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"One of most successful public-partner partnerships has been with the Florida East Coast Railway and the State of Florida."

– Steven Cernak,
President and Chief Executive Officer,
Port Everglades

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Credit: Hamburg Sud


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ON THE COVER

On the Cover

A very large crude carrier berthed at the port of Corpus Christi gets ready to load a cargo of export crude oil. Port Corpus Christi is the fourth largest port in the United States in total tonnage (about 100 million tons per year), a gateway to international and domestic marine commerce. The story begins on page 30.

Image: Port Corpus Christi

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Editor's Note

Ports Under Pressure

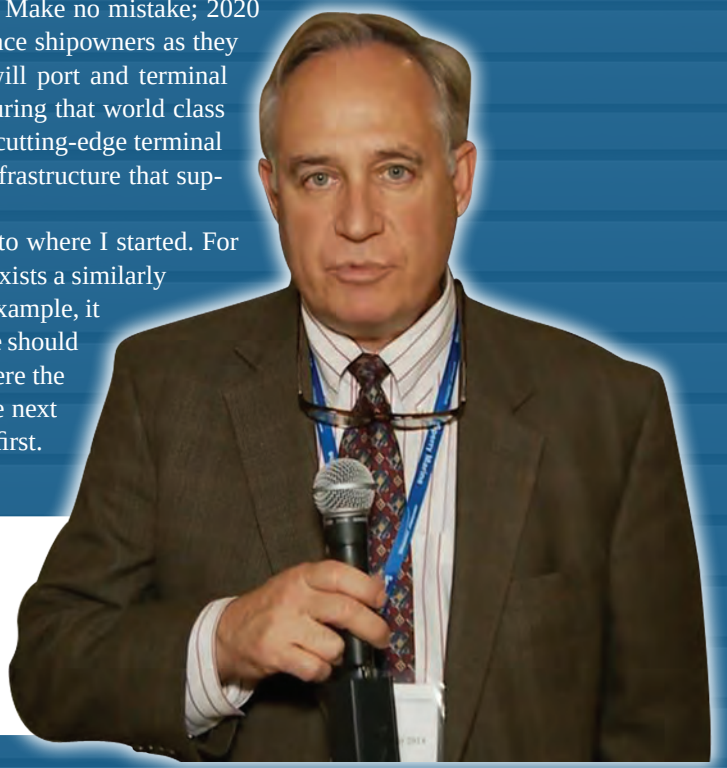
It occurred to me – actually while putting together the line-up for this MLPro edition – that when it comes to handicapping the environmental and regulatory pressures thrust upon the waterfront, much if not all of the emphasis seems to be on the burden endured by the vessels themselves. That oversight is indeed crushing, especially when it comes to shipowners trying to survive in the depressed bulk, container and/or offshore sectors. What's not so obvious is the identical pressure being exerted on ports, infrastructure and those other variables that make ocean shipping possible.

In this edition, PMSA Vice President Mike Moore explores the intersection of ports and environmental regulations, especially where it impacts the bottom line for deep draft, intermodal gateways. That impact is substantial. For example, the California Air Resources Board recently took action to ultimately achieve 100% zero-emissions in the Golden State's ports. They want that done by 2030. At an estimated price tag of $36 billion, some stakeholders have dubbed it a "declaration of war" on freight. Moore's unique perspective starts on page 14.

Separately and when ports are not plugging vessels into shore power, electrifying forklifts and trying to reduce both container dwell time and truck idling in the intermodal queue, there are many other issues to address. Among them is the effort to secure financing for desperately needed infrastructure improvements in a post-Panamax world. That's because all of the under keel clearance on the planet is of little to no value if the shoreside aspect of this equation – robust quays, modern and large capacity cranes aren't also in place. To that end, Barry Parker's look at port finance, so-called P3 projects in particular, is an enlightening window into how "it gets done" on the waterfront today. It sounds easy, but it is anything but.

While we're at it, it turns out that 'bunkers' isn't a dirty word anymore. That said; and in an era of low cost energy and related bunker costs, it would be a mistake to grow complacent about such an important part of the marine freight equation. Make no mistake; 2020 is just around the corner. Like the important decisions that face shipowners as they decide how to achieve environmental compliance, so too will port and terminal operators have to ramp up their game when it comes to ensuring that world class refueling infrastructure is in place. Without it, even the most cutting-edge terminal in the world can get bypassed if tomorrow's fuels and the infrastructure that supports them aren't also present.

In this case, it is appropriate that I finish by circling back to where I started. For every multi-million dollar problem facing ships today, there exists a similarly taxing challenge ashore. Some of that is interconnected. For example, it is difficult enough to decide what kind of bunker infrastructure should be laid into place when ports and terminal scarcely know where the ever-changing liner trades will decide to call next. Hence, the next time you think about ships and commerce, think about ports first.



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A FULL AGENDA FOR THE INTERNATIONAL CONTAINER TRADES

THE PAST COUPLE OF MONTHS HAVE BEEN CHOCK-A-BLOCK FULL OF MARITIME ACTIVITY IN THE INTERNATIONAL CONTAINER TRADES.

BY WILLIAM P. DOYLE

As the Big-3 Japanese Lines remain still on track to spin-off their container business units into a single stand-alone container carrier company, some delayed merger and acquisition activity is finally moving ahead. Separately, Congress has taken a keen interest in the Shipping Act.

Japanese Lines

On May 2, 2017, the U.S. Federal Maritime Commission (FMC), unanimously voted to reject the *Tripartite Agreement* proposed by Kawasaki Kisen Kaisha, Ltd. (K Line); Mitsui O.S.K. Lines Ltd. (MOL); and Nippon Yusen Kaisha (NYK). This agreement was styled as a joint venture seeking to comply with joint venture regulations under the jurisdiction of the FMC.

The decision by the FMC in no way precludes the Japanese carriers from merging their container trade business units into a single stand-alone company. Rather, the vote recognizes that the FMC cannot approve certain actions that would allow the three Japanese companies to act as a merged entity prior to

Image credit: Maersk

actually merging. That's because The Shipping Act does not provide the Federal Maritime Commission with authority to review and approve mergers.

Simply stated, the parties forming the joint venture retain their corporate identities and provide assets into the venture. Here, the Japanese Lines' stated goal was to break away from their parent companies and form a standalone container carrier company, thus jettisoning their corporate identities. In essence, what the companies were seeking was to front-run the company well ahead of any actual merger. In order to receive the benefits of a merger, one needs to first merge. The Commission has continuing regulatory oversight on agreements between established ocean common carriers and marine terminal operators.

Much of what the Tripartite parties were asking for revolved around pre-merger or pre-consolidation coordination. For instance, the parties were seeking authority to share information and conduct joint negotiations with third party businesses in the United States for as much as year in advance of any potential merger. Under the general antitrust laws, 'gun jumping' is forbidden and so is the practice of sharing competitive information or the premature combining of parties.

In addition, this proposed Tripartite Agreement sought authority to transfer shares or ownership interests in U.S. -based marine terminals owned and/or operated by the Japanese lines. Inasmuch as the pre-coordination activity of the liners is beyond the scope of FMC's jurisdiction, this same rationale applies to marine terminal assets in the U.S.

Previously, the Competition Commission of Singapore (CCS) approved the proposed joint container shipping venture between Japanese ocean carriers. Singapore granted the approval on March 24, 2017. Interestingly, the same day that the Singaporean approval was announced, the Japanese Lines filed their proposed Tripartite Agreement with the FMC.

The Japanese Lines have moved forward since the FMC's ruling. In Mid-May, the parties filed a notice with the European Union Commission (EC) that it would be forming a "full-function JV." The three Japanese companies plan to merge their global container shipping businesses and container terminal businesses, excluding terminals in Japan. The EC is expected to rule on the JV by June 28, 2017.

On May 31, 2017, the Big Three announced that their new company would be named the Ocean Network Express (ONE). Subject to global regulatory approvals, ONE would be headquartered in Singapore, with regional head offices based in Hon Kong, London, Richmond and Sao Paulo. The new entity is expected to remain in a member of THE Alliance along with Germany's Hapag-Lloyd and Taiwan's Yang Ming. The parties expect to officially launch the company in April 2018.

It is estimated that ONE would have a collective 1.4 million TEUs of capacity, making it the sixth largest container carrier in the world.

Mergers and Acquisitions

The ***Maersk Line acquisition of Hamburg Süd*** was approved by the Board of Directors of both companies on or about April 28, 2017. Completion is subject of approval of regulators. The price approved by the both companies is 3.7 billion EUR (or about 4.0 billion USD). In April 2017, the European Commission cleared the proposed acquisition of Germany's Hamburg Süd by Maersk Line, subject to certain conditions including selling off Maersk's Mercosul Line. Mercosul is a Brazilian cabotage trade operator.

Keeping Mercosul Line under the Maersk umbrella would have given Maersk Line an 80% share of trade to Brazil because Hamburg- Süd's ownership of Aliança Navegaçao. Maersk's Mercosul currently has 21% share, while Aliança claims 59% in the trade. Moreover, conditions of the approval require Hamburg Süd to withdraw from five consortia trade routes - Northern Europe and Central America/Caribbean (Eurosal 1/SAWC), Northern Europe and West Coast South America (Eurosal 2/SAWC), Northern Europe and Middle East (EPIC 2), the Mediterranean and West Coast South America (CCWM/Medandes), and the Mediterranean and East Coast South America (MESA).

According to the European Commission's analysis, the merger would have resulted in anti-competitive effects on the corresponding five trade routes. In particular, these links could have enabled the merged entity to influence key parameters of competition, such as capacity, for a very large proportion of those markets, to the detriment of their commercial customers and, ultimately, of consumers.

The takeover of Hamburg Süd was cleared by the US Department of Justice in March 2017. Maersk intends to maintain the business model of Hamburg Süd as well as the commercial structure in the regions. Upon completion of the deal, several Maersk Line senior executives will join the top management team of Hamburg Süd.

Separately, the ***merger between Hapag-Lloyd and United Arab Shipping Company (UASC)*** was completed. The merged entity will become one top-5 largest container carriers in the world. Its fleet will comprise over 230 vessels, with a total capacity of 1.6 million transporting over 10 million TEU a year on global trade lanes.

UASC was established in 1976 by six Persian Gulf states: Bahrain, Iraq, Kuwait, Qatar, Saudi Arabia and United Arab Emirates. Qatar Investment Authority and Public Investment Fund of the Kingdom of Saudi Arabia (PIF) are currently UASC's two majority shareholders, and will become new key shareholders of Hapag-Lloyd. UASC's other shareholders, including Kuwait Investment Authority, Iraqi Fund for External Development (IFED), United Arab Emirates and Bahrain's participation will be reflected with a combined 3.6% stake in Hapag-Lloyd in the form of free float shares.

Prior to the merger, UASC was implementing one of the

industry's largest and most technologically advanced new building programs, with 17 newbuilds on order; comprised of six 18,800 TEU and eleven 15,000 TEU containerships. These vessels will be the first ultra large containerships in the industry to be delivered 'LNG ready'; enabling the future use of dual fuel main engine technology.

Maersk is party to the 2M Alliance with Mediterranean Shipping Company (MSC).

Hamburg Süd who had not previously been party to one of the major Alliances will now be a member of 2M by virtue of its acquisition by Maersk. Hapag Lloyd is a member of the OCEAN Alliance with China Ocean Shipping and CMA CGM. UASC through merging with Hapag Lloyd will be subsumed into the OCEAN Alliance.

On the Hill

Both the U.S. House of Representatives and the U.S. Senate have been actively involved with shipping matters this year. As requested by House and Senate leaders, I participated in several rounds of discussions and drafting reviews throughout the legislative process. That legislative activity from the appropriate Committees in the Senate and House is outlined to follow:

U.S. Senate: Federal Maritime Commission Authorization Act of 2017 (Approved May 18 in the ***Senate Commerce, Science and Transportation Committee***)

- ***Preventing deceptive practices:*** *clarifies that a person "may not act, including holding itself out by solicitation, advertisement, or otherwise, as an ocean transportation intermediary unless the person holds an ocean transportation license issued by the Federal Maritime Commission."*
- ***Financial responsibility:*** *clarifies that "A person may not act, including holding itself out by solicitation, advertisement, or otherwise as an ocean transportation intermediary unless the person furnishes a bond, proof of insurance, or other surety—"*
- ***Reports filed with the Commission:*** *Expands the ability of the Federal Maritime Commission to require not just from common carriers but also from marine terminal operators, filing with the Commission of periodical or special reports, an account, record, rate, or charge, or a memorandum of facts and transactions related to the business of the marine terminal operator, as applicable.*
- ***Treatment of tug operators:*** *expands the exception to the exemption from antitrust laws to include tug operators under § 40307(b) – "This part does not extend antitrust immunity to – (1) an agreement with or among air carriers, rail carriers, motor carriers, tug operators or common carriers by water not subject to this part relating to transportation within the United States;"*
- ***Treatment of tug operators:*** *amends § 41105(4) to read: (4) negotiate with a tug operator, non-ocean carrier or group of non-ocean carriers (such as truck, rail, or air operators) on any matter relating to rates or services provided to ocean common carriers within the United States by those tug operators or non-ocean carriers, unless the negotiations and any resulting agreements are not in violation of the antitrust laws and are consistent with the purposes of this part, except that this paragraph does not prohibit the setting and publishing of a joint through rate by a conference, joint venture, or association of ocean common carriers."*

Image credit: Hapag-Lloyd

The Senate Bill can be found here: ***https://www.commerce.senate.gov/public/_cache/files/29bad739-ba4a-48f0-80c5-2d99b60e2f31/C27BD95522D37EC4D6FAA53FC091E03C.updated-cg.pdf***

U.S. House of Representatives: Federal Maritime Commission Authorization Act of 2017, H.R. 2593 (Approved by the House Transportation and Infrastructure Committee on May 24, 2017)

- ***Defines Port Services*** as "intermediary services provided to an ocean carrier at a United States port to facilitate vessels operated by such a carrier to operate and load and unload cargo at such port, including towage, cargo handling, and bunkering."
- ***Adds a new prohibition to § 41105 to protect marine terminal operators from concerted action by two or more common carriers that may not:*** "(9) negotiate with a provider of port services, other than a provider of towing vessel services, on any matter relating to rates or services provided within the United States by such provider, unless advance notice is provided to the Federal Maritime Commission of the intent and need for the negotiation, the negotiation and any resulting agreement are not in violation of the antitrust laws and are consistent with the purposes of this part, and, as determined by the Commission, the negotiation and any resulting agreement will not substantially lessen competition in the purchasing of port services provided at United States ports (this paragraph does not prohibit the setting and publishing of a joint through rate by a conference, joint venture, or association of common carriers)."
- ***Adds a new prohibition to § 41105 to protect domestic tug operators from a group of two or more common carriers that may not:*** "(10) negotiate with a provider of towing vessel services on any matter relating to rates or services provided within the United States by towing vessels."
- ***Amends § 41307(b):*** (b) Reduction in Competition. — (1) Action by commission. — If, at any time after the filing or effective date of an agreement under chapter 403 of this title, the Commission determines that the agreement is likely, by a reduction in competition, to produce an unreasonable reduction in transportation service, produce an unreasonable increase in transportation cost, or substantially lessen
- competition in the purchasing of port services the Commission, after notice to the person filing the agreement, may bring a civil action in the United States District Court for the District of Columbia to enjoin the operation of the agreement. The Commission's sole remedy with respect to an agreement likely to have such an effect is an action under this subsection.
- ***Adds at the end of § 41307(b) a provision that allows the FMC to consider a party's other agreements, when considering a pending agreement:*** "(4) COMPETITION FACTORS. —In making a determination under this subsection, the Commission may consider any relevant competition factors in affected markets, including, without limitation, the competitive effect of agreements other than the agreement under review."
- ***Reports filed with the Commission:*** amends § 40104(a) and expands the ability of the Federal Maritime Commission to require not just from common carriers but also from marine terminal operators and ocean transportation intermediaries (Senate bill does not include OTIs) to file with the Commission a periodical or special report, an account, record, rate, or charge, or a memorandum of facts and transactions.
- ***Amends the OTI license requirement found in § 40901(a) and clarifies that:*** "A person in the United States may not advertise, hold oneself out, or act as an ocean transportation intermediary unless the person holds an ocean transportation intermediary's license issued by the Federal Maritime Commission." Also amends § 40902(a) with a similar prohibition.
- ***Interrelated agreements:*** Amends § 41104 and adds that a common carrier, either alone or in conjunction with any other person, directly or indirectly, may not: (13) participate in a rate discussion agreement and a vessel sharing agreement, slot sharing agreement, space sharing agreement, or similar agreement for use of vessels by two or more ocean common carriers, unless the Commission has granted the parties an exemption pursuant to section 40103. Carriers in prohibited agreements in effect on the date of enactment shall have 1 year from such date of enactment to either (1) obtain an exemption from the application of section 41104(13) of title 46, United States Code, or (2) withdraw from the agreement as necessary to comply with the section 41104(13).

The House Bills can be found here:

H.R. 2593: ***https://transportation.house.gov/uploadedfiles/2017-05-23_-_fmc_bill_text.pdf***

Hunter amendment – approved: ***https://transportation.house.gov/uploadedfiles/hunter_020_xml_004.pdf***

The next steps include the full House and Senate to vote on their respective versions of the bills. Thereafter, both chambers should conference the bills and iron out any inconsistences between the bills, eventually resulting in a final bill that could become new legislation.

The Author

William P. Doyle

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THE INTERSECTION OF PORTS AND ENVIRONMENTAL REGULATIONS

CHARTING THE BEST ROUTE.

BY MIKE MOORE

Trade, federal preemption and states' rights have been the subject of debate, legal cases and jurisdictional battles for more than 200 years. During my time in the Coast Guard and serving as Captain of the Port, Puget Sound, we dealt with a preemption case involving tankers that went to the Supreme Court. Earlier in my career, it was the role of the federal pilotage in a state pilotage system, again decided at the Supreme Court. And, in my current role as Vice President of the Pacific Merchant Shipping Association, jurisdictional questions come up continuously, particularly around the role of the state.

The Reactive Evolution of Rules

International and coastal trade and businesses are best served by strong international and federal regulatory systems augmented only when appropriate by more local standards of care. A patchwork state-by-state system is simply suboptimal, leads to confusion and is more easily hijacked by political and special interests.

Over the decades, the maritime sector has experienced the waxing and waning of new environmental regulations. Significant accidents typically led to new legislation. This reactive approach led to significant improvements in marine safety and environmental protection after accidents. For example, shipboard boiler explosions of the 1800s killed thousands but became a thing of the past due to standards and inspections.

Vessel construction came to include watertight bulkheads and subdivision to prevent progressive flooding (as a result of the Titanic tragedy). Double hulled tankers and protectively located fuel tanks on cargo ships now better protect the environment. Critical system redundancies address loss of steering, navigation and communication capabilities. Vessel traffic management systems provide order and predictability. New technologies like GPS, electronic charts, virtual aids to navigation and Automatic Identification System (AIS) equipment improve navigation safety.

A New, Better Way

In the late 1980's, a more proactive approach emerged. The model of accident, outcry and reactive legislation was replaced by a focus on intervening before an accident. Analysis of leading indicators and incident trends led to pre-accident improvements. And, an emphasis on growing a safety and compliance culture within companies began to emerge.

Safety system audits with checks and balances started to become the norm. In 1994, Port State Control foreign vessel examinations replaced the old "tell the flag state" approach. This change began to quickly weed out the number of substandard vessels. Vessel oil spill volumes nationwide plummeted 93% from the 1970's to the turn of century with the vast majority coming from recreational, fishing and derelict vessels, not deep draft vessels.

Continuous improvement included regulatory and non-regulatory approaches. Companies, industry sectors and Harbor Safety Committees implemented standards of care and best practices to further safety and environmental protection.

Unnecessary Balkanization of Rules

And then, in the late 1990's a new dynamic began to develop. States more aggressively asserted jurisdiction into international and federal arenas. Special interests began to attack ports and freight; some with intention to improve operations but others focused on stopping specific commodities or projects.

States, local governments and citizens have every right to push for high levels of safety and environmental protection. And they should. However, doing so constructively requires knowledge about how safety and environmental systems work. Unfortunately, that knowledge is often lacking. Without professional and informed dialogue, battle lines are drawn and politics dominate. Jurisdictional overreach undermines cooperation and creates uncertainties over standards, compliance expectations and costs.

Industry, ports and those that depend on them do not thrive under a cloud of growing uncertainties. Jurisdiction, standards and expectations need to be clarified. Court cases have helped but tensions remain as states, NGOs and some elected officials push irrational policies unsupported by facts. I have seen proposals to prohibit oil transfers at night, to require tugs to escort tugs and to require equipment and capabilities that do

> *CARB ALREADY REGULATES EQUIPMENT USED TO MOVE CARGO ON AND OFF SHIPS, TRUCKS AND TRAINS. THIS EQUIPMENT CONTRIBUTES LESS THAN ONE PERCENT OF CALIFORNIA'S TOTAL GHG EMISSIONS. CARB'S DESIRE TO CONVERT THIS EQUIPMENT TO ZERO EMISSIONS BY 2030 WOULD COST UP TO $36 BILLION. SOME INDUSTRY LEADERS CALLED THIS UNILATERAL ACTION A "DECLARATION OF WAR" ON FREIGHT.*

not exist in hopes that doing so will lead to new inventions.

On the West Coast, we have clear examples of how problems arise from states overreaching their authority into the federal and international realms. California is a state with a long history of dancing to its own tune. The California Air Resources Board (CARB) took actions recently to direct new rulemaking on "indirect sources" and 100% zero-emissions Cargo Handling Equipment and 100% At-Berth use of shoreside power for all vessels at ports by 2030.

CARB already regulates equipment used to move cargo on and off ships, trucks and trains. This equipment contributes less than one percent of California's total GHG emissions. CARB's desire to convert this equipment to zero emissions by 2030 would cost up to $36 billion. Some industry leaders called this unilateral action a "declaration of war" on freight.

Port representatives pointed out CARB action was already impacting policy positions and would reduce throughput and market share. Trust was shattered and uncertainty created.

Ironically, cargo diversion caused by such a mandate would almost certainly increase the environmental footprint as cargo is rerouted.

Charting a Better Way

Conversely, in Washington State, industry, ports, agencies and NGOs came together to fund three port emissions inventories since 2005 to serve as a baseline. Stakeholders knew federal and international standards for ships were keys to success. Augmenting these standards with voluntary incentive-based programs made the most sense. The good news is that is exactly what happened, which resulted in dramatically lower emissions from vessels.

The international regime happened thanks to a consensus of all stakeholders supporting a treaty to reduce emissions from oceangoing vessels. The international framework approved by U.S. and Canadian governments led to the North American Emissions Control Area. This, in addition to federal requirements and non-regulatory incentive based programs, greatly reduced emissions with some pollutants decreased by over 90%. This is a continuing and impressive success story.

Separately, California also chose to develop unattainable and unenforceable ballast water rules. The unachievable standards have been delayed three times now. Meanwhile, the Coast Guard has a robust program including reporting, exchange, treatment – and enforcement on every Port State Control examination. Type approvals for ballast water treatment systems are being issued and equipment is being installed at costs that are projected to reach as much as $4 million per vessel. While not cheap, this is a well thought out, highly-tested approach that avoids the chaos, uncertainty and cost of a state-by-state approach.

In Washington State, there was another push to establish a ballast water ship fee to essentially copy California. The effort was turned back after legislators learned more about the federal program. Ironically, Washington and California have the same level of protection even though one state has a large multi-million dollar ship fee funded staff and one does not.

Oil spill prevention continues to be a lightning rod issue in the PNW. Record keeping since 1972 shows "zero" spills from cargo vessels calling on Puget Sound ports due to a grounding or collision. Continuous improvement is key but states are pressured to push their jurisdiction due to 'sky is falling' mantras coming from special interests wishing to see shipping and projects curtailed. Puget Sound has lost 900 annual cargo vessel calls since 1992, yet special interests like to claim that an explosion of shipping activity is risking our very way of life.

I'd be remiss discussing federal (versus) state jurisdiction without mention of the longest standing regulatory issue – pilotage. We need safe, efficient pilotage at fair and reasonable rates for safety and environmental protection. But when pilotage costs of single port call exceed $40,000 on a large container ship, as it did in Seattle then it is time to review the system. Federal pilotage versus state pilotage may become part of debate once again highlighting the federal/state jurisdiction issue. Will reforms actually result or will pilotage dating back to the Phoenicians continue the status quo?

The last example is the most recent. Environmental permitting for port projects is being hijacked by political and special interests to kill projects. This relatively new strategy seeks to require the inclusion of carbon use from cradle to grave of virtually anything connected with a project. The goal is to deny the project completely or to require onerous permit conditions to mitigate impacts well beyond the operation or control of the terminal.

The obvious conclusion is that a state-by-state patchwork of complicated and often contradictory rules and regulations creates more harm than good. People who make their living in the logistics and maritime trade industries need to have certainty and predictability. Federal and international rules as well as collaboration with stakeholders at the local level have created robust marine safety and environmental protection systems. Our challenge is to continuously improve these systems, not replace them with a confusing patchwork, driven by the political winds of the day rather than operational and technical realities.

Cargo, jobs and economic well-being of ports, regions and our country depend on trade and the efficient movement of goods. Cargo diversion due to ill-advised regulatory overreach, confusion and cost does not do the economy or environment any good.

Experience demonstrates how to chart the best route to effective and efficient environmental stewardship – we should take that route. Otherwise, cargo, jobs and economic well-being of ports, regions and our country will most certainly take another.

The Author

Captain Mike Moore

is a Vice President with the Pacific Merchant Shipping Association representing ocean carriers, tug companies, agents and container terminal operators. He is a graduate of the Coast Guard Academy and retired in 2002 as Captain of the Port, Puget Sound. He holds a Master of Marine Affairs degree from the University of Washington and serves in board leadership positions for the Alaska Maritime Prevention & Response Network and an Emergency Response Towing Vessel Compliance Group in Washington State.

Navigating the Rough Waters of Misclassification

Over the last few decades, international trade has exploded, driven in large part by tremendous improvements in efficiency and transportation cost reductions related to the containerization of freight.

By Steve Bojan

Reaping success depends on an intricately orchestrated chain of events where owner-operator independent contractors move containers to and from ports; haul them to the warehouses or rail yards then to their final destination – stores and factories across the country.

Today, the relationship between motor carriers and the owner-operators has never been more complicated. A big part of truckload transportation since deregulation, the independent contractor model is dependent on whether these owner-operators are truly classified as independent contractors or actually misclassified employees, deserving of employee status which includes wages and benefits.

Owner-operators, who would like the benefits that are extended to employees, and state and federal agencies and union forces, who would like to collect wage and salary taxes, have come together to cast a shadow over this business model. This has compounded the proliferation of class action lawsuits that have piggybacked on top of government agency actions.

In the maritime industry, the movement of containers from the docks to warehouses, rail yards or consignees must be seamless and timely. When this doesn't happen, efficiency goes down, costs go up, containers get lost, customer timetables are compromised and competition becomes stiffer.

Adobestock courtesy Nightman1965

> SEVERAL RECENT SETTLEMENTS OUT OF CALIFORNIA PITTING TRUCKING COMPANIES AGAINST OWNER-OPERATORS CLAIMING THE LATTER SHOULD BE CLASSIFIED AS EMPLOYEES HAVE RAISED A RED FLAG FOR MANY MARITIME EMPLOYERS. IN FACT, ONE OF THE LARGEST DRAYAGE OPERATORS IN CALIFORNIA SOUGHT TO PROTECT ITSELF BY CONVERTING TO AN ALL-EMPLOYEE MODEL, WITH ONLY COMPANY-OWNED UNITS. JUST OVER A YEAR AFTER THE SWITCH, THE COMPANY FOUND IT COULD NOT COMPETE WITH PRICING FROM PORT-TRUCKING COMPANIES USING OWNER-OPERATORS, AND THEREFORE CLOSED THEIR OPERATIONS IN THE STATE.

Your Line of Defense

When owner-operators are not being treated as an independent transportation vendor, they are more likely to challenge the motor carrier or maritime company they're working for in a court of law to cover their loss expenses and disability. And, this is only the tip of the iceberg in terms of the exposure drayage companies and other container carriers could face. Once an independent contractor is reclassified, all of the issues and exposures associated with an employee come into play. This will be a significant financial shock to an operation that has previously had very few employee-related assets.

Maritime fleet companies accused of misclassifying owner-operators will face significant exposure, both legally and financially. This will open their business up to scrutiny, including questions such as: Are the owner-operators eligible for employee benefits; paid time off, salaried vacation days and short-term disability? Are they being compensated according to market standards? And, an area of particular focus because of the potentially high price tag: If there is a loss of cargo or an accident, is the independent contractor covered under the motor carrier's workers' compensation policy?

As a maritime owner or operator, there are a number of steps you can take to protect yourself. Here's a list of 8 Best Practices for Maritime Companies:

1. Draft a proper lease agreement:

The lease agreement between the motor carrier and the independent owner-operator will be the motor carrier's first line of defense if a lawsuit should arise. Lease agreements should be drawn up and regularly reviewed by an experienced attorney. The lease agreement should clearly spell out that the owner-operator is an independent contractor and not an employee, and include numerous other provisions to support that assertion. For example, it might specify that when the motor carrier leases a vehicle to an independent contractor, the independent contractor is still free to do business with other motor carriers; the independent contractor has the ability to refuse loads or choose his own routes or that the independent contractor is required to hire any person they need to help in performing the duty of their job. The lease agreement should also spell out requirements for injury insurance, responsibility for cargo claims and equipment specifications.

2. Know who you're doing business with:

Make sure you are dealing with transportation companies that are addressing the issue of misclassification so your company isn't drawn into lawsuit due to the negligence of a third party vendor. If necessary, even include a stipulation in your contract with all third parties to ensure they are dealing appropriately with their owner-operators, as there are a number of organizations out there that still haven't adopted improved labor practices.

3. Educate your employees and owner-operators:

Take the time, effort and expense necessary to make sure your staff isn't treating owner-operator port-truckers as employees. For example, institute policies and procedures that avoid telling owner-operators how exactly to complete tasks or provide with them specific rules, like where to fuel up or what route they should take to deliver a load. Educate the owner-operators on your relationship with them as well. Let them know which aspects of their job they are responsible for.

4. Keep an arm's length:

When it comes to tracking your product along the roadways, keep an arm's length relationship with the owner-operator. For example, independent contractors could be deemed employees if they buy tires where and when the company requests; fuel up at locations the company requests; don't pay their own escrow or are paid by the hour or salaried, instead of being paid by the load. This also includes reprimanding the owner-operator for actions you deem inappropriate or not up to your standards. You might reprimand a non-compliant employee, but a true independent contractor shouldn't be reprimanded. Understand that they're not your employee and make sure your relationship reflects that in every encounter.

5. Know who is on your yard:

A lot of the strength in the misclassification movement is driven

by unions. Do not let unauthorized people on your yard and avoid having drivers or others congregate so that agitators can misrepresent the current structure.

6. Minimize wait times:

Long wait times at the ports can be a potent driver of dissatisfaction among owner-operators, resulting in relatively low pay for long hours, causing drivers to become disgruntled and initiate conversations about fairness. It's in your best interest to do everything in your power to minimize wait times. Creating good processes that move people in and out quickly keeps owner-operators happy. Have a scheduling process in place that lets drayage companies plan effectively. Educate dock workers that truckers should be in and out of their facilities as quick as possible. Make sure that everybody respects the time of the truck driver.

7. Make sure you have the capacity to move the product:

As the owner-operator, independent contractor model of business is increasingly challenged, and legal suits become common place, more and more fleet carriers may move out of the space. This will increase demand and therefore, it'll be critical to make sure you have capacity to move the product.

8. When in doubt, consult an attorney:

Each state and local region will have their own new and existing regulations and unique labor climate when it comes to working with the owner-operator independent contractor. When you're in doubt, consult an attorney to make sure you're in the clear.

Stay Up on Local Laws and Issues

There is a thin veil between the shipping/drayage company and the owner-operator, independent contractor. If this veil isn't held tight, the shipping company could be construed as the employer, resulting in enormous tax, salary, worker's compensation and other insurance implications.

Several recent settlements out of California pitting trucking companies against owner-operators claiming the latter should be classified as employees have raised a red flag for many maritime employers. In fact, one of the largest drayage operators in California sought to protect itself by converting to an all-employee model, with only company-owned units. Just over a year after the switch, the company found it could not compete with pricing from port-trucking companies using owner-operators, and therefore closed their operations in the state.

This is just the beginning. This issue is not only likely to persist, but is likely to spread to other coastal areas around the country in the coming months. In order to survive—and even thrive—today's shipping companies must evaluate their relationships with owner-operators. Review the list of best practices above, consult a local regulatory compliance attorney and create policies and procedures to ensure you're maintaining the right relationships from here on out.

The Author

Steve Bojan is Vice President and Transportation Practice Leader, Risk Services Division, HUB International.

A Location Strategy for

By Guy T. Noll, Maritime Principal Consultant, Esri

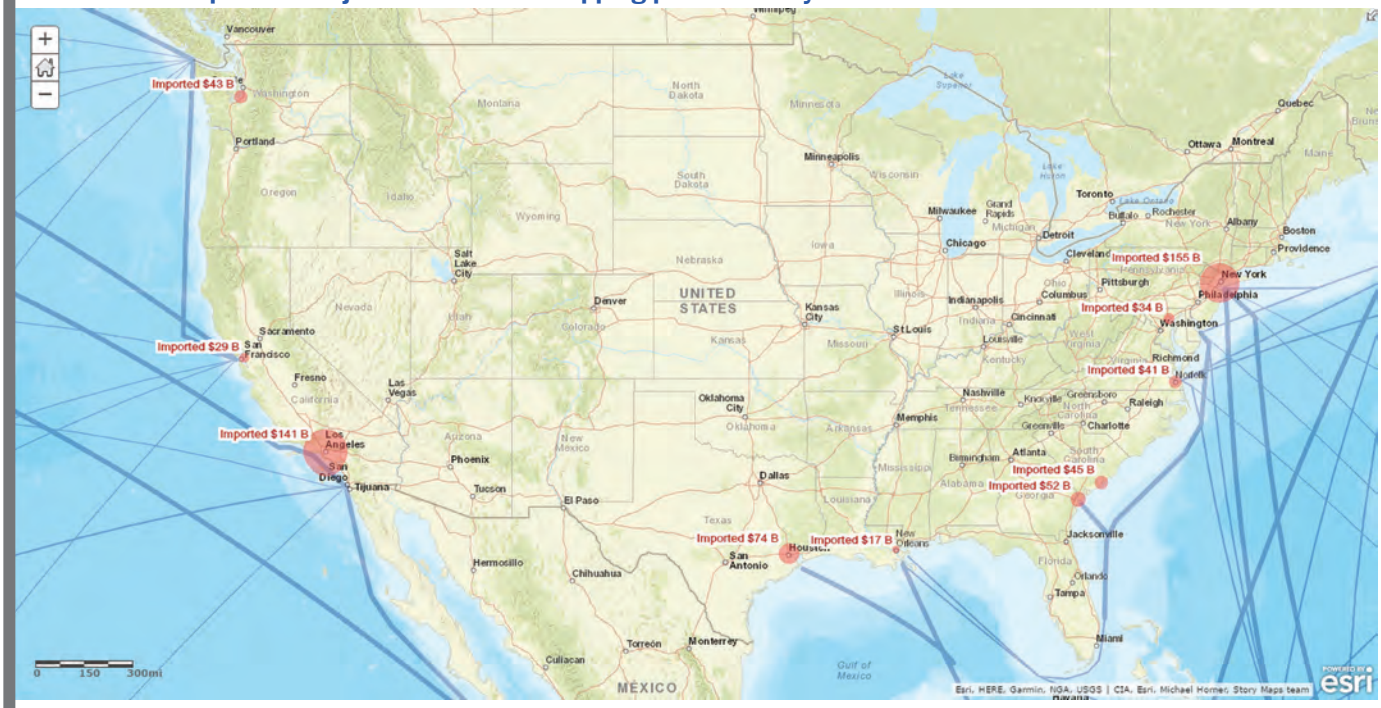
"When you've been to one port, you've been to one port." So goes a saying exemplifying the understanding among the maritime community that every port is inherently unique. Each port has an exceptional identity and, likewise, an exceptional way in which its problems must be presented, addressed and solved. Each port's challenges are location-specific, from the range of tide levels and other environmental conditions to governance by political jurisdictions. There are also economic drivers determined by location.

One of the most critical factors in U.S. cargo pricing is the Harbor Maintenance Tax (HMT), based on the value of cargo transiting ports, to pay for maintaining and operating navigational channels. This tax creates a fund that is used almost exclusively to support shipping in ports that have channels supported by the U.S. Army Corps of Engineers and require regular maintenance to improve under keel clearance (UKC). The HMT has affected the cost of cargo at different ports in ways specific to their location. As we assess the changes in the way this tax has been challenged and reaffirmed over the years—culminating in the latest, the Water Infrastructure Improvements for the Nation (WIIN) Act of 2016—it is clear that imports from deepwater West Coast ports act as the primary funding for the improvements in under keel clearance along the Gulf of Mexico and East Coast ports.

The revelation that ports are contributing funds disproportionately generally results in discussions of how to best attain full usage of money by more equitable distribution. This is an American Association of Port Authorities (AAPA) talking point, and it is a positive step toward addressing the myriad needs of our marine transportation system beyond mere channel dredging. Harbor berths, for example, need to be deep enough for the water level at every stage of the tidal cycle to accommodate the loading of ships. However, if ports and their stakeholders continue to look at these issues only from a local or regional context, they miss the opportunity to address the greater challenge of national port resiliency within the HMT funding structure.

Three scenarios, all assuming the fully funded Harbor Main-

The value of imports at major United States shipping ports for the year 2014.



Funding Port Infrastructure

tenance Trust Fund (HMTF) is still in use by 2020, highlight the need to look at ports as a unified structure for national economic security:

Scenario 1—Winners Keep Winning

The HMTF is primarily used as an appropriations offset for UKC management to continue funding U.S. Army Corps of Engineers dredging operations. These funds will enable the continuation of building capacity for Neopanamax freight traffic as well as deepening berths alongside in the major ports. Continued HMT and cost-share revenue will provide sufficient funding under WIIN to complete the projects.

For the ports that cannot create the perceived need for these investments, no substantive change will occur, and larger traffic is going to pass them by. Not only that, but the ability to create short sea shipping routes from the "winner ports" to the lesser ports will be impacted by both the cost of protectionism of re-importing containers or semi-processed bulk goods, and the complex and opaque rules governing HMT rebates.

Scenario 2—Lake Wobegon

Much like Garrison Keillor's fictional town Lake Wobegon, “where all the children are above average,” HMT revenue continues to grow while the sharing behavior to ensure equity is somehow achieved. This would occur only as major and favored port UKC projects are replaced by other port requirements, continuing to the midtier ports and maybe even some of the harbors of refuge and subsistence ports under some scoring criteria that would manage to prioritize regionalism. Such criteria would need to be transparent to achieve this outcome.

Scenario 3—A Broken System

Suppose a long-term, national challenge to the ports system occurs. The frame of reference for such an impact would be something even greater than the 2012 port clerks strike in Los Angeles/Long Beach, which cost the region $8 billion, and more substantive than the trucker strike of 2015. While these shutdowns can be mitigated through port-to-port agreements, an environmental crisis would be beyond that level of control. What if, for example, global water levels increase due to melting of Greenland and Antarctic ice sheets? In some models, such increases could occur rapidly, like the observed changes in glacier thinning in Alaska, Nepal, and Patagonia. Such a discontinuity in the historic record of sea level would create wide-ranging impacts for the nation, including waterfront parcel loss, reinsurance losses, and coastal pollution. It would also imperil the infrastructure at many ports, from laydown areas to wastewater facilities.

Charting the Route through Future Challenges

Port infrastructure investments will be put at greater risk with sea level rise, and mitigation of these risks will require rebalancing HMTF usage from deepening channels to shoreside facilities management. This will have higher differential impacts at the smaller ports with less robust connections to shore transportation hubs, but it may also show some local resiliency as changes are made over a decade or so.

What can be done? Ports need to become active in managing these infrastructure risks. Per WIIN, key steps must be identified: assess current infrastructure with a focus on risks due to flooding at key shipment transfer points; monitor local changes through actively measuring the trends at the port; create regional failover points for transshipment activity, similar to the ways that strikes have been mitigated in the past; develop an environmental consequence plan for ports that mitigate the impacts from non-point-source pollution, flooded laydown areas, storage tanks, and pipeline corridor damage; and develop plans for ballast water management.

Now is the time to create dialog with U.S. Maritime Administration (MARAD), National Oceanic and Atmospheric Administration (NOAA) and other agencies and stakeholders to develop scenarios for the high-risk/lower-probability environmental or other sea level changes that could have national impacts on the HMTF funding stream, and determine how to maintain the revenue for improving infrastructure.

Shipping involves more than simply carrying goods from point A to point B. A successful port strategy is about safely and sustainably carrying the right goods to the right place by the right time and for the right price. The information to mitigate shipping risk must be sensitized to where the shipment is headed, or the national shipping framework may fail when challenged by the large environmental changes that affect the shore. A resilient shipping system means making location and time the centerpiece of port infrastructure planning.

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A Closer Look

PORTS

Ports under Public Private Partnerships

Because any port is only as efficient as its weakest link, so-called P3 funding will be the key to driving the future intermodal equation.

Adobestock CREDIT SB Goodwin

By Barry Parker

Seaport and marine terminal finance draws from a wide range of funding sources, often combined to pay for a particular project. Ports are public goods, and as such, sometimes they also see varying contributions from Federal, state, regional, and local entities. At its lowest common denominator, the port business is all about connectivity; hence 'port' projects will frequently include an intermodal component, linking the actual dockside to the port's hinterlands – the typical origin of outbound cargo, or ultimate destination for inbound shipments.

Paying for all of that has evolved over time. In places like Long Beach, California, where a multi-billion dollar Alameda corridor project eventually provided excellent rail access into the port complex, the realization that much of port spending will actually be made outside the gates and away from the docks is the right thing to do. Earlier this year, interim Port of Long Beach Chief Executive Duane L. Kenagy told MLPro that, going forward, a great deal of the port's capital program – about $1 billion – will be to invest in rail facilities. He added, "The first leg of that journey is on rail, and then a short drayage out into the inland empire." But, he cautioned, "That has to become commercially attractive in order for that to work." That kind of so-called P3 project also brings with a different risk model, for all stakeholders.

SITREP 2017: Infrastructure 101

U.S. infrastructure (which includes the waterfront and surface rail and road connections) is in desperate need of investment. In the American Society of Civil Engineers (ASCE) 2017 Infrastructure Report Card, Ports earned the grade of C+, and the Inland Waterway system grade of D. About those grades, the ASCE report advised, "As ships get bigger, congestion at landside connections to other components of the freight network increasingly hinders ports' productivity. Similarly, on the water side, larger ships require deeper navigation channels … to remain competitive globally and with one another, ports have been investing in expansion, modernization, and repairs."

The ASCE estimates that ports plan to spend $154.8 billion from 2016 to 2020 on expansion, but they point to a huge shortfall on the landside, which ASCE said is scheduled to receive only $11 billion in new federal funding for freight improvements through 2020, in the face of projected needs totaling $29 billion. Kurt Nagle, President and CEO of the American Association of Port Authorities (AAPA), said: "The port industry has identified a need of $66 billion in federal investments to port-related infrastructure over the next decade."

Because of the sheer diversity of port ownership and organization, as well as geographic contours – there is no one specific financing formula. Businesses (not governments) are responsible for movements of cargo. Quite often, port finance will include a private component alongside the government investment. Such deals are broadly referred to as Public Private Partnerships (P3), with each transaction having a unique structure. PPPs will only grow in importance under the Trump Administration. Lawyers Albert E Dotson, Jr. and Eric Singer from the Miami-based firm Bilzin Sumberg, wrote recently, "The new plan is anticipated to rely upon public-private partnerships (P3s) to bridge the gap between the cost of needed infrastructure and available government dollars."

> *P3s are never going to be enough to supplant government spending, but government expenditure is no longer enough if the breakdown of vital public facilities is to be reversed.*
>
> – AIG white paper

Government funding comes in a variety of flavors. An important initiative has been the Department of Transportation's (DOT) Transportation Investment Generating Economic Recovery (TIGER) program, which has provided finance for dozens of port projects since its inception in 2009. According to the DOT, the grants have provided $5.1 billion of funding for projects since 2009. ASCE data says that port projects have comprised 11% of TIGER grants. However, the newly released Fiscal 2018 Budget does not provide any funding for TIGER.

Another set of DOT grants, dubbed FASTLANE, came out of the 2015 Fixing America's Surface Transportation Act. The ports, who are eligible to apply, have waxed enthusiastic because projects related to intermodal freight are eligible for the awards. Fiscal 2016 awards announced in July 2016 included the Port of Savannah ($44 million for a multi-modal connector facilitating on-dock rail), Portland, Me ($7.7 million for projects including upgraded rail and highway crossings), Boston ($42 million for improvements at the Conley Container Terminal) and New York ($10.7 million for various rail connection enhancements).

A Washington, DC group advocating infrastructure investment, the Coalition for America's Gateways and Trade Corridors (CAGTC) applauded the 2018 budget, stressed that Federal grant programs attract private capital (at a ratio of 3.5x) and noted: "Public-private partnerships will not be the solution to all infrastructure needs, they can help advance the Nation's most important, regionally significant projects."

P3 in Practice

The roster of projects in south Florida (a P3 friendly state), from the bigger access projects to the very specific business-related efforts, provides a good example of how varied funds sources – including those from the private sector – can be combined. In Miami, the new tunnel for trucks opened in mid-2014, nearly four years after construction began. The tunnel, which links the interstate highway network directly with the containership berths on Dodge Island, enables trucks to circumvent the congested downtown streets. A 'win-win' for everyone.

Financing for the tunnel was done through a web of highly complicated deals. In classic PPP style (a structure known as "Design-Build-Finance-Operate-Maintain," where construction risk stays with the private participants), an investor consortium, consisting of Meridiam Infrastructure (a fund packager which raises money from institutional investors) and Bouygues (a construction behemoth worldwide, with headquarters in France) owner of the project's equity, constructed the tunnel (and then got paid).

The State of Florida, through its Department of Transportation (FLDOT), paid for 50% of design/construction (handled by the construction division of Bouygues), originally pegged at around $670 million. The remaining 50 percent of the design/construction costs were divided up between Miami-Dade County (which oversees the port in its role as a "landlord") and the City of Miami. The operations and maintenance are subcontracted to a private "concessionaire" until 2044, when ownership reverts back to FLDOT. According to the US DOT, total capital cost of the project was $1.1 billion, and total payments (including annual "Availability Payments" paid each year to the private concessionaire) are estimated to be $2.65 billion – much of it coming from the state. The private investors – insurance companies and pension funds who have invested through the Meridiam Infrastructure North America Fund – see their return over decades.

Separately, and to accommodate the bigger post-Panamax vessels, a $220 million dredging project for deepening the channel to 52 feet, was paid for by the state ($112 million), with Miami-Dade County investing the $108 million balance. The state also contributed $20 million, approximately half the cost of four new cranes, with a reach of 22 containers, to serve the larger vessels. A related project – this one to improve intermodal freight connections – linking the port with the rail network, was paid for jointly by the state, the Florida Department of Transportation (FDOT), and the Port of Miami. TIGER grants played a role in funding this project, and privately owned Florida East Coast Railway also provided capital.

Further up the coast, at Port Everglades, which is operated by Broward County, expansion is in the works. Following a late 2016 authorization, the port has embarked on an expansion plan (with completion in 2022) that includes dredging to deepen its entrance channel and turning basin from its present 42 feet depth to 50 feet. The estimated $374 million cost is set to split mostly between the Federal government and the Port, with money generated solely from user fees. The state is contributing a small amount towards design. In late May, Port Everglades announced plans for a $437.5 million expansion project where new berths for larger vessels would be added (alongside an expanded turning area), and crane rail infrastructure for new Super Post-Panamax cranes on order would be added.

Port Everglades has now received approvals from Broward County for its Port Everglades International Logistics Center, LLC (PE-ILC), a foreign trade zone (FTZ) that will be completed in 2019, replacing an obsolete facility. The port, which encompasses Hollywood, Dania and Fort Lauderdale, is no stranger to P3 arrangements. Steven Cernak, the port's President and Chief Executive Officer, told MLPro, "One of most successful public-partner partnerships has been with the Florida East Coast Railway and the State of Florida."

Mid-2014 saw the opening of an Intermodal Container Transfer Facility (near dock rail) that brings containers close to the berths via the FECR, instead of draying them through a congested part of Fort Lauderdale. In this deal, as described by the port, "Port Everglades contributed 42.5 acres of land … valued at $19 million. Construction costs are estimated to total $53 million, which will be paid through $18 million in grants through FDOT's Strategic Intermodal System program, a $30 million FDOT State Infrastructure Bank loan, and $5 million from FECR's capital plan. Mr. Cernak, who is also Chairman-elect of the AAPA, noted: "Together, we were able to build a 43-acre Intermodal Container Transfer Facility that can handle both domestic and international freight."

In the new PE-ILC transaction, a long time tenant at the existing FTZ, International Warehouse Services, Inc. (IWS) will be leasing a newly constructed facility which will offer a wide range of logistics services, including 3PL warehousing, government inspections, and refrigerated storage. Eric Swanson, Florida-based Principal at Treadwell Franklin Infrastructure Capital, LLC (TFIC), described his firm's role, saying, "TFIC is focused on the development of projects that are related to core infrastructure such as seaports, airports, and other transit nodes. Our role is to structure, lead and manage the transaction, including attracting the appropriate financing."

The deal's structure sees a major private component, with Mr. Swanson telling MLPro, "The local partnership that includes TFIC, IWS and ANF Group (a construction company) is doing the predevelopment work and will attract equity and debt financing to the project. The project is a 30-year lease

Port of Miami tunnel view

Credit: Daniel Azoulay; Smith Aerial Photos

One of most successful public-partner partnerships has been with the Florida East Coast Railway and the State of Florida.

– Steven Cernak, Port Everglade's President and Chief Executive Officer

Credit: Broward County's Port Everglades

with an option for another 20 years. IWS will be one of the anchor tenants of the project." He added, "Port Everglades will be providing a milestone payment of $3 million which is essentially to accommodate the site work required on the project as well as other needs. The Port has been very cooperative in working with our group to allow private financing, but has not provided any other funding mechanism."

The ABC's of PPP's

For all the publicity and attention given this unique type of financing today, Mr. Cernak stressed that port executives are still learning about the structuring of P3's and that going forward, collaboration would be the key to future successes. "Public-private partnerships are both a challenge and an opportunity," he insists, adding, "We must come together to share experiences on benefits and risks that will help us progress in developing P3s and attract future investments." Separately, TFIC's Swanson offered that "P3 projects are essential to the growth and efficiency of Port operations. Used properly by both private and public entities, P3's can be effective tools for the execution of Port master plans and operations."

In a recently delivered AIG white paper entitled, "The United States: ***The World's Largest Emerging P3 Market: Rebuilding America's Infrastructure***," the future of P3 structured transportation and infrastructure projects is painted as the way forward for many reasons. But, if the U.S. Department of Transportation (USDOT) defines P3s as "contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery and financing of transportation projects," then the AIG advice that "All private sector participants will be challenged to accept risk beyond their comfort zone and what had traditionally been the regime in other project delivery methods; and a significant portion of that risk, will not be transferrable to conventional insurance coverage," should be given equal attention.

In the end, a lot of good is coming from new and innovative financing packages, especially where it involves ports and infrastructure. But, warns AIG in the same white paper, "P3s are never going to be enough to supplant government spending, but government expenditure is no longer enough if the breakdown of vital public facilities is to be reversed." A cursory look at the state of the infrastructure on our inland waterways probably makes that clear enough.

Another Kind of P3

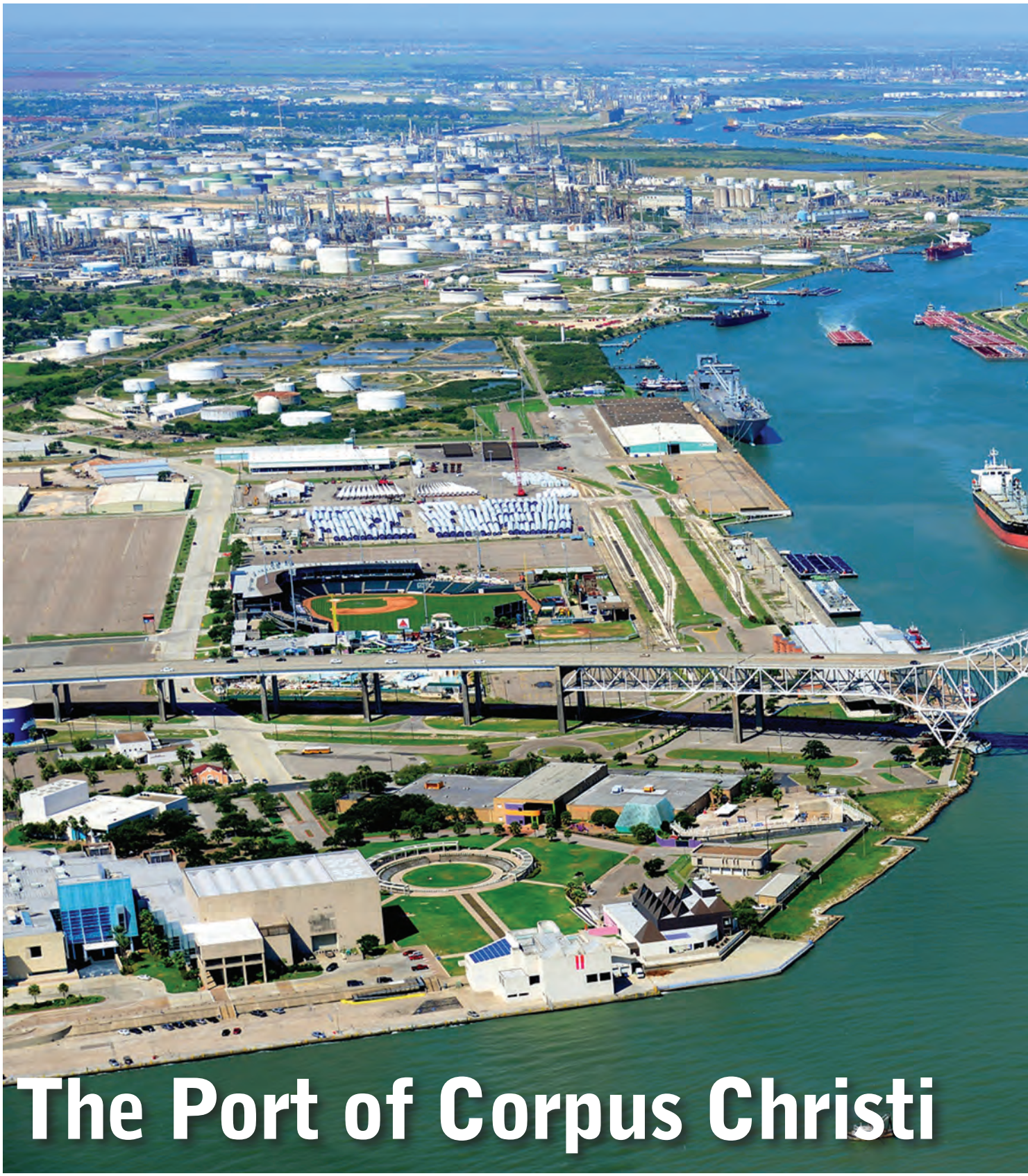
Miami, Florida is set to enter a PPP deal of a different sort. In March 2017, cruise giant Royal Caribbean (RCL) broke ground on new terminal that will provide a homeport for its largest cruise vessels. In a recent regulatory filing, RCL reveals: "In July 2016, we executed an agreement with Miami Dade County (MDC), which was simultaneously assigned to Sumitomo Banking Corporation (SMBC), to lease land from MDC and construct a new cruise terminal at PortMiami in Miami, Florida. During the construction period, SMBC will fund the costs of the terminal's construction and land lease. Upon completion of the terminal's construction, we will operate and lease the terminal from SMBC for a five-year term. We determined that the lease arrangement between SMBC and us should be accounted for as an operating lease upon completion of the terminal." At a time that changes are coming to lease accounting, such a lease would remain off the books – not showing up on RCL's balance sheet. When the deal was signed, local media sources reported, "The County agreed to pay $15 million for new roads to the terminal and surface work, while Royal Caribbean said it would finance the $247 million development (SMBC loan). The cruise company will also pay the county $9.5 million in annual rent."

The Author

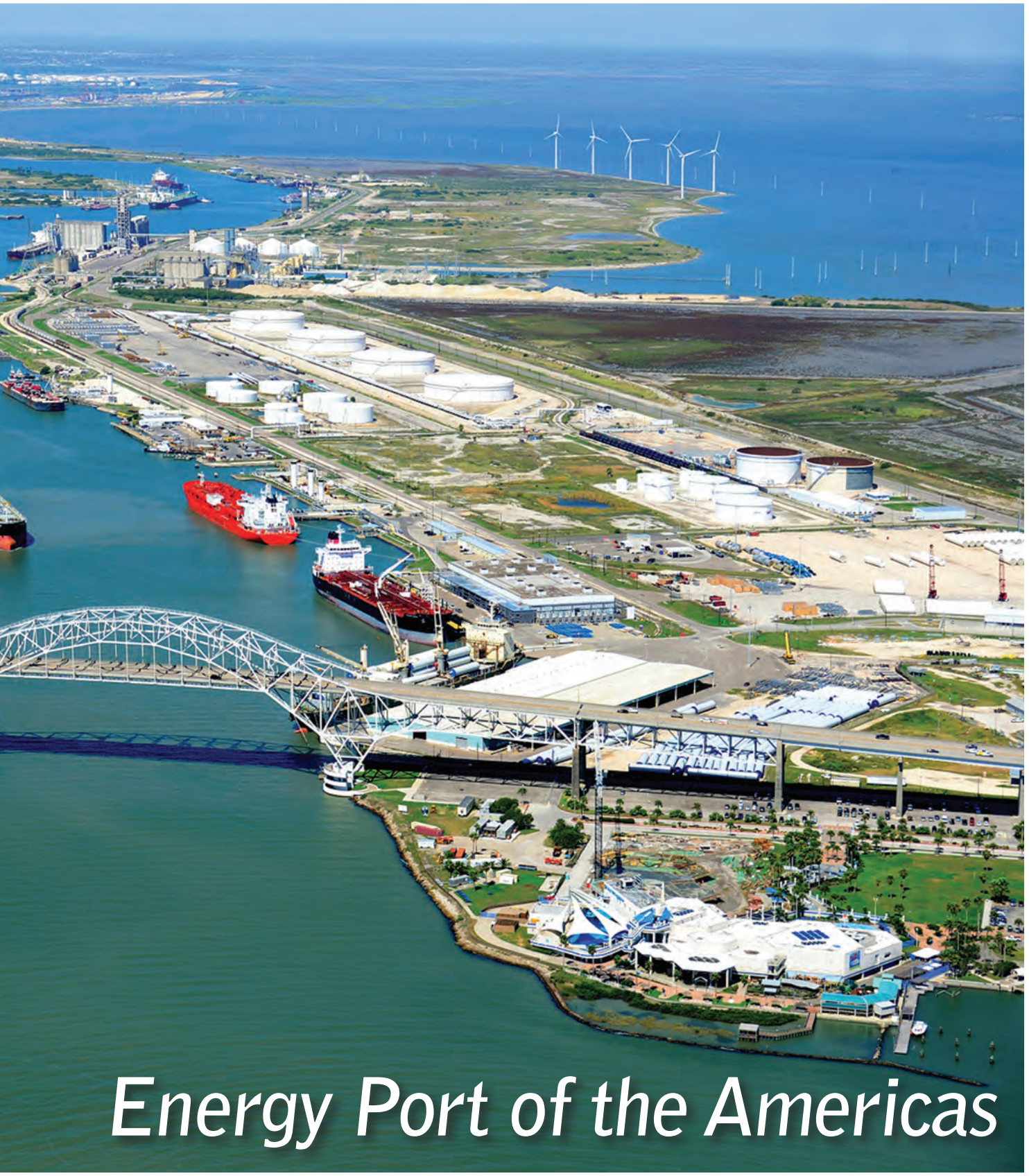
Barry Parker

of bdp1 Consulting Ltd provides strategic and tactical support, including analytics and communications, to businesses across the maritime spectrum. The company can be found online at www.conconnect.com

Credit: Broward County's Port Everglades



The Port of Corpus Christi



Energy Port of the Americas

By Greg Trauthwein

The Port of Corpus Christi lives up to its moniker *'Energy Port of the Americas,'* as the movement of energy in and out dominates the port's history and future. John P. LaRue, Executive Director, Port Corpus Christi recently visited ***Maritime Logistics Professional***'s headquarters in New York City to discuss the nearly $50 billion in investment projects driving the port forward.

"Let's just start with what we are and what we are not," said LaRue. "We are not a container port. Up until a few years ago we were an oil import port (serving) three refineries: Citgo, Valero and Flint Hills Resources. We also have two grain elevators; and the only facility that we operate directly is dry bulk."

Pure and simple, the Port of Corpus Christi is an energy hub, connecting the Gulf of Mexico with the vast U.S. inland waterway system, positioned between the country's two largest shale oil and gas plays, the Permian Basin and Eagle Ford. Port Corpus Christi is the fourth largest port in the United States in total tonnage (about 100 million tons per year), a gateway to international and domestic marine commerce.

While the general assumption may be that anything energy-centric would languish today given the three-plus year global swoon in energy pricing, Port Corpus Christi has held its own. Cheap energy has attracted foreign industrial investment in the port, and the decision by the U.S. government in 2015 to allow the export of oil means that today Port Corpus Christi exports more oil than it imports. (Last year it imported 15.7 million and exported 29.7 million tons of crude. For a look at the Top 10 imports and exports, see **Chart 1**.)

Top 10 Commodities, Import vs. Export

	Inbound		Outbound	
Rank	Commodity	Tons	Commodity	Tons
1	Crude Oil	15,761,584	Crude Oil	29,714,938
2	Fuel Oil	4,637,798	Gasoline	6,066,359
3	Gas Oil	4,246,925	Diesel	4,531,766
4	Bauxite	3,244,344	Sorghum	2,652,955
5	Feedstock	2,581,068	Feedstock	2,588,666
6	Aggregate	1,672,308	Condensate	2,045,939
7	Naphtha	1,072,998	Gas Oil	1,844,819
8	Reformate	708,888	Fuel Oil	1,653,480
9	Benzene	599,896	Cumene	1,336,286
10	Fertilizer	439,804	Naphtha	1,334,888
11	Other	3,218,693	Other	11,520,094
TOTALS	***	**38,184,306**	***	**65,290,190**

Chart 1: source (Port of Corpus Christi)

"We saw a significant downturn in tonnage and revenue (last year), as we were down about 10%, in some categories even more," said LaRue. "This year has started to bounce back in a big way, and we have seen an uptick this year from just about everybody. The ability to export crude has made a big difference."

Illustrating the point using a top Port Corpus Christi customer [Oxy], that firm has made quantum leaps in the export of crude oil, going from zero barrels in 2015 to five million barrels in 2016, with a projection to export 35 million barrels in 2017.

$50 Billion in Investment

"About five years ago with the shale revolution, logistics started to change," said LaRue. "We received a lot of interest from mid-stream oil companies that wanted to move oil to other U.S. ports, which drove a mini-construction boom with new docks."

The mini-construction boom in new docks is one piece in a mega-construction boom in and around the port, with nearly $50 billion in investment over the past four years to today. "That's more than some states," LaRue said.

While cheap energy courtesy of the current global oil and gas price swoon conspired to reduce port revenues last year, there is a silver lining, LaRue said. "We have a lot of new industries coming in and we've been able to attract a lot of foreign direct investment because – not just because of the shale oil – but we have a lot of natural gas, and there are a lot of companies right now that want natural gas to use in their processes."

Austrian steel maker Voestalpine is one, as it is using gas to heat iron ore and make it into an iron briquettes, importing the raw materials and exporting the briquettes to Europe. MG is another, an Italian PET manufacturer, currently building one of the largest PET plants. The list goes on, with OxyChem involved in a JV producing ethylene; Chinese TPCO finishing a plant this year to manufacture oil and gas pipe, and Cheniere, which is building an LNG plant in Port Corpus Christi, a project which in and of itself has 3,500 people working today. "We have a lot of work for a lot of people right now," LaRue said. "Between TPCO, M&G and Cheniere, we probably have 5,500 to 6,000 construction workers active today (in the port) … and this is in a community of 300,000. The drop in oil prices has had its impact as a lot of the people that were working the shale formations have come down and are working construction for us."

While each of these projects is substantial, the showstopper was recently announced; a joint venture between ExxonMobil and SABIC for a new $10 billion, 1,300-acre plastics manufacturing complex on the South Texas Gulf Coast.

The project is under engineering review and design now, and when it comes to fruition it is touted to be the largest ethylene cracker in the country. The numbers surrounding the project are Texas-big, as it is projected to create 6,000 jobs during peak construction, create 600 new permanent jobs at

the site with a $90,000 average annual salary plus benefits, not to mention the $22 billion in economic gains for the state during construction and the $50 billion in economic gains for the state during first six years.

Interestingly, LaRue sees even more room for growth, particularly in the cracker market. "I think this is really the start of a wave of larger announcements," he said, adding, "You see continued demand for basic plastics with a growing middle class in India, China and across Asia. Ethylene and Propylene are the building blocks, and there are many investments in cracker-type projects."

Digging Deeper

While LaRue is paid to attract businesses to his port, he is a fairly pragmatic in his assessment. He reiterates its proximity to the two major shale plays as a significant plank in the port's financial success, and also notes the positive business climate in Texas, "which is more conducive to energy operations."

"One of the unique things about Port Corpus Christi is we own our own oil docks," said LaRue, noting that it provides a significant revenue stream for the port. "Now with the shale we are seeing more and more activity."

"Most ports receive little or no revenue from (private dock) facilities 'inside the fence line' of the oil companies," he said. But at Port Corpus Christi, the port gets a percentage of the wharfage for cargo unloaded at private docks, as the port owns the land along the ship channel that ship must cross. "This is a unique revenue stream for the port." For vessel owners, shippers and manufacturers, LaRue is quick to mention these advantages:

- ***Air Attainment:*** *The port is in Air Attainment,*

We saw a significant downturn in tonnage and revenue (last year), as we were down about 10%, in some categories even more. This year has started to bounce back in a big way, and we have seen an uptick this year from just about everybody. The ability to export crude has made a big difference.
– John P. LaRue,
Executive Director, Port Corpus Christi

meaning the process to build a plant is cheaper and shorter than a port not in attainment.

- ***Free Flowing:*** *Lack of vessel congestion, with normally only 4 to 6 ships waiting to get in. "We don't have fog, we don't have a big tidal fluctuation (normally only 1 to 2 feet)."*
- ***Rail Service:*** *There are three rail services serving the port, providing reliability and competitiveness.*
- ***Proximity to Mexico:*** *The port is 2.5 hours from the Mexican border. Mexico is a large and growing trade partner with Port Corpus Christi, with $1.7 billion in exports to Mexico in 2016 (vs. $1.4 billion in 2015), and $115 million in imports from Mexico in 2016 (vs. $88 million in 2015).*
- ***Stability:*** *The U.S. is a stable environment, and LaRue counts the stability of the U.S. as a factor in attracting foreign manufacturing dollars.*
- ***Cheap Energy:*** *Plentiful supplies of natural gas that, unlike other areas of the world, is more stable in price and availability, not beholden to political whim.*

But Port Corpus Christi has its challenges too, with the number one being attaining the federal funding to dredge its 36 mile long ship channel from its current depth of 47 feet to the authorized depth of 54 feet. "Infrastructure is always the biggest challenge," said LaRue, and in step with most every commercial port in the world, dredging tops the chart. Port Corpus Christi received the authorization to dredge its ship channel to 54 feet in 2007, but federal funding has not followed. "The project is clean and there are no environmental issues with dredge material. We just we can't get it through the Administration," said LaRue. "Right now if you are not in the President's budget (because there are no earmarks) you can't start the project."

Rather than sit idle and hope, Port Corpus Christi is investing its own $32 million to get phase one of the project started, caring for the stretch from the Gulf of Mexico to inside the bay. "It's called accelerated funding, and there is some risk, because if it is never funded, we have to eat it," said LaRue. "But they will fund it. The total project cost to dredge to 54 feet is $350 million, but if we just sit here and wait for them to do it, it will never get done. We're going to put up $140 million (in total)."

Meanwhile the port will wait on a re-energized discussion on infrastructure funding in Washington. "This is the type of project that should be on someone's list, as the benefits are almost all export driven. If they get serious about infrastructure funding, we can get this project done in three to four years. If they don't it could drag on for seven or eight years."

Website: **http://www.portcorpuschristi.com/**

Port of Corpus Christi:
THE Energy Port of the Americas

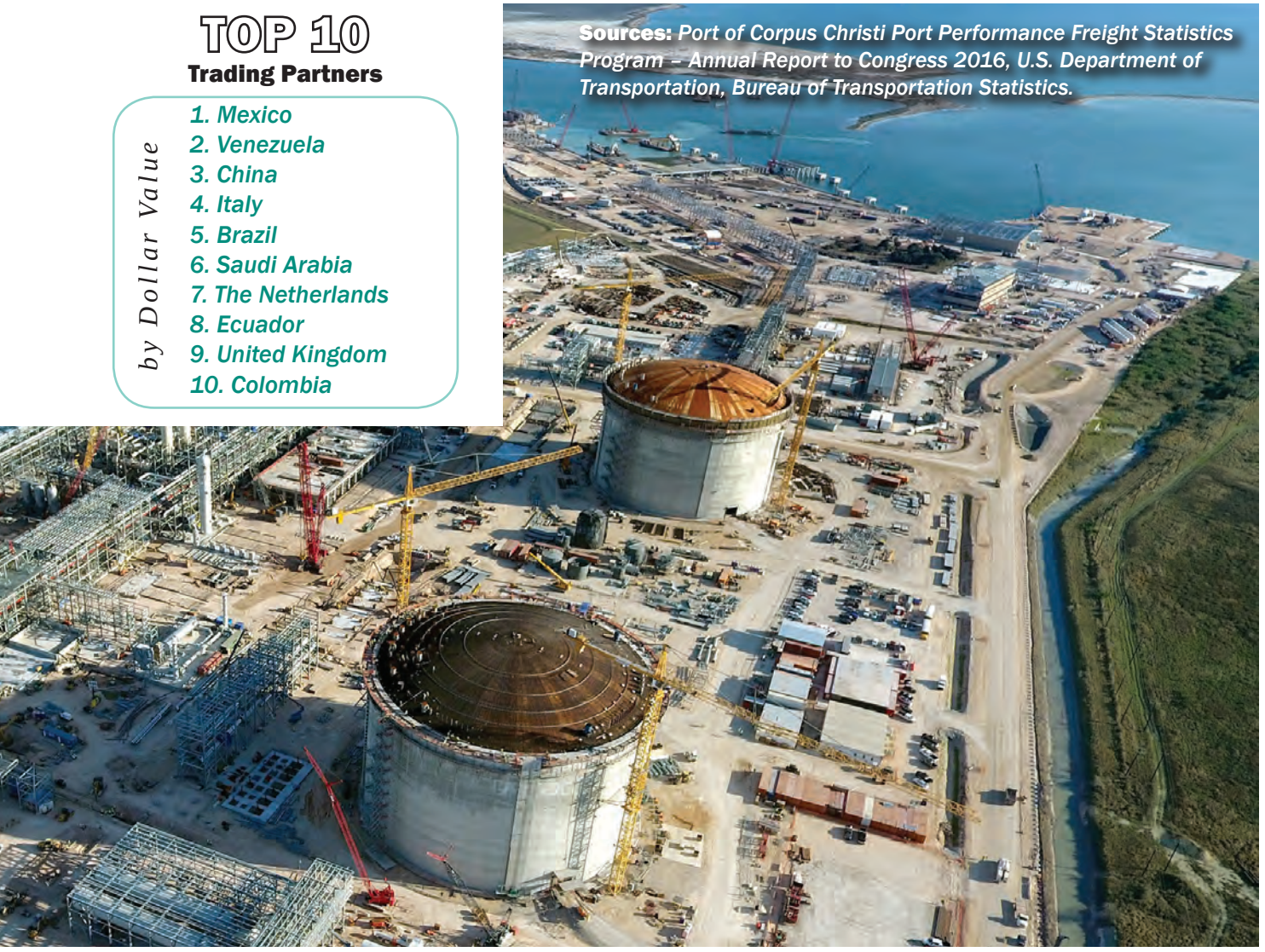
The Port of Corpus Christi provides access to the U.S. inland waterway system from its location on the western Gulf of Mexico. It handles liquid bulk, RoRo, break-bulk, dry bulk and containerized cargo through multiple terminals. By the numbers, the port looks something like this:

- ***$50 Billion: Amount of investment projects, foreign and domestic, in past 4 years or underway.***
- ***11,016: Total vessel calls in 2015***
- ***$350: Cost in millions to dredge the channel into Port of Corpus Christi from 47' to 52'.***
- ***$140: Investment in millions that Port Corpus Christi is spending to start dredging its channel to 52'.***
- ***85.7: Total tonnage (domestic and foreign), in millions, in 2015.***
- ***80.2: Percentage of total tonnage classified as Petroleum and Petroleum Products.***
- ***47: The depth, in feet, of the current channel into Port of Corpus Christi.***
- ***52: Authorized channel depth to be achieved when project (approved in 2007 under WRDA) finally makes it into the president's budget.***

TOP 10
Trading Partners

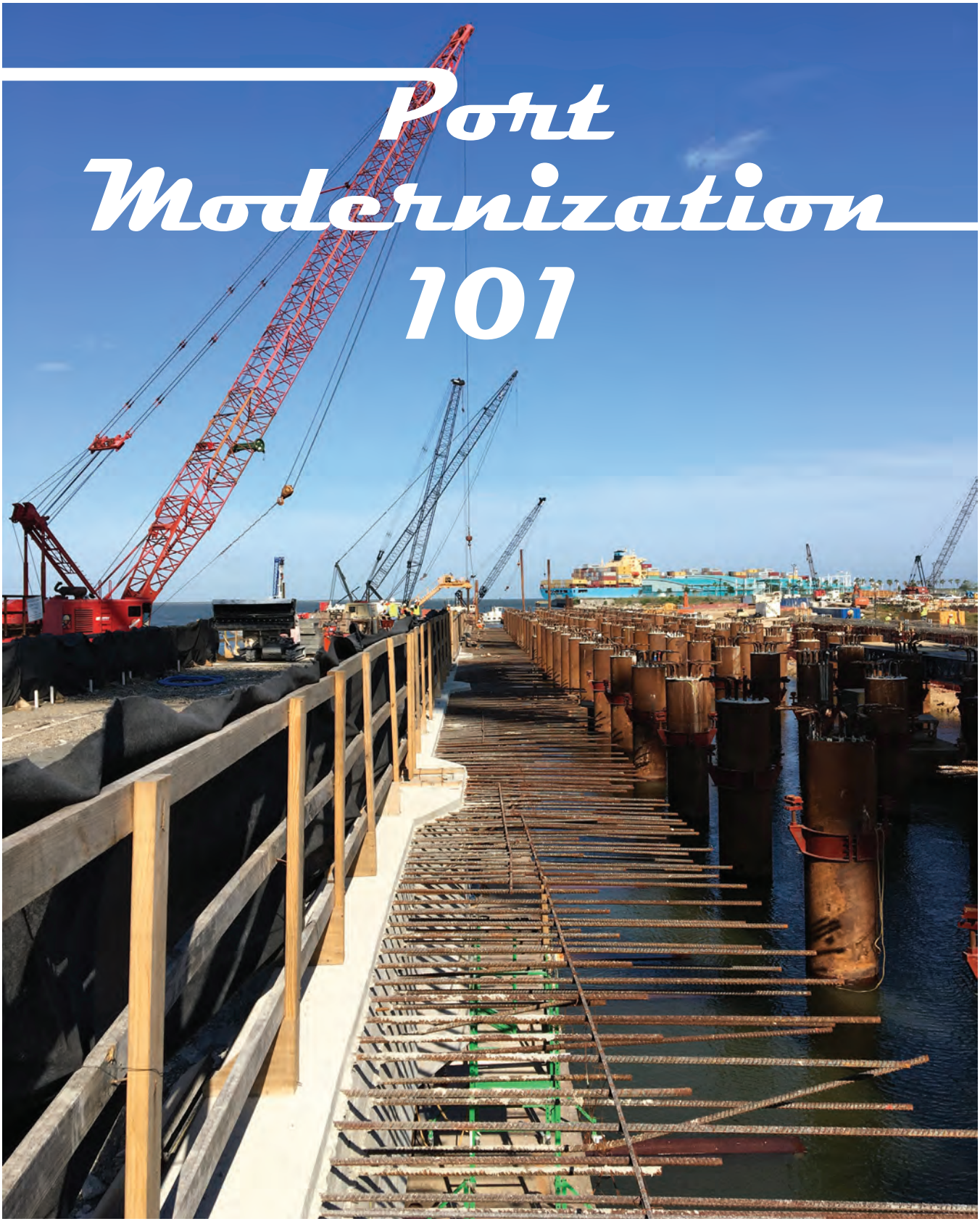
by Dollar Value

1. *Mexico*
2. *Venezuela*
3. *China*
4. *Italy*
5. *Brazil*
6. *Saudi Arabia*
7. *The Netherlands*
8. *Ecuador*
9. *United Kingdom*
10. *Colombia*



Sources: *Port of Corpus Christi Port Performance Freight Statistics Program – Annual Report to Congress 2016, U.S. Department of Transportation, Bureau of Transportation Statistics.*

Port Modernization 101



Concrete construction of the water side crane beam progresses behind drilled shaft construction

As marine vessels double in size, Port Houston leverages McCarthy Building Company's experience and track record as it looks to maintain its enviable rank among U.S. ports. A massive renovation and growth project is now underway in the Bayou City.

By Joseph Keefe

It is heating up again in the Nation's second busiest port, and not just because the dog days of summer are almost upon us. Houston, like other major, blue water gateways to the United States, is in the midst of several major infrastructure upgrades. At the heart of that effort is McCarthy Building Companies, a U.S. based construction firm that won the contract to accomplish not one, but three different projects in the Bayou City's largest economic engine.

Actually, McCarthy has a longstanding relationship with Port Houston. Bob Rogers, McCarthy Vice President of Marine Operations, told ***MLPro*** this month, "Since 1991, we've completed 22 projects with the Port worth about $450 million. Our expertise with port facilities is quite broad – we build marine structures – docks, wharves, piers - container storage yards and everything in between."

Rogers, who joined McCarthy in 2000 as a project engineer, has throughout his 16-year McCarthy career, contributed to the success of several projects including the reconstruction of IH 410 in San Antonio, the Port of Houston Bayport Terminal Wharf 1, and MARAD's Beaumont Layberth Facility, just to name a few.

It turns out that Houston isn't the only port that's ramping up for the expected 'new normal' from increasingly larger, deeper and heavier marine traffic emanating from the expanded Panama Canal. For its part, McCarthy has worked for several ports along the Texas gulf coast in recent years, completing in 2012 an 800 foot concrete bulk cargo dock for Port Freeport that included about 700,000 cubic yards of mechanical and hydraulic dredging. "We also constructed the Port of Port Arthur's last major wharf expansion – a 2,800 linear foot concrete dock on concrete cylinder pile foundations," said Rogers, adding, "Additionally, we work for many private clients in the energy, oil/gas and midstream markets building ship docks, liquid terminals, and site development work such as tank foundations and pipe racks."

PORT HOUSTON HEATS UP

At Port Houston, McCarthy is engaged in three different projects; specifically the Barbours Cut Wharf Rehabilitation (Phase 2), which began in January 2016; the Bayport Wharf 2 project and the Barbours Cut C1 Middle Yard and East End Reconstruction, both of which commenced last year, as well. All of these efforts involve the goals of increasing capacity and modernizing the existing facilities to meet the requirements of tomorrow's traffic.

As one of the busiest ports in the world and consistently ranked either first or second for U.S. ports in terms of tonnage, imports, exports and total tonnage, the projects aim to help the Port maintain that ranking. Doubling down on its existing traffic and that which is sure to come, to and from the expanded Panama Canal, the port upgrades are substantial. The Barbours Cut Wharf 2 Rehabilitation project, for example, involves an upgrade to support larger cranes that can accommodate post-Panamax vessels, while the Bayport Wharf 2 construction will create 670 linear feet of new wharf for a container off-loading facility. Work at the Container Yard One and East End at Barbours Cut Terminal consists of the reconstruction of 40+ acres of container yard space.

For Barbours Cut, Port Houston has purchased ZPMC cranes which are scheduled to arrive from China in mid-2017. McCarthy's contract requires them to ensure that the crane rail is installed and new electrical service to the cranes is working and ready to receive them upon delivery. Those new ship-to-shore gantry cranes will most likely be installed by the manufacturer directly.

The 10-acre Container Yard 1 is 40 years old, and the 30-acre East End Yard currently serves as a storage area for miscellaneous cargo. To handle the additional container cargo that will be generated by post-Panamax vessels, the entire 40-acre area is being upgraded to a full service container yard, which requires a new 18 inch-thick RCC paving section, trench drain system, electrical service and high mast lighting.

For the Barbours Cut Wharf 2 rehabilitation project, McCarthy will also be involved in the dredging effort. Rogers says that this is not often the case, since maintenance dredging is generally performed under separate contracts that include federal funding and allow use of USACE owned placement areas.

McCarthy's peak collective workforce between the three projects will top out around 200. Rogers explains, "We are anticipating almost 700,000 total man hours to complete these projects, 350,000 of which will be self-performed by McCarthy's direct hire labor." Each project is being administered under a separate contract, so each project has different start and

"We are anticipating almost 700,000 total man hours to complete these projects, 350,000 of which will be self-performed by McCarthy's direct hire labor."

– Bob Rogers, McCarthy Vice President of Marine Operations

completion dates but all are underway concurrently. Making all of that possible, the work involves contracts that run into the hundreds of millions of dollars.

ON THE WATERFRONT: *SPECIAL CHALLENGES*

Like any capital project at an operational facility, avoiding impact to daily operations is of paramount importance. Working in a federal port of entry is a challenge; in of itself. Rogers explains further, "Port Houston is one of the busiest container ports in the country, and our work has to be performed within very tight site constraints. A lot of coordination goes into providing safe and efficient access for concrete trucks, hauling trucks, material deliveries, and our workers - all critical to maintaining the project schedule. We also have to closely coordinate our water-side construction activities as to not interfere with frequent vessel traffic. As you can imagine, barge mounted equipment isn't safe to operate in a 4 foot swell from a passing deep draft vessel."

Modernization efforts such as the Barbours Cut work are unique because, in the course of rehabilitating 40 year-old facilities, it is also true that engineering standards have changed over time. For example, structural and electrical requirements of modern day container terminals are vastly different than they were 40 years ago. Retrofitting and modernizing an existing structure while extending its overall service life is challenging. Rogers adds, "Often times the engineer is basing their retrofit design off of the original designer's plans, which may or may not be accurate once the existing structure is uncovered."

Beyond the minutia of the work itself, waterfront construction involves both waterborne work and shore-side traditional work. Managing a workforce and the insurance requirements on the waterfront can be complicated. Longshore issues and/or the Jones Act can both apply on the same assignment. Rogers shrugs off the challenge, saying, "On certain Port projects we often face exposure to both types of work, but it's not unusual. Our Master Insurance Program, including Workers' Compensation, provides coverage that complies with both USH&L and Jones Act requirements. It's really standard course of business

Contract Name	Time Frames (Approximate)	Contract Value
Barbours Cut Wharf Rehabilitation Phase 2	Jan 2016 – July 2017	$38,748,550
Barbours Cut C1 Middle Yard and East End Reconstruction	July 2016 – Aug 2018	$46,948,923
Bayport Wharf 2:	Aug 2016 – Dec 2017	$35,434,616

Source: McCarthy Building Companies

for constructing projects at a container or dock facility."

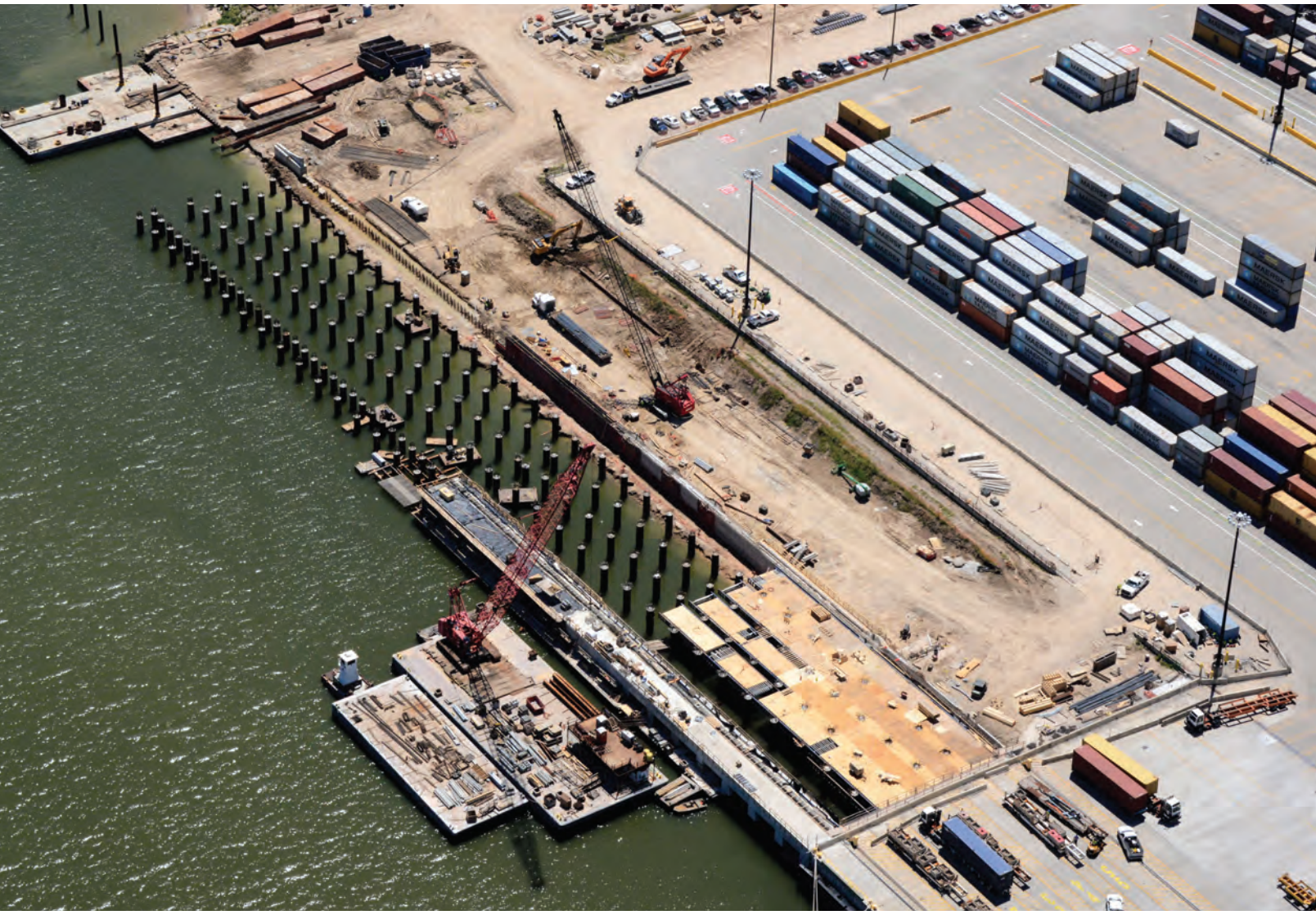
Nevertheless, and while McCarthy is one of the Nation's most diverse contractors, Rogers concedes that marine projects are unique. "Whether they require a waterfront or landside construction approach, we understand the safety and execution challenges that come with these types of projects. We strive to keep all of our employees with marine experience engaged in our current marine projects, while at the same time training and developing the next generation of marine builders as we continue to expand our portfolio."

PORT HOUSTON: *NOT MCCARTHY'S FIRST RODEO*

McCarthy and Port Houston have a long history together. For example, McCarthy only recently completed the Barbours Cut Wharf Rehabilitation Phase 1 project as well as the Bayport Wharf 1 project. Bayport Wharf 1 project was the 1,300 linear feet dock section that the current Bayport Wharf 2 project ties into. Of note, the Bayport Wharf 1 project was twice the size of Wharf 2, but was completed in only four more months.

The deepened Panama Canal has appreciably moved the needle for marine construction firms here in the United States, at least, says Rogers, at a handful of the nation's larger ports. Houston is no different.

Rogers explains, "Port Houston is unique in that not only are they retrofitting the existing Barbours Cut terminal, but are also concurrently building the entirely new Bayport Terminal, where we've been actively working since 2005. Most large U.S. container ports have been preparing for the canal expansion for quite some time, so projects like these have been carefully programmed, budgeted, planned, and implemented over the course of several years. Now it is crunch time – the canal is open, and ports are scrambling to implement projects they may have been delaying over the past few years." And, that's where McCarthy, its experience and expertise come in.



Turnkey Logistics:

THE CROWLE

60 years of experience in the Puerto Rico trade corridor provides Crowley with the knowhow, means and staying power for the 60 that will surely follow.

By Joseph Keefe

In March, the announcement that three new, ship-to-shore container cranes were scheduled for delivery to Crowley Puerto Rico Services' Isla Grande Terminal in San Juan would normally qualify as routine logistics PR. In this case, the electric-powered cranes will be used to load and discharge containerized cargo being carried aboard Crowley's two new liquefied natural gas (LNG)-powered, Commitment Class ConRo ships. The first of those innovative vessels is expected to be in service in the second half of 2017 and the other in the first half of 2018.

When all of that is complete, Crowley's quest to bring quicker, more efficient, and cost-effective freight services to the Island Commonwealth might be viewed as 'complete.' But, that's hardly the case. That's because the 125-year old firm has been catering to this market for more than 60 years, always with an eye towards improvement to service, safety, the environment, and yes – the bottom line, too. As mid-summer approaches, it is clear that they are succeeding and the work continues on all points.

In a prepared statement issued this Spring, John Hourihan

Jr., Crowley's senior vice president and general manager, Puerto Rico services, said simply, "Our new terminal infrastructure will help us enhance Puerto Rico as a shipping and logistics hub for the Caribbean Basin and beyond, and open up many new opportunities for our customers." Those remarks underscore what it takes to provide turnkey, door-to-door service, as opposed to just moving freight as a sideline into the U.S. Commonwealth.

Serving the Puerto Rico market from the 85-acre Isla Grande Terminal since 1954, longer than any other Jones Act operator, Crowley has more than 250 Puerto Rico employees. The commitment to the trade goes far beyond just moving cargo. That said, the number one ranked ocean carrier between the island and the U.S. mainland boasts more weekly sailings and more cargo carried annually than any other shipping line. That's about to get even busier; as faster, more efficient ships begin to call at the Caribbean's most modern marine terminal.

A Niche Model that Works

Crowley has always offered its local service in a RO/RO mode where the container and chassis stay together. An extension of the 53-foot mainland trucking model, the end-to-end service has evolved over time into a routine practice. Hourihan explains, "By being RO/RO on barges, we're not limited by the size equipment that we use, either by its length, its height, or its width. So these 53's are larger size not only in their length, but in their width." Hence, it was always Crowley's intention to allow U.S.-based shippers also looking for destinations in Puerto Rico to have the flexibility to duplicate the same shipping patterns prevalent on the U.S. mainland.

"We dubbed it as being a 'bridge' to Puerto Rico," said Hourihan, adding, "The ability to handle '53's', as well as the ability to handle 102"-wide containers, is very limited in terms of the container vessels that can accommodate that. Most container ships are set up to handle the 96-inch wide and the 40-foot length box. When we needed to replace the assets we've had in service for all these years – our triple-deck barges – we actually built these vessels to be able to replicate that in being able to handle 53 and 45 foot, 102-inch wide containers."

The 53-foot model does have its limitations. In many cases, cargo that 'weighs out' in the 53-footer won't also fill the cubic capacity of that same box. But, for Crowley's Puerto Rican freight model, those problems typically don't apply, especially since the practice is more an extension of the U.S. over-the-road freight model. Shippers over time developed their carton sizes, palette sizes, and the number of loads they can get into a domestic container. "Puerto Rico just became another U.S. destination," says Hourihan, adding, "In our trade, it's not a trans-loading concept or view – it's more just those customers that ship domestic product to Akron, and they also ship that same domestic product to San Juan."

Frank Larkin, Crowley's senior vice president and general manager, logistics and commercial services, agrees. "We view the customer supply chain into Puerto Rico as an extension of the U.S. domestic transportation system. So obviously, the 53-foot (van) is a cornerstone of the U.S. land transportation system and so to offer the greatest amount of seamless flexibility in terms of the supply chain and what we have had for the last 60 years, these can 'roll on, roll off' with our barges. That was a natural extension of the 53."

At the same time, there remains a robust 40-foot trade that goes into Puerto Rico. That includes 20, 45, 40 and 45-foot reefers, too. Crowley's new ConRo's are designed to handle all of them. In March, Crowley Maritime Corp. and VT Halter Marine launched Crowley's new Commitment Class ship El Coquí, one of the world's first combination container/Roll on-Roll off (ConRo) ships powered by liquefied natural gas. The event marked the first in a series of milestones expected to be achieved this year as part of Crowley's $550 million project to

> *It's self-evident with the systems we're putting in place, our terminal operating system and with our common carrier systems we're looking to being able to have a holistic view of the equipment, coming off the ship, being in the terminal, and then out the gate.*
>
> – John Hourihan Jr.,
>
> Crowley's Senior Vice President and General Manager, Puerto Rico services

expand and modernize the company's shipping and logistics services between Florida and San Juan, Puerto Rico.

El Coquí is expected to begin service in the U.S. Jones Act trades in early December. When that happens, the vessel and its sister ship to follow will be able to transport up to 2,400 twenty-foot-equivalent container units (TEUs) and a mix of nearly 400 cars and larger vehicles in the enclosed, ventilated and weather-tight Ro/Ro decks. A wide range of container sizes and types can be accommodated, ranging from 20-foot standard, to 53-foot by 102-inch-wide, high-capacity units, as well as up to 300 refrigerated containers. Aboard the vessels, new electrical infrastructure, additional reefer plugs, and a real-time monitoring system to support perishables and other sensitive cargoes ensures that the increased capacity also brings with it, increased quality.

Unlike the international 40-foot freight model, the Crowley way is to provide multiple options to satisfy a wide range of freight requirements – and not just the 53-foot model. Hence, the domestic customer looking to trade in Puerto Rico has a lot more choices than the average person shipping a container from LA to Shanghai.

Turnkey Service means Dedicated Assets

Crowley's $550 million investment in Puerto Rico includes a new 900-foot-long, 114-foot-wide concrete pier at Isla Grande and associated dredging; expanding terminal capacity for handling refrigerated containers; paving 15 acres to accommodate container stacking; adding containers and associated handling equipment to its fleet; installing a new electrical substation to provide power for the new gantry cranes; constructing a new seven-lane exit gate for increased efficiency; and installing hardware required for a new, state-of-the-art terminal operating software system.

Armed with a 30-year lease at both the San Juan location and a new space in the Port of Jacksonville, Florida, Crowley is raising the bar on the phrase 'turnkey.' Hourihan agrees, saying, "It does have its advantages of being able to control our operations, our gates, to control our vessel operations, and allows us to get what we're looking for – and that is speed."

At a time when container terminal operators and ports elsewhere are in a state of flux, waiting for the myriad mergers and new liner alliances to shake out, Crowley knows exactly what will be calling at its own facilities, when and how they intend to increase efficiencies. The commonality of operating the terminal as well as the vessels that are designed to go into those facilities is all designed to provide speed and economy of scale. "It's self-evident with the systems we're putting in place, our terminal operating system and with our common carrier systems we're looking to being able to have a holistic view of the equipment, coming off the ship, being in the terminal, and then out the gate," adds Hourihan.

At the root of all the new equipment and dedicated terminals is one key underlying effort, says Larkin. "We're trying to always have a deeper understanding of the customer's supply chains, and with that deeper understanding of the totality of their supply chain, to be able to craft solutions specifically for their supply chains," he explained, adding, "But all of the solutions – and all of our discussions with the customers – come down to two key, pivotal points when discussing customer supply chains. What we're trying to provide is a solution that increases the velocity of the customer's supply chain, something that ultimately impacts their total landed cost. We are always trying – whether it be from a U.S. domestic land transportation standpoint, from a cross-docking standpoint at any of our facilities, the additional capabilities that we're going to bring to bear now with these new ships, and the speed associated with them – is to improve velocity and overall total landed cost."

A key part of that equation involves using vessels that boast a collective increase of 40 percent capacity and, of course, the service speed of 21 knots, something that will dramatically increase turnaround times in these trades. Previously, Crowley's barges were on 14-day turn, given the slower transit, whereas the new vessels are on 7-day turns. With that added capacity

and increased speed, Crowley nevertheless stayed true to its model that emanated from the barges. Hourihan explains, "Another feature of the vessels [a carryover from the barges] is that these are not container vessels – these are ConRo vessels in that we have garage space to handle about 400 cars."

Asked if some of that increased (40 percent) capacity was represented by the demise of Horizon Lines, Hourihan instead said, "The faster transit allows us to carry more weekly capacity than the barges, which went every other week. The design for these vessels – and our decisions on which way we're going here with our future – was locked and loaded before Horizon left the trade."

The Environment

Fueling the new ConRo ships with LNG will reduce emissions significantly, including a 100-percent reduction in sulphur oxide (SOx) and particulate matter (PM) and a 92-percent reduction in nitrogen oxide (NOx), compared with other fossil fuels. The move to LNG was not inexpensive, but it comes in sharp contrast to other vessels and operators in this trade, who previously operated tonnage that could not comply with the required ECA environmental standards. Hourihan concedes that the Jones Act in part made these investments possible, but it is also true that no other operator – foreign or domestic – has made the same commitment to Puerto Rico and its people.

In Jacksonville, two 260-ton, cryogenic LNG tanks situated at Crowley's leased property at JAXPORT's Talleyrand Marine Terminal sit conveniently adjacent to Crowley's operating terminal and will serve as the fueling station for the LNG-powered ships. Notably – and unlike their local competition in these trades who will load fuel via barge – Crowley's fueling operation is going to be performed landside, from storage tanks and directly onto the vessel. Eliminating the risky marine aspect of that operation brings another layer of safety to the Crowley business model. The storage tanks, the largest located on a marine terminal (supporting vessel operations) anywhere in the world, represent another first for maritime industry.

The increased capacity in the Puerto Rico trades also brings a markedly cleaner footprint. Hourihan couches that achievement as a milestone for industry, saying, "With both Crowley and Tote calling at Jacksonville and trading to and from Puerto Rico, this represents the first scheduled liner trade in the world using LNG-powered vessels." He adds quickly, "It makes sense because you need to know where you're going to get your gas. The Puerto Rico trade was a natural starting point because the trade that we are in, we always know where we're going and we always know where our gas station is."

The decision to go with LNG for the ConRo vessels, for Crowley, was a big one. And, it was expensive. Hourihan declined to put a number on it, saying only, "When the ships were initially contemplated and designed, the LNG was always part of the design. And we never looked at just a conventional ship in this particular design or engine choice. So it would be difficult to give you a number."

Perhaps the most important number of all involves the measurable reduction in emissions. For Crowley, and comparing their (coming) cleaner footprint, the shift to LNG will eventually reduce its carbon footprint by a whopping 35 percent per container.

Service Enhancements

Faster, fit-for-purpose vessels and dedicated terminals only go so far when it comes to improving the supply chain. That's why Crowley settled on a single terminal operating system – in their case, Tideworks – for all of its Puerto Rican trade connections. That's something that integrates across all vessels, loading plans and in the terminals. Standardized around that particular platform, Crowley is rolling Tideworks out in Port Everglades (January 2016), Jacksonville (June 2017) and in San Juan (April 2017). In this case, once the vetting of all of

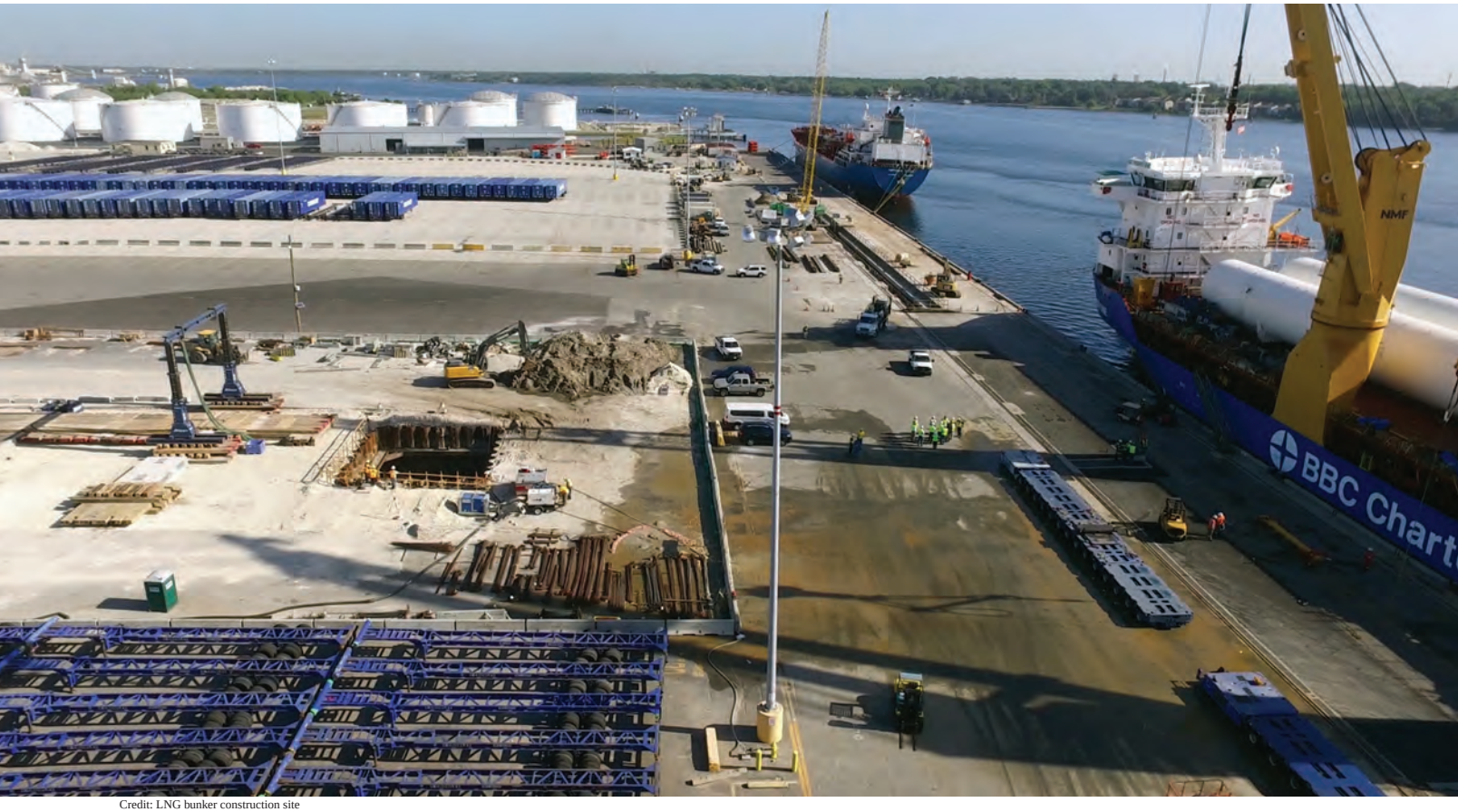
the available options was completed, was an easy one.

"We went the way of using an existing provider just recognizing that they offer and have developed the systems they have, and have had a lot of opportunity to fine-tune it. It was pretty easy for us to decide that we're not going to 'home grow' this," explained Hourihan, adding, "Frankly, we've gained the realization that we're better off dealing with a package off the shelf that's tested and proven, as opposed to try and do it all ourselves."

Already, the new terminal operating system (TOS) in San Juan is allowing cargo to be delivered and dispatched from the terminal 50 percent faster than it had been previously, providing customers with increased supply chain velocity. Trucks move faster because Crowley workers – previously exposed to the elements – now work indoors, in a gate control center, interacting with the truck drivers via kiosks. Safety is improved because gate workers are no longer in the truck lanes. The operation is now paperless. Eventually, the TOS in San Juan will improve efficiencies in the way Crowley stows its vessels,

We view the customer supply chain into Puerto Rico as an extension of the U.S. domestic transportation system. So obviously, the 53-foot (van) is a cornerstone of the U.S. land transportation system and so to offer the greatest amount of seamless flexibility in terms of the supply chain and what we have had for the last 60 years, these can 'roll on, roll off' with our barges. That was a natural extension of the 53.

– Frank Larkin,
Crowley's Senior Vice President and General Manager, logistics and commercial services



Credit: LNG bunker construction site

stages cargo, and positions container handling equipment.

As part of its multi-terminal project with Crowley, Tideworks will also be providing Disaster Recovery (DR) capabilities. The DR facility is located in a geologically stable and geographically disparate region, so if a catastrophic event occurs at Tideworks' primary data center, the TOS technology ensures that Crowley's terminals will continue to function.

At the heart of Crowley's philosophy, and one which is rapidly being tightened via use of its new TOS (and other technologies), is the leveraging of considerable in-house resources that ultimately provide value for the customer. Crowley's Larkin insists, "That speaks to kind of the seamless nature of what we want to be able to provide to customers. If time is literally the most important commodity on the planet, if we can save people time through that seamless integration of things, again, we think we are providing value."

Ayesha Diaz, Crowley's General Manager, Warehousing, has her own take on that concept. That involves 24/7 supply chain contract visibility and real time visibility and transparency for the customers. About 18 months ago, and in order provide that transparency, as many as 14 different operating platforms within Crowley Logistics were consolidated onto one platform, aptly named CargoWise. "We have the system to provide visibility to the customers. Everything that we receive, every document that we upload into our system, it's updated and customer will have immediate visibility."

That sort of visibility is already paying dividends for Crowley – and its customers. One island-wide retail chain, for example, was being managed by another logistics provider using different companies to provide different segments of the business that the account required. Crowley proposed a different way forward. Diaz explained, "It's not just about time. It is about providing a full supply chain solution. As an example, they were receiving 'X' number of smaller assorted containers and we offered a full supply chain solution with our customer, utilizing 53-foot containers while at the same time increasing capacity." That move, says Crowley, coupled with the totally in-house solution, saved the retailer about $300,000 in a six month period.

Separately, and in the grocery markets, Crowley has taken shipments from various different food suppliers and worked to top load partially laden containers with lighter cargo. For example, a 53-foot box could be partially stuffed with canned goods that would otherwise bring the container to full weight before its cubic capacity would be reached. A load of considerably lighter potato chips would then "cube out" the container. Maximizing the cubic area of oceangoing material, in this case, ultimately reduces the overall number of shipments that a client might need to make, as opposed to having straight-load shipments of those individual products.

That sort of effort also involves making sure that facilities on each end are capable and ready to perform these services. And, says Larkin, it is about being able to offer more choices than the otherwise very rigid 40-foot model can allow. "We also offer cross-dock services in our operations close to Jacksonville, trying to reduce the cost of the miles on that inland transportation.

"We think in terms of total landed cost. If we have to position an oceangoing container out to Chicago as an empty, that is wasted money in the customer's supply chain. So if we can do domestic vans from Chicago into Jacksonville, and do the cross-dock tier, we're eliminating empty miles of equipment which equates to significant savings that we're able to pass on to customers." In doing so, Crowley eliminates the so-called shoreside 'ballast leg.'

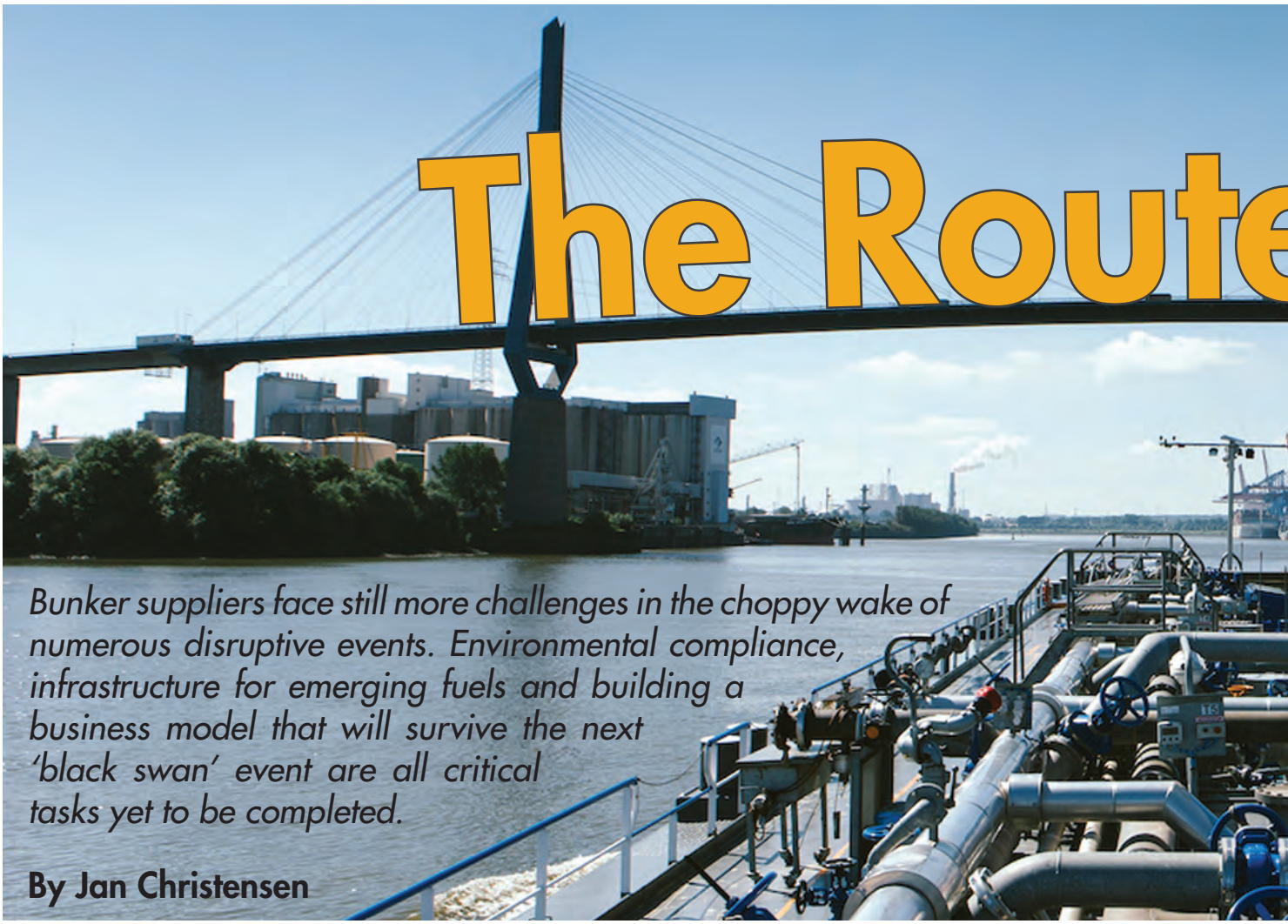
Finally, customers have always been loath to break the integrity of the seal on their shipments in transit. But, when a particular cargo is in the hands of just one service provider from start to finish – in this case Crowley – the mindset can change in that they want to explore ways to become more efficient. The container model was built upon the premise that it eliminated – for lack of a better phrase – theft on the wharf in break bulk cargoes. Crowley's view is that taking the movement totally in-house from Point A to Point B, no matter where it is, all under Crowley's control for the entire intermodal trip, is the better way to go.

"We, of course, focus on the container's ride from the U.S. to Puerto Rico," says Diaz, continuing, "But it's also important to mention that we here in Puerto Rico are also providing the final mile delivery to the customers here at this destination. Yes, we can deliver intact containers from the port to the customer's door. But we are also handling those goods at our facilities. We have the capacity to transfer those goods into our smaller equipment to be able to perform that kind of delivery, as well."

Small Trade Corridor – Big Picture

With well over a billion dollars spent in the Jones Act Puerto Rico trades, it is way past time to doubt the commitment of Crowley, and to be fair, some of its competitors. At a time when Jones Act naysayers would advocate the elimination of the Jones Act between Puerto Rico and the mainland, the evidence is clear that the domestic model holds far more in way of economies for the island and those who would like to do business there than it does for registered tonnage operators who would like to service the island in a tramp mode.

Investment in these trades today involves far more than the bottom line of a couple of Jones Act carriers. Crowley's 60-year history here, its renewed commitment to a more efficient future, and the environmentally correct way that they are bringing that reality to the region, speaks volumes. Here at the beginning, persevering through good times and bad, Crowley will no doubt be calling on San Juan long after I'm gone. That takes turnkey logistics – the Crowley way.



The Route

Bunker suppliers face still more challenges in the choppy wake of numerous disruptive events. Environmental compliance, infrastructure for emerging fuels and building a business model that will survive the next 'black swan' event are all critical tasks yet to be completed.

By Jan Christensen

From OW Bunker and Hanjin, to the Baltic Dry Index's historic lows and frequent IMO regulatory intervention, shipping's unsettled environment over the last ten years has been one of constant change. Developing trends in disruptive technology, human capital, and market demand have forced the industry to re-examine some of its cornerstone assumptions, and challenged traditional understanding of commercial practice.

100 years after the global fleet started its shift from coal to oil, the shipping industry faces another profound change in the energy that it will use to power its vessels. As a consequence, global physical bunker suppliers now need to take a fresh look at the emerging challenges that ship owners and operators face in relation to fuel procurement.

The Future of HFO

For decades heavy fuel oil (HFO) has been the shipping industry's bunker fuel of choice. In 2016, according to Wood Mackenzie, global demand stood at almost 70% of total demand. With the implementation of the IMO's MARPOL Annex VI regulation in 2020 that stipulates that ship owners can only burn a fuel with a sulphur content of less than 0.5%, new decisions need to be made. The current front running choices are distillates and distillate-based products, Liquefied Natural Gas (LNG), or installing an emissions abatement system, or scrubber, as they are more commonly known.

There are already emission control areas (ECAs) regulating sulphur content in fuel oil to less than 0.1% in the Baltic Sea, the North Sea, the North American coasts and the U.S. Caribbean, so this change isn't a total bolt from the blue. Likewise, this has been a clear priority for many years. The IMO's phased approach should be seen in a wide context. From 4.5% (adopted in 1997), to 3.5% (adopted in 2008), and now to the 0.5% sulphur limit in 2020; there has been a clear and consistent trend for lower sulphur fuels.

From an environmental perspective, NGOs and opinion formers in favor of its implementation have fought a strong argument

for change. The sulphur oxide content in HFO can be as much as 3,500 times greater than current European diesel standards for vehicles. However, despite this, it will not come without costs. In an interview with news agency Reuters in October 2016, MSC, the world's second largest container line, calculated that its additional fuel expenses would be in the region of $2 billion annually. In a market that continues to struggle financially from reduced margins, low freight rates, more competition and little liquidity, its impact for some could be devastating.

Despite these figures, implementation of the steps that will be needed to create a strategy for compliance has been slow, and January 1st 2020 isn't getting any further away. In less than 1,000 days every owner and operator will need to develop a compliance solution if they are to keep their operations running smoothly, and suppliers will have a critical role assisting them to make it as efficient and profitable as possible.

It is time for owners, operators, and suppliers to face facts: this change is coming and it will pose real challenges. As Edmund Hughes, head of air pollution and energy efficiency at the IMO, said in May of this year, the 0.5% global sulphur limit on bunker fuels is "highly unlikely" to face any delay.

Challenges throughout the Supply Chain

There will also be a significant impact on marine energy infrastructure. Refineries may use larger vessels to ship product to Europe to maximize economies of scale, which will require larger terminals or the dredging of existing ones so that they are accessible. There will also need to be a reconfiguration of storage tanks to hold clean products rather than fuel oil, as well as adapting pipelines to take middle distillates to coastal bunkering terminals. Projects of this nature cannot be realized overnight.

Nor can a successful fuel compliance strategy. Clearly the likes of the Res Cogitans case – in which the UK's Supreme Court held that a non-physical bunker supplier could be entitled to payment for bunkers that it had not itself paid for – have only served to underline the potential risks of buying fuel oil. But in-

> *There will also be a significant impact on marine energy infrastructure. Refineries may use larger vessels to ship product to Europe to maximize economies of scale, which will require larger terminals or the dredging of existing ones so that they are accessible. There will also need to be a reconfiguration of storage tanks to hold clean products rather than fuel oil, as well as adapting pipelines to take middle distillates to coastal bunkering terminals. Projects of this nature cannot be realized overnight.*

decision is not a viable strategy to deal with unavoidable change.

To avoid a Res Cogitans situation, disintermediation – or cutting out the middlemen and going direct to physical suppliers – has been one of the most substantial changes in recent bunkering history. This is threatening the continuity of smaller bunkering companies and standalone trading houses. When combined with the usual arguments over quality and quantity, the result is a confluence of owners who feel perplexed and apprehensive about fuel procurement and bunkering in general.

This is having a significant impact on the relationship between owners and suppliers, and how physical suppliers in particular should position themselves within the market. Increasingly we're finding that leading ship owners are now looking beyond the price of the product in isolation, and towards the total cost of ownership. Cost is evidently still very important, but with ship owners facing more pressures from charterers to improve their own operational and environmental efficiencies and sustainability, they're dissecting every element of their operations, including bunkering.

There are two key elements to providing value that goes beyond the dollar figure per ton. The end-to-end physical process used to deliver the fuel, and the strategic counsel that's provided at the outset to the customer for the specific, individual compliance strategy that best suits their needs.

For any credible physical supplier, the quality and quantity

of your products needs to be a 'given' in today's market. However, delivering on quality and quantity is not just the right thing to do from a moral perspective. When managed correctly, they are also critical areas where efficiencies can be gained within the bunkering process.

Mass Flow Meters (MFM) are one prominent example. In Singapore last year, there were more than 48.6 million tonnes delivered. With the average stem size typically in the region of 1,100 mt, just think about the amount of time that ship owners and operators will save now that they're mandatory. By some estimates, use of MFMs could decrease time spent bunkering by about 2-3 hours for each vessel and potentially improve the number of barge turnarounds in Singapore, for example, from the present eight per month to 10-12 times a month. Additionally, the fuel quantity variance when employing an MFM is believed to be a maximum of 0.5%, significantly smaller than the sounding tape method of up to 0.7%. This provides huge added value in terms of driving efficiencies into customers' operations, saving them time, resource, and money.

As a global independent physical supplier, we have looked closely at our operations to ensure that our infrastructure is calibrated to best support our customers in line with the changing demands of the shipping industry, and the current and future challenges that ship owners face in relation to fuel supply.

The complexities within the fuel supply chain, as well as uncertainties over current and future pricing and compliance, mean that ship owners require real strategic counsel. Bomin believes that distillates, or distillate-based products, will be the most widely used solution for the global sulphur cap. The global infrastructure for LNG needs significant development, which realistically makes it a medium-term solution at best. As for scrubbers, installation requires significant upfront capital, and while financing models are coming into the market in line with the potential favorable spread between HFO and distillates, there are still questions over whether demand can be met for installation both from the manufacturers' and ship yards' perspectives.

What's Next: delivering real knowledge to customers

Bomin is validating a number of solutions that will effectively deliver compliance for its customers. That is why we recently signed a memorandum of understanding (MOU) with listed Canadian company, Genoil, to look at the potential for developing a proposition for the supply of compliant low sulphur products, using Genoil's GHU (Hydroconversion Upgrader), which takes the sulphur out of HFO.

The key point is that to reliably deliver what ship owners and operators need, physical suppliers must have an in-depth understanding of the market, as well as their customers' businesses and operations; the make-up of their fleet and their trading routes. They must genuinely understand the issues and challenges that they face.

They must be able to impart real knowledge, and discuss strategically the most appropriate fuel procurement strategy. Not just for the short-term, but for the medium term and beyond. One that effectively manages risk and costs, and mitigates against volatile and rising crude prices to maximize levels of customer profitability. And one that, of course, ensures compliance.

The Author

Jan Christensen is Global Head of Bunker Operations for the Bomin Group, a global physical supplier and trader of marine fuel oil. Christensen has extensive experience of the oil and derivatives industries. Before joining Bomin, he was Vice President of OW Bunker's Physical Division, and prior to this he was head of Maersk Oil's Fuel Trading Operation for seven years. As Global Head of Bunker Operations, he is responsible for developing, and coordinating the Group's global supply operations and infrastructure. Bomin is wholly-owned by Mabanaft, the trading division of Marquard & Bahls, a privately-owned petroleum company, headquartered in Germany.

The Evolving Freight Fo

Logistics Trends & Insights LLC's

April 2017 survey, based on 80 responses, reveals some interesting trends in the world of freight forwarding. But, who participated in this year's survey? Every region of the world was represented, led by Europe with 34.2% of the responses. These responses came from logistics providers, forwarders, carriers, shippers, government, and industry consultants. Notably, logistics providers comprised 43.0% of the responses, followed by forwarders with 19.0% of the responses.

Not surprisingly, technology – a critical linchpin for all aspects of the global supply chain – plays a key role in all of that. According to the survey, like the many components that collectively make up the supply chain, the freight forwarding market is fragmented; something that is sparking change. That's because, with fragmentation comes both inefficiencies and opportunities.

Beyond the survey, a Global Freight Forwarding report is in the works for early fall in partnership with Mike King of Mike King & Associates. That project will include, among other things, analysis from the survey, an APAC forwarding index, market sizing, rankings and much more.

What is a Freight Forwarder? One survey answer claimed, "The definition, one who specializes in the arrangement of and shipment of goods on behalf of businesses will be on top for the next ten years. It is shifting." Indeed, says Logistics Trends & Insights LLC, the market is not only undergoing a redefinition but it also has literally been caught in the middle of global political and economic changes. Shifts in political thought favoring protectionism or populism along with continued concerns within the ocean and air freight markets have led many forwarders to seek acquisitions, new services and new geographies in order to stay afloat. While gross revenues and volumes for many forwarders grew in the past year or so, they came at a price with lower profits and in some cases, a financial loss.

A question asked this year and also in 2016 was "As a forwarder, my most critical pain point is…" and like last year, the majority of respondents indicated tight margins followed by rates, uncertain global environment and lastly, 13.0% said capacity. As to what Forwarders bring to the table, a new question for this year asked, "What do customers value most from a forwarder?" The majority of respondents, 33.7%, indicated trade expertise. However, 45% of the responses were split among low rates, visibility of cargo movements and ease and timeliness in booking freight while 21.3% indicated additional thoughts including all of these choices: *credibility, communication and*

Fig 2. As a forwarder, my most critical pain point is:

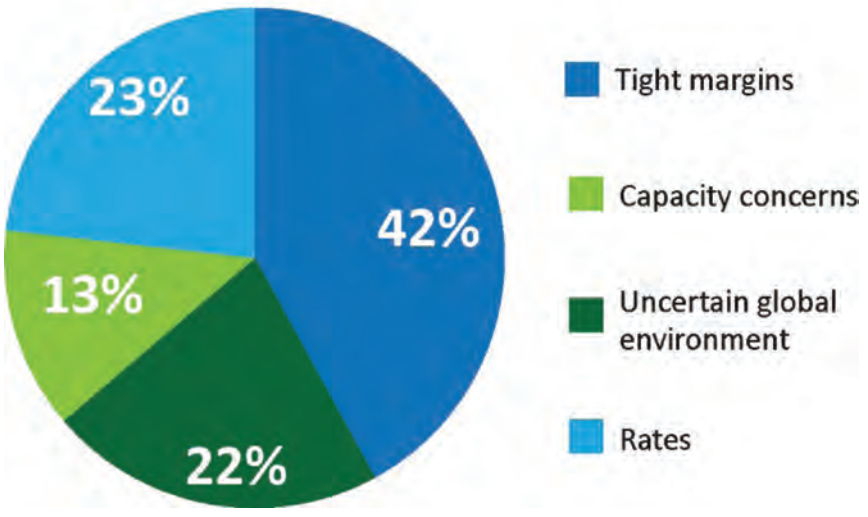
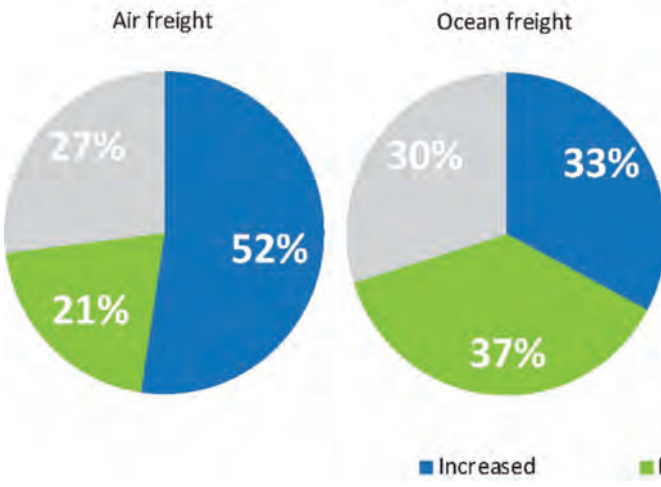


Fig 4. In terms of revenue, in the p
market share



RWARDING MARKET 2017

control, analysis, development of supply chain solutions.

Market share shifts were telling over the past 12 months. In terms of revenues by mode of transport – air, ocean, rail and truck – forwarders' biggest market share increase was air freight (42.3% of survey responses). The air freight market has experienced a revival. According to IATA, freight ton kilometers increased 3.8% in 2016. This was nearly double the industry's average growth rate of 2.0% over the last five years.

On the other hand, the biggest decline in market share, in terms of revenue, was not a big surprise – ocean freight. 32.5% of respondents noted a loss in market share in this mode probably due to the historic low ocean freight rates hit in 2016. Nevertheless, and In terms of market share by volume for the past 12 months, all four modes noted increases with air freight noting the highest gains at 48.7%, trucking with 48.0%, ocean freight 43.6% and rail with 32.5%. That said; turning those volumes into profitable revenue it seems has been the challenge for many forwarders.

Growth Opportunities: Technology is King

Not surprisingly, most respondents (44.6%), indicated they plan to differentiate by investing in technology and automation, closely followed in order by niche services (41.2%), new trade lanes (9.5%) and mergers & acquisitions (4.1%). Indeed, technology is playing a major role in forwarders' evolution. As proof, Logistics Trends & Insights LLC points to DB Schenker's investment in UShip, DHL's launch of its online freight marketplace CILLOX and even FedEx's introduction of FedEx Fulfillment. All of those efforts are all redefining the way items are fulfilled, booked and shipped. Niche services is another important differentiator. These services typically revolve around specialized industry needs such as cold chain. Panalpina has made recent investments in such niche providers as Air Connection and Airflo to expand its perishables solution. Other forwarders including DHL, UPS and FedEx have expanded their track and trace capabilities, specialized packaging as well warehousing and distribution networks.

E-commerce is also creating opportunities for forwarders including fulfillment and cross-border services. FedEx and UPS acquired niche providers in this space and DHL introduced plug & play fulfillment facilities. Amazon, Alibaba, JD.com and other ecommerce providers are taking heightened roles in logistics. And beyond industry specific niche services, China's One Belt One Road (OBOR) initiative provides another opportunity for forwarders and shippers. For example, Forwarders have, in the past, focused primarily on air and ocean services but now rail connecting Asia and Europe is a growing option to air and ocean – *cheaper than air and quicker than ocean is how many tout this rail solution.*

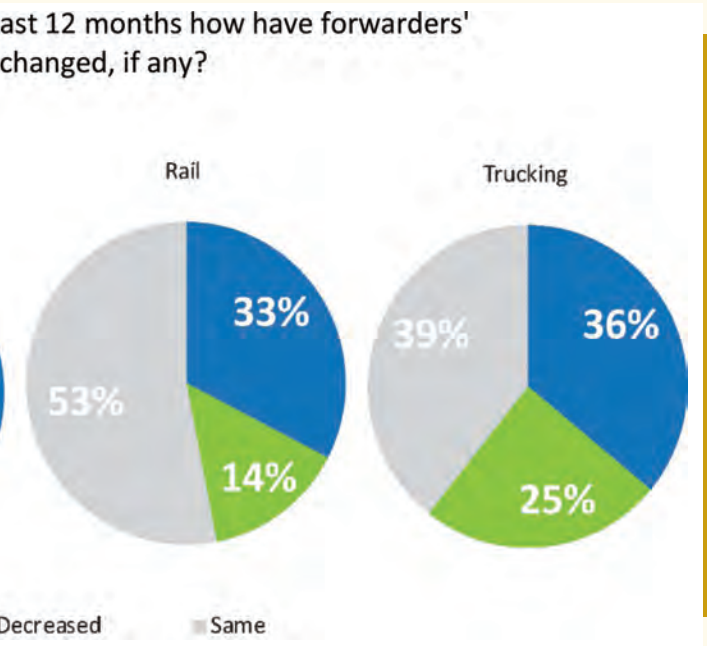
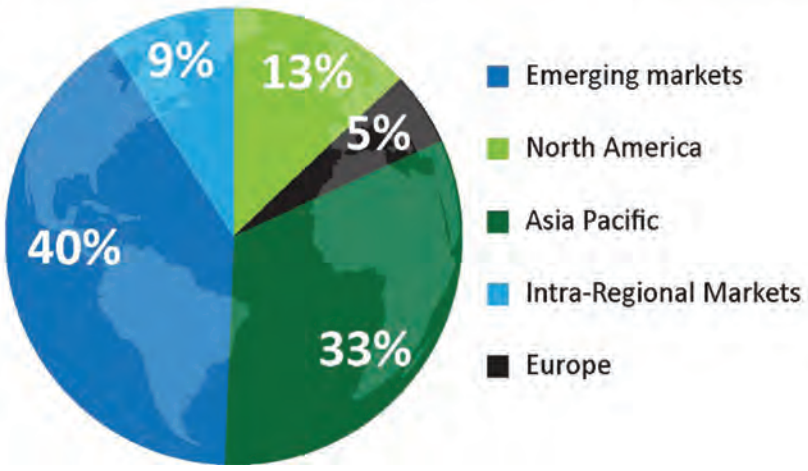


Fig 7. What geographic regions offer the best opportunities for forwarders?



Opportunities

So, where are these opportunities? We asked and 40.3% of respondents indicated emerging markets while 32.5% noted Asia-Pacific. North America came in at 12.9% followed by intra-regional markets with 9.1% and finally Europe with 5.2% of the responses. No matter where these opportunities reside, the opportunities are huge: PWC notes that 50% of the world's population growth between now and 2050 is expected to come from Africa and Euromonitor International notes that emerging markets account for 90% of the global population aged under 30. Separately, McKinsey expects that over the next two decades, the middle class will expand by three billion coming almost exclusively from the emerging world. As investments in infrastructure such as port and airport expansion, road and rail networks as well as in connectivity are bringing commerce to these countries and with it new trade lane patterns and demand for forwarding expertise.

In terms of 'opportunity,' North America came in at a distant third, but, says Logistics Trends & Insights LLC, don't let that fool you. Although its opportunities are a bit different versus emerging markets and Asia-Pacific, improving economic conditions has this region ripe for supply chain expansions. Politics, however, dampens some of that optimism as a possible 'NAFTA re-do' and rumors of import taxes swirl around the US situation, in particular.

Technology

A whopping 58.1% of responses indicated the forwarding improvements would come next in the form of digitization of all services. Worth noting, operational efficiencies, visibility and customer service all noted similar responses with several comments indicating all of these improvements. Bottom line: *technology is leading the way for supply chains and forwarders have taken note.* A resounding 92.4% of responses indicated that digitization will add value for forwarders. Indeed, PWC research shows that the digitization of supply chains improves transparency throughout the supply chain, communication among supply chain partners, collaboration among supply chain partners and flexibility and responsiveness. Bottom Line: digitization is not a 'nice to have' but instead a 'need to have' for all supply chains.

Also according to the survey, Online freight marketplaces were regarded as an opportunity – and not a threat – by 58.2% of respondents. That's because online freight marketplaces are designed to give shippers access to and book rates directly from carriers whether ocean, air, truck or rail and rates from forwarders. In addition, shipment visibility is included along with various reporting tools and analytics. That these online freight marketplaces can improve efficiencies as well as level the playing field for not only carriers and forwarders but also among shippers, big and small, plays a big part in that sentiment.

Relevancy

The survey's final questions asked simply, "Are traditional forwarders relevant in today's environment?" And, while 68.4% of this year's survey respondents responded 'yes', that number was down from last year's figure of 94%. So, asks, Logistics Trends & Insights LLC, what changed over the past year? Is the freight forwarding

market facing an identity crisis? Many unanswered questions remain, but, says the survey providers, "One thing is for sure, freight forwarders are facing disruption at a much rapid rate and will need to adapt quickly or face extinction."

Logistics Trends & Insights LLC / on the WEB: **www.LogisticsTI.com**

All Graphics courtesy of *Visually Explained*

The Evolving Freight Forwarding Market

*Survey was conducted in April 2017 and the results are based on 80 responses.

2017 survey* results

What is a FREIGHT FORWARDER?

A firm specializing in arranging and shipping of merchandise on behalf of shippers — 67%

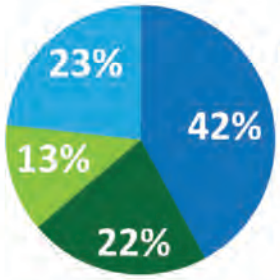
A facilitator, value-adder and a consultant — 22%

Other — 11%

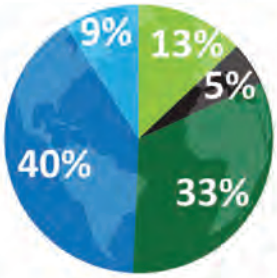
What do CUSTOMERS VALUE most from a forwarder?

- Low rates — 15%
- Trade expertise — 34%
- Visibility of cargo movements — 11%
- Ease and timeliness in booking freight — 19%
- Other — 21%

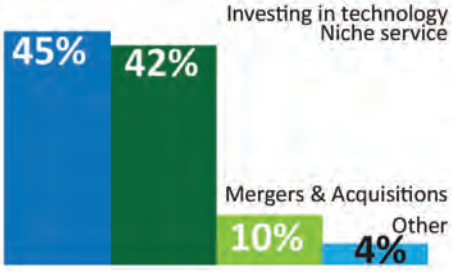
As a forwarder, my most CRITICAL PAIN POINT is



What GEOGRAPHIC REGIONS offer the best opportunities for forwarders?



My STRATEGY to differentiate is



What improvement will be utilized the most the NEXT 5 YEARS?

- Digitization of all services — 58%
- Operational efficiencies — 14%
- Visibility — 15%
- Customer service — 14%

Are ONLINE freight marketplaces an opportunity or threat for traditional freight forwarders?

58% Opportunity

22% Threat

20% Not sure

Are you able to obtain needed containers in a TIMELY MANNER?

Do you believe DIGITIZATION will add value for forwarders?

92% Yes

5% No

3% Other

Are TRADITIONAL forwarders relevant in today's environment?

68% Yes

17% No

15% Not sure

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