“Port congestion” is today’s buzz phrase in the maritime community. Every trade journal seems to ponder the problem. But why are we so concerned, and what should we do about it?

Ports compete in a wide-open marketplace. Shippers can choose from a range of logistics paths, responding to customer needs by shifting vessel patterns between competing ports in a given market range. However, most port market ranges are not subject to any overall strategic capacity planning. U.S. ports are free to make expansion decisions without considering what other ports might be doing, and ports in competing countries within the same range also act independently. This competition should make for efficient freight movement because it allows shippers to find the cheapest, most effective shipping path. Right? Well, maybe.

It takes a long time to build new capacity. Open land next to deep water is no longer plentiful. Building deepwater landfills is expensive and time-consuming. Environmental permitting is getting more complicated, expensive, and restrictive. And meanwhile, the ‘natives’ are getting restless.

Most ports are in busy urban areas, but much of the freight is destined for distant inland markets, which means port city residents unfairly carry the environmental burden. In many cities, residents are responding by applying political pressure to restrict port traffic increases, despite the contribution such traffic makes to their local economy. The environmental headaches are perceived as outweighing the economic benefits.

The restrictions on port development mean that rapid shifts of freight between ports in a given market range can cause chaos. In 2004, there were tremendous port congestion problems in Southern California, due largely to an imbalance in growth across the West Coast ports.

This year has seen a rapid rebalancing of trans-Pacific loads across the West Coast, Gulf Coast, and even East Coast ports. This is good in the short term, but the ports involved must be careful: Shifting just 5 per cent of Southern California’s traffic to another port can increase that port’s traffic by as much as a third. How many ports could handle that onslaught of volume?

Port capacity is all about velocity: The faster freight moves, the more a port can handle through its fixed resource base. By making better use of existing facilities, ports can defer time-consuming and difficult new developments. But what does that mean in practical terms?

Velocity is simply distance over time. At sea, container freight moves at 25 knots. Sailing 6,300 nautical miles from Hong Kong to Los Angeles consumes 11–12 days, but it may take three days to empty the ship. Then, the containers usually loiter in the terminal for five more days. It takes another day to traverse the L.A. area, which is about 50 miles across. Thus the average velocity of the freight drops to about 0.25 knots. All the wonderful technology built into maritime transport is stymied by the port system’s inability to get the freight inland efficiently.

While that container is inching along, it consumes valuable port and urban resources: berths, terminal yards, urban roads, and regional highways. To reduce that consumption, we must increase speed systemwide. We cannot just attack one element at a time – that will only shift the congestion down the line. We must attack the velocity problem at all points simultaneously, so that each element of the transport chain can take up the strain as neighboring links are improved.

U.S. ports are starting to take a more systematic approach to velocity improvement. The Port Authority of New York and New Jersey just completed a comprehensive port improvement plan. The Port of Oakland recently completed a multimodal maritime development alternatives study, coordinated by JWD Group. The Port of Los Angeles is coordinating improvements across all transport links. West Coast operators are working to increase container velocity inside and outside their terminals. But what sorts of improvements are contemplated? Consider these examples:

Extended gate hours: Expanding gate operating hours will maximise the use of off-peak roadway capacity. Southern California ports will start offering 16–18 hour/day gate operations this summer. (However, truckers and inland warehouse and distribution operators who don’t normally work at night may demand additional compensation.)

Congestion pricing: Various congestion pricing schemes are being introduced to deflect peak-hour use of port, roadway, and rail capacity. Congestion pricing is complicated, and very difficult to make “fair” across the logistics system. To this end, JWD Group prepared a pan-terminal survey of night operating costs, establishing the basis for the “PierPass OffPeak” daytime container movement charge.

Trucker appointment systems: For off-peak gate hours to work, truckers need assurances they will be safely and efficiently served at night. Many Southern California terminals are moving toward requiring appointments for the pickup of import loads (during both day and night operations). This will allow the operators to efficiently prepare imports for delivery to truckers, reducing delay and increasing overall yard velocity.

Off-dock container yards: Some liner operators, trucking companies, and even stevedores are establishing off-port container storage yards, splitting container storage dwell time across more facilities. This allows containers to be moved to off-dock facilities quickly and efficiently at night. Since those facilities are usually in less-congested areas, containers are more accessible for onward truck and rail movement.
Fast rail shuttles: Some agencies (e.g., the Port of Oakland, the Port Authority of New York and New Jersey, and the Alameda Corridor Transit Authority) are considering the deployment of rapid inland rail shuttles, moving containers from congested port areas to more spacious inland rail complexes for reconsolidation and distribution.

Integrated maritime and rail movement: Several ports are examining methods for expediting the movement of containers between maritime and rail systems. Rail capacity is perhaps the most rigid element; increasing the operating tempo is difficult, and building new track takes time and money. The challenge is to make rail cars available when containers are ready, and vice versa.

Expanded rail connections: Some ports are expanding rail connectivity through rail operating yards, main-line access tracks, and switching and routing tracks. These improvements enhance the staging of rail-car resources and promote efficient train movement systemwide.

Automated yard marshaling and inventory control: Many marine terminal operators are deploying automated inventory control systems to track containers in real time. Operators are also pursuing automated solutions, such as using robotic cranes to marshal containers outside of terminal operating hours. This makes containers accessible sooner, improving truck service and increasing overall velocity.

High-speed gates: Most terminals are deploying automated high-speed gates that use optical character recognition, digital imaging, and other technologies to expedite truck/terminal operations. These systems enhance off-peak truck movement, exploiting residual capacities in the system.

Multi-pick cranes: Many ports have pursued the deployment of quay cranes capable of twin-20 operations. Productivity will increase as the technology for tandem-40/quad-20 operations matures. However, as JWD has learned through recent planning projects, these new cranes will have a profound impact on terminal layout and operations. Their deployment will require a comprehensive approach to site planning and operations.

None of these approaches will significantly relieve port congestion by itself. Each relies on improvements in other areas, and on other logistics links. But, we can already move at 25 knots at sea; it is now time to enhance freight velocity through the ports.