Supplementary bottled

For US ocean shippers, two of the last three years have seen system failure approaching meltdown. Customers experienced severe disruption in their international supply chains. Although awareness for 2005 is heightened, it remains to be seen if trade growth will be handled without mishap.

In ‘Clearing the way’, CI April 2005, pp76-79, the apparent shortfall of US marine terminal capacity was dealt with – including how productivity improvement would obviate the need for extensive investment. As investment has become increasingly challenging, this is crucial.

But there is also a need for a more holistic approach to the problem. The growth in global trade and increased sophistication of supply chains seem to call out for a paradigm shift among all parties, both globally and in North America.

‘Global’ in this context could mean two things. Obviously, it applies to the scope of trade inherent in the container shipping business. However, it also refers to the extent of participants in the supply chain. Although the marine terminal is the focus for most activity, the full transportation system involves any number of varied players.

Perhaps the best place to start is with the issues surrounding inventory deployment. Although logisticians have made great strides in the corporate world, merchandising is still the dominant force, and the transportation industry finds itself in the crossfire. The challenges are significant:

• To achieve economies of scale, merchandise is often manufactured many months before its intended sale. This inventory must be accommodated somewhere in the supply chain, and marine containers and terminals are frequent points of rest.
• To realise increased sales of high-selling items, increased shipments during peak season exacerbate an already overburdened transportation system.
• Retailers can reduce overall inventory levels by 20-25% by deferring inventory deployment allocations from Asia manufacturing until North American arrival. This increase in transloading activity has already significantly burdened the southern California infrastructure, and it could spread to other locations.
• The reduction in inventory becomes even more attractive as the value of any stockholding increases and interest rates rise. Both of these macroeconomic trends seem possible – the former, given the Chinese Central Bank’s decision to allow the renminbi to float, and the latter, by recent Federal Reserve activity.

Better forecasting would be a good start. The annual posturing of shippers and carriers requires shippers to overestimate their requirements to scare carriers into better rates. An honest exchange of information would allow the industry to better anticipate cargo flows.

Increased intact movement would also allow marine terminals to rapidly process intermodal movements off the vessel to inland destinations. Unfortunately, this requirement seems to be moving in the opposite direction of the industry trend, although it is possible that this function might move off-shore – for example, to the Caribbean for US East Coast (USEC) and Gulf ports.

Visibility is another area that could be improved globally. Although the industry has seen significant improvement in tracking and tracing visibility over the past 10 years, there is still much more to be done. Although many hardware vendors are touting the advantages of radio frequency identification (RFID) and global positioning system (GPS) capability, these advances are almost worthless if the underlying computer systems are unable to process and comprehend the data.

Overcoming these obstacles will mean increased velocity and reliability. Velocity is important not only for loaded transit time, but for empty handling as well. The sooner the load/empty status is updated, the sooner that asset can be redeployed for its next move. This results in fewer assets accommodating the same level of business – and creates additional capacity.

Increased reliability will enable carriers and customers to demand less of a buffered stock of assets (equipment and infrastructure) and time. Again, the number of assets...
in the transportation system (and terminal) is reduced.

The relationship between visibility and security has proved mutually beneficial. Increased visibility will enable better security, which reduces transit delays and enhances reliability (from fewer security holds.)

Equally, security requirements could provide the impetus for better visibility. For example, the 24-hour rule improved vessel manifest timeliness and accuracy, and provided significant benefits to shipping lines.

Increasing capacity also has implications for vessel realignment. Because of manufacturing and commercial cycles, vessels commonly bunch their sailing schedules, which increases the challenge of processing vessels. Many believe that changing schedules will alleviate many terminal problems. However, the solution is complicated.

While schedule windows are sometimes available at North American terminals, this is rarely the case in Asia – and infrequent in Europe. The three largest tradelanes in the world are now centred on Asia-North America, Asia-Europe, and intra-Asia. It is almost impossible to change one schedule without impacting many more.

The introduction of 8,000TEU-plus vessels could well have made the question moot. Many of these vessels are now scheduled to be in port for five or six days, so the production has almost become week-round as a result. However, these larger ships come with other unique challenges.

Since some of these vessels are deployed in shuttle rotations, such as Shanghai-Los Angeles, vessel stowage of distinct blocks is not always achieved, and multiple alliance partners just add to the complexity. However, the ability to stow cargo in the inverse order of likely terminal departure (ie recognising 'hot locals', and incorporating intermodal train plan sequencing) would provide significant improvements in cargo velocity and efficiency.

Along with vessel realignment, such logistics network rationalisation could be a worthwhile exercise. Changing vessel rotation might result in a change of transhipment flows from congested terminals to terminals with more available capacity, for instance.

The greatest challenge here could be transfer costs between trades, and understanding the true cost of providing your own service against purchasing a truly arms-length transaction from a commercial feeder. The same challenge extends to using a subsidiary terminal, rather than a public terminal.

Such changes could be complicated because a vessel might serve multiple trades on a single voyage. For example, a transpacific rotation might also be used for intra-Asia moves, with slots being used more than once. Vessel and trade accounting could give results that are counter-intuitive.

Another important issue for the industry as a whole is metrics. There is an old adage: ‘You can’t manage what you can’t measure.’ Although terminal productivity metrics are well-established, and commonly used to manage internally, they are treated as nothing less than top secret. Development of standardised industry metrics would serve several purposes, and could be developed on various levels.

Strategic metrics could be developed to understand the utilisation of the strategic assets deployed. These would clearly identify best-of-breed practices that could serve as models for the rest of the industry. Annual measures should include throughput per unit of land or quay.

For these measurements to be meaningful, universal methodologies need to be developed for throughput. Not only must the measurement be meaningful, but distinctions need to be drawn between actual vessel loading and transhipment, which includes intermodal, barges and lighters, besides traditional feeder vessels. Gate throughput needs to distinguish containers, chassis and bobtails. Classification of land as to the actual use (eg, gate, yard, vessel, rail, container freight stations, office or maintenance) would make this even more invaluable.

Perhaps the best outcome of such benchmarking would be for terminals that consistently lag behind their brethren in terms of performance to face the cold hard fact that they are not nearly as good as they represent to their principals.

Operational metrics should also be developed for viewing in a real-time environment, with stakeholders able to see the operation as a series of peaks and valleys. If different terminals within a single port complex had different peak periods, which were made visible, it is possible that activity could flow to the periods of least activity. Many terminals provide live feeds of their gate lanes on their websites, so this is only the next step.

But establishing industry metrics is only the start of effectively utilising information. Transportation is an asset-based, network-operating industry, and terminal performance is closely related to the performance of the overall network. The two cannot be optimised individually.

Unfortunately, network information is only available on individual components – all of which have different spans of format, control and interest:

- terminals move units between vessels, trains and gates

### THE SCOPE OF THE SOLUTIONS

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### National policy

- Improved intermodal performance
- Increased on-deck performance
- Improved flow on the lines
- Reduced time to market
- Reduced cost of goods
- Increased customer satisfaction
railroads move containers between rail origin and destination
shipping companies are aware of bill of lading (B/L) origin and destination, as well as carrier purchase orders
customs brokers handle B/L and entry
truckers have control between terminals and customer locations
third-party logistics providers (3PLs) handle cargo at a stock keeping unit (SKU) level.

In short, nobody can track containers through the entire logistics network. When you consider that cargo could be vanned and devanned between international and domestic equipment, the challenge seems overwhelming. The current state-of-the-art data, Port Import Export Reporting Service (PIERS), is increasingly viewed as having little value beyond origin and destination port pairs.

Compilation of network flows would allow all stakeholders to understand the inherent trade-offs between different operating strategies. Asset utilisation would be evaluated for the entire supply chain, not individual components, as is the case now. While it might not immediately cause behaviour change, it would at least allow the industry to understand what is – and what might be. Right now, unfortunately, each party does what is best from its individual perspective.

The implications for supply chain security are even more ominous. We cannot fully track the equipment, let alone the cargo. This shortcutting will probably change in the near future. If the industry cannot effect positive change, the US Department of Homeland Security will probably intervene.

Within North America, there are specific tasks that could be undertaken in order to make terminals more productive.

Perhaps the greatest difference between North American ports and their counterparts in Asia is the lack of 24-hour operations. Certainly, the increased labour expense for night shifts and hoot owl shifts (0300h-0800h) is prohibitive.

However, the problem goes much deeper. The supply chain is not truly 24/7 in many parts of North America. It is very difficult for trucks to pick up containers and hold them. Not only are there hours of service and insurance issues, but the necessary parking areas outside the marine terminals are insufficient.

In some areas, inland parking areas have been developed. Containers are shuttled between the marine terminal and this facility in a form of substituted service. These services have been developed by terminal operators as a way to accommodate increased volume without acquiring more land. The additional volume subsidises the foregone investment and increased handling. Expansion of this concept is restricted by a disagreement about the extent of waterfront labour’s right to follow their work inland.

The challenge of zoning and land-use policy is that the oversight is highly fragmented. Local municipalities have more influence than the federal and state governments. It is not uncommon for there to be numerous jurisdictional issues. For example, the facility might be located in one town, but truck traffic restrictions might exist in another.

These restrictive covenants are becoming increasingly difficult to challenge. Distribution centres are often in remote areas, to take advantage of low real estate costs. However, over time, those same low real estate costs can attract residential development that does not desire the noise of all-night activity and truck traffic. Resistance often categorised as NIMBY (not in my back yard) has evolved into outright blanket rejection, or BANANA (build absolutely nothing anywhere near anything.)

Until 24/7 operations are standard, better co-ordination is essential, and this will need to balance the requirements of the terminals and truckers. There have been myriad discussions about how this improvement should be managed, and how benefits can be shared.

Scheduled appointments have been held up, as truckers have opposed the approach, seeing it as too rigid. In theory, such a system could allow a trucker to increase its throughput. However, if the first move is delayed, the entire day’s schedule is ruined in the first 30 minutes, through no fault of the driver.

Computer systems to allow improved visibility are a way to increase trucker efficiency while reducing empty movements through a terminal. Street turns, which enable the reloading of an empty container without it being returned to/picked up from a marine terminal, would create significant additional capacity. The intermittent empty terminal dwell is eliminated, as well as two empty gate moves and terminal handling.

To date, most of these solutions have been viewed as proprietary efforts by certain industry participants to enforce a technology standard (and perhaps a business opportunity) on the local community.

Another area in North America that would help is a more disciplined approach to free time. In comparison to Asia, where export demand for empty containers means that empties are picked up and returned full promptly, North America is a predominantly inbound market. Once containers are unloaded, import loads wait

A CALL TO ARMS ON US FREIGHT POLICY

There are many challenges facing the North American marine terminal industry. Unfortunately, unlike many places in the world, the US itself lacks a national freight policy. Such a mandate could help resolve inherent trade-offs and conflicting economic externalities.

For example, consider that there has always been a trade-off between on- and off-dock rail. Whereas off-dock does not consume land, it does add to gate and highway congestion. Many public policy leaders feel that increased shorthaul intermodal could solve the problem of highway congestion, such as a rail shuttle train to inland points now served by truck or barge service to outlying ports.

There are several challenges to overcome:

• Many shorthaul intermodal rail services require subsidy to reach economic breakeven. Although they could pose significant public benefit, these positive aspects do not always transfer to the profit-and-loss account.
• Many shorthaul services would consume scarce resources (eg train slots) already in short supply for long-distance services.
• Charges such as the harbour maintenance tax and labour assessments must be ‘paid twice’ on rehandled units that move to/from shortsea solutions.
• Other policy mandates, such as the Jones Act, create a cost structure that is difficult to support in a competitive marketplace.
customs clearance and customer pick-up, and very often, they need to be ‘pushed’ out of the terminal.

In theory, free time is a financial penalty to encourage swift pick-up. However, there are several obstacles to this intended result:

- The assessed amounts are often too low to provide much incentive. To many importers, it is just a (small) cost of doing business.
- Customers have negotiated extended free time in their service contracts.
- The overlapping jurisdictions of port, terminal and ocean carrier mean that charges can be waived.

This problem correlates closely with inventory deployment, discussed above. If the product is not ready for commercial deployment, and warehousing is not otherwise available, the box needs to set somewhere. And marine terminals are secure, with the box remaining in the ocean carrier’s possession, custody and responsibility.

In 2005, free time is being reduced, rates are being increased and laxity is becoming more infrequent. Everyone seems to recognise that the terms of free time must change. However, it remains to be seen if individual shippers are willing to sacrifice their negotiated advantage.

Intermodal chassis are another area for potential efficiency gains. North America is unique because steamship lines provide the chassis, instead of the customer or trucker. This creates significant terminal problems.

The most obvious is the amount of terminal capacity consumed by storing empty chassis. It is not unknown for these to consume up to 20% of a terminal’s land area (see ‘Pooling resources’, pp21-23).

Further space is lost by premounting containers on chassis. This ‘wheeled operation’ consumes more space than stacked containers. It also causes operational difficulties by trying to understand which specific units need to be mounted – and when. Very often, mounted units will sit for up to a week before they are picked up.

Terminal gate capacity (and trucking expense) is consumed by the need to reposition chassis between terminals in the same port complex.

Although some ocean carrier alliances have instituted local sharing of chassis, terminal operators are often required to manage individual chassis fleets for each tenant. This only increases operational complexity and wasted space.

The trucking community has become very sensitive to equipment roadworthiness, or ‘roadability’. Under current law, if a terminal loads an unsafe container on a chassis that is stopped by the police, the trucker is responsible. (Experience has shown that empty chassis are much more prone to in-terminal damage.)

Trucker groups are pushing back with legislative initiatives of their own. Terminals now need to provide some sort of maintenance and repair services for these chassis, which just further consumes scarce resources.

There are two possible solutions. The most desirable would be for truckers to own the chassis, eliminating the issue of empty chassis storage. It would also resolve the roadability issue, because the chassis would be the trucker’s asset, and divided responsibility would no longer apply. Unfortunately, such a change is not possible on a piecemeal approach, and most truckers would resist the requirement to invest in assets.

The other approach would be to develop regional pools of chassis, as a common asset that could be used by all lines. This would not eliminate empty storage, but it would reduce individual buffer stocks and the overall space required.

While the mathematics are clearly compelling, it is unclear if lines would be willing to risk the possibility of not having ‘their’ chassis when they are needed. Terminals that operate chassis pools as separate profit centres would also be reluctant.

Several alliances have developed these. However, even they have problems in tracking utilisation, leakage and maintenance and repair.

Meanwhile, terminals have created extensive on-dock capabilities to accommodate intermodal rail. Although these operations often reside within the marine terminal, vessel- and rail-handling are two distinct transactions that occur around the container coming to a point of rest, such as a storage area.

Integrated vessel and rail operations remain a cherished (but so far unattainable) ideal. If this could happen, the labour productivity savings would be immense. It would also free up additional land. On-dock facilities usually have storage tracks to accommodate operational overflow and railcar buffer stock. An improved loading methodology would prevent the need for rail storage, and that land could be reassigned to supporting vessel operations.

As a case in point, several marine terminals have entirely ceased on-dock operations in order to use the land for more traditional purposes.

None of these issues can be addressed in a vacuum. Nor can terminal paradigm shifts happen by themselves. The challenges are great because new capacity will not keep up with trade growth. New ideas and ways of doing business must be introduced, so that we can expand capacity in the supply chain through innovation and improvement.

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