The role that maintenance and upgrades play at ports is naturally critical to keeping assets running well and cargo moving as efficiently as possible. Ports are challenged to prioritize their limited resources between major capital investments required for bigger ships, versus the cyclical major upgrades of wharves and other facilities. And although fostering partnerships with shipping lines and public and private sector agencies continues to help support the supply chain infrastructure, more is needed.

Ensuring the land side part of the equation is operating optimally is also crucial. “Making sure land side rail and truck connections are working efficiently has been somewhat downplayed because ports have typically been able to solve their worst problems inside the gate,” says Rachel C. Vandenber, Vice President of Dewberry, a Virginia-based industry consultancy. “Going forward, partnering with the local transportation entities and state level departments of transportation is going to be really important.”

Vandenber believes looking at ports more holistically, as part of the broader cargo transportation solution is vital to making progress as an industry. “With the FAST...
Act that was recently approved in the U.S., for the first time ever ports are eligible for federal surface transportation funding,” she adds. “I think that’s in recognition that ports are part of the transportation system, so those kind of overall network solutions are going to be key to preparing and adapting for the future.”

Getting ready for future trade while handling today’s cargo is always a challenge. Constrained berth capacity prompted the Port Everglades Southport Turning Notch Extension (STNE) project, which is expected to be completed and operational by the end of 2019.

The $269.4 million undertaking will add an additional five berths. The existing STNE is being lengthened from 900 feet to 2,400 feet. In addition, the extension will also replace 8.7 acres of an existing mangrove conservation easement with a 16.5-acre upland enhancement with approximately 70,000 new mangroves and wetland plants as well as completing a number of environmental improvements in nearby West Lake Park.

Another project involves improving container cranes. The port will be getting customized cranes to adapt to the larger ships that call. The new cranes will operate on a separate rail system to allow for the continued use of the existing cranes during construction. “Because of the height of the new cranes, we are going through an FAA approval process, which has taken a number of years,” reports Steven M. Cernak, Chief Executive & Port Director.

On the port dredging side, in partnership with the U.S. Army Corps of Engineers, Port Everglades is advancing a 19-year effort to deepen and widen its navigational channels and entrance channel to handle larger cargo ships.

The main navigational channels will be deepened from 42 to 48 feet and widened to enable improved maneuverability, and the entrance channel will be deepened from 45 feet to 55 feet. Another part of the channel will be widened at an existing narrow point to allow larger ships to pass each other. Construction is estimated to be complete by 2022. The total estimated price tag is $374.1 million, with Port Everglades and the state contributing $184.2 million, and the rest coming from the federal government.

“The time it takes me from the concept of a project to where you can actually order something takes a lot of time,” says Cernak. “And during the course of that time, your business model may change or you may have different business needs and you want to revisit something and that just opens the whole process all over again.”

While government agencies are kicking in some of the money, Cernak says that new agreements with port customers include sharing in infrastructure costs in exchange for guarantees of volume.

Port Everglades is also continuously upgrading its passenger facilities by modernizing and expanding its eight cruise terminals for efficient guest processing.

At the Port of Lake Charles, tracking crane down time is a top priority since its bulk terminal is an important main source of revenue. Bulk Terminal No. 1 is a dry bulk terminal, owned and operated by the port. The terminal handles more than 3.1 million short tons of dry bulk material.
A gHID lighting retrofit at Talleyrand Marine Terminal (JAXPORT) replaced the high pressure sodium technology seen at left, while providing 12 percent energy savings and a payback under one year.

Genesys retrofit 1000W HPS lights with its gHID 320W (pictured) at JAXPORT’s Marine Corps Support Facility Blount Island, improving visual acuity and color rendering.

Hoegh Autoliners, at the Port of Jacksonville, noted a 15 percent decrease in accidents the year after installing gHID lighting. “I believe the brighter, safer work environment (this) lighting delivers played a key role in that reduction and makes our jobs easier,” said Jason Kirkland, Port Operations Supervisor – South Atlantic.

annually such as petroleum coke, calcined coke, barite, coal, rutile, woodchips and other dry bulk commodities.

“We have implemented a preventative and predictive maintenance program where we go straight from the owner’s manual on how to maintain it, but we take additional steps on the predictive aspect and bring in equipment like infrared guns that show hotspots on electrical items,” says Donald J. Brinkman, Director of Engineering, Maintenance, and Development. “We also perform vibration monitoring on bearings to know when they’re headed toward failure so we’re able to replace them before they fail.”

If an incident does happen to occur with a crane, a post-incident investigation is carried out to determine the root cause, then maintenance records are updated accordingly. For the same terminal, the port recently went through a series of scrapers that weren’t performing well. The scrapers used to clean the conveyor belts kept failing prematurely. Once the port switched to a higher grade of scraper the maintenance expense was reduced and conveyor belts are lasting longer.

Maintenance tracking is done with a software tool that tracks work orders and expenses, which also gives insight into where next the port needs to move in terms of upgrades and other projects. “It helps drive our decisions on capital dollars,” adds Brinkman.

Ongoing maintenance of assets is also a priority at the Port of Halifax. The South End Container Terminal and Fairview Cove Container Terminal are in good shape, says Paul MacIsaac, Senior Vice-President, but they are being watched closely to determine when major maintenance or repairs to items such as the cope walls or rail will have to be completed.

The South End Container Terminal contains 74 acres of land, 4,000 linear feet of dock and 8,000 feet of on-dock, double-stack rail. The Fairview Cove Container Terminal contains 70 acres of land and 2,297 linear feet of dock and has 11,000 feet of on-dock, double-stack rail.

Four years ago, the port purchased a remotely-operated vehicle to assist with regular inspection of piers for any needed repairs and capital upgrades. In addition, the port has increased its number of in-ground outlets for refrigerated containers. Currently, the port offers 300 connections at each of its terminals. The port has also
upgraded its lighting infrastructure, moving to more directed LED lights with automated controls in order to conserve energy.

“Over the past 10 years, we’ve carried out infrastructure investment to the tune of $250 million for projects as simple as upgrades to buildings to as significant as building new berths,” says MacIsaac.

A real-time monitoring system has also been established for the two suspension bridges that transverse Halifax Harbor. “The system monitors the air gap, which changes with the tides and air temperature,” explains MacIsaac. “Through adopting that technology, we have modified the navigation charts to show greater height and greater air gap. This provides ships flexibility in going to and from our terminals to enable fluidity of traffic.”

In addition, a technically-advanced weather buoy provides real-time data on weather and sea conditions, allowing for more precise scheduling for the shipping lines and groups like the Atlantic Pilotage Authority who navigate many of the larger vessels into Halifax Harbor.

Lighting at ports and terminals is important to safety and daily operations. Genesys Global, Inc. (Genesys) provides a unique, highly efficient, very high frequency HID (high intensity discharge) ballast known as gHID that can be used to replace the ballast in any existing HID infrastructure. In fact, according to Genesys, gHID provides energy savings comparable to LED up to 75 percent, at a fraction of the cost, with better area light quality and dispersion.

“Our goal was to design a more efficient ballast,” says Jason D. Ramsey, chief technology officer and founder. “We’re finding great market adoption and acceptance in the port space. gHID gives a significant level of efficiency and an extended maintenance cycle.”

Mid-installation of a gHID retrofit at JAXPORT’s Marine Corps Support Facility Blount Island, gHID is the bright white light on the pole in the foreground and pre-existing HPS is in the background.