



A First Glimpse at September

Note: *Because West Coast ports are usually much quicker in releasing their monthly TEU tallies than their rival ports elsewhere in the country, these “First Glimpse” numbers are necessarily incomplete and may give a misleading indication of the latest trends.*

So what are the early reporting ports telling us about September?

Normally, the Port of Oakland is the first to report its previous month’s figures. So we begin with the Bay Area port’s numbers. Outbound loads were down 2.4% from August but up 10.6% year-over-year. Outbound loads slipped by 0.6% from August but were up 5.0% from September of last year. The port also reported September was its busiest month ever, with total traffic (loads + empties) of 225,809 TEUs.

Down at the Port of Los Angeles, inbound loads (471,795 TEUs) were down by 8.6% from August but jumped by 17.3% over September 2019. Outbound loads were down 0.8% from August and off by 0.3% from last September. Next door at the Port of Long Beach, inbound loads (405,618 TEUs) were up 11.2% from August and up 14.3% year-over-year. Outbound loads were down 8.7% from September of last year. Together, the two San Pedro Bay ports report a 15.9% year-over-year jump in inbound loads but a parallel 4.3% fall-off in outbound loads. Long Beach saw its busiest month ever, a peak which Los Angeles hit in August.

Up in the Northwest, the Ports of Tacoma and Seattle enjoyed a brisk uptick in international traffic in September. While import loads at the two Northwest Seaport Alliance ports were down 6.8% from a year earlier, the two ports did post a 13.6% pop over August. Similarly, although export loads were off by 18.5% from September 2019, they were up 21.9% over August.

Back East, Charleston reported September inbound loads were down 6.8% from August but up just 0.3% from a year earlier. Loaded outbound TEUs were down 2.0% year-over-year. At the Port of Virginia, inbound loads were up just 0.2% over August but up 5.6% over last September. Outbound loads were 5.5% higher this September than last.

On the Gulf Coast, the Port of Houston’s inbound load volume was up 4.1% over August and 14.3% over last September. Outbound loads, however, were off by 6.2% from August and down 9.7% year-over-year.

Up in British Columbia, the Port of Vancouver saw its September inbound loads decline by 6.5% from August and less than 0.1% from a year earlier. Meanwhile, the Port of Prince Rupert reported September import loads were 11.0% lower than in August and down 5.3% year-over-year. Export loads were 2.4% ahead of last September.



Photos courtesy of the Port of Oakland Credit: Jay Ach



Parsing the August 2020 TEU Numbers

Please note: The numbers here are not derived from forecasting algorithms or the partial information available from U.S. Customs and Border Protection but instead represent the actual TEU counts as reported by the major North American seaports we survey each month. The U.S. mainland ports we monitor collectively handle over 90% of the container movements at continental U.S. ports.

August 2020 Import Traffic

By any definition, this summer witnessed an import surge that was largely unexpected, a disturbing reminder of the perils of prophecy and a topic which certainly should be on the agenda for future maritime trade conferences.

In Southern California, the Port of Los Angeles handled 516,286 laden inbound TEUs, more inbound loads than in any other month in its history. That represented an 8.3% (+39,673 TEUs) bump over the same month a year earlier, but also a 13.2% jump from July, which in turn was a 20.1% increase over June. Next door at the Port of Long Beach, inbound loads were up 13.0% (+42,012 TEUs) over August 2019. Together, the two San Pedro Bay ports posted a 10.2% (+81,685 TEUs) year-over-year gain in inbound loads.

Up the coast in the San Francisco Bay Area, inbound traffic at the Port of Oakland improved by 9.0% (+7,941 TEUs) over a year earlier. However, the Northwest Seaport Alliance Ports of Tacoma and Seattle fell 3.9% shy of last year's pace, handling 4,377 fewer inbound loaded TEUs than they had in August 2019.

Altogether, the five major U.S. West container ports posted an 8.5%

Exhibit 1	August 2020 - Inbound Loaded TEUs at Selected Ports					
	Aug 2020	Aug 2019	% Change	Aug 2020 YTD	Aug 2019 YTD	% Change
Los Angeles	516,286	476,613	8.3%	2,922,948	3,174,318	-7.9%
Long Beach	364,792	322,780	13.0%	2,401,565	2,449,939	-2.0%
San Pedro Bay Totals	881,078	799,393	10.2%	5,324,513	5,624,257	-5.3%
Oakland	96,264	88,323	9.0%	647,048	653,006	-0.9%
NWSA	107,890	112,267	-3.9%	777,087	927,530	-16.2%
USWC Totals	1,085,232	999,983	8.5%	6,748,648	7,204,793	-6.3%
Boston	10,162	14,047	-27.7%	89,662	99,959	-10.3%
NYNJ	366,887	342,541	7.1%	2,401,697	2,525,575	-4.9%
Maryland	44,305	44,878	-1.3%	333,433	354,706	-6.0%
Virginia	120,914	121,542	-0.5%	815,659	920,478	-11.4%
South Carolina	96,965	103,221	-6.1%	659,103	716,337	-8.0%
Georgia	227,537	217,017	4.8%	1,401,660	1,489,720	-5.9%
Jaxport	27,738	30,484	-9.0%	230,737	239,791	-3.8%
Port Everglades	25,150	24,407	3.0%	193,771	214,196	-9.5%
Miami	36,847	37,787	-2.5%	264,752	291,447	-9.2%
USEC Totals	956,505	935,924	2.2%	6,390,474	6,852,209	-6.7%
New Orleans	10,239	11,908	-14.0%	91,403	92,840	-1.5%
Houston	116,714	110,318	5.8%	788,771	826,167	-4.5%
USGC Totals	126,953	122,226	3.9%	880,174	919,007	-4.2%
Vancouver	167,095	145,819	14.8%	693,440	765,709	-9.4%
Prince Rupert	68,064	71,453	-4.7%	404,954	437,108	-7.4%
BC Totals	235,159	217,272	8.2%	1,098,394	1,202,817	-8.7%
US/BC Totals	2,403,849	2,275,405	5.6%	15,117,690	16,178,826	-6.6%
US Total	2,168,690	2,058,133	5.4%	14,019,296	14,976,009	-6.4%
USWC/BC	1,320,391	1,217,255	8.5%	7,847,042	8,407,610	-9.5%

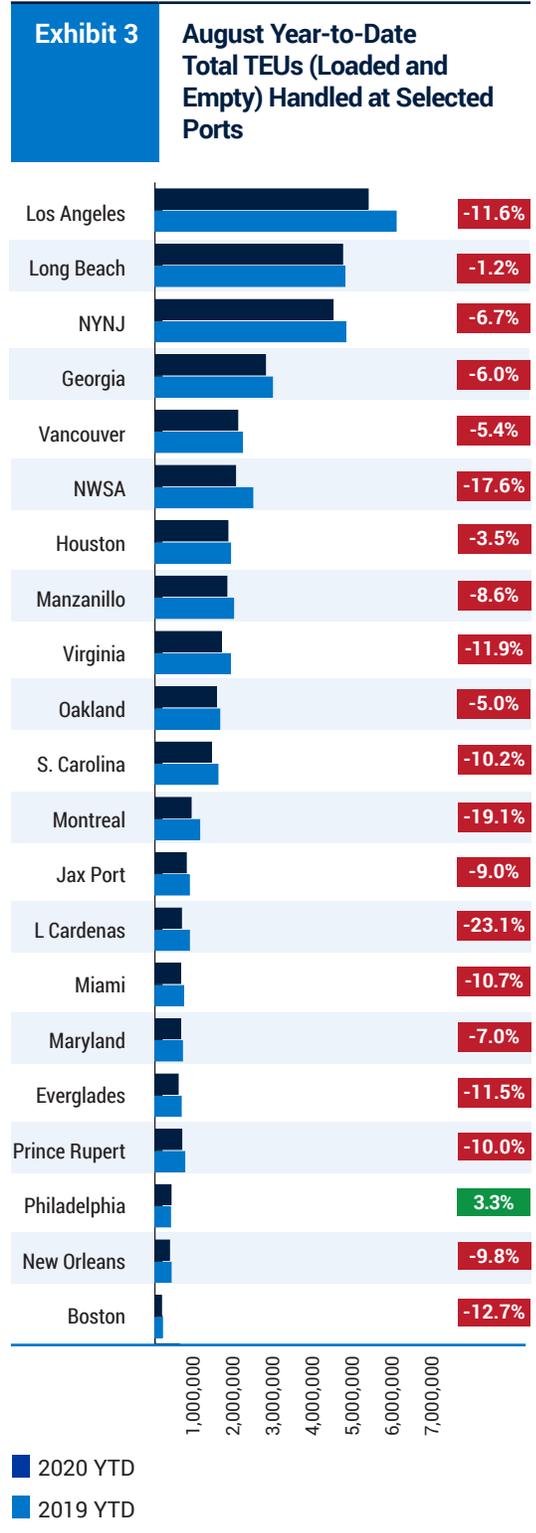
Source Individual Ports



Parsing the August 2020 TEU Numbers Continued

Exhibit 2		August 2020 - Outbound Loaded TEUs at Selected Ports				
	Aug 2020	Aug 2019	% Change	Aug 2020 YTD	Aug 2019 YTD	% Change
Los Angeles	131,429	146,284	-10.2%	1,005,892	1,216,304	-17.3%
Long Beach	126,177	124,975	1.0%	999,600	968,854	3.2%
San Pedro Bay Totals	257,606	271,259	-5.0%	2,005,492	2,185,158	-8.2%
Oakland	76,144	75,080	1.4%	610,097	615,145	-0.8%
NWSA	54,918	74,852	-24.6%	522,805	602,408	-13.2%
USWC Totals	388,668	421,191	-7.7%	3,138,394	3,402,711	-7.8%
Boston	7,033	8,220	-14.4%	49,524	54,837	-9.7%
NYNJ	103,037	127,237	-19.0%	865,419	986,770	-12.3%
Maryland	18,638	19,924	-6.5%	142,670	154,392	-7.6%
Virginia	75,325	80,655	-6.6%	609,751	655,460	-7.0%
South Carolina	66,825	73,927	-9.6%	513,788	560,782	-8.4%
Georgia	115,665	125,558	-7.9%	973,363	1,003,980	-3.0%
Jaxport	44,119	42,934	2.8%	326,666	332,378	-1.7%
Port Everglades	28,298	37,602	-24.7%	218,747	282,201	-22.5%
Miami	32,812	32,980	-0.5%	239,998	274,185	-12.5%
USEC Totals	491,752	549,037	-10.4%	3,939,926	4,304,985	-8.5%
New Orleans	22,192	26,022	-14.7%	187,366	200,200	-6.4%
Houston	98,552	109,388	-9.9%	831,650	836,350	-0.6%
USGC Totals	120,744	135,410	-10.8%	1,019,016	1,036,550	-1.7%
Vancouver	77,353	92,120	-16.0%	693,440	756,709	-8.4%
Prince Rupert	16,626	15,144	9.8%	132,921	132,187	0.6%
British Columbia Totals	93,979	107,264	-12.4%	826,361	888,896	-7.0%
US/Canada Total	1,095,143	1,212,902	-9.7%	8,923,697	9,633,142	-7.4%
US Total	1,001,164	1,105,638	-9.4%	8,097,336	8,744,246	-7.4%
USWC/BC	482,647	528,455	-8.7%	3,964,755	4,291,607	-7.6%

Source: Individual Ports



Source: Individual Ports



Parsing the August 2020 TEU Numbers Continued

Exhibit 4 USWC Ports Shares of Worldwide U.S. Mainland, August 2020

	Aug 2020	July 2020	Aug 2019
Shares of U.S. Mainland Ports Containerized Import Tonnage			
LA/LB	29.6%	30.3%	27.3%
Oakland	4.1%	4.4%	4.3%
NWSA	4.5%	4.8%	5.4%
Shares of U.S. Mainland Ports Containerized Import Value			
LA/LB	36.8%	37.6%	34.6%
Oakland	3.9%	4.0%	3.9%
NWSA	5.8%	6.3%	7.3%
Shares of U.S. Mainland Containerized Export Tonnage			
LA/LB	22.2%	22.2%	20.9%
Oakland	6.5%	6.4%	5.9%
NWSA	7.0%	7.0%	8.4%
Shares of U.S. Mainland Containerized Export Value			
LA/LB	21.7%	22.6%	20.1%
Oakland	6.9%	7.6%	6.1%
NWSA	4.2%	4.3%	4.6%

Source: U.S. Commerce Department.

(+85,249 TEUs) increase in inbound loads in August. Their collective share of inbound loads through the fourteen mainland U.S. ports we monitor rose in August to 50.0% from 48.6% a year ago.

August 2020 Outbound Traffic

Containerized export numbers were down 9.4% from last August at the fourteen mainland U.S. ports monitored by this newsletter. Only Long Beach (+1.0%), Oakland (+1.4%), and JaxPort (+2.8%) reported year-over-year gains. Some, like the NWSA ports (-24.6%) and Port Everglades (-24.7%) fared very poorly. The port recording the steepest fall-off in outbound loaded TEU numbers was the Port of New York New Jersey, where outbound loads plunged by 24,200 TEUs from a year earlier.

Altogether, the five major USWC ports saw outbound

Exhibit 5 USWC Ports Shares of U.S. Mainland Trade With East Asia, August 2020

	Aug 2020	July 2020	Aug 2019
Shares of U.S. Mainland Ports' East Asian Container Import Tonnage			
LA/LB	45.7%	48.0%	42.6%
Oakland	4.3%	4.7%	4.5%
NWSA	6.4%	6.9%	7.6%
Shares of U.S. Mainland Ports' East Asian Container Import Value			
LA/LB	52.3%	54.3%	49.7%
Oakland	4.4%	4.8%	4.4%
NWSA	8.0%	8.8%	10.3%
Shares of U.S. Mainland Ports' East Asian Container Export Tonnage			
LA/LB	35.5%	35.2%	36.1%
Oakland	8.9%	8.6%	9.0%
NWSA	10.7%	10.1%	13.9%
Shares of U.S. Mainland Ports' East Asian Container Export Value			
LA/LB	41.2%	42.9%	41.5%
Oakland	12.0%	12.2%	10.8%
NWSA	8.1%	7.7%	9.7%

Source: U.S. Commerce Department.

loads decline by 7.7% (-32,523 TEUs) from August of last year, while the fall-off at the nine USEC ports we track was 10.4% (-57,285 TEUs). Outbound loads from New Orleans and Houston, the two Gulf Coast we monitor, were off by 10.8% (-14,666 TEUs) from last August. Up in British Columbia, while Prince Rupert's outbound loads grew, Vancouver's declined more sharply, leaving the two Canadian Pacific ports down 12.4% (-13,285 TEUs).

For August, the USWC share of outbound loads from mainland U.S. seaports increased to 38.8% from 38.1% last year.

Weights and Values

Even though the TEU is the shipping industry's preferred unit of measurement, we offer two alternative metrics – the declared weight and value of the goods contained



Parsing the August TEU Numbers *Continued*

in those TEUs – in hopes of further illuminating recent trends in the container trade along the USWC.

Exhibit 4: USWC Ports and the Worldwide Container Trade. Exhibit 4 features some unusual numbers on containerized imports (regardless of point of origin) entering mainland U.S. ports. The two San Pedro Bay ports actually saw their combined percentage of containerized import tonnage in August slip to 29.6% from 30.3% in July but remain higher than the 27.2% share recorded in August 2019. Those numbers were parallel to the two ports' combined share of the value of the nation's containerized import trade, with a 36.8% share in August tailing off from a 37.6% share in July while staying well ahead of their 34.6% share of last August. Meanwhile, the Port of Oakland's share of import tonnage declined to 4.1% from 4.4% in July and from 4.3% a year ago. Meanwhile, Oakland's share of import value edged lower in August to 3.9% from 4.0% in July but remained identical to its 3.9% share last August. Further north, the two NWSA ports saw their combined share of import tonnage slide to 4.5% from 4.8% in July and from 5.4% a year earlier. In value terms, the NWSA ports' share dropped in August to 5.8% from 6.3% in July and from 7.3% in August 2019.

On the export side, the Southern California ports gained market share in both tonnage and value terms. Oakland fared even better with significant year-over-year gains in both export value and export tonnage. Not so positive were the numbers for the NWSA ports, who saw their combined share of U.S. containerized export tonnage plunge while their share of export value crept down from a year ago.

Exhibit 5: USWC Ports and the East Asia Trade. The numbers on containerized imports arriving at U.S. mainland ports from East Asia in August evidenced a shift in the recent Asian import surge to ports on the East and Gulf Coasts. Although still handling more of the nation's containerized import tonnage from East Asia than their combined 42.6% share last August, the Ports of Los Angeles and Long Beach saw their collective share of that trade slip to 45.7% in August from 48.0% in July. At the same time, their joint share of containerized import value declined to 52.3% from 54.3% in July but still remained higher than their 49.7% share last August. Elsewhere along the coast, Oakland's August tonnage share slipped

to 4.3% from 4.7% in July from 4.5% a year earlier. As has lately been the case, the NWSA ports suffered declines in both import value and tonnage shares both from July and from August 2019.

Exports were a different story, though. On the outbound side, the San Pedro Bay ports' share of the nation's containerized export tonnage to East Asia in August dipped to 35.5% from 36.1% a year earlier, while their combined share of the value of those containerized exports likewise slipped to 41.2% from 41.5%. Oakland meanwhile experienced a slight decline in its share of containerized export tonnage to East Asia but grew its value share. At the top of the West Coast, the two NWSA ports suffered significant declines in both their tonnage and value share of U.S. containerized exports to East Asia.

Who's #1?

August is currently the most recent month for which comparable statistics are available for ranking the nation's three busiest ports. So, for the record, the **Port of Los Angeles was the nation's busiest container port in August** with total traffic (loaded + empty) amounting to 961,833 TEUs. The Port of Long Beach ran second with 725,610 TEUs, while the Port of New York/New Jersey (PNYNJ) placed far behind in third place with 688,365 TEUs.

For the fussy few who think empty boxes should not count, the rank order remains unchanged. Los Angeles handled 647,715 loaded TEUs as opposed to 491,569 laden TEUs at Long Beach. Trailing behind in third was PNYNJ with just 469,954 laden TEUs.

The YTD totals (loads + empties) for the first eight months of the year showed Los Angeles in the lead with 5,580,110 TEUs. Long Beach with 4,911,726 TEUs bested PNYNJ's total of 3,973,088 TEUs. Strictly in terms of loads, LA handled 3,928,842 laden TEUs through August, with Long Beach (3,400,563 TEUs) topping PNYNJ (3,267,116 TEUs).

The Perils of Prophecy (Summer 2020 Edition)

We have occasionally commented in the forty-three previous issues of this newsletter about the essential iffyness of container trade forecasts. Sometimes, we've shrugged our shoulders at the boldness of long-range predictions based on dubious data. Most of the time, though, we've marveled at the audacity of seers who are



Perils of Prophecy *Continued*

obviously assuming no one will ever check back to see how things panned out.

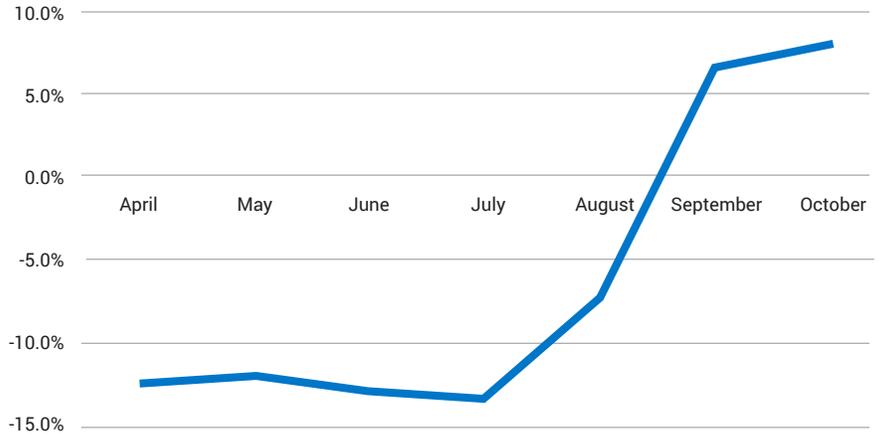
And then there are the occasions when we can only sympathize with prognosticators who have just had a great big black swan smack into their windscreens. This is such an occasion. One of the most widely watched and respected prophecies of containerized import traffic at U.S. ports is the Global Port Tracker (GPT), a collaboration of the National Retail Federation and Hackett Associates. This has not been the most gratifying year for the GPT.

Monthly press releases from the National Retail Federation provide regular updates of the GPT outlooks, typically beginning five months before a target month and concluding with an after-the-fact calculation of how many inbound loaded TEUs actually arrived at the thirteen U.S. ports monitored by the GPT. **Exhibit 6** below shows how difficult it proved to get a handle on imports for the month of August. In its first take, issued on April 7, GPT expected August to be an obvious victim of the pandemic-induced slowdown of maritime trade, with imports expected to be down 12.5% from the previous August. GPT continued to expect this year's August to be a dismal month for imports until a September 9 revision that suddenly pointed to a 6.0% year-over-year increase in import loads. By October 8, with port tallies in hand, GPT concluded that August had, in the end, seen an 8.0% year-over-

Exhibit 6

Global Port Tracker Forecasts for August 2020 TEU Imports

Source: National Retail Federation



year increase in import TEUs.

So now that we are a third of our way through the year's fourth quarter, our thoughts and prayers go out to those seeking to divine the future as we move into a phase fraught with an unusually high degree of epidemiological, electoral, and military uncertainty. As much as a resurgent pox this winter and widespread civil unrest spawned by disputed balloting may challenge forecasting models, we're pretty much certain none of the maritime trade forecasts currently being peddled fully comprehends how profoundly a military confrontation in the Taiwan Straits in the next several weeks would impair transpacific container shipping in the first quarter of 2021.

Happy Halloween.



Jock O’Connell’s Commentary: Asymmetries and Bromides on the Docks

Those of us who talk or write about maritime trade tend to be obsessive about containerized *imports*. Arguably the leading topic of conversation among North American port pundits in recent years has been the steady diversion of containers on the eastbound transpacific trade from the U.S. West Coast to ports along the East and Gulf Coasts and in British Columbia. In a perverse way, it’s come to be treated almost as a contest, with partisans cheering or moaning as the respective coasts’ scorecards are updated each month.

Containerized *exports*, by contrast, are accorded much less respect. Except, that is, if y’all are associated with the Port of Savannah and take particular delight in pointing out that, ahem, you’re regularly shipping more outbound loaded TEUs than those Yankees up at the Port of New York/ New Jersey. (Even the Port of Oakland, once quick to loudly boast that it was the only major American port to export more loaded containers than it imported, can’t say that anymore.)

Lately, though, a lot more attention is being paid to containerized exports, largely because there are so relatively few of them.

Appearing on CNBC late last month, Gene Seroka, who heads the Port of Los Angeles, said that he’s been troubled by the huge imbalance between containerized imports and exports moving through his port, America’s largest. In August, for example, the port handled 516,286 loaded inbound TEUs as opposed to just 131,429 loaded outbound TEUs, a ratio of nearly 4 to 1. In September, the port saw inbound loads slide to 471,795 TEUs, while outbound loads slipped to 130,397 TEUs.

Exhibit A

Port of Los Angeles: Inbound vs. Outbound Loaded TEUs

Source: Port of Los Angeles Statistics

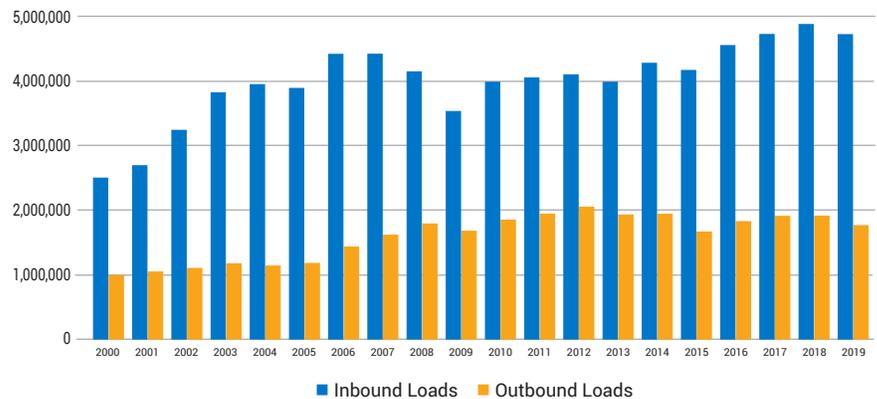
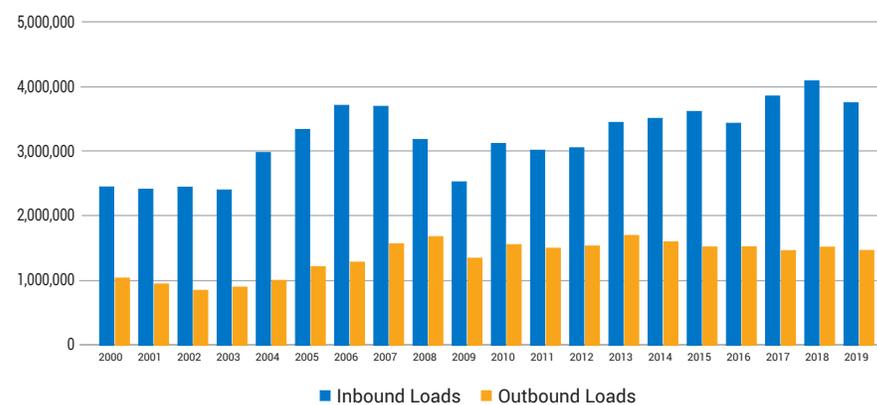


Exhibit B

Port of Long Beach: Inbound vs. Outbound Loaded TEUs

Source: Port of Long Beach Statistics



The chasm between inbound and outbound loads is hardly a recent phenomenon at the Port of LA, although it has definitely been made more acute this summer by shippers who, having opted to ignore the imperatives of the much-touted Four Corners Strategy, have been pushing unprecedented volumes of containerized imports through the Port of Los Angeles and the neighboring Port of Long Beach.

For the historically-minded, the Port of LA’s long record of imposing gaps between inbound and outbound loads is depicted in **Exhibit A**, while **Exhibit B** displays the similarly broad disparities at the Port of Long Beach, where inbound loads have been lately exceeding outbound loads by a margin of over three-to-one.



Commentary Continued

To be sure, it's not as though ships are sailing from the two Southern California ports with hundreds of thousands of containers less than the inbound TEUs they had discharged at the ports. **Exhibit C** reveals why. Apart from the period of the Great Recession, outbound empty boxes have represented the great majority of the Port of LA's outbound container traffic. (The Port of Long Beach does not routinely post statistics that differentiate empty inbound containers from empty outbound containers. However, it is generally assumed that, as at the Port of LA, empty outbound TEUs account for about 90% of all empties the Port of Long Beach handles.)

Exhibit C sheds a somewhat different light on the container trade asymmetry at the Port of LA (and, by implication, at the Port of Long Beach). While August saw a record 516,286 loaded TEUs discharged at the Port of LA, it also saw the port ship 313,379 empty TEUs, the most in any month in the port's illustrious history. In September, inbound loads slipped 8.6% from August's total to 471,795 TEUs, but the volume of empty TEUs on the outbound trade fell by 11.8% to 276,547 TEUs.

As **Exhibit D** reveals, if all containers (loaded as well as empty) are counted, the ratio of inbound containers to outbound is not nearly as horribly out of whack as the four-to-one or five-to-one ratios recently being cited. In all the years since 2000, the number of TEUs entering the Port of LA has exceeded the number of TEUs leaving the port by an average of 13.1%. In fact, before this year, the most acute imbalances of imports over exports occurred in the pre-Great Recession years, when the port was seeing its fastest period of growth. More recently, although the number of loaded inbound TEUs at

Exhibit C

Port of Los Angeles: Outbound Loaded TEUs vs. Outbound Empty TEUs, 2000-2020 (September)

Source: Port of Los Angeles Statistics

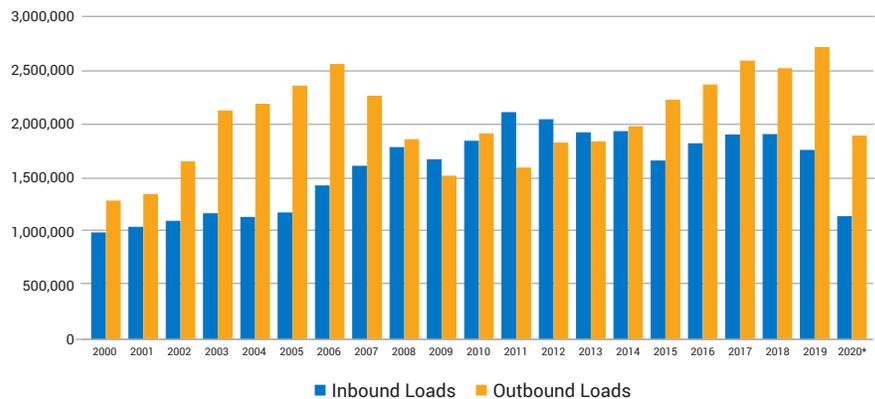
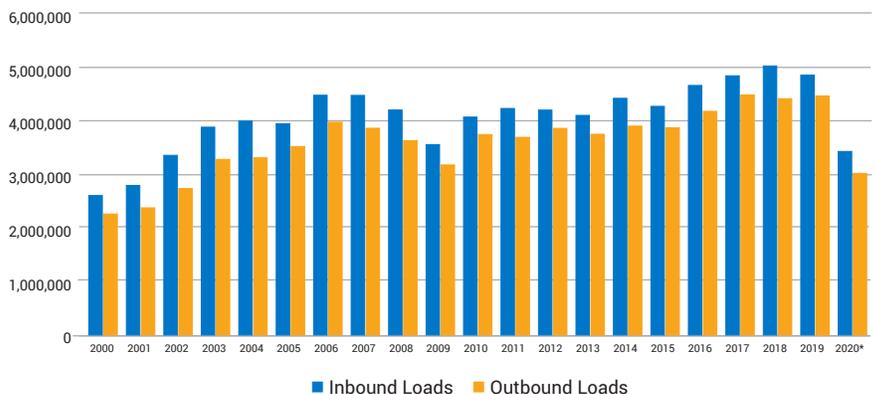


Exhibit D

Port of Los Angeles: Inbound vs. Outbound All TEUs

Source: Port of Los Angeles Statistics



the Port of LA in August was nearly four times higher than the number of outbound loads, overall inbound traffic at the Port of LA in that month exceeded its outbound traffic by just 16.2% margin (517,025 TEUs over 444,808 TEUs). In September, that edge grew to 17.1%.

The imbalance of container trade at the San Pedro Bay ports is even more imbalanced in terms of the **dollar value** of the containerized goods moving through the two ports, as **Exhibit E** demonstrates. Last year, for example, containerized imports at the Ports of Los Angeles and Long Beach (\$274.06 billion) exceeded the value of containerized exports (\$57.44 billion) by 377%. Through August of this year, the disparity has been (\$165.90 billion) over (\$35.16 billion) slightly less at 372%.



Commentary Continued

The gaping gap between the containerized imports and exports – whether measured in terms of loaded TEUs or dollar value – should come as no real shock. It is, after all, a stark reflection of the simple fact that, if you were born in the latest year in which the United States ran a merchandise trade surplus, you would be 45 years old now.

The prospect that the current container imbalances will be resolved by a swift resolution of the current trade war with China (an increasingly unlikely prospect) or, in the longer run, a magical resurgence in the international competitiveness of American goods-producing industries is apt to be frustrated. As **Exhibit F** indicates, growth in the real value of America’s merchandise export trade since the end of the Great Recession has been rather less than spectacular.

Up to a point, it would be preferable if more of those empty containers sailing from the San Pedro Bay ports actually contained more than Southern California air. (That point, of course, being reached when ocean carriers decide to ratchet up rates on export loads to the extent current exporters of low-margin merchandise are priced out of foreign markets.)

So it is not surprising to hear increased chatter down on the docks about the desirability of a national export strategy that somehow might have the singular effect in boosting the approximately 17% of the nation’s merchandise export trade that departs U.S. seaports in containers. Calling for a national export strategy has a fine rhetorical ring to it. But I’m inclined to wonder to what federal government these calls are being directed – the federal government that has rolled out a National Infrastructure Plan or the one that has formulated a National Health Care Policy or the one that has devised a National Housing Initiative?

Exhibit E Containerized Trade Value Imbalances at San Pedro Bay

Source: U.S. Commerce Department

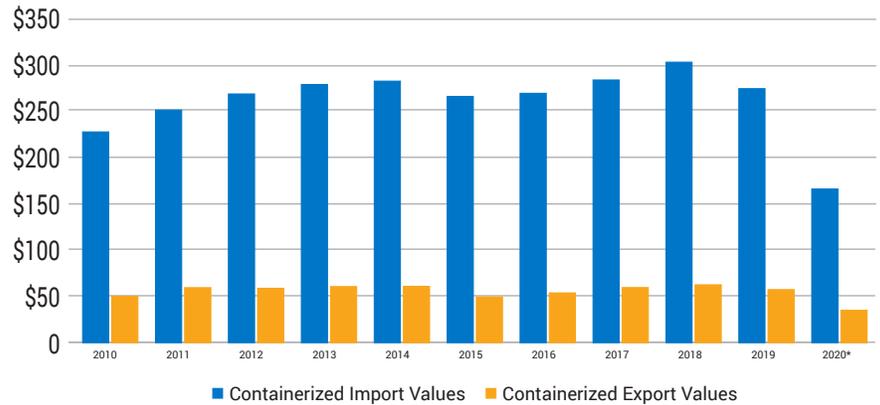
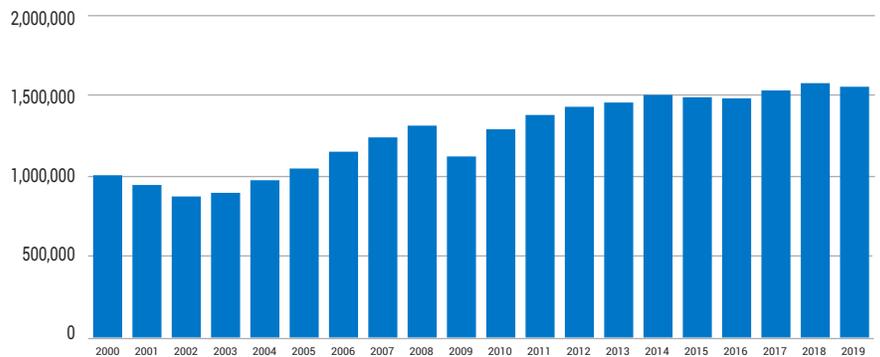


Exhibit F U.S. Non-Petroleum Exports (Billions of Chained 2012 Dollars)

Source: U.S. Commerce Department



Disclaimer: The views expressed in Jock’s commentaries are his own and may not reflect the positions of the Pacific Merchant Shipping Association.



Is This Leadership?

By Thomas Jelenić
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California has adopted stringent zero-emission vehicle (ZEVs) requirements that seek to have ZEV sales increasing from 2% to 5% to 10% over a number of years. Much concern was raised about whether such requirements are feasible or sensible. But California considers itself a leader and is moving forward with the certainty that the right regulatory signals will force the technology into the marketplace. The year was 1990.

The 2% goal was to be achieved by 1998 and the 10% goal by 2003¹. By the end of 2019, pure ZEV sales only made up 5.3% of the California market². California now has a regulatory ZEV goal for 10% of new car purchases by 2025. Twenty-two years after the original deadline... was that leadership or has California become consumed by setting goals, rather than meeting them.

Demonstrating its belief that there is nothing to be learned from history, even recent history, California has once again issued a sweeping technology mandate before the needed technology has been proven. The mandate bans the sale of internal combustion engine cars by 2035 and requires all heavy duty trucks to be zero emission (ZE) by 2045, while calling out “drayage trucks” to complete the transition by 2035 (despite the fact there is no physical or operational difference between “trucks” and “drayage trucks”). The order also called out off-road equipment, like cargo-handling equipment (CHE) used in ports, to complete the transition to 100% ZE by 2035 even though off-road equipment is more diverse, has more severe duty-cycles, and is produced in fewer numbers than on-road vehicles. The most recent analyses by the ports of Long Beach and Los Angeles have determined that there are currently no feasible ZE heavy duty trucks³ or CHE⁴ available for deployment. Yet, CARB is already proposing to ban new trucks from serving California ports unless the trucks are ZE beginning in 2024⁵ even though the technology needed to meet the ports’ needs does not yet exist. Certainly, it must only be a matter of the proper regulatory signals.

In any case, the ZE clock is now running. California’s port terminal operators must figure out how to transition to ZE equipment over the next 15 years. The challenges are

not trivial. First up, are the deadlines real? California has a history of setting audacious goals, then moving the finish line. That does not inspire confidence when a company must invest billions against an out-of-state competitor that does not have to make the same investment.

On the technological front, obstacles for heavy-duty equipment are more challenging than for passenger cars. By sales, it would seem that most Californians feel that electric vehicles do not meet their driving needs or their budget constraints. Scale that up to equipment that must move 80,000 pounds over steep grades and long distances and the technology limitations become more daunting. Yet, despite some window dressing, California officials remain solely focused on battery electric technologies. Unfortunately, the operational constraints of goods movement mean that all vying technologies have strengths and weaknesses.

Because of the years developing the passenger car market, battery technology has made significant progress. Still, it is limited by range. Worse, the cost of extended range for battery technology is linear. The more range needed; the larger the battery needed. With larger batteries, come higher costs and reduced load. With hydrogen fuel cells, these challenges vanish, but new challenges emerge. While potentially more viable than battery electric, hydrogen is further behind in terms of technological development, with additional concerns regarding fuel supply and price.

However, the growing interest in ZE technologies has spurred investment into alternatives to battery electric. There are a number of hydrogen demonstrations currently being conducted in the San Pedro Bay ports for both CHE and trucks. Unlike battery-electric, extending the range of hydrogen-powered CHE comes at the marginal cost for larger tanks, while hydrogen has operational characteristics similar to today’s existing operations that make it an attractive alternative.

Hydrogen technologies may also have some attraction for port authorities. The billions of dollars that will be needed to bring the necessary electrical infrastructure



Is This Leadership? Continued

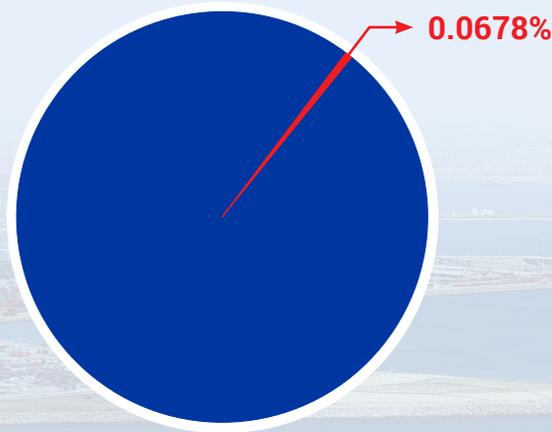
to marine terminals and installation of terminal charging infrastructure will stretch the budgets and construction capabilities of port authorities. By comparison, the shore power infrastructure capital program took a decade to implement. Electrical infrastructure for battery-powered CHE will likely require infrastructure five times the scale of shore power. Hydrogen-fueled equipment will not need any of this infrastructure, instead utilizing shared infrastructure similar to today's diesel infrastructure.

There is one other way that hydrogen may be an interesting ZE alternative for port facilities. As ocean carriers consider solutions for future IMO mandates for greenhouse gas reductions, one possible solution being considered is ammonia^{6,7}. Whether ammonia makes the cut as a vessel GHG solution is anyone's guess today, especially given concerns regarding ammonia toxicity. But the interesting element here is that ammonia is essentially a method of storing hydrogen⁸.

Is it possible that both vessels and marine terminals that serve them move toward a mutual hydrogen economy to solve the question of reducing greenhouse gas emissions? Nobody today probably knows the answer. In California, though, the question has been reduced to: do we have time to determine the answer? Unfortunately, a clock, set by political expediency, is ticking.

1. <https://www.transportpolicy.net/standard/california-zev/>
2. <https://www.cncda.org/wp-content/uploads/Cal-Covering-4Q-19.pdf>
3. <https://cleanairactionplan.org/strategies/trucks/>
4. <https://cleanairactionplan.org/2019/09/20/cargo-handling-equipment-assessment-released/>
5. https://ww2.arb.ca.gov/sites/default/files/2020-10/2020_MSS_October_Webinar_Presentation.pdf
6. <https://safety4sea.com/cm-the-case-of-ammonia-as-a-marine-fuel/>
7. <https://www.greentechmedia.com/articles/read/marine-sector-looks-to-ammonia-to-decarbonize-shipping>
8. <https://phys.org/news/2020-08-hydrogen-economy-mass-production-high-purity.html>

San Pedro Bay Ports Marine Terminal Equipment Share of California GHG Emissions



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Dwell Time Is Up for September

