dig through freight bill data, and start building models to better understand performance, find tactical problems, and prescribe business process fixes. Penske took a more proactive approach by using

effort to extend this ethos throughout the entire organization.

"We have dedicated resources assigned to each functional area that are responsible for embedding Lean culture beyond the four walls of manufacturing or even warehousing," says Thompson. "We are investing around the concepts of Lean and Six Sigma to drive standardization and improvement in the overall process."



Penske Logistics helps Whirlpool build more responsiveness and resiliency into its supply chain, and gives close attention to using data for critical decision support.

data to predict what will happen, and getting out in front of carriers from a capacity perspective.

It's not unlike the way manufacturers engineer just-in-time production systems—getting better forecasts, synchronizing upstream processes to pull in accordance with demand, and leveling variability. It's just happening on a bigger scale at a macro level. Whirlpool is allowing its manufacturing strengths to bleed into other aspects of its supply chain, with Penske's assistance.

"Whirlpool has its own system that is well-defined and built around competencies, as well as the appropriate structures and milestones," says Thompson.

Whirlpool has a culture of continuous improvement. Lean Six Sigma runs through its production and distribution nodes. But over the past several years, the company has made a greater

Dating back to the late 1990s, distribution and manufacturing have worked in lockstep. But now, Whirlpool is taking Lean Six Sigma to finance, human resources, and other back office support functions.

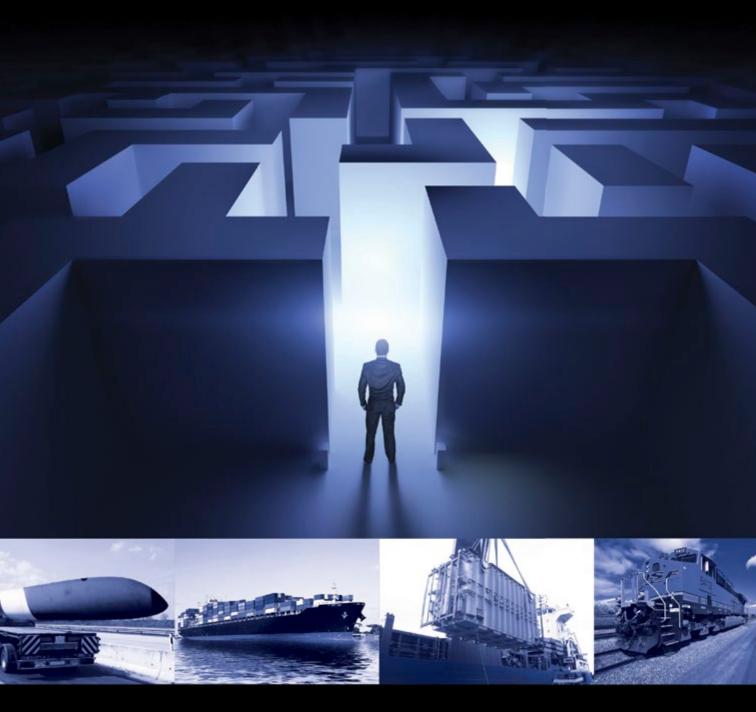
"Lean Six Sigma is a key piece. Our daily focus is weeding out cost and inefficiencies," says Daymon. "Transformations—some small, some big—happen every day."

Whirlpool's center of excellence is built around agility. Whether it's absorbing a Maytag acquisition, weathering a housing market crash, or providing greater latitude to expand as the economy rebounds, the company has a sustainable structure in place that can flex and adapt to change.

"Consider the market dynamics we had to deal with in 2008," says Thompson. "We had to adjust down and make sure we had flexibility within our network. Accurate data allowed us to make precise decisions."

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Whirlpool also recognized that Penske needed end-to-end access to planning functions in order to become a true extension of the enterprise, and fully optimize transportation operations. That requires a certain level of trust between the two companies.

While Thompson acknowledges the center of excellence has been transformative, he's also quick to point out that this change has been evolutionary, not revolutionary. "We didn't just bring Penske in and flip the switch on the network," he says.

It has been a multi-year journey. Penske's scope and touch has slowly expanded as the project hit new milestones and contracts were renewed. The 3PL has become as much an input to setting strategy as it is executor.

Objectives and expectations have similarly evolved as the two companies refine metrics and data to get a better read on future trends. This pays dividends in some interesting ways.

"When we started out, we decided to just get the data and metrics right, see how it performs, then figure out how to optimize transportation," says Thompson. "Today, we're taking a more holistic approach by looking at how we can get ahead of the curve, especially as the economy improves.

"We're in a better position to forecast out and provide some reliability to our carrier base," he adds. "Carriers want shippers they can depend on. When we award a bid, we consistently tender that business. We provide heavy drop-and-hook, driverfriendly scenarios."

As capacity tightens, and carriers start picking where they want to put their assets, they'll want to do business with companies such as Whirlpool and Penske because they have a good handle on demand. In a hardening market, that type of value is hard to come by and increasingly important.

Forward-thinking Action

The Toyota Production System has had a profound impact on how manufacturers approach variability and work flow on the shop floor. So it's little wonder that many are taking a page out of their own production manuals to better manage variability elsewhere in the supply chain. It's a trend that transcends even the manufacturing space as other industries follow suit.

Whether it's adapting Lean and/or Six Sigma best practices throughout the enterprise, shortening lead times by nearshoring production, or separating non-core functions and outsourcing, manufacturers are creating latitude in their networks to account for demand variability—good and bad. Agility has become a critical success factor, especially as economic uncertainty persists around the world.

Whirlpool's Transportation Center of Excellence demonstrates how one company is moving the outsourcing needle in a different direction to build more responsiveness and resiliency in the supply chain. As Penske's Daymon suggests, a rear-view-mirror approach to data analytics and process improvement works to an extent. But at some point, companies need to move beyond that myopic focus and find a more holistic view of upstream and downstream flows to get ahead of the variability curve.

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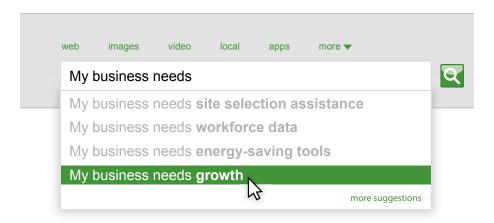
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A Whole New Game

Vendor Managed Inventory is shaking off its old-school image and regaining popularity thanks to improved technology, robust communication, tighter demand signal linkage, and a new openness to collaboration that has turbo-charged enterprise benefits.

BY LISA TERRY

t was cutting edge—in the 1980s. Vendor Managed Inventory (VMI) has quietly chugged along for years, appreciated yet unheralded in industries including automotive, consumer goods/retail, and pharmaceuticals. But today, VMI is shaking off its antiquated image and regaining the spotlight in markets such as healthcare and retail.

VMI advocates are making this once-separate process more central and mainstream. For consumer products behemoths and their largest customers, for example, it's not so much vendor-managed inventory as it is a fully collaborative approach

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to managing inventory across the majority of product lines and channels, closely aligned to retailer forecasts and planned promotions. For others, such as industrial distributors, VMI is a well-oiled replenishment machine used by customers to keep both production and maintenance, repair, and overhaul (MRO) materials flowing.

But not all VMI programs succeed at that level. The process requires senior management endorsement, a collaborative mindset among supply chain partners, the right data sharing technology, and a certain level of trust. Without these elements in place, VMI initiatives often fail to deliver on their promise and ultimately collapse.

VMI THEN AND NOW

The original VMI concept was simple—let the vendor manage the fulfillment of high-volume material at an agreed-upon inventory level. VMI was seen as a way to reduce inventories, cut costs, improve supply chain efficiencies, and reduce administrative tasks around creating and managing orders.

Over time, and depending on industry, VMI took on different names and models: vendor managed replenishment, supplier managed inventory, direct store delivery, direct plant delivery, and field inventory management. In retail, the concept was incorporated into collaborative planning, forecasting, and replenishment (CPFR).

Some practitioners apply VMI processes to their suppliers as well as their customers. "It's the same business process—sharing forecast demand with suppliers to allow them to more tightly synch product and distribution plans," says Karin Bursa, vice president of marketing at Atlanta-based Logility, a provider of supply chain software solutions. "VMI processes typically reduce inventory for both suppliers and buyers, and decrease order cycle days."

A small percentage of trading partners include consignment in their versions of VMI. In healthcare, VMI is seen as a way to ensure essential inventory is available without overstocking materials that are ultimately unneeded. For a knee replacement, for example, a surgeon can't determine the exact size replacement joint needed until the procedure, so a variety of sizes must be on hand. VMI enables the care facility to meet that need without investing in excess

inventory by only paying for the joint used.

Aerospace and defense also make use of the consignment model, while in automotive it's simply delivering purchased inventory at the right cadence. "It's 'here's what we need, now figure out how to support it," says David Huffman, director of industry solutions for Dallas-based One Network Enterprises, a cloud-based supply chain management software provider.

In retail, fast-moving consumer goods and food staples are long-standing VMI users, but it has recently found its way to fashion, primarily for basics such as jeans. As retailers increase their willingness to share data, VMI is evolving to become more collaborative and sophisticated.

"As systems and data have advanced, and grown more precise, retail relationships are evolving naturally from VMI to a more collaborative process based on broad visibility and data sharing," says Bruce Christiansen, senior vice president for Park City Group, a Salt Lake City-based company that provides supply chain Software-as-a-Service to suppliers and retailers.

Even long-standing retail direct store delivery (DSD) processes are starting to be incorporated into supplier collaboration and data sharing programs, as opposed to separate programs that stock shelves with whatever the consumer goods manufacturer has on the truck.

"Retailers know they have to work harder



to attract and retain customers," says Christiansen. "If the DSD supply chain is behaving and performing differently than the rest of the supply chain, they need to figure out how to see that. It makes for some interesting conversations—some positive and productive, and some tough."

NEW MARKETS, NEW DATA

Advanced users are integrating the demand signals they glean from VMI earlier in their supply chain planning processes, so they can use this data to drive their own forecasts, production planning, and material flows alongside "regular" orders.

"New markets and new kinds of data are being shared," says Christiansen.

In addition to CPG/retail, automotive, and pharma, seasoned VMI users include aerospace/defense and industrial distribution, both for production materials and MRO. In MRO, VMI is increasingly linked to industrial vending. For example, Hisco Industrial Supply, a distributor of mission-critical materials, offers cloud-based VMI services to aerospace and automotive customers, remotely viewing vending equipment inventory levels via integrating with its ERP system, and receiving alerts when inventory hits certain minimum/maximum levels.

In addition to the typical VMI benefits, users of these systems can reduce shrink, gain better insight into consumption patterns, and internally assign costs to certain accounts or lines. Such analytic capabilities help suppliers add value in a competitive field.

"Industrial vending is a megatrend in the industry, and it's changing how we do business with our customers," says Larry Hollinger, sales support manager for Hisco. He predicts expansion into additional categories as these solutions evolve with capabilities such as scales and visual optics.

Another development is the rise in use of third-party logistics (3PL) providers to ensure VMI execution aligns with the plan. 3PLs take on the role of middleman, managing the data and carrying out VMI processes on behalf of clients.

But VMI isn't for every company, or

VMI allows vending machine manufacturer Hisco Industrial Supply and its customers to achieve cost savings due to logistics and pricing efficiencies, and inventory planning.



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800.845.8090 smc3.com/unyson every type of product. "VMI works best in operations with a steady flow of products," says Huffman. "It's harder to implement with high-demand volatility products. Vendors are hesitant to manage when they are blind to demand." For that reason, VMI is used less in the high-tech and trendy fashion industries.

TRADING PARTNERS WITH BENEFITS

As a concept, VMI has always been about driving efficiency by cutting inventory and administrative costs. Early on, companies accomplished those goals through spreadsheets and hands-on inventory management—showing up, taking a count, and refilling stock back to ideal levels. As VMI solutions emerged, and the ability to access and communicate more discrete levels of data improved, VMI became more accurate, automated, and remotely managed.

When Datalliance, a Cincinnati-based provider of VMI and related services, studied 1,000 customers across industries in 2012, and again in 2013, it found VMI processes delivered an average 22-percent increase in sales, 14-percent increase in turns, and 40-percent reduction in out-of-stocks from VMI processes. Full truckload shippers saw increases of between four and six percent in truck fill.

Transportation savings has only recently been embraced as a VMI benefit that contributes to environmental sustainability efforts. At General Mills, improved forecasting as a result of its Collaborative Replenishment program enables the food manufacturer to build and ship orders in advance (see sidebar, right). The company also ships more efficiently by combining VMI processes with load optimization software, and sometimes bypassing the General Mills distribution center with direct-to-plant shipping.

With a range of product weights—from heavy jars of tomato sauce to lightweight snack foods—General Mills finds considerable opportunity to balance loads without exceeding weight limits. "The efficiencies we gain mean fewer trucks on the road, making fewer stops along the way," says Dennis Gould, manager of collaborative replenishment projects.

The sweet spot for implementing VMI processes is with customers or suppliers with sufficient volume to justify the



General Mills Says Cheerio to VMI; Makes Collaborative Replenishment Its New Lucky Charm

At the leading edge, companies such as General Mills have evolved into a next-gen version of Vendor Managed Inventory (VMI). "We don't use the term VMI," says Dennis Gould, manager of collaborative replenishment projects, which is also the term General Mills favors for its process. "We've gone into customer systems and managed their forecasts, and in some cases we're doing inventory replenishment."

Through deep collaboration and data sharing, the consumer goods leader is striving to reposition VMI as the way inventory and orders are managed between manufacturer and customer. "We're attempting to have customers send us that output as an order forecast, and using that in back-end systems," Gould says. One snag is that some retailers employ antiquated systems that cannot produce the data as needed. One significant contributor to General Mills' VMI success is its retailer partners' increasing willingness to share data, which many retailers have been hesitant to do in the past.

For General Mills, the end state for collaborative replenishment is using six to 10 weeks of retailer forecast data to determine where to source from, and how to place product into source locations. As they reach a critical mass of volume, they can fully optimize and better plan and deploy product to comply with demand, including the peaks relating to promotions. At some point, this process is not truly replenishment, as in refilling inventory after it reaches a minimum level. It's synchronizing demand and shipments continually to meet demand. "We have become more laser focused on improving collaboration and forecasting so replenishment has become secondary to better forecasts," Gould says.

General Mills' collaborative replenishment initiatives are linked to its efforts to better understand and improve on-shelf availability using customer data. As the company's analytics processes and ability to act on forecast data continue to evolve, the opportunity to improve on-shelf inventory, increase sales, and achieve incremental sales gains from promotions will only continue.



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expense. Another key characteristic is a strong, trusting relationship. VMI requires the customer to share proprietary data and entrust control of critical product flow to an outside entity. Customers must feel confident that suppliers will not abuse the privilege by pushing through excessive orders to meet quarterly sales goals.

"Companies have to commit to VMI. They are taking responsibility for the lifeblood of the customer," says Carl Hall, president and CEO of Datalliance. Two percent of Datalliance customers don't continue their programs each year due to lack of true commitment.

Other important steps to a successful program include:

- 1. Identify the problem/opportunity. Some VMI programs are about inventory or fill rate, others are about transportation or handling costs. Most companies focus VMI programs on high-velocity products and top trading partners, sometimes expanding to smaller accounts later.
- 2. Measure the current state through agreed-upon KPIs and identify roadblocks to improvement. Set realistic expectations for the improvements VMI will deliver.
- 3. Set up automated processes to share in-stock levels, forecasts, and point-of-sale data at the required level of granularity and frequency. EDI is an essential tool for this. Systems that facilitate 100-percent data visibility for both supplier and customer enable the best collaboration. "A good forecast—and more importantly, a shared forecast—leads to the best results," says Christiansen.
- 4. Segment data to track demand by specific customer or supplier, or even specific channel within that customer, using robust planning software. Systems written specifically for VMI process flows differ from general business applications such as ERP systems, which use purchase order-based structure.
- **5. Don't set it and forget it.** "VMI is a process that has to be monitored," says Hollinger. "Customers have to be involved in the process. As suppliers communicate feedback, customers can make internal changes that improve their business."
- 6. Mine VMI data to glean insights, identify obstacles, integrate findings into production planning, and drive better results. In mature VMI relationships,

Cardinal Health Prescribes A Healthy Dose of VMI

The healthcare industry is under doctor's orders to trim costs and increase the quality of care. Medical products distributors are finding relief in Vendor Managed Inventory (VMI). Multiple VMI pilots are in place across the United States as the healthcare industry fine-tunes the concept to meet its own needs and regulatory requirements.

"Healthcare comprises too much or wrong inventory, and products that are close to their expiration dates," notes Robert Doone, vice president, integrated logistics services for Cardinal Health, a healthcare services company based in Dublin, Ohio.

Cardinal Health's revitalized VMI program provides full visibility of inventory – down to lot, serial number, expiration dates, device identification – all the way to point of use. "We work with manufacturers to help manage finished goods, creating visibility to enable better inventory management," he says.

Manufacturers can use the data for production and raw materials planning, and to learn more about consumption trends so their sales force can focus on customer collaboration, not inventory management. They also benefit from lower inventory, decreased obsolescence and expirations, and improved workflow and profit margins. Clinical sites embrace VMI because they only pay for the inventory they use in one monthly invoice, and they don't have to manage it.

"The healthcare industry has so much at stake," says Nikki Frasier, director of solution strategy for Cardinal Health's innovative logistics services. "Yes, there is economic pressure, like any industry. But we can't discount patient safety. The stakes are higher than in many traditional supply chains."

trading partners exchange additional data sets to enhance the process or boost the benefits.

Automation is a key step to successful VMI, but implementing and maintaining integration with multiple trading partners can add complexity and cost. It can be particularly challenging when a company wants to look at multiple steps forward or backward in the supply chain to forecast and manage inventory needs. Some providers, such as One Network, address this issue by operating a network that enables multiple parties to view and share data.

Practitioners are confident that VMI will continue to evolve as it attracts more attention and resources. As technology advances, VMI will become increasingly exception-based, so managers are alerted only when things get out of synch.

"That allows trading partners to focus on other priorities, such as upcoming promotions or specific packaging, that make it harder to replace their VMI supplier," Bursa says. This ties into a retail trend toward joint product development with suppliers as a competitive differentiator.

Hall predicts increased use of VMI in two-step supply chains, rather than just managing inventory moving to DCs. "Retailers are making a bigger push to get suppliers involved in store-level inventory," he says. VMI will also continue to be tapped to boost transportation efficiency.

Retailers are continually refining their ability to collect data on specific consumers, and their purchasing habits and channel preferences. Eventually, they can use that data to ensure in-stock items align with the items consumers want to buy, where and when they want them. That means managing inventory not only to the shelf level, but also to the individual customer level.

Vendor Managed Inventory is well-established, but the practice has taken on new characteristics based on vertical industry needs. Common to all industries is the significant contribution of evolving technology. As the ability to share, analyze, and collaborate on inventory continues to improve, VMI will gain steam as an effective strategy to drive savings and benefits.



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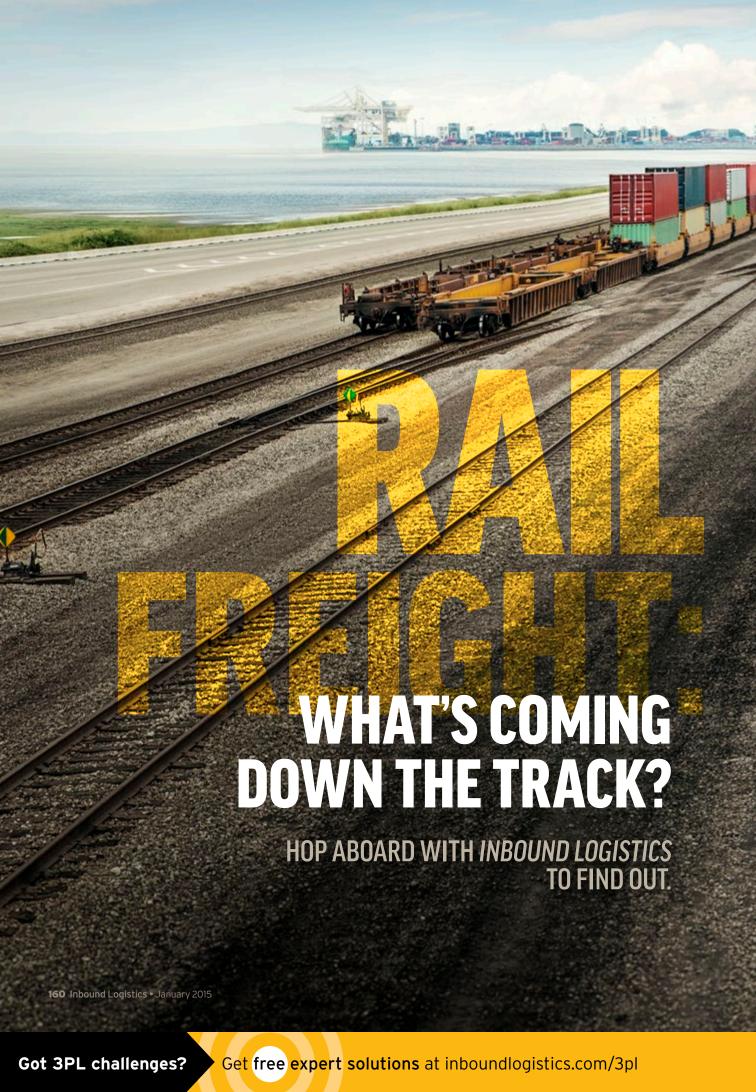
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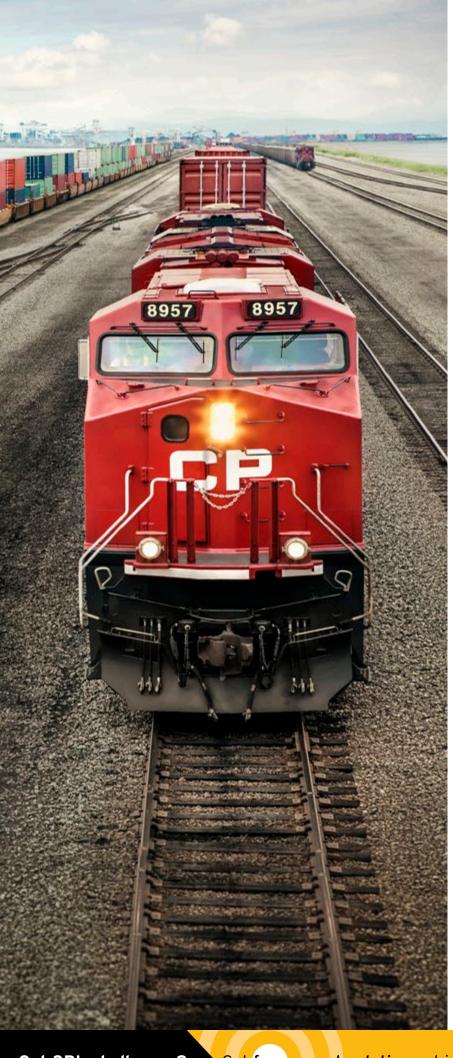
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BY JOSEPH O'REILLY

ouble-stack intermodal trains have become a familiar sight and sound in Canmore, Alberta, a sleepy enclave situated 64 miles west of Calgary in Canada's Rocky Mountains. The town, created in 1884 by Scotsman Donald Smith, co-founder of the Canadian Pacific Railway, was once a major provincial coal-mining center. That boom period has long since passed.

Today, a panoply of technicolored 53and 40-foot intermodal boxes—Canadian Tire red, Hapag-Lloyd orange, APL blue, and Yang Ming white—regularly dominate Canmore's townscape. Less frequently, bleak gray coal trains break up the ennui, representing the ongoing shift in freight traffic across North America.

The growth of domestic and international intermodal, grain exports, crude by rail, and frac sand—all of which offset the corollary drop in coal shipments—is pushing railroad capacity and velocity to the max. Investment and development, often unseen and in places far removed from the beaten tracks, is happening at pace. Class I railroads are spending billions of dollars to upgrade infrastructure and equipment.

It couldn't be happening at a better time.

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North America's energy and manufacturing revival, and the railroad's reckoning as a conduit to that end, is assured. As environmental mandates, cost containment directives, and capacity constraints shade transportation decision-making, the railroad is becoming a bigger part of the solution.

Invariably, there are some headwinds as well. Service disruptions and delays in the Upper Midwest in winter 2013 placed railroads on notice. Captive shippers are pushing for regulation to address the lack of competition and capricious rate increases. In the aftermath of 2013's *Lac-Mégantic* accident in Quebec, Canada, railroad safety is under greater scrutiny as the rollout of positive train control (PTC) progresses at a glacial pace. And, the changing commodity profile is forcing industry to rethink conventional network design.

Inbound Logistics hit the road during fall 2014 to get an up-close view, around the bend, of where the railroad industry is tracking in 2015 and beyond. From New York City's skyscrapers to America's oil and gas headquarters in Houston, to Canada's Rocky Mountains, hop along

as we block, switch, and brake our way through trends and topics shaping the future of rail freight.

INTERMODAL ALL THE WAY

The growth story in the railroad industry is intermodal. As capacity concerns choke transportation efficiency, and driver availability continues to drain capital resources, shippers are running to the rails.

Speaking at *Progressive Railroading*'s RailTrends conference in New York City in November 2014, Joni Casey, president and CEO of the Intermodal Association of North America (IANA), documented this growth.

"2014 was an atypical year," she said. "Volume growth accelerated from February to March. But it kept increasing through May at a higher rate compared to last year. This reflects earlier international shipments, especially imports, that were coming in to the West Coast in advance of the labor negotiations."

Year-to-date volumes in November 2014 were 500,000 units more than 2013. Total intermodal volume rose 5.1 percent in the third quarter. Both domestic and

international volumes reported gains of 5.5 percent and 4.7 percent, respectively, year-over-year.

More telling, international and domestic intermodal volumes are beginning to balance out, reflecting an ongoing shift in these two markets, according to Casey. On a seasonally adjusted basis, domestic volumes exceeded international in third-quarter 2014 for the first time since IANA began tracking this type of data 17 years ago.

"Domestic intermodal volume is tightly connected to overall growth because it drives everything," Casey said. By comparison, international is exposed to more volatility in monthly loadings, as the current West Coast labor situation demonstrates.

Intermodal's sweet spot is between 750 and 1,500 miles—a range that contributes to almost half of all loads, as IANA's data indicates. The 750- to 1,000-mile haul is the fastest-growing segment. Still, as carriers such as Florida East Coast Railway have demonstrated, in certain markets shorthaul intermodal less than 500 and even 300 miles has become advantageous.

On the tracks, railroads have felt the accelerating pulse of intermodal growth.



Capacity concerns and an ongoing truck driver shortage continue to make intermodal rail an attractive alternative to highway freight for many shippers.



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4 A move from Philadelphia to the Chicago Belt Railway Company (BRC) for delivery to one of our western rail partners takes four intermediate handlings. With the Bellevue expansion, it will require two. We'll bypass the BRC by blocking cars further into our western partners' network. That's how you increase capacity. ""

- **Deb Butler**, Executive Vice President of Planning and Chief Information Officer, Norfolk Southern

Canadian Pacific's (CP) Calgary yard is swelling with boxes, a consequence of increasing Vancouver port traffic due to the U.S. West Coast labor impasse, explains Michael Arena, regional account manager of Canadian Pacific Railway.

CP's commodity portfolio comprises about 22 percent intermodal, 36 percent general merchandise, and 42 percent bulk. It traditionally had strength in coal, grain, and forest products. But the railroad expects to grow intermodal traffic 50 percent over the next four years. CP's revival under CEO Hunter Harrison's leadership is predicated on building longer origin-destination unit trains, and eliminating stops. This creates better margins.

CP currently runs 61-hour train service from Calgary to Toronto, and 96 hours from Vancouver to Toronto. It also experienced a spike in Canadian National (CN) carload traffic, and highway conversions between Vancouver and Calgary—a 32-hour run. The challenges of moving freight over the road in the Canadian Rockies have always given rail an edge.

Shippers are taking note. Sears and Canadian Tire have distribution centers adjacent to CP's Calgary yard. Home Depot is building two facilities, totaling one million square feet, mere minutes away. The new complex is part of a supply chain strategy to leverage rail intermodal deeper within its distribution network, and provide rapid deployment to stores across Western Canada—in lieu of serving these locations from Vancouver.

CN, which opened a \$200-million intermodal facility on the outskirts of Calgary in 2013—complementing an existing yard

downtown—also expects volumes to grow. The new facility is designated specifically for intermodal movements while the other yard handles bulk and automobiles.

Similar to CP, CN's intermodal share comprises 23 percent, its top product category in terms of freight revenue. Volume was up 13 percent in third-quarter 2014, according to Jim Vena, executive vice president and chief operating officer for the Montreal-based railroad.

The challenge for growing intermodal locations is creating balance between moves. "Calgary is an inbound market with lots of empties," says Vena. The railroads are exploring opportunities to find product that can move back west so they can better utilize equipment and position containers. For example, grain and beer are strong export commodities out of the Canadian prairie. Railroads and service providers are also looking at innovative ways to box bulk cargoes - grain, for example - that traditionally moved on other equipment.

MEXICO: THE LAST GREAT FRONTIER

Mexico holds even more opportunities. Kansas City Southern's operational bailiwick is cross-border trade. The railroad has seen increasing growth in automotive, heavy appliance, and household movements—and that potential is bleeding into other industries.

"Kansas City Southern's market research indicates that approximately 3.1 million trucks move across the border to our target U.S. markets," explains Patrick Ottensmeyer, executive vice president and chief marketing officer for the Missouribased Class I railroad. "Currently, we have

about two to three percent of this available market."

There is a huge upside in terms of potential conversions. So why hasn't the railroad tapped this brimming revenue stream yet? Simply because the infrastructure didn't exist until recently, acknowledges Ottensmeyer.

Kansas City Southern has been building out its network between Houston and Mexico City over the past five years, spending more than \$300 million acquiring terminals and adding capacity. "Crossborder U.S.-Mexico movements are the last great frontier for truck-to-rail conversion," he adds.

If that isn't incentive enough for shippers, Mexico's opening energy market sweetens the pot. The government's decision to modify its constitution in 2013, and allow more competition and foreign investment in its oil and gas industry, has lit a fuse. Ottensmeyer expects Mexico's energy market will eventually explode, much like the current situation in Canada.

Despite rail's resurgence as a major mover and shaker in the U.S. industrial complex, rapid growth has exposed some cracks in the machine. At the 2013 RailTrends conference, Hunter Harrison pointed to the reality that railroad networks built a halfcentury ago have outgrown their utility. In some cases, railroads need to reconfigure their networks and eliminate underutilized hump yards, which reduces touches.

Harrison has breathed new life into CP by following the precision railroading mantra he pioneered at CN. Industry at large is following that lead by focusing more attention on origin-destination unit trains.

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"The unit train model is an express train that doesn't stop," explained Richard McClure, president of ARC Strategic Advisors Group, while presenting at the SCM Leaders on Demand Oil and Gas symposium in Houston in November 2014.

"A conventional manifest train, which is made up of 10, 15, or 20 different products, has to stop off along the way," he said. "If a train starts in Fort Worth, for example, and goes to the West Coast, it might stop in Nebraska, Utah, and Arizona. That process usually takes 34 days. The unit train model reduces that time to five days. The only reason railroads stop is because they have to change out crews every 12 hours by law."

MIXING IT UP

If there's enough demand to build and run more unit trains, it makes sense to prioritize that business because it increases velocity in the system. But increasing traffic mix on the rails has created a challenge. BNSF's well-documented service meltdown in winter 2013 has been attributed to bad weather and operational constraints. Railroads have been quick to deflect captive shipper claims that problems are structural and systemic.

"One big issue is the change in traffic commodity mix," explained Ed Hamberger, president and CEO of the American Association of Railroads, at RailTrends. "We've had two record grain harvests, and growth in domestic intermodal. The traffic lanes that are transporting record domestic intermodal volumes are the same ones moving coal out of Powder River Basin."

Deb Butler, executive vice president of planning and chief information officer for Norfolk Southern, supports that claim. "The bulk network, which includes crude units, is now trying to occupy the same routes as our premium intermodal network," she says. "The change in mix creates different dynamics of how the railroad operates. It creates the need for resiliency in terms of crews, locomotives, and infrastructure."

Apart from that, a sluggish and congested railroad is also impacting the rollout of PTC technologies. The deadline for full deployment remains a moving target



Canadian Pacific expects to grow intermodal traffic by 50 percent over the next four years.

as industry seeks an extension beyond the mandated Dec. 31, 2015, date.

"We are at the point of PTC deployment where, regardless of when the deadline falls, we need to start putting hardware out in the field and testing it," Butler adds. "That requires track time. But track time in a congested network will only create more congestion. We'll manage it as best we can."

CHALLENGE: INCREASING VELOCITY

Railroads are "putting steel in the ground" and buying more locomotives and equipment to counter decelerating rail velocity and swelling terminal dwell times. BNSF, for example, pledged to spend \$5 billion in 2014—\$2.3 billion on its core network; \$1.6 billion on equipment acquisitions; \$900 million for terminal, line, and intermodal expansion projects; and \$200 million on PTC.

As the science of railroading evolves, carriers are taking a more sophisticated approach to speeding up the network. At RailTrends, Butler presented a step-bystep overview of how Norfolk Southern has reconfigured its network.

The Norfolk, Va.-headquartered railroad operates 20,000 miles of track in 22 states and Washington, D.C., with access to every major eastern U.S. seaport. Ninety-five percent of its routes are cleared for double-stacked intermodal trains; two-thirds of its core network is double-track or better.

"General merchandise roughly represents one-third of the units Norfolk Southern moves," Butler explained. "Although that network offers significant leverage during up cycles, single carload business requires gathering, distribution, and switching functions, which result in materially disproportionate consumption of locomotives and crew start resources."

In other words, manifest trains are a more labor- and capital-exhaustive business, especially compared to the unit train model. So the rails have even greater incentive to drive efficiencies in this area.

"Origin and destination handling represents between 25 to 50 percent of total transit time," Butler said. "That leaves 50 to 75 percent of transit time on road trains and in intermediary terminals. If we want to return the network to the velocity we saw in 2012 and 2013, we need to focus our attention here."

Norfolk Southern started looking at different metrics to measure performance, teasing out data to support better analysis of its network. The railroad gave higher priority to line haul miles per day—the average miles per day for all general merchandise shipments from departure origin terminal to destination arrival terminal. In sum, Norfolk Southern was able to make a correlation between line haul miles per day and on-time shipment performance.

SPINNING UP THE NETWORK

"As long as we are adequately resourced for the volumes we move, we have a long theoretical runway before we reach the part of the curve where incremental costs creep up as velocity increases," Butler said. "That's why we often talk about our goal of spinning up the network. We have proven, all else being equal, the faster our velocity the lower our incremental operational costs."

As such, the railroad identified three



In their own words

Georgia Ports Authority has been able to provide a single terminal in one location that allows us to go in and out of one spot – regardless of the carrier, regardless of the chassis, regardless of the dray provider – to come out in one seamless move. That sort of forward thinking by the Georgia Ports Authority has really provided us the opportunity to have that seamless execution. I'd probably call it best in class, as it relates to turn times and our drivers being able to come in and out in a pretty rapid manner.

Reade Kidd • Home DepotDirector of International Logistics

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See why the fourth-largest retailer in America and fifth-largest in the world depends on the single-terminal advantage to import 20% of its U.S. freight through Savannah.



Infrastructure investment continues to drive the rails. One example: Norfolk Southern's \$161-million expansion of its yard in Bellevue, Ohio, will make the facility one of North America's largest rail car classification and switching yards.

primary levers for improving velocity in its system: invest in infrastructure, eliminate freight car switches between origin and destination, and reduce handling time.

CAPACITY CONCERNS

For the industry at large, infrastructure investment has become a rallying cry, especially given negative publicity over recent operational and service issues. Simply put, railroads need to ramp up capacity to accommodate growing volumes across all commodity groups.

"As volume increases, or as the mix of traffic tilts toward unscheduled unit trains on our core intermodal routes, increasing velocity may require more than an adequate supply of locomotives and crews," said Butler. "We may also have to invest in infrastructure and technology."

She pointed to two specific examples.

First, the recently opened Englewood Flyover in Chicago is a bridge that

separates Norfolk Southern and Amtrak trains from Metra, Northeast Illinois' regional commuter rail system. The \$142-million project is part of Chicago Region Environmental and Transportation Efficiency (CREATE), a public-private partnership between the U.S. Department of Transportation, the state, the city, Metra, Amtrak, and Class I railroads to invest upwards of \$4 billion in 70 different projects aimed at easing passenger and freight rail congestion in Chicago.

The flyover opened in October 2014 and Norfolk Southern has gained an additional six to eight hours of access to its Chicago mainline every day. That's a pretty considerable upside.

Second, Norfolk Southern is in the process of expanding its Bellevue, Ohio, yard. When the railroad first opened the facility in 1967, it had the prescience to allocate enough property to double future capacity. That's exactly what Norfolk Southern has done more than 40 years and \$161 million later.

The Bellevue yard is situated where Norfolk Southern's major north-south and east-west corridors meet. "Every network study we've conducted shows that more traffic wants to flow to Bellevue than it could hold," said Butler.

The railroad is in the process of phasing in its new operational plan, but Butler expects the expansion will deliver immediate impacts.

"A move from Philadelphia to the Chicago Belt Railway Company (BRC) for delivery to one of our western rail partners takes four intermediate handlings," she explained. "With the Bellevue expansion, it will require two. We'll bypass the BRC by blocking cars further into our western partners' network. That's how you increase capacity," she adds.

On the regulatory front, competitive switching remains an unsettled topic as rail



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shippers and carriers await a long-overdue decision from the Surface Transportation Board on how to proceed.

National Industrial Transportation League (NITL) CEO and President Bruce Carlton has been a staunch advocate of increasing rail competition among Class I carriers through mandated reciprocal switching. As the North American Ironically, the railroad's poor record of late has become its biggest defense. Shippers want better customer service, and they want more competitive switching and pricing.

"You can't have it both ways. Either allow the industry to continue to earn revenue and re-invest that capital, or reregulate, cap rates, and have a service diminution. Which one do you want?" Hamberger asked.

You can't have it both ways. Either allow the industry to continue to earn revenue and re-invest that capital, or reregulate, cap rates, and have a service diminution. Which one do you want? "

-Ed Hamberger, President and CEO, American Association of Railroads

energy boom continues to grow, it presents a new wrinkle.

Railroads are carrying record volumes of "domestic energy," raw materials (frac sand), and equipment to and from drill sites. As they gravitate toward the lucrative oil and gas business, captive shippers are feeling the pinch. Lingering service issues have only escalated their angst.

Carlton's antagonist on the rail side, AAR's Ed Hamberger, has led the charge against competitive switching. At the 2014 RailTrends, he again stated the association's position.

"NITL points out reciprocal switching will only affect 1.5 million carloads, which saves them \$1,000 a carload—or \$1.5 billion. Our study says it will impact 7.5 million carloads. At \$1,000 a carload, that's \$7.5 billion," he explained.

"But let's take the average, 4.5 million. That's \$4.5 billion that goes out of the industry, 4.5 million more switches, and 4.5 million times more inefficiencies loaded onto the network," Hamberger added. "That means more locomotive time in the yard, and more crews to manage the switches. Every switch is worth one day, so that's 4.5 million more days in transit time."

Reciprocal switching remains a divisive issue among shippers and carriers—and one that's unlikely to be resolved in the immediate future.

TANK CAR STANDARDS

Of greater importance and urgency for the railroad industry is the issue of new tank car standards. Ever since the *Lac-Mégantic* derailment, Canadian officials have been pressing Class I railroads and tank car suppliers to adopt new crude-carrying equipment standards.

The DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) is expected to announce a rulemaking in early 2015 regarding specifications for hazmat tank cars that carry crude oil and ethanol. A few different options are on the table, with varying modifications that include steel jacket thickness, electronically controlled pneumatic brakes, and head shields. The only certainty is the hefty price tag associated with retrofits and new builds. Some estimates have pegged the total cost at more than \$60 billion.

PHMSA is looking at three impacts: technical, regulatory, and economic. Not surprisingly, there's some difficulty justifying the costs of the new rule. The challenge is that "standards are still being defined, which creates a lag in production and pushes back deliveries even farther," says McClure.

Making matters worse, a shortage of railcars already exists.

The unsettled Keystone XL pipeline debate, and growth in crude oil and natural gas production, has been welcome news for railroads, especially as coal traffic continues its long, slow decline. South Dakota's Bakken fields also are experiencing a gush in frac sand movements—to the point of a major equipment shortage.

"Demand for frac sand increased 100 percent this past year. Sand mines are at capacity," says McClure. "Three years ago, there were five frac sand mines in Wisconsin. Today there are 105."

The Railway Supply Institute (RSI), a Washington, D.C.-based lobby that serves the interests of railroad suppliers, offers another perspective.

"Fourth-quarter statistics indicate a backlog of approximately 100,000 freight cars that have been ordered but not yet delivered," notes Tom Simpson, president of RSI. "We haven't seen numbers like this since the late 1970s, when economic policies in place made it imperative to invest in freight cars to earn a return on investment."

The equipment shortage has hit tank cars the hardest—53,000 by RSI's estimate—as well as small covered hopper cars (21,000) that are used to haul frac sand. Some observers expect it will take five years to replace the fleet. Companies that buy new equipment today can expect deliveries by the third quarter of 2017.

RSI's research suggests the PHMSA proposed regulation will force more than 90,000 tank cars from service at various times until shop capacity can carry out necessary modifications. If that alone isn't cause for concern, consider that upwards of 50 percent of the crude oil and ethanol fleet could be idle by 2020; or that 70,000 more trucks will be carrying 1.6 million loads of crude and ethanol on U.S. highways by 2018.

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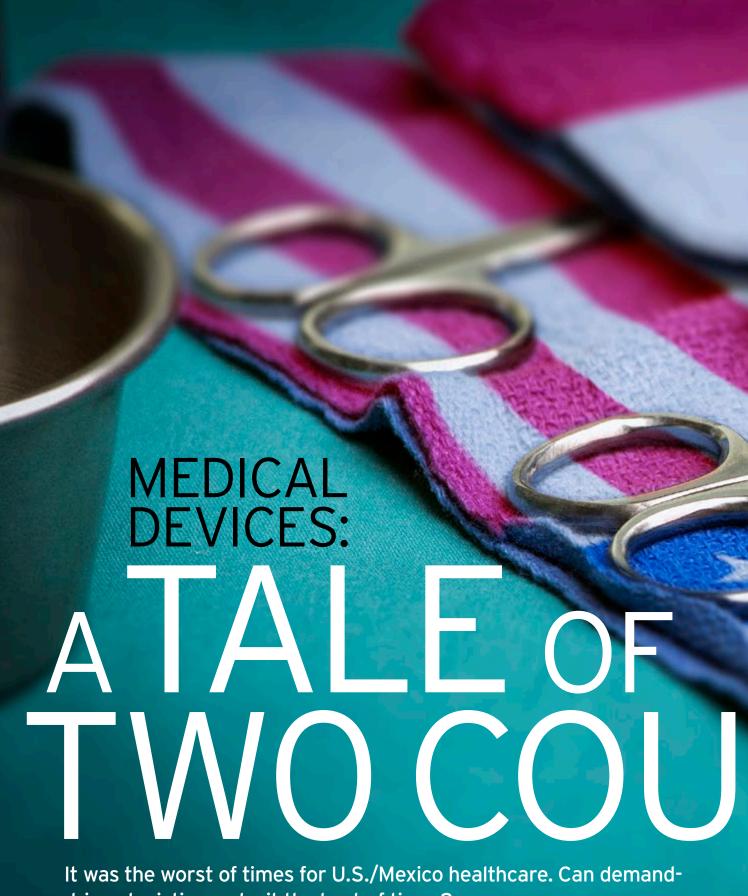
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or the medical device industry, business as usual ended in 2013. A convergence of factors created a perfect storm of disruption for the sector, particularly in two of its major markets—the United States and Mexico.

The first factor is the phased implementation of President Obama's healthcare plan, which will eventually extend health insurance coverage to an estimated 32 million Americans who do not have any form of health insurance.

Second, Mexico passed a major initiative to provide basic healthcare coverage to the country's entire population by 2020, causing an expected annual average spending increase of 10.2 percent between 2013 and 2017.

Third, a new 2.3-percent U.S. excise tax on medical devices took effect in January 2013.

Fourth, intense price pressure from payers—insurance companies, corporations, and government—is shrinking margins.

Fifth is a payer-driven shift in performance requirements—from selling devices and treating episodes to delivering positive patient outcomes.

Finally, there's a transition to a more geographically dispersed distribution channel.

Medical device manufacturers are struggling to adapt to this flood of fast-paced change—particularly to the pressure of reducing costs. In the past, the sector enjoyed robust profit margins—some

as high as 40 percent for high-end devices. Those days are gone.

Unquestionably, the industry succeeds in meeting some tough service challenges—delivering products that heal, maintain, or save lives in a manner that meets exacting service demands. At the same time, though, the medical device supply chain is costly. Manufacturers load the supply chain with buffer inventory—everywhere—to avoid stockouts. Effective inventory visibility and control is limited or non-existent. Emergency orders drive the design of the entire system—even the non-emergency devices supply chain. Track-and-trace requirements keep growing, and a difficult reverse product flow further complicates the picture.

The result: While the medical device supply chain delivers extraordinary service, it does so at a high cost structure that is unsustainable going forward, given the new market realities in the United States and Mexico.

Medical device manufacturers recognize change is imperative, and are looking at all aspects of their business for solutions. The supply chain has risen to the top of the agenda as a prime instrument with which to address these convergent pressures.

The End of Business as Usual

The medical device industry is large and global. The U.S. medical device sector, which is valued at more than \$60 billion, is the world's largest, and accounts for nearly 20 percent of the \$350-billion global industry, by production, according to the



The medical device supply chain delivers extraordinary service that helps save lives, but that comes at a high price. Manufacturers are looking to improve their supply chains to help cut some of those costs, and meet exacting inventory and regulatory demands.

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U.S. International Trade Commission. Moreover, seven of the world's 10 largest medical device original equipment manufacturers (OEMs), by revenue, are headquartered in the United States.

Although far smaller, the Mexican medical device market—valued at \$2.8 billion in 2008—is projected to grow at a CAGR of 5.7 percent to an estimated \$5.4 billion in 2020.

Intensifying Cost Pressure

The pressure to reduce cost across the medical device supply chain has never been greater. "Our nation's fiscal challenges and our industry's bulk are on a collision course," writes Paul Keckley, executive director of Deloitte Center for Health Solutions, in a recent report about the U.S. market. National health spending is projected to grow at an average rate of 5.7 percent annually between 2014 and 2021, which would be 0.9 percent faster than the expected annual increase in gross domestic product during this period, according to the U.S. Congressional Budget Office.

Concern over this health spending increase is prompting hospitals and other medical providers to focus on cost cutting. Medical device manufacturers are caught in the crossfire, according to the Deloitte Center for Health Solutions. Hospitals and other medical providers are requiring better prices, and health plans want steeper discounts.

Because of intensifying price pressures from insurers and

AN X-RAY OF THE U.S. MEDICAL DEVICE SECTOR

Key numbers inside the U.S. medical device industry:

- At an estimated \$127 billion in 2013, the U.S. medical device market is the world's largest, accounting for 40 percent of the global market.
- Per capita expenditure on medical devices, at \$399 USD, is the highest in the world.
- Seven of the world's top 10 medical device manufacturers are U.S. companies. These include Baxter, Boston Scientific, Covidien, General Electric, Johnson & Johnson, Medtronic and Zimmer.
- ☐ Imports represent an increasingly significant part of the market, and now account for around 30 percent of the total. This growth is partly due to U.S. manufacturers shifting some production to lower-cost labor markets such as Mexico. In 2011, consumables achieved the fastest growth rate at 12.1 percent (\$5.3 billion USD), while diagnostic imaging rose by 7.4 percent (\$8.9 billion USD).

SOURCES: Espicom, The Medical Device Market: USA, Opportunities and Challenges, 2013. Medical Device and Diagnostic Industry, The U.S. Medical Device Industry in 2012: Challenges at Home and Abroad



governments, the traditional sales model for medical devices is beginning to change. Doctor preference typically drove hospital purchasing decisions, particularly for high-value devices such as hip or knee implants.

"While that's still the case, hospitals are doing what they can to reduce the number of suppliers, and better control their SKU portfolios for lower value or less 'preference-sensitive' medical device products," says Wayne Wooddell, vice president, business development-life sciences and healthcare at Exel Inc., a third-party logistics provider with U.S. headquarters in Westerville, Ohio.

At the same time, insurance companies and regulators are shifting toward performance-based healthcare management, focusing on patient outcomes rather than procedures. This puts pressure on medical device manufacturers to compete either on cost, or by differentiating their products based on superior patient results.

The Aging Boom

The populations of the United States and Mexico are growing older—fast. The growth in the number and proportion of older adults is unprecedented in U.S. history. Two factors—longer life spans and aging baby boomers—will combine to double the population of Americans aged 65 years or older during the next 25 years to about 72 million. By 2030, older adults will account for roughly 20 percent of the U.S. population, up from 14 percent today, according to the Centers for Disease Control. In Mexico, an estimated 12 percent of the population will be 65 or older by 2030.

Simultaneously, there has been a major shift in the leading causes of death for all age groups, from infectious diseases and acute illnesses to chronic diseases and degenerative illnesses, including diabetes, cancer, and heart disease. Treatment for conditions such as these consumes more healthcare resources over a longer period—pushing government healthcare budgets skyward at a rapidly accelerating rate.

New Track-and-Trace Regulations

New safety regulations introduced in the United States and elsewhere require device makers to implement robust product tracking and data collection systems in the supply chain, at a substantial cost.



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Specifically, in 2013, the Food and Drug Administration (FDA) released a final rule establishing a unique device identification system designed to identify devices through distribution and use.

The final rule, which began taking effect in 2013, requires device labelers to include a unique device identifier (UDI) on most device labels and packages readable by automatic scanners.

Device labelers must also submit certain information about each device to FDA's Global Unique Device Identification Database (GUDID). The public will be able to search and download information from this database.

The FDA issued the rules in an effort to improve patient safety and modernize post-market surveillance of device performance. Manufacturers have up to seven years (2020) to fully comply for all devices ultimately requiring a UDI.

The European Union is in the process of revising its medical device safety regulations along similar lines, again to enhance patient safety. Other countries are likely to follow suit.

Supply Chain Challenges

Beyond these market forces, the traditional medical device supply chain carries significant challenges of its own. While these issues vary somewhat in nature and degree between the United States and Mexico, essentially they boil down to four key concerns:

1. Inventory everywhere. For both the United States and Mexico, managing inventory is a critical challenge. "There is inventory everywhere—in the regional distribution center, forward stocking locations, the logistics service provider's warehouse, the sales reps' car trunks, on consignment in the hospital, and at the sterilization point," says Scott Cubbler, president, life sciences and

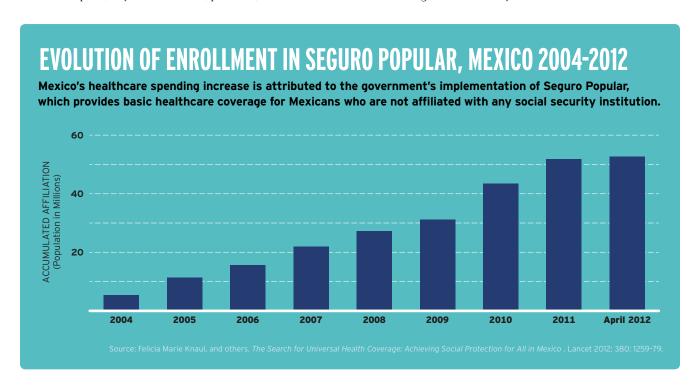
healthcare-Americas for Exel/DHL Supply Chain.

With regard to the forward stocking points, "It is not uncommon for a medical device company to operate a network of small distribution points sprinkled across their markets—anywhere from 40 to 100 such locations," explains Phil Siewert, senior director business development, Exel/DHL Supply Chain. "These facilities are small—about 2,000 square feet—and are used to feed product to end customers in final-mile delivery."

This inventory-everywhere system is not only expensive, but the complexity of trying to track product throughout the chain is enormous. It is easy to lose visibility of product in the channel.

2. The unknown in the operating room. Another factor that adds complexity and cost to the devices supply chain—particularly implants—is the need to hedge against the unknown in the operating room (OR). In planning an implant procedure, the surgeon requests a tremendous volume of parts. For a left knee replacement, the doctor may order a surgical kit with knee sizes two through 10, and only use size four. Each implant comes with essentially a closet-sized tote bin of product going into a surgery.

Unused equipment, which is still owned by the device-maker (consignment inventory), is out of circulation and unavailable for sale. "With devices such as pacemakers, three or four sizes might be sent to surgery, which is not a big deal from a cost-of-inventory perspective," explains the supply chain director at one device manufacturer. "Orthopedics, however, requires sending a tool truck-sized kit into surgery. The doctor uses just a fraction of that inventory, and the rest comes back to be sterilized, inspected, rekitted, repackaged, re-inventoried, and stored—until it moves out to the field again to start the cycle all over."



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This means turn rates for very expensive consignment inventory are extremely low.

3. The high cost of service. In the United States, intense competition among medical device manufacturers has prompted many to use delivery as a competitive lever. Manufacturers try to outdo each other on service, so they further complicate the supply chain by guaranteeing hospitals that orders placed by 7 p.m. can be delivered the next morning.

As a result, hospitals often wait until the last minute to place orders, which forces manufacturers to rely on a costly premium delivery system to fulfill next-day deliveries. This means manufac-

turers must have distribution centers (DCs) located next to air express hubs to get product to the hospitals next day. They also load the system with inventory in order to fulfill their high level of order promising.

"For supply chain operations, this lastminute ordering profile drives tremendous variation in workflow through the distribution channel," Siewert notes. "It also means the supply chain must operate in 'emergency mode', with a huge spike in workload occurring at the end of the day. And shipments must move via expensive next-day delivery service."

4. Expanded demand footprint. ${\rm In}$ Mexico, the expansion in healthcare coverage means medical device manufacturers face a rapidly growing geographic distribu-

tion footprint, as healthcare delivery services reach beyond the major metropolitan areas. They must now ship products to more remote areas far from DCs, which are usually located in large cities, adding cost to the supply chain.

Solutions for the Future

Leading medical device manufacturers are turning to innovative supply chain solutions to tackle these challenges—and working closely with third-party logistics service providers and customers to execute these new ideas. Among the new supply chain strategies:

■ **Leveraging shared capacity.** In both the United States and Mexico, medical device manufacturers typically have customer overlap, meaning multiple companies are shipping to the same group of customers, creating considerable duplication of supply chain assets, resources, and costs-all geared toward serving the same customer cluster.

It would make sense, therefore, for manufacturers to reduce this redundancy by using a single logistics service provider to create a shared, multi-customer supply chain solution. This solution would manage the flow of medical device goods and services to and from the hospital. The idea would be to cluster manufacturers in a single warehouse near the hospital they are servicing, and consolidate deliveries and services to the hospital.

"Having six different deliveries to a hospital, and going to six different wards with four different highly trained drivers doesn't make sense," explains Wooddell. Instead, the 3PL could create a metro hub, consolidate deliveries, eliminate overlapping deliveries, and provide full service with just two drivers.

"This shared capabilities model would enable manufacturers to compete on the basis of their product, rather than on the finalmile delivery," Cubbler adds.

"In the United States, we have the challenge of a complicated supply chain for medical devices," says Wooddell. "The challenge in Mexico is simply to get the product to the point of use. But

because Mexico doesn't have the demand yet, its medical device sector is in a position to learn from the United States, build the right supply chain, and set the right behaviors to help them avoid the costly infrastructure required to meet customer expectations in the United States."

Direct to Market Delivery

To this end, some manufacturers operating in Mexico are considering using a qualified 3PL to provide direct-to-market delivery. In this scenario, a single 3PL would replace the numerous small distributors that currently serve as the go-between in the manufacturer-customer relationship.

Some manufacturers are also working with 3PLs to set up forward stocking

facilities in major metropolitan areas to service hospitals and stand-alone surgical centers. Under this arrangement, "we position consignment inventory in the forward stocking location instead of spreading it across many hospitals," says Daniel Pardo, president, Mexico and life sciences LATAM, for DHL Supply Chain. "This way, we can deliver product quickly, while reducing the amount of inventory in the supply chain."

■ Collaborating toward Lean. One practice that would complement this shared services supply chain is greater collaboration among all trading partners—manufacturers, their customers, and 3PLs—in the devices supply chain.

"We're working with customers to improve our scheduling," reports the supply chain director for one device manufacturer. "The more time we have to react to something, the better we can plan.

"From a reconstructive perspective, if we know the schedule of surgeries in advance, we can plan and sequence our implants to the hospital on a just-in-time basis," the director adds. "Every knee set costs \$55,000, so the better we plan, the less inventory we have sitting idle in the field, and the more we reduce our costs."

■ Streamlining inbound to manufacturing. Better forecasted demand visibility enables device companies to pool inventory

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"Supply chain

innovation offers a

powerful opportunity

to change the status

quo and drive cost out

of the system."

Phil Siewert,

Exel/DHL Supply Chain

farther upstream in the channel, in fewer, more centralized locations. "The challenge is to streamline inventories in the field, maximize velocity, and, at the same time, not miss surgeries," notes the supply chain director.

Exacting Information

More advanced planning and forecasting also would include additional details about exact order requirements. This is particularly important for implants because it would reduce the volume of product being exchanged with the hospital in operating room surgical kits.

"If we had more exact, accurate information about what's needed for a procedure, we could deliver a tackle box-sized kit to a spinal procedure instead of a tool truck-sized kit," comments a logistics director for a major U.S. device manufacturer.

Longer lead times and better forecast information would enable manufacturers and their logistics service providers to manage the flow of product in a more controlled manner across the distribution network.

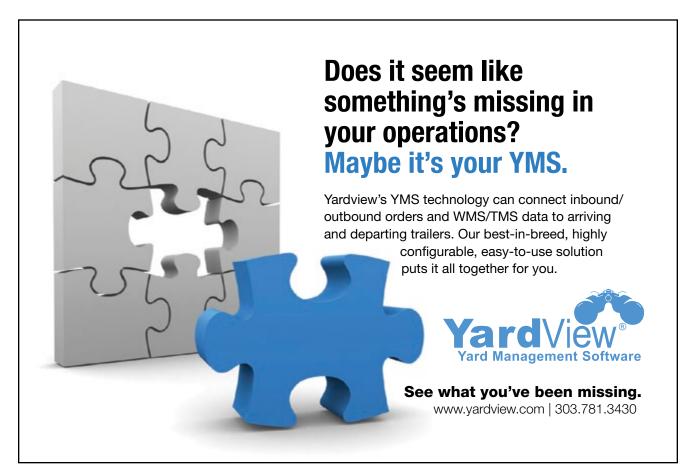
"It would reduce reliance on high-cost express delivery systems," Wooddell says. "It also would reduce the need for buffer inventory at hundreds of stocking points, while still delivering high levels of availability and customer service."

The path forward is not an easy one for the medical device sector, as it reengineers its business model and the supporting supply chain. "Fortunately, healthcare institutions in particular, and the industry as a whole, are beginning to realize that the level of cost savings needed won't come just from squeezing suppliers for price concessions," observes one manufacturer. "One multi-billion-dollar hospital system told us, 'we could beat you up on price, but we know to reach our cost objectives, that won't be enough. We need to take a more systemic, strategic approach to reducing costs."

Changing the Status Quo

"Supply chain innovation offers a powerful opportunity to change the status quo and drive cost out of the system," suggests Siewert. "If the industry can improve the quality and flow of information, reduce uncertainty, and develop solutions such as shared supply chains, it can create a more efficient path to market. This will help the industry meet the challenges of controlling and reducing costs, while delivering on its service promise."

"This is not something we can accomplish alone," notes one device manufacturer. "We need to bring all of our supply chain partners to the table, and all work together to streamline how we get product to the customer."



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BIG BIG DATA

Big data is a big deal, but what is it? *Inbound Logistics* asks four industry experts to file their report on big data and its benefits.

YOUR STICKY NOTE AND SPREADSHEET FILING SYSTEM has outlived its usefulness. But with so much data coming from your yard, warehouse, transportation management systems, logistics partners, suppliers, and sales team, what in the world do you do with it? All of this data combined is known as big data, and if you don't know how to process it all, it can give you a real headache.

Every shipper knows that big data is a big deal. It's not quite a household term, but it's certainly a phrase used in every office. But what does it mean? How does it apply to your operation? How can you use it to make intelligent, well-informed decisions? What kind of software do you need to curate your data?

It all seems intimidating, and without the proper guidance, it's hard to know where to begin. With so many questions on the table, *Inbound Logistics* gathered a few "Data Miners" to talk about trends and challenges in the business intelligence world.

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Everyone talks about big data, but what is it? How do you define it as it relates to supply chain and logistics management?

GJENDEM: Big data refers to the increasing volumes of data from existing, new, and emerging sources—smartphones, sensors, social media, and the Internet of Things—and the technologies that can analyze data to gain insights that can help a business make a decision about an issue or opportunity. When applying big data analytics to supply chain or logistics management, the data insights can offer companies a strategic advantage. For example, companies can make data-driven decisions on how to improve customer service and demand fulfillment, or establish quicker and more effective reaction times to supply chain issues. BENADRETTI: Big data, as the name suggests, is large sets of related data that may be scrutinized to reveal trends, patterns, and other relationships. While most enterprise applications can manage large data sets, the key with big data is not just the amount of data, but also its complexity and the difficulties of processing it utilizing traditional enterprise applications. In some cases, it could be comparatively smaller data sets with huge complexities.

Big data is produced from multiple sources, yet related in every aspect of its intended utilization. Consider the number of data points and origins connected to large and complex supply chains. Now, consider being able to bring all that together, and having it related to a few entities in the enterprise with the ability to see relationships. Also consider the importance of relating the data to a single business entity that helps with decision-making.

Data in the supply chain must be controlled to make it meaningful. This means that with the high throughput and complexities of absorbing all the data, the relevancy of what gets introduced and analyzed is critical to the true meaning of big data. FRIEDMAN: Big data is a popular term used to describe the exponential growth and availability of data, both structured and unstructured. Taking a practical approach, the business question you need to answer is: how do I create tangible outcomes based on practical opportunities using big data? Data needs to be condensed—presenting only what is relevant. For example, executives may want summary data across the company's product lines, or managers could want more detail, but only for the areas that they oversee.

Chief data officers or IT professionals are challenged with not only providing the infrastructure, but also working with others to provide meaning to big data.

CAMPBELL: Considering its position as the nexus of the supply and demand planning process, of all corporate functions, the supply chain likely collects the greatest amount of raw data. In the most elemental sense, big data, as we define it, forms the building blocks of the supply chain in transactions, movements, product details, and customer and supplier information. The difference between yesterday and today is not that there is more of it, it's the relative ease and speed with which the supply chain can create business insight with its data. In this way, big data isn't new to the supply chain, but the ability to quickly and cheaply leverage it is.

Where is big data located? Where can shippers mine it from?

GJENDEM: Data is everywhere. Through the rise of social media, smartphones, and the Internet of Things, new data types and sources are appearing every day, providing companies with the ability to discover new insights on how to best achieve their business goals. For shippers, structured data can be found in many places including enterprise resource planning (ERP), transportation management systems, and planning and

MEET THE DATA MINERS



FRODE HUSE GJENDEM, managing director, Accenture Analytics— Operations Analytics



JOEY BENADRETTI, president, SYSPRO USA



HAROLD B. FRIEDMAN, senior vice president of global corporate development, Data2Logistics



ALEC CAMPBELL, global vice president, supply chain design and innovation, UTi Worldwide

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procurement systems. Unstructured data can also be found in data sources surrounding the company, including financial data, weather data, or GPS data from trucks.

BENADRETTI: Big data originates from multiple entry points and is traditionally housed in multiple locations—servers, databases, or tables. The relationships are complex, and the complexity is what often drives the inability of organizations to understand it. **FRIEDMAN:** Big data can be found in many data streams—both inside and outside the organization. Below is an example of a big data information stream. Each of these 10 actions leaves a data trail that is compiled to measure performance and create process efficiencies.

- 1. An order is received from a client or a purchase order is sent to a vendor.
- **2.** The Warehouse Management System (WMS) notifies the warehouse of the product that needs to be shipped.
 - **3.** An electronic load tender is broadcast to multiple carriers.
- **4.** A carrier is selected based on price, time performance, loss and damage experience, and billing accuracy. This information is gathered from prior shipments.
- **5.** When the carrier picks up the load, its terminal is notified of the pickup, so the product can be tracked.
 - **6.** The WMS makes the appropriate adjustment to inventory.
- **7.** An electronic bill of lading is prepared and accepted by the carrier.
 - **8.** An advanced shipping notice is sent to the receiver.
- **9.** A record of the shipment is passed to the payment process to serve as an authorization for shipment to be paid, and to accrue the expense until the freight bill is received.
- **10.** The carrier submits its freight bill via electronic data interchange, and it is audited, matched to the shipment authorization record, and staged for payment.

CAMPBELL: For the supply chain, internal sources of big data lie primarily in regional ERP systems, production systems, warehouse management systems, and transportation management systems. Unique to the supply chain, data can also be external with distributors/customers, suppliers, and the logistics providers between each party such as forwarders, contract warehousing, contract manufacturing, and customs brokers. Most shippers UTi serves tend to underestimate the business case needed to co-opt their key providers to share forecasting, movement, or other non-standard data. As a provider, we understand how and why this can be difficult. We proactively share with our shippers the data they might need, and help them communicate and collaborate externally.

What are the biggest challenges shippers face regarding managing big data?

GJENDEM: Shippers face two main challenges with big data—deciding on the desired insights-driven goal, and understanding how to extract the data signal from the noise that will support the desired outcome. To overcome these challenges, shippers should

first establish a strong relationship between the business and IT. Effective collaboration is key for developing strategies that lead to data-driven business outcomes. Then, it's important for the shipper to gain an understanding of the data's potential to reach the goal. The shipper can gain this understanding by applying exploratory approaches to data to find correlations, patterns, or predictions that can be relevant for the business.

BENADRETTI: Often, shippers only know the immediate relationships; for example, where did it come from and where is it going? They may not know the true origin and end points. Because shippers do not have visibility of the entire supply chain, it is often difficult for them to understand the importance and sensitivity of products shipped.

Take the transportation of human organs. The shipper knows everything about the organ it is shipping and is able to help move the proverbial supply chain along. This is true for most specialized shippers, but not always for the shipper of consumer or other goods. So consider shippers that move bulk products across the ocean or the country. Without knowing the data points involved in the supply chain, they may not be able to

"Big data isn't new to the supply chain, but the ability to quickly and cheaply leverage it is."

—Alec Campbell, UTi Worldwide

appreciate the importance a customer or vendor is placing on the shipping process.

When shippers have better insight into the entire supply chain when shipping goods for multiple customers in the same containers or shipment manifests, they are better situated to deal with the difficulties of contamination, shelf life, and protecting corporate trademark secrets. They also gain the ability to make strategic and operational decisions that affect the supply chain.

Another impact is understanding all the touchpoints and higher costs that can emanate from areas such as insurance, security, and the utilization of faster ships to avoid sea pirates in certain shipping lanes.

FRIEDMAN: First, shippers must determine the type of information they need. Second, they need IT support to access this information. Third, they must commit resources to capitalize on the data captured.

CAMPBELL: Shippers typically assume they don't have the data, or don't have time to do the work, and both those positions are slightly off-base. The biggest challenges are almost always either confidence in the quality of data (this is different than not having data), or having the proper people resources on hand to manage or extract data for analysis by an outside provider (this is different

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than not having time). The quality issue is often related to legacy or mismatched global systems, and the scale of data cleanup needed. The people resources issue typically arises because few supply chains have adequate dedicated IT staff who know what data is available—and can be made available to a consultant or other provider. Both issues are reasons to ask a third-party logistics (3PL) provider to help innovate and collaborate.

What are some specific ways big data can impact supply chain—and ultimately, enterprise—performance?

GJENDEM: Building a modern data supply chain—enabling all data to flow smoothly and quickly through an enterprise—helps to cultivate data into a company asset that can positively impact the supply chain and the overall business in various ways.

For instance, shippers would be able to more effectively analyze data from different sources, such as contextual sensor data on shipped storage containers, and weather data to understand the conditions goods are being transported in. These data insights can help a company better understand whether a shipment will be on time and arrive with the right quality. This data-driven improvement in supply chain efficiency could increase revenues or improve customer service.

BENADRETTI: Big data impacts more than the technology or application used to deliver it. Having big data without the means to understand it removes a lot of decision-making from the supply chain. Obvious factors, such as delivery methods and interface options, are affected by the size and complexity of the available data, the ability and interpretation of which could eliminate delayed actions, and ultimately poor service or decision-making.

FRIEDMAN: Having better information within a warehouse impacts inventory because turnover rates can be better managed, popular items can be identified, out-of-stock items can be reduced, and companies gain improved visibility to who is buying what. As a result, they can reduce cost and improve the bottom line.

Big data also impacts transportation because shipping smarter allows companies to optimize selected service levels with performance required. They can also consolidate shipments, build round trips, and optimize carrier selection based on cost and performance. The result is reduced transportation expense that falls to the bottom line.

Also, having access to information that allows companies to have the right product available, and deliver complete orders on time, improves customer service and builds customer loyalty, which will increase sales.





CAMPBELL: We are using big data in two specific ways. One way is to identify and quantify supply chain risk. UTi worked with an automotive parts supplier to perform an expedited freight risk analysis using the supplier's shipment data, rates, and event likelihoods. The project resulted in the shipper re-ordering the procurement ranking of suppliers based on a new logistics risk factor. The key was the trust to share data.

The second way is network optimization. The network modeling shippers can perform today when the proper data is sourced is both advanced and comparatively low cost. One tool

-Joey Benadretti, SYSPRO USA

"Understanding all the data points in the supply chain can be transformed into information that impacts the decision making process."

we use is LLamasoft Supply Chain Guru, which can generate rapid insight into current and future supply chain performance at the SKU and customer level. We can work with companies to model precise costs, service levels, and working capital needs for a two versus four distribution center model, or for switching to

What types of data can create real value for shippers? In what area should shippers look to get the quickest ROI from analyzing big data?

ocean freight for slow-moving products.

GJENDEM: To get the most value from data, companies should establish a clear view of what will be a competitive differentiator for them, and an understanding of how their industry is evolving. Then they need to develop an actionable road map based on those insights. It is also important for businesses to pursue a single big data pilot or proof of concept first, then let the results cascade into a larger enterprise-wide strategy from there.

Specifically for shippers, big data can deliver value by helping them reduce shipping costs and increase service levels. To achieve these results, shippers should seek to understand the primary and secondary drivers of their costs and service level issues, then build a data model with linked data sources that can provide insights on how external and internal events are affecting their costs or issues. For example, shippers can use raw material or commodity price predictions to understand future fuel prices. These insights can support a fuel purchasing strategy and cost management. Additionally, boat operators can analyze weather and wave data to optimize shipping routes and fuel consumptions, and traffic data can provide dynamic input to effectively route delivery trucks. BENADRETTI: Understanding costs provides the biggest value to any organization, and identifies where ROI might lie. Cost

of product is not just the cost of making the product, but also the cost of moving the goods from Point A to Point B. Now, consider what delays might cost an organization in spoiled product, lost revenue due to poor customer service, and costs and tax implications related to shipping less product more often. Understanding all the key data points in the supply chain allows shippers to learn all the layers and elements of their cost structures, and helps them make smart decisions. In turn, shippers can increase revenues by making sure the right amount of product is shipped from the right locations using the right

> on time, all the time. FRIEDMAN: Big data ROI depends on the shipper's current access to information and if it is kept in separate silos or harmonized to maximize value. You do not have to spend all your time on

routes to deliver the right service

the technical side of big data. You can broaden your horizons and concentrate more effort

on discovering the business questions you need to answer. This will allow you to focus on practical opportunities with tangible outcomes. The best ROI can be found in inventory and transportation.

CAMPBELL: Inventory optimization is widely known to have a steep ROI and rapid payback, but the challenge is finding the data and being able to operate the system. UTi has an inventory optimization desk that collects millions of data points each day related to specific clients' sales/POS, transportation, warehouse SKUs on hand, new supplier orders, and supplier delivery. This center of excellence performs optimal replenishment planning for some innovative companies. This is an extremely ripe area for shippers, especially those who also warehouse, to collaborate for inventory optimization purposes.

How can shippers tap into big data for decision support? How can they extract it for strategic improvements?

GJENDEM: Big data and analytics should be shaped in a way that integrates it into the shipper's planning and operational processes. Once shippers perform analytics and achieve insights, they can make the resulting data-driven decisions in a few ways - automated for projects such as route optimization, or manually for matters such as fuel contracting. For decisions having longer-term impact, shippers can look at developing proof of concept simulations that explore different internal and external variables to gauge where optimal impact can be realized.

BENADRETTI: Understanding all the data points in the supply chain can be transformed into information that impacts the decision-making process. For example, data can impact obscure

areas such as how weather affects the transportation of goods by ships, and the degrees of water damage and lost cargo affected by the choice of transportation corridors. That allows decision-making on more than just where to manufacture a product or what raw material must be used, but also how to get the best quality product to the customer on time at a reasonable cost. It limits the ability to make strategic and operational decisions that affect the supply chain.

FRIEDMAN: Shippers need IT professionals on their team. Trying to capture key bits of information from fast-moving flows of big data is not easy. An organization must set priorities, identify opportunities, and determine the value proposition. Start small and look for little wins before making big investments in massive projects. This will require a change in culture—from just getting the product out the door to finding the optimum way to meet the needs of customers.

CAMPBELL: Shippers overestimate data availability issues, and sometimes lack the resources to execute on a big data project. So the answer to how shippers can tap into data and extract improvements is to ask for help. More shippers should invest time in understanding supplier capabilities to help extract and advise on big data projects. The advantage is a 3PL has likely done a similar project before, and can share cross-industry insight and best practices.

Shippers have always had concerns about the security of cloud applications, especially where proprietary information is involved. Are these concerns still real? What should technology buyers consider before they adopt hosted, cloud-based solutions?

BENADRETTI: Data security is always a concern, and as recent events have shown, it can be crippling to any organization that cannot secure its data. Company secrets are just as important.

By ensuring that the proper data is seen by the proper users, accidental sharing of this information can be reduced. Having a central access point for big data is only the first step in data security. With such an access point, you can provide a dual layer of protection and the ability to take corrective action if there is a data break.

CAMPBELL: The concerns are still very real from a risk mitigation perspective, particularly for consumer-facing businesses. Unfortunately, there is no magic bullet technology as cloud and on-premise systems both have similar security vulnerabilities. Solving this issue is a matter of sitting down with an objective adviser—not the software company selling a product—and studying the business need, risks, and possible solutions.

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GLOBAL PORTS A BOATLOAD OF OPPORTUNITY

Facing a number of challenges and constraints, the global port industry is addressing concerns and capitalizing on new opportunities. By Joseph O'Reilly

he North American port industry is rife with change—both good and bad. Shippers are currently on red alert as the U.S. West Coast labor impasse lingers. If they haven't already, many are re-evaluating port and distribution strategies.

Changing global trade patterns—new markets to source from and sell into—are forcing similar action. Closer to home, shippers and consignees are looking more closely at data analytics to find locations that are better served to meet customer demand.

Given the West Coast labor brouhaha, the Panama Canal's

grand re-opening in early 2016 assumes new importance. Ports across the country, and around the world, are ramping up for a shift in global trade flows, especially as larger vessels come online. Accordingly, infrastructure development is accelerating at pace.

Inbound Logistics recently met and spoke with a number of different players in the maritime industry to glean their respective opinions on port topics and trends ranging from big data to bigger ships. Pick up your anchor and follow along as these captains of industry spin the wheel through today's "port complex."

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GEORGIA'S PORT STATE OF MIND

Savannah, Ga., is the gateway to the U.S. Southeast's booming population. The Georgia Ports Authority (GPA), in concert with Savannah Economic Development Authority, has been throttling forward to deliver a number of different projects that will expand infrastructure and services on and off terminal.

Jamie McCurry, senior director of administration and governmental affairs at the Georgia Ports Authority, and Hugh "Trip" Tollison, president and CEO of the Savannah Economic Development Authority, met with *Inbound Logistics* to offer an overview of current happenings in the Hostess City as it looks to entertain a new boom in container trade.

IL: Talk about the Georgia Ports Authority's growth as one of the leading container hubs in the United States.

Mccurry: Savannah is the fourth-busiest container port in the country—it has been the fastest-growing container port for the past decade and a half.

The Southeast's population expansion played a big part in our development. Savannah is the closest port to Atlanta, the capital of the Southeast, which is about 100 miles away. Against that consumption growth, we also have significant manufacturing, mining, and agricultural industries. Our exports have always been strong, and imports continue to strengthen as the population shift continues.

What's unique about Savannah, in terms of being one of the top 10 container ports in the country, is we are by far the smallest

city. We're not serving a metropolitan area so we don't have constraints inhibiting our growth. The port's 1,200-acre Garden City container facility is the largest single terminal in North America. We're the owner and operator so we control investment in the port.

We typically manage the facility with about 20 percent excess capacity. We did 3.1 million TEUs in fiscal 2013, both inbound and outbound. We average about 8,500 to 9,000 truck moves per day, that's about 80 percent of our volume in and out of the facility. The remaining 20 percent moves by rail.

By managing the Garden City facility with excess capacity, we can easily accommodate seasonal ebbs and flows. The terminal has a total capacity of about 4.5 million TEUs. Our plan over the next 10 years is to grow that number to 6.5 million TEUs within our existing footprint.

IL: One disadvantage that some top container ports run into is lack of local transportation infrastructure. What is Savannah doing to address concerns outside the port?

Mccurry: We're on the up-river side of Savannah proper. The terminal is located six miles from I-16 and I-95, the major eastwest and north-south arteries. So our traffic is not going back through town.

We're currently working on three last-mile projects, the biggest of which is the Jimmy DeLoach Parkway extension. We currently have an exit off I-95 that terminates two miles away. The project will build a three-mile extension directly into the terminal. That's fully funded with state money and should be complete by late 2016. It will be a game changer.

In concert with that extension, a smaller partner project will



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widen the Grange Road, one of two exits off the parkway into our facility. Again that's state money. We're also adding a third container interchange gate on the newly expanded Grange Road. The third of the last-mile projects is an extension of Interstate 516, which connects with I-16 down river from our terminal.

Regarding the demographic shift and congestion concerns, up river of town holds a lot of room for development. That's where we'll likely see more public-private partnerships to build warehouse and distribution facilities.

TOLLISON: Having the port 32 miles up river provides a tremendous advantage for us because we have access to the two interstates and two Class I railroads. Other ports have to truck through urban areas.

Between the late 1990s and early 2000s, we created the Crossroads Business Center. We acquired a tract of land, nearly

2,000 acres, that has become home to a number of distribution centers (DCs) for companies such as IKEA, Target, Home Depot, and Dollar Tree. We're looking at other opportunities to expand the park. The port has land as well. We have plenty of opportunities for public-private partnerships where we can go in, buy the land, and give it to companies that meet our jobs and investment qualifications. We've had plenty of activity-a lot of scratching and sniffing-with companies that aren't located there now.

Mccurry: The Crossroads Business Center has been one of the key pillars in our ability to grow. It lured the first significant DCs to Savannah. Inherently, we're an export-rich region. We've never had a lot of import traf-

fic. We wanted to balance that dynamic and bring in more ocean carriers—give them more reason to serve Savannah and expand their services. Without the Crossroads Business Center, it's hard to imagine we'd have the same traction.

TOLLISON: The business park, the growth of the Southeast population, and the labor issues the West Coast experienced in 2002 have been gifts to the port's growth. That strike diverted traffic elsewhere. Customers in Asian markets recognized the efficiencies of coming into the East Coast, especially Savannah. The rest is history.

IL: West Coast ports and the International Longshoremen's Association (ILA) have an uneasy relationship, as the most recent strike demonstrated. Why does Georgia have such a good rapport with the longshoremen?

Mccurry: For whatever reason, Georgia's relationship with the longshoremen is unfortunately unique. It's not unfortunate for us, but I say that because as a country, we should be able to get along better than we do.

I think it's a matter of communication. Georgia Ports Authority employees are not unionized, but the ILA works in the facility. We

work side by side. We're the owner-operator, so ILA drivers don't handle a lot of the internal yard operations. We keep the lines of communication open. In the big scheme of things, as dangerous as the port environment can be, we work closely with the ILA to prioritize safety.

I don't know what the secret sauce is, but ILA gets it, especially in terms of productivity. We're spending money on facilities, and making the working environment as good for them as we can, and they're doing a good job managing the ships.

TOLLISON: We also incorporate ILA throughout the fabric of the business community, not just port-related activities. Take Willie Seymore, an ILA national vice president and former president of the ILA in Savannah. He's on our board of directors at the economic development authority. We talk to him constantly.

So when we pass a sales tax referendum, and some of those

sales tax dollars go to building the ILA hall in Savannah—which is unheard of—it demonstrates we're willing to work with the ILA no

matter what. IL: What is the port doing to augment its intermodal capabilities?

-Jamie McCurry. Georgia Ports Authority

Mccurry: We run 20 to 80 percent truck to rail. We think rail will grow to 25 percent, but probably not much more given the proximity of DCs to the Garden City terminal. A growing percentage on top of growing volume means a lot more rail traffic. We're not far under capacity at the Chatham Yard Intermodal Container Transfer Facility (ICTF) where CSX pulls into and we have quite a bit of space at Norfolk

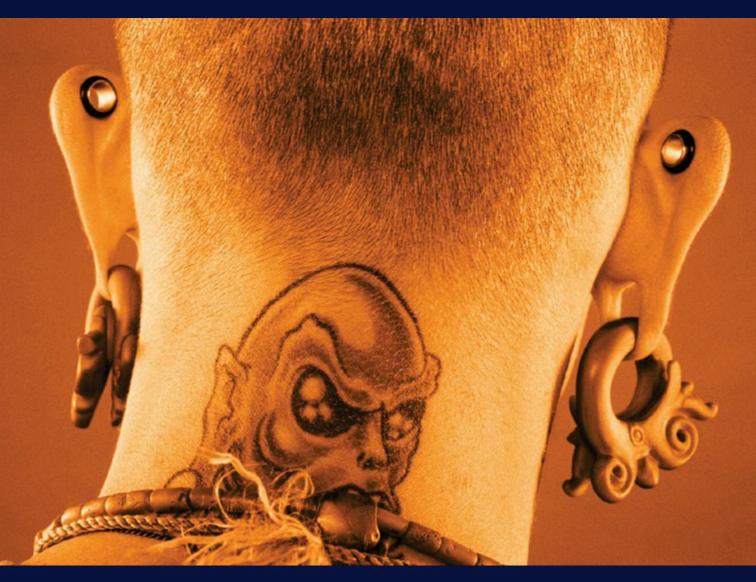
Southern's Mason Yard. That can be doubled and is a key part of our strategic plan.

When we talk about rail intermodal capacity in Savannah there obviously will be railroad investment in the future. That's required as volumes continue to grow. There also will be road projects in addition to the Jimmy DeLoach Parkway extension. It's not going to keep rail traffic from growing, but to ensure that co-existence we need a modal mix and we need to invest in some overpasses.

We also have an inland port in Cordele, Ga., located in the southwest part of the state. It's not our property, but we partner with the private company that runs the facility. There will be some container yard usage there, as well as a chassis depot. We're working with the operator to identify opportunities for our customers where we can eliminate empty boxes that are moving back to the terminal.

You'll see more opportunities of that type elsewhere in the state. Even if we don't own or operate rail yards we'll still help to coordinate development parks to facilitate our customers' equipment usage, which eases congestion at our terminal and makes it more efficient.

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IL: The State of Georgia has been proactive in its support of transportation and logistics infrastructure investment. How has the positive enforcement benefited the port?

Mccurry: The philosophical structure we have with the State of Georgia has fortunately been pretty consistent. We are a state authority. We're owned by the state. The Governor appoints our board and hires our director. That said, the state stays out of the micromanagement side of the business.

We're tied directly into the Governor's office, but treated as a separate operating entity. It's an 'inside the gate, outside the gate' relationship. We're the ones on the hook for the capital improvement program at the terminal, which is \$80 million to \$100 million annually between all the facilities. We've reached a scale with our operations where we don't have to go to the state for money, even if it's a loan. We're low maintenance and produce good results. The elected leadership is supportive. They're involved, and we keep them in the loop, but they don't try to micromanage the business. That's a challenge you see in other places.

TOLLISON: Several years ago, when we were looking to appropriate funds from the state budget for our harbor deepening project, politicians in Atlanta gave us some attitude about why Savannah was getting this money. GPA, to its credit, made it clear the port is a state asset—it isn't just about Savannah; what we're doing benefits Atlanta and the entire southeast United States.

It took years to change the mindset of some folks, but now we're getting bipartisan support. It's automatic when funding comes up for debate. There's no opposition.

EMBRACING BIG SHIPS AND BIG DATA

The current labor impasse at U.S. West Coast ports has given shippers plenty to think about as they weigh the resiliency of their supply chains.

Tantamount to growing risk exposure, shippers, carriers, and third-party logistics (3PLs) providers are also more attuned to network responsiveness and efficiency. They are better equipped to identify problems and take corrective action. That includes sourcing decision-making, network design, and port selection.

To point, big data is slowly creeping its way into the maritime industry. Sandra Moran, chief marketing officer for Parsippany, N.J.-based ocean shipping e-commerce platform INTTRA, takes a deep dive into how industry is using analytics to make better decisions about port selection.

IL: Explain how INTTRA's platform collects data.

MORAN: INTTRA is an electronic shipping platform for containerized freight. We underlie many systems in use by direct shippers or outsourced to 3PLs. That includes a network of 54 ocean carriers. On the demand side, INTTRA's platform processes transactions for 55,000 companies.

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What's interesting about the 55,000 users is the number of 3PLs on that side of the network. When you look at INTTRA's data in aggregate, it includes shipping transactions from around the world and across all industries. It's representative of what is happening in the market.

IL: How do shippers, carriers, and third-party logistics providers leverage this information?

MORAN: The research we've done around port dwell times is based on container status event messages. We get two million event messages daily across all of INTTRA's connected carriers. We don't just have visibility into the containers that are booked on our platform; we have 35 percent of the world's data on container moves.

For example, we started looking at data around the notion that larger ships are causing a ripple effect inside the port. We performed a number of measurements—one was comparing the difference in times between vessel arrival, which is a container status event message, and other port events. Even within what you might consider the classic domain of the port, there are a series of container status event messages: vessel arrival, container unload, container available for deliver, and container gates out, among others.

So shippers or 3PLs can start looking at how long it takes to unload a container after vessel arrival. As they move down the chain to something like "gates out" they get into other areas of port productivity. By that point they've already dealt with chassis availability and port congestion.

Ports are another target audience. Some use INTTRA to benchmark their performance—in other words, to strengthen their value proposition. So a shipper may perceive end-to-end from Long Beach, Calif., to Texas will take *x* number of days. But if you're stuck in the port for *y* days, prudence may dictate the best route is through a more efficient port with longer ground transit times.

IL: Do you see shippers using this type of data to take a more proactive approach when it comes to port selection?

MORAN: I only see this happening with companies that are at the top of their maturity in terms of using supply chain as an asset within the company. Many are not quite there yet. But I think that's what will happen. Look at all the investment in supply chain planning, only to have a disconnect between planning and execution. That's the final frontier of optimization.

II.: What does your data reveal about the current labor impasse on the U.S. West Coast?

MORAN: We see triple-digit increases in the amount of time it takes for cargo to get out of these ports on each one of the milestone measures. The increases are across the entire system.

[Editor's note: For example, the time it took between when a ship docked at L.A./Long Beach and when a container was available for

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pickup more than doubled to about 80 hours between September 2013 and September 2014, according to INTTRA data.]

It isn't just the chassis shortage; there's also a dramatic increase in time getting cargo out on the road and rails. Our data supports what we hear is happening.

IL: How do you see big data changing the maritime industry?

MORAN: When I think about the maturity of the industry, awareness is the first step, followed by analysis, then execution. How do we go from a rear-mirror perspective to becoming more proactive?

There are limitations to how this system works. If a service disruption occurs at the Port of Los Angeles, shippers can't just take a container off the vessel and route it dynamically. That said, we should reach a point where shippers or service providers can spot a problem, perform what-if scenario modeling, and quickly move to alternatives if necessary.

Industry-wide, we're at the awareness stage of maturity.

OF BEATLES AND BOXES

Liverpool is known for a lot of things—the Fab Four, automotive manufacturing, and the red and blue rivalry that exists between its Everton and Liverpool football clubs. At one time, the city was also one of Britain's foremost port centers. But as progressively larger ships passed by Liverpool's antiquated lock system, the port lost market share to facilities in the south of England.

Today, Liverpool's horizon is once again looking red. Peel Ports, which owns and operates the Port of Liverpool, as well as peer ports in Belfast, Dublin, Glasgow, and Manchester, among others, has embarked on a \$452-million redevelopment project to dredge the River Mersey Channel and upgrade its infrastructure.

Peel Ports CEO Mark Whitworth, and David Appleton, container shipping advisor to the port, met with *Inbound Logistics* to share their insight on the Liverpool2 investment, which will double its container-handling capacity, as well as challenges and opportunities serving the UK and European markets.

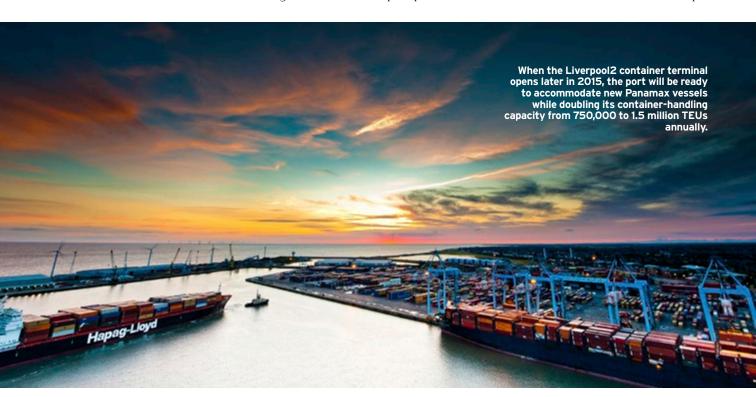
IL: Talk about the Port of Liverpool's unique model.

WHITWORTH: For one, we own the infrastructure and land in perpetuity. It's all freehold so we don't have any concession agreements. In most of our locations, we are the statutory harbor authority so we control operations end-to-end.

Consequently, we are involved along the value chain. For example, we run our own multi-user warehousing facility.

We had a customer that operated a 150,000-square-foot ware-house at the port. It imported cheap plastic furniture from the Far East and inevitably went bust overnight. We were coming into the back end of the recession, and found ourselves with a large, unused facility. That doesn't normally happen in this business. We decided to take it back under our direction and set up a multi-user warehouse facility to serve our small and medium-sized businesses.

Just to contextualize that, we were previously earning \$6.80 per square foot from this warehouse. Now it's more than \$15 per



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square foot. It has grown quicker than we expected. In fact, we've found that warehousing utilization is in the high 90th percentile. So we're already looking to invest again.

APPLETON: The port-centric logistics model is gaining strength, especially as traditional warehouses in the center of the country come to the end of their leases and companies look at other locations where land and labor costs might be cheaper. Now they're considering logistics activities in the port. It's the logical next step.

IL: How's does Britain's global trade dynamic compare with Liverpool's value proposition?

APPLETON: Today we have a major imbalance in container flows in the United Kingdom. Around 90 percent of containers coming into the region enter through England's southern ports. Yet 60 percent of that volume eventually finds its way to our hinterland. It's an odd dynamic. Liverpool has about 65 percent of the UK population within 150 miles. So containers coming into the south of England are traveling a more expensive journey to get to primary consumption areas.

Liverpool was a dominant port in England until the late 1960s and early 1970s. Vessels have to come through a lock system to get into the port. As ships got bigger, naturally over time we became constrained. The market reacted accordingly.

So Liverpool2, the first and only deepwater container terminal in the north of England, addresses this constraint. Atypically, our sell is not just to the shipping lines but also to end-users. Our message is that someone is paying the bill so let's work together to take cost out of the value chain.

We don't discriminate—forwarders, 3PLs, and global shippers. We're sending a message to all. We hope by pressing buttons all along that journey there will be a level of recognition that forces change.

IL: Is congestion a problem?

WHITWORTH: It's not like what you see in the United States. There's a ring of steel around London called the M25. The London Gateway development on the River Thames outside the city is a new option for shippers and carriers. But it's not difficult to see how that will eventually become constrained purely by the traffic flows out of London.

Congestion in the United Kingdom is more about road and rail infrastructure. The latter is at capacity. The new High Speed 2 (HS2) rail line connecting the north of London is focused on passenger volumes, but ultimately will ease congestion on the existing network and free capacity for container flows. But realistically that's 20 years away from completion.

IL: How is Liverpool equipped to handle a surge in container volume without similarly contributing to local congestion?

WHITWORTH: As you can imagine we're banging the desk hard with central government in the United Kingdom regarding this concern.

But we have 10 major motorways within five miles of port. There are a number of arteries to disperse volume north, south, and east.

Uniquely, we also have the Manchester ship canal, which was originally created to move cargo straight to the center of Manchester 44 miles inland. We control that asset. We have about 25,000 container moves a year on the canal. It can accommodate smaller feeder vessels up to 200-TEU capacity.

Liverpool has all the major modal flows at its doorstep quite naturally. Felixstowe, located on the southeast coast of England, is Britain's largest port. It needs to make significant investments—particularly the A14, a major arterial road—to enable volume growth without further congestion. We don't require that. That's the advantage we bring to our customers.

IL: Talk about the Manchester canal. How do area businesses leverage this asset?

WHITWORTH: The canal is unique. The United Kingdom is a small area. If you put a pin in its center, the most efficient distribution point, you'd probably land near Manchester. We can take container volumes directly there. One-third of the United Kingdom's largest warehouses are within 70 miles of Liverpool.

We have one canned food importer that brings containers into Liverpool, then decamps them onto feeder vessels that travel the Manchester ship canal. That leg of the journey is not weight constrained at all. The customer can fill the container without any of the road haulage constraints that exist. That's proven to be quite a successful value proposition.

When you talk about congestion, these are the dynamics that over the years contributed to England behaving unnaturally. It was forced to. Liverpool couldn't handle larger vessels. So they migrated south.

Phase one of our redevelopment project is delivering L2. The second phase will focus on building more DCs along the Manchester ship canal. We already own three locations, all of which are rail, road, and canal connected. The ultimate objective is to establish distribution centers along the route.

IL: Compared to the United States, short-sea shipping is a vital part of the European transportation network. How does that play into Liverpool's growth plans?

WHITWORTH: There is a significant amount of intra-European short sea traffic. Uniquely in the United Kingdom, Peel Ports has two feeder shipping lines. Coastal Container Line serves the Irish Sea between Britain and Ireland. We have facilities in Dublin and Belfast. BG Freight connects us to Europe. It feeds our competitor ports as well, I might add. It's a pretty substantial business, short of \$150 million in turnover. That has been a good lever. Maersk is one of our biggest customers in that business.

But this is a unique model. There aren't too many examples where port groups have their own feeder vessels.

APPLETON: The United Kingdom doesn't have any Jones Act issues



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as in the United States. Also it's difficult to go very far in Europe without running into another country. So there's a huge amount of intra-European shipping.

IL: Given the trade imbalance in the United Kingdom – 90 percent imports to 10 percent exports – how do you efficiently reposition assets?

WHITWORTH: Peel Ports Group's BG Freight plays a big part in that regard. A significant percentage of its turnover comes from repositioning containers in the United Kingdom.

APPLETON: One difference in the United Kingdom compared to the United States is that freight forwarders dictate a large volume of traffic, although that might be changing. In the Asia-Europe trade, for example, forwarders control 75 percent of all shipments that come into the United Kingdom. It hasn't reached that level yet in the Trans-Pacific, but it's headed in that direction.

Consequently, forwarders control huge inland volumes, as well. They make money on the rail and haulage legs, not on the ocean side. The steamship lines aren't paying for it and they don't take an active enough interest to bring vessels closer to where cargo is going. Somebody pays, and that's the customer. That has to change.

WHITWORTH: We're trying to change embedded behaviors. Industry has gotten used to working unnaturally. Logically, it doesn't make sense to bring product into Southampton, for example, and truck it to the northwest and beyond. The population is at Liverpool's doorstep.

IL: North American shippers are currently dealing with a chassis crisis as a shortage of equipment and changing ownership dynamics increase costs and complexity. What is the United Kingdom's chassis paradigm?

APPLETON: Truckers have always owned the chassis so it's not a problem. Chassis exist because of wheeled operations, which is the American model created by Sealand.

When Sealand started up in Europe, it had wheeled operations in Felixstowe. But by the end of the 1980s, at the insistence of the port, that model was dismantled. Land is more constrained in Europe than the United States. It was considered wasteful to have rows of chassis sitting on the quay with a single container on each one. Now it's all stacked operations. It's the truck driver's responsibility to turn up for a container with a chassis.

CHASING THE CHASSIS CONUNDRUM

When the Federal Motor Carrier Safety Administration (FMCSA) began enforcing its Requirements for Intermodal Equipment Providers and for Motor Carriers and Drivers Operating Intermodal Equipment rule in 2010—more conveniently called the Roadability Rule—it raised a new regulatory specter for shippers, intermediaries, and carriers across all modes.



The Roadability Rule expanded inspection and maintenance requirements for chassis providers, increasing dwell times and costs.

Ocean carriers, facing economic challenges of their own, started exiting the chassis business in spades. This created an enormous void. Flash forward almost five years, and the chassis situation remains unsettled. Equipment shortages have been well-documented at some ports. Others are still wrangling over how and where to store and interchange chassis equipment.

David Hamm, senior manager, communications for Princeton, N.J.-based TRAC Intermodal, a chassis solutions provider, offers some insight to how industry is managing the chassis problem.

IL: As steamship lines exit the chassis business, how are roles changing in the maritime supply chain?

HAMM: With the advent of bigger ships and new alliances, steamship lines are increasing their focus on filling ship capacity and slowly transitioning to port bills of lading. Consequently, new parties such as beneficial cargo owners (BCOs) and non-vessel-operating common carriers (NVOCCs) are, in some cases, arranging directly for the first and last mile—including the purchase of chassis solutions. BCOs are now beginning to understand the associated costs of land-based asset utilization, such as container and chassis dwell times. This will eventually lead to improved and more efficient supply chains.

IL: Some ports have taken a creative approach to developing chassis management programs, such as neutral chassis pools and co-op chassis pools. What are the differences?

HAMM: Neutral chassis pools feature clear accountability. The contributor is responsible for chassis availability at the right place, the right time, and in the right condition. (*Editor's note: a "contributor" is defined as any entity that provides chassis to a pool for its users.*) Rail and port host facilities enjoy clear bilateral understanding that allows for rapid and nimble problem resolution and product development.

Co-op chassis pools enable multiple asset owners to supply chassis to a pool on behalf of customers. As it's currently designed,



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contributors are not represented at the governance level. So in some ways, the pool is not held accountable to either the contributors or their customers.

A third model is emerging; we call it the market pool. This allows for multiple parties to contribute assets on behalf of customers. Contributors largely make up the governing board. All chassis contributed to the pool are interoperable. This hybrid model holds the pool directly accountable to the contributors while offering customers choice. Management structure and software exists to execute the market pool.

A fourth model, the "pool of pools" tries to combine existing pools at common locations to create interoperable chassis while preserving individual pool terms, conditions, and chassis marking. Currently, no management structure or software exists to execute this system.

IL: Any other options shippers can use to secure equipment?

HAMM: Some new options and provisioning alternatives might be beneficial to large BCOs, NVOCCs, and truckers. These include:

■ Hybrid leased chassis — where customers lease a chassis but the intermodal equipment provider (IEP) offers a suite of maintenance and service coverage options, which might be located at customer facilities.

- Pool products—where the IEP interchanges with a trucking company, but billing is to a third party such as a BCO.
- Bundled door-to-door solutions—where the IEP provides drayage, warehousing, kitting, and other value-added services.

IL: What impact do chassis have at inland ports and intermodal ramps?

HAMM: Inland ports and intermodal rail ramps present an interesting set of opportunities and challenges driven by the wheeled nature of many facilities. To unload the train, the facility needs a chassis to move the container from the rail side to a designated parking facility where the container stays mounted to the chassis.

A wheeled facility consumes chassis that are not on the street. So responsibility for use and payment of this equipment while on terminal needs to be established. IEPs and hosts need to agree how to maintain and pay for this type of chassis use.

IL: What advice would you offer shippers/consignees?

HAMM: First, consult a professional. Second, consider all the costs, not just the per diem rate. Third, review all the alternatives. Some might be better for certain markets, and some work well together as a bundle.







TECHNOLOGY

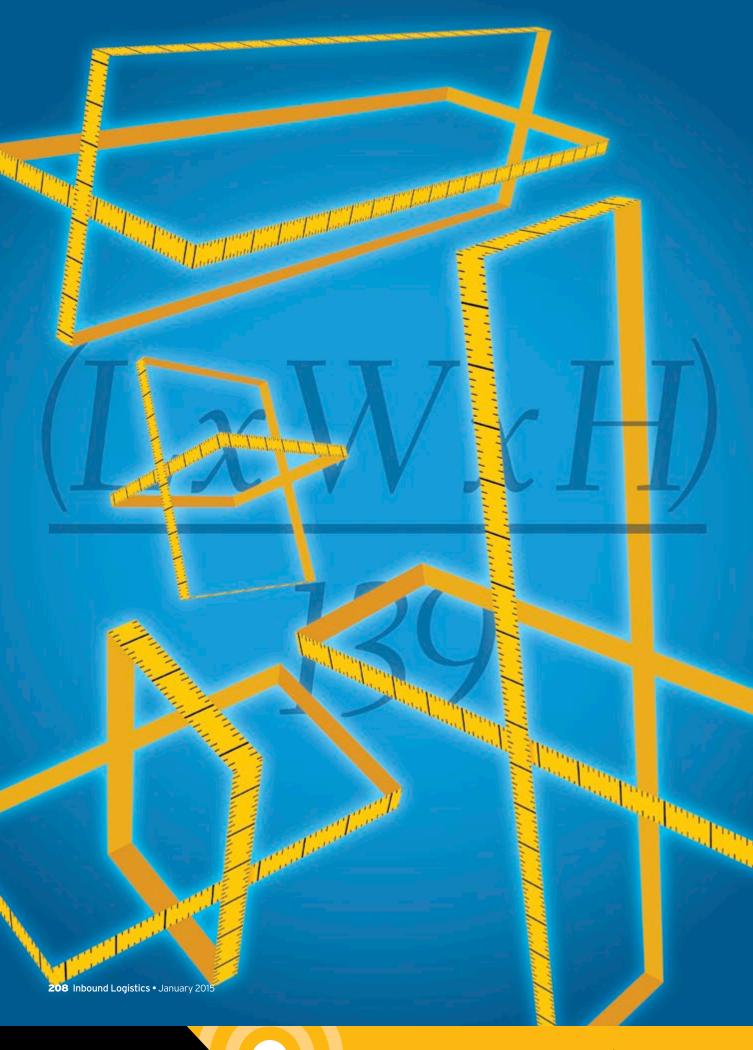
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Opening Opportunities For Your Supply Chain



A DINI FUTURE For PACKAGING

Trying to wrap your head around Dimensional (DIM) Weight Pricing and how it affects your shipping and logistics operations? Asked and answered! Here's some expert advice on understanding the new models, and how to mitigate the costs.

rom the largest corporations to the smallest Etsy e-tailers, the shift to a dimensional weight pricing model is having a drastic effect on the way items are packaged and shipped. Shippers have to be smarter with their packages, or new costs could give them a swift kick to the bank account.

The new pricing model shouldn't come as too much of a surprise. Large parcel shipping companies such as UPS and FedEx have had an eye on dimensional weight pricing for awhile. While the growth of the e-commerce market created unprecedented shipping volumes, costs have also soared for parcel carriers. At the same time, a shortage of drivers and equipment has left them scrambling for capacity. The plan, or at least the hope, is that dimensional weight pricing will relieve some of their pain. But what about shippers?

That's what *Inbound Logistics* wanted to know, so we asked three shipping experts for guidance. Turn the page for their perspectives on how shippers can get a brighter view of DIM.

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It's a DIM New Year—Now What?

Kevin Fletcher | Senior Vice President, Kenco Transportation Services kevin.fletcher@kencogroup.com | 800-758-3289

What is Dimensional (DIM) Weight Pricing?

Dimensional Weight Pricing utilizes a formula to calculate the minimum billable weight based on a package's cubic volume. You can calculate DIM for your parcel by multiplying length-in-inches by width by height, and dividing the product by a DIM factor. For FedEx and UPS, that DIM factor is 166 for domestic shipments.

Why should I care?

On Jan. 1, 2015, the major parcel carriers implemented DIM weight pricing on ground packages smaller than three cubic feet. The billable weight for packages is now whichever weight

is greater between actual weight and dimensional weight.

Previously, the rate for ground parcels smaller than three cubic feet was based on actual weight, while those larger than three cubic feet were subject to DIM weight. The recent change affects shipping costs because it is estimated that up to 75 percent of the most widely used box sizes are less than three cubic feet. Some industry experts predict an average increase of approximately 30 percent in parcel shipping costs due to DIM, in addition to the recent 4.9-percent annual increase taken for 2015 by the same carriers.

I didn't do anything to prepare. What can I do to catch up?

Don't panic, but don't hesitate. Start with a parcel analysis to see how many of your shipments are smaller than three cubic feet, and concentrate on making changes in that segment. Here are some initial steps to take:

- Be more efficient with your packaging. Train your employees to find the most cost-effective boxes and packaging for each shipment, and have different options on hand. It's no longer "one size fits all."
- Compare and optimize carriers. Shop around, and select carriers that offer the best pricing options for your commonly
- Track small packages. Where are most of your smaller boxes being delivered? Could you group them into larger shipments to a regional center, and have them delivered by local carriers who charge less?

I sort of made a plan, but how do I know if it's working?

Request transparency from your parcel carriers. They should make billing easy and transparent, enabling you to choose the best options for your business.

Evaluate your cost for small packages shipped in 2014 against what you're spending in 2015. Be sure to compare same-size packages going to the same destination. See if your competitors have increased shipping prices for customers, and by how much. Track your shipping volumes to see if your customers are also shopping around for options.



I have a plan, but how can I make it better?

Keep your plan dynamic - don't let it rest on a shelf. There are many more options than you might think, so keep exploring efficiencies. When was the last time you looked at and updated the sizes and materials you use for packaging? Can you address any factors upstream in the supply chain to improve density before the product is packed for shipping?

I ship in big volumes, so how will DIM affect me?

You can take advantage of the economies of less-than-truckload (LTL) by adopting a consolidation/ deconsolidation program that focuses your volume shipments in the most cost-effective mode. One such strategy is zone skipping, where you bypass the parcel carrier's traditional "zones." This is accomplished by utilizing LTL carriers to transport shipments to the parcel carrier's hub in the destination state or region. The

parcel carrier then unpacks the load, and delivers the individual parcels to their final destination.

We don't have the in-house expertise to manage all this. So where do we start?

A logistics partner with expertise and success in engineering parcel solutions might be an option. The right partner will have comprehensive analysis resources and tools, a solid grasp of the market from both carrier and shipper perspectives, deep understanding of parcel-pricing models, senior-level relationships with carriers, and robust dashboard and reporting capabilities.



Three Practical Tips for Defeating The DIM Factor in 2015

Jim Haller | Program Director of Transportation Services, NPI jhaller@npifinancial.com | 404-591-7630

Dimensional weight pricing isn't new. For years, shippers have paid more to ship low-weight, high-bulk packages measuring three cubic feet or more. And, except for a wild jump in 2010, pricing has made sense relative to carrier capacity. Packaging for items such as pillows and baskets has a large footprint, and it seemed justifiable that carriers should price those shipments accordingly.

What makes the recent changes newsworthy is that the pricing will now be applied to all ground shipments-regardless of package size. Depending on your carrier and packaging, the cost to ship

a small kitchen appliance (a blender, for example) may cost 35 percent more under the new pricing structure. Paper products, such as a 32-pack of toilet paper, could cost nearly 40 percent more. It's no wonder shippers are reacting with alarm.

So what's driving this price increase? The past 12 months have challenged the shipping industry, especially larger carriers. Lower-thanexpected financial performance in late 2013 and early 2014 put pressure on them to make up the slack. Meanwhile, shippers are opting for less expedited domestic service, and an overall slowdown in demand has occurred for international shipping services. One other constraint is the fallout from 2013's changes to the U.S. Hours-of-Service rules for truck drivers, which increased workforce costs and contributed to a driver shortage.

One bright spot for carriers is capacity, which is tightening for

industry leaders as well as smaller regional players. The scales of supply and demand are tipping in the carriers' favor - but it's happening at a time when most have spent the past five years shrinking their fleets to balance fixed asset costs. Smart growth is a challenge for any business, but even more so for carriers that can't expand and contract their infrastructure with ease.

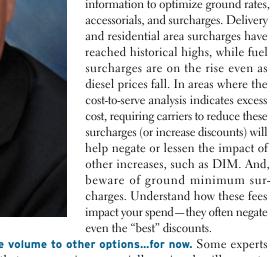
All these factors underscore why dimensional weight pricing has come to the forefront. Carriers see this strategy as a way to motivate shippers to use more efficient packaging to increase the throughput of existing capacity. They also see it as a way to reduce fuel costs, and a tactic to maximize existing driver resources. Some carriers have gone so far as to open their packaging research and testing facilities to help shippers optimize packaging.

But what about shippers who have already fine-tuned packaging? How can they mitigate the cost impact of dimensional weight pricing? For most, it comes down to a practical three-step plan:

1. Quantify carrier cost-to-serve. Where is your carrier making excess margin? More than 55 different cost variables or levers dictate whether carrier profits on your company's shipments are in line with fair market value. Examples include package characteristics, whether a carrier is already serving a commercial location and resource utilization for economies of scale, future and current

> capacity demands, and imbalances across lanes. Understanding how your carrier profits from your unique shipping profile, and determining whether that margin is reasonable, is the first step in mitigating the impact of any major price change.

> 2. Review and re-validate rates and surcharges. A cost-to-serve analysis should provide you with information to optimize ground rates,

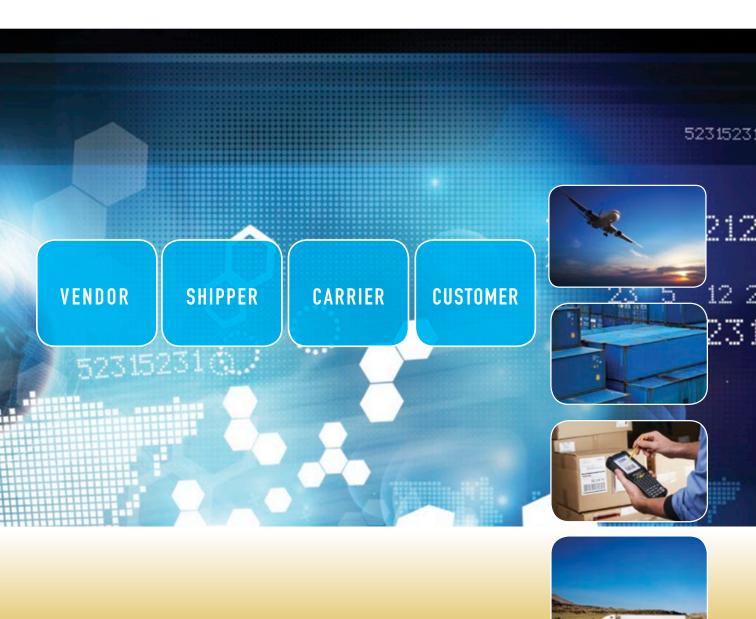


3. Move volume to other options...for now. Some experts speculate that more carriers, especially regional, will move to dimensional weight pricing. This may be the case, but for now shippers will find that regional carriers offer more favorable pricing and comparable service levels when compared to large carrier incumbents. Additionally, using hybrid delivery options that combine large carrier offerings with last-mile delivery via the U.S. Postal Service is a cost-effective alternative.

Recent changes to dimensional weight pricing will also be compounded by carriers' annual rate increases, which will undoubtedly push rates even higher in 2015. This double-whammy will impact shipper budgets and margins. Now is the time to minimize—and possibly negate—the impact of rising small parcel costs.



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Is Changing Shipping Pricing Methodologies Beneficial for Shippers?

John Haber | CEO, Spend Management Experts jhaber@spendmgmt.com | 404-432-5424

Peak season 2014 is behind us and the New Year brings shippers new challenges. Dimensional weight pricing has shippers paying more for ground packages.

What's driving the changes in parcel pricing methodologies for UPS and FedEx?

According to each carrier, shippers will reap benefits from reduced packaging materials and overall package sizes, which will, in turn, lead to related reductions in fuel use, vehicle emissions, and transportation costs. A much less publicized, but more likely result of the changes is a windfall in new revenue and profits for the carriers themselves, with estimates of hundreds of millions of dollars in annual incremental revenues for both UPS and FedEx predicted.

The U.S. Postal Service (USPS) also utilizes DIM weight pricing, but only for packages moving more than 600 miles and exceeding one cubic foot. In September 2014, the USPS

announced it would not implement any further changes to its DIM policies. This is being positioned as a big cost differentiator for USPS, but is likely due, in part, to its lack of infrastructure to accurately measure each shipment.

Many shippers remain unprepared for the changes and are unclear as to how the pricing change will impact them. An estimated 30 percent of all ground shipments will be impacted by the new policy, with per-package costs forecasted to rise as little as five percent on the low end and up to 40 percent on the high end. This ambiguity surrounding the shipping cost impact stems mostly from a lack of understanding of DIM weight pricing.

FedEx and UPS instituted dimensional weight pricing nearly a decade ago for ground parcels measuring at least three cubic feet. DIM weight pricing is likely to spread to other modes such as LTL shipping. The same

benefits as those given for ground parcel—reductions in fuel use, vehicle emissions, and transportation costs—are applicable to LTL carriers. Some have been piloting dimensional weight pricing, and installing equipment that can capture the cubic dimension of a pallet or shipment. Rates could increase "significantly" for shippers moving bulky, lightweight items via LTL, according to industry analysts.

Is this the end of "free shipping" for consumers?

Shipping is already one of the largest, most rapidly increasing costs for online retailers. Larger shippers such as Amazon and Walmart will attempt to grandfather in current pricing rules. Smaller retailers have less leverage, and will face challenges in offsetting these costs. One thing is certain: Retailers, both large and small, need to review their shipping profile and carrier contracts to help identify and navigate around the cost increases.

Many shippers will find that absorbing the expected increase

in parcel shipment costs is not a viable option. Shippers will face difficulty passing the increases through to customers, especially with customer expectations of "free" shipping.

Ultimately, dimensional weight pricing will become the norm across the majority of transportation modes. While it will indeed help reduce fuel usage, vehicle emissions, and transportation costs, shippers will be negatively impacted by higher shipping costs. How will shippers manage through consumer expectations of "free shipping"? What impact will potential DIM changes have on a trucking industry already facing a shortage of drivers and increased regulations?

As DIM changes fully take hold, shippers will need to evaluate their transportation network, transportation spend, and modal allocations to remain competitive in an ever-changing transportation landscape.















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U.S. MANUFACTURING: ALL SYSTEMS GROW

North America's manufacturing sector is on an upward trajectory. But, will a shortage of young talent, compounded by baby boomers' negative perceptions about millennials, impact continued expansion? ThomasNet's latest Industry Market Barometer research provides the answer.

DEMOGRAPHICS & METHODOLOGY

A total of 490 manufacturers and custom manufacturers from North America, primarily the United States, responded to the Industry Market Barometer (IMB) survey. The overwhelming majority represents small and mid-size businesses, mirroring the manufacturing marketplace, most notably:

- More than half (60 percent) of the companies are small, with up to 100 employees.
- 58 percent have annual revenues of less than \$25 million.

The respondents who provided data are primarily owners, executives, and general managers. As buyers and sellers of industrial products and services, 67 percent are from manufacturing – durable or non-durable – and 33 percent are from custom manufacturing services companies. The 38-question IMB survey was conducted during a sixweek period from Aug. 4, 2014, through Sept. 8, 2014.

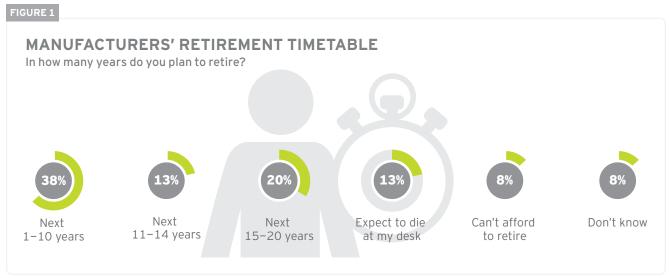
he news for the general economy may be mixed, but for manufacturers it's all systems growth. ThomasNet's annual Industry Market Barometer® (IMB) survey of buyers and sellers of products and services in North America's industrial/commercial marketplace shows an upward trajectory for this sector, year after year, as they continue to lead the economy forward. These companies are growing, hiring, and investing for more growth to come. More than half (58 percent) grew in 2013, and 63 percent expected to grow by the end of 2014.

Positive indicators are everywhere. Manufacturers are getting more business from existing markets, and average account values are rising. Nearly eight out of 10 (76 percent) are now selling overseas, and 33 percent expect this to rise, too. In anticipation of what's ahead, they're increasing production capacity, optimizing manufacturing operations, and upgrading facilities. Hiring and retraining staff are top priorities to help them scale. More than half (52 percent) of these manufacturers expect to add staff over the next several months, up from the 42 percent who planned to hire in 2013.

Troublesome Trends Mar Picture of Growth

A deeper look at the 2013 survey results raises concerns about whether manufacturing is sufficiently prepared to handle continued growth. One key fundamental is missing—a robust pipeline of skilled workers. Having the people to operate the machines, work the lines, and create new products is mission-critical. Yes, manufacturers are hiring and developing their people, but to keep up with the opportunities at hand, they will need to recruit faster, smarter, and harder.

The 2013 IMB survey called attention to a "ticking biological clock"—the disruption that is coming as baby boomers leave the workforce in accelerating numbers, without people primed to replace them. In 2014, 38 percent of manufacturers report that they'll leave their jobs in one to 10 years (*see Figure 1*), and most lack a plan to fill their shoes. And, with more than 200,000 jobs still unfilled, manufacturers can't afford to wait for new talent to walk in the door. They tell us they need skilled, experienced people—line workers, trade workers, engineers, and production managers—and they're nowhere to be found.



All charts sourced by ThomasNet's IMB, November 2014

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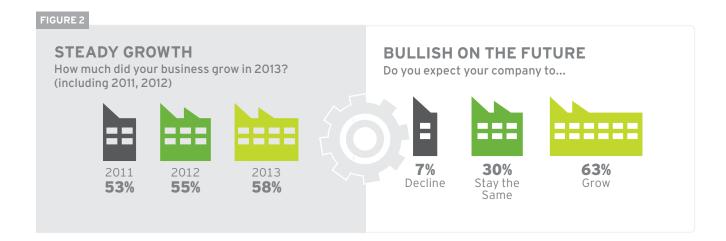


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Yet, one solution is in plain sight—formulating plans to attract the generation of millennials (ages 18-32) who will comprise about 75 percent of the workforce by 2025. For an industry that values specialized training and experience, this generation represents a goldmine of opportunity as most millennials are technology savvy. Manufacturing is increasingly headed toward digitization, and heavily reliant on this skillset. Whether changing careers or just entering the workforce, millennials can take the time to learn the business before their predecessors retire. Yet, most manufacturers (62 percent) say millennials represent a small fraction of their workforce, and eight out of 10 have no explicit plans to increase these numbers.

Perception Impedes Growth

The 2014 data shows that the manufacturing industry increasingly aligns with millennials' value systems and technology expertise. The research demonstrates that millennials have an opportunity to make a social impact working with sustainable and green technologies, solar energy, and wind power. In addition, respondents cite innovations in design and manufacturing software, automation/robotics, and 3D printing as intrinsic to today's jobs.

More than eight out of 10 (81 percent) IMB respondents are baby boomer age or older. On the one hand, these manufacturers don't see their industry as a place for millennials. A larger

issue is at play — younger people still perceive manufacturing as "blue collar" work, according to 46 percent of respondents. And baby boomers' perceptions of millennials exacerbate the challenge. Forty-three percent of respondents say they believe that this generation lacks the work ethic and discipline to succeed.

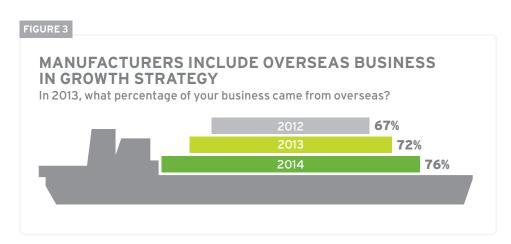
One bright spot that can help bridge intergenerational barriers is apprenticeship programs. In 2013, IMB respondents were advocating for such programs, and in 2014, a small number are using them to teach skilled trades such as machining, production, assembly, CNC milling and turning, and welding. Manufacturers see these programs as a way to fill skill gaps and get new talent into place. But until misunderstandings on both sides are erased, the manufacturing community won't be able to fully participate.

In short, the manufacturing sector is at a crossroads. To take its rightful place as a growth leader, this sector must embrace the future workforce who will get them there. The path has been laid for them to succeed, and the question is whether they'll act in time. The glory days for American manufacturing could be back again, for years to come. Closing the gaps between baby boomers and millennials is critical to making this happen.

Growth Trend Continues

For the third consecutive year, business is trending up for manufacturers, according to IMB survey results. Of the nearly 500 North American manufacturers that responded, more than half (58 percent) reported business growth in 2013, and nearly two-thirds (63 percent) expect increases in 2014 (see Figure 2).

Manufacturers attribute growth to a number of strategic areas. More business in core, existing markets (78 percent) tops the charts, followed by increases in average customer account value (48 percent); and sales of new product or service offerings (28 percent).





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HOW MANUFACTURING IS EVOLVING

Manufacturers cite five key areas as having a significant impact on their companies in the next two years.



1. Sustainable and green technologies



2. Advanced materials



3. Design and manufacturing software



4. Automation and robotics



5. Recycling and remanufacturing

Manufacturers continue to invest and do business overseas, too. This has grown year over year, with 76 percent of respondents citing some form of overseas business as part of their growth strategy (*see Figure 3*). In 2015, one- third (33 percent) expect overseas business to increase.

Factors Contributing to Growth

How manufacturers plan to grow remains consistent year over year. Manufacturers' websites (56 percent) top the list of tactics that impact their ability to secure new business, followed by expanding their sales force (42 percent), events/tradeshow marketing (40 percent), customer service initiatives (32 percent), and expanding distributor networks (28 percent). Nearly seven out of 10 (68 percent) manufacturers see domestic reshoring as an opportunity for additional growth.

How Manufacturing is Evolving

Manufacturers cite five key areas as having a significant impact on their companies in the next two years (*see Figure 4*): sustainable and green technologies, advanced materials, design and manufacturing software, automation and robotics, and recycling and remanufacturing.

While lower on the list, respondents also mention additive manufacturing/3D printing, and energy-related technologies such as solar and wind. In past IMB surveys, sustainable and green initiatives fell to the bottom of the priority list. Anecdotally, "being green" is now perceived as advantageous to manufacturers due to a rise in customer expectations, as well as the availability of more affordable implementation. As a reaction to this new reality, more manufacturers and their suppliers are incorporating green initiatives into their operations.

Made in America

When respondents were asked whether they would buy American-made products more frequently next year versus last, less than one-quarter (23 percent) said they would. Last year appeared to be the tipping point at 40 percent, while nearly three quarters (73 percent) said they would buy American-made products at about the same frequency.

Future Investments

Ninety-seven percent of manufacturers report that they will be directing resources in 2015 toward competing more aggressively in their core markets, and improving customer retention and service (96 percent). Additional strategies include both increasing (91 percent) and developing existing staff (94 percent).

These companies are also making capital investments to support growth. Increasing production capacity, optimizing manufacturing operations, and upgrading facilities reflect the need to accommodate increased production.

Demand for More Workers, Skills Gap Still Exists

In response to positive growth forecasts, hiring is on the upswing, with 52 percent of manufacturers expecting to increase headcount by June 2015. This is 10 percent more than last year (42 percent). Companies say the key areas needing staff are line workers (60 percent); manufacturing/production management (54 percent); skilled trade workers (53 percent); and engineering (50 percent). Also, when asked what they believe an ideal candidate in these same areas should possess, tenure and specialization outweigh advanced degrees (see Figure 5).

In 2013, manufacturers said hiring was one of their biggest challenges. Anecdotally, this continues to be a critical concern.

Troublesome Trends

Manufacturing is dominated by a baby boomer audience, with 80 percent of IMB respondents between the ages of 45 and 65+. Nearly half (49 percent) are 55 and older.

When asked when they plan to retire, 38 percent say within the next 10 years. Unfortunately, nearly seven out of 10 respondents (65 percent) say there is no succession plan in place to fill their position.

The 2013 IMB survey reported on the untapped workforce of millennials (ages 18-32), which is expected to comprise about 75 percent of the national workforce by 2025. Six out of 10 (62 percent) manufacturers employ a small number of millennials (25 percent or fewer).

Moreover, an alarming number of companies (56 percent) say that they expect this number to stay the same in 2015. In addition, slightly more than eight out of 10 manufacturers

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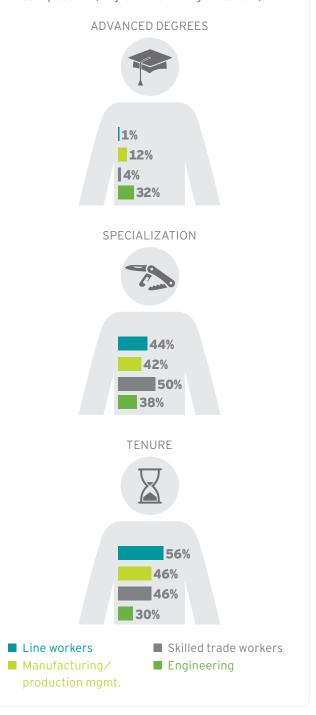
FOR MORE INFORMATION Rob O'Brian, CEcD/President Joplin Area Chamber of Commerce 320 East 4th Street, Joplin, MO 64801 www.joplincc.com * robrian@joplincc.com (phone) 417.624.4150 (fax) 417.624.4303



FIGURE 5

POSITIONS IN DEMAND

Q: Whether you will be increasing staff or not, select the most important credentials you believe an ideal candidate in any of the following areas should possess (degree vs. training vs. tenure)



(81 percent) have no explicit plans to increase the number of millennials that they employ.

With so many manufacturers planning to hire in 2015, and the fact that many baby boomers are retiring, it's surprising that more manufacturers don't have a plan to bring on more millennials to fill the pipeline.

Respondents do appear to be making headway in one area—developing apprenticeship programs. For those manufacturers where an apprenticeship program is applicable, 51 percent have a program in place, and 23 percent have a program planned.

An overwhelming number of respondents perceive apprenticeships as a viable opportunity for manufacturers to bridge the skills gap, and believe that these types of programs can contribute to their success. For the most part, manufacturers agree that these programs are a smart way to ensure that institutional intelligence and skills get transferred to the next generation.

These programs often offer mutual benefits for apprentices and manufacturers alike. Companies can tap into millennials' technology skills while offering this generation an opportunity to learn their business.

A large number of respondents, however, feel that apprenticeships face an inherent issue—that millennials lack the discipline and work ethic to succeed. Further, many feel that there is a larger issue at work: a lingering "blue collar" perception of manufacturing. Strong anecdotal evidence supports this sentiment, and raises concerns about manufacturers' overall ability to grow in light of these staffing challenges.

Where Do We Go From Here?

The 2014 IMB survey spotlights North American manufacturing's resilience and continued growth. Manufacturers are embracing new technologies, including sustainable and green tools, design and manufacturing software, automation and robotics, and more.

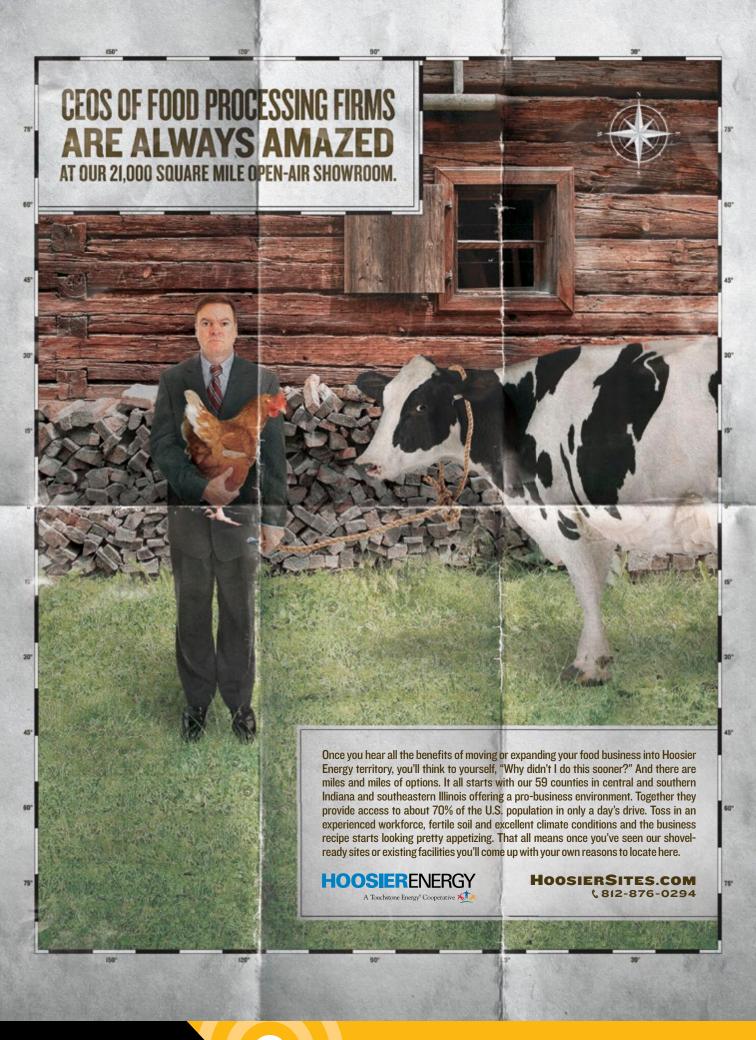
They continue to expand aggressively in core markets, and are investing in capital equipment, production capacity, optimizing manufacturing operations, and upgrading facilities. Moreover, manufacturers continue to invest resources in tactics that will secure new business with an eye toward domestic reshoring as an important growth opportunity.

Yet, some issues could derail this high-speed train. The desire and ability to attract the next generation of workers will be the wild card that will either point manufacturers to further growth or will become their Achilles heel. The IMB survey reveals that this issue is reaching a mission-critical level with an aging workforce and nearly 70 percent without a succession plan.

Respondents believe that millennials perceive manufacturing as a "blue collar" industry. In addition, respondents report that millennials may lack a solid work ethic. This adds up to a serious concern that manufacturers may not be able or willing to hire and retain the number of millennials necessary to sustain their growth.

Being aware of these issues, however, is the first step toward solving them. North American manufacturing has always been able to adapt to changing market conditions. In fact, the IMB survey reports that many companies are moving forward with apprenticeship programs that will lead the way for the next generation of skilled trade workers and further galvanize growth.

As manufacturing continues to prosper, we must not rest on our laurels. Instead, we must re-double our energies to break new ground toward achieving continued success.





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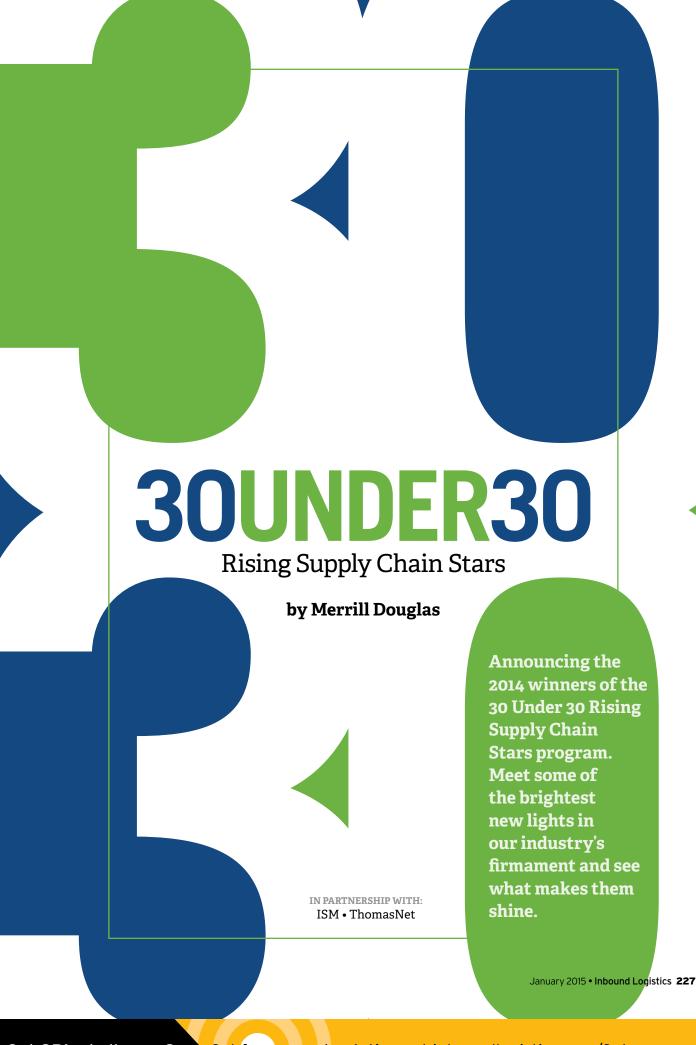
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s more baby boomers reach retirement age, supply chain executives are looking with trepidation at a looming talent gap. To stay strong, the industry needs an influx of fresh faces, especially professionals drawn from the millennial generation—people born between 1982 and the early 2000s.

By 2025, millennials will make up about 75 percent of the supply chain workforce, researchers say. To groom these supply chain leaders, companies must attract the brightest and most innovative members of that generation today.

Luckily, millennials are already making their mark on the supply chain profession. Brimming with energy, at ease with technology, skilled in leadership, and adept at collaboration, the best among the newcomers have already emerged as rising stars.

To bring attention to those young luminaries, and to show millennials how wonderful, rich, and rewarding a supply chain career can be, ThomasNet, the Institute for Supply Management (ISM), and Inbound Logistics teamed up to create a recognition program — 30 Under 30 Rising Supply Chain Stars. The program honors 30 professionals who are 30 years or younger, and already making their mark in the purchasing/supply chain management field. These include one Megawatt Star who is receiving additional honors.

Advancing the purchasing/supply chain management profession has been a shared goal of ThomasNet, a leading free resource for supplier discovery and product sourcing, and educational association ISM, dating back more than 100 years. That's when Elwood B. Hendricks, a salesman for the Thomas Register of American Manufacturers (ThomasNet.com's predecessor) saw a need for a national organization to help purchasing agents advance. His vision led to the formation of the Purchasing Agents' Association of New York in 1914 (now ISM-New York), a springboard for the national ISM.

To select these rising supply chain stars, ThomasNet and ISM invited the supply chain community to nominate outstanding supply chain practitioners, 30 years old or younger, for recognition. Each nomination detailed the candidate's stellar qualities and described their most extraordinary achievements. A selection committee evaluated more than 225 entries to choose the 30 Rising Stars, including one top-ranked Megawatt Star. Winners were chosen for their notable accomplishments and their demonstration of initiative, collaboration, innovation, and/or leadership—at work as well as within ISM and other industry associations.

Each winner receives a complimentary, one-year membership to ISM and a pass to ISM's 2015 annual conference, May 3-6, 2015, in Phoenix. In addition, our Megawatt Star and her nominator win an all-expenses-paid trip to the conference.

Consider how much our Megawatt Star has already achieved at 29 years old. Katy Conrad Maynor, Category Manager, Finished Lubricants/

WHERE THEY HAIL FROM

Beyond the continental U.S., four of this year's selectees were born in India, Puerto Rico, Venezuela, and "between Costa Rica and Germany," respectively.

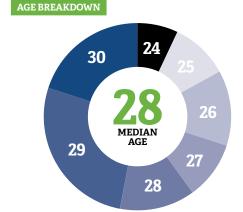


Beyond the continental U.S., two of this year's selectees work in the United Kingdom, and another works in Malaysia.

GENDER BREAKDOWN



Women make up exactly two-thirds of this year's selectees.



B2B with Shell Oil in Houston, runs procurement and negotiates contracts for Shell's Global Commercial business. Her achievements at Shell are too numerous to list, but among them:

- Developed a new approach to one supplier relationship that yielded big savings across half that vendor's portfolio.
- Built a regional sourcing strategy for Shell's business-to-business products.
- Co-led the creation of a successful contracting model.

By highlighting the achievements of our Megawatt Star, and our Rising Stars, ThomasNet, ISM, and *Inbound Logistics* want to demonstrate how exciting and rewarding a career in supply chain management can be. We hope that our 30 Under 30 will become role models, inspiring other talented millennials to choose careers in our industry, and give more of a "cool factor" to a profession that has been off their radar.

But attracting millennials is far from easy. People from this generation often land jobs in the industry accidentally, or consider a supply chain career only after trying out several others. For example, one of our Rising Stars learned about the profession from a roommate, and decided to explore it.

Moreover, many millennials are unaware that supply chain management careers empower them



to make a difference—to foster sustainability/green practices, for example. Our Rising Stars say that their positions enable them to:

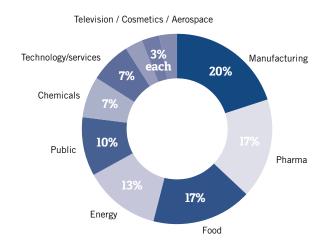
- Improve access to vital products and services—from medicines for hard-to-treat diseases, to clean energy.
- Make a big financial impact—saving their organizations money, helping them work more efficiently and strategically, and improving corporate profitability. Collectively, this group has helped their companies save millions of dollars.
- Be a key player in strategic projects where top management has a stake.
 - Work overseas and navigate different cultures.
- Hone their negotiating, management, and leadership skills.

- Learn about different functions, products, and industries.
 - Do something new every day.

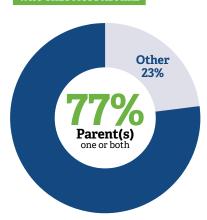
Many don't know how well the jobs in this industry pay, either. ISM's 2014 Salary Survey shows that the average pay for a supply chain professional with up to four years on the job is \$72,119 annually. This is on par with engineering, which was recently ranked as one of the highest paying positions starting out.

Although they work in many different industries, and reached their current roles via all sorts of routes, our Rising Stars have a lot in common. Nearly all say they love their work because it touches every aspect of the company. They love the variety they find in their jobs, pointing out

INDUSTRIES THEY NOW INFLUENCE



WHO THEY MOST ADMIRE



Among the other most admired people cited were Facebook COO Sheryl Sandberg, Indian cricketer M.S. Dhoni, Oprah Winfrey, and Steve Jobs.

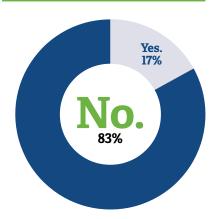
IN THEIR BLU-RAY COLLECTIONS...

Dead Poets Society (1989), Dirty Dancing (1987), Elf (2003), Forrest Gump (1994), Good Will Hunting (1997), Inception (2010), The Intouchables (2011), The Lives of Others (2006), Mary Poppins (1964), My Best Friend's Wedding (1997), My Big Fat Greek Wedding (2002), The Notebook (2004), Pride and Prejudice (2005), The Princess Bride (1987), Rocky (1976), Sound of Music (1965), Star Wars Episode VI: Return of the Jedi (1983), Steel Magnolias (1989), The Usual Suspects (1995), The Wizard of Oz (1939)

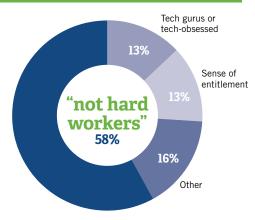
ON THEIR PLAYLISTS...

The Avett Brothers, Bon Iver, Billy Joel, Kings of Leon, LCD Soundsystem, The National, Max Richter, Coldplay, Arcade Fire, Malpaís, Red Hot Chili Peppers, Radiohead, Pink Floyd, Coldplay, Darius Rucker, Frank Sinatra, Beyonce, A.R. Rahman, Dave Matthews Band, The Script, Dispatch, Shania Twain, Kenny Chesney, The New Basement Tapes, Ed Sheeran, Carrie Underwood, John Mayer, Justin Timberlake

CHOSE SUPPLY CHAIN AS THEIR CAREER?



BIGGEST MISCONCEPTION ABOUT MILLENNIALS?



that no two projects are ever the same. They enjoy working with people and building relationships. And noting the abundant and diverse opportunities available, every one of them recommends a career in supply chain management to other millennials.

ThomasNet, ISM, and *Inbound Logistics* will continue to spread the word to the millennial generation: Supply chain is a place where you can innovate, make a difference, and build an ever-changing career that lasts a lifetime.

So, turn the pages to meet our 30 Under 30 Rising Supply Chain Stars, and get ready to be dazzled!

Meet the 2014 Rising Supply Chain Stars...

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How she shines Katy Conrad Maynor isn't just a rising star—she's a rock star, says nominator David Allen. A superb negotiator and born leader, Maynor displays a special flair for uniting people with conflicting goals, guiding them toward solutions that pay off for all. Among her many achievements at Shell Oil since 2008: She devised a new approach to one supplier relationship that yielded big savings across half that vendor's portfolio; built a regional sourcing strategy for Shell's business-to-business (B2B) products; and co-led the creation of a successful new contracting model.

Why supply chain? Maynor was a business major at Ohio State, headed for a marketing career, when an

IN HER OWN WORDS

What do you hope to

accomplish in the next

growing as a supply chain

professional, and learning

leaders so I can be more

effective within teams

and as a leader. Would

you recommend a supply

chain career to someone

chance to make a direct

impact on the bottom line

under 30? Yes. The

is rewarding.

10 years? To continue

from inspirational

on-campus talk by a member of the Limited Brands' logistics team gave her a look at life on the supply side. "Getting the product to the end consumer, and matching demand to what is available, sounded like a fascinating challenge," she says. Later, a 12-week internship at Shell sold her on the supply chain, and especially on procurement. One big draw was the chance to make a direct impact on the bottom line. "If businesses can get this right—an optimized supply chain with constructive relationships—it can be a source of competitive advantage," she says. "It's exciting to be part of that effort."

Her job today Maynor negotiates contracts and manages suppliers for Shell's Global Commercial business. "I also work

with our businesses to help make our supply chain run more smoothly and gain efficiencies," she says. It's a global role that Maynor usually fills from Houston. But in 2014, Shell sent her on special assignment to London, where she focused particularly on European suppliers. She also started tackling new duties, procuring services for a team that develops long-term strategies for Shell.

Rewards of the job "I love working with smart engineering and business professionals," says Maynor. "They challenge me. They make me sharper." She

also loves solving tough problems—for instance, balancing the pros and cons of different sourcing options, uncovering hidden costs and risk factors, to reach the best possible solution. "The rewarding part is when we make a real change that improves our business, and makes our team stronger as a result," she says.

ISM activist "Katy has a passion for connecting new professionals with experienced supply chain practitioners," says Allen. That's why, as part of the ISM-Houston affiliate, she took a lead role in creating the organization's first Emerging Professional's Group (EPG), building a network of 250 members. "We want to encourage a constant pipeline of new

talent coming into ISM and into the supply chain management discipline," Maynor says. The Houston group now serves as a role model for other ISM affiliates.

Outside the office Maynor enjoys time with family and friends. She also loves to travel, indulging her curiosity about various world cultures. She mentors college business majors, and in her downtime she relaxes with mysteries and biographies, and takes Pilates. A figure skater growing up, she also continues to enjoy that sport.

On leadership "Lead from wherever you are," Maynor recommends. That's her own modus operandi. Whether she's the

designated leader, or simply a member of the team, Maynor knows how to influence a group to achieve its best. That often takes courage. "When something doesn't look right, or you have to deliver a message that is the right message but isn't popular, you need to communicate it respectfully and stand behind it," she says.

Advice to new supply chain professionals "Take risks. Being willing to move to a new city or country, or take on a challenge I've never faced before, has led to some of the most valuable and rewarding experiences of my life."



A Quick Study

Nicholas Ammaturo | AGE: 30

Director, Profit Improvement and Procurement, Hudson's Bay Company, New York, New York Nominated by Robert Odomirok, Senior Manager, A&M Procurement, PepsiCo Inc.

Up for any challenge If variety is the spice of life, Nick Ammaturo's career is a feast of flavors. He has worked in the food and beverage industry, facilities maintenance, beauty products, and now—with a recent move to the Hudson's Bay Company—in retail.



Wherever he lands, he excels. In part, that's because he knows how to make a quick but thorough study of any challenge he's about to tackle. "Nick believes in knowing the business cold to make informed decisions," says nominator Robert Odomirok.

Where he has been At his last job at Avon Products, Ammaturo wore two hats. In one, he led an initiative to implement a global supply chain collaboration system. "I was the project manager, overseeing IT, finance,

IN HIS OWN WORDS

Most challenging part of your job?

Demonstrating how procurement process and strategy can unlock value to the organization. If you could start over, would you still choose this profession? Definitely. You gain skills that you can apply outside of work. This profession teaches you to ask the right questions and be informed in many areas.

planning, engineering—all the stakeholders," he says. With his other hat on, he focused on logistics, leading a series of RFPs for linehaul transportation management and order fulfillment services.

Lighting to lobsters One of Ammaturo's most memorable projects occurred at FM Facility Maintenance. The mission was to source a wide range of services—plumbing, lighting, elevators, food equipment, lobster tanks—for a national supermarket chain.

He had to master tons of information at the start. "For a few months, I just hit the road," he says. "I visited at least 100 supermarket locations, learning about every aspect of the business, then trying to understand the costs, and how to add value." The project started in September and had to wrap up by February.

Not only did Ammaturo get the contracts squared away, but he also implemented training to help the stores cut costs by operating more efficiently. In the end, the project saved the client about 15 percent.

The next generation Ammaturo got into supply chain management by chance. He was interning in Beijing as a marketing analyst when a recruiter called to offer him a position in global procurement at PepsiCo. "I had no exposure to the field until I happened to get that phone call," he says. That's why he likes to return to his alma mater, Villanova University, to talk to management classes about the supply chain: he wants to make sure students hear about this profession he loves.

He also reaches out to younger people as president of the ISM-7 Counties chapter. With his urging, the group recently launched a new, more dynamic website that is optimized for mobile devices as well as PCs. Ammaturo has been recruiting business professors in New York to write articles for the site and, in turn, to bring in chapter members to talk to their classes.

Baking his way to the top An avid cook, Ammaturo ran a food blog, *Fork to Cork*, through 2011. "One recipe has gotten me promoted several times," he jokes. "Every place I work, I bake that blueberry tart, and everyone remembers it."

The Juggler

Natalie Andrasko | AGE: 29

Senior Procurement Specialist, ConAgra Foods, St. Louis, Missouri Nominated by Jami Bliss, Director of Procurement, Teva Pharmaceuticals

Agile and quick Versatility might be Natalie Andrasko's middle name. "Natalie has transitioned between industries, companies, and roles in the past five years, and hits the ground running each time," says nominator Jami Bliss. She has worked for business units that make products as diverse as baby powder, narcotic medications, and popcorn. As a demand planner for Johnson & Johnson's baby products division, she improved forecasting accuracy metrics by 23 percent. At ConAgra Foods, one recent achievement was using a new e-sourcing tool to conduct a procurement for paper packaging that saved the company \$17 million.

How she got here Andrasko's supply chain career began with a casual visit to a career fair at Penn State, where she majored in biological engineering. "I figured I'd go to the fair just to practice my networking skills," she says. "But I landed a co-op with Johnson & Johnson, as a supply planner."

She later joined Johnson & Johnson's Global Operations Leadership Development Program. Rotations through roles in laboratory work, acquisitions work, and demand planning showed her that her true interests lay with the supply chain.

Why supply chain? "I want to continue to be challenged," says Andrasko. "Supply chain is a fabulous career because it's so dynamic. You touch so many different areas of the organization that your opportunities are endless."

Challenge and reward In her last role in package sourcing, Andrasko faced the tough task of collecting information she needed from multiple ERP systems. That data was crucial, for example, in the sourcing event that saved \$17 million. "Often, the systems didn't have the data we needed, so we had to go to the plants and internal business partners to hunt it down," she says.

That project—and all her work in packaging—brought Andrasko tremendous satisfaction. "When you finish a project that saves millions of dollars, it's rewarding to know that you've made such an impact on the business."



IN HER OWN WORDS

Most significant career accomplishment to date? I facilitated a paper packaging sourcing event within the procurement group that netted large savings for the company. We hit our savings goals for the year as a result. If you could start over, would you still choose this profession? Yes. I feel like my work matters, and that gives me the confidence to continue developing as a leader.

Latest project Andrasko recently switched to a new role focused on averting obsolescence. When ConAgra produces products for sale under retailers' private labels, she makes sure they get to market well before their sell-by dates. This takes a great deal of coordination with teams in demand forecasting, warehousing, distribution, and many other functions.

Finding balance It's important to set boundaries between business and personal life, Andrasko says. "When I get home, I leave my phone in my purse and do my best to unplug from work for the day...at least until my two-year-old son goes to sleep."



A Bundle of Energy

Alejandra Baptista | AGE: 27

Vendor Master Specialist, NuStar Energy, San Antonio, Texas Nominated by Cheryl Foster, Supervisor, Contract Administration, NuStar Energy



IN HER OWN WORDS

Most significant project to date?

I conducted a thorough invoice analysis of a top supplier and found it had not been applying the negotiated discount. My efforts led to a \$158,000 credit. Does your job have a significant impact on your company? Absolutely! I know what I do helps create revenue, impacting the top and bottom lines.

Her many talents Don't try to pigeonhole Alejandra Baptista. She has worked as a buyer, but she has also probed the depths of enterprise resource planning (ERP) software, mastering several different versions of SAP. Baptista has become so adept at using the software that she became a trainer, and lent support to users during a system upgrade.

In her current role at NuStar Energy, Baptista maintains the crucial vendor master database. In addition, she works with accounts payable to make sure vendors are paid correctly and on time. But when a chance arises to help NuStar in a new way, she grabs it. For example, "Alejandra has stepped out of her box to maintain records for most of our contractors that are required to hold insurance," says nominator Cheryl Foster. "She is eager to learn and always volunteers for new projects."

Sharp-eyed auditor Baptista started making her mark in her earliest days at NuStar, soon after she graduated from Baylor University. Her project was to scrutinize invoices to make sure they adhered to the terms of suppliers' contracts. She soon zeroed in on one vendor that wasn't always applying the promised

discounts. So she started a full-scale analysis.

"I pulled invoices over the course of our contract period, and created a spreadsheet to document each invoice and where the discounts were not being met," she says. Armed with the facts from Baptista's presentation, management worked with the vendor to set things right. "We got back about \$158,000," she says.

Pleasures of the job "It's fun learning what goes on behind the scenes with our vendor records," Baptista says. "And it's rewarding to know that what I do makes other people's jobs easier. For example, because I set up the records correctly, we can meet payment terms that win us discounts from our vendors."

Outside the office Baptista is devoted to staying active. "If I hear about a company-sponsored team, I'll be on it—practically any sport," she says. It's hard to stop her. After tearing her anterior cruciate ligament during a company

soccer game in 2010, she pursued rigorous physical therapy and training to prepare for the 2013 San Antonio Rock 'n' Roll Half Marathon.

In 2014, she joined the board of ISM-San Antonio as secretary. She's also an active community volunteer—for instance, with the Junior League of San Antonio's Family Endeavors program. "We do crafts with moms and their children who need supportive interaction," she says. "It has been very rewarding."

A Breath of Fresh Air

Matthew Bauer | AGE: 29

Procurement Administrator, City of Mesa, Arizona Nominated by Steve Dahle, Strategic Procurement Officer, Maricopa County, Arizona

Guinea pig Maricopa County, Ariz., hired Matthew Bauer as an experiment. Could an inexperienced graduate fresh from Arizona State's supply chain management program succeed as a government procurement officer? The answer was yes—with a vengeance. In fact, when the county procurement supervisor retired two years later, Bauer stepped into that role.

The job Today, Bauer is procurement administrator for the City of Mesa, Ariz., one of the youngest people in the United States to hold such a role in government. His achievements earned him the Gabe Zimmerman Award for Innovation from the Center for the Future of Arizona, and won his agency at Maricopa County the Innovations in Public Procurement Award for 2013 from the National Institute of Governmental Purchasing (NIGP). "Through his innovative ideas and ability to drive change, Matthew saved local government more than \$10 million," says nominator Steve Dahle.

Fresh ideas "When I started at the county, I was the youngest person in the department by about 15 years," Bauer says. He seized the chance to soak up all the knowledge he could from his colleagues, procurement veterans with about 200 years in combined experience.

But Bauer also brought fresh ideas to an organization that had been doing business in the same way for 30 years. "For example, we were able to move into electronic procurement, and implemented a full e-procurement suite," he says. Early on, he also convinced his boss to experiment with the then-controversial idea of using reverse auctions.

Going, going... In a reverse auction, multiple sellers bid against one another online, ideally driving prices lower. When Bauer first suggested this strategy at Maricopa County, his boss resisted, claiming it wouldn't work in government. But Bauer kept pushing. When the county finally ran a reverse auction for bulk flour, that event drove the price from 38 cents per pound to 20 cents, saving nearly \$1 million over the next three years. Bauer has since used reverse auctions for other commodities, and even for unconventional procurements, such as one for employee benefits. His successes have won coverage by *Governing* and *GovPro* magazines, ABC, CBS, and other media outlets.



IN HIS OWN WORDS

Implementing new ideas, such as using procurement strategies to conduct reverse auctions on employee benefits contracts. It resulted in almost \$7 million in savings. Does your job have a significant impact on your company? The work I do has a significant impact on the local community. The products and

services I acquire allow agencies

to conduct operations on behalf

of citizens.

Most rewarding part of your job?

The fun side One perk of working in government procurement is the variety of unusual experiences it provides. "I watched autopsies, because I was purchasing gas chromatograph mass spectrometers for the medical examiner," he says. "I went onto Chase Field, the Diamondbacks' baseball stadium, because we did a reroofing project there. I purchased bulletproof vests and helicopters—things you'd never expect to be involved in."

Outside the office Bauer heads the Young Professionals Committee for the Arizona State Capital Chapter of NIGP. "I like encouraging other young professionals into supply chain jobs, especially in government," he says. He has also chaired the Scholarship Committee for NIGP's national organization. Bauer and his wife like getting out in the Arizona sunshine, going rock climbing, hiking, and playing with their dogs. "And I like to watch sports," he adds. "I'm a big Phoenix Suns fan."





Ahead of the Game

Stephanie Bedard | AGE: 25

Business Operations Analyst, Johnson & Johnson, High Wycombe, U.K.

Nominated by Jami Bliss, Director of Procurement, Teva Pharmaceuticals

Bring it on Pitch Stephanie Bedard a curve ball, a fast ball, a knuckleball— whatever you throw her, she'll hit it out of the park. "Stephanie has been successful in roles as disparate as consumer packaged goods, new product development, and medical device distribution operations," says nominator Jami Bliss. These days, she's embracing a new assignment in the U.K. Highly adaptive and always game to take on the next challenge, Bedard stands out for her ability to connect, lead, shape, and deliver, Bliss says.

Why supply chain? After her freshman year at the University of South Carolina, Bedard spent the summer studying in Europe. One day, she found herself on the floor of an automotive assembly plant in Prague. "It was just magical," she recalls. A silver minivan moved by on the line, followed by a yellow sedan. "Car doors came flying overhead, arriving from the different suppliers that were co-located with the plant. The sense of urgency and operational focus were really exciting."

That look into just-in-time manufacturing so inspired Bedard that she switched her major from economics and international business to international business, global supply chain and operations management.

Major win As a top performer in Johnson & Johnson's Global Operations Leadership Development program,

IN HER OWN WORDS

How did you get into supply chain management? In 2010, I found myself in a just-in-time Skoda Volkswagen plant outside of Prague. I was so impressed that I decided supply chain and operations was where I needed to be. Would you recommend a supply chain career to someone under 30? It's a dynamic and engaging field. To stay cutting edge, we need transformational big thinkers. Join us. Warning: Supply chain isn't for the faint of heart.

Bedard did three work rotations. During one, she led the team that prepared a facility in Memphis to distribute product for a J&J business that makes premium equipment for cardiovascular care.

Bedard was responsible for all aspects of that project, such as developing receiving, picking, and shipping processes; arranging to make and store shipping cartons; creating an ad hoc database to track product before it became live inventory; and having cages and racks built to quarantine and store the product.

The project timeline was tight. To add even more excitement, a last-minute hiccup in the warehouse management system forced Bedard's team to go into overdrive, picking, packing, and shipping product themselves, alongside hourly associates.

"We had people working crazy overtime to make sure we could get orders out the door, so surgeries wouldn't be canceled," all while triple-checking their compliance with regulatory requirements, says Bedard. In the end, customers received their product without a hitch. "It was incredible to see the team mobilize and make that happen."

New horizons In October 2014, Bedard joined a global team that handles facilities management for the J&J enterprise. That job has sent

her a whole new range of tasks to tackle, such as: auditing supplier performance; measuring the success of energy conservation efforts; monitoring performance of building infrastructure; and exploring how to give J&J employees a distinct workplace experience—a workplace brand, if you will.

Bedard loves the new challenge. "There's a lot to learn," she says. "That's what's most exciting about any new job."

Purchasing Made Perfect

Jenna Benkula | AGE: 30

Purchasing Manager, Glanbia Foods, Twin Falls, Idaho Nominated by Declan Dalton, Purchasing Agent, Glanbia Foods

Better and better Perfection is the name of the game for Jenna Benkula. At the University of Idaho, as a dual major in human resources and production operations management, she put a special emphasis on process improvement. "I wanted to apply the Lean and Six Sigma concepts to a service role," she says.

Streamlining workflows and driving out flaws is now a major focus for Benkula at Glanbia Foods, the Idaho-based cheese and dairy manufacturer where she has worked since graduation. "Jenna's rise in our organization is due to her drive for continuous improvement in our processes and our people," says nominator Declan Dalton. "She constantly pushes us to identify and eliminate waste."

The job, part one Like a superhero, Benkula maintains two identities at work. The first is category manager for business services, chemicals, and ingredient process aids. Within those areas, she nurtures relationships with vendors, and works with local purchasing managers who buy for their sites. "The purchasing manager handles day-to-day transactions, such as a rush order for chemicals," she says. "When a buy is more strategic, I get involved."

Part two: striving for 'slick' Her alter ego—purchasing manager—concentrates even more intensely on strategy. "We're focused on trying to make our processes more 'slick," Benkula says. If the procurement team can do its day-to-day work more efficiently, that will free members to spend more time on innovation.

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General Ge

IN HER OWN WORDS

Most difficult part of your job?
Getting to a place where we can move away from transactional, day-to-day tasks to focus on strategic initiatives. If you could start over, would you still choose this profession? Yes. There is never a boring day, and while it can be challenging, the opportunities to learn and grow as an individual make it all worthwhile.

So, for example, the team is investigating how to make better use of the company's ERP system. Members are also exploring how to consolidate Glanbia's other software tools. "We want to consolidate into one system, so we can get a unified picture of our supplier relationships, contracts, tenders, and projects," she says.

Early management Right now, Benkula is in the midst of a process improvement project based on a concept used by Glanbia's engineering team called "early management." This involves defining steps for people to follow at the start of a project, to keep problems from cropping up later.

One key step is to capture the "voice of the customer," to make sure the project answers all the needs of the people it will serve. Say, for example, Glanbia needs to procure lab supplies. "You lay out a draft project scope, tell the purchasing managers at the production sites what you intend to do, and ask what they need from this process. Based on that input from your internal customers, you develop a more detailed scope of work." Once everyone agrees on the scope, the project manager uses that document to define the products and services the vendor will deliver.

Outside the office "I dedicate most of my time outside of work to hanging with my family," says Benkula. "My three brothers, two sisters, niece, and two nephews are important to me. They make everything worthwhile."



Taking the Lead

Paul Boyer | AGE: 28

Site Head of Procurement, F. Hoffmann-La Roche, Ltd., Hillsboro, Oregon Nominated by Tania Santiago-Mirabal, Latin America Indirect Procurement Manager, Millicom

Up the ladder A skilled leader who has proven his ability to pull teams together on complex projects, Paul Boyer has just moved up to a new challenge at healthcare firm F. Hoffmann-La Roche. Until recently, he worked as a global category manager, responsible for primary packaging for targeted therapies. Now, he is a site head of procurement, in charge of all sourcing for a manufacturing plant.

"I lead a team of people managing direct and indirect materials, specifically capital and equipment, facilities, services, and site operations," Boyer says.



Based on his track record, there's no doubt that he'll thrive in the new job. "Paul demonstrates a level of professionalism far beyond what one would expect from someone his age," says nominator Tania Santiago-Mirabal. "His management has received positive feedback from stakeholders at all levels."

How he got here Boyer was a business major at Miami University of Ohio when Tom Speh, a professor and past president of the Council of Supply Chain Management Professionals, gave a guest lecture to his marketing

class. "He talked about increasing revenues versus decreasing costs to achieve a target," Boyer says. "It provided a look at the impact procurement can make. I found it fascinating."

Boyer asked for a bit of Speh's time the following week. "We talked for a few hours," he recalls. "Then I went straight to admissions, and enrolled in the supply chain program."

One for all In one of Boyer's biggest projects as global category manager, he led the procurement team's participation in an effort to source a pre-filled glass syringe that would serve for most cancer therapies in Roche's development pipeline. "Before we got involved, seven or eight molecules in the pipeline had their own specifications," he says. Running a separate procurement for each, then using all those slightly different packaging platforms at the same plant, would have wasted a lot of resources. Instead, officials at Roche wanted to create a standard set of specs, and choose a standard set of suppliers. Boyer's job was to run the cross-functional sourcing team and get everyone to buy into this new approach to sourcing.

The nearly three-year effort saved Roche a great deal in resources. "And it sets us up for success as these molecules move through the development process and eventually launch," Boyer says.

Advice to millennials "If you're still in school, try to get a solid grounding in something other than supply chain," Boyer says. "You need specialties of your own—a unique perspective you can bring to the job. For those who are getting into the workforce now, find a good mentor."

make a difference in the world.

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IN HIS OWN WORDS

Most rewarding part of your

job? This type of work inspires

and challenges. Getting out of bed in the morning, and going above

and beyond, is easy to do. What

do you hope to accomplish in the

next 10 years? Continue pursuing

and are in line with my values and

passions. Through my work, I can

opportunities that keep me engaged

A World of Opportunity

Christina Butterworth | AGE: 30

Global Supply Markets Project Manager, Halliburton, Kuala Lumpur, Malaysia Nominated by Jami Bliss, Director of Procurement, Teva Pharmaceuticals

The job Given her expertise on the supply side, you might be surprised to learn how much time Christina Butterworth spends talking with customers. As a global supply market (GSM) project manager at Halliburton, Butterworth helps business development teams win projects ranging from \$1 million to more than \$3 billion in scope.

Her job is to make sure everyone understands the cost factors that lie behind Halliburton's pricing. Through extensive research and analysis, Butterworth builds a picture of all the costs involved—for materials, transportation, contract services, and everything else the project requires.

She often sits at the bargaining table, too. "Some business development professionals want a supply chain 'wing man' to assist in the negotiations," Butterworth says. "That's an exciting role. I'm negotiating with extremely talented supply chain professionals from some of our top customers."

Seeing the world Having caught the travel bug early in life, Butterworth was thrilled when Halliburton sent her to Malaysia in 2014. "It has been the highlight of my career so far," she says. Her mission was to extend the GSM concept to the Asia-Pacific market, where it hadn't been tried before.

Since arriving in Kuala Lumpur, Butterworth has led her GSM team on more than 90 projects. The new posting has taught her about many more of Halliburton's products and services, and has given her the chance to visit about a dozen countries. "Learning about different cultures and eating new foods has been incredible," she says. As a bonus, she has taken the opportunity to earn her open water scuba diving certificate.

Influential leader Butterworth's projects are often complex, and may require cooperation from a wide range of people. That's not easy to achieve. "Sometimes you need support from various teams, with diverse priorities, to achieve a common goal," she explains.

She prevails because she has honed a skill she calls "influential leadership." Butterworth knows how to get people pulling in the same direction for the good of their company. "Throughout her career, Christina has been able to gain trust, articulate a vision, and lead a team to success," says nominator Jami Bliss.

Helping the next generation Along with her Houston colleague, megawatt star Katy Conrad Maynor, Butterworth played a major part in launching ISM-Houston's 250-member Emerging Professionals Group (EPG). Butterworth chaired the EPG committee in its first two years, and helped spread the word on how to create such a group at ISM's Affiliate Leadership training events in 2012 and 2013.

Advice to millennials "If you're in school and want to enter the supply chain field, get as many internships or co-ops as you can," says Butterworth. "You'll get a chance to see everything supply chain management can offer before you have to make a more strategic decision on your career path. Also, don't be afraid to take risks."



IN HER OWN WORDS

Most significant career accomplishment to date? I was involved in the startup of ISM Houston's Emerging Professionals Group. I chaired the committee for two years. One year, the group grew to more than 250 members and held four events. Would you recommend a supply chain career to someone under 30? Yes. My advice would be to take calculated risks in your life and career. You lend yourself to more opportunities, and won't feel the need to look back and think you should have done something a different way.





Sourcing for Success

Erica Canlas | AGE: 25

Sourcing Lead, Commercial and Business Services Procurement, Johnson & Johnson Consumer Products Company, a Division of Johnson & Johnson Group of Consumer Companies Inc., Skillman, New Jersey Nominated by Eliza Gonzalez, Director, Global Procurement and Talent Management, Johnson & Johnson Family of Companies

Wide reach Since joining Johnson & Johnson (J&J) as a co-op in 2010, and a fulltime employee in 2011, Erica Canlas has wielded an extensive shopping list. Check in with her at different times, and you'd have found her cultivating value for the company across everything from advertising to shrink wrap.

Today, Canlas still handles an impressively complex portfolio, supporting procurement of professional services (consulting and temporary labor), auto fleets for sales reps, travel, meetings, event planning, and point-of-sale retail displays. She keeps making an impact. "In only four years at J&J, she has amassed an incredible list of accomplishments in procurement, and has earned the respect of leaders in marketing, logistics, sales, and finance," says nominator Eliza Gonzalez.

Change agent One of the top challenges Canlas faces in her job is overcoming resistance to change. "People get used to the way they've been doing things, or they're used to working with an existing supplier," she says. When she spots a chance to source an excellent product or service better, faster, or at a more competitive price,

it can be hard to influence people at multiple levels, inside and outside the company, to embrace that change.

That's where her experience with many different categories comes in handy. "It is rewarding to think about what I've learned in one role, and share those lessons with stakeholders in a different category," she says.

Success story Shrink wrap offers a great example of Canlas's sourcing prowess. As a sourcing analyst for logistics, Canlas pored over every line in the operating budget of the third-party logistics (3PL) companies that served J&J, looking for opportunities to add value. "One area that I tackled was shipping supplies," she says.

In particular, one distribution center in California was buying shrink wrap from a supplier that had a good track record, and met the company's supplier diversity goals. But Canlas believed that J&J could buy the product for less. So she sat down with the supplier, the 3PL, and stakeholders within Johnson & Johnson to talk about how the material worked, its connection to raw goods, how much the company used, and what future demand might be. "We also did

benchmarking, looking at pricing for comparable material from other suppliers," she says. Those negotiations yielded major savings, while preserving the partnership with a strong supplier.

Outside the office While she works hard, Canlas also makes sure to devote time to family and friends. She also keeps active. "I exercise regularly, and I enjoy hiking and other outdoor activities," she says. "I also enjoy cooking and experimenting with new recipes." On top of all that, she's working toward an MBA at Rider University, N.J.

IN HER OWN WORDS

Most significant career accomplishment to date? I led efforts to deliver savings for distribution center shipping supplies while maintaining operational and quality requirements. I engaged the supplier, 3PL, and business stakeholders to benchmark pricing for comparable materials from suppliers, and yielded major savings while maintaining the incumbent supplier relationship.



Relationship Builder

Robert Cassin | AGE: 25

Specialist, Global Procurement, Ingredion, Westchester, Illinois Nominated by Bhart Sarin, Global Procurement, Business Services Team, Ingredion

Man in high demand A natural relationship-builder known for his integrity, Robert Cassin has earned the trust of colleagues and stakeholders throughout Ingredion. "This, combined with strong analytical and project management skills, has made him a highly sought-after talent in the company," says nominator Bhart Sarin.

Since joining the food ingredients company in early 2012, Cassin has delivered so much value that in 2014 he was chosen for a special six-month assignment in Shanghai. There, he helped Ingredien's procurement team in China implement best practices and tools developed at the company's headquarters.

"I was focused on procurement, but a huge part of my work was

to establish relationships with the leadership team at that site," says Cassin. Those ties continue to pay off. "Now I can serve as a primary resource for anyone who's trying to get something done in China."

His work today Back in Illinois, Cassin leads procurement for human resources services, and works on other strategic sourcing projects case-by-case. "Those projects fall into a variety of categories—logistics, chemicals, or packaging," he says. The projects focus mainly on the needs of Ingredion sites in South America and the Asia-Pacific region. "I'm involved in the entire sourcing process—from developing ideas for an opportunity all the way through contracting and execution," he says.

Pleasures of the job An avid solver of problems and puzzles, Cassin brings that enthusiasm to all the projects he tackles. "The most attractive part of procurement is coming up with solutions, and being able to realize different opportunities," he says.

Major win One of Cassin's biggest successes at Ingredion so far was a project that developed stronger packaging for transporting a key product from manufacturing plant to customer. "Working closely with our suppliers, who are experts in the field, we came across a new opportunity using high-performance extensible paper rather than natural kraft paper," he says. After performing extensive tests and some trials, the team—which Cassin led—decided to create packaging based on this material.

That choice produced several benefits. "We developed a solution that uses less transportation, requires less warehouse space for storage, and is more sustainable—using 33 percent less paper," Cassin says. The new packaging reduced Ingredion's impact on the environment while also saving money. "The project was so successful, it was a finalist for our internal CEO Awards program," Sarin adds.

Advice to millennials "If you get the chance to work globally and to travel abroad, take it," Cassin says. "It's an incredible experience to see different cultures and learn how the business operates in other areas of the world. You'll expand your network as well."

And definitely consider a career in supply chain. "If you're passionate about learning and growing, gaining new experiences and skills that you can call upon in the future, this work offers an unbelievable opportunity," he says.

IN HIS OWN WORDS

Does your job have a significant impact on your company? Yes.

My role allows me to deliver savings that help drive profits for my organization. If you could start over, would you still choose this profession? Yes, my profession has given me the opportunity to live and work all over the world. I find my work extremely rewarding.



A Sweet Feat

Erin Clancy | AGE: 30

Commercial Manager, Mars Chocolate, North America, Hackettstown, New Jersey Nominated by Cheryl D'Cruz-Young, Managing Director, Diversified Search

Dandy gig There's no question what's most fun about Erin Clancy's job. "We're producing chocolate!" she says. At the company that brings the world M&M's, and other brand chocolates, Clancy manages relationships with third-party manufacturers and co-packers. Helping to design supply chains, and making sure that partnerships yield improved results, she handles a constantly changing portfolio worth approximately \$50 million.

From start to shelf Part of Clancy's role is to help Mars bring new products to market. One stellar example was M&M's Milk Chocolate Snack Mix, a blend of M&M's, cookies, pretzels, and nuts that *Confectionery News* named the #1 Innovative Product of 2012. "I was part of the product

team from development through execution," Clancy says. "Seeing the product on the store shelf, and knowing how much I had to do with creating it, was the most rewarding experience I've had at Mars."



IN HER OWN WORDS

Does your job have a significant impact on your company? Absolutely. Supply chain creates value every day by supporting multiple products across multiple brands. Would you recommend a supply chain career to someone under 30? Yes. Success in supply chain management can boost a company ahead of its competitors.

The importance of allies A BS from the University of Maryland in logistics, transportation, and supply chain management, plus operations and quality management, gave Clancy much of the knowledge she needed to launch her career. But only when she took a seat in Mars Chocolate's open-plan office did she absorb another crucial lesson about supply chain success—the importance of exchanging information with allies throughout the company.

"You have to form the right relationships with people from your own function and throughout the business," she says. When you keep people in the loop about your projects, there's no telling who will turn up with crucial advice at just the right moment. "Suddenly, it's the advice that will make or break your project," she says.

Having a field day Clancy is a big proponent of engagement, the principle that people are most excited to come to work when they feel connected,

valued, and supported. A member of the Mars Engagement Leadership Team, she was the driving force behind the annual Mars Field Day, which began in 2011. "The idea was to have the various functions compete outside the office, like field days we had in grade school," she says. Clancy won the needed buy-in from management, planned the activities, and was delighted to see co-workers compete in events such as volleyball, tug-of-war, a water sponge relay, and a 10-legged race.

Personal best Just as she drives herself to new heights of excellence at work, Clancy loves striving for the best in the competitive sport CrossFit. "I apply what I learn in the gym to my professional life, always pushing harder and setting and achieving new goals," she says. She also teaches CrossFit classes, and loves seeing her students shine. "It's extremely satisfying watching members do a movement they never thought they could do, run farther or faster than they ever thought possible, or lift more weight than they imagined they could."



The Dean of Hard Work

Brian Dean | AGE: 26

Purchasing Agent, General Dynamics C4 Systems, Scottsdale, Arizona Self-nominated

Whatever it takes Brian Dean throws himself into challenges with

joy, embracing every new experience as a way to build his strength. If he doesn't know the answer to a question, he'll pull out all the stops to find it. If a project turns tough, he'll work late into the night to get the job done right and on time. No wonder one of General Dynamics' (GD) strategic suppliers singled him out for praise after an annual contract negotiation. "We have never seen a buyer work as hard on anything as Brian did on those agreements," the vendor said.

The job As a purchasing agent for GD's G4 Systems, Dean buys radio frequency and microwave components used in radios, encryption devices, and other products for military communications. His special challenge is balancing day-to-day purchasing with his strategic procurement mission: finding ways to drive out costs. The key to success, he says, is to stay in touch with engineers and material planners, and keep a sharp eye on the future. "If we know about a project ahead of time, then we can see what relationships we have with potential suppliers, or forge new ones," Dean notes.

Resident expert At GD's Scottsdale facility, Dean is the sole person responsible for buying products through the "gray market"—the network of brokers who are not official sources of a manufacturer's components. Often, these are replacement parts no longer made by the original equipment manufacturer (OEM), but available as excess or re-sold inventory.

GD goes to the gray market only as a last resort, and buyers must work with special care so that they never buy counterfeits. "I was part of the team that wrote our company's stringent guidelines for using the gray market," Dean says. In fact, he's the Scottsdale facility's resident expert on the subject. Colleagues at other GD businesses often seek his advice on how to work successfully with reputable gray market suppliers.

Big win Dean scored one of his major successes on a team that integrated purchasing for GD Canada and other businesses into the Scottsdale operation. He shouldered the workload of multiple buyers, and took charge of streamlining existing businesses processes. The work paid off handsomely. For instance, the team cut GD Canada's supplier base from about 50 to just three. "And because we were buying in bigger volumes, we got better pricing," Dean adds. Also, for high-volume components, the team found new opportunities to buy directly from OEMs, rather than from distributors.

Advice to millennials "Find a boss who is as committed to your growth as you are, someone who gives young people opportunities to take charge of things that other companies might not," Dean says. "And once you're in a job, don't be afraid to put yourself out there and offer creative solutions. Younger people often have a different mindset, compared with the way things have been done in the past. That's a huge asset."

IN HIS OWN WORDS

Most difficult part of your job?

Adapting between meeting the day-to-day requirements of the job, while still working toward bigpicture opportunities that could benefit the company in the long run. If you could start over, would you still choose this profession?

Yes, but I would double-major in finance. You should understand not only how goods move throughout an organization and the world, but how money moves as well.



The Lone Arranger

Laura Dearborn Stearns | AGE: 26

Supply Chain Business Analyst, Cisco Systems, San Jose, California Nominated by John Hutton, Manager, Supply Chain Operations, Cisco Systems

Sharp intelligence The way you might squeeze juice from an orange, Laura Dearborn Stearns squeezes value from data. In one of her roles as a supply chain business analyst in Cisco's Global Manufacturing Operations, she builds reports that show how well components flow from suppliers to the partners that manufacture Cisco's products.

Do deliveries arrive on time? If demand for a part exceeds supply, do the supplier and manufacturer work together well to solve the problem? Stearns' tools extract the answers from a business intelligence (BI) system. Then she presents the information in ways that quickly tell users all they need to know.

"I make sure the data is available, accurate, and displayed in a usable format," she says. "Reports have to be useful to internal users, partners, and suppliers—

people with a variety of roles and priorities."

On her own The most impressive aspect of Stearns' BI work is that she leads the effort on her own, says nominator John Hutton. "She does not have co-workers or internal IT support to lean on for assistance." Instead, Stearns works directly with the software vendor to customize the BI platform for Cisco's particular needs. Stearns had no formal training to prepare her to work with this IT tool. "It was all on-the-job learning," she says.

She continues to create new reports, metrics, and dashboards, each one helping her team work a little smarter. "This effort is driving innovation, and creating more efficient ways to share information and collaborate," Hutton says.

Early warning Steams also uses the BI system herself, to keep an eye on how suppliers and manufacturers collaborate to avert component shortages. She ensures that everyone sticks to established processes, and sounds the alarm when things seem to be veering off course. "For example, a lot of shortages could indicate that things aren't going well industry-wide or for a certain commodity," Steams says. "So I make sure management is notified."

Rewards of the job "I enjoy telling a story with data to give people new insights," Stearns says. "Then they can use that information to do a better job for the business."

Do it right Keeping tabs on a highly complex supply chain with many moving parts isn't easy. Stearns succeeds because she knows how to focus on the big picture and on a project's smallest elements. "I'm detail-oriented," she says. "I have an organized approach. And I like to look at the quality of the impact I'm having. I don't want to do something just to get it done. I want to get it done right."

IN HER OWN WORDS

Most challenging part of your job? Managing the complexity inherent in the supply chain, and the needs of all stakeholders in a given project or process. Most exciting career accomplishment to date? Leading the business intelligence for our supply collaboration platform. I pioneered the development and implementation of reports and dashboards that enable stakeholders to gain new information and drive action for increased efficiency.

Always in Motion

Christina DeKoning | AGE: 28

Material Analyst, Northrop Grumman Systems Corporation, San Diego, California Nominated by Corey Moore, Vice President, Global Supply Chain Program Management, Northrop Grumman Systems Corp.

Striving for excellence Nothing stops Christina DeKoning. "I constantly challenge myself and those around me, asking, 'Can we do this better or smarter?" she says. That drive for excellence has propelled her into a variety of roles at Northrop Grumman, including her current job as leader of the Global Supply Chain organization's supply chain affordability inititaives. "Her work ethic, and dedication to success are evident in everything she does," says nominator Corey Moore.

The job DeKoning serves as liaison between Northrop Grumman's manufacturing programs and its Global Supply Chain organization, leading efforts to drive down costs. "I work with all the functions within the supply chain—subcontracts, procurement, goods movement, logistics, and planning," she says.

In the quest for greater affordability, DeKoning focuses not just on one-on-one supplier relationships, but also on broader strategy. For instance, she created an annual event called the Supplier Sustainment Affordability Summit, where major vendors discuss ways to cut costs while still delivering superior products. "For example, if we find an opportunity with one supplier, we ask if we can apply it to others," she says.



IN HER OWN WORDS

Would you recommend a career in supply chain management to someone under 30? Absolutely. The opportunities are endless, and there are multiple roles and options within the field. If you could start over, would you still choose this profession? Yes. This profession has taught me about organizations and how they operate. A strong supply chain gives a competitive edge that is crucial in today's global economy. Companies can't function without a supply chain.

The thrill of victory One highlight of DeKoning's career to date was the project that won her Northrop Grumman's Timely Award Plan Certificate. DeKoning's assignment started when the company secured an important contract with a customer. DeKoning spent nearly three years getting everything in line with suppliers to support that product. "We were under significant pressure to meet our deadline," she recalls. "The project involved months of travel and living on-site, working through the challenges with various companies. But, we got it done, and I flew home two days before Christmas."

She returned exhausted, but also triumphant. "The customer was happy. The company was happy. And all the stakeholders involved were ecstatic," she says. "It was an all-hands-on-deck job, and we got it done."

So-called downtime DeKoning brings the same high energy to her personal life. She works out and recently ran a half marathon. "But my real passion outside of work is horses," she says. A rider since the age of three, she keeps horses on her property and competes in barrel races. "I've tried relaxing, but it's not really my thing," she notes.

Advice to millennials Definitely consider a career in supply chain. "The opportunities are broad, and demand for supply chain expertise is through the roof," DeKoning says. "Professionals who understand the entire supply chain lifecycle are hard to come by."





The Human Touch

Aubrey Edwards | AGE: 26

Category Specialist, Alliance Data, Plano, Texas Nominated by Tyler Werneke, Senior Manager, Strategic Procurement, Alliance Data

Gaining consensus Aubrey Edwards has a special flair for building relationships, says nominator Tyler Werneke. That's a crucial skill in her job as category specialist at Alliance Data, a global provider of datadriven marketing and loyalty programs for companies that serve consumers.

Edwards' prime mission is to hunt for ways to gain more value for Alliance while also cutting travel, financial services, and

marketing costs. These projects usually serve the whole enterprise, and it can be hard to get people with different perspectives and needs to agree on one solution. "You have to take the time to develop relationships with individuals, so they'll trust your opinion," Edwards says. "And the more you learn about a category, the greater the chance that you'll come up with insights that others couldn't have reached themselves."

IN HER OWN WORDS

Most significant project to date? I

led the project team for a software license management solution. Through the RFP process and successful negotiations, we achieved more than \$500,000 in savings. What do you hope to accomplish in the next 10 years? I'd like to make a positive impact on procurement and supply chain by bringing new ideas and innovations to the table.

Early wins During 2013, just seven months after she joined Alliance Data, Edwards achieved more than \$261,000 in savings. In those early days, she also played a key role in procuring the technology behind a new employee recognition program. "The system operates like a Facebook news feed," she says. It provides a forum where managers can praise employees for good work, and colleagues can "like" the news.

"The system has been hugely successful—and I know it will keep employees at Alliance satisfied for years to come," Edwards says.

Bringing everyone together More recently, Edwards worked her consensusbuilding magic in a project to choose a tool for managing the company's many software licenses. "I knew in my heart which solution would best get the job done for everyone," she says.

But individuals from different lines of business had their own ideas about what they needed, depending on their specific technical requirements. Gaining buy-in from everyone took a lot of legwork. "I flew to different locations, held

meetings, and conducted demonstrations," Edwards recalls. Eventually, her work paid off. "We landed on the supplier that my team had been hoping for from the beginning," she says. "Then, in negotiating the contract, we got the pricing down substantially, saving more than \$500,000. It was a big win."

Outside the office Edwards participates in her local ISM affiliate, but says she's basically a homebody. "I was married in April 2014, and I spend a lot of time with my husband and our golden retriever," she says. Edwards makes frequent trips from her home in Plano, Texas, to visit family in Houston. She also enjoys hanging out with friends, trying new restaurants, going for walks, and watching college football. "My newest guilty pleasure," she adds, "is watching *Shark Tank* on Friday night with a glass of wine."



Schooled in the Art of Purchasing

Leah Halvorson | AGE: 28

Director of Procurement and Supply Chain Development, Minneapolis Public Schools, Minneapolis, Minnesota Nominated by Sherry Bakken, Executive Assistant to the COO, Minneapolis Public Schools

Fast ascent "Leah Halvorson is incredibly wise beyond her years," says nominator Sherry Bakken. And once she started working for the Minneapolis Public Schools, Halvorson was quick to rise. Just one month after she joined the district as a senior buyer, tasked with implementing new contract management processes, Halvorson applied for—and won—the newly open job of director of procurement. Clearly, she had already made a big impact. "Even in a setting where she is not the 'designated' leader, people gravitate to her and automatically take direction from her," Bakken says.

Her mission Before Halvorson arrived, purchasing at the Minneapolis Public Schools was a transactional affair. "It didn't matter if a product could be purchased at a better price, or we could get a volume discount," she recalls. Nor did it matter if staff bought similar products from 20 different vendors. The department simply turned each requisition into a purchase order. Tapping her private sector experience, Halvorson has been transforming the district's purchasing department into a strategic operation that seizes every chance to reduce cost and waste.

Pizza slices To increase those opportunities, Halvorson has brought asset management, travel, contract management, sourcing, purchasing cards, records management, the document center, and vendor management under the procurement umbrella. By hunting down new chances for improvement, her department has made gains, including a partnership with a local vendor that cut the school district's \$60,000 annual pizza bill in half. Savings have added up quickly. "She and her department were able to achieve \$883,000 in cost savings in fiscal year 2013, and \$2 million in 2014," Bakken says.

Soaking it up Halvorson honed her negotiating skills early in life. A member of debate teams in high school and at the University of Florida, Gainesville, she learned to get into the minds of opponents and anticipate their arguments. Later, she learned about vendor management by watching her boss in action at Life Time Fitness, where Halvorson worked as purchasing project manager. "I used the opportunity to be a sponge," she says. "I also asked if I could be a fly on the wall when he met with executive staff and the board, so I could learn how to interact with that level of management."

The right stuff "It takes a certain kind of personality to work in procurement," Halvorson says. "You have to be assertive, because you will have tough conversations at times." You also have to keep pushing your standards higher. "Often, the procurement department is expected to accomplish what looks to be the impossible," she says. "Once you do, that becomes your new norm. I enjoy that. You have to keep upping your game."

IN HER OWN WORDS

Most difficult part of your job? Being a change agent. I am constantly looking for process improvements and cost efficiencies, and with that comes change. Most significant career accomplishment to date? I opened our Document Center (DC) that was previously unsuccessful. The DC saved about \$350,000 in its first year, \$1 million in the second year, and is projecting to hit about \$1.5 million in its third year—representing about a 33-percent increase.



Bread Winner

Stephanie Kessler Thayer | AGE: 29

Manager, Development Purchasing, Panera Bread, St. Louis, Missouri Self-nominated

Back in the spotlight Winning a place on a list of up-and-coming young professionals is getting to be a habit for Stephanie Kessler Thayer, who appeared in the *St. Louis Business Journal*'s 30 Under 30 list in 2014. An accomplished project manager, Kessler Thayer is the go-to person for furniture, fixtures, and equipment in more than 1,800 Panera Bread cafés across half the United States.

When it's time to open a new café, replace existing equipment, or roll out an innovation—such as electronic kiosks for placing orders—Kessler Thayer makes sure everything comes together correctly and on time. She creates and maintains work plans, budgets, scopes of work, and rules of engagement for \$27.5 million worth of rollout and replacement activity.



Why supply chain? Before earning her MBA and

embarking on a supply chain career, Kessler Thayer majored in international relations at Webster University. But even as an undergraduate, when she first heard about supply chain management, she felt the attraction. "I

discovered that supply chain involved all my professional passions — negotiation, estimation, working with people, and finding common ground," she says.

IN HER OWN WORDS

Does your job have a significant impact on your company? From maintaining supplier relationships to implementing cost-savings initiatives, procurement has a significant impact on a business' ability to operate and grow efficiently. Would you recommend a supply chain career to someone under 30? I highly recommend it. If you love numbers, people, and exciting projects, supply chain is a great field.

Success story Before joining Panera in 2013, Kessler Thayer worked at Ralcorp, later purchased by ConAgra. As a procurement specialist in packaging, she quickly spotted a problem with the inventory data used to forecast product demand.

"I noticed some severe forecasting inaccuracies," she recalls. "The database was missing some information, and that provided an opportunity to improve the process." Further investigation revealed that the database was missing about 30,000 item numbers that hadn't carried over during a system conversion five years earlier. "That was skewing the data sets by about 20 percent," she notes.

Once Kessler Thayer pinpointed this, and other errors in the database, she and her colleagues were able to address them. Then she invented a new, hybrid forecasting method that took better account of factors such as seasonal demand. "We streamlined that supply chain process, making sure we were not missing the data that was so valuable for our suppliers and our plants," she says.

Outside the office As busy as her job keeps her, Thayer Kessler also invests energy in her community. She serves on the boards of the St. Louis Public Radio Young Friends, and the Young Friends of the Missouri Botanical Garden. She also volunteers at the Academy of Science—St. Louis.

For fun, she and her husband rebuild 1970s-era motorcycles. "You should see me clean a carburetor!" she says. "And I bake because, after all, I work for a company that prides itself on bread and pumpkin muffins. I spend most Saturday afternoons in the kitchen—after my run, of course."

Catching a Code

Sarah Klemsz | AGE: 24

Supply Chain Analyst, The Boeing Company, Portland, Oregon Nominated by Derek Westfall, Supply Chain Analyst, The Boeing Company

Why supply chain? "I'm a big nerd—I can't help myself!" laughs Sarah Klemsz. She's a whiz with computer code, and she likes to base decisions on hard data. But it was the relationship aspect of supply chain management—observed during a summer internship at Boeing—that lured her into the field. "I liked that the buyer group was the interface between the shop and engineering," she says. "It's all about coordinating with people to optimize."

Welcome to the 21st century After graduating from University of Portland, Klemsz joined Boeing as a supply chain analyst, responsible for relationships with 15 suppliers and about 1,100 parts, all used to make controls that pilots use to fly commercial aircraft. Before long, she had also created an extra role for herself: modernizing how Boeing's Portland supply chain group generates reports.

Before Klemsz came along, reporting was largely a manual process. Team members hunted down data they needed in Boeing's ERP system and other sources; then they rekeyed the information into a spreadsheet or database program. That didn't make sense to Klemsz. "It's the 21st century. We've 3D-printed a car, we've landed a probe on a comet, and we're paying people to type?" So she started writing code to automate those reports.

Labor savings Her efforts made a dramatic impact. For example, an automated tool now runs a components shortage report every morning. It updates managers with real-time information, while saving the supply chain analyst team one hour every day, which they devote to more mission-critical work. "The tool saved \$526,000 in labor costs and was recognized by the Portland site as the largest cost saving project in 2013," says nominator Derek Westfall.

To keep the ball rolling, Klemsz pulled several tech-savvy colleagues into a new Supply Chain Information and Technology (SCIT) team. "We started getting together to bounce around ideas, and share the code we had already developed, so information would flow seamlessly among our homegrown systems," she says.

Pleasures of the job "I love the Aha! moments in my work, when everything falls into place," Klemsz says. She's especially fascinated by risk management— how a business turns uncertainty into a course of action. Come port strike, blizzard, or tsunami, the supply chain stands ready. "We know what will happen, and we've got the plan," she says.

Michigan bound By the time you read this profile, Klemsz will be at the University of Michigan, working on a master's degree in supply chain management at the University of Michigan. After that, she hopes to return to Boeing, she says, and maybe also pursue another advanced degree—in data analytics.

Outside the office A hiker and kayaker, Klemsz also volunteers as a Girl Scout leader. She's especially proud of the two high school students she has been supporting in their work toward the Gold Award, the Girl Scout's highest rank. "I started with the students when they were in middle school," she says. "It's rewarding to be along for their journey."



IN HER OWN WORDS

Does your job have a significant impact on your company? Yes. Each time we streamline a process, it makes the work easier, and saves the company money. Would you recommend a supply chain career to someone under 30? Absolutely!

Businesses are putting more emphasis on their supply chains. It is an exciting time to join the field.





IN HIS OWN WORDS

Does your job have a significant impact on your company?

Yes. When I find ways to save the company money, it opens up new opportunities for us to reinvest. Would you recommend a supply chain career to someone under 30? I would recommend it, because it allows you to see the big picture view of your company.

Power Player

Andrew Lattof | AGE: 27

Buyer, Xcel Energy, Denver, Colorado Nominated by Karen Cook, Purchasing Manager, Xcel Energy

Top scorer Andrew Lattof has cleared hiking trails in Alaska, and built homes for Habitat for Humanity. Today, he slashes costs for Xcel Energy, racking up more than \$500,000 in savings by the time of his 30 Under 30 nomination. "Andrew had the highest savings contributions of any buyer in 2013," writes nominator Karen Cook. And he's poised to climb even further. "He is a high-potential leadership candidate," she adds.

Total transformation It's impressive enough when a purchasing team hoists itself from the bottom of the performance ladder to the top. When Lattof joined the group that supports Xcel's transmission

and distribution business, he led that transformation while also shouldering a double workload.

His key strategy? Communication. "We worked with the engineering teams to give them more accurate lead time information, so they could better plan their products and order materials," Lattof says. Enhanced planning netted a 100-percent improvement in on-time, in-full deliveries, with fewer costly expedited shipments.

New mission In 2014, Xcel chose Lattof for a special assignment: negotiating master service agreements with contractors who make repairs at the company's power plants. Because these agreements set up the terms and rates for services in advance, Xcel can call a maintenance contractor on short notice and get a quick response.

Learning the intricacies of all the equipment and services involved, so he can negotiate effectively, presents a big challenge. "I can use training modules to educate myself," Lattof says. "But what's even more helpful is to talk to the engineers."

Curiosity pays One secret behind Lattof's success is that he loves to ask questions. It's how he learns which processes could do with an efficiency boost, and it's also how he powers his negotiations with vendors. "You never know what you're not getting unless you ask for it," he says. Sometimes all a buyer needs to do is inquire whether there's any way to lower a price. "It's surprising how often you can find additional value for your company and for the relationship with the contractor," he notes.

From novice to trainer When he first came to Xcel, Lattof's penchant for questions also led him into conversations with colleagues about their jobs—what they did and how they did it. Soon, new hires started seeking him out, and those informal chats morphed into training sessions. "While initially in a junior role, he contributed to the training of all subsequent new hires in our purchasing team, as well as in our material coordination and supply chain hotline teams," Cook says.

Outside the office Lattof volunteers for the Colorado Outward Bound School, and has run an aid station for the Leadville 100, a long-distance, high-altitude trail race. He revels in Colorado's outdoor opportunities. "I enjoy skiing and ice hockey in the winter," he says. "In the summer, I go fly fishing, hiking, and camping."



Live and Learn

Ryan Mulcrone | AGE: 27

Senior Buyer and Category Manager, E.I. DuPont de Nemours & Company, Wilmington, Delaware Nominated by Thomas Weisenbach, Executive Buyer, E.I. DuPont de Nemours & Company

Quick study Ryan Mulcrone never stops learning and never stops teaching. As one of the youngest in his MBA program at Ohio State, he absorbed all the knowledge he could—not just from classes, but also from older classmates who had worked in the corporate world.

Since arriving at DuPont, he has been paying it forward, gaining know-how and passing it along whenever he can. "At first, I spent my year as a capital buyer, learning how we buy," Mulcrone says. "When I became enough of an expert, I started revising training documents, and teaching the project process to others at DuPont."

Houston turnaround His talent for instruction led to one of Mulcrone's big successes at DuPont. As a senior buyer and capital sourcing liaison, he spent nearly two years in Houston helping to transform a sourcing team there—part of a larger team of contractors—from laggard performers into stars.

His first step was to learn where the group was falling short. "I got involved in weekly project meetings," he says. "I designed and set up a 'voice of the customer' survey to get feedback on what they were lacking, and I shared it with them." Then, rather than dictate what to change, he asked team members to design their own improvements. "I also upgraded many of the training documents and databases, and retrained the team," he says

When DuPont switched to a different contractor, a new sourcing team stepped in to use the processes Mulcrone had helped to put in place. "I was heavily involved in ensuring a seamless transition from one contractor to another," he says. "Before I left, the director of engineering told me that sourcing had become a bright spot within the office."

His job today Since May 2014, Mulcrone has been managing relationships with companies that supply construction, maintenance, and engineering services to multiple DuPont facilities. His portfolio is worth \$500 million annually.

"The site operations and engineering teams, and the contractors, come to me with contractual or billing questions, or other issues related to the overall master agreement," Mulcrone says. He also works on strategic planning, helping make decisions such as how many contractors DuPont should use for site services, and how to divide the work among different suppliers.

Perils of personality Overseeing service contracts is a special challenge because it involves "buying" people rather than products, Mulcrone says. "Emotion and personality are involved," he notes. "You have to juggle the opinions and mindsets of many different people."

How does he do it so well? "I try to listen more than I talk," Mulcrone explains. "I always hear people out before I jump in to agree or disagree."

Outside the office Mulcrone relocated from Houston to Delaware in August 2014, and got married in September. Since then, he and his wife have been shopping for a home. "When I'm not working, I'm house hunting," he says.

IN HIS OWN WORDS

Most rewarding part of your job?

Getting to work across sourcing, operations, engineering, plant sites, and external suppliers, and helping to solve problems every day. No one day is the same. Would you recommend a supply chain career to someone under 30?

Yes. It's a quickly growing field that is demonstrating more value to companies.



IN HIS OWN WORDS

Most difficult part of your job?

Dealing with business uncertainties, such as exchange rates and external factors, which can disrupt the supply chain. Does your job have a significant impact on your company? Absolutely. I have led sourcing studies that had a large impact on direct material costs, resulting in bottom-line savings.

Master Builder

Arun Raman | AGE: 29

Supply Chain Performance Engineer, Caterpillar, Peoria, Illinois Nominated by Javier Zarazua, Black Belt, Caterpillar; Betty Kelly, Six Sigma Black Belt, Caterpillar; Angela LaMere, Supply Manager, Caterpillar

Taking it up a notch Arun Raman is an outstanding builder and shaper. "He has taken supply chain design and transformation to a whole new level for our business," says colleague Betty Kelly, a Six Sigma Black Belt. Case in point: when Raman designed the supply chain for a new Caterpillar product—the general duty undercarriage—he slashed manufacturing costs so effectively that his process became a new model for the company. "Over the past few years, my strategic sourcing process has been used in 94 projects, saving Caterpillar \$56 million," he says.

The job Raman leads strategic sourcing for the Caterpillar unit that makes undercarriages—the moving parts that drive the company's bulldozers, harvesters, and other machines. His influence is strong: peers and managers regularly look to him for ideas and information. "Arun has quickly established himself as the resident expert on strategic sourcing on our team," says Angela Mare, supply chain manager at Caterpillar.

Why supply chain? "I'm good at math, which is used everywhere in the supply chain," says Raman. He majored in information technology in college, then homed in on supply chain management while working for his M.S. in industrial engineering at Penn State. For Raman, though, the lure of this career goes way beyond numbers. "I like to be challenged every day," he says, and the supply chain satisfies that need. He also loves the chance to work with suppliers all over the globe. "In the morning, I talk with Europe, at night I talk with China," he notes. "That excites me."

The big challenge The dynamics of the global economy guarantee more than enough complexity to keep Raman's job compelling. For example, in the past 18 months, the Japanese currency has weakened by 25 to 30 percent. Two years ago, Raman advised moving manufacturing out of Japan. "But maybe that's not such a good idea, now that we can get some of our components there for 30 percent less," he says. Staying flexible in a volatile world is never easy. But helping to define the manufacturing footprint for the next 10 to 15 years is one of the enjoyable aspects of his work, he says.

Endless opportunities Active in APICS since his student days, Raman now uses that organization to advocate for the rising generation. Not only does he serve as director of student chapter affairs for the Lincoln Land Chapter of APICS, but he has earned a spot on the APICS national board. As student/young professional director, he works to ensure that APICS is serving the interests of millennials.

"Making a difference in people's lives makes me happy," Raman says. "So it's a pleasure to introduce young people to the endless possibilities found in a supply chain career."

From the food we eat to the huge machines that build our homes and roads—everything needs to move from supplier to consumer," he says. "The supply chain is literally everywhere."

The Tool Maker

Thomas Raterman | AGE: 28

Contract Administrator, Strategic Sourcing, Howard Hughes Medical Institute, Chevy Chase, Maryland Nominated by Judith Smith, Associate Director, Strategic Sourcing, Howard Hughes Medical Institute

Building a toolkit There's no end to the items in Thomas Raterman's toolkit. As soon as he arrived at Howard Hughes Medical Insitute (HHMI) as a procurement analyst, he started creating instruments such as a supplier scorecard, a log for tracking savings, procurement metrics, a supplier information database, and a method for benchmarking the prices HHMI pays for various items.

"We're using these tools because we do not have a supplier relationship management application to monitor supplier performance," says nominator Judith Smith, Raterman's boss. Raterman's databases, metrics, and reports fill the gap.

Sourcing for science These days, Raterman uses those tools in his work as a contract administrator, part of a team responsible for procuring general lab supplies. A science philanthropy, HHMI supports the work of researchers at more than 70 host institutions in the United States. HHMI's sourcing department strikes deals with suppliers for products and materials those researchers need in their labs

Raterman is part of the team responsible for those agreements.

"We set up contracts, work with pricing, and manage the relationships," he says. "We leverage our spending as best we can to ensure that we're getting the best price, quality, and service for the scientists." He also works with suppliers to clear up any issues that arise involving price, service, or delivery.

IN HIS OWN WORDS

Most significant career accomplishment to date? Working to set up a primary vendor relationship with a key supplier through an RFP process. This yielded several positive benefits, and was a big change for the organization. Does your job have a significant impact on your company? Yes. We enable end users to order supplies efficiently. Overall price, quality, and service improve by developing strategic relationships with key suppliers.

Major win In 2014, Raterman played a key role on a team that decided to contract with a primary vendor for general lab supplies, then conducted a procurement to choose that vendor. "My role was to help guide that conversation, provide key data, and answer questions to help drive the team toward consensus," he says.

"In addition to doing a spend and market analysis, Tom also created a sophisticated and detailed evaluation matrix for the group to score the suppliers' proposals," says Smith.

Once the group chose a supplier and negotiated a contract, Raterman created several tools to help scientists in the labs easily find the equipment they needed. The impact of his work extends well beyond that particular project. "These tools are now sourcing templates that will be used time and again," Smith says.

What's cool about the job "The Institute's mission is awesome," says Raterman. "It's rewarding to see the great things we're doing." He points to scientist Eric Betzig of HHMI's own Janelia Research Campus, a co-winner of the Nobel Prize in Chemistry in 2014. "He did all the hard work, of course, but it's great to support that kind of mission," Raterman notes.

Advice to millennials "Be open to trying new things," Raterman says. "You can take many paths in supply chain—logistics, warehousing operations, procurement. If you have an opportunity, try each of them. It will help you discover what you enjoy most."



IN HER OWN WORDS

Does your job have a significant impact on your company? Yes. Spearheading the effective management of our strategic third-party suppliers and measuring them on key metrics enables us to deliver on our goals. If you could start over, would you still choose this profession? Yes. I feel I was born to do this profession because it combines strategy, operations, and strong management skills.

Embracing the Entrepreneurial Spirit

Tania Santiago-Mirabal | AGE: 30

Latin America Indirect Procurement Manager,
Millicom, Coral Gables, Florida
Nominated by Jami Bliss, Procurement Director, Teva Pharmaceuticals, and
Sandy Lukaski, Executive Director, R. Gene & Nancy D. Richter Foundation

Moving up These are exhilarating times for Tania Santiago-Mirabal. After working for two renowned corporate giants—IBM Global Business Services and Pfizer—she recently moved to a very different setting. In September 2014, she became manager of Latin America indirect procurement for Millicom, a Stockholm-based firm that provides mobile, cable, broadband, and other services in Latin America and Africa.

From her office in Miami, Santiago-Mirabal is responsible for all of Millicom's indirect purchases in Latin America—legal services, marketing services, office supplies, and a great deal more. It's a big change from her previous roles. "As a consultant at IBM, and at Pfizer, I managed a particular category," she says. "Here, I have it all." She's also developing global and regional procurement strategies for the seven Latin American countries where Millicom operates.

A look back Santiago-Mirabal came to Millicom with a remarkable resume. At Pfizer, one project was recommending new marketing categories for procurement teams to support. She created a category called market access—services that Pfizer uses while developing a new drug, to gauge what the market might be willing to pay for it. Building a list of preferred suppliers, she then negotiated and executed a series of contracts. "We were able to reduce hourly rates for these niche providers by 11 percent, which generated significant savings for the organization," she says.

A more unusual challenge came when Santiago-Mirabal led the deaccession of a corporate art collection by a renowned American painter, choosing an auction

house to handle the transaction with extreme confidentiality. "The sale of artwork generated significantly more than the initial targets set by the CFO," says nominator Jami Bliss.

'I feel like an owner' "Tania exemplifies innovative spirit," Bliss says. Millicom—which started small but is growing fast—offers room for that spirit to soar. "The company encourages entrepreneurship," says Santiago-Mirabal. "I feel like I'm an owner."

She is excited that in 2015 she'll start visiting Millicom's Latin American markets. "I'm passionate about Latin America," she says. "It's a market that's growing significantly, and quickly, especially in the telecomms realm."

The bride drives a bargain So deeply has Santiago-Mirabal absorbed the lessons of supply chain management, she used an RFP to choose a venue for her June 2013 wedding in San Juan, Puerto Rico. That strategy yielded some big wins, including \$2,000 in savings on beverage service and complimentary music.

Award-winning volunteer Santiago-Mirabal inherited a tradition of community service from her parents. She got involved with New York Cares, which runs volunteer programs for nonprofits, government agencies, and public schools, and led a music and art therapy program for children with autism. That work won her a leadership award from New York Cares. She also served on the board of Tender Care Human Services, which helps people with developmental disabilities.



Changing the Channel

Amy Schwantner | AGE: 29

Manager, Strategic Sourcing, CBS Corporation, New York, New York Nominated by Mike Smyklo, Vice President, Strategic Sourcing, CBS Corporation

Fearless Looking at Amy Schwantner's achievements, you'd never guess that she has been working in procurement for fewer than three years. It took her just 18 months to rise from

analyst to manager at CBS. Part of her secret is the way she plunges into whatever challenge comes her way. "It's rare for an employee of Amy's experience level to show so much fearlessness in successfully managing complex projects and intricate work environments," says her boss, nominator Mike Smyklo.

Many players Schwantner's bailiwick at CBS is sourcing professional services. She leads projects to choose suppliers, and to find opportunities to reduce costs in areas such as employee benefits programs, payroll services, and outside legal counsel.

Perhaps the hardest aspect of her work arises from the fact that CBS is a multifaceted and decentralized company with two dozen business units involved in television, radio, Internet, print media, and more. "Many projects I work on involve 10 to 20 internal stakeholders," Schwantner says. Executives have their own goals, priorities, and personality. Schwantner must help this large group arrive at a solution that pleases everyone.

Recent challenge She handles those initiatives with flair. Take, for example, a recent project focused on payroll services for CBS's entertainment divisions. It was an especially sensitive assignment because it involved so much spending and affected so many divisions, and only a few suppliers offer the service that CBS required.

Schwantner's job was to collect data on the relationship with the current provider—an incumbent of more than 20 years—analyze that information, and identify ways to gain better terms. She would also develop an RFP based on new specifications and run the procurement.

Building trust The project got a lot of pushback from division executives who weren't pleased about the prospect of change. So Schwantner embarked on a trust-building mission, recruiting those stakeholders into the project to make sure the results addressed their needs. "It took months to develop this cross-functional, cross-divisional team," she says.

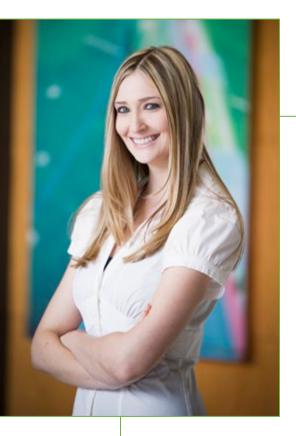
In the end, everybody won. CBS stuck with its existing provider, but on much better terms. "The initiative will result in cost savings in the millions," Smyklo says. The new contract has also provided a model for agreements between this important vendor and its other clients in the entertainment industry.

Outside the office Schwantner spent much of 2014 planning an October wedding. Then she and her husband took off for a honeymoon in South Africa. Her hometown is a popular beach spot on Long Island, and she's a Superstorm Sandy survivor. Each year, with her sister, Schwantner joins a two-day walk around New York City to raise money to fight breast cancer.

Rewards of the job "My work is never repetitive or mundane—it's always something new," Schwantner says. "And I love the opportunity to work on high-level, strategic projects that drive real change."

IN HER OWN WORDS

Most rewarding parts of your job? High-level and strategic projects, vital to business operations, that result in significant savings and change across the organization. If you could start over, would you still choose this profession? I would because it drives real change.



IN HER OWN WORDS

What is the most rewarding part of your job? Knowing how everything I do contributes to our nation's security and helps our men and women in the armed forces do their jobs and come home safely. If you could start over, would you still choose this profession? A day hasn't gone by when I wished I was in a different profession. I love the responsibility that comes with being a procurement analyst, and knowing the impact I have on the company and the country.

Ton of Talent

Pamela Ton | AGE: 26

Procurement Analyst, Northrop Grumman Systems Corp., El Segundo, California Nominated by Andy Grider, Procurement Manager, Northrop Grumman Systems Corp.

Buyer, leader, mentor Managers and colleagues at Northrop Grumman sing the praises of Pamela Ton for her work both as a buyer and as a leader. "Key stakeholders regularly recognize Pamela for her outstanding support and customer service," says her boss, nominator Andy Grider.

While handling procurements, mainly for electronic components, Ton has also taken a lead role on engagement projects for her buying group. And she has been training and mentoring new buyers, who have excelled under her guidance. "The extensive support she has provided is the best I have seen in my 10 years at Northrop Grumman Aerospace Systems," Grider says.

Making connections In 2013, Ton was chosen to take part in a Leadership Development Program, designed to help employees understand how their work connects to Northrop Grumman's overall vision. "We were assigned to mentors who reported directly to our global supply chain vice president," Ton recalls. "We attended program reviews and specialized courses that usually only managers attend."

The program's many meetings and dinners gave Ton a chance to talk with high-level managers throughout her organization, based all over the United States. "These managers now know me by name," she says. The relationships she forged have helped greatly in her work.

Treat suppliers as friends Relationships with suppliers are also key in Ton's job. That's especially true when someone from a program she supports calls needing a part—tomorrow. Because many electronic parts have lead times as long as one year, Ton starts scrambling to get a replacement fast. "I take it personally if I can't get a part tomorrow," she says.

To live up to that personal commitment, Ton takes a personal approach with her suppliers. "I treat them as if they are friends," she says. "I ask about their personal lives, and they ask about mine. So when I need to ask a favor in an emergency, they're always willing to help."

Rewards of the job The most enjoyable aspect of Ton's work is its variety. "I meet new people all the time, working with colleagues and suppliers around the country, and working on a new assignment every day," she says. The most rewarding part of her work, though, is the serious purpose it serves. "I like knowing that my daily work contributes to our nation's security, and helps our men and women in the armed forces do their jobs and come home safely."

Outside the office "My number-one hobby is travel," Ton says. "In 2013, I visited Morocco, Portugal, and Spain. In 2014, I took a trip to the United Kingdom and Ireland, and in 2015 I'm planning a Mediterranean trip." She recently took up yoga, and she admits to one guilty pleasure: "I love reality TV, especially *The Voice* and *The Bachelor*."

Eye on the Big Picture

Maren von Platen | AGE: 29

Sourcing Manager, Bayer HealthCare, Whippany, New Jersey Nominated by Kristina Rey, Senior Manager, Strategic Sourcing, Daiichi Sankyo

Pharma star Combining sharp analytical skills with a talent for building relationships, Maren von Platen has won admiration for her work in every stage of her career. "Maren has received accolades and praise from many of her peers," says nominator Kristina Rey, von Platen's boss at Daiichi Sanko. "Her colleagues and managers from Merck and Schering-Plough all cite her consistently excellent performance."

In October 2014, von Platen accepted a new challenge: becoming a sourcing manager at Bayer HealthCare. She loves the pharmaceutical industry because of its mission. "Pharma is about saving lives," she says.

Creative focus Having already sourced direct and indirect products, as well as various services, these days von Platen focuses on creative agencies. Her work goes far beyond choosing partners to manage marketing campaigns. One big goal is to encourage innovation in the way the internal teams that promote Bayer's brands use marketing services.

"I have to get them to focus on the big picture—how we use marketing to generate revenue, how marketing teams can launch new programs, and how they can improve the way they work with strategic suppliers, so they get better and faster results," she says.

What's great about supply chain? Experience in supply chain management provides tools that will serve you well in just about any industry. "It helps you hone skills, such as discipline and patience, that you need to solve complex problems," says von Platen. "It also teaches you to be thorough and plan ahead."

Building from the ground up One of the proudest moments in von Platen's career came after a previous employer, Schering-Plough, merged with Merck. Von Platen was assigned to a project to combine the companies' sourcing organizations in Latin America. Her fluent Spanish (she was born in Germany but raised in Costa Rica) made her a natural for the job.

"Our task was to develop a single organization that included all the roles, responsibilities, and pipelines of the two companies, and create a roadmap for how it would operate over the next three years," von Platen says. "We also wanted to make the Latin American organization shine against other regions. Its purchasing volume was small, but we hoped to make the region a force for innovation or process improvement."

IN HER OWN WORDS

Does your job have a significant impact on your company? Yes. Anyone who is part of an organization is part of the generator that impacts the business. Would you recommend a supply chain career to someone under 30? Absolutely. This career gives you the discipline and patience to solve complex projects, along with planning techniques and strategy.

Von Platen helped design regional sourcing teams, each responsible for a category across Latin America. Along with her boss, she harmonized the information systems and cleaned up the data, providing a single view of spending across the region. They also developed an action plan for process improvement.

"I loved helping to create an organization and define how it would work," von Platen says. "The project also exposed me to the entire product lifecycle, from research and development to manufacturing to go-to-market. And I worked with brilliant people. It was unbelievable how much I learned."



Diving in With **Both Feet**

Jamie Walker | AGE: 24

Sourcing Buyer, Raw Materials, E.I. DuPont de Nemours & Company, Wilmington, Delaware Nominated by Rhonda Bradley, Sourcing Manager, E.I. DuPont de Nemours & Company

Deep dive The ink on her degree in supply chain management and information systems from Penn State was barely dry when E.I. DuPont made Jamie

Walker a sourcing buyer for equipment and services. She took charge of capital equipment purchases totaling more than \$50,000, and services such as engineering, design, construction, and maintenance, for 14 North American production plants. Walker developed sourcing strategies, qualified potential buyers, conducted procurements, analyzed bids, recommended awards, and generated purchase orders.

That's high-level work for someone fresh out of college, but DuPont often asks new hires to dive into the deep end of the pool. "The learning curve was overwhelming and slightly intimidating, but it has been a fantastic experience," she says. In that sink-or-swim environment, she performed like an Olympic medalist.

One key to Walker's success was building strong relationships. "I networked with everyone I could, so I always had someone to turn to no matter what problem I was facing," she says.



Most satisfying part of your job? When I successfully complete a project that results in significant savings, or when I finalize a difficult terms negotiation. Most significant career accomplishment to date?

I completed 127 projects that saved more than \$5.7 million for DuPont during my first two years as a sourcing professional.

Entrepreneurial spirit Not only did Walker work on 56 projects in her first year as a full-time buyer at DuPont, but she saved the company \$3 million on a spending portfolio of \$18 million; that's nearly 17 percent. Creativity and persistence helped her rack up those achievements. "Even when the opportunities weren't easy to see, I took the initiative to go the extra step and find them," she says. Supportive mentors at DuPont helped, too, she adds.

New job In September 2014, Walker took on a new assignment: sourcing metal powders used in DuPont's microcircuit business. "I work with the buyers to get those raw materials to the locations where they're needed, ensuring short lead times," she says. Besides negotiating pricing with suppliers, she identifies second sources for key materials, so if the primary source can't deliver, DuPont still has a steady supply.

Devoted to diversity Walker has also distinguished herself as a champion of diversity. In 2014, she represented DuPont at the National Minority Supplier Development Council Leadership Awards and at the ISM Supply Chain Diversity Summit. "That networking helped Jamie award more than \$2 million to small and diverse suppliers in 2014," says nominator Rhonda Bradley. In 2013 and 2014, DuPont's Sourcing and

Logistics organization started an initiative to make more purchases from small and diverse suppliers. Toward that end, Walker started to require that every bid event she ran include at least one small or diverse business. If such vendors didn't step up on their own, Walker went out and found them. "It took a lot of research, but we have tools at DuPont that help us identify those suppliers," she says.

Blue ribbon volunteer Having grown up riding horses with a 4-H Club, Walker now returns the favor as a volunteer team leader with her local 4-H. "I go to the horse shows with the younger members and do what the older members used to do for me," she says. "It feels good to give back."



Signed, Sealed, Delivered

Wesley Whitney | AGE: 29

Sourcing Specialist, Enterprise Products, Houston, Texas Nominated by Claire Allison, Sourcing Specialist, Enterprise Products

Top communicator One reason Wesley Whitney is so good at his job is because he knows how to connect. "His communication skills are unmatched by anyone I have ever worked with," says nominator Claire Allison. "He can relate to our contractors in the field, then turn around and have an executive-level meeting in the blink of an eye."

That talent is crucial to Whitney's job at Enterprise Products, where many products and services he sources are used in blue-collar environments.

"A contract isn't worth the paper it's written on if the end user and suppliers aren't willing to execute what we put in place," Whitney says. But when you're sitting in a skyscraper in Houston, it can be hard to understand the needs of people turning wrenches in the field. So, when he starts a new project, Whitney always sits down with his stakeholders to learn exactly what they're looking for. Then he crafts a contract that delivers.

Building value As a sourcing specialist, Whitney looks for chances to gain greater value from suppliers by forging strategic agreements. He has scored some serious savings—for example, 12 to 15 percent on \$4 million worth of annual spending on industrial cleaning, and 17 to 25 percent on water filtration.

His efforts focus on far more than lowering costs. "Anybody can cut costs," Whitney says. "The challenge is doing it with service-based commodities." That's when other types of value move to the foreground. Factors such as efficiency, consistency, timely delivery, and safety don't show up on invoices, but they're crucial to meeting the needs of Whitney's stakeholders.

How he got here Whitney was a case manager for a law firm when he decided he wanted a career in the energy industry. "My dad was a roughneck on an oil rig; the oil business has been in my family for three generations," says the Texas native.

A friend who held a supply chain job at Hess Corporation filled Whitney in on the opportunities available in sourcing. Then a family friend and mentor helped him get an interview with Enterprise, which yielded his current job as a sourcing analyst.

Whitney arrived with no background in supply chain, but he was determined to excel, and his manager and director gave him the chance to learn on the job. Long talks with his friend at Hess also got him up to speed on topics such as sourcing processes and key performance indicators. "I felt like I got a crash course in supply chain—almost an associate's degree," he says.

Outside the office Getting married and buying a home have kept Whitney busy recently. "There's nothing like six-figure debt to make you feel like you've grown up," he says. He and his wife work out, participate in CrossFit, and do a lot of hunting and hiking. They also mentor high school students in Houston through a program called Young Life.



IN HIS OWN WORDS

Does your job have a significant impact on your company? Absolutely. We've only just begun to tap the value our strategic sourcing group can bring to the company. Would you recommend a supply chain career to someone under 30? Without hesitation. You can obtain a breadth of skills that cross several industries.



IN HER OWN WORDS

Does your job have a significant impact on your company?

Absolutely. Not only do I have a direct impact on the bottom line, but changes in the supply chain affect business operations. If you could start over, would you still choose this profession? Yes. I've grown especially fond of the purchasing function, and enjoy being a professional negotiator.

Wolff at the Door

Jennifer Wolff | AGE: 30

Supply Chain Strategy Manager, Masco Cabinetry, Ann Arbor, Michigan Nominated by Joe Ceccoli, Managing Director, Supply Chain, Masco Cabinetry

Bring it on "I've never turned down a challenge, at work or in my personal life," says Jennifer Wolff. That's one reason she relishes her job as supply chain strategy manager at Masco Cabinetry. It's a project-based role, so she never knows what new adventure she'll embark on next. "My boss has come to me with some off-the-wall requests, and I've embraced them," she says.

Big win Embraced and aced, one might add. Consider the time Wolff took charge of closing down a Masco plant that made cabinet components. She had to identify which Masco or third-party facilities should take over which portions of that plant's output, then complete the transition by a firm deadline.

During the move, Wolff couldn't let any components go out of stock or excess inventory pile up. "That required detailed follow-up and many visits to the receiving plants," she says "The key to finding the right balance was to move things slowly. That let us fine-tune processes at the receiving plants, and home in on quality."

The results were terrific. "Because she was willing to work outside her comfort zone, and could drive change in a difficult environment, Jennifer brought extraordinary value to our company," says Wolff's boss and nominator Joe Ceccoli.

Get out on the floor Wolff learned about supply chain management through a management development program at Chrysler. Her first rotation put her at a Chrysler Sebring plant, where she supervised union drivers who delivered materials to the production line.

"That program was a game changer for me," Wolff says. "It taught me a lot about leadership." Managing people who aren't required to cooperate with you takes creativity, she says. She also learned firsthand how crucial it is to think about the needs of production workers when designing a supply chain process. "It's easy to make decisions that look good on paper without considering the impact those decisions will make on the people who receive the deliveries or work with the materials," she says. Anyone headed for a supply chain career in manufacturing

should try to work on the production floor as early as possible, Wolff advises.

Opening doors "Jennifer has a strong passion for helping others to succeed," notes Ceccoli. That's why she started a supply chain internship program from the ground up at Masco, and why she continues to recruit and mentor students for that program.

Outside the office With a new baby at home, Wolff and her husband are embracing a whole new set of challenges. They also continue to work on their 100-year-old house. "We're doing what we can to preserve its original beauty while making it functional for a modern family," she says. When she needs to unwind, she goes for a long run. "We have some beautiful parks in Ann Arbor," she says. "I like to get lost in them."







atural disasters and other events have exposed weaknesses in lean global, regional, and domestic supply chains, disrupting connections between companies, their suppliers, and their customers. In the next phase of supply chain development, companies are creating ways to circumvent disruptions and minimize their impact on the business. This C.H. Robinson whitepaper looks at the issues companies should consider when developing a more resilient supply chain.



For decades, finding efficiencies has been the primary driver in evolving supply chains. Companies have promoted "problem solving to drive out waste and rely on just-in-time flow, a process that is determined by customer demand," says Jon Miller, *The Necessity of Redundancy in Lean* (Quality Digest, April 30, 2010).

As efficiencies have increased with Lean and similar systems, highly optimized networks have been developed, lowering inventory and other costs. But a series of well-publicized events that compromised supply chains has prompted many leaders to wonder if an operation can be too lean.

In the past, disasters were felt primarily by companies in an affected region. Now, problems that used to be isolated to a region can have far-reaching impact on many supply chains, especially those that

are lean and global. Their suppliers and customers can be located anywhere in the world. Inventory that is strategically positioned for lean operations may be poorly situated to serve key customers if disruption occurs.

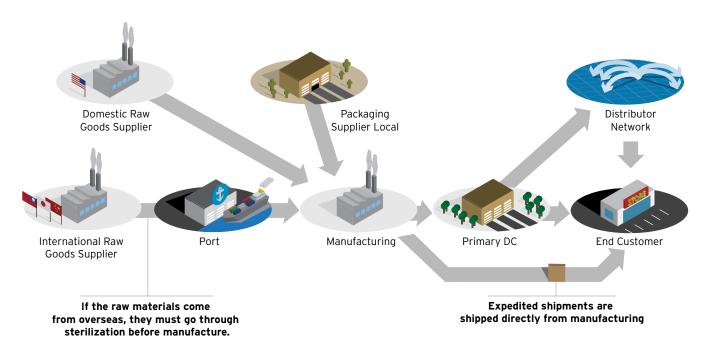
While gaining efficiencies and reducing costs will remain high on the list of priorities, analyzing different levels of risk and building in resiliency is the next frontier in supply chain management. Financial models assess different levels of supply chain risk on the overall balance sheet—carrying costs, inventory, and cycle times. C-level executives seek mitigation strategies for natural disasters or man-made events that could interfere with business interests. In this era of scrutiny, managers with compelling ways to add resiliency to the global supply chain and help the overall

company's profit and loss will have arguments that leadership is ready to hear.

Developing a resiliency plan is now a must for any company. But global companies—especially those with high-value, high-demand products coming from multiple locations—are most likely to need such plans. Certain industries are particularly vulnerable to disruption. Retailers and brand name pharmaceutical companies require speed to market to keep sales channels open and customers satisfied. Manufacturers need raw materials and supplies at planned intervals to prevent downed plant lines and maintain machinery. Food and beverage companies must be able to trace problems back to their source in multi-tiered supply networks, and understand divergent regulations for food quality around the world, according to Deloitte

FIGURE 1 PROCESS FLOW MAP

As a neutral third party, a consultant or provider can work with key stakeholders from across the organization and provide insight on the supply chain's current state. As each stakeholder explains how orders flow from supplier to customer, the consultant combines all perspectives in a single page map. Process flow maps simultaneously reveal efficiency gaps and potential risks for analysis.



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Insights' Supply Chain Risk: Answers to Five Often-Asked Questions (The Wall Street Journal, April 19, 2013).

For global organizations, it may be less obvious where process and supply gaps exist. Even though many of these companies use transportation management systems (TMS) to achieve efficiencies, few of those systems provide global visibility. Incompatibilities in technology, language, culture, and regulation between and across continents can prevent identification of transportation and operational chokeholds.

Yet, certain considerations can help build backup plans for more resilient supply chains and help companies adapt to changing circumstances while maintaining their central objectives, says IDC Energy Insights in 2014 Predictions: Worldwide Oil & Gas (Dec. 11, 2013).

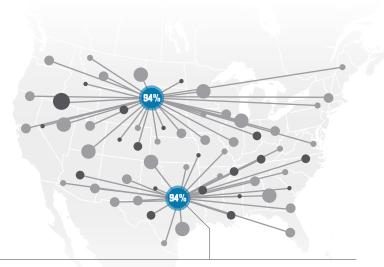
Companies with resilient global supply chains are more likely to have goods available when they need them, and to be able to continue serving customers without disruption. And because they can see their inventory, they are less likely to spend unnecessarily to transport emergency supplies. "The 'hardened' enterprise will be able to not only withstand all manner of disruption, but also increase its competitiveness," says Yossi Sheffi in Building a Resilient Supply Chain (HBR Blog Network, Aug. 14, 2007). "Unforeseen disruptions can create shortages that are not dissimilar to the demand spikes caused by supply/demand imbalances; resilient enterprises can thus react to changing market demand ahead of their competitors."

Mapping the Supply Chain to Find the Gaps

Identifying potential chokepoints in the global supply chain is the first challenge. Maps can be simple or highly complex, but they help the company visualize where the greatest risks can be found.

As a neutral third party, a consultant or provider can work with key stakeholders from across the organization and provide insight on the supply chain's current state. FIGURE 2 NETWORK MODELING MAP

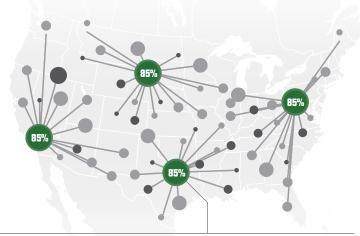
Companies that plan for service disruptions gain an advantage over less prepared competitors in providing continuous service to customers.



BEFORE NETWORK MODELING: 2 MANUFACTURING PLANTS

Each plant operates at 94% capacity and distributes to specific customers.

During peak months, they can operate at 110%. But there is insufficient capacity to serve all customers from one location if the other is catastrophically disrupted.



AFTER NETWORK MODELING: 4 MANUFACTURING PLANTS
Each plant operates at 85% capacity. If service from one location is interrupted, others ramp up to 100% production. Alternate plans specify which locations will serve specific customers in the event of a disaster.



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As each stakeholder explains how orders flow from supplier to customer, the consultant combines all perspectives in a single page map. Process flow maps simultaneously reveal efficiency gaps and potential risks for analysis (see Figure 1, pg. 266).

Network Modeling

As companies experience significant changes in their operations (e.g., mergers and acquisitions, factory closings, customer gains or losses), they can enlist help from a logistics expert to model the current and future network. Network modeling reveals where materials and inventory are located, and how end customers are served through distribution channels. The map shows where the company has the biggest inefficiencies and the greatest risk. Detailed

analysis leads to recommendations on where vendors and distribution points are, and where they ideally will be positioned (see Figure 2, pg. 268).

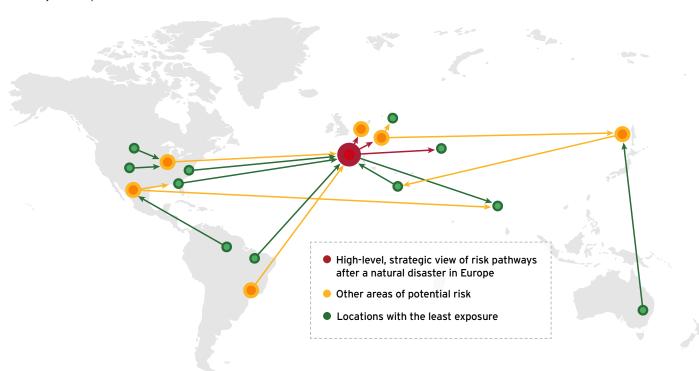
Global network modeling requires not only data, but deep knowledge of local and regional complexities. It is not equally easy to do business in all regions of the world. Some countries have complex provincial and state government regulations. These regulations make it essential to carefully choose the ideal location and type of warehouse to perform the necessary operational tasks.

Dr. Bruce Arntzen, researcher at Massachusetts Institute of Technology's Center for Transportation and Logistics, is developing Hi-Viz Supply Chain displays that gather data from corporate databases, such as enterprise resource planning systems. The program automatically generates several types of flow diagrams and maps of a company's supply chain. Visual displays of risk events can be superimposed on top of supply chain images to show chokeholds. Information that can be displayed includes:

- Locations of plants, suppliers, customers, and major transportation lanes.
- Alerts of natural disasters, strikes and protests, or infrastructure failure.
- Heat maps (frequency diagrams) of hurricanes, floods, or earthquakes.
- Inventory deployment (dollars and days of supply) across the network.
- Risk pathways (most vulnerable segments) across the network.
- Risk exposure and value at risk for each location in the network.

FIGURE 3 HI-VIZ SUPPLY CHAIN TOOLS

Hi-Viz Supply Chain tools offer a variety of maps and flow diagrams of the supply chain's plants, suppliers, customers, and major transportation lanes.







REDUCE EMPTY MILES

MINIMIZE IDLE TIME SECURE RFO PROCESS

REDUCE FREIGHT COSTS



FLEXIBLE SCHEDULING

GREATER MARKET INSIGHT



REAL-TIME INFORMATION

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Predicted "customer blackout days" from the loss of any site or lane in the network.

With Hi-Viz Supply Chain maps (see Figure 3, pg. 270), companies can identify which nodes of a supply chain could be disrupted and answer questions like these:

- Where is the weakest link? What is the probability that the node will be disrupted?
- What are the downstream ripple effects of the loss of a node or link in the network? What downstream plants, DCs, and customers will be disrupted, and at what cost?
- What supply chain actions would make the company less vulnerable (e.g., backup suppliers, extra inventory, overlapping DC coverage)?
- Where to begin: across the network, what is the highest risk?

While it is impossible to prevent all supply chain risk, global companies can and should assess how much risk they can tolerate and develop a plan to mitigate the most likely risks to their business.

Here are some tips to help reduce risk:

- Find alternate sources for critical materials if there is only one supplier. Also verify that suppliers have assessed risk with their own vendors, and that they have more than one source for essential materials.
- Consider interchangeable parts or products. If certain materials become unavailable, there may be similar materials or products that could be substituted. For example, U.S. cities banned the use of triclosan from antibacterial hand soaps when the ingredient was linked to brain damage and cancer (Ethan Huff, FDA may ban antibacterial soap ingredients such as triclosan, Natural News.com, Dec. 20, 2013) Manufacturers responded by substituting a similar product without this ingredient to satisfy regulations and customers.
- Ensure there are alternate distribution solutions if suppliers and customers

are in the same region. If disruption occurs, suppliers may need to reroute products to keep manufacturing underway, or open a facility closer to key customers to keep product flowing.

- Develop plans for safety stock. Regional strikes can shut down a supply chain, making it impossible to serve customers. Having a critical part held up at an international border can shut down a production line. Smart, well-intentioned, lean inventory management can present more areas of risk that can disrupt a supply chain. Consider what it will mean if key customers cannot be served for a day, a week, or a month. Some companies maintain one day or more of safety stock close to key customers. If a temporary disruption occurs, they can examine forecasts and point-of-sale data to determine priorities and deploy the safety stock until regular shipping can resume.
- Set up forward stocking locations. Consider positioning non-critical parts close to customers. That enables better speed to market during temporary disruptions while lowering costs.
- Create parallel supply chains. When product launches are essential to profitability, a parallel supply chain can directly connect independent production facilities with sales sites, bypassing the traditional supply chain.
- Consider postponement. Ramping up all inventory increases carrying costs and inventory expenses. To control costs and add resilience, shippers can hold off on deliveries until they have a better sense of when a disruption will be over, or until they can gain more clarity on customer demand. Fast-moving SKUs can be positioned regionally, close to customers; lesser-used SKUs or products can be moved farther back in the supply chain and sent to the regional DCs as needed. Similarly, manufacturers can place most-used components closer to manufacturing facilities for faster access when they need to step up production.
- Consider tradeoffs and risks when choosing locations for sourcing or

FIGURE 4 QUESTIONS TO ANSWER TO ADD RESILIENCE TO THE SUPPLY CHAIN

SUPPLIERS

Which SKUs come from which suppliers, and what regulations exist in supplier locations?

Are there backup suppliers for critical components, and do the suppliers' sources of rare raw materials have alternative sources?

Should vendors be changed to provide the necessary safety stock?

TRANSPORTATION & DISTRIBUTION

If there is a disaster, what transportation alternatives can keep product flowing?

How easy is it to import and export from distribution locations?

INVENTORY

Where is inventory located? Is it at the right levels?

Are most-used SKUs close to key customers?

Should there be a plan for safety stock or forward stocking?

Which key lanes cannot afford to have financially optimized inventory levels?

TECHNOLOGY

If operations technology is disrupted, corrupted, or destroyed, how quickly can data be recovered?

If you use a provider's technology, what is their plan for data redundancy? For backups? For security?

distribution. During the threatened West Coast port strike, shippers developed alternate strategies to bringing product to the West Coast and trucking it east. Some shipped from Asia through the Panama Canal and to the West Coast and from Asia to Canada to the United States. Others moved supply sources to Mexico; for them, having lower transportation costs and inventory closer to U.S. customers outweighed the risks of potential crime, theft, and governmental issues.

- Leverage all types of transportation. Introduce newer members of the team to the full range of logistics options, and help junior employees recognize the best options.
- Teach employees how to evaluate risk/cost/service tradeoffs. Velocity of delivery is a consideration in air-to-ocean, consolidated-air-to-direct-air, and truck-to-rail combinations. Even within a single transportation type, there are tradeoffs. Ocean freight that goes to direct port of call has a shorter transit time, but costs more; ocean shipments that stop at multiple ports of calls have longer transits and lower costs for transportation. But the more vessel stops there are, the greater potential there is for delays and disruption.
- Have an expediting strategy. Not all freight needs to be expedited if disruption occurs. For instance, rather than sending whole truckloads by air after a disaster, work with customers to airfreight only what they need immediately, and truck the rest.
- Conduct thorough due diligence on potential transportation providers. As with suppliers, working with reputable providers can help reduce unexpected supply chain failures.
- Make sure all data has a backup. Whether the system belongs to the company or a provider, ask what the disaster recovery plan is and how often it is tested.
- Your backup should have a backup. If the backup goes down, a good, resilient plan will be ready for continuous or fast recovery.
 - Safeguard critical data. Employ

4 TOOLS THAT SUPPORT SUPPLY CHAIN RESILIENCY

TECHNOLOGY. Supply chain resilience is easier to achieve with a global TMS. Having visibility to global operations enables optimization and identifies chokepoints and areas of risk that should be analyzed.

A GLOBAL TRANSPORTATION PROVIDER. Many companies can manage air or ocean shipments globally. But very few have the capability to tell where everything is, in any mode, around the world. Experienced transportation experts who understand how to use a global TMS can help companies manage the level of risk that's acceptable and plan for contingencies.

A VERY SPECIFIC CARRIER STRATEGY. Shippers can review their allocation of modes—truckload, rail, intermodal, ocean, and air—and create options for moving freight in other ways if the supply chain is disrupted.

A BALANCED APPROACH TO SUPPLY. Global companies can analyze how to balance sourcing across regions to gain "preferred customer" status with suppliers in key regions. That way, the company can still obtain materials and products if other supplier routes are disrupted.

vigilance and advanced security measures to protect the company's information and reputation, and ensure system stability, integrity, and performance.

Does Redundancy Have a Place in Lean?

How lean is too lean? As well-known brands have suffered through highly publicized service disruptions in recent years, that question has gained renewed attention in corporate boardrooms. The focus on hyper-efficient supply chains reveals that "fewer parts and fewer suppliers can drive down material costs and radically simplify operations," note Glendon, Lee, and Lyndon Bird in the 5th Annual Supply Chain Resilience Survey, Business Continuity Institute (BCI), April 2013. "But when a strategic supplier of a critical part encounters a hiccup, it can have crippling and costly implications for the enterprise." The company in the case study is similar to companies surveyed by BCI. They asked

519 global shippers whether key suppliers would declare them a priority customer in the event of a disruption; 64 percent said they either did not know where their organization would be in the ranking or knew for only some key suppliers.

Complete redundancy is cost-prohibitive, but some redundant stock, systems, and resources can help avoid the waste of system breakdown if a disaster occurs, even in a highly efficient supply chain. Companies can look at key raw materials, customers, and lanes where having a solely financially driven plan is not an option the business can afford. In addition, shippers can consider questions about suppliers, inventory, transportation, and technology to discern how much risk is tolerable and develop the "what if" questions and solutions that can lead to resilience.

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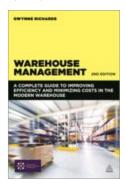
Inclement weather and capacity problems giving your supply chain the winter woes? Chill out! Here are some good reads to keep you up to date on supply chain, logistics, and transportation best practices.

By Jason McDowell



Warehouse Management: A Complete Guide to Improving Efficiency and Minimizing Costs In the Modern Warehouse, 2nd Edition

By Gwynne Richards

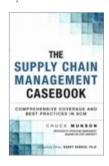


Warehouse managers are under enormous pressure to reduce order lead times, increase productivity, cut costs, and improve customer service—all while ensuring the health and safety of warehouse employees, and protecting the environment. To help warehouse managers confront these issues head-on, Richards provides a comprehensive guide to implementing best practices in their facilities.

Key Takeaways: Warehouses are no longer just places to store goods. They act as fulfillment centers, sortation and consolidation points, crossdocks, and transshipment sites. This book will help warehouse managers gain a full understanding of these different uses, and the technology necessary to maintain operational efficiency in order to succeed.

The Supply Chain Management Casebook: Comprehensive Coverage and Best Practices in SCM

By Chuck Munson



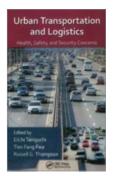
This collection of 30 focused case studies addresses virtually every aspect of supply chain management—from procurement to warehousing, strategy to risk management, and technology to supplier selection and ethics. A global team of contributors presents key challenges in the pharmaceutical and fashion industries, and previews issues such as the limits of Lean logistics and the potential of 3-D printing.

Key Takeaways: A true business logistics professional should know how to address a problem before it arises. This book outlines a multitude of supply chain challenges faced by companies of varying sizes and operations, and arms logistics and supply chain managers with the tools they need to preemptively prevent supply chain disruption.

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Urban Transportation and Logistics: Health, Safety, and Security Concerns

Edited by Eiichi Taniguchi, et al



Managing transportation and logistics systems in urban areas requires looking at those systems from the viewpoint of safety and security considerations for human life. This book considers urban supply chains, road safety in hazardous material transport, and logistics and transport design in mixed-traffic areas. The need for improved planning relative to human usage, freight transportation, and city logistics planning is also covered.

Numerous examples and global case studies provide real-world insight for practitioners and researchers.

Key Takeaways: Much of what we do every day depends in some way on the design of our logistics systems—even more so in metropolitan areas. Hazardous materials need to be picked up, and need to get delivered, so they must move among the population. Considering population safety as a factor when developing logistics networks and transportation systems is key.

Global Logistics: New Directions In Supply Chain Management, 7th Edition

By Donald Waters and Stephen Rinsler



As companies focus on increased competition, new opportunities presented by technology, and concern for the environment, the strategic role of the supply chain lies at the heart of many long-term plans. Waters and Rinsler provide ideas, best practices, and suggestions on how to handle current and future trends in logistics and supply chain management. Their guidance covers topics such as agile supply chains,

logistics IT, sustainability, and performance management.

Key Takeaways: Logistics processes are the glue that effectively holds a company's operations together. Maintaining competitive speed to market and high levels of customer service—at a reasonable cost—are necessary for an organization's survival.



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Coyote offers an internally developed and customizable supply chain platform to shippers of all sizes. And Coyote's mobile innovations allow us to be in touch with carriers 24/7/365.

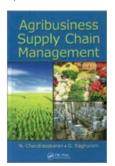
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Agribusiness Supply Chain Management

By N. Chandrasekaran and G. Raghuram



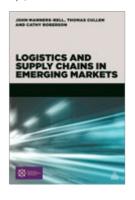
The agribusiness supply chain includes a number of processes such as supply management, production management, and demand management. Managers of these functions can be plagued by issues such as production and demand diversity, bulkiness of produce, perishability, and seasonality. This book highlights the complexity and importance of supply chain management for businesses

that deal in agricultural products, and helps readers in the agribusiness sector systematically approach decision-making.

Key Takeaways: This book emphasizes the importance of maintaining a supply chain with well-designed infrastructure, technology, and financial resources. Multiple stakeholders in the agricultural supply chain — government, farmers, distributors — provide their perspectives, leaving readers with a well-rounded understanding of how all functions operate, and how they are interrelated.

Logistics and Supply Chains in Emerging Markets

By John Manners-Bell et al



Companies with global operations need to know how to make the most of opportunities arising in newly industrialized markets. This book explores the challenges of investing and operating in widely dispersed—and sometimes unstable—emerging markets. Sections on the BRIC countries, Asia, Latin America, Africa, Central Asia, and the Middle East guide readers through key political, social, and economic considerations.

Key Takeaways: Some emerging markets are unstable due to fragile political or security situations, poor infrastructure, or troubled economies. Others are ready to explode with opportunity at any moment. Companies looking to develop opportunities and relationships with these markets must be able to discern which areas will provide more reward than risk.

Supplier Relationship Management: Unlocking The Hidden Value in Your Supply Base

By Jonathan O'Brien



As businesses grow, it can sometimes be hard to differentiate between key strategic partners and lower-tier suppliers, and to maximize the value of each relationship. This guide helps readers build a supplier management strategy that helps drive improvements and reduce risks. It also delves into the potential of supplier networks to foster innovation, process improvement, and growth.

Key Takeaways: Supplier relationship management runs like an orchestra. Each section of the orchestra needs a conductor so they know when to play, how loud to play, and what to play. A company's suppliers and partners need good governance to maintain focus and direction, and ensure that they are playing their parts at the right time.

The Definitive Guide to Integrated Supply Chain Management: Optimize the Interaction Between Supply Chain Processes, Tools, and Technologies

By Brian J. Gibson, et al



Supply chain management plays a huge role in boosting customer service, reducing costs, and improving financial performance. This book provides the knowledge readers need to start designing, implementing, and managing an effective supply chain. The authors feature supply chain management best practices that have been proven to work in organizations of many sizes, types, and industries.

Key Takeaways: To improve performance, and prevent disruption in their operations, supply chain practitioners need to thoroughly understand the various facets of supply chain management, and become familiar with all the technology options available to them. This book is an excellent starting point.



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CONCORD

International Crossing **Business Park** Location (Under Construction) Building size: 277,253 s.f. Build-to-suit office space Ceiling height: 32' clear height Sprinkler: ESFR Sprinkler System Dock doors: 70 dock doors with Trailer: Storage onsite Depth: 240' Column spacing: 45' typical



KINSTON Highway 70 West

Industrial Park Location: 2010 Smithfield Way, Kinston, NC 28504 Building size: 40,000 s.f. expandable to 160,000 s.f. Year built: 2009 Acreage: 9 acres with additional 8 acres available Ceiling height: 30 feet Dock doors: 2 dock-high, 1 drive-in

Flooring: 10 mil vapor barrier



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MONROF

Doors: Two drive-in

Monroe Corporate Center Location: 447 Goldmine Rd., Monroe, NC 28110 Building size: 102,000 s.f. Year built: 2013 Ceiling height: 30 feet clear Dock doors: 4 dock-high. Flooring: Stone



CONCORD

International Business Park Location: 4541 Enterprise Dr., Concord, NC 28027 Building size: 88,527 s.f. expandable up to 141,000 s.f. Year built: 2011 Acreage: 12.8 acres Ceiling height: 28 feet



CONCORD

Concord Airport Business Park Location: 7055 Northwinds Dr., Concord, NC 28027 Building size: 150,000 s.f. Year built: under construction Ceiling height: 32 feet clear Dock doors: 20-30 side loading Flooring: 6 inch concrete Adjacent to Concord Regional Airport



SHELBY

Dock doors: 4

Foothills Commerce Center Location: 1001 Partnership Drive Shelby NC 28152 Building size: 100,000 s.f. expandable to 200,000 s.f. Year built: 2013 Ceiling height: 30 feet Rail: .56 miles Walls: Structural precast 100% ESFR



BRENDA DANIELS

Manager, Economic Development 800.768.7697, ext. 6363 bdaniels@electricities.org





Concord Airport Business Park Location: 7035 Northwinds Dr. Concord, NC 28027 Building size: 400,000 s.f. Year built: under construction Ceiling height: 36 feet Dock doors: 40-80 side loading Flooring: 6 inch concrete Adjacent to Concord Regional Airport







Strategic Procurement: Organizing Suppliers and Supply Chains for Competitive Advantage, 2nd Edition

By Caroline Booth



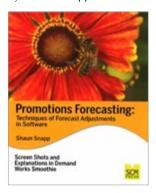
Successful corporate executives recognize the opportunities presented by strategic procurement. This book shows readers how to cut costs while improving business processes, and focuses on the importance of supplier relationships. Topics covered include optimizing supply chains, understanding the role the entire enterprise plays in good procurement, making the company important to suppliers, dealing with mergers and

acquisitions, managing supplier-related risk, and managing the rewards and pitfalls of global supply.

Key Takeaways: Companies that don't recognize the value of procurement in the boardroom are throwing away money. Company leaders need to recognize supplier relationship management as a key business lever, and learn to reshape their organizations to manage third-party spend.

Promotions Forecasting: Techniques of Forecast Adjustments in Software

By Shaun Snapp



Promotions aren't always direct to consumer. Sometimes they are to wholesalers or distributors. When they are happening in so many areas, they become hard to track. But accurately accounting for promotions is the only way to guarantee the availability of the promoted product. In-house promotions and competitor promotions change demand. Being able to forecast the impact

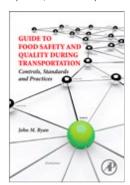
on demand is vital to maintaining service levels.

Key Takeaways: Managing promotions does not have to break the bank or even be exceedingly difficult. But it does require patience and a willingness to follow a disciplined process.

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Guide to Food Safety and Quality During Transportation: Controls, Standards, and Practices

By Dr. John M. Ryan



This book focuses specifically on food movers normally overlooked by today's food safety auditors, compliance schemes, government agencies, quality control personnel, and transportation executives. It outlines delivery control solutions, provides basic standards designed to protect the transportation industry, and addresses problems associated with transporting food. Dr. Ryan offers practical solutions that focus on container sanitation,

traceability, and food safety and quality needs.

Key Takeaways: Under the federal Food and Drug Administration's safety laws, shippers are now responsible for specifying temperature and sanitation procedures for hired carriers. Shippers must make sure they choose carrier partners that they can rely on to properly clean and disinfect equipment, maintain proper temperatures during transport, and avoid paperwork delays.

Humanitarian Logistics: Meeting the Challenge of Preparing for and Responding to Disasters, 2nd Edition

By Martin Christopher and Peter Tatham



Christopher and Tatham assess the principal challenges faced by humanitarian logistics practitioners, and consider how to develop a more efficient and effective response to disasters. The authors particularly focus on disaster preparation and best practices. This edition shares insights and lessons learned from practitioners during recent natural disasters.

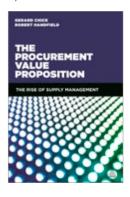
Key Takeaways: By their very nature,

commercial and humanitarian supply chains share a lot in common. Learning and applying best practices from business logistics can help to improve humanitarian operations, and save lives.



The Procurement Value Proposition: The Rise of Supply Management

By Gerard Chick and Robert Handfield



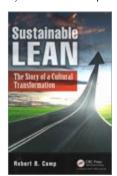
As the pressures on modern enterprise continue to increase, supply chain and procurement executives must deliver faster turnarounds, higher profits, and decreased costs, as dictated by senior management. This book helps practitioners and business leaders advance their strategic understanding of how procurement can deliver business value by covering trends including sustainability, technological advances, geopolitical

and macroeconomic changes, developments in procurement strategies, and changing business platforms and cultures.

Key Takeaways: Purchasing and supply chain managers must begin to transition from the way they've traditionally operated. New ways of thinking about supply structures, processes, skills, and competencies are becoming necessary as we enter the next generation of procurement.

Sustainable Lean: The Story of a Cultural Transformation

By Robert B. Camp

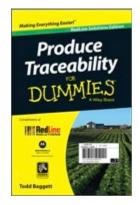


You hired a consultant to get your company on the road to a Lean operation, but how do you sustain it over the long term? This book follows Jim, the plant manager of an electronics firm that has seen its first Lean initiative fail. A Lean consultant then teaches Jim invaluable lessons that help him establish a new and sustainable Lean program at his company.

Key Takeaways: Anybody can start a Lean transformation, but not every company or person can sustain it. More than 80 percent of Lean initiatives fail due to lack of involvement from corporate leadership. Executives must lead a new Lean program by involvement and by example. Here's the book that shows you how.

Produce Traceability for Dummies

By Todd Baggett



With the Food Safety Modernization Act coming into effect, this book demystifies produce traceability, and helps shippers, growers, and carriers adapt to new regulations. Baggett covers everything about fresh produce traceability, from understanding the Produce Traceability Initiative and the latest government regulations, to dealing with a recall. The book also includes an overview of traceability solutions.

Key Takeaways: With new regulations in play, grower-shippers have to be able to track their commodities through the supply chain. Traceability solutions can help to keep customers satisfied and avoid legal problems.

Global Logistics Strategies: Delivering the Goods

By John Manners-Bell



If you are interested in the development of the logistics sector, how it has been influenced by economic factors and demand trends, current risks to the industry, and how it will evolve over the coming years, this is the book for you. Manners-Bell defines, explores, and describes in detail six key logistics segments: freight forwarding, contract logistics, shipping, road freight, air cargo, and express. He also explores

the individual supply chain dynamics and logistics demands of major vertical sectors.

Key Takeaways: A detailed and clear description of the past three decades of logistics gives readers an understanding of how today's logistics sector and global supply chain evolved. Manners-Bell also helps readers dig into and understand the various transportation modes and supply chain verticals.

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WAREHOUSE WORKHORSES

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Taking a Smart Approach to WMS RFPs

Dan Grimm, Vice President, Global Solution Consulting Dawn Jones, Proposal Manager, IBS

o understand where requests for proposals (RFPs) for warehouse management systems (WMS) often go wrong, imagine you are being interviewed for admission to your dream college. You try to demonstrate specific reasons why you'd be a great addition to the school. But instead of engaging in friendly dialog, the interviewer pulls out a list of 100 generic questions and starts interrogating you like you're a suspect on Law & Order. Worse, the questions feel more like they're being asked so the recruiter can simply check off a box to say they were asked.

Sounds ludicrous, but that's the approach many shippers seem to take in preparing RFPs when purchasing a WMS. They feel like the more questions they ask, the better job they've done vetting the candidates.

The truth is, you can get so caught up in asking a volume of questions that you forget to dig deep on the priorities. That means at the end of the RFP process, you still don't know which WMS products are

As individuals who have been on both sides of the RFP equation, we've learned a lot about what gives an RFP value. Here are some suggestions for constructing an RFP for a WMS that will deliver better results:

■ Be willing to meet with potential **WMS** suppliers first. Shippers often believe the RFP process requires utter detachment from potential suppliers. Giving suppliers the chance to learn how your business operates (if they ask) before responding to

the best fit for your business.

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your RFP will help them develop meaningful answers to your questions. It may add a few weeks to the process. But you'll be living with your WMS for the next five to 10 years, so it is worth the investment.

- Ask questions that require deeper answers. At the RFP stage, every contender's goal is to not be eliminated. Providing yes/no questions doesn't tell you anything, and lets the responding companies give you the answers you want to hear. Think through what your business actually needs, then ask questions around those topics. Go for depth of answers, not quantity. The deeper the responding companies have to go into a topic, the better you'll see how their solutions fit your organization.
- Minimize the number of high-level or functional questions. The more high-level your RFP, the more platitudes or marketing messages you will get back as answers. This is also true of asking a lot of functional questions. WMS has been around for a while, and there are more similarities than differences to their functions.

Focus instead on implementation and support. WMS solutions can be difficult to implement, so be sure your supplier has the knowledge and available resources to help you get it in place efficiently. Also make sure there is a support organization with a proven track record of helping customers derive full value from their investments. In the long term, those areas will become more significant than any individual feature or feature set.

■ Ensure you have organizational and executive buy-in. A WMS touches many functional areas within the organization, so give them input into how the RFP is constructed, as well as into the decision-making process. Include warehouse management, IT, operations, and business process decision-makers. Also include finance to ensure there is a budget. Most of all, gain C-level buy-in so you don't just go through the motions before the project is spiked.

The goals of a college interview and an RFP are similar: learn enough about the candidate to decide if moving ahead is warranted. Take the time to put your WMS RFP together with the goal of gaining a deep understanding of potential suppliers rather than just checking a box. It's the smart way to approach an otherwise difficult process.

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TECHNOLOGY TOOLS

Datria Voice

Datria Voice provides multilingual, hands-free picking commands to guide workflow and facilitate communication between employees and enterprise systems, increasing fulfillment accuracy and productivity. The system is compatible with most non-proprietary devices and existing infrastructure, enabling operations to reduce hardware, implementation, and maintenance costs. A flexible architecture allows operations to scale with demand and maintain efficient fulfillment when adding workflows and employees.

TECHNOLOGY TOOLS

R2000 Detection Laser Scanner

These 2-D laser scanners are useful in applications such as detecting protrusions or obstacles over a large area; avoiding collisions on overhead monorails; detecting small overhangs such as damaged pallets; monitoring entryways and exits; controlling pallet height on palletizers; and verifying empty, full, or overfilled cartons on conveyors. The scanners have an operating life of 20 years when used in temperatures between 14 and 122 degrees Fahrenheit.







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VAREHOUSEWISDOM



Measuring the Value Of Warehouse Data

Tadeusz Dyduch, Senior Product Manager, Apriso

n today's highly global manufacturing and supply chain economy, it's no surprise that manufacturers need to embrace better communication to manage cultural, geographic, and language differences to help them operate effectively. In the end, better communication means better efficiency, less waste, and higher customer satisfaction.

Complex, global economic issues have only increased the difficulty in overcoming the top challenges faced by logistics professionals: cost reduction, visibility, customer service, integration, and data management.

While these are not new challenges, there are new options for resolving them. More mature solutions now yield greater visibility, improved logistics execution, and faster access to consolidated data from across the company to understand operations with greater precision — reducing costs and improving customer satisfaction.

"Single Version of the Truth"

Almost every warehouse management system (WMS) provides a way to streamline logistics operations coupled with some sort of reporting or analytics.

But recent years have demonstrated that integration and data management challenges require more than just a few interfaces or consolidation layers. Current best practices say that to gain the best possible visibility and integration, people need to share the same data and have access to it quickly. Sounds like a reuse

costs and improving customer sa

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WAREHOUSE WOORK HORSES



PACKAGING SOLUTIONS
RELIMER Group

BEUMER fillpac

The BEUMER fillpac can be flexibly integrated into most existing packaging lines, and is equipped with a weighing unit that determines the exact filling weight of the bags and fills them accordingly. The system is designed for capacities ranging from 300 to 6,000 bags hourly, and can fill various bag types. Almost all built-in components of the BEUMER fillpac are available commercially, reducing spare part delivery times and lowering capital costs.



of the well-known ERP slogan of having a "single version of the truth," but this has become particularly important when warehouse operations are mixed with value-added activities.

A single version of the truth is sometimes interpreted as using a reporting layer above distinct data sources, which doesn't address the bigger challenge of leveraging normalized data to make realtime decisions.

As an example, think about the different units of measure or time stamps that various systems utilize when managing inventory. Unification attempts could lead to inaccuracies or inconsistencies—there is no precise or "right" way to synchronize or convert one into another. Running a consolidated execution system—a single platform, for instance—addresses this challenge while dramatically reducing the cost and challenge of integration and data management.

This approach enables accurate and real-time visibility and analytics, which can then be shared with the operations execution staff through a feedback loop, which is particularly important in a dynamic environment.

Change or Die

Today it is imperative for businesses to adapt quickly to changing conditions. Logistics execution is no different. And, as order status updates are critical to improve customer satisfaction and order fulfillment, accuracy and real-time visibility to each of these actions has a two-pronged impact on both the customer's and operation's experience.

That means not only must hardware and software be adaptable, but flexible rules must be seamlessly synchronized with business partners and internal workforces. It is in everyone's own best interest to ensure each of these essential components can support change. Some vendors are now embracing the approach of providing business process management and deployment tools to their suppliers. Immediate benefits include greater visibility to support greater agility—two objectives that are mutually beneficial to all.

Having the ability to analyze big data can accelerate business transformation. The ability to become a more dynamic,

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PRODUCT MOVERS KION North America Corporation

STILL Liftrunner Tugger Train System

The CX-T and LTX tractors tow Liftrunner trains full of products and materials around warehouses and production lines, allowing a single operator to supply an area of the facility in greater capacities than possible with just a forklift or pallet truck. The system is modular, so you can adapt it to suit your specific requirements.



PACKAGING SOLUTIONS
Storopack

AIRplus Bubble On-Demand System

Need to package small items such as cosmetics or cellphones, or delicate items such as fluorescent tubes? AIRplus bubble cushions come in 12-inch and 24-inch sizes, and have a perforation every six inches for easy tearing. The machine can be installed directly near each packaging station or a central coiler can be set up amidst multiple stations.





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adaptable business hinges on the ability to know how to use the data toward the goal of evolving and automating your business processes; toward transforming the next wave of manually performed or unstructured processes to the next plateau of productivity and competitiveness. This is where the need to distill big data into salient knowledge via advanced search and analytics has become the next capability for gaining insight and navigating the forest of continuous process improvement.

In order for this to happen, modern companies have an underlying business process management capability in place. It is the blueprint for how a company works internally, as well as with external partners and customers.

By creating a process-centric model for your business, then integrating big data results, a company can deliver the right information to the right person at the right time. In other words, this process-based setup takes the information that has been analyzed and makes it actionable, which can then let the enterprise achieve its next level of agility.

What's Next?

Companies need state-of-the-art technology to fine-tune operations and stay the course. This kind of innovation is not easy. But as the industry leaders in global markets begin leapfrogging their competitors, it will be clear that innovation is not just a buzzword. It will become a key to survival.

More logistics and manufacturing professionals have come to realize that to reduce costs and improve customer satisfaction, they need to have good, real-time insight into their operations. To do this, they must have their data managed in a unified environment that can be adjusted as the pace of business changes.

Businesses adopting solutions that support such approaches are capable of setting significantly higher standards in customer service, while keeping or even improving their operating margins. This totally integrated approach is a sign of a new era for logistics and warehouse management professionals.

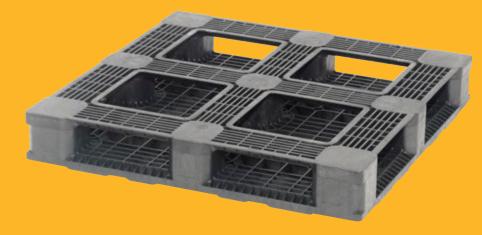
WARE HORSES NORSES



STORAGE GEAR Cabka-IPS

Endur S7 and C7.2 Block Pallets

These pallets are square, feature high-impact resistance, and have a load capacity for more than 2,700 pounds. The C7.2 is sized for use in containers, while the S7 features a larger footprint more suitable for the warehouse. Both pallets are available with three or six runners, depending on operational needs, and come with an open or closed upper deck, which can be equipped with antislip strips.





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NAREHOUSEWISDON



Three Ways a WCS Can Improve Your Operation

Randy Marble, Director of Software Solutions, Wynright Corporation

ust as customer expectations have become more diverse and specific over the past few years, retailers are evolving in the way they fulfill those orders. There just doesn't seem to be a one-size-fits-all solution for distribution in the current landscape.

Big retailers are automating as much of their facilities as possible, and are adopting new technologies as they become available. These large operations are pushing out large volumes of product in many different directions, but increasingly, medium-sized and small operations also need to incorporate some level of automation so they can stay competitive and fulfill both large and individual shipments.

The growth in e-commerce and other specialized customer requirements has prompted many warehouse managers to consider or integrate some type of automation for their operations. Implementing a warehouse control system (WCS) to help coordinate materials handling equipment,

processes, and systems is one way to accomplish this.

A modular WCS lets companies of any size automate just the most essential segments of their warehouses or distribution centers, enabling them to provide impeccable service to customers without over-investing in a solution that's more comprehensive than they need.

The modules integrate seamlessly with the people and processes already in place, allowing companies to compete with the best—even if they aren't necessarily the biggest.

Here are three ways that a WCS can help improve your company's response to customer expectations:

PRODUCT MOVERSSouthworth Products

Surface Mount Dock Lifts

This lift acts as a scissor lift, making it unnecessary to dig a pit to install a permanent model. The lift has a lowered height of five inches, a raised height of 58 inches, and offers a built-in 30-inch ramp with a nine-inch slope. The lifts feature an extra-wide base and plate rollers for increased stability when travelling around a facility. Models are available in 4,000-pound, 5,000-pound, and 6,000-pound weight capacities with six-foot by six-foot or six-foot by eight-foot platform sizes.

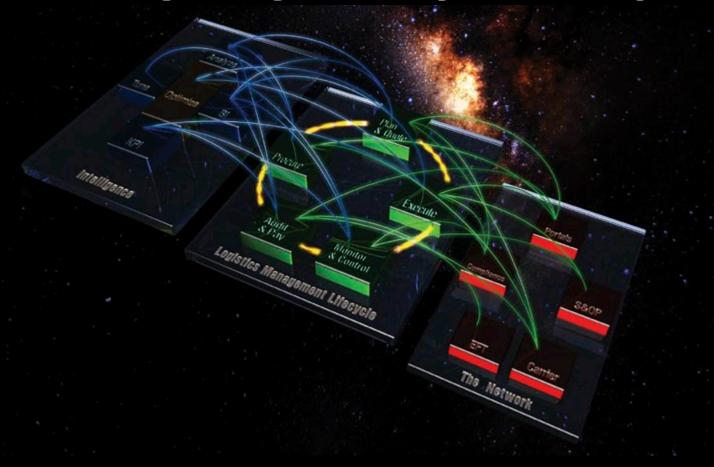
PACKAGING SOLUTIONS Combi Packaging Systems and Motion Controls Robotics

ErgoPack Robotic Packing Station

For warehouses and distribution facilities that need a consistent high throughput and leave little room for human error, this robotic packing station can fully automate case packing operations that require verifying lot or serial numbers, varying pack counts, or creating retail-ready packages. The machine also automates many tasks that are difficult or unsafe for humans.

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1. Improving competitiveness. A

WCS enables companies to efficiently process and ship both individual and bulk orders from a single location. One facility can then satisfy both needs, which saves organizations money and space—especially because the software allows for more densely packed inventory. The software evaluates orders and determines the most efficient way to route inventory to the appropriate stations within the facility, based on size and destination.

The software also reduces the dependency on people to complete the most repetitive and heavy-lifting processes in the warehouse/distribution center by automating the movement of goods, which lessens the impact on operations as the labor force shrinks. It also takes factors such as vacations, sick days, fatigue, and human error out of the equation.

2. Sharpening business processes. No one wants to manage a warehouse/DC in the dark. A WCS gives operators real-time, granular insights into their systems that allow them to fine-tune all the different processes as they're running.

Each WCS module provides insight into the performance of its particular area of usage, such as a zone, storage area, pinch points and schedules, then turns operational data into useful information that can be applied to affect positive change. It's an iterative practice. Operators get new information; they improve the process; and the cycle continues on, with each round becoming incrementally more streamlined and efficient than the last.

3. Responding to high-volume orders. Some companies are in business to sell and distribute airplane engines—and some sell pencils. The same type of material solution doesn't work for everyone, a fact that is becoming all the more pronounced as companies are forced to respond to evermore varied customer demands.

A WCS lets companies use their materials handling equipment to move products to the appropriate stations, satisfying both small- and high-volume orders shipping to a multitude of locations with the same finesse. Yet because it's modular, companies can pick and choose just the elements that make sense for their product mixes.

Having a system that is malleable and modular allows companies to maximize their situations without completely redesigning existing systems.

No matter how you look at it, materials handling technology is evolving, and there's no going back. The number of potential users concerned about integrating software with their existing systems is declining, and that decline marks a growing embrace of technology's ability to help businesses expand strategically.

As a result of that embrace, companies of any size are able to delight their customers by overnighting a single monogrammed backpack to a family who ordered it online, or by restocking shelves full of the latest spring fashions after a department store's rapid sell-out.

A WCS serves as the bridge that connects the existing warehouse/distribution center with the new way of doing business, yielding clarity and control over operations in a way that businesses didn't even realize they needed until the omni-channel marketplace emerged.



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NAREHOUSEWISDON



Keeping it Simple with Warehouse Execution Systems

Dave Williams, Director of Software and Solutions Delivery, Westfalia Technologies

ith the increased emphasis on automation, today's manufacturers and distributors are realizing the importance of software applications in running their operations as efficiently as possible. Most of these companies are accustomed to using both a warehouse management system (WMS) and a warehouse control system (WCS) to help move product more quickly, create optimal inventory levels, and improve order fulfillment accuracy.

In a typical warehouse, however, the WMS and WCS tend to be separate applications. Without seamless integration of the WMS and WCS, this combination of applications actually creates more challenges.

Consider the functions of these two interdependent applications: the WCS receives commands from the WMS and, in turn, tells the equipment what to do. In essence, the WMS manages the workflow of the operation, while the WCS executes the workflow utilizing automation.

In order to reap the benefits of automation with separate WMS and WCS applications, however, complex integration efforts are often required. In addition, valuable time and resources are needed to support both systems and ensure that they continue to effectively communicate with one another.

Enter the warehouse execution system (WES). A WES is a software solution that offers an integrated set of WMS and WCS functionality within a single application. A WES is able to simplify warehouse

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WAREHOUSE WORK HORSES



SAFETY EQUIPMENT Rite Hite

Dok-Lok SHR-5000

Prevent trailer separation accidents or theft with this trailer-locking mechanism, which locks trailers to the loading dock. It is engineered to withstand harsh conditions, and its solid steel construction can endure repeated contact with trailers backing in and out of the loading dock area. The Dok-Lok SHR-5000 also comes standard with the Rite-Vu Light Communication System, which communicates clear, constant restraint status to the truck driver, forklift operator, and loading dock personnel.

PRODUCT MOVERS Yale Materials Handling Corporation

Enclosed End Rider Series

Engineered for multi-shift applications in warehouses, crossdocks, and shipping operations, the enclosed end riders offer 8,000 pounds (MPR080VG model) and 10,000 pounds (MPR100VG model) of lifting capacity. The 10,000-pound model features a 160-inch fork, allowing operators to stack and transport up to eight pallets at once.



communication and controls while greatly reducing the complexity of utilizing several "function-specific" applications.

Ideal for organizations with increased order volumes and high throughput needs, a WES is able to receive and track product, while optimally marrying inventory to customer orders through its order fulfillment processing capabilities.

As users generate orders for fulfillment, the WES efficiently breaks the orders into logical units of work, then utilizes its WCS functionality to direct automated material handling equipment and/or manual labor to execute the work. Higher-level WMS functions, such as inventory tracking and lot management, continue to be managed within the WMS components of the WES application.

Like a conductor of an orchestra, the WES provides the overall coordination of all WMS and WCS functionality in one application—inventory management, order management, billing, and workflow, as well as the direction of material handling equipment in real time throughout the entire warehouse, as products move in and out of the facility.

One System, Multiple Benefits

As a "two-in-one" solution, WES holds many distinct advantages over individually implemented WMS and WCS systems. First, the need for complex integrations is dramatically reduced because of the WES's built-in WMS and WCS feature sets. Less time and fewer resources are necessary to ensure that the WMS and WCS can effectively communicate with one another.

Adding value to the company's investment, a WES offers the flexibility of interfacing with other applications and host systems, such as a corporate ERP and other automated equipment such as wrappers and print apply units. Inevitably, customizations are necessary within a WES. That effort should be focused on implementing customer-specific business rules and the interfaces needed to accommodate specific ERP/host system needs, not on integrating the WMS and WCS applications.

An often overlooked benefit of having a single application is the consistency that is created across the organization. When

implemented companywide, a WES requires less of a learning curve for those using the application as everyone is using the same system. Organizations can transfer individuals from one location to another without retraining them, therefore resulting in greater productivity.

Lastly, with a WES, manufacturers and distributors tend to quickly uncover new areas of cost savings. Essentially, because there is only one application to support and, because that system is designed to work with automation, the organization is able to maximize the benefits of the automated systems, while also increasing inventory accuracy and reducing labor costs.

Deployment Options

While a WES is able to replace WMS and WCS applications altogether, its flexibility allows for various deployment options. For those with an existing WMS looking to introduce a WCS to assist in automation, it is best to opt for a WES instead of bringing in a WCS. The company has the ability to continue using its WMS, integrate it with the WES, and then enable the WES' WCS functionality.

Alternatively, if an organization has not yet introduced automation warranting a WCS, it can still implement the WES, utilize its WMS capabilities, and then "turn on" the WCS functionality when needed. This allows operators to utilize a familiar user interface, thus reducing training time and shortening the duration of the system startup.

Ultimately, a sophisticated Warehouse Execution System has the ability to help an organization utilize its automation and warehouse personnel more efficiently, deliver better storage utilization, increase inventory accuracy, improve product traceability, and allow for customizations to accommodate specific customer warehousing needs.

Although WES is a relatively new concept, it is poised to take off, especially as the need for automation continues to grow. Without a doubt, manufacturers and distributors who consider WES now, rather than later, are positioning themselves to gain an edge in the increasingly competitive global marketplace today and in the future.

WARE

SAFETY EQUIPMENT Visual Workplace

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Communicate critical information and safety instructions to warehouse workers clearly and effectively with these floor signs. The signs are peel and stick, easy to apply, and made of durable high-bond acrylic that withstands forklift and heavy foot traffic. Signs are scratch-resistant, anti-skid, and available in three sizes: 12-inch or 17-inch round, and 14-inch by 20-inch rectangular.







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SAFETY EQUIPMENT FabEnCo, Inc.

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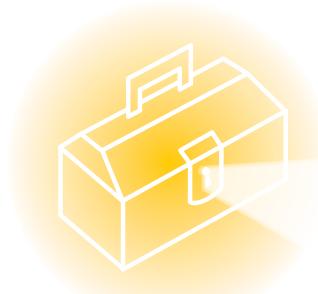
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I.T. Toolkit by Marty Weil

The Luxury of Logistics Excellence

To expand its footprint in the luxury accessories market, Royce Leather indulged in a solution that connects it to new customers and streamlines fulfillment. That's how Royce rolls.

mpressing new buyers and forging relationships with some of the world's largest department stores and retailers was a priority for luxury leather accessories company Royce Leather. But proving to retailers it could successfully meet their high-volume demand was a challenge. So Royce turned to a software services company to gain access to a pool of 2,000 retailers, become a more attractive vendor, uncover new opportunities, and prove its fulfillment capabilities.

Royce Leather dates back to 1944, when Austrian immigrant and leather artisan Eugene Bauer started a tradition of luxury leather goods by making his first wallet. Three generations later, the Bauer family has established the Royce Leather brand as one of the fastest growing names in the luxury leather accessories market, no mean feat for a small, family-owned company.

Secaucus, N.J.-based Royce specializes in personal accessories, such as wallets, briefcases, and travel essentials for men and women. It also offers

household and office furnishings, and gift items. The company's products are available at many online retailers, mass retailers, and department stores. It sells internationally and its warehouses boast complete fulfillment capabilities. How Royce achieved this position is a success story and sets an example for any small vendor looking to establish itself as a big player in the retail market.

"Establishing relationships with retailers was challenging for us because we were a small fish in a big pond—an ocean really," says Billy Bauer, Eugene's

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descendent and owner of Royce. "We tried to impress buyers, but we needed a greater element of legitimacy to get and hold their attention."

To help achieve this goal, Royce turned to Minneapolis-based SPS Commerce, a supply chain services company that provides Software-as-a-Service (SaaS) solutions for retailers and vendors that source and supply products through retail channels. SPS provides a multi-tenant platform that allows companies to connect once to its network, and it handles the connections so companies can interface with one another.

For small companies such as Royce, one principal challenge in adding new retail customers is integrating the flow of orders and information to and from retailers and any third-party partners involved in fulfilling them. By establishing a comprehensive connection that allows Royce to quickly add new customers as it grows its business, SPS eliminates that challenge.

The SPS solution provides both enterprise resource planning (ERP) level integration, where data flows from one ERP system into another, and a suite of Web-based products. This allows smaller businesses to receive orders via a browser-based cloud interface that enables transactions with trading partners in the form that best fits. In the case of Royce, SPS integrates with its operating processes.

"Our products and services can go toeto-toe with the best competitors, but we needed to show retailers our fulfillment capabilities and ability to meet increasing volume as demand grows," says Bauer. Before companies such as Macy's, Best Buy, or Burlington Coat Factory take on a new vendor, they must have confidence that the vendor can meet their requirements and handle increased responsibility. "SPS helped us prove to these retailers that we could meet their demands successfully," says Bauer.

The Other Side of the Equation

While the SPS platform was one side of Royce's retail equation, its Retail Universe Sourcing Community was the other. Royce has been using the multi-tenant platform for approximately seven years and joined Retail Universe in 2012.

Retail Universe provides Royce with a connection to the world's top retailers, suppliers, and third-party logistics (3PL) providers. Modeled after easy-to-use social networking sites, the community gives users a unified site to:

- Promote products and capabilities to potential retail customers.
- Highlight and promote their ability to ship direct to consumer, transact through EDI, and integrate with e-commerce platforms.
- Get merchandise in front of interested retail buyers.
 - Publish attributes and digital

Thanks to a Software-as-a-Service solution that streamlines fulfillment, Royce Leather has business growth in the bag. assets to showcase e-commerce-ready prod-

■ Bolster their reputation within the community by highlighting existing trading partners.

The Retail Universe community facilitates Royce's ability to collaborate with retailers by showcasing its products in an easily accessible and usable database. "The community acts as a virtual trade show," says Bauer. "It provides value. As a company with limited capital, we can't afford to attend every trade show and industry event we might benefit from. Retail Universe levels the playing field for small firms such as Royce."

With more than 1,000 SKUs on the site, participation in the community has both boosted sales and established Royce as a recognizable trading partner in the retail sector. "The community enables us to be seen on major retailer's sites such as Macys.com and Kohls.com, so we are perceived with a greater level of legitimacy and respect," Bauer notes.

Being associated with and able to comply to e-commerce giants that uphold high levels of performance standards reflects a large degree of competency about Royce.

Expanding the Sales Arsenal

According to Bauer, Royce used to fight for sales with one resource—its products. But SPS has expanded the arsenal by enabling logistics excellence and adding credibility.

Retail Universe's primary use is directto-consumer fulfillment. Many retailers are hungry to expand the number of products they offer on e-commerce sites using drop-ship capability. Retail Universe highlights their fulfillment capabilities as filters in the community. For example, a retailer can ask for a list of luxury briefcases available for drop-ship and the site provides that information at a click. With Retail Universe, Royce is now leveraging its logistics and fulfillment capabilities to garner new business.

Sometimes, when a business grows rapidly, it makes sense to outsource noncore competencies to a vendor that has



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the ability to scale at a rate beyond what it could if it kept operations in-house. Relying on SPS Commerce to host the connection to its ERP system—then leveraging Retail Universe's connections to more than 2,000 retailers worldwide—allows Royce to be more agile and uncover new sales opportunities.

Participating in the network on the sourcing side also enables Royce to scale, because it's able to quickly engage with many potential customers—without

Staples, Sears, and Walmart. "Given this massive influx of business in Canada—and the dearth of leather goods in Canada—it made sense for us to open a facility there," says Bauer.

The company is also exploring the idea of establishing European distribution centers. For example, U.K. retailers Harrah's, Wayfair, and TJX represent a huge opportunity for Royce. "Many retailers mandate that their suppliers maintain facilities on the continent," says Bauer. "So we're

"Fulfillment proficiency distinguishes suppliers from their competitors, and validates legitimacy among retailers."

-Billy Bauer, Owner, Royce Leather

manual communication or trade show exhibitions. This creates more expansive market activity while keeping costs down.

"Participating in Retail Universe has made us more compelling to retail buyers looking for new suppliers," says Bauer. "The heightened level of brand awareness comes from being in front of the people that matter the most, with the information they need to truly assess us. That has made a monumental difference."

Expanding the DC Network

Royce's key distribution center is a 10,000-square-foot facility in Secaucus, from which it ships worldwide. But growth in new markets has prompted the firm to establish facilities elsewhere.

With direct-to-consumer fulfillment, the service area is critical. For example, some retailers find it difficult to foster direct-to-consumer fulfillment from the United States to Canada because it is a complex operation. But Royce's ability to indicate the range of countries it can fulfill within, and have those areas defined through the SPS software tools, allows it to highlight a competitive advantage.

Royce recently opened a new distribution center in Ontario, Canada, primarily to serve the volume of business it does with the Canadian operations of Best Buy, starting small to demonstrate that we are serious about serving the market, that we have strong distribution capabilities, and that we're expecting high growth."

To SKU or Not to SKU

When Royce started up e-commerce operations in early 2000, the retail industry had reached a consensus that "the more SKUs, the better." They thought that a larger number of SKUs correlated with greater sales, because the probability of purchase increased through more options for the customer.

Thus Royce's SKUs grew to more than 1,000, but times have changed. "Now we're looking to cut the number of SKUs—by half," Bauer says. "Addition by subtraction" allows better focus on core competencies, greater economies of scale, and lower production costs.

"This is the movement now," he adds. "We're determining the competitive advantages of our products, then focusing on putting those products in front of retailers." Royce is tailoring its products using insight from SPS and direct communication from buyers.

One big challenge in retail is the increased emphasis on synchronizing product information among trading partners. This has become increasingly

important as e-commerce continues to grow significantly faster than traditional brick-and-mortar retail. For a product to be successful in e-commerce it needs to be accompanied by its digital assets: all the characteristics that can make it attractive to a buyer scanning an online product detail page. Further, the speed at which retailers are moving has dramatically increased: instead of adding 10 to 20 vendors every month as in the past, today they're adding 100 to 200 vendors monthly. This requires all trading partners to move faster.

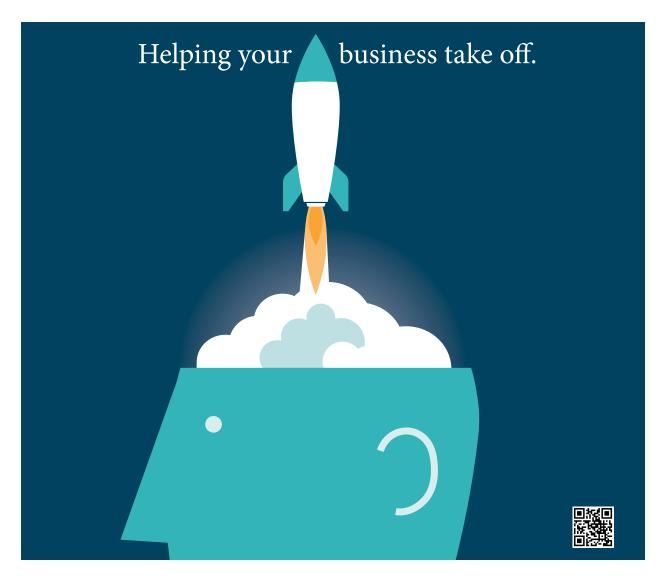
Companies need to have a solution in place that lets them quickly synchronize their information with new customers. As the market changes and these new demands emerge, solutions such as SPS Commerce have helped vendors expanding their retail footprint. This has been the case for Royce, Bauer says.

Fulfillment as the Future

"Fulfillment proficiency distinguishes suppliers from their competitors, and validates legitimacy among retailers," says Bauer. By adopting the SPS Commerce platform, Royce now has a refined ability to determine what products are overstocked, and the rate at which items are selling. Inventory accuracy also has increased. For example, the company does a huge volume of business with Amazon (85 percent of its products are available through Amazon Prime). Keeping up with the velocity of that business requires the functionality provided by the SPS system.

The system also provides enterprise analytics, which are especially valuable given that Royce doesn't have the marketing resources of its larger competitors. The analytics help ensure the right products are in the right places, and inventory is sufficient to meet fulfillment requirements. They also provide insight into product assortment trends.

"The system enables us to do so much logistically: shipping, inventory, and sales management," Bauer says. "That's what has made it an integral part of developing our business."



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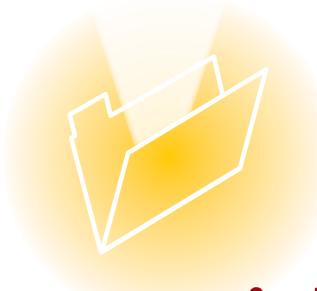
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Casebook by Marty Weil

Building a Bridge to Continuous Improvement

Tired of relying on e-mail blasts to place freight, L.B. Foster ups its game with a third-party solution that has transformed

the enterprise.

he good news: L.B. Foster was rapidly growing. The bad news: that growth made it a struggle to keep up with transportation and logistics demands. By turning to a third-party logistics provider, L.B. Foster was able to implement an enterprise logistics solution that can handle as much freight as the company can enter—quickly and efficiently.

Pittsburgh-based L.B. Foster supplies transportation, construction, utility, energy, recreation, and agriculture markets with materials to build and maintain infrastructure. As a manufacturer, fabricator, and distributor of quality materials, the company is committed to meeting customer requirements and increasing their satisfaction through continual product and service improvements. This drive toward improvement has had a dynamic effect on L.B. Foster's logistics and transportation processes.

"In 2009, we identified a pressing need to improve the way we handled freight,"

says Arnie McAuley, material services manager at L.B. Foster. The company was growing rapidly, but was using methods that didn't allow it to easily keep up with the demand to place freight. It didn't have an easy way to secure contracts with carriers other than running inquiries on a homegrown system with a rudimentary rate structure driving the database.

After interviewing five logistics solution providers, L.B. Foster settled on Hickory, N.C.-based third-party logistics provider Transportation Insight to address its freight challenges, and

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improve logistics processes across the organization. Since then, the company's logistics and transportation processes have been transformed.

Email Fail

In the past, L.B. Foster used an email blast system it created to book freight. The company would send inquiries to carriers, who responded one at a time. This process was time-consuming and inefficient, and complicated by the fact that the organization had many types of decentralized activities in the field. Some used L.B. Foster's centralized transportation group and its homegrown system, but others did not. Utilization was elective. "We didn't have a standard way of booking freight," says McAuley.

Enter Transportation Insight, whose bundled logistics solution went beyond standard transportation management systems (TMS) to include carrier sourcing, freight bill payment and audit, and business intelligence. This enterprise logistics solution helped transform L.B. Foster from a company struggling to place freight to one that can place as much as it needs quickly and efficiently.

L.B. Foster uses the Transportation Insight solution to manage two types of freight: flatbed and less-than-truckload (LTL).

■ **Flatbed.** The company brought a group of carriers with them to the Transportation Insight solution that are maintained, added, or deleted based on performance, and posted on L.B. Foster's bid board. The company reviews bids and places freight based on this review. Carriers are tendered notice, then accept or reject the job.

Once a job is accepted, the system automatically sends the shipper a bill of lading (BOL). L.B. Foster receives automatic notifications that the bid has been booked, when the shipment is in transit, and when it's delivered. This visibility across the logistics chain did not exist before. "The Transportation Insight system keeps us in contact with a group of carriers in real time," says McAuley.

LTL. Transportation Insight negotiated contracted rates with a group of

common carriers. That provides L.B. Foster with a standard process to contract LTL. The company checks options based on lane, pricing rank, and the number of days it should take to move a shipment. The selection is made and awarded electronically to the carrier. From that point, the shipment follows the same process as flatbed freight from BOL through notifications.

Unique Requirements

Because of the scale and nature of its operations, L.B. Foster's logistics network is different from the majority of companies transporting goods. "Our freight is unique because we have no lanes," notes McAuley. "We have few repeat orders and destinations. We can ship to and from anywhere in the country, wherever a contractor is working."

The company can't operate a typical contract-pricing equation, where a system can connect point A to point B simply by referencing the contracted rate and the carrier to use. Consequently, L.B. Foster needed an application that afforded user-friendly, highly scalable, tactical sourcing



Fabricated bridge products manufacturer L.B. Foster faces unique transportation challenges, such as few repeat orders and destinations. A third-party solution helps streamline the carrier bid process, resulting in reduced costs and improved efficiencies.





"The system is an extension of our focus on being a lean enterprise. It enables our processes to be more efficient and responsive to change, allowing us to handle greater volume without adding headcount."

-Arnie McAuley, Material Services Manager, L.B. Foster

methodologies in a TMS environment.

"L.B. Foster's solution is primarily centered on bid-board activities—almost a reverse auction—where we broadcast loads to a select group of carriers and brokers that Transportation Insight vetted and contracted on our behalf," explains McAuley.

Also, the company can now process more loads than it could with the old system. "We can place as many loads as we can enter," says McAuley. "There's no limit to processing flatbed and LTL loads."

"The solution also generates bills of lading, which we formerly did manually outside the system," he adds. "It also allows us to make one monthly payment to Transportation Insight, rather than paying all carriers individually (Transportation Insight pays the individual carriers). The solution consolidated all these different activities into one platform."

Automating and simplifying payments replaced a time-intensive and complicated manual process. The new solution saves time, labor, and capital while allowing better utilization of assets as the company continues to grow.

Truckloads of Benefits

The bundled solution offers several benefits to L.B. Foster. First is greater control over logistics providers. L.B. Foster no longer has to deal with the uncertainty introduced by field personnel electing to use carriers that may not have been vetted from a risk, performance, and liability perspective.

Second, the solution offers competitive pricing through a more repeatable, scalable, and reliable process.

Third, customer service has improved because shipment pickup and delivery occurs more predictably. Just as important, those who have a stake in the logistics process receive proactive notification. Creating an environment where logistics information is more visible to shippers, vendors, and customers—internal and external—is a key advantage over the legacy system.

Fourth, the solution enables improved decision-making. Business intelligence capabilities drive better decision-making by providing more accurate and less latent information. L.B. Foster receives detailed data on carriers and their performance. "We get a daily status report on loads in the system," notes McAuley. "We didn't have these metrics before."

Implement Now, Pay Later

McAuley was attracted to Transportation Insight for several reasons. First, the 3PL didn't charge until the new system was up and running. "Many providers wanted money up front, before the system went live," he says. "Transportation Insight was willing to invest time and money in us to make sure its system was right for us."

A second attraction was Transportation Insight's understanding of Lean processes. "I asked all potential providers what they could do to help make us a Lean enterprise, and Transportation Insight was the only one that answered in terms of process improvements," says McAuley. "They know what continuous improvement is all about."

By examining a company's processes from vendor to customer, Transportation Insight works to create a value stream map of the extended supply chain's current and future state. By identifying and removing non-value-added elements, companies gain efficiencies on the production floor, in the office, on the shipping docks, and throughout the enterprise.

According to McAuley, the implementation went smoothly. Transportation Insight spent considerable time with L.B. Foster on site to gain a clear understanding of goals, and the companies held weekly implementation meetings as the project developed. When Transportation Insight was ready to take the solution live, it sent staff to the L.B. Foster site to work collaboratively through the transition.

People Power

"The difference between Transportation Insight and other providers comes down to people," says McAuley. "Their people have grown and changed over the five years since we implemented the solution, but they've consistently looked at our business with an eye toward helping us improve. They rose to that challenge."

One area of current growth for L.B. Foster is in global markets, with international shipping demands increasing considerably. The capabilities for international shipping have always been part of the enterprise solution, but McAuley emphasizes that Transportation Insight has been responsive to emerging needs. "We constantly communicate what we need the system to do, or changes we'd like to make," he says.

Housing data in a central place—and having the resources to analyze it—is something L.B. Foster couldn't do before implementing the bundled Transportation Insight solution. Now, using the data for decision support helps them better respond to future needs.

"The system is an extension of our focus on being a lean enterprise," notes McAuley. "The Transportation Insight solution enables our processes to be more efficient and more responsive to change, allowing us to handle greater volume without adding headcount.

"We have improved carrier performance, loads and cost analysis, and flatbed and LTL shipping since we partnered with Transportation Insight," he adds. "We expect our processes to continue to improve as we move forward."













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Ryder

TITLE: Stay Safe: How a Dedicated Transportation Solution

Can Help You Minimize Risk and Drive Safety

DOWNLOAD: bit.ly/1srxepy

SUMMARY: With tougher safety regulations, special handling requirements, and driver turnover, companies are looking for alternative transportation management solutions. Offload the risks of owning, running, and managing a transportation network by downloading this comprehensive

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CITO Research

TITLE: Enterprise Mobility Management: The Big Bang Theory

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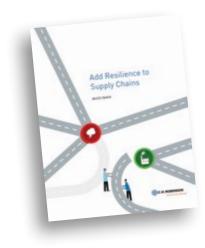
SUMMARY: The array of choices facing mobile device users can be dizzying. Whether your enterprise needs the entire stack of device, content- and app-management capabilities, and containerization, or just a few, you need some kind of enterprise mobility strategy. This research describes how companies that have deployed enterprise mobility management have been able to overcome many challenges, satisfy employee access demands, secure corporate data, and delight management with new potential for productivity and ROI.

Demand Solutions

TITLE: 42 Principles of Forecasting

DOWNLOAD: bit.ly/11mtg9s

SUMMARY: Forecasting is a thankless task. You're always wrong, and your work is never done. Good forecasts aren't always celebrated, but inaccurate forecasts will always be criticized. While poor forecasts deserve to be critiqued, good forecasts—or consistent improvements in forecast accuracy—equally deserve hosannas and rewards. Download this free e-book to learn practical and actionable tips to help your company improve its forecasting process.



C.H. Robinson

TITLE: Add Resilience to Supply Chains

DOWNLOAD: bit.ly/1lmthtV

SUMMARY: Natural disasters and other events can disrupt connections between

you, suppliers, and customers. You can circumvent disruptions or minimize their impact on the supply chain. This whitepaper explores which companies face the greatest risk for disruption, what supply chain mapping can reveal about risk, and how you can build resilience into

your supply chain.

Cerasis

TITLE: The Value of a TMS and Logistics Services

For Effective Inbound Freight Management

DOWNLOAD: bit.ly/11mtgGy

SUMMARY: This whitepaper will help you gain a deeper understanding of how

to effectively manage the nuances of LTL freight shipping. It covers the challenges logistics executives face in inbound freight shipping; areas to focus on to improve inbound freight management; and the requirements of an effective transportation management system. Learn how deploying an effective inbound freight program reaps benefits including significant cost reductions, improved transportation efficiency, better control over incoming goods, a boost in customer service, reduction in cycle time, and even freedom from legal

headaches.

DHL

TITLE: Building the Smarter Energy Supply Chain

DOWNLOAD: bit.ly/1lmtywQ

SUMMARY: This comprehensive whitepaper provides an overview on building a smarter supply chain in the energy sector. It urges logistics executives to rethink traditional energy supply chain models, and implement a highly integrated approach, before logistics drives up costs and destroys profit margins. The report—based on research by Lisa Harrington, associate director at the Supply Chain Management Center of the Robert H. Smith School of Business, University of Maryland—advocates an orchestrated, data-driven, end-to-end supply chain model that increases visibility and reliability, and reduces costs

and risk.

UTi Worldwide

TITLE: Big Data in the Supply Chain

DOWNLOAD: bit.ly/1Hrqnok

SUMMARY: Prior to investing resources in "big data" systems, software, and

people, firms must understand that data aggregation alone is insufficient. Without a well-thought-out strategy, big data projects can result in confusion between teams, or worse, lead to sunk costs. This whitepaper uses three examples to illustrate data-driven improvement opportunities in transportation, warehousing, and network design. The ultimate deliverable of data-oriented efforts should be greater

transparency in decision-making.

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Tompkins International

TITLE: The Alibaba Effect: What Today's 3PLs Need to Know

DOWNLOAD: bit.ly/11mtyNE

SUMMARY: Alibaba has burst onto the global scene, and is poised to make a huge impact on today's marketplace. This new player in the e-tail space,

coupled with increasing customer expectations, means that today's third-party logistics (3PL) providers need new omni-channel strategies and solutions. Download this free whitepaper to learn how marketplaces such as Alibaba are developing new opportunities for retailers and consumer product companies. You'll also discover the best ways that 3PLs can provide smart supply chain solutions to support these

companies.

CTSI Global

TITLE: The Economics of Transportation Management Systems

DOWNLOAD: bit.ly/1thL2oR

-

Transportation is one of the biggest expenses for companies, and these costs continue to increase. Learn about current industry conditions, the factors that are contributing to these cost increases, and the benefits a Transportation Management System (TMS) can provide.

This whitepaper will answer all your questions, from the TMS options

available to the return on investment.

Intelligrated

TITLE: Seven Order Fulfillment Strategies

To Fast Track Your E-Commerce Business Growth

DOWNLOAD: bit.ly/11mtzkx

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SUMMARY: Most e-commerce businesses start small, manually fulfilling daily orders, and handling growth by simply adding more staff, more shifts, and more storage. This approach can work to a limited extent, but with increased success comes increased order volume, lines per order, complexity, and the inevitable need to upgrade to a fulfillment facility with some level of automation. This whitepaper shares seven proven order fulfillment growth strategies, and includes tips that can help you get your orders out the door efficiently, accurately, and cost-effectively

as your business grows and seasonal demand occurs.

Amber Road

TITLE: Aberdeen Group Report: Domestic vs. International

Supply Chain Performance & Investment Disparity

DOWNLOAD: bit.ly/1yYk9pH

SUMMARY: The increased complexity of global supply chains has led to longer lead

times, more in-transit inventory, and the need to control downstream and upstream logistics. These costs add up, which means that a one-percent investment in international supply chain efficiency yields a far greater return than investment in the domestic supply chain. Download this report to learn how you can maximize your global supply chain

performance.





Weber Logistics

TITLE: Choosing a 3PL for Food Product Distribution:

5 Critical Areas to Evaluate

DOWNLOAD: bit.lv/1thMifB

SUMMARY: You know the perils of food logistics. Let your guard down, and a

truckload of perishables turns into an unsellable mess. Or you get stuck with racks full of canned goods nearing their sell-by date. The right third-party logistics provider can help you avoid those pitfalls, while cutting costs and keeping you compliant with relevant government regulations. How do you know which 3PL to trust with your food shipments? Download this free whitepaper to discover the five essential

questions every food shipper should ask.

Dassault Systemes

TITLE: Digital Twin: Manufacturing Excellence Through a Virtual Factory

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SUMMARY: Download this whitepaper to learn how a new concept—a "digital twin"—can be used to improve the feedback loop from production back to design. Manufacturers embracing a digital twin strategy can accelerate innovation cycles—and better adjust to continuous process

improvement—with greater ease and effectiveness.



TITLE: Building Environmentally Responsible Supply Chains

DOWNLOAD: bit.ly/1thL7ZQ

SUMMARY: A company's environmental and sustainability policies strongly

influence consumer perception. Environmentally responsible supply chains not only have the potential to sway brand loyalty, but to simultaneously reduce carbon footprint and bottom-line costs through improved efficiency. Download NFI's whitepaper to learn how sustainable technological improvements and management best practices can help you in transportation and freight management, warehousing and distribution, and property design and construction.



TITLE: Common Myths About Dock Scheduling

DOWNLOAD: bit.ly/1xSS57m

SUMMARY: This whitepaper addresses some of the myths related to dock

scheduling, such as: "I only need a basic appointment tool," "My carriers and suppliers will never do it," and "We can't afford to refuse loads, so why bother scheduling?" The whitepaper also discusses some misperceptions about appointment scheduling, and examines the true costs associated with implementing dock scheduling software. Bust the myths of dock scheduling by downloading this free whitepaper today.

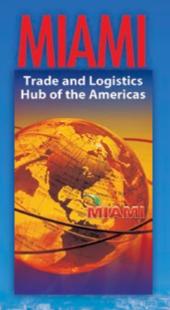


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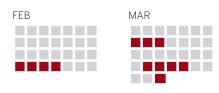
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NHERE

In the midst of a capacity crunch, constantly shifting regulations, and increased demand fueled by a recovering economy, keeping your supply chain humming can be a challenge. Attending industry conferences is one way to keep up with best practices and innovations. Mark your calendar for these leading events.



FEB 22-25, 2015

Orlando, Fla.

Retail Supply Chain Conference 2015

Retail Industry Leaders Association www.retailsupplychain.org

This conference addresses current and relevant issues facing the retail industry. With RILA's focus on supply chain education, attendees gain exposure to best practices and leading strategies, as well as networking opportunities with experts who can help boost supply chain execution.

MAR 8-10, 2015 Savannah, Ga.

2015 IWLA Convention & Expo

International Warehouse **Logistics Association** www.iwla.com

Special educational sessions cover an array of topics, including adapting to industry mergers and acquisitions, attracting and retaining talent, and complying with warehousing and transportation law. All attendees are also welcome at IWLA council meetings, and the exhibition presents the latest warehousing and logistics solutions.

MAR 23-25, 2015

Orlando, Fla.

41st Annual **Transportation** & Logistics **Council Conference**

Transportation & **Logistics Council** www.tlcouncil.org

Sessions and workshops touch on all transportation modes, and address a range of topics

including the general state of the transportation industry, cargo security, loss and damage claims, and reverse logistics. Pre-conference seminars cover transportation law, freight claims, and contracting for logistics services. A Certified Claims Professional primer class is also available.

MAR 23-26, 2015 Chicago, III.

ProMat 2015

www.modexshow.com

ProMat attendees get hands-on demonstrations of the latest innovations from more than 800 logistics, materials handling, and manufacturing solutions providers. Through exhibits, educational sessions, keynotes, and partner events, participants learn best practices and tools to apply to their own companies. Participants also gain access to co-located Automate 2015, a robotics, machine vision, and motion-control technology event

MAR 31-APR 1, 2015

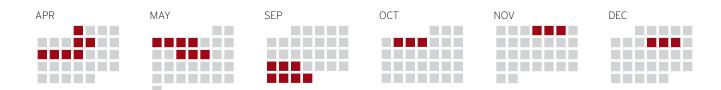
Atlanta, Ga.

Sixth Annual Georgia **Logistics Summit**

The Georgia Center of Innovation for Logistics www.georgialogistics.com

The Georgia Logistics Summit is packed with valuable business information and networking opportunities. Keynote speakers address topics including enabling logistics in rapid growth markets; and the logistics of manufacturing, growth, and expansion in Georgia. Breakout sessions cover e-commerce, intermodal, and transportation of perishables.

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APR 8-9, 2015

Atlanta, Ga.

Home Delivery **World 2014**

Terrapinn www.terrapinn.com/ homedelivery

Through a combination of strategic keynote presentations, case studies, and collaborative roundtable discussions, Home Delivery World gives retailers, small- and medium-sized enterprises, and other home delivery market stakeholders the opportunity to design their own conference experience. Panels cover topics including the latest models and strategies for ship-from-store and in-store pickup, reverse logistics, and final-mile innovations and strategies.

APR 12-15, 2015 Orlando, Fla.

NASSTRAC Annual Shippers Conference & Transportation Expo

National Shippers Strategic Transportation Council www.nasstrac.org

This conference attracts transportation and supply chain executives from manufacturers, retailers, and distributors, as well as thirdparty logistics providers and carriers. Educational sessions cover relevant topics in transportation, including density-based pricing, buyer relationships, and supply chain innovations and sustainability.

MAY 3-6, 2015 Orlando, Fla.

WERC 2014

Warehouse Education and Research Council www.werc.org/2015

This conference focuses on education and practical takeaways for logistics and warehousing professionals. Attendees can participate in panels, educational sessions, a variety of tours, and a materials handling exhibition.

MAY 3-6, 2015

Phoenix, Ariz.

ISM 2015 Annual Conference

Institute for Supply Management www.ism.ws/conferences

This event focuses on professional development for supply chain managers. Multiple learning tracks based on current industry issues are available, as are a series of facility tours.

MAY 12-14, 2015

Phoenix, Ariz.

Gartner Supply Chain **Executive Conference**

Gartner www.gartner.com

More than 50 analyst-led sessions cover the full spectrum of supply chain management. and deliver actionable advice about distribution and logistics strategy and planning. Topics include supply chain collaboration, transformation. and sales and operations planning; and supply chain performance management, analytics, and segmentation.

SEPT 20-22, 2015

Ft. Lauderdale, Fla.

Intermodal Expo 2015

Intermodal Association of North America www.intermodal.org

This annual exposition gives members of the intermodal freight community an opportunity to attend educational sessions, and network with peers and other industry leaders. The show floor features demonstrations of the latest intermodal-related innovations and technologies.

SEPT 27-30, 2015

San Diego, Calif.

CSCMP Annual Conference

Council of Supply Chain Management Professionals www.cscmpconference.org

The Council of Supply Chain Management Professionals' (CSCMP) Annual Global Conference offers supply chain management practitioners the opportunity to learn ways to cut costs and keep supply chains competitive. An exhibition showcases the latest innovations in supply chain and operations management solutions.

OCT 5-7, 2015

Las Vegas, Nev.

APICS 2015

Association for Operations Management www.apics.org

This annual event offers education, best practices, and thought leadership to help attendees lead their

organizations toward goals such as achieving maximum productivity, meeting consumer demand, and remaining agile amid instability or unpredictability.

NOV 4-6, 2015

Miami, Fla.

Air & Sea Cargo Americas

World Trade Center Miami www.seacargoamericas.com

Air & Sea Cargo Americas brings together all facets of the aviation, maritime, and logistics sectors to enhance the cargo industry in the Western Hemisphere. This year's topics include security; regional consolidation; manufacturer and shipper needs in highgrowth cargo; trade facilitation; improving productivity, speed, and service quality; responding to market changes and demands from shippers consolidators, and forwarders; and controlling costs while streamlining customer service.

DEC 9-11, 2015

Addison, Texas

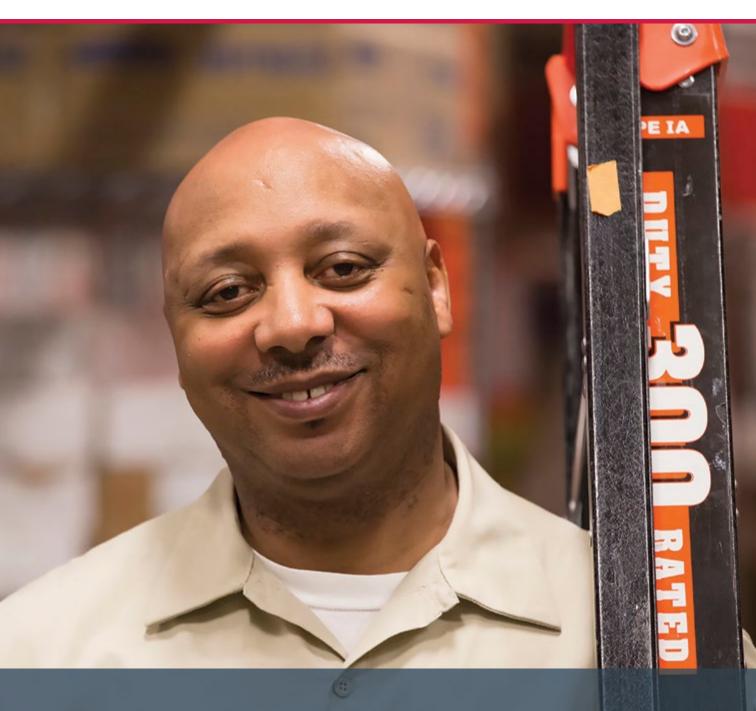
13th Annual Supply Chain & Logistics Summit

WTG Events www.supplychain.us.com

This conference gives supply chain and logistics executives the chance to hear industry case studies, participate in keynote sessions and interactive master classes, and gain an understanding of up-to-date industry developments and best practices.

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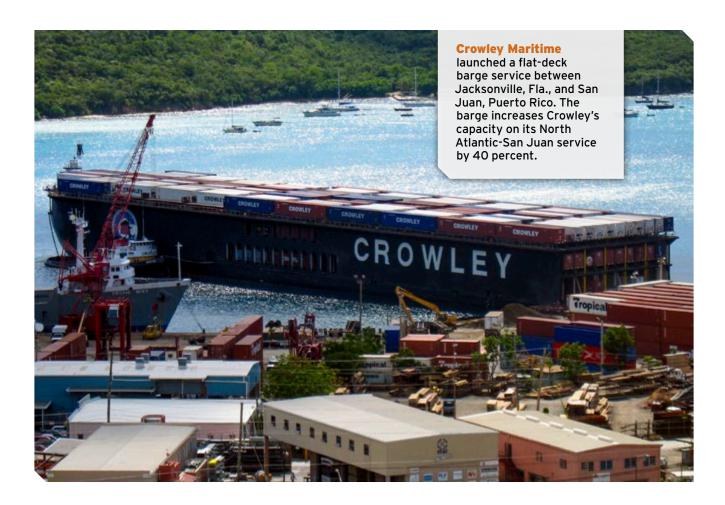
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NEW SERVICES & SOLUTIONS



//Technology//

The latest release of **JDA Software's** *JDA Warehouse Management* solution helps retailers handle the increased volume of returns generated by omnichannel selling. Key capabilities include returns tracking, routing, and processing; and the disposition of returns inventory to get it back on the shelf faster.

Technology development company **WiseTech Global** integrated the *VelaTrack* container tracking system into its *CargoWise One* solution, allowing users to increase visibility of their cargo with real-time event tracking as it moves through the supply chain.

Logistics IT provider **Symphony EYC** released a new version of its *G.O.L.D.* Warehouse Voice Operations solution

that is compatible with Android-based mobile devices. The Android app can also be integrated with the wearable VocalVest, which eliminates the need for a headset and has a pocket for the Android device.

Materials handling solutions provider **Intelligrated** redesigned and enhanced ontimeparts.com, a website for procuring spare parts for

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materials handling equipment. The new site offers a refreshed design, and improved back-end integration to connect users with an inventory of more than 75,000 original equipment manufacturer and commodity parts.

HighJump, a supply chain management software developer, launched the HighJump Retail Advantage solution to help retailers and grocers meet the demands of omni-channel customers. The software drives the movement of goods from receipt, to inventory, to the store shelf, and to replenishment.

The Cloud-Based Demand Planning and Forecasting Software-as-a-Service solution from supply chain software developer Causometrix enables distributors and manufacturers to accurately predict product demand, which helps reduce inventory costs and inaccuracies, and avoid stockouts.

Third-party logistics (3PL) provider A.N. Deringer integrated a production-planning tool into its online customer portal. eShipPartner Production Planning uses past shipment data to forecast estimates of average weekly demand and outof-stock dates, prompting clients to submit production orders when needed.

Supply chain solutions provider **Llamasoft** launched its supply chain design solution on the web at supplychainguru.com. The Softwareas-a-Service enables businesses to increase the scope of their supply chain modeling without the need for an IT infrastructure.

Lion Technology launched its Hazardous Waste in California online course to help hazardous waste

Supply chain solutions provider A. Duie Pyle opened a 132,000-square-foot warehouse in Westampton, N.J. The facility has 101 dock doors, is located near I-95 and I-295, and supports the company's less-than truckload, truckload, warehousing and distribution, custom dedicated, and brokerage services.

generators in the state comply with state and federal regulations, and meet annual training requirements. The online course guides personnel through the end-to-end management of hazardous waste.

Oracle's Project-Driven Supply Chain software integrates the company's Primavera and Value Chain Planning solutions to help project managers and material planners enhance collaboration, material planning, decision-making, and execution throughout a project lifecycle.

APEXWare, a mobile warehouse management system from **DecisionPoint Systems**, helps warehouse operations go paperless, reduce errors, lower inventory costs, and improve transaction accuracy. Mobile and vehicle-mounted computers with integrated bar-code scanners streamline pick and putaway functions.

Trucking Webcam.com provides up-to-date information on current congestion conditions at the Port of Long Beach and the Port of Los Angeles. Live webcam feeds at the major port terminals assist truck drivers, fleet managers, and shippers who need realtime, accurate port information.



Honeywell Scanning and Mobility released a hands-free, wrist-mounted version of its Dolphin 70e Black mobile device. The device can be worn for extended periods of time, and features a large screen, flexible touchscreen keypads, and support for multiple scanner types.



The NASSTRAC Annual Shippers Conference & Transportation Expo is geared to your business needs, connects you with transportation decision-makers from broad market segments and provides you with interactive sessions for true professional development.

You want real world takeaways based on solutions that work. Experience what true professional development is all about at the NASSTRAC Shippers Conference & Transportation Expo.

Best rates expire February 16!

Visit www.nasstrac.org/conference to learn more and to register.

Fleet management solutions provider iGlobal LLC updated its ELOG application to reflect changes to Hoursof-Service regulations. The company will work with all users to make sure mobile data terminals reflect the latest changes to the 34-hour restart provisions.

//Services//

Global logistics company Gebrüder **Weiss** opened three new locations in Moscow, Russia, at Domodedovo Airport, Sheremetyevo Airport, and the center of the city. Air cargo, sea freight, ground transport, multimodal solutions, logistics services, and project cargo solutions are offered.

Less-than-truckload carrier Old Dominion Freight Line moved to a new service center in Portland, Ore. The facility features 136 dock doors, and acts as a local freight hub.

3PL Dupré Logistics opened a terminal in Douglas, Wyo., to expand its Crude Oil Business Group. The company chose the new location to serve expanding oil operations in the Powder River Basin in Wyoming, and the DJ Basin in Colorado.

Less-than-truckload carrier Southeastern Freight Lines relocated its Van Buren, Ark., service center in response to increased demand in the region. The new 39-door facility

enables the company to provide better service in the Sun Belt region.

3PL Yusen Logistics established a logistics campus at the Dinh Vu Industrial Zone in Hai Phong, Vietnam. The site contains a 129,166-square-foot warehouse, a 256,934-square-foot empty container depot with storage capacity for 3,000 TEUs, and a vehicle yard.

Dayton Freight, a less-than-truckload carrier, began operating a new service center in Des Moines, Iowa. The 28,000-square-foot, 52-door facility allows the carrier to provide faster service and increased capacity in the region.



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Inbound Logistics' online library of "how to" articles gives you instant access to practical, instructive guidance on topics ranging from managing your supply chain after a natural disaster to fostering long-term 3PL partnerships, balancing export demand, and choosing a transportation management system. Find these exclusive guides, and many more, at:

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Keynote Speaker, Robert Gates

Robert Gates' distinguished career includes serving as our nation's 22nd secretary of defense. Among his many accolades are the Presidential Medal of Freedom, the National Security Medal and the Presidential Citizens Medal. He has authored two memoirs, with his latest, *Duty: Memoirs of a Secretary at War* (2014), currently on the *New York Times Best Sellers List*.



Keynote Speaker, Sallie Krawcheck

Sallie Krawcheck is the owner of Ellevate. Ellevate is the leading professional women's networking organization, which is committed to the economic empowerment of women globally. Her extensive financial background includes past president of Bank of America Global Wealth Management as well as chief executive officer and chair for Citi Global Wealth Management.



ABF Freight teamed up with the International Brotherhood of Teamsters and the U.S. Army to begin offering a program that trains soldiers to be truck drivers upon exiting the military. ABF drivers provide classroom instruction and driving training during the final weeks of enlistment, and qualifying soldiers receive a Class A Commercial Driver's License and Hazardous Material Certification upon completing the course.

Ocean freight consolidator **CaroTrans** added container freight stations in Cincinnati and Indianapolis to its network. The stations allow regional shippers to drop off cargo closer to home instead of having to truck it to hubs in Chicago.

Transportation and logistics provider **Pilot Freight Services** has new facilities scheduled to open in the first quarter of 2015 in Mexico City and Vancouver. Both locations will offer air, ocean, ground, import, export, logistics, and home delivery services.

Mobile technology manufacturer Winmate's M101H rugged tablet features a 10.1-inch screen, Windows 8.1 operating system, 1-D and 2-D barcode data capture, Bluetooth and WiFi capability, and support for all major cellular carriers. The tablet is protected against water, extreme temperatures, shock and dust, and drops up to four feet, and weighs only 2.6 pounds.



Third-party logistics provider **Suddath Global Logistics** expanded its Los Angeles-area warehouse in La Mirada, Calif., to 74,000 square feet, and its Dallas/Fort Worth-area facility in Grand Prairie, Texas, to 49,900 square feet. Both locations provide warehousing, fulfillment, distribution, freight forwarding, and logistics management services.

Fresh fruit and vegetable distributor
Front Row Produce moved to
a 57,000-square-foot facility in

Overland, Mo., doubling the company's distribution footprint. The new location features refrigerated and freezer storage areas, and a temperature-controlled loading dock.

ASF Intermodal, a drayage provider, opened a new facility in Fort Worth, Texas. The new building is the company's third facility in Texas, and provides drayage services to the BNSF terminal in Haslet.

Climate-controlled intermodal equipment provider **Tiger Cool Express LLC** expanded its container fleet to 234 by adding 35 temperature-controlled containers. The insulated containers hold temperatures as low as -20 degrees Fahrenheit.

Transportation management and logistics software provider **Transplace** opened new facilities in Calgary and Montreal. The Canadian offices help Transplace expand its service portfolio to offer more cross-border and intra-Canada options.

UPS expanded four of its North American distribution facilities, adding 1.2 million square feet to the company's network. The facilities in Mira Loma, Calif., Hebron and





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INBRIEF

Louisville, Ky., and Toronto, Ontario, provide supply chain solutions such as warehousing and fulfillment; inventory, transportation, and returns management; custom kitting and packaging; and store-ready displays.

//Transportation//

COFC Logistics, an independent intermodal logistics company, began offering intermodal service between Chicago and Silao, Guanajuato, Mexico. The route is served jointly by BNSF and Ferromex, and provides sixth-morning availability.

Ocean carriers **Evergreen Line** and **Cheng Lie Navigation** teamed up to launch a new service between China and the Philippines. Two 1,000-TEU vessels operate the weekly route, and four Evergreen feeder loops provide access to and from all major ports in the Philippines.



Transportation provider OOCL launched its North China/ Pusan/Southeast Asia Service. The new route is serviced with four 2,200- to 2,500-TEU containerships, and covers destinations in North China, Korea, Singapore, Thailand, and Taiwan.

Logistics providers **SDV** and **Bolloré Africa Logistics** began jointly operating an end-to-end West Africa Air Express freight service. The route was developed to provide additional capacity to countries affected by the Ebola outbreak, but is available for all types of cargo.

DHL added a connection between Milwaukee, Wis., and the company's global hub in Cincinnati. The new flight, serviced by a Boeing 767-200, adds an average one hour and 15 minutes to cutoff times for the region's international shippers. Ocean shipping company **Sea Star Line** added a weekly container barge service between Jacksonville, Fla., and San Juan, Puerto Rico. Two barges serve the route with a combined 800-FEU capacity.

Air cargo carrier **Cathay Pacific Cargo** signed a master rental agreement to provide shippers with the **DoKaSch Temperature Solutions** Opticooler for temperature-controlled shipments. The climate-controlled containers safeguard pharmaceutical shipments for up to 100 hours.

USA Truck, a transportation and logistics provider, relocated its Chicago facility to a larger space, and opened a new site in Jacksonville, Fla. The new facilities feature the Strategic Capacity Services freight brokerage offering, which matches shipments with approved carriers in a low-capacity market.

Ocean carrier **CMA CGM** improved its service between Asia and East Africa with its new ASEA Kenya and ASEA Tanzania services. The carrier also provides intermodal and logistics solutions for landlocked African countries to reach the coast and use the new routes to ship to Asia.

Japanese airline **All Nippon Airways** entered into a joint venture with air cargo carrier **Lufthansa Cargo AG.**



IAG Cargo launched its Cargo Connector service in San Francisco. The service enables shippers and forwarders to have shipments weighing less than 660 pounds collected and delivered to the airport at no additional cost.

Both airlines have commenced joint sales of shipments on flights from Japan to Europe, providing shippers with more frequent flights and additional destinations.

//Products//

The Alert Band, from appliance manufacturer Impecca, monitors truck driver brainwaves, and sends an early warning alert to the mobile phones and designated contacts of fatigued drivers three to five minutes before they fall asleep at the wheel. The device provides a fatigue rating to the driver between zero to 100–zero being rested and 100 being unable to drive—with scores

higher than 80 considered dangerous. The device claims an accuracy level of 90 percent.

Electric three-wheeled scooters from MyGoPET allow employees to move around facilities at five times the speed of walking. The scooters can go 25 miles per charge, and an optional trailer can tow up to 300 pounds to assist in product movement.

Mitsubishi Caterpillar Forklift America

added Jungheinrich ETV 110/112 Series moving mast reach trucks to its product line. The new series features increased maximum lift heights, making it ideal for narrow aisle and high-rack applications where space is at a premium.

The PowerStak Model PPS-3000-AS heavy-duty power stacker from Presto Lifts features 3,000 pounds of capacity with a 24-inch load center. A two-stage telescopic mast enables it to lift loads up to 125 inches, allowing it to service racks up to 10 feet high. Solid steel straddle legs can be adjusted to accommodate any type of pallet or skid.

Intercomp, a materials handling equipment manufacturer, introduced the CS750 Crane Scale for mediumduty industrial applications, including warehousing and shipping docks. The scale weighs between 100 and 1,000 pounds, and four D batteries power the device for 500 to 800 hours.



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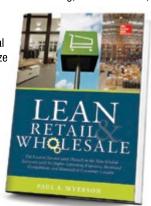
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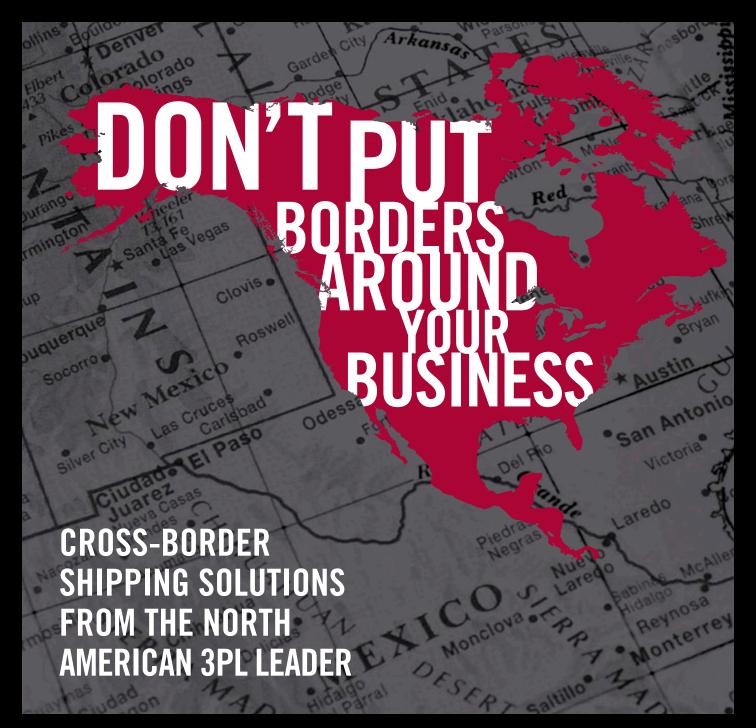




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