WorldCargo news

Towards a new ART form?

Is there any scope for an all-rail terminal in the Pacific Northwest?

In the light of containerised trade growth forecasts, US ports are faced with serious capacity problems. Even if one allows for a 150 per cent increase in productivity to 6000 TEU/acre, the gap between supply of and demand for port facilities will get wider.

According to Professor Asaf Ashar of the US National Ports and Waterways Institute, on present trends there is a need to double, at least, the present amount of terminal acres, but there is a shortage of developable waterfront land, while environmental resistance to port expansion and new terminals is also growing.

Ashar also highlights growing concern over connectivity, particularly as it relates to the US West Coast ports and their intermodal rail services ("bridges") to the Midwest/Northeast. There is no mystery to this. The main dynamic of growth is US imports from China/SEA but more than three quarters of the US population lives east of the Rockies.

An estimate of Ashar's, based on ship capacity, is that about 75 per cent of non-local (ie discretionary) cargo is handled by USWC ports, with the rest handled by USEC ports. Accordingly, close to 60 per cent (0.78 x 0.75) is handled by the "bridges."

Shake the water

Ashar believes that enlargement of the Panama Canal will eventually allow all-water services to the USEC with ships of more than 10,000 TEU capacity. This will lead to a major shake-up of present call patterns, because of depth problems in most of the USEC port range.

USEC port geography is favourable for coastwise transhipment, but would be cost-prohibitive due to the Jones Act and high handling costs in the ports.

Hence hub and spoke services are likely to develop around offshore hubs (eg Freeport, Caucedo, Jamaica, etc). The hub and spoke pattern means that the (potential) capacity of smaller USEC ports can be added to that of the existing container ports, considerably increasing overall port capacity on the USEC range and relieving the I-95 trucking corridor

At the moment, notes Ashar, US Gulf Coast ports are only marginally involved in handling Asian trade via Panama or via Suez and there is no indication of a major change in the future.

None appear to have plans to handle containerships in the 8000-10,000 TEU range. However, both Bayport (*see box below for update*) and Texas City are located close to the sea with short access channels that would be relatively easy to deepen if deemed necessary.

Unlike the USEC, USWC geography is not favourable for hub and spoke shipping patterns and secondary container port development. There are three container port clusters: San Pedro Bay, San Francisco Bay and Puget Sound (which can be "stretched" to include Vancouver, BC and Portland, Or). Of the eight container ports in these clusters, only San Francisco and Portland are not TEU "millionaires." There are almost no secondary container ports on the NAWC range.

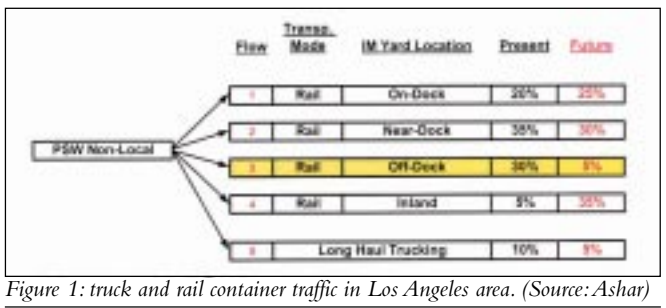


Figure 1: truck and rail container traffic in Los Angeles area. (Source: Ashar)

Owing to population density, Pacific Southwest (PSW) traffic is much larger than that of the Pacific Northwest (PNW). The adjacent San Pedro Bay ports, Los Angeles and Long Beach, handle 85 per cent of the PSW cargo.

Struggling to keep up

Both ports, says Ashar, will have difficulty coping with future demand, because of the prohibitive cost of and environmental resistance to reclamation and the concomitant requirement to provide same area wetland in mitigation.

An even more critical constraint is hinterland connectivity, especially the congestion created in the port area by trucking non-local cargo between marine terminals, distribution centres (DC) and intermodal railyards.

Recently, DCs have migrated inland, to the "Inland Empire," located 50–75 miles away from the ports, where land and labour are less expensive. Congestion can be eased by serving the DCs with shuttle trains instead of trucks and by boosting on-dock and near-dock rail terminals at the expense of off-dock facilities.

Figure 1 provides an estimate of present distribution by mode of non-local cargo in the Los Angeles area, along with likely impacts of the above changes. Note the substantial reduction in the off-dock portion from 30 to five per cent and the increase in inland rail from five to 35 per cent.

One difficulty is that although top capacity of the Alameda Corridor is estimated at 150 trains/day (3.5 times its current load), this may not be enough if shuttle trains to inland ports/DCs are included.

Poor connectivity

Altogether it seems that hinterland connectivity, which relates to both road and rail traffic in the port area, is the main constraint on the PSW ports' ability to handle non-local cargo. A possible solution could be a diversion of some of the non-local cargo to other port regions - not only the USEC using via Panama or via Suez all-water services, as discussed above, but also to the PNW, the so-called northern bridge.

The PNW is on average 600–750 n/m closer to Asia than the PSW, while the rail distances between the PNW and PSW to the US Midwest and Northeast are the same. Hence, the northern bridge is faster by about 1.5 days. Presently, the share of non-local cargo in most PNW terminals already reaches 70–80 per cent of throughput. But overall traffic and terminal size are relatively small and the two major US ports, Seattle and Tacoma, have limited land reserves.

A recent contender for non-local cargo is Vancouver, BC, boosted by competitive rail services of Canadian railroads to the US Midwest and Atlantic regions. Vancouver has major expansion opportunities at Roberts Bank.

Pure thoughts

Where this leads in Ashar's thinking is the development of "pure rail" shipping services calling at pure rail ports (PRP) - or all rail terminals (ART), somewhere in the PNW. *Figure 2* presents a conceptual layout of a PRP/ART (*not to scale*). The point is that the CY, perpendicular to the quay, *is* the on-dock railyard and the containers are moved direct from ship to railcar. The object is to move the boxes and not to store them.

In this layout, containers are transported from the ship to the waterside of the yard by AGVs and the stackcars are worked by (automated) RMGs. However, the interface could be provided by shuttle carriers. These would provide flexibility as, if they are "overwidth," they can also work the stackcars if required (cf: NIY Tacoma, Expressrail NY/NJ).

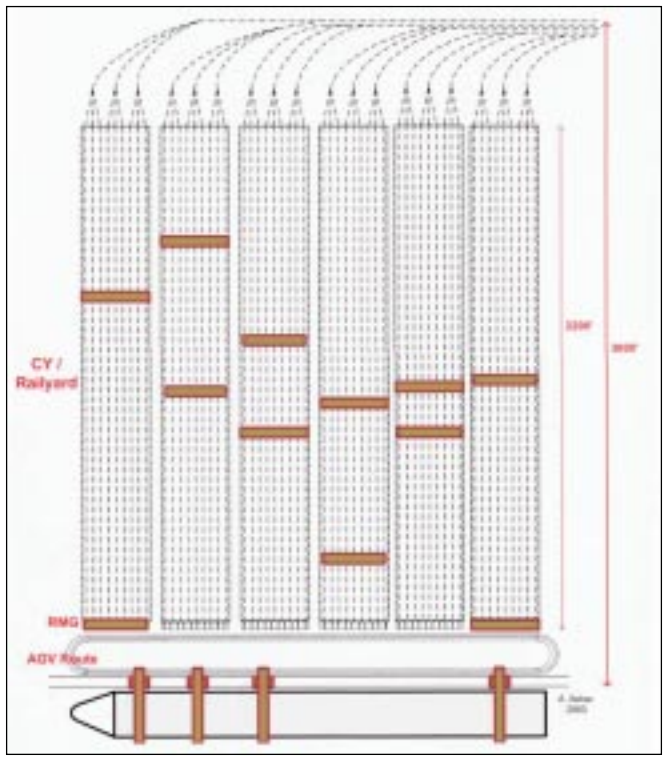


Figure 2: conceptual (not drawn to scale) layout of all-rail terminal or "pure rail port." Each rail track caters for seven stack cars. (ibid)

Another possibility is to link the RMGs to the cranes. The backreach would be extra long

Houston Bayport stalled

A federal court has imposed a temporary halt on the Port of Houston Authority (PHA) starting construction of its proposed container terminal at Bayport. The lawsuit was filed in June 2003 by attorney Jim Blackburn on behalf of the City of Shoreacres and other local municipalities and organisations, including the Galveston Bay Conservation and Preservation Association (GBCPA).

Judge Vanessa Gilmore said that she will conduct an oral hearing on 20 April on the merits of the dispute which, as previously reported (*WorldCargo News*, February 2002, p7), has pitted several local cities and environmental groups against the US Army Corps of Engineers.

"This is a fair result," said GBCPA spokeswoman Katie Chimenti. "It prevents taxpayer dollars from being spent on a hasty construction start. Should the port authority eventually lose the case, this injunction will prevent irreparable harm from occurring on the Bayport site in the meantime."

The PHA, for its part, welcomed the judge's "extraordinary effort" in setting such a tight deadline to resolve the dispute. The lawsuit did not name PHA as a defendant, but it filed a motion to intervene in the lawsuit on behalf of the Corps.

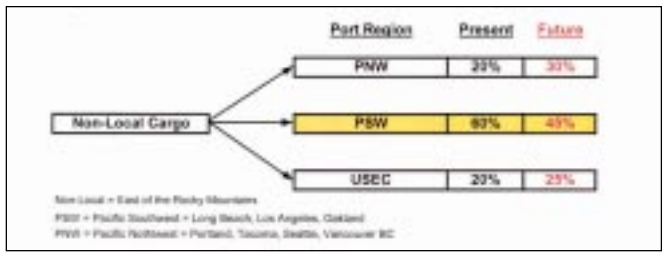
"The plaintiffs' challenge is a weak effort to infringe on the port authority's rights and harm the region's economy and job base," said PHA chairman Jim Edmonds. "We look forward to presenting solid, factual arguments that support the validity of the Corps' process."

Edmonds added that the PHA "has drawn on expertise developed in other ports around the world to make Bayport environmentally sound. "We will continue to review our development plans as new environmental technologies and techniques evolve," he remarked.

The PHA and the Corps signed the federal permit for the project in January this year, marking the critical step in the process to build the US$1.2 bill terminal. Phase 1A would provide 1660ft of the planned final 7000ft of wharf and 65 acres of the ultimate 1043 acre facility.

Pending the court's decision and the start of construction, first phase is targeted to be operational in mid- to late 2006. Subsequent phases would be built incrementally over several years, according to market demand. ❑

Figure 3: coastal distribution of Asian, non-local cargo. (ibid)



and the RMGs would have a cantilever and a rotating trolley to turn the containers through 90 deg once they have picked them up under the backreach. Back-up would be provided by overwidth straddle carriers for peak factors and in case an RMG went down. But it would be impossible to "sort" the train according to destination with this system.

As each loading track has to be able to accommodate up to seven stack cars (a quarter of a unit train) the "depth" of the terminal needs to be around 3000ft. Say, then, a 6000 TEU "pure rail" ship calls. This equates to 10 stack trains or 40 x 2200ft long loading tracks within the width profile of the ship berth (say 350m). If trains were bringing back export cargo, more tracks would be required. There is thus no practical alternative to RMGs.

Strategic purchases by CN hold the key to a new container terminal at Prince Rupert

The critical issue, says Ashar is the overall ship-to-rail concept and operating system. The fundamental requirements are dedication of a shipping service to rail and seamless co-ordination of ship and train service. Ashar says that the industry is "nearly there" in some cases with 70-80 per cent ship-to-rail (eg Tacoma - Evergreen and APM).

Ashar expects the "express" PNW bridge to have a substantial advantage in transit time and cost over conventional PSW bridge services. Apart from the PNW being 1.5 days closer to Asia and the shipping cost being lower, another 1.5 days would be saved by the specialised ship-to-rail transfer. Overall, estimates Ashar, the specialised northern bridge could have the advantage of three days of transit time and US$100/FEU in shipping and port costs. This is considered sufficient to stimulate substantial diversion of non-local cargoes from the PSW to the PNWs.

The effects of the PNW PRP and all-water hub and spoke services on diverting discretionary cargo from the PSW to the PNW and USEC ranges respectively are summarised in *Figure 3*. They amount to, Ashar says, "a reversal of fortune."

On the USEC, secondary ports have been losing cargoes to major ports for years because of load-centering. On the USWC, the PNW, which was the birthplace of the landbridge, has been losing market share to PSW. But "what goes around comes around."

Too rigid?

An obvious point about the ART/PRP concept is that it makes no allowance for local cargo and an interchange area with road trucks. It also focuses exclusively on import flows. But what shipping line would want to pass up whatever opportunity existed for local cargo and exports?

If outbound cargo is factored in, then, in the opinion of one operator, Mogens Christofferson, terminal planning manager for TSI at Deltaport, it would almost certainly have to be grounded and sorted before being loaded to vessel. A direct rail-to-ship "hit" would only be possible if the cars were pre-sorted at an inland rail port.

Christofferson adds that the import cycle may be more complex than "meets the eye" even if the trains are loaded for a handful of destinations, say Chicago or New York. Even if Chicago is the destination of the train it may not be the final destination of the container and it will have to be transferred to other trains when it gets there. There are more than 20 rail yards in Chicago alone, says Christofferson, and "we know from experience that cargo must be blocked on trains to have an effective delivery system to inland destinations."

Rupert the ARTist?

One candidate for an ART is the Port of Prince Rupert in northern BC, which is the closest port on the entire NAWC range (outside Alaska) to Asia. It also has no local market to speak of, so the terminal would be very close to a 100 per cent ART. As reported in last month's *WorldCargo News* (p8), the port authority (PRPA) has issued RFPs from investors/operators to convert its underutilised Fairview Cove general cargo facility into a container terminal.

PRPA's C$1.6 mill design and engineering study is expected to be completed in May. Port president and CEO Don Krusel says he hopes to sign an operating agreement in April this year and to have the terminal operational by late 2005.

Things are clearly moving very quickly! One interested party could be P&O Ports which acquired the operator of Fairview Cove, Casco, from BCR Marine at the start of last year (*WorldCargo News*, January 2003, p9).

The spur for PRPA is the continuing decline in forest products exports, but the real catalyst for a container terminal operator is CN's purchase, last November, of BC Rail and its commitment to reopen its Dawson Creek line and invest up to C$15 mill in rail infrastructure enhancements which would allow double-stack on its northern BC tracks. Meanwhile, the Province of British Columbia has committed C$17.2 mill towards construction of a container terminal, from the sale proceeds of BC Rail.

CN is already operating between Prince Rupert and the US Midwest. Last November, it started regular shipments of China-bound, taconite ore pellets from US Steel Corp's Minntac mine in Mountain Iron, Minnesota. The ore is shipped through Prince Rupert's coal terminal on Ridley Island, which was closed down when a Japanese supply contract ran out.

A mere 17 miles

The key to a container terminal at Prince Rupert is CN's strategic purchase not only of BC Rail but also of Great Lakes Transportation (GLT) from Blackstone Group last October. GLT's assets in the US Midwest/Great Lakes region are all based on iron ore transport and include the 212-mile long Duluth, Missabe & Iron Range Railway (DM&IR). However, the nub of the whole deal, analysts say, is a 17-mile stretch of DM&IR track that is an essential link in intermodal rail services between BC ports and Chicago.

Krusel has acknowledged that if the container terminal project goes ahead, it will "in essence" be an ART because there is no local market. "The business case is built on moving intermodal cargo between Asia and the North American midwest along the shortest land-sea corridor between those markets," he said.

The final design and layout of the terminal is not yet known but the "concept will be to move as many boxes as possible directly between ship and rail because, at least to start, nearly 100 per cent of the traffic will be moved by rail."

Looking ahead, PRPA hopes to build regional export traffic, mainly in forestry and agricultural products stuffed into containers. Some exports may be attracted to rail by the low backhaul rates. But obviously trucking will come into play and the ART has to provide for this. ❑