AN INDUSTRY AT AN INFLECTION POINT

THE NEED FOR DRAYAGE ALTERNATIVES

Mike Wychocki, CEO, EagleRail Container Logistics

Like other high-throughput industries seeking to support exponential growth and increased profit, the international container shipping and intermodal industry is examining every component of the supply chain in order to make more of the handling and transportation processes quicker, cheaper, more data-centric.and obviously, automated wherever possible. To date, most of the focus has been on two responsible strategies; first, improving already existing hardware technologies and software platforms, and second, having each party focus on their expertise and domain(s). However, when an unaddressed portion of a holistic ecosystem is in such dire need of improvement, it takes both 'out-of-the-box,' and, in this case, 'out-of-the-gate' thinking, both literally and figuratively.

When it comes to resolving the short-haul drayage bottleneck issue however, the container-handling industry is at that inflection point, in our opinion. How do we know this? Two ways; first, reported ship turn-times and stack-delay numbers are significantly up, and second, serious alternative solutions are starting to be discussed in trade journals like PTI. Some good, some not, but all prompting a real examination of alternatives.

Recent industry surveys and forecasts have shown universal concern about the single critical element most identified as the unaddressed blockage to faster terminal container-handling efficiencies; antiquated short-haul and 'drayage' trucking processes. While billions of dollars of investment have produced impressive strides in handling-equipment automation, and smarter, more AI-centric software, these solutions have not addressed the broken process between ports and intermodal; the oft-ignored manual, dirty, uncoordinated and data-poor independent trucking.

The US Federal Maritime Commission's final report on detention and demurrage fees highlights the fact that ever larger container ships might be creating diseconomies of scale for the drayage industry and shippers. The FMC report says growing ship size means a container might not be discharged until days after vessel arrival, depending on where it's stowed and the work schedule of the particular terminal.

Despite the increasing visibility across all aspects of the supply chain, containers go into a "black hole" once they arrive at berth. Smaller container ships were able to unload containers over one to three days. But today's mega-vessels may take four to five days to unload. These delays in ship-turns are consistent at most ports around the world with many delays exceeding seven days. In turn, ocean carriers are avoiding these congested ports with the aim of reducing operating expenses and achieving more ship-turns.

CONGESTION FOCUS IN THE TRADE PRESS

In 2015, Maersk found the time vessels spend in port on a standard round trip has increased 50% from 12 to 18 days, while Drewry Maritime Advisors recently found that upsizing from a 13,000 TEU vessel to 19,000 TEU, a capacity increase of some 46%, had led to only a 20% increase in berth productivity. In addition, Maersk Line spent some 19% of its total costs on ship fuel in 2014 – amounting to US$4.6bn per year – and made around 31,000 port calls with its own operated ships, with 1,500-1,800 moves per call. CTI Analysis calculated that a 7% reduction in port stay, say 1.3 hours out of a total of a 13-18 hour call, would "reduce fuel consumption to the tune of maybe $120m per year," because it would allow the company to steam slower once it had left port.

So, what factors have contributed to this transportation bottleneck crisis-in-the-making, and why address it now? For the past 10+ years, the pressure was building, but efforts to fix the short-haul drayage operations 'outside the gate,' and between operations, was always 'someone else's problem.' A blind-eye was typically turned, and it was assumed more and cheaper independent trucking firms were always available.

WHY IS THE INDUSTRY GETTING SERIOUS NOW?

Here is what has changed: The better ports are attracting more volume, but they are land-locked. Larger mega-ships are causing unload 'bunching' from larger discharges. There is very little real estate open for additional roads or ground rail to handle additional gating processes and most ports don't have internal space to load train wagons on site, even if a ground-rail line could be extended on-dock. Plus, there is a global shortage of short-haul drivers, and in many places, chassis during peak hours. And lastly, the highly publicized efforts to clean-up port pollution run contrary to adding more short-haul diesel trucks to handle this volume growth and mega-ship bunching, even if driverless.

This all leads to a reduction in port efficiency and stands to worsen as container throughput rises. According to Drewry's latest five-year container port demand forecast, volumes are set to increase on average by just under 6% a year. This would add 240m TEU to global container port throughput by 2022 – 45m TEU a year – "broadly equivalent to the size of the world's largest container port, Shanghai."

When the industry combines these existing limiting factors with future trends of more hinterland inland container depots, deep sea jetties and the need for start-to-finish digital connectivity via IoT, it becomes clear that 'responsible' solutions inside the various 4-walls will not be able to keep up with these problems and future processes outside the gate.

Which brings us back to the various short-haul transportation solutions. When we interview port operators and port authorities, and it is acknowledged that additional road capacity and on-dock ground rail will not be the solution, we will typically white-board options. The most common possible 'out-of-the-box' solutions are: tunnels, tubes, drones or some form of light-rail/fixed guideway. When one considers the high cost of digging and disruption for tunnels, and aerial safety concerns over drones, the only truly practical solution that stands out is light-rail/fixed guideway.

One other, non-transportation solution that is gaining traction, however, is the multi-story, automated 'rack-and-stack' stacking elevators which can store containers up to 10-high in a large “juke box” like warehouse rack. We applaud these efforts as they create additional slots on the same terminal footprint, but they do not address the gating bottleneck issues, the connectivity to hinterland intermodal destinations, nor removing dirty trucks from the roads. And in fact, may make it worse.

WHY OVERHEAD FIX GUIDEWAY/LIGHT-RAIL?

Overhead fixed guideway/light-rail has been in use for 100 years in both the movement of heavy equipment for manufacturing, as well as passenger movement in China, Japan, Germany and France. It is a proven solution, especially when combined with city-decongestion trends in highway 'fly-overs', plus now common automated robotic warehouses for high-volume and repetitive pick-up and delivery routes.

HOW EAGLERAIL WORKS

EagleRail is the world's first automated, 100% electric, Overhead Container Transportation Solution, dramatically improving port and intermodal operations and efficiency. A typical EagleRail system is a two-lane, bi-directional structure with 4-6 pick-up/drop-off nodes, each with a double-loading station, and enough carriers for handling 'peak,' not just average volumes. There are pull-off spurs at prescribed intervals for both by-pass capabilities as well as for holding temporary problematic issues. The system is fully electric and can have solar panel augmentation on top of the rail. It can run 24/7 automatically via a smart routing software named Eagle-i (Vision with IntelligenceTM) with video and digital monitoring from a remote Operators Room. The routes, carrier status and container condition are all continuously monitored via

IoT sensors and portions of the data capture are available to share with the partners in the supply chain. EagleRail load/unload stations can interface directly with an STS crane, a rail mounted gantry, and a reach stacker, so it's well suited for all intermodal environments; ship berths, stacks and trucks yards, and perhaps most importantly, railway interfaces.

QUANTIFYING THE BENEFITS

There are three primary, tangible commercial benefits to automated fixed guideway/light rail; first, greater real estate slot-turns and tarmac productivity, which EagleRail calculates using FlexSim simulation software, and which are often projected to be greater than 50% per installation. Secondly, greatly reduced travel time between nodes.often 75% faster when compared to long queues and gating issues. And lastly, removal of up to 60% of CO2 emissions in and around ports when compared to the needed diesel trucks, and, of course, the increased road safety that follows. All these benefits will be monetizable by the port operators, increasing fees and profitability though higher volumes and faster throughput.

Also, and not unimportant, there are several secondary social, safety and environmental benefits. First, the reduction of oft loosely regulated short-haul trucks on the road, which for a medium-volume installation, can be 5,000 per day. This will give road capacity back to passenger vehicles. Second, the system can conquer topographical challenges that ground-based systems cannot, including incline/declines of up to 6%, and also over waterways. And lastly, critical data interconnectivity which tracks and monitors the status of all containers on the system, not only gives short-haul container status and location visibility, but also connects the holistic data-stream from ship manifest, to operator Terminal Operating System to Rail and third-party logistics systems.

CONCLUSION

The shipping and intermodal industries have invested billions in larger ships, automated port handling equipment and more intelligent software, but the short-haul trucking/drayage bottleneck remains. The time to think 'outside the box,' and 'outside the gate' to create a holistic supply-chain/multi-party solutions is now. And that requires the diligent consideration of cleaner, smart, more efficient overhead automated fixed guideway/light-rail shuttling of containers for high-volume, repetitive routes. While this solution is not for every challenged drayage situation, it is a good alternative to additional short-haul trucks and can be thought of as a complimentary short-haul rail system that is compatible and complimentary to long-haul rail and over-the-road trucking. We believe there is the need and room in the industry for this third alternative. Watch this space.

ABOUT THE AUTHOR

Since founding EagleRail Container Logistics over 5 years ago, Mike has visited over 15 countries and 30 ports studying the intermodal space and discussing the needs of the industry and how automation for short-haul container shuttling outside the port would benefit the entire supply chain. Previous to EagleRail, Wychocki spent 30 years managing several marketing and advertising firms. In 2017, Mike and EagleRail were featured speakers at the United Nations Clean Oceans conference in NYC, and that same year helped launch a clean water port study group with the University of Sao Paulo Brazil, named "Bridging the Blue Economy".

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