Attachment 1: Adjustments to the Ro-Ro Capacity Analysis

MEMORANDUM

To: BCDC Staff

From: Dan Smith, Tioga

Date: 12/19/19

Subject: Adjustments to the Ro-Ro Capacity Analysis

At the 12/5/19 SPAC meeting, Brendan O'Meara of the Port of San Francisco noted that the annual throughput per acre used for the Ro-Ro capacity analysis was based on *imports*, and did not reflect the recent higher *export* throughput at the Port's Pier 80. In the last 12 months, the Port moved 146,203 vehicles over 60 acres, an average of 2,437/acre (versus an average of 1,700/acre for imports). The higher export average is due to the much shorter on-terminal dwell, since there is no need for processing.

Using the 2019 Port of San Francisco actual of 146,203 instead of the previous estimate of 100,000 raised the 2050 moderate growth export vehicle forecast from 184,240 to 269,365, and the 2050 Ro-Ro totals from 633,739 to 718,863. There were corresponding changes to the slow and strong growth scenarios.

Tioga also revised the Ro-Ro analysis to include separate productivity scenarios for exports, as shown in Exhibit 1.

Exhibit 1: Revised Ro-Ro Productivity Scenarios

Import Case	Average Dwell Days	Unit Size Distribution - Square feet				Occupancy Index	% Change	Annual Units per Acre
		Compact 88.8	Mid-Size 96.6	Truck 109.7	Average			
Low Productivity	18.0	25%	50%	25%	97.9	1,763	24%	**1,371**
Base Case	15.0	40%	50%	10%	94.8	1,422	na	**1,700**
High Productivity	12.0	50%	50%	0%	92.7	1,113	-22%	**2,173**

Export Case	Average Dwell Days	Unit Size Distribution - Square feet				Occupancy Index	% Change	Annual Units per Acre
		Compact 88.8	Mid-Size 96.6	Truck 109.7	Average			
Low Productivity	5.3	25%	50%	25%	97.9	514	52%	**1,603**
Base Case (SF 2019)	3.5		100%		96.6	338	na	**2,437**
High Productivity	2.3	50%	50%	0%	92.7	216	-36%	**3,809**

The base case export productivity was set at San Francisco's recent 12-month average, assuming all mid-size autos (Teslas) and an average dwell of 3.5 days corresponding to a weekly vessel service. The low productivity case was set at 1,603 per acre based on a 50% increase in dwell time and a broader mix of vehicles (e.g. some Tesla trucks or other larger vehicles). The high productivity case reflects 50% shorter dwell time and a mix of smaller vehicles.

These productivity factors were separately applied to the import and export forecasts as shown in Exhibit 2.

Exhibit 2: Import and Export Growth and Productivity Analysis

Import Scenarios		**2018**	**2019**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**CAGR**
Slow Growth		**333,132**	**335,131**	**337,142**	**347,378**	**357,925**	**368,792**	**379,990**	**391,527**	**403,415**	**0.6%**
Low Prod. Acres	L/L	196	201	206	232	261	269	277	285	294	1.3%
Base Prod. Acres	L/B	196	197	198	204	211	217	224	230	**237**	0.6%
High Prod. Acres	L/H	196	193	190	177	165	170	175	180	186	-0.2%
Moderate Growth		**333,132**	**336,266**	**339,429**	**355,695**	**372,742**	**390,605**	**409,325**	**428,942**	**449,498**	**0.9%**
Low Prod. Acres	B/L	196	201	207	237	272	285	298	313	328	1.6%
Base Prod. Acres	**B/B**	196	**198**	**200**	**209**	**219**	**230**	**241**	**252**	**264**	**0.9%**
High Prod. Acres	B/H	196	194	192	181	172	180	188	197	207	0.2%
Strong Growth		**333,132**	**338,191**	**343,328**	**370,203**	**399,182**	**430,430**	**464,124**	**500,455**	**539,631**	**1.5%**
Low Prod. Acres	H/L	196	203	209	247	291	314	338	365	393	2.2%
Base Prod. Acres	H/B	196	199	202	218	235	253	273	294	**317**	1.5%
High Prod. Acres	H/H	196	195	194	189	184	198	214	230	248	0.7%

Export Scenarios		**2018**	**2019**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**CAGR**
Slow Growth		**27,539**	**146,203**	**146,203**	**162,902**	**167,015**	**171,232**	**175,556**	**179,989**	**184,534**	**6.1%**
Low Prod. Acres	L/L	11	62	64	85	104	107	110	112	115	7.5%
Base Prod. Acres	L/B	11	60	60	67	69	70	72	74	**76**	6.1%
High Prod. Acres	L/H	11	58	56	52	44	45	46	47	48	4.7%
Moderate Growth		**27,539**	**146,203**	**160,823**	**209,910**	**223,368**	**234,073**	**245,291**	**257,046**	**269,365**	**7.4%**
Low Prod. Acres	B/L	11	62	71	110	139	146	153	160	168	8.8%
Base Prod. Acres	**B/B**	**11**	**60**	**66**	**86**	**92**	**96**	**101**	**105**	**111**	**7.4%**
High Prod. Acres	B/H	11	58	61	66	59	61	64	67	71	5.9%
Strong Growth		**27,539**	**146,203**	**182,754**	**298,573**	**321,946**	**347,147**	**374,322**	**403,624**	**435,219**	**9.0%**
Low Prod. Acres	H/L	11	62	80	156	201	217	234	252	272	10.4%
Base Prod. Acres	H/B	11	60	75	123	132	142	154	166	**179**	9.0%
High Prod. Acres	H/H	11	58	70	94	85	91	98	106	114	7.5%

The combined import/export analysis in

Exhibit 3 shows the new acreage estimates. The greater growth in exports offsets the higher export throughput, resulting in a slight increase in acres required: 160 acres versus the earlier estimate of 158 acres (Exhibit 4).

Exhibit 3: 12/19/19 Revised Combined Ro-Ro Scenarios

12/19/2019 Combined Scenarios		2018	2019	2020	2025	2030	2035	2040	2045	2050	CAGR	Existing Acres	New Acres	Available	% Used
Slow Growth		**360,671**	**481,334**	**483,345**	**510,280**	**524,940**	**540,025**	**555,546**	**571,516**	**587,949**	**1.5%**				
Low Prod. Acres	L/L	207	263	270	317	365	376	387	398	409	2.1%	215	194	377	109%
Base Prod. Acres	L/B	207	257	258	271	279	287	296	304	**313**	1.3%	215	98	377	83%
High Prod. Acres	L/H	207	251	246	229	209	215	221	227	234	0.4%	215	19	377	62%
Moderate Growth		**360,671**	**482,469**	**500,252**	**565,606**	**596,110**	**624,678**	**654,616**	**685,988**	**718,863**	**2.2%**				
Low Prod. Acres	B/L	207	264	278	347	411	431	452	473	496	2.8%	215	281	377	132%
Base Prod. Acres	**B/B**	**207**	**258**	**266**	**295**	**311**	**326**	**341**	**358**	**375**	**1.9%**	**215**	**160**	**377**	**99%**
High Prod. Acres	B/H	207	252	253	248	230	241	253	265	278	0.9%	215	63	377	74%
Strong Growth		**360,671**	**484,394**	**526,081**	**668,777**	**721,128**	**777,578**	**838,446**	**904,079**	**974,850**	**3.2%**				
Low Prod. Acres	H/L	207	265	290	403	492	530	572	617	665	3.7%	215	450	377	176%
Base Prod. Acres	H/B	207	259	277	340	367	396	427	460	**496**	2.8%	215	281	377	132%
High Prod. Acres	H/H	207	253	263	283	268	289	312	336	363	1.8%	215	148	377	96%

Exhibit 4: 11/25/19 Revised Combined Ro-Ro Scenario

11/25/2019 Combined Scenarios		2018	2020	2030	2040	2050	CAGR	Existing Acres	New Acres	Available	% Used
Slow Growth		**360,671**	**437,142**	**472,160**	**500,067**	**529,633**	**1.2%**				
Low Prod. Acres	L/L	212	267	344	365	386	1.9%	215	171	377	102%
Base Prod. Acres	L/B	212	257	278	294	**312**	1.2%	215	97	377	83%
High Prod. Acres	L/H	212	247	217	230	244	0.4%	215	29	377	65%
Moderate Growth		**360,671**	**499,429**	**525,521**	**577,099**	**633,739**	**1.8%**				
Low Prod. Acres	B/L	212	274	383	421	462	2.5%	215	247	377	123%
Base Prod. Acres	**B/B**	212	**264**	**309**	**339**	**373**	**1.8%**	**215**	**158**	**377**	**99%**
High Prod. Acres	B/H	212	254	242	266	292	1.0%	215	77	377	77%
Strong Growth		**360,671**	**468,328**	**619,387**	**720,153**	**837,312**	**2.7%**				
Low Prod. Acres	H/L	212	286	452	525	611	3.4%	215	396	377	162%
Base Prod. Acres	H/B	212	275	364	424	**493**	2.7%	215	278	377	131%
High Prod. Acres	H/H	212	264	285	331	385	1.9%	215	170	377	102%

The corresponding revised overall acreage requirements are shown in Exhibit 5.

Exhibit 5: Overall Bay Area Seaport Terminal Space Requirements

Site	Acres	Potential Use		
		Container	Ro-Ro	Dry Bulk
SF Pier 96 & Other	67		X	X
Oakland Berths 20-21	20	X		X
Oakland Berths 22-24	130	X		
Oakland Berths 33-34	20	X		
Oakland Roundhouse	26	X		
Oakland Howard*	38	X	X	X
Benicia Short-Term Lease	35		X	
Richmond Terminal 3	20		X	X
Available Acres	**356**	**176-234**	**35-162**	**0-147**
Moderate Growth Needs	**327**	**136**	**160**	**30**
Slow Growth Needs	98	0	98	0
Strong Growth Needs	753	397	281	75

* Post turning basin expansion: 38 acres container, 40 acres Ro-Ro or dry bulk

Attachment 2: Container Terminal Capacity Estimates Memo

Memorandum

To: BCDC staff

From: Dan Smith, Tioga

Date: 12/31/19

Subject: Container Terminal Capacity Estimates

As requested, we have reviewed the two container terminal capacity estimates developed for the Seaport Plan updates; our benchmarking approach, and Mercator's terminal-by-terminal analysis.

This memorandum:

- Summarizes and compares the two approaches.
- Provides additional current benchmarks.
- Compares current estimates with previous studies.

Container Terminal Estimation Approaches

There are two basic ways to develop Bay Area container terminal estimates for long-term planning. Both approaches have strengths and weaknesses. Ideally, the two approaches should yield similar estimates and increase the confidence of planners.

Benchmarking

Benchmarking entails locating comparable terminals with published capacity estimates and placing Bay Area terminals along the established range. The Tioga analysis took this approach. The benchmarking approach yields estimates of what has been achieved at comparable facilities elsewhere, and therefore what Bay Area facilities can be reasonably expected to achieve. There is no guarantee that benchmarking will yield an estimate of optimal performance. As used by Tioga, the benchmarking approach also does not specify how capacity increases would be achieved or what factors might limit long-term capacity. In recognition of increasing vessel size Tioga conducted a separate berth capacity analysis.

The reliability of the benchmarking approach depends on the comparability of the benchmarks chosen. Current estimates of terminal or port capacity are not widely available, so timeliness and comparability can become issues. The basis and reliability of estimates from other ports and terminals may be unknown, and broad estimates rounded to the nearest million TEU may be imprecise. Benchmarking may yield either conservative or aggressive estimates depending on which benchmarks are used.

Exhibit 1 shows Tioga's comparison of average TEU/acre for major U.S. container ports. Oakland's current productivity is high, right behind New York-New Jersey.

Exhibit 1: 2017 Port Productivity Comparison

Port	Container Terminal Acres	TEU	TEU/Acre
Los Angeles	1,704	9,343,192	5,483
Long Beach	1,399	7,544,507	5,393
New York & New Jersey	1,496	6,710,817	4,486
Oakland (2018)	**593**	**2,537,400**	**4,279**
Charleston	597	2,177,550	3,647
Seattle/Tacoma	1,011	3,665,329	3,625
Mobile	90	318,889	3,543
Savannah	1,200	4,046,212	3,372
Baltimore	294	962,484	3,274
Virginia	896	2,841,016	3,171
Houston	811	2,459,107	3,032
Boston	90	270,881	3,010
12-port Average	**10,181**	**42,877,384**	**4,212**

There are many variations in marine container terminal operations and capacities.

- **Wheeled.** "Wheeled" operations, in which containers are placed on chassis and parked, have the lowest capacity per acre but also the lowest operating cost. West Coast terminals were mostly wheeled until ocean carriers began withdrawing from chassis supply, starting in 2010. Most terminals retain a portion of their wheeled operations for special handling, such as for refrigerated cargo.

- **Stacked.** Most U.S. container terminals are now largely stacked, using a variety of lift equipment to handle containers without chassis and storing the chassis separately. Stacked terminals have higher throughput per acre than wheeled terminals, but also higher operating cost due to the additional handling.

Conventional terminals, as discussed in this analysis, include wheeled, stacked, and mixed terminals, including all existing Oakland terminals. These terminals may include some aspects of automation such as the use of optical character recognition (OCR) at entry gates, but all container operations are performed with manually operated equipment.

High productivity terminals also come in multiple variations, depending on the type and extent of automation.

Semi-automated terminals. Some terminals, such as the Virginia International Gateway at Portsmouth, VA, combine automated and manned operations throughout the terminal. Others, such as TraPac at Los Angeles, have sections of the terminal automated and other sections manned.

Auto-strad terminals. "Auto-strads" are automated straddle carriers. This type of automation is used in Australia and is receiving increased industry attention for its lower capital cost and its capability of deployment in existing, rather than newly built terminals. APM Terminals has proposed deploying auto-strads in a portion of its Los Angeles terminal.

These less-than-complete automation approaches are viewed by many observers as being more cost-effective than more elaborate automation, especially for improving existing terminals. For this analysis we have grouped

these approaches as "high productivity." As noted in the Tioga report, capacity increases beyond "high productivity" at all terminals could conceivably come from:

- More aggressive automation (e.g. ASCs and AGVs).
- Improved information flow and operational optimization to reduce container dwell times.
- Use of off-dock space for "relief" container storage capacity.
- Moving empty storage off-dock.

These are the same type of changes anticipated in the Mercator analysis.

"Complete" automation. The more aggressive automation approaches are often referred to as "complete automation," although the label is a misnomer. In all North American examples to date, such as the Long Beach Container Terminal (LBCT) at Long Beach, the shipside container cranes are manned. The actual automation is in the container yard, where Automated Guided Vehicles (AGVs) move containers to and from stacks served by automated stacking cranes (ASCs). Automation on this scale, however, requires building a new terminal or completely replacing an existing terminal, heavy capital investment, and a long development time.

Exhibit 2 compares claimed capacities and throughput per acre for benchmark terminals in each group. Few terminals post their capacities, so the available data are limited. Tioga chose the benchmarks in Exhibit 2 to illustrate progressively greater automation and other factors thought to increase throughput per acre. The examples were also chosen among the relatively few terminals with readily accessible published capacities. Tioga has located two additional West Coast terminals – Total Terminals International (TTI) at Long Beach and APM at Los Angeles – with published capacities.

Exhibit 2: Terminal Productivity Benchmarks (updated from November draft)

Terminal	Acres	Published Capacity Annual TEU*	Max TEU/Acre**	Sustainable @ 80%**	Average
Conventional Terminals					
Oakland OICT	**290**	**1,600,440**	**8,335**	**6,668**	**6,676**
OICT Off-dock	**30**				
TTI Long Beach	385	3,000,000	7,792	6,234	
GCT Deltaport	210	1,800,000	8,571	6,857	
APM Los Angeles	507	4,400,000	8,679	6,943	
High Productivity					
VIG Portsmouth	291	2,000,000	6,873	5,498	**7,112**
TraPac Los Angeles	220	1,600,000	7,273	5,818	
Sydney Auto-strad	156	1,600,000	10,282	8,226	
Brisbane Auto-strad	99	1,100,000	11,134	8,907	
"Complete" Automation					
LBCT Long Beach	170	3,100,000	18,235	14,588	**11,366**
GCT Bayonne	167	1,700,000	10,180	8,144	

* OICT is actual TEU

** Assumes current average is 95% of sustainable max

Source: Industry publications and terminal websites

OICT currently has Oakland's highest throughput and throughput per acre. Multiple industry and study sources describe OICT as being near maximum capacity; OICT representatives suggest that the terminal is operating at about 75% of capacity.

Exhibit 3: 2018 Port of Oakland Productivity

Oakland & OICT 2018 Average TEU/Acre	
Oakland 2018 TEU	2,537,400
Oakland Acres in Use	593
Oakland Avg TEU/Acre	**4,279**
OICT 2018 TEU	1,600,400
OICT Acres in Use	290
STE Off-dock Staging	30
OICT Avg TEU/Acre	**5,001**

Exhibit 3 shows that OICT's 2018 volume was 1,600,400 TEU over 320 acres (290 terminal acres and 30 off-dock acres), a *current* average of 5,001 annual TEU/acre.

- Based on multiple opinions that OICT is operating near capacity, the consultant team assumed that the terminal is at 75% of a *sustainable capacity* of 6,668 TEU/acre.
- The industry rule of thumb is that a terminal's *sustainable throughput is 80% of its maximum capacity* (Exhibit 2), which yields a current *maximum* capacity of 8,335 TEU per acre or 2.7 million annual TEU for the 320 acres in use.
- On this basis, if all 593 acres of Oakland terminals and off-dock staging currently in use reached OICT's estimated annual *sustainable* capacity per acre, the Port as a whole would have a *maximum* capacity of 4,942,655 annual TEU and a *sustainable* capacity of 3,954,322 annual TEU (80% of the maximum capacity).

As Exhibit 2 shows, this estimate puts OICT's productivity in the mid-range of conventional terminals and higher that VIG Portsmouth or TraPac Los Angeles. Exhibit 2 calculates that the *sustainable* average for conventional terminals is 6,676 TEU/acre, for high productivity terminals is 7,112 (6.5% higher), and for "complete" automation is 11,366 TEU/acre (70.3% higher than the conventional average). It should be noted that the claims for high throughputs at completely automated terminals have not yet been proven in practice.

Tioga's container capacity estimates therefore use the *sustainable* capacity estimates of 6,668 annual TEU/acre for conventional terminals (OICT) and 7,112 annual TEU/acre for high-productivity terminals.

Terminal-by-Terminal Analysis

Terminal-by-terminal analysis involves calculating capacity as a function of current or potential storage capacity, berth capacity, container dwell time, operating hours, etc. Mercator's analysis took this approach. The terminal-by-terminal approach relies on the basic relationship between container yard space and stacking height, which together determine static storage capacity, and container dwell time, which determines how quickly that storage capacity turns over. More comprehensive analyses also examine berth, gate, and rail throughput capacity to insure that those factors do not constrain overall terminal volume. The terminal-by-terminal approach thus "rethinks" existing terminal configurations and operations to estimate what could be achieved if the terminal can indeed operate as envisioned.

The terminal-by-terminal approach is highly dependent on assumptions regarding:

- Container ground slots potentially available.
- Maximum and average stacking heights.
- Container dwell time and slot turnover.
- Gate, berth, and rail capacity.

Mercator used Google Earth aerial photos and terminal diagrams to define existing and potential terminal footprints. Mercator then reallocated terminal space to increase container storage at the expense of chassis storage, wheeled chassis parking, and other functions that could theoretically be moved off-terminal. Mercator also increased the average stacking height. An independent assessment of Mercator's storage capacity estimates would require detailed review, and might best be referred to the terminal operators.

Exhibit 4 displays Mercator's assumptions regarding conversion from TEU to FEU, peaking, maximum practical storage utilization, container dwell time, and operating days. Mercator used the same factors for all West Coast ports. While the actual volumes almost certainly differ, there are few if any independent sources for these values.

- The dwell time and operating days assumptions are critical. The 5-day dwell time and 360 operating days together imply that each container slot can turn over 72 times per year.
- The 5-day average dwell time may be reasonable for import and export cargo according to informal contacts with terminal operators, but not for empties. Empties typically have much longer dwell times and would raise the average significantly above 5 days. More precise data should be requested from terminal operators.

Oakland terminals currently operate 250-260 days per year. Terminals are ordinarily open weekdays and closed on holidays, and may occasionally open on Saturdays to alleviate congestion. The container terminal industry has experimented with weekend operations. Vessels are commonly worked over weekends as required, but terminal gates are seldom open due both to higher labor costs on weekends and to the low volume of cargo delivered and received. As Exhibit 5 shows, data from Los Angeles and Long Beach terminals shows that only 3.6% of the cargo moves to or from terminals on weekends. Thus, even if terminals choose to be open 360 days per year in the future, throughput capacity will not increase accordingly.

Exhibit 4: Mercator Input Factors

Model Inputs	Units	Port of Oakland	San Pedro Bay	NWSA
TEU/FEU	TEU/lift	1.80	1.80	1.80
Peak Inventory/Avg Inventory	Times	1.25	1.25	1.25
Allowable Occupancy	Days	65%	65%	65%
Avg Dwell Time	Days/yr	5.0	5.0	5.0
Work day/year	Days	360	360	360

Exhibit 5: LALB Container Gate Move Count by Day of Week

	Moves	Share
Monday	140,627	20.9%
Tuesday	152,380	22.6%
Wednesday	140,213	20.8%
Thursday	126,484	18.8%
Friday	89,534	13.3%
Saturday	21,301	3.2%
Sunday	2,675	0.4%
	673,214	100.0%

Does not include bobtails or bare chassis

Exhibit 6 shows the sensitivity of Mercator's average productivity estimates to dwell time and working days. The base value of 11,400 TEU per acre corresponds to the 5-day/360-day combination. The average capacity declines significantly under current Oakland conditions.

Exhibit 6: Sensitivity of Mercator Estimates

Estimated TEU/Acre		Average Container Dwell Time in Days						
		4.0	**4.5**	**5.0**	**5.5**	**6.0**	**6.5**	**7.0**
Working Days per Year	**250**	10,180	9,260	8,540	7,940	7,440	7,000	6,660
	260	10,500	9,540	8,780	8,160	7,660	7,240	6,840
	310	12,140	11,020	10,100	9,360	8,760	8,240	7,780
	360	13,760	12,460	**11,400**	10,560	9,840	9,240	8,720

Sustainable vs. Maximum Capacity

The distinction between sustainable and maximum capacity is widely acknowledged in the container terminal industry. Variations in vessel size and schedules, cargo seasonality, and other factors combine to create daily, weekly, monthly, and annual peaks and valleys. This peaking prevents marine terminals from operating continuously at maximum capacity. Capacity estimates can allow for peaking and other factors in multiple ways. For example:

- Multiplying by an overall sustainability factor (Tioga used 80%).
- Dividing maximum capacity by a peaking factor (Mercator divided maximum capacity by 1.25).
- Multiplying static capacity by an occupancy factor (Mercator used 65%).

In all cases the sustainability or peaking factor must be applied carefully to avoid double-counting or under counting, and to ensure that the chosen factor is appropriate for the port or terminal in question. Most factors, including those used by both Tioga and Mercator, are "rules of thumb" rather than values unique to Bay Area container shipping.

- For the High Productivity scenario, Tioga used the average of published capacities for selected North American and Australian terminals (8,890 TEU per acre) and multiplied by 80% to yield 7,112 sustainable TEU per acre. In Mercator's report, it is suggested that the published capacities already reflect a peaking or sustainability factor and that Tioga has double-counted. This suggestion has not been documented or verified.

- Mercator estimated maximum throughput capacity at an average of 21,437 TEU/acre, and then divided by a peaking factor of 1.25 and multiplied by a maximum occupancy factor of 65% (together equivalent to 52%) to derive a working capacity of 11,400 TEU/acre.

Mercator also estimated capacities at other West Coast terminals, but as those estimates used the same methods and assumptions as Mercator's Oakland estimates, those figures cannot be used as benchmarks. The Mercator estimates differ from capacities published on terminal websites.

2012 IWR Analysis

In 2012, Tioga completed a nationwide container port capacity analysis for the U.S. Army Corps of Engineers Institute for Water Resources (IWR) based on 2010 data. That study followed a terminal-by-terminal approach, using aerial photos to estimate container yard storage capacity.

As shown in Exhibit 7, estimates of annual TEU per acre capacity ranged from 4,973 for Seattle to 7,290 for Los Angeles/Long Beach. Oakland was estimated at an average annual capacity of 5,477 TEU per acre.

Exhibit 7: U.S. West Coast Capacity Summary

2010 Capacity & Utilization Measures	West Coast					
Container Yard	**LALB**	**Oakland**	**Portland**	**Seattle**	**Tacoma**	**West Coast Ports**
2010 TEU	14,095,401	2,330,214	181,100	1,376,496	976,705	18,959,916
Gross Acres	2,589	801	124	540	525	4,579
Sustainable CY TEU Capacity @ 80%	18,873,792	4,387,040	862,400	2,685,200	2,636,480	29,444,912
Average Sustainable TEU/Gross Acre	7,290	5,477	6,955	4,973	5,022	6,430
CY Utilization	**75%**	**53%**	**26%**	**64%**	**37%**	**64%**
Container Cranes	**LALB**	**Oakland**	**Portland**	**Seattle**	**Tacoma**	**West Coast Ports**
Cranes	132	33	9	27	25	226
Annual Crane Capacity - TEU	32,881,461	8,061,448	2,268,000	6,409,184	6,576,824	56,196,918
Crane Utilization	**43%**	**29%**	**8%**	**21%**	**15%**	**34%**
Berths and Vessels	**LALB**	**Oakland**	**Portland**	**Seattle**	**Tacoma**	**West Coast Ports**
Berths	51	21	2	11	9	94
Berth Feet	56,978	22,454	2,820	12,790	13,560	108,602
Berth Utilization - Vessel Call Basis	**25%**	**40%**	**15%**	**33%**	**23%**	**29%**

The study also estimated crane and berth capacity to verify that they were not limiting factors.

2015 PMSA/Moffat & Nichol Estimates

In 2015, Moffat & Nichol undertook a series of West Coast terminal capacity and expansion cost estimates on behalf of the Pacific Merchant Shipping Association (PMSA). As show in Exhibit 8 Moffat & Nichol considered three potential long-term electrified operating modes. "eHostlers" would replace conventional wheeled operations. "eRTG" operations would replace current rubber-tired gantry (RTG) operations, such as those at most Oakland

terminal. "ASC" (automated stacking crane) operations would have the highest density, reflecting then-current concepts for "fully automated" terminals.

Exhibit 8: 2015 Moffat & Nichol Operating Modes

Mode	Annual TEU/gross acre
Conventional (eHostlers)	3,500
All Electric (eRTG)	7,200
All Electric High Density (ASC)	10,000

Moffat & Nichol's estimate included a peaking factor of 1.2, equivalent to a sustainability factor of 83%, and would be roughly comparable to Tioga's estimates using an 80% sustainability factor. The average of 7,200 TEU/acre for eRTG systems compares closely to Tioga's benchmark figure of 7,112 TEU/ace for "high productivity" operations short of full automation. The report also noted that a minimum of 100 acres per weekly large-vessel service was required to support the High Density mode.

Exhibit 9 applies the three different Moffat & Nichol development levels to the long-term acreage available at Oakland Terminals, respecting the limits of the smaller terminals to adopt eRTG or ASC modes.

Exhibit 9: Moffat & Nichol Factors Applied to Oakland Acreage

Site	Build-out Acres	Conventional TEU/Acre	Conventional Capacity	All Electric TEU/Acre	All Electric Capacity	Optimal Mode	Optimal TEU/Acre	Optimal Capacity
Ben Nutter Berths 33-34	**95**	3,500	332,500	7,200	684,000	eRTG	7,200	684,000
OICT 55-56 OICT 57-59	**290**	3,500	1,015,000	7,200	2,088,000	ASC	10,000	2,900,000
TraPac	**123**	3,500	430,500	7,200	885,600	ASC	10,000	1,230,000
Matson** Roundhouse**	**101**	3,500	353,500	3,500	353,500	eHostlers	3,500	353,500
Berths 20-21 Berths 22-24	**150**	3,500	525,000	7,200	1,080,000	ASC	10,000	1,500,000
Howard*	**40**	3,500	140,000	3,500	140,000	eHostlers	3,500	140,000
Total	**799**	**3,500**	**2,796,500**	**6,547**	**5,231,100**	**-**	**8,520**	**6,807,500**

* Assumes 10 acres will be used for Inner Harbor Turning Basin
** The combined Matson/Roundhouse site does not have a workable configuration for eRTG or ASC

2010 Port of LA Estimates

As of 2010, the Port of Los Angeles was using 7,000 TEU/acre to estimate terminal capacity (Exhibit 10). This figure can be compared to the 2010 IWR estimate of 7,290 TEU/acre (Exhibit 7) or the 2017 actual average of 5,483 TEU/acre (Exhibit 1).

Exhibit 10: 2010 Port of Los Angeles Presentation Slide

2009 Seaport Plan Update

The 2009 Seaport Plan Update relied on two recent documents that together provide insights into container cargo capacity at the Port of Oakland.

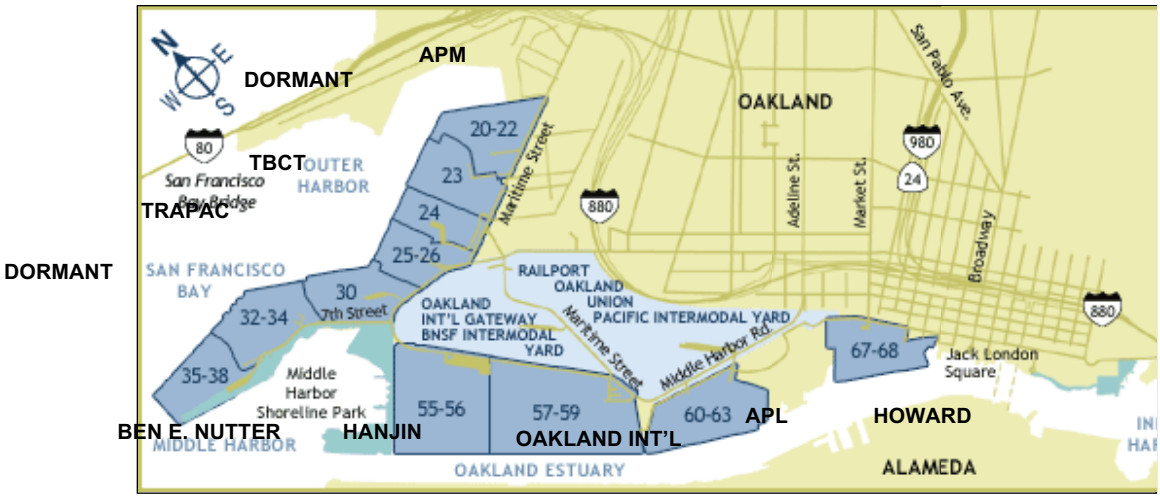
- The Maritime Development Alternatives Study (MDAS), completed by a consultant team in August 2004, presented an extensive analysis of the Port's present and future container cargo capacity in terms of berths, terminals, rail capacity, and highway capacity.

- The Maritime Air Quality Improvement Plan (MAQIP), completed in April 2009, provided a master plan for air quality improvements deemed necessary for growth. The MAQIP analyzes the Port's ability to achieve target TEU throughputs while meeting air quality and health impact goals.

The MDAS found that within the 2030 forecast horizon, the Port of Oakland's capacity was not constrained by its maritime facilities, but rather by the capacity and performance of the road and rail intermodal connectors. Those road and rail connections and facilities will need substantial improvement before reaching the capacity of the Port terminals themselves.

In 2009 the Port of Oakland had eight active marine terminals, as shown in Exhibit 11.

Exhibit 11: Port of Oakland Terminals and Berths



Source: Port of Oakland website

Exhibit 12 lists the Oakland terminals and their sizes as they existed in early 2009.

Exhibit 12: Port of Oakland Terminals and Acreage

Terminal	Berths	Acres
APL	60-63	79.4
APMT	20-23	106.8
Ben E. Nutter	35-37,38	58.1
Charles P Howard	67-68	50.3
Hanjin (TTI)	55-56	120.0
OICT (SSA)	57-59	150.0
Outer Harbor	33-34	44.6
TransBay	25-26	44.3
TraPac	30-32	65.7
ITS/Ports America	24	51.0
Total		**770.1**

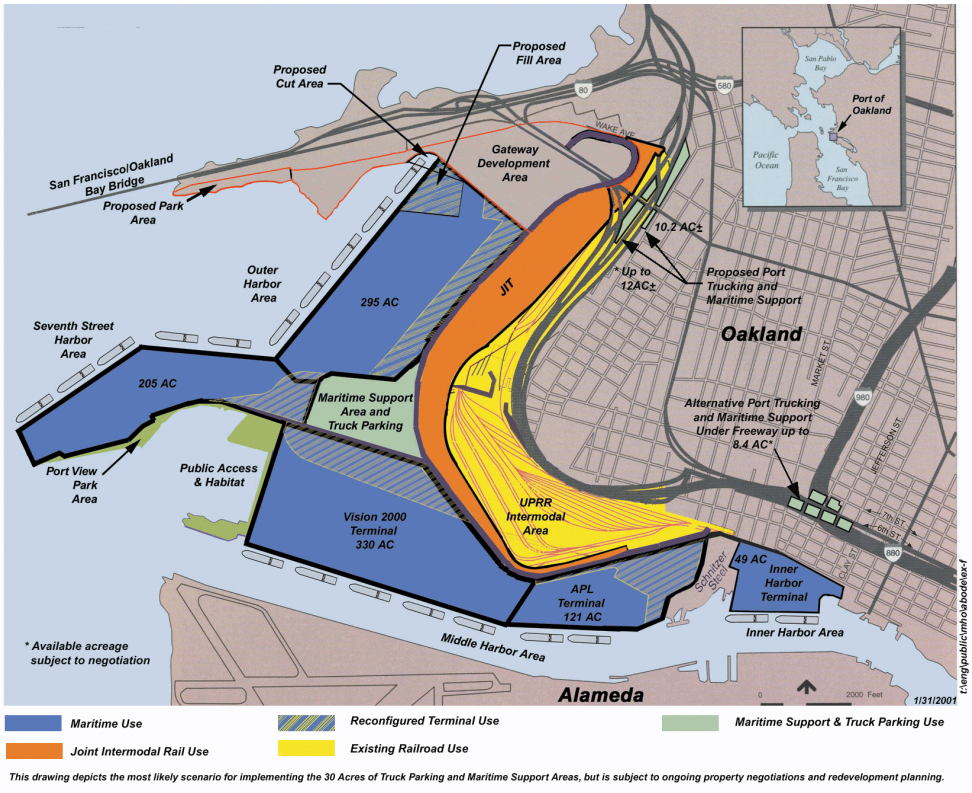
Source: Port of Oakland

The 2009 Seaport Plan then anticipated an eventual total of 1000 acres, which included:

- The 30-acre Berth 20 fill site;
- An additional portion of the Oakland Army Base;
- The "Roundhouse" site of about 40 acres; and
- Part of the 85 acres now used as the OIG rail terminal.

Exhibit 13 shows the approximate location and configuration of the relevant acreage that was anticipated after conveyance of the Oakland Army Base and development of the Joint Intermodal Terminal (which became OIG). The total adds up to the 1000 acres shown in the previous Seaport Plan.

Exhibit 13: Port of Oakland Acreage (planned as of 2001)



Source: Port of Oakland

The striped areas in Exhibit 13 show acreage that was anticipated to be included in the marine terminals. A comparison with Exhibit 11 and aerial photos of the terminals reveal the following differences.

- The Berth 20 fill had not occurred.
- What is shown in Exhibit 13 as the Joint Intermodal Terminal (JIT) site became the planned OHIT site. The JIT (now called OIG) was built in the striped area adjacent to the "Vision 2000" terminals.
- The 295 acres of the Outer Harbor terminals includes the shaded area on the east of Maritime Street.
- The striped area at the east of the Seventh Street peninsula had not been incorporated into marine terminals.
- The Roundhouse area east of the APL terminal was not then part of the marine operation.

Near-term plans for Oakland terminals were not that aggressive as of 2009, adding up to about **866 acres** of marine terminals.

Near-term Capacity. The MDAS project team concluded that Oakland's maritime terminals could handle between 5.5 and 6.0 million annual TEU on the current (2004) maritime space, including the Berth 21 fill. According to the capacity model developed for the MDAS, the limiting factor at this throughput would be berth space at Berths 21 to 26 and 55 to 59, and container yard space at other facilities.

In both the near term and the long term, the effective capacity of the Port of Oakland depends on the ability of the road and rail system to move containers to and from the Port as well as the capacity of the marine terminals.

Long-term Capacity. The ability of the Port to handle cargo increases beyond about 3.3 to 3.5 million annual TEU depended on the willingness and ability of all parties involved to invest in infrastructure, handling equipment, and systems, and to incur higher unit operating costs. As the MDAS noted, marine terminal operators can substantially increase the operating storage density of their facilities if they are willing to spend more capital and operating money per lift.

The Port of Oakland was operating at averages of around 3,000-3,500 annual TEU per acre. The upper MDAS estimate of 6.0 million TEU on about 900 acres at Oakland (including the Berth 21 fill) implies a capacity of about **6,667 TEU per acre**, about the same as recently estimated by Tioga for conventional terminals using the same technology.

Exhibit 14 applies a range of unit capacity and throughput estimates to three acreage totals for the Port of Oakland.

- 770 acres, the approximate total of existing active terminals (Exhibit 12).
- 866 acres, the approximate total of planned terminal acreage (Exhibit 12).
- 1,000 acres, the total from the Seaport Plan, which includes land that may eventually be used for rail terminals or other purposes.

Exhibit 14: Port of Oakland Container Terminal Capacity Comparisons

TEU/Acre		Annual TEU at Acreage		
		770	866	1,000
Oakland 2000 (513 acres)	3,464	2,667,145	2,999,672	3,463,824
Oakland 2008 (770 acres)	2,904	2,236,244	2,515,048	2,904,213
BCDC 2010 @6.4 mtons/TEU	3,832	2,950,664	3,318,539	3,817,995
LALB 2005	4,612	3,551,008	3,993,732	4,611,699
MDAS 2004	6,667	5,133,590	5,773,622	6,667,000

Oakland's actual average in 2000, with about 513 active acres, was 3,464 TEU/acre. In 2008, with about 770 active acres, Oakland averaged 2,904 TEU per acre. The reduction was the product of terminal expansion and the recession-induced cargo downturn.

The Seaport Plan capacity estimate of 24,525,000 metric tons at the original average of 6.4 metric tons/TEU (12 short tons per container) applied to 1,000 acres yields an average of 3,832 TEU/acre, slightly more than the Port of Oakland had been averaging.

Los Angeles and Long Beach (LALB) together averaged 4,612 TEU/acre in 2005 using basically the same operating methods as Oakland's terminals (and, for the most part, being operated by the same firms). The current estimates of the LALB maximum under conventional technology is 10,477 per acre. These comparisons require caution, however, as some of the Los Angeles and Long Beach terminals include on-dock rail facilities while Oakland's are near-dock and not included in terminal sizes.

1988 Seaport Plan Capacity Estimates

The 1988 Manalytics/WEFA report provided the container terminal capacity estimates used in the Seaport Plan as of 2009. In 1988 some of the SF Bay Area container terminals were actually combination terminals that might handle break bulk or Ro-Ro cargo as well. The 1988 capacity analysis focused on requirements for berths, and

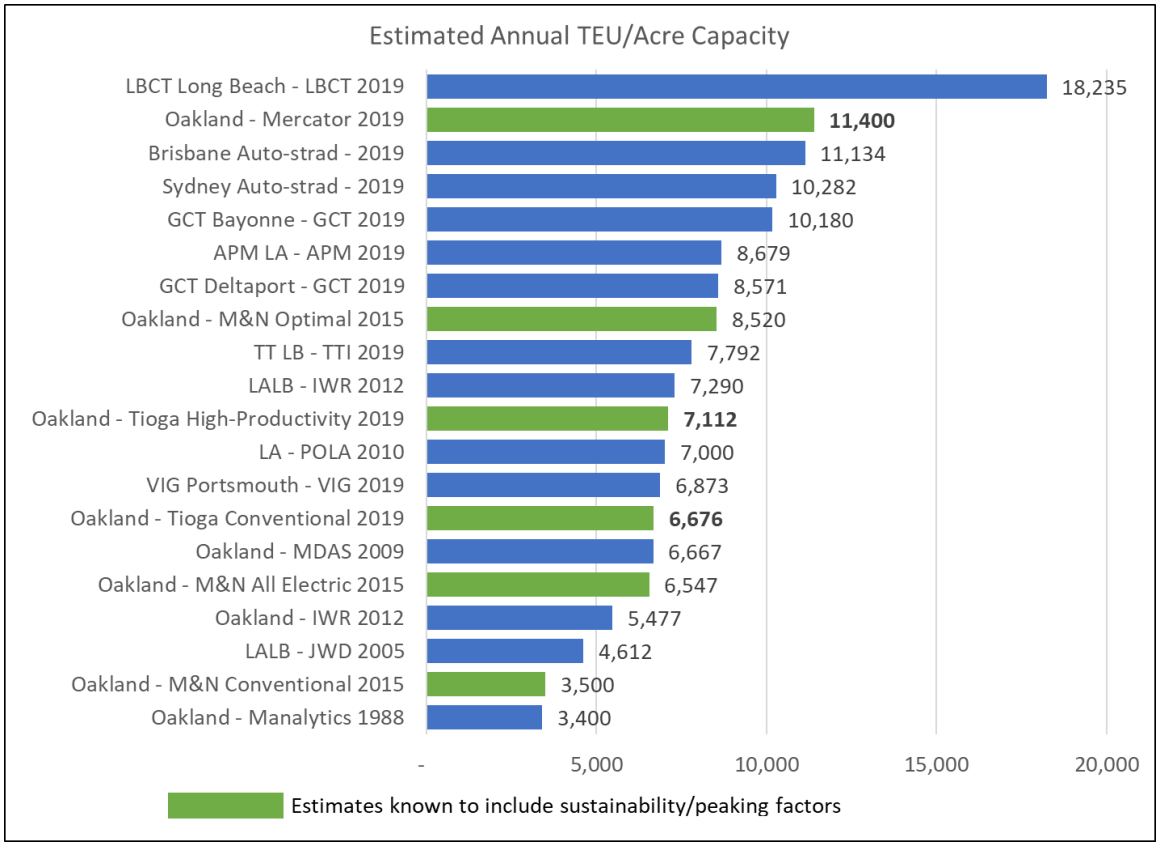
then estimated the acreage required to support each berth depending on terminal type. There was thus no simple relationship between TEU and terminal acres in the Seaport Plan.

The Manalytics study team surveyed Bay Area marine terminal operators to determine realistic averages for terminal throughput. Manalytics used averages of 1,400 containers per acre (2,380 TEU) for wheeled terminals and 2,000 containers per acre (3,400 TEU) for stacked terminals. The latter average of 3,400 TEU per acre was very close to the actual Oakland average prior to the recession.

Summary Comparison

Exhibit 15 compares the container terminal capacity estimates cited in this memo. Estimates are specifically identified as known to include sustainability or peaking factors.

Exhibit 15: Summary Estimate Comparison



Attachment 3: Cover Letters for Terminal Operator Reviewers

San Francisco Bay Conservation and Development Commission
375 Beale Street, Suite 510, San Francisco, California 94105 tel 415 352 3600 fax 888 348 5190
State of California | Gavin Newsom – Governor | info@bcdc.ca.gov | www.bcdc.ca.gov

January 10, 2020

Matson
[redacted]
ATTN: Chris Hurley, Terminal Manager

SUBJECT: Review request for Seaport Plan update forecast reports

Dear Chris:

The San Francisco Bay Conservation and Development Commission (BCDC) is in the process of updating its *San Francisco Bay Area Seaport Plan* (Seaport Plan), which establishes the agency's policies regarding the designation of port priority use areas and the development of port facilities within BCDC's jurisdiction. As part of the update process, BCDC is working with a consultant team to develop projections for cargo demand and port capacity through the year 2050. To ensure that the projections provide a solid foundation for the updated Seaport Plan's policies, BCDC staff is requesting your assistance in reviewing the draft capacity projections. As a terminal operator, your insight into the trends and issues related to seaport planning in the Bay Area can help us to verify that our projections are reasonable and appropriate for our local context. Included in this review package are two capacity reports for your consideration, as well as two supporting documents to aid in your review. Background information on the documents and the Seaport Plan, as well as guiding questions for your review are included below. Following your review, we would like to schedule a phone or in-person interview with you to receive and discuss your comments. If you would prefer to provide written responses instead of participating in an interview, you may e-mail them to Katharine Pan at katharine.pan@bcdc.ca.gov. For more information on the Seaport Plan, visit https://www.bcdc.ca.gov/BPA/BPASeaportPlan.html.

BACKGROUND

Bay Area Seaport Plan

The Seaport Plan is an element of the *San Francisco Bay Plan* (Bay Plan) and is used by BCDC in making port-related decisions on permit applications, consistency determinations, and related matters. A major goal of the Seaport Plan is to reserve sufficient shoreline area to accommodate future growth in maritime cargo, thereby minimizing the need to fill the Bay for port development. To accomplish this goal, the Seaport Plan designates areas determined necessary for future port development as port priority use to reserve them for cargo handling or related uses. The Seaport Plan also includes policies that encourage technical and operational improvements to improve throughput efficiency.

Seaport Plan Update

On January 17, 2019, BCDC voted to initiate two Bay Plan amendments to update the Seaport Plan. Bay Plan Amendment (BPA) No. 1-19 is a general update of the Seaport Plan to revise cargo and capacity forecasts and related policies, ensure consistency with updated Bay Plan policies, and address change requests from the ports. BPA No. 2-19 specifically addresses a request by the Oakland Athletics (Oakland A's) to remove the port priority use designation from Howard Terminal at the Port of Oakland to allow for the development of a baseball stadium and mixed-used district on and adjacent to the site. BCDC staff is currently conducting research to allow the Commission to make an informed decision on these two proposed amendments.

Seaport Plan Advisory Committee

The Seaport Plan Advisory Committee (SPAC) consists of representatives from BCDC, the Metropolitan Transportation Commission/Association of Bay Area Governments, the Marine Exchange, the five Bay Area ports, the California Department of Transportation, and Save the Bay. The SPAC considers amendments to the Seaport Plan and provides recommendations to BCDC and its staff based on technical expertise, background reports, and public comment.

Draft Cargo Forecast

As part of the update process, BCDC commissioned consultants from the Tioga Group and Hackett Associates to prepare a regional forecast of oceangoing cargo and terminal capacity through 2050. An initial draft of the *2019-2050 Bay Area Seaport Forecast* (Draft Cargo Forecast) was presented to the SPAC at its first meeting on June 27, 2019, and a revised draft was presented at a second meeting on December 5, 2019. The revised draft, dated November 19, 2019, is available on the BCDC website https://www.bcdc.ca.gov/seaport/SeaportForecastSPACReview.pdf) and attached for your review. See below for direction on the sections to focus on.

Mercator Report

Following the publication of the first draft of the Draft Cargo Forecast in June 2019, the applicant for BPA 2-19 (the Oakland A's) retained Mercator International to review the Draft Cargo Forecast and conduct an alternative analysis of whether Howard Terminal would be needed to meet cargo projections. The report, *Expected Demand for Howard Terminal as a Cargo Handling Facility* (Mercator Report), accepts the Draft Cargo Forecast's cargo demand projections, but argues that future demand can be met at new and existing terminals without the use of Howard Terminal. The Mercator Report is available online (https://mercatorintl.com/expected-demand-for-howard-terminal-as-a-cargo-handling-facility/) and is attached for your review.

REVIEW GUIDANCE

Purpose of Review

The SPAC is reviewing the Draft Cargo Forecast and preparing to accept the forecast numbers as a basis for potential map and policy revisions in the updated Seaport Plan. At its December 5, 2019 meeting, the SPAC received a presentation from the Tioga Group on the revised Draft Cargo Forecast, as well as a presentation from Mercator International on its assessment of future Bay Area terminal capacity. In considering the differences between the two reports, SPAC members requested that BCDC staff further review the differences in the methodology, assumptions, and findings of the two capacity reports to ensure that the final accepted forecast is as realistic as possible. Thus, staff is seeking the expertise of Port of Oakland terminal operators in assessing the appropriateness of the methodology and assumptions used to determine cargo capacity in the Draft Cargo Forecast, as well as the feasibility of the cargo capacity projections in light of arguments made in the Mercator Report.

Attachments

The following documents are included in this review packet.

- **Attachment 1: Draft Cargo Forecast** – This report was prepared on behalf of BCDC by the Tioga Group and Hackett Associates. It has previously been reviewed by the SPAC and staff at the five Bay Area ports. Please focus your review on:
    - Executive Summary;
    - III. Containerized Forecast and Capacity Analysis;
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  If time allows, we would also like your thoughts on chapters 4 and 5.
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Guiding Questions

Please keep these questions in mind as you review the attached documents. Your feedback on these issues are of particular interest to the SPAC as they deliberate on the Cargo Forecast. Additionally, feel free to note any other information you believe would be useful.

1. The Draft Cargo Forecast and the Mercator report each use different methods for calculating sustainable capacity. What are your thoughts on the appropriateness of the two methods? Is one more suitable than the other? Is there a better approach that we should consider?
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5. What kinds of externalities—such as truck congestion, off-port land use changes, etc.—could result from potential productivity improvements at the port?
6. If cargo capacity at Bay Area ports nears its limit and Howard Terminal could be used to increase capacity, what would be some likely scenarios for its use?

Thank you for your time and attention in this matter. Your contributions to this process are greatly appreciated. Please do not hesitate to contact us if you have any questions or other issues related to this request.

Sincerely,

KATHARINE PAN
Waterfront Planner

San Francisco Bay Conservation and Development Commission
375 Beale Street, Suite 510
San Francisco, California 94105
Tel: 415-352-3650 Fax: 888-348-5190
Email: katharine.pan@bcdc.ca.gov
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State of California | Gavin Newsom – Governor | info@bcdc.ca.gov | www.bcdc.ca.gov

January 10, 2020

SSA Terminals
[redacted]
ATTN: Susan Ransom, Client Relations/Customer Support Manager

SUBJECT: Review request for Seaport Plan update forecast reports

Dear Susan:

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Sincerely,

KATHARINE PAN
Waterfront Planner

San Francisco Bay Conservation and Development Commission
375 Beale Street, Suite 510
San Francisco, California 94105
Tel: 415-352-3650 Fax: 888-348-5190
Email: katharine.pan@bcdc.ca.gov
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State of California | Gavin Newsom – Governor | info@bcdc.ca.gov | www.bcdc.ca.gov

January 10, 2020

Everport Terminal
[redacted]
ATTN: Michael Andrews, Terminal Manager

SUBJECT: Review request for Seaport Plan update forecast reports

Dear Michael:

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Seaport Plan Update

On January 17, 2019, BCDC voted to initiate two Bay Plan amendments to update the Seaport Plan. Bay Plan Amendment (BPA) No. 1-19 is a general update of the Seaport Plan to revise cargo and capacity forecasts and related policies, ensure consistency with updated Bay Plan policies, and address change requests from the ports. BPA No. 2-19 specifically addresses a request by the Oakland Athletics (Oakland A's) to remove the port priority use designation from Howard Terminal at the Port of Oakland to allow for the development of a baseball stadium and mixed-used district on and adjacent to the site. BCDC staff is currently conducting research to allow the Commission to make an informed decision on these two proposed amendments.

Seaport Plan Advisory Committee

The Seaport Plan Advisory Committee (SPAC) consists of representatives from BCDC, the Metropolitan Transportation Commission/Association of Bay Area Governments, the Marine Exchange, the five Bay Area ports, the California Department of Transportation, and Save the Bay. The SPAC considers amendments to the Seaport Plan and provides recommendations to BCDC and its staff based on technical expertise, background reports, and public comment.

Draft Cargo Forecast

As part of the update process, BCDC commissioned consultants from the Tioga Group and Hackett Associates to prepare a regional forecast of oceangoing cargo and terminal capacity through 2050. An initial draft of the *2019-2050 Bay Area Seaport Forecast* (Draft Cargo Forecast) was presented to the SPAC at its first meeting on June 27, 2019, and a revised draft was presented at a second meeting on December 5, 2019. The revised draft, dated November 19, 2019, is available on the BCDC website https://www.bcdc.ca.gov/seaport/SeaportForecastSPACReview.pdf) and attached for your review. See below for direction on the sections to focus on.

Mercator Report

Following the publication of the first draft of the Draft Cargo Forecast in June 2019, the applicant for BPA 2-19 (the Oakland A's) retained Mercator International to review the Draft Cargo Forecast and conduct an alternative analysis of whether Howard Terminal would be needed to meet cargo projections. The report, *Expected Demand for Howard Terminal as a Cargo Handling Facility* (Mercator Report), accepts the Draft Cargo Forecast's cargo demand projections, but argues that future demand can be met at new and existing terminals without the use of Howard Terminal. The Mercator Report is available online (https://mercatorintl.com/expected-demand-for-howard-terminal-as-a-cargo-handling-facility/) and is attached for your review.

REVIEW GUIDANCE

Purpose of Review

The SPAC is reviewing the Draft Cargo Forecast and preparing to accept the forecast numbers as a basis for potential map and policy revisions in the updated Seaport Plan. At its December 5, 2019 meeting, the SPAC received a presentation from the Tioga Group on the revised Draft Cargo Forecast, as well as a presentation from Mercator International on its assessment of future Bay Area terminal capacity. In considering the differences between the two reports, SPAC members requested that BCDC staff further review the differences in the methodology, assumptions, and findings of the two capacity reports to ensure that the final accepted forecast is as realistic as possible. Thus, staff is seeking the expertise of Port of Oakland terminal operators in assessing the appropriateness of the methodology and assumptions used to determine cargo capacity in the Draft Cargo Forecast, as well as the feasibility of the cargo capacity projections in light of arguments made in the Mercator Report.

Attachments

The following documents are included in this review packet.

- **Attachment 1: Draft Cargo Forecast** – This report was prepared on behalf of BCDC by the Tioga Group and Hackett Associates. It has previously been reviewed by the SPAC and staff at the five Bay Area ports. Please focus your review on:
    - Executive Summary;
    - III. Containerized Forecast and Capacity Analysis;
    - VIII. Cargo and Capacity Findings; and
    - Appendix: Potential Role of Oakland's Howard Terminal.
- **Attachment 2: Mercator Report** – This report was prepared for the Oakland A's by Mercator International in response to the Draft Cargo Forecast and was shared with the SPAC on December 5, 2019. Please focus your review on:
    - Chapter 2: Bay Area (Oakland) container terminal capacity requirements, and
    - Chapter 3: Future utility of Howard Terminal to container shipping lines.

  If time allows, we would also like your thoughts on chapters 4 and 5.
- **Attachment 3: Container Terminal Capacity Estimates** – This December 31, 2019 memorandum was prepared by the Tioga Group to summarize the differences in methodology between the two reports and compare the draft estimates to those from previous studies. This a supporting document that may help in your review.
- **Attachment 4: December 5, 2019 SPAC Staff Report** – The staff report includes a brief summary of the planning process to date as well as a table comparing major differences in the methodology, assumptions, and findings of the two reports, and may help in your review.

Guiding Questions

Please keep these questions in mind as you review the attached documents. Your feedback on these issues are of particular interest to the SPAC as they deliberate on the Cargo Forecast. Additionally, feel free to note any other information you believe would be useful.

1. The Draft Cargo Forecast and the Mercator report each use different methods for calculating sustainable capacity. What are your thoughts on the appropriateness of the two methods? Is one more suitable than the other? Is there a better approach that we should consider?
2. Are the capacity estimates stated in the Draft Cargo Forecast reasonable for planning purposes? If not, how could they be improved?
3. The Draft Cargo Forecast and the Mercator report each identify different benchmark terminals to use as models for estimating capacity at Oakland's terminals. Are the terminals used in the different reports useful comparisons for the Port of Oakland? Which terminals do you think would serve as the best models?
4. What are the most critical capacity constraints and have they been adequately considered in the Draft Cargo Forecast or the Mercator report? (These may include dwell time, operating days, and land use, as discussed in the Container Terminal Capacity Estimates memo, as well as others we have not mentioned).
5. What kinds of externalities—such as truck congestion, off-port land use changes, etc.—could result from potential productivity improvements at the port?
6. If cargo capacity at Bay Area ports nears its limit and Howard Terminal could be used to increase capacity, what would be some likely scenarios for its use?

Thank you for your time and attention in this matter. Your contributions to this process are greatly appreciated. Please do not hesitate to contact us if you have any questions or other issues related to this request.

Sincerely,

KATHARINE PAN
Waterfront Planner

San Francisco Bay Conservation and Development Commission
375 Beale Street, Suite 510
San Francisco, California 94105
Tel: 415-352-3650 Fax: 888-348-5190
Email: katharine.pan@bcdc.ca.gov
Website: www.bcdc.ca.gov

Attachment 4: SSA Response

SSATerminals

February 4, 2020

To: Bay Conservation and Development Committee

Subject: Tioga / Mercator Survey Review

Thank you for the opportunity to review the materials regarding the Mercator and Tioga reports. Although we differ on some of the calculations, the main issue that concerns us with respect to the Mercator report, was the assumption that SSA's Oakland International Container Terminal (OICT) would invest billions of dollars into densifying our terminal in order to eliminate the need to expand at some point. Please find our comments below:

- The Mercator report uses "Working Days/year" at 360. Please note that while vessels work at 360 days, our rates with the carriers are based on Monday thru Friday receiving and deliveries.

- With no on-dock rail, OICT is currently at 6,000 gates moves both shifts. In light of this, there is concern about increased traffic as proposed by Mercator. Adding additional vehicle traffic to already high volume truck traffic areas is of great concern to the ocean carriers currently calling Oakland. Ocean carriers and their customers (importers/exporters) have experienced extreme congestion in the past and are not willing to go through that pain again. Diverting to other Ports is an option for them.

- The potential volume that Mercator listed within their report we feel is unrealistic. It is our opinion maximum volume at the OICT facility is 2.1 M TEU's. As Long Beach Container Terminal (LBCT) was cited by Mercator as a possible model, this was essentially a "greenfield" site constructed at a cost of $2 billion dollars which LBCT and POLB spent for full automation. If OICT were to automate as did LBCT with the potential growth rate of 40%, it would require a cost of 2 billion dollars compared to our current cost of approximately 100 million for equipment to handle similar volumes. Although we recognize automation would result in labor cost savings, those savings would not nearly offset the costs to utilize automation – and excludes the labor relations issues. In addition to the capital investment, it would require the shutdown of the terminal for a long period of time in order to retrofit, with vessels rerouted to other terminals or ports at a great loss of revenue and possible permanent loss of business. OICT currently runs 23 ships a week down the Oakland Estuary and operates seven days a weekday and night.

SSATerminals

- SSAT recently signed a long term lease with the Port of Oakland with over a billion dollar commitment, which we feel was not conducted in good faith. During these negotiations the Port never disclosed the potential for Howard Terminal becoming the site of a new baseball stadium, residential housing, luxury hotel and commercial/retail developments, all of which have multiple detrimental effects on maritime business. If the development is approved, the Port would need to renegotiate the dollar commitment in the terms of SSAT's contract.

- Unlike LBCT and other terminals in Southern California, which are owned and operated by ocean carriers who have the ability to dictate their volumes, SSAT is an independent stevedoring operator with 20 different ocean carriers calling OICT. The ocean carriers are already skeptical of venturing into long term contracts with SSAT because of the push to build the ballpark/housing/commercial/retail development. SSAT is very concerned about the potential loss of business from ocean carriers and loss of business due to importer/exporter(customer) concerns over added congestion. Keep in mind that SSA Oakland is currently doing 70% of the business at the Port and is the largest contributor to the Port's revenue. If we lose business, everyone suffers including the Port and all other maritime businesses. This is not conjecture, but a real possibility.

- SSAT is investing 60 million dollars in new cranes to handle the 18 – 20,000 TEU ships. These ships will not be able to turn at the current turning basin and will require part of Howard Terminal to widen it. We have discussed this subject extensively with the Port and have been assured that the turning basin issue will be solved to our satisfaction. As of this point, we have seen no plans or specifics as to when and how the turning basin will be widened. We have grave concerns that the ballpark will adversely affect this issue.

As a final comment, SSAT has been a good partner with the Port of Oakland for many years. Our commitment to the Port is self-evident as noted above. We have made substantial investments in the Port, making it an important trade gateway for California. We want to continue that relationship with the Port, but the development of a large residential/entertainment/hotel/retail establishment within an industrial maritime area that is intersected by heavily used rail lines, truck routes and vessel operations operating day and night seems like a direct conflict of interest to the proposed Oakland A's taking over Howard Terminal.

SSATerminals

Your consideration of entertaining a Plan B and fixing up the Oakland Coliseum site with current infrastructure in place (freeway, Bart, parking), and easy egress in and out, would be beneficial and appreciated.

Should you need anything further, please feel free to reach out.

Thank you,

Ed DeNike

President, SSA Terminals

Attachment 5: Peer Review Packet Cover Letter

San Francisco Bay Conservation and Development Commission

375 Beale Street, Suite 510, San Francisco, California 94105 tel 415 352 3600 fax 888 348 5190

State of California | Gavin Newsom – Governor | info@bcdc.ca.gov | www.bcdc.ca.gov

February 4, 2020

Jim Fawcett, PhD
Director, Marine Science & Policy Outreach
University of Southern California
Los Angeles, CA 90089

SUBJECT: Review request for Seaport Plan update forecast reports

Dear Jim:

The San Francisco Bay Conservation and Development Commission (BCDC) is in the process of updating its *San Francisco Bay Area Seaport Plan* (Seaport Plan), which establishes the agency's policies regarding the designation of port priority use areas and the development of port facilities within BCDC's jurisdiction. As part of the update process, BCDC is working with a consultant team to develop projections for cargo demand and port capacity through the year 2050. To ensure that the projections provide a solid foundation for the updated Seaport Plan's policies, BCDC staff is requesting your assistance in reviewing our draft capacity projections. We are seeking a peer review of two reports on terminal capacity based on your expertise in port operations, including a brief written response with your reactions to the capacity estimates in the reports.

Included in this review package are two capacity reports for your consideration, as well as the current Seaport Plan document to aid in your review. Documents have been blinded (references to authors have been removed) in order to reduce the potential for bias. Therefore, in order to maintain objectivity, please do not conduct additional research into this project. Background information on the documents and the Seaport Plan, as well as guiding questions for your review are included below. If possible, we would like to receive your peer review the week of February 17. Please submit your review to Katharine Pan at katharine.pan@bcdc.ca.gov. If you have any questions or requests for additional context, don't hesitate to e-mail Katharine or call her at (415)-352-3650.

BACKGROUND

Bay Area Seaport Plan

The Seaport Plan is an element of the *San Francisco Bay Plan* (Bay Plan) and is used by BCDC in making port-related decisions on permit applications, consistency determinations, and related matters. A major goal of the Seaport Plan is to reserve sufficient shoreline area to accommodate future growth in maritime cargo, thereby minimizing the need to fill the Bay for port development. To accomplish this goal, the Seaport Plan designates areas determined necessary for future port development as port priority use to reserve them for cargo handling or related uses. The Seaport Plan also includes policies that encourage technical and operational improvements to improve throughput efficiency.

Seaport Plan Update

On January 17, 2019, BCDC voted to initiate two Bay Plan amendments to update the Seaport Plan. Bay Plan Amendment (BPA) No. 1-19 is a general update of the Seaport Plan to revise cargo and capacity forecasts and related policies, ensure consistency with updated Bay Plan policies, and address change requests from the ports. BPA No. 2-19 specifically addresses a request by the Oakland Athletics (Oakland A's) to remove the port priority use designation from Howard Terminal at the Port of Oakland to allow for the development of a baseball stadium and mixed-used district on and adjacent to the site. BCDC staff is currently conducting research to allow the Commission to make an informed decision on these two proposed amendments.

Seaport Plan Advisory Committee

The Seaport Plan Advisory Committee (SPAC) consists of representatives from BCDC, the Metropolitan Transportation Commission/Association of Bay Area Governments, the Marine Exchange, the five Bay Area ports, the California Department of Transportation, and Save the Bay. The SPAC considers amendments to the Seaport Plan and provides recommendations to BCDC and its staff based on technical expertise, background reports, and public comment.

Draft Cargo Forecast

As part of the update process, BCDC commissioned Consultant A to prepare a regional forecast of oceangoing cargo and terminal capacity through 2050. An initial draft of the *2019-2050 Bay Area Seaport Forecast* (Draft Cargo Forecast) was presented to the SPAC at its first meeting on June 27, 2019, and a revised draft was presented at a second meeting on December 5, 2019. The revised draft, dated November 19, 2019, is attached for your review. See below for direction on the sections to focus on.

Howard Terminal Demand Report

Following the publication of the first draft of the Draft Cargo Forecast in June 2019, the applicant for BPA 2-19 (the Oakland A's) retained Consultant B to review the Draft Cargo Forecast and conduct an alternative analysis of whether Howard Terminal would be needed to meet cargo projections. The report, *Expected Demand for Howard Terminal as a Cargo Handling Facility* (Report B), accepts the Draft Cargo Forecast's cargo demand projections, but argues that future demand can be met at new and existing terminals without the use of Howard Terminal. The report is attached for your review.

REVIEW GUIDANCE

Purpose of Review

The SPAC is reviewing the Draft Cargo Forecast and preparing to accept the forecast numbers as a basis for potential map and policy revisions in the updated Seaport Plan. At its December 5, 2019 meeting, the SPAC received a presentation from Consultant A on the revised Draft Cargo Forecast, as well as a presentation from Consultant B on its assessment of future Bay Area terminal capacity. In considering the differences between the two reports, SPAC members requested that BCDC staff further review the differences in the methodology, assumptions, and findings of the two capacity reports to ensure that the final accepted forecast is as realistic as possible. Thus, staff is seeking third-party reviewers with expertise in port operations to assess the appropriateness of the methodology and assumptions used to determine cargo capacity in the Draft Cargo Forecast, as well as the feasibility of the cargo capacity projections in light of arguments made in Report B.

Attachments

The following documents are included in this review packet.

- **Attachment 1: Draft Cargo Forecast** – This report was prepared on behalf of BCDC by Consultant A. It has previously been reviewed by the SPAC and staff at the five Bay Area ports. Please focus your review on:
    - Executive Summary;
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    - VIII. Cargo and Capacity Findings; and
    - Appendix: Potential Role of Oakland's Howard Terminal.
- **Attachment 2: Report B** – This report was prepared for the Oakland A's by Consultant B in response to the Draft Cargo Forecast and was shared with the SPAC on December 5, 2019. Please focus your review on:
    - Chapter 2: Bay Area (Oakland) container terminal capacity requirements, and
    - Chapter 3: Future utility of Howard Terminal to container shipping lines.
- **Attachment 3: 2012 San Francisco Bay Area Seaport Plan** – This is the current version of the Seaport Plan. It should give you a sense of how the forecast will be used and the scope of our policies. This document is attached for context and is not required for review.

Guiding Questions

Please keep these questions in mind as you review the attached documents. Your feedback on these issues are of particular interest to the SPAC as they deliberate on the Cargo Forecast. Additionally, feel free to note any other information you believe would be useful.

1. The Draft Cargo Forecast and Report B each use different methods for calculating sustainable capacity. What are your thoughts on the appropriateness of the two methods? Is one more suitable than the other? Is there a better approach that we should consider?
2. Are the capacity estimates stated in the Draft Cargo Forecast reasonable for planning purposes? If not, how could they be improved?
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6. If cargo capacity at Bay Area ports nears its limit and Howard Terminal could be used to increase capacity, what would be some likely scenarios for its use?

Thank you for your time and assistance in this matter. Your contributions to this process are greatly appreciated. Please do not hesitate to contact us if you have any questions or other issues related to this request.

Sincerely,

KATHARINE PAN
Waterfront Planner

San Francisco Bay Conservation and Development Commission
375 Beale Street, Suite 510
San Francisco, California 94105
Tel: 415-352-3650 Fax: 888-348-5190
Email: katharine.pan@bcdc.ca.gov
Website: www.bcdc.ca.gov

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State of California | Gavin Newsom – Governor | info@bcdc.ca.gov | www.bcdc.ca.gov

February 6, 2020

Asaf Ashar
National Ports and Waterways Initiative
University of New Orleans
Washington, DC

SUBJECT: Review request for Seaport Plan update forecast reports

Dear Asaf:

The San Francisco Bay Conservation and Development Commission (BCDC) is in the process of updating its *San Francisco Bay Area Seaport Plan* (Seaport Plan), which establishes the agency's policies regarding the designation of port priority use areas and the development of port facilities within BCDC's jurisdiction. As part of the update process, BCDC is working with a consultant team to develop projections for cargo demand and port capacity through the year 2050. To ensure that the projections provide a solid foundation for the updated Seaport Plan's policies, BCDC staff is requesting your assistance in reviewing our draft capacity projections. We are seeking a peer review of two reports on terminal capacity based on your expertise in port operations, including a brief written response with your reactions to the capacity estimates in the reports.

Included in this review package are two capacity reports for your consideration, as well as the current Seaport Plan document to aid in your review. Documents have been blinded (references to authors have been removed) in order to reduce the potential for bias. Therefore, in order to maintain objectivity, please do not conduct additional research into this project. Background information on the documents and the Seaport Plan, as well as guiding questions for your review are included below. If possible, we would like to receive your peer review the week of February 17. Please submit your review to Katharine Pan at katharine.pan@bcdc.ca.gov. If you have any questions or requests for additional context, don't hesitate to e-mail Katharine or call her at (415)-352-3650.

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Draft Cargo Forecast

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REVIEW GUIDANCE

Purpose of Review

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Sincerely,

KATHARINE PAN
Waterfront Planner

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Tel: 415-352-3650 Fax: 888-348-5190
Email: katharine.pan@bcdc.ca.gov
Website: www.bcdc.ca.gov

Attachment 6: Jim Fawcett, CV and Peer Review

Curriculum Vitae

Education
Ph.D., University of Southern California, Urban and Regional Planning, 1983
M.Pl., University of Southern California, Urban and Regional Planning, 1975
B.A., California State University, Northridge, Political Science/Sociology, 1968

Employment
2002-Present - Director, Marine Science and Policy Outreach, and Marine Transportation/Seaport Specialist Sea Grant Program Wrigley Institute for Environmental Studies University of Southern California

2002-Present - Adjunct Associate Professor of Public Policy, School of Policy, Planning and Development University of Southern California. Course: Coastal Policy and Planning (Graduate)

2011-Present - Adjunct Associate Professor of Environmental Studies, College of Letters, Arts & Sciences University of Southern California. Course: Marine and Coastal Environmental Policy (Undergraduate)

2000-Present - Consulting Urbanist and Development Advisor, J.A. Fawcett Consultants

1993-2000 - Chief of Planning, County of Los Angeles Department of Beaches and Harbors

1977-1993 - University of Southern California Hancock Institute for Marine Studies Sea Grant Program

1988-1993 - Associate Director, Sea Grant Program

1985-1993 - Director, Marine Advisory Services

1977-1985 - Coastal Zone Management Specialist and Port Management Specialist

LECTURESHIPS HELD CONCURRENTLY WITH MY USC POSITION (1984-1993):
1984-1993 - California State Polytechnic University, Pomona, College of Business Department of Finance, Real Estate and Law. Courses: Real Estate Principles Real Estate Appraisal Urban Land Economics Urban Land Development Seminar in Real Estate Principles/Appraisal (Graduate)

1986 - University of Southern California, School of Urban and Regional Planning. Courses: Coastal Zone Management (Graduate), Environmental Policy (Graduate)

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OK

1984-86 - University of Southern California Hancock Institute for Marine Studies Graduate Program in Marine Affairs.
Courses: Seaport Planning (Graduate), Coastal Zone Management (Graduate)

1978-79 - University of Southern California, School of Public Administration Environmental Management Institute. Course: Coastal Zone Management (Graduate)

1975-77 - Partner and Principal, Fawcett, Ohigashi, Pestor & Associates Consulting Urban Planners

1971-73 - Disability Examiner California Department of Rehabilitation Disability Determination Program

1968-71 - Lieutenant, United States Navy, Assistant Communications Officer, Radio Officer USS Eldorado (LCC-11)

ORGANIZATIONAL MEMBERSHIPS
Lambda Alpha International (land economics, honorary); International President, 2006-7, International First Vice President, 2004-5, International Editor, 2000-2004, Los Angeles Chapter, President, 1995-97, Vice-President, 1993-95, International Board of Governors, 1998-Present, International Member of the Year, 2002

Antioch University, Los Angeles, Board of Trustees, 2009-10

Antioch University, Los Angeles, Strategic Plan Advisory Committee, 2007

Antioch University, Los Angeles, Campus Siting Advisory Committee, 2007-2009

Sigma Xi (scientific research, honorary), 1988-Present

Aquarium of the Pacific, Marine Transportation Exhibit Advisory Committee, 2008-10

LAX Coastal Chamber of Commerce, Marina Affairs Committee, Vice-chair, 2003-10

University of California Sea Grant Research Review Panel, 2000-02

Human Services Network (public foundation), Board of Directors, 1998-2005, President, 1998-2000

Westchester-LAX-Marina del Rey Chamber of Commerce, Vice-Chair, Marina Affairs Committee, 2002-07

Pacific Congress on Marine Science & Technology, Ports & Harbors Section Head, 1994-2000

Marine Technology Society, Chair, National Marine Recreation Committee, 1994-95

Marina Foundation: President, 1992-93; Vice-President, 1989-92; Director, 1985-88; Co-Chair

Marine Policy Association, Advisory Board, 1991-92

Library Advisory Council, 1990-92; Project Manager, Marina del Rey Library Expansion Project, 1989-92

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Journal of Urban Regeneration and Renewal, Henry Stewart Publications, London

California Politics and Policy, The Edmund G. "Pat" Brown Institute of Public Affairs, Los Angeles

PUBLICATIONS

Fawcett, J.A. (2010). Challenges to Apprehension and Prosecution of East African Maritime Pirates. *Maritime Policy and Management*, 37(7), 753-765.

Fawcett, J.A. (Ed.) (2007). *Port Continuity Planning: Maintaining the Region's Economic Lifeblood, Proceedings of a Conference on Maritime Cargo Security* (USC Sea Grant Technical Report, USCSG- TR-04-2007). Los Angeles: University of Southern California Sea Grant Program.

Fawcett, J.A. (2006). Port Governance and Privatization in the United States: Public Ownership and Private Operation. In M. Brooks and K. Cullinane (Eds.), *Devolution, Port Governance and Port Performance*. New York: Elsevier.

Fawcett, J.A. (2006). *Survey and Evaluation of the Port Community Advisory Committee, Port of Los Angeles, California* (USC Sea Grant Technical Report, USCSG-TR-04-2006). Los Angeles: USC Sea Grant Program.

Fawcett, J.A. (2004). Multiple Articles. In R. Caves, R., (Ed.). *An Encyclopedia of the City*. Basingstoke, Hampshire, U.K.: Routledge.

Makela, R. A. and J. A. Fawcett. (1993, January 03). A Way to Help Cities that Hurts California's Future. *Los Angeles Times*, Opinion.

Fawcett, J. A. and H. S. Marcus, eds. (1991). Port Growth and Coastal Management [Special Issue]. *Coastal Management*, 19(3).

Fawcett, J. A. and H. S. Marcus. (1991). Are Port Growth and Coastal Management Compatible? *Coastal Management* 19(3), 275-295.

Price, W., Fawcett, J., & West, K. (1991). California and its Seaports: Port Management Issues and State Policy Questions. In J. H. Kirlin and D. R. Winkler (Eds.), *California Policy Choices, 1991 (pp. 199- 230).* Los Angeles: School of Public Administration, University of Southern California.

Fawcett, J. A. (1989). A Tale of Two Ports with 2020 Vision. *Oceanus* 3:79-84.

Fawcett, J. A. (1986). Redefining Local Government Power: The Influence of Informal Powers in Challenging Joint Implementation of a State Coastal Plan. *Policy Studies Review* 2:330-340.

Smith, F. and Fawcett, J. A. (1986). Comprehensive Management Study: Confidential Report to the Crescent City, CA Harbor District. Corvallis, OR: Oregon Sea Grant College Program.

Fawcett, J. A. and Liffmann, M. M. (1986). *Non-Maritime Port Activities: A Research Agenda*. (USC Sea Grant Technical Report, USCSG-TR-03-85). Los Angeles: USC Sea Grant Program.

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OK

Fawcett, J. A. (1984). *But a Faded Dream: Federal Coastal Zone Policy in the 80's.* In Oceans 84 (pp. 878-883). Washington, DC: Marine Technology Society.

Fawcett, J. A. (1983). Planning the California Coast: Progress and Prospects. *Real Estate and Construction Report*, 4, 11-19.

Fawcett, J. A. (1983). *An Analysis of the Issue Content of State-Local Conflict in California Coastal Planning*. Unpublished doctoral dissertation, University of Southern California, Los Angeles.

Wingo, L. W. and Fawcett, J. A. (1983). The Intergovernmental Politics of Coastal Planning. In *Coastal Zone 83* (pp. 1651-1665). New York: American Society of Civil Engineers.

Fawcett, J. A., Manus, A. T. and Sorensen, J., (Eds.). (1981). *Proceedings of a Forum on Recreational Access to the Coastal Zone*. Los Angeles: USC Sea Grant Program.

Wingo, L. W. and Fawcett, J. A. 1980. Coastal Zone Integration of State and Local Plans. In *Coastal Zone 80* (pp. 2052-2065). New York: American Society of Civil Engineers.

Fawcett, J. A. (1980). Enhancement of Public Participation Through Process Delineation: A Cooperative Effort. In *Coastal Zone 80* (supplement to the proceedings). New York: American Society of Civil Engineers.

Wingo, L. W. and Fawcett, J. A. (1980). State-Local Conflicts in Planning and Development: The California Coastal Management Program. In *Proceedings of a Conference on Land Use and the Law*. Los Angeles: USC School of Law.

Fawcett, J. A. and Katz, B. A. (1979). *Resource Management by Regulation: Coastal Development Permits in the California Coastal Zone*. USC Sea Grant Technical Report, USCSG-TR-02-79). Los Angeles: USC Sea Grant Program.

TECHNICAL REPORT

Fawcett, J.A. (2009). *City Dock #1, Marine Research Institute Opportunity Site: Visioning Study*. Study prepared for the Port of Los Angeles and the Annenberg Foundation. Los Angeles: Southern California Marine Institute

SELECTED PAPERS

Fawcett, J.A. (2010, September). *Green Ports*. Special lecture presented to Department of Shipping and Logistics Management, Graduate School of Global Human Resource Development, Chung Ang University, Seoul, Korea.

Fawcett, J.A. (2010, September). *Green Ports*. Special lecture presented to the College of Maritime Science and Management, National Taiwan Ocean University, Keelung, Taiwan.

Fawcett, J.A. (2010, April). *Developing an Effective Response to Maritime Piracy and Robbery*. Paper presented at the International Forum on Maritime Security, National Taiwan Ocean University, Department of Shipping and Transportation Management, Keelung, Taiwan.

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Fawcett, J.A. (2009). *Coastal Resilience: The Seaport Component and NOAA*. Paper presented at the 2009 National Harbor Safety Committees Meeting, Tampa, Florida.

Fawcett, J.A. (2008, November). *Developing Korean Free Economic Zones for Maximum Impact in the 21st Century*. Paper presented at the annual conference of the Korea Academy of International Commerce, Busan, Korea. Also presented at the conference, International Logistics and e-Trade Development in Northeast Asia on the Economic Depression, Seoul, Korea.

Fawcett, J.A. (2008, December). *Changes in U.S. Politics: Impacts on the Shipping Industry.* Paper presented at 2008 International Seminar on Port and Shipping, National Taiwan Ocean University, Keelung, Taiwan.

Fawcett, J.A. (2008, August). *The Working Waterfront and Offshore Aquaculture in Southern California*. Paper presented at the Aquarium of the Pacific Forum: "Sustainable Offshore Marine Aquaculture: An Opportunity for California—Environmentally & Economically?" Long Beach, California.

Fawcett, J.A. (2007, July). *Introducing the Public to Marine Commerce: Effective Urban Waterfronts*. Paper presented at the Coastal Zone 07 Conference, Portland, OR.

Fawcett, J.A. (2007, July). *Balancing Port Industrial Growth and Environmental Protection: An International Challenge.* Paper presented at the International Conference of the Korea Port Economic Association, Kunsan City, Korea.

Fawcett, J.A. (2006, December). *Pacific Port Growth and Management Issues for the 21st Century*. Paper presented at the conference, Trade Development in Northeast Asia and the Role of the Pyeongtaek/Dangjin Port as a Sea Gateway of Korea, Seoul, Korea.

Fawcett, J.A. (2006, December). *Maritime Air Quality and Security as Influences on Port Management in Northeast Asia.* Paper presented at the conference, The Cooperation of International Trade and Logistics in Northeast Asia, National Taiwan Ocean University, Keelung, Taiwan.

Fawcett, J.A. (2006, December). *Managing Air Quality at the Docks: Challenges for Pacific Shipping*. Paper presented at the Institute for Traffic and Transportation, National Chiao Tung University, Taipei, Taiwan.

Fawcett, J.A. (2006, December). *Critical Themes for Goods Movement in the Pacific Rim: Air Quality and Security*. Paper presented at the Department of Logistics and Shipping Management, Kainan University, Taoyuan, Taiwan.

Fawcett, J.A. (2005, July). *A Place at the Table: Port Plans and Coastal Management*. Coastal Zone 05, New Orleans, LA.

Fawcett, J.A. (2005, April). *Harbor Safety in the 21st Century: The Influence of Short Sea Shipping*. National Harbor Safety Committee Conference, Long Beach, CA.

Fawcett, J.A. (2005, April). *Paul Revere (A Digital Apparition) Comes to the Coast: Spreading the Word on Coastal Conditions to Every Village, Middlesex and Farm*. ASCE Conference on Coastal Disasters,

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OK

Fawcett, J.A. (2003, September). *Seaports and Coastal Management: A Short Voyage Through the Ages.* Coastal Zone 03 Conference, Baltimore.

Fawcett, J. A. (1995, September). *Trans-Asia-Pacific Shipping: Indications of Future Trends from the U.S. Perspective*. Asian-Pacific Seatransport Conference, Singapore.

Fawcett, J.A. (1994, July). *In Situ Non-Destructive Testing and Remediation of Cast Concrete Seawall Panels: Technological Challenges in Ports and Marinas*. Pacific Congress on Marine Science and Technology (PACON 94), Townsville, Queensland, Australia.

Fawcett, J. A. (1991, September). *Making Preparations for the 21st Century: The Ports of Los Angeles and Long Beach in Transition*. Asian and Pacific Congress on Maritime Transport, Huangzhou, Zhejiang, China.

Fawcett, J. A. and Caves, R. (1987, November). *The Influence of Reagan Federalism on a Comprehensive Federal Coastal Zone Policy*. Association of Collegiate Schools of Planning, Los Angeles.

Fawcett, J. A. (1985, March). *The Influence of "Home Rule" on State-Local Conflict Resolution in the California Coastal Zone.* Western Political Science Association annual meeting, Las Vegas.

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25 February 2020

Katharine Pan, AICP
Waterfront Planner
San Francisco Bay Conservation and Development Commission
375 Beale Street, Suite 510
San Francisco, CA. 94105

Dear Ms. Pan:

Re: Peer review of *2019-2050 Bay Area Seaport Forecast, Revised Draft Final* [Report A] and *Expected Demand for Howard Terminal as a cargo handling facility* [Report B]

Thank you for the opportunity to review and comment on these two documents as well as the existing *San Francisco Area Seaport Plan, April 18, 1996 as amended through January 2012.* As you have advised, I shall restrict my comments to the containerized cargo portion of port operations. Further, my response is directed to the six fundamental questions that you asked in your letter of February 4, 2020 and will respond to them in order.

You initially asked:

1. ***The Draft Cargo Forecast and Report B each use different methods for calculating sustainable capacity. What are your thoughts on the appropriateness of the two methods? Is on more suitable than the other? Is there a better approach that we should consider?***

Sustainable capacity includes not only steady-state capacity but adequate capacity to meet peak needs for both imports and exports and is a function of anticipated economic activity in the region and the hinterland served by the port. The UCLA Anderson economic forecast and the California County Level Economic forecast predict similar growth rates for the Bay Area by 2048 with approximately 3 million new residents, one million new homes and crop values and industrial production in the range of 0.8% to 1.9%. Thus the area is predicted to grow at a modest rate through the period. The question is then how these trends will affect containerized cargo flow through the Port. As shown in Table 31 (Draft Cargo Forecast), dry cargo and containers grew at a modest pace through the past decade and given a predicted similar growth rate for population, agriculture and industrial production, no dramatic economic

or demographic shift appears on the horizon at this time. All of which would indicate a modest increase in demand for sustainable Bay Area cargo capacity.

With respect to methods, Report A takes current levels of throughput as the basis for its projections and suggests that demand for container capacity is moving in a pattern consistent with economic projections, albeit as affected by the 2008-09 economic slowdown, the effect in 2015 of the 2014 PMA-ILWU contract dispute and "frontloading" in anticipation of 2019 US tariffs on Chinese imports. These are all short-term dislocations of a type that are inevitable in the goods movement business and looking at the next thirty years, it is reasonable to expect similar year-to-year dislocations, of currently of unknown cause, frequency and magnitude. Nevertheless, the underlying demand for capacity is a function of the robustness of the underlying economy. For the past twenty years, Report A notes a compound annual growth rate of inbound loaded TEUs of 3.8% and of 0.9% of outbound loaded TEUs, consistent with this conclusion. Over the period, international trade has increased slightly and there has been a consistently similar share of outbound and inbound loaded containers with an overall growth in container movement of 1.1% over the two decades.

With respect to the calculation of sustainable capacity: it is defined by The Bureau of Transportation Statistics of the US Department of Transportation as *80% of maximum capacity of the terminal*.[1] Report B rejects that standard in favor of a unique standard. In Report B (p. 8), the consultant states that "The application of a 20% discount is arbitrary and no support for such discount is provided. Consultant B prefers to simply calculate achievable capacities using conservative assumptions and not employ such a reduction factor." In fact the USDOT uses the 80% of capacity standard to permit useful comparisons between performance of container terminals. Instead, Report B suggests that "*an assessment of the sufficiency of future capacity must be based on expected future throughput performance*, [my italics] not current performance based on current layouts and performance." [sic] (P.8). Commensurate statistical measures are essential for making international as well as domestic comparisons of similar operations thus prudence would caution adherence to standards set by the USDOT rather than a unique metric.

- The Draft Report bases its future capacity analysis on current capacity as its baseline.
- Assuming that Consultant B seeks to use an alternative measure of cargo capacity, based on a uniquely calculated metric, can the consultant elucidate the methodology for its uniquely derived statistics?

2. ***Are the capacity estimates stated in the Draft Cargo Forecast reasonable for planning purposes? If not, how could they be improved?***

[1] See: https://www.bts.gov/sites/bts.dot.gov/files/legacy/PPFSWG%20071516%20Smith%20Port%20Metrics%20Presentation_0.pdf

The Draft Cargo Forecast is comprehensive in its estimates of capacity for the port. Not only has it identified potential sites for expansion of container (as well as other) cargoes, it has also based its forecast on historical traffic through the terminals and utilizes estimates of future economic activity in the region through 2050. Moreover, three estimates are made: slow, moderate and strong growth, each reflecting differing constraints upon existing port facilities.

- A narrative (Draft, p. 80) describing in more expansive detail the differences between the three types of estimates would be helpful to the reader.
- The statement of aggregate growth rates is useful, but does the Port have a sense of expansion capacity in TEU for each terminal under each growth rate scenario?

Report B argues that the port is currently underutilizing the available container terminal resources and that [presumably with an infusion of capital devoted to additional mechanization] throughput can be increased utilizing existing terminal resources. The report anticipates that the port could handle 7.2 million TEU annually by utilizing high-density operations at the terminals without use of the Howard Terminal. What is missing from the analysis is acknowledgement of fiscal limitations on the Port of Oakland or of labor negotiations that would be likely with the International Longshore and Warehouse Union (ILWU) over mechanization. Examination of these and other externalities (of all kinds) from such an increase from 2.1 to 7.2 million TEU in throughput is also missing from the analysis.

- Consultant B would strengthen its position by expanding its discussion over labor, environmental, fiscal and political aspects of its strategy. The exclusive focus on throughput leaves many questions of feasibility unasked as well as unanswered. [See response to Question 5 concerning externalities below].

3. ***The Draft Cargo Forecast and Report B each identify different benchmark terminals to use as models for estimating capacity at Oakland's terminals. Are the terminals used in the different reports useful comparisons for the Port of Oakland? Which terminals do you think would serve as the best models?***

Report B assembles the entire array of major West Coast container terminals, assesses their estimated capacities and calculates a TEU/acre capacity for each, ultimately using the calculated capacities to derive mean, median, upper quartile and upper 10% capacity for each.

- given what the Consultant B has stated on page 10 of its report, what is the source of the cargo estimates that are presented; are they derived from published data or are they uniquely derived by the consultant?
- The summary TEU/acre statistics (mean, median, upper quartile and upper 10%) conflate both automated, semi-automated and non-automated terminals. Disaggregating the terminal types would create a clearer picture of comparisons.

- Terminals of similar size, layout and composition as Consultant B notes elsewhere would allow for more accurate comparisons to Oakland. For example: Seattle (T-18); Tacoma (Pierce County-Evergreen or Husky-ITS); Los Angeles (Everport, Yusen, WBCT Cosco YML, WBCT YML Cosco); Long Beach (Pier A, Pier J, Pier G). (Expected demand, p. 10).

4. ***What are the most critical capacity constraints and have they been adequately considered in the Draft Cargo Forecast or Report B? (These may include dwell time, operating days, and land use, as discussed in the Container Terminal Capacity Estimates memo, as well as others we have not mentioned).***

Potential legal constraint:

- Is the Howard Terminal held by the Port of Oakland under terms of the California Tidelands Act? If so, is conversion of a *port priority* use into another use acceptable under the terms of the Act?

Physical capacity constraints:

- Lack of adequate turning basins for vessels of 14,000 TEU and greater. (Draft, p. 102 and Exhibits 211 and 212, pp. 198-9)
- Alongside depth of less than 50'+/-

Management capacity constraints:

- As Consultant B notes: "Current operations and layout are not "capacity optimized," with significant terminal area being dedicated to chassis parking and other low-density uses." (Expected demand, p. 8) Is there an estimate of the shortfall of current capacity if the terminals were "capacity optimized?" What is the Consultant's definition of "capacity optimization?"
- How much capacity could be gained by potential container terminal use at Oakland Berths 22-24 and horizontal expansion of the Ben Nutter Terminal onto Berths 33-34 currently also in ancillary use? (Draft, p. 13)
- How much capacity could be gained at the Roundhouse Parcel, which could expand container use on the adjacent Matson Terminal? (Draft, p. 13)
- If the ancillary uses at these terminals were consolidated, is there an alternative location and how much space would be required? Is consolidation feasible for these uses?
- To what extent would IT enhancements speed container flow through all terminals, reducing dwell time? Is the Port aware of a schedule for implementing those enhancements? (Draft, p. 92)
- Has either consultant explored coordination with regional distribution centers to move wheeled boxes during night hours to facilitate speed of throughput for inbound cargo?

5. ***What kinds of externalities—such as truck congestion, off-port land use changes, etc.—could result from potential productivity improvements at the port?***

A significant challenge to growth of the Port of Oakland is its close proximity to urbanized land uses in the City of Oakland and buffered only somewhat from the City of Alameda by the

former Alameda Naval Air Station. In such an environment, any increase in cargo handling at the port is likely to create additional external effects on residents and businesses in these communities, especially Oakland.

Major impacts:

- Diminished air quality for the entire air basin from diesel exhaust. New requirements from the California Air Quality Management Board (CARB) have imposed restrictions on port emissions from yard equipment yet most will be diesel powered for some time as electric power for equipment becomes more sophisticated and powerful. In the meantime, maintenance of exhaust scrubbers and testing of yard equipment emissions will pose a cost and political tug on port managers as they seek to expand operations.
- Truck congestion as noted above is a constant external effect of port operations, especially when truck traffic to regional distribution centers is mixed with already heavy commuting traffic. More than merely congestion, additional truck drayage to these centers also raises diesel emissions despite cleaner burning diesel power.
- Consultant B notes that capacity optimization is currently a limiting factor in cargo throughput or at least on terminal capacity. If empties (containers waiting to be reassigned or backloaded overseas) are stored on heavily used terminals, capacity could be enhanced by moving empties off those terminals. While moving these boxes can recover operating space, their movement further exacerbates off-port traffic as they are being moved or recovered for shipment. The Draft Report (p. 93) discusses off-site storage of empties as a post-Phase VI action without further discussion. The Consultant B report does not address the issue. This is an issue that will become more salient if container operations expand.
- However, if there are underutilized container terminals in the port at this time, it is difficult to conclude that container throughput is currently limited by underutilized terminals.
- Recent experience (2010-2017) demonstrates that average cargo volumes for the period have expanded from ~4,800 TEU in 2010 to ~6,300 in 2017 (Draft, Exhibits 68, 69, p. 64) discharging/loading from ~1,300 to ~1,600 TEU per port call over the period and that vessel size has also increased. If this trend continues, the surge of discharged containers can be expected to grow, favoring larger terminals or additional offsite storage areas. That surge would also be transferred to trains at the adjacent intermodal container transfer facility (ICTF) and also to roadways for regional deliveries, further exacerbating the conditions noted above.
- Although not noted in either report, obstruction of grade crossings for long container trains has been a problem elsewhere requiring ultimately funding to grade separate roadways and tracks to optimize both traffic and safety. Is this likely to be a constraint to port growth?

6. ***If cargo capacity at Bay Area ports nears its limit and Howard Terminal could be used to increase capacity, what would some be some likely scenarios for its use?***

Port facilities, irrespective of location are precious resources; they must be accessible not only from the sea but also from the shorelands and they have protection under any coastal management regime I can imagine because of their coastal dependence. Yet, at this time the Howard Terminal is one of a number of sites in the port that is underutilized. Nevertheless, the port and BCDC have a responsibility not merely to the present but also to the future to wisely husband it and similar coastal resources and not convert them into uses that do not depend upon a coastal location; that is the principle criterion in considering its future because, once lost to non-coastal dependent uses, it will be difficult both fiscally and politically to restore them to priority port use.

As larger vessels become more frequent and the Inner Harbor Turning Basin becomes a priority, it is estimated that ten acres of land will be lost from the 50-acre Howard Terminal (Draft, p. 89). As the basin is dredged, it is conceivable that the adjacent Howard Terminal could also be dredged from its current depth of -42 feet to -50 feet, creating a berth that is feasible for the large neo-Panamax vessels that are more frequent in the Asia tradelanes. While the turning basin will reduce berth length by 965 feet as well as the 70 feet of dolphins on the west end, discussions with the port apparently consider a concept of adding a 500-foot dolphin extension to the east side of the terminal, creating a 1,491-foot berth, viable as a single neo-Panamax berth or dual Panamax berths. (Draft, Exhibits 105, 106, p. 104). Without such extension, the berth remains adequate for Panamax sized vessels at 981 feet and an alongside water depth of 42 feet. Either option retains the use of the site as a container terminal.

Conclusions

1. The cargo estimates for 2020-2050 are only estimates—speculative scenarios based on assumptions made about economic health and trade as well as the actions of competitor ports—for the period under study.
2. Containerized cargo operations per acre could be increased by use of automation, expanded IT infrastructure, and more efficient use of existing terminals as well as activating terminals that are currently underutilized.
3. Private costs will fall on the Port of Oakland (infrastructure improvements), shippers, carriers and buyers of goods passing through the seaport and under more intensive container terminal use.
4. Public costs of traffic congestion, air pollution, noise and disruption of adjacent quality of life will fall on the citizens of the San Francisco Bay Area potentially as a result of more intensive containerized cargo passing through the port.
5. The costs of converting the Howard Terminal from a *port priority* use to a non-port priority use are speculative based on the intensity of its alternative use.
6. The benefits of such conversion will accrue to the user and to the City of Oakland based on the revenue the city derives from an alternative use.
7. Ultimately, the question of whether the terminal should be put to an alternative use rests with the Port and the City of Oakland to determine whether the potential

diseconomies of more intensive cargo terminal use will be offset by the benefits of an alternative use of the Howard Terminal.

Thank you for the opportunity to review these two studies. The conclusions expressed are mine alone and are limited in all but very minor respects to the material presented in the two reports as well as my own background and expertise. They do not reflect the opinion of the University of Southern California or the USC Sea Grant Program.

Very truly yours,

James A. Fawcett, PhD

JAF:

James A. Fawcett, PhD

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Los Angeles, CA 90064-2009

09 March 2020

Katharine Pan, AICP
San Francisco Bay Conservation and Development Commission
375 Beale St., Suite 510
San Francisco, CA 94105

Dear Ms. Pan:

Re: Response to your questions in your email of 06 March 2020

Question 1: In your response to Question 1, you say that it might be prudent to use the USDOT standard of an 80% sustainable capacity rate. Does this mean that you believe Report A's approach (which assumes that sustainable capacity is 80% of maximum capacity) is reasonable? On a related note, Consultant B does apply some factors to their work—one being a peaking factor of 1.25 and another 65% allowable use factor. Do you have any thoughts on how these compare?

- It is not just prudent; it is a standard established by the USDOT. If consultant B wishes to use a different standard than that specified by the USDOT, he should provide a thorough justification of why another standard is appropriate. And, if he does use a different standard then I don't understand how he would compare his estimates to the estimates conducted by any other port using the USDOT standard. It's called a "standard" because it allows interport comparisons of sustainable volume. Admittedly, consultant A has used a conservative standard, but if the Port were to lose capacity to an irretrievable (i.e. non-port priority) use, then the consequence would either be limiting the volume of traffic into the one major deep-draft port in the Bay, being required to use more advanced container processing technology, or expanding the footprint of the port into the Bay. If BCDC's priority is to limit further landfill, options one and two would be the only choice.

Question 2: One more question about the 80%-- we're just wondering where you may have encountered this before. First, how did you come across the presentation that you cited in your report. Second, have you seen others in the industry use this method or something similar, and are there other sources you know of?

- There are lots of papers on optimizing container terminal throughput but many of those other ports have either room to expand or a government eager to trade environmental quality for economic advantage. For example, the Port of Keelung or Kaohsiung in Taiwan, both of which have been extensively expanded with landfill. Oakland can't play

that game. Gharehgozli, et al. (citation follows) demonstrate that as megaships become more common, stacking protocols become more complicated and terminal space for stacking becomes critical. Moreover, delays in arrival further complicate the process because of the large volumes of containers that need to be reshuffled. The authors provide a model for estimating delays due to shuffling.

Heuristic estimation of container stacking and reshuffling operations under the containership delay factor and mega-ship challenge
Amir Gharehgozli, Joan P. Mileski & Okan Duru
Maritime Policy & Management, Vol 44, Issue 3 (2017), pp. 373-391.

Question 3: On page 3, you noted that Report A could describe in more detail the differences between the three types of estimates. Do you have any suggestions as to what additional explanations would be helpful?

- A short narrative example of what would create slow growth at the Port of Oakland as well as a similar description of moderate and high growth more than merely a statement/citation of the compound annual growth rate as a figure is essential to understanding the rationale for these three characterizations of growth. What would cause each of the three rates of growth to occur. The reason this is important is that Consultant B is generally assuming that the port *will experience* high growth rates in the future and you are entitled to know what assumptions are being made about the nature of those growth characterizations.

Question 4: For Question 3, do you have any comments on the benchmark terminals used by Consultant A (discussion beginning on page 85 of the report, see in particular Exhibit 90)?

- Answered below in Q. 5.

Question 5: I know you are not as familiar with the specifics of terminal operation at the Port of Oakland, but did you have any gut reactions to the projected estimated throughput capacities presented in each report? Report A uses 7,112 TEU/ac per year for a high productivity terminal in 2050 using an average of benchmarks from terminals in North America and Australia. Report B uses 11,414 TEU/ac per year assuming a different configuration of available land at the port, higher stacking heights, a 5-day container dwell time, and additional operating days.

- It is interesting that in calculating the 7,112 TEU/ac throughput rate as an average of four terminals, at least three of those terminals use technology more advanced than is currently being used in Oakland (I'm unfamiliar with VIG Portsmouth). And, while the technology is not the most automated, as in the adjacent comparison in that chart for Long Beach and Bayonne, NJ at an average of 11,366 TEU/ac, also the four terminals cited by Consultant A are not located in very high population and rail density areas, which might justify high-capacity automated operations. The point being that the comparison made by Consultant B is incommensurate.

- Also, given the point made by Gharehgozli, increased stacking density promotes delays in processing containers as well as utilizes additional terminal space for reshuffling that is a function of increased TEU volumes.

Question 6: Lastly can you think of any questions I should have asked, but didn't?

- I realize that you are primarily concerned with landfill in the Bay but the major issue that I see in converting port priority land to non-priority use is that it violates a basic principle of coastal management in that precious coastal resources should be allocated to *coastal dependent* uses. The technical basis of these two reports ignores that principle. That said, I realize that the City of Oakland wants a new ballpark and that it believes that this is a scenic, landmark site. Yet, the long-term utility of the site is described in the plan as "port priority." Once lost, it will be lost to cargo handling use for at least the 30-year term of this planning outlook.
- One other point that I believe is critical: consultants can estimate container throughput and argue about terminal capacity but for every estimate there will be a counter-estimate using different assumptions. The underlying question is a political one: whether the value to the public is greater in its current goods movement use or converted to a recreational use?

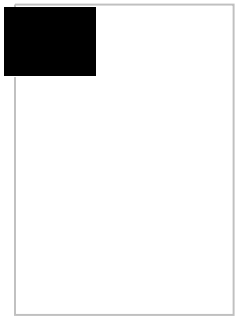
Very truly yours,

James A. Fawcett, PhD

JAF:

Attachment 7: Asaf Ashar, CV and Peer Review

Asaf Ashar, PhD - Research Professor (emeritus) and Independent Consultant, Ports, Shipping and Intermodal Transportation



Dr. Ashar is Research Professor (emeritus) with the National Ports & Waterways Institute (NPWI), USA, and independent consultant. NPWI is a maritime research program of The University of New Orleans and, previously, Louisiana State University, with offices in New Orleans, LA and Washington D.C. Dr. Ashar has been with NPWI since 1985. Before that he was Senior Port Planner and Transportation Analyst with the Port of Seattle, WA, USA (1981 – 1985), and Senior Advisor for Operations with the Port and Rail Authority of Israel, Ports of Haifa & Ashdod (1972 – 1980). His academic background includes degrees in Industrial Engineering & Management (Technion, Israel, 1967), Marine System Management (Massachusetts Institute of Technology, USA,1982), and Maritime Studies and International Transport (University of Cardiff, United Kingdom,1993).

Dr. Ashar has participated in numerous conferences and was quoted in many publications, among them: *Wall Street Journal*, *USA Today, New York Times, Los Angeles Times, Financial Times, Atlanta Journal Constitution, The Miami Herald, The Sun Herald, Fortune, The Journal of Commerce, American Shippers, Lloyd's List, Dredging Today, Port Technology, World Cargo News, Containerization International, Container Management, Port Strategy*, and *Cargo Systems;* and was interviewed on two *National Public Radio* stations (Washington DC and Los Angeles). He also has developed and taught seminars and graduate courses on Ports & Shipping.

Dr. Ashar served as Expert Witness in several cases involving US port channels, US port investments in new handling equipment, costs and rates for water and land transportation, foreign government's bidding process for port concessions, US port leasing contracts for marine terminals, inter-port competition and Hurricane-related interruptions to cruise shipping operations.

Dr. Ashar has over 50 academic and professional publications, among them the highly publicized series on The Fourth Revolution: Long-Terms Prospects of Liner Shipping (*Containerization International,* Dec 1999 & Jan 2000), Reversal of Fortune, Long-Term Forecast for US Ports, *(Containerization International*, Jan 2004, and *World Cargo News*, March 2004) and Revolution #4 (*Containerization International*, Dec 2006),the impact of Panama Canal Expansion on US Ports (*Containerization International*, July 2010), the Deepening US Port Channels (*Journal of Commerce*, Jan 2011) and, most recently, the Revised Fourth Revolution (*Port Technology,* Sep 2012*, Journal of Commerce,* Nov 2012*, and WorldCargo,* March 2013*)* and Big Ships, Deep Channels and Transfer Terminals (*Port Technology, Jan 2019).*

Dr. Ashar's areas of expertise include, in ports:

- National and regional port master plans
- Due diligence studies for port investments
- Port marketing and strategic analyzes
- National multi-modal plans (coastal, inland waterways, rail, road)
- On/off-dock intermodal railyards
- Port privatization and concession programs
- Port legislation and regulatory reforms
- Port cost and pricing strategies
- Port operations and productivity analysis
- Port facility planning for container, general and bulk cargoes

In shipping:

- Fleet forecast (ship capacity and main dimensions)
- Ship characterization and shipping costs
- Deployment strategies of shipping lines
- Future shipping and transshipping service patterns
- Inland waterways containerships and Container on Barge (COB)
- Coastal, Inter-Island, River/ Sea and Short-Sea Shipping
- Fast ferries and Ro/Pax shipping

Dr. Ashar has more than 40 years of experience with ports, shipping, and multi-modal transportation projects, in the US and more than 30 countries in Asia, South & Central America, Caribbean, East & West Africa, East & West Europe, Australia, and the Middle East. His recent projects of special interest include:

- The impact of big ships on container terminals worldwide, focusing on off-dock container yards (ICDs, Dry Ports)
- The impact of Panama Canal expansion on US East & Gulf Coast ports, especially with regards to channel deepening
- Strategic development plans for The Yangshan port complex in Shanghai, China; Inchon, South Korea; St. Antonio, Valparaiso & St. Vicente, Chile; Embraport, Santos, Brazil; Callao, Peru; Ghana, Nigeria, Kenya, Tanzania and Namibia
- Feasibility assessments of Panama Canal and "dry" canals through Mexico and Costa Rica
- Short-sea, coastal and Inland Waterways shipping for both domestic and international containers in the US, Mexico, Bangladesh and the Philippines
- Due diligence assessments for investors in port concessions in Brazil, Colombia, Panama, El Salvador, Costa Rica, Haiti, Panama, South Korea, Germany, Turkey and Namibia
- Feasibility of investments in access channels of US ports, including New York, Savannah, Jacksonville and Palm Beach
- Seminars and workshops on ports and shipping in the US, Spain, Haiti and South Africa

Dr. Ashar originated and prepared the conceptual design of Embraport, a 2-million TEU, $1 billion-investment container terminal in Santos, Brazil and that of San Antonio Outer Harbor Plan, Chile, a new deep-water harbor with full-build capacity of 6 million TEU, recently approved by the Chilean government.

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Major Projects (Recent Years):

- ***Ports and Shipping Expert, Port of Oakland, CA (USA) Masterplan**, for San Francisco Bay Conservation and Development Commission (2020)*
- ***Ports and Shipping Expert, Port of Yangon (Myanmar) Strategic Masterplan**, for Nathan Inc. and USAID (on-going).*
- ***Ports and Shipping Expert, Port of Takoradi (Ghana) Expansion, Due Diligence**, for Nathan Inc. and The Sankofa Corporation, Romford, United Kingdom (2019).*
- ***Ports and Shipping Expert, Course on Port Productivity, Optimization and Capacity Planning**, Durban, South Africa, for ECC, Johannesburg, South Africa (2018)* PDF
- ***Expert Witness, Home Port vs. Port of Registration in Cruise Shipping,** for Palter, Stokley & Sims, Houston, TX (2018).*
- ***Ports and Shipping Expert, Reassessment of Port of Jacksonville's Channel**, for St. John Riverkeeper, Jacksonville, FL, USA (2017)*
- ***Port Operation Expert, Port of Cape Haitian Rehabilitation and PPP Program,** for USAID/Nathan (2017-8).*
- ***Ports and Shipping Expert, Advanced Topics in Trade & Trade Facilitation Workshop,** for USAID/Palladium (2016).*
- ***Port Advisor, Port of Albany Strategic Development Plan,** for Port of Albany, NY, USA (2015).*
- ***Ports and Shipping Expert, Transshipment Potentials, Jamaica Logistic Hub,** for Port Authority of Jamaica (2016).*
- ***Shipping Expert, Feasibility of Puerto Antioquia, Colombia,** for Astris Finance (2016).*
- ***Ports and Shipping Expert, Prospects of Armuelles Port, Panama,** for Panama's Maritime Authority and Central America Bank for Development (2015).*
- ***Container Logistic Expert, Inland Transport, Somaliland,** for the World Bank (2015).*
- ***Expert Witness, Prospect of Ferry Services in New York,** for Emery, Celli, Brinckerhoff & Abady LLP (2015).*
- ***Expert Witness, Patent Application for Ship Handling System, USA,** for Mintz, Levin, Cohn, Ferris, Glovsky & Popeco, P.C. (2015).*
- ***Ports and Shipping Expert, Advanced Topics in Trade & Trade Facilitation Workshop, USA,** for USAID/Carana (2015).*
- ***Shipping Expert, Moin Container Terminal Market Assessment, Costa Rica,** for APM Terminals (2015).*
- ***Port and Shipping Expert, Evaluation of a Major Container Terminal Acquisition in Latin America,** for APM Terminals (2014).*
- ***Port and Shipping Expert, Review of the Philippines System of Ports and Domestic Shipping,** for Compete/USAID (2014).*
- ***Port and Shipping Expert, Review of US Army Corps of Engineer Channel Study, Palm Beach Harbor, Florida, USA,** for Concerned Residents (2014).*
- ***Team Leader, Port Rationalization Study (National Port Development Plan), Trinidad & Tobago,** for the Government of Trinidad & Tobago, Ministry of Planning and Sustainable Development Transport, (2014).*
- ***Section Leader, Port, Shipping and Intermodal Rail, National Logistics Strategy for Ethiopia,** for the Government of Ethiopia, Ministry of Transport under the guidance of the Prime Minister, Addis Ababa, Ethiopia, (2013/4).*
- ***Port and Shipping Expert, Feasibility of a new Container Terminal in Surabaya, Indonesia,** for private investors, (2013).*
- ***Principle Investigator, The Impact of Jones Act Modification on US Coastal Shipping,** for Louisiana Research Transportation Center (University Transportation Center Program), Baton Rouge, LA, USA (2013).*PDF PDF2 *https://www.ltrc.lsu.edu/pdf/2014/fr_525.pdf*;
- ***Shipping and Port Marketing Expert, Due Diligence of TCBuen Terminal Expansion Plan, Buenaventura, Colombia,** for International Finance Corporation, Washington DC, USA (2012).*
- ***Expert Witness, Port of Valparaiso's Concession Plan,** for Ultramar Group, Santiago, Chile (2012).*
- ***Expert Witness, Port of Savannah's Channel Deepening,** for Natural Resources Defense Council, Inc., New York, USA (2012). **PDF**. http://www.southernenvironment.org/uploads/fck/file/savannah_harbor/exhibite_ashar_final.pdf*
- ***Shipping Expert and Port Planner, Northern Haiti Port Development Plan,** for Southern Environmental Law Center, Charleston, SC, USA (2012).*
- ***Shipping Expert and Port Planner, Pre-Feasibility of Concession Plan, Port of Sao Sebastiao, Brazil,** for Oderbrecht Transport, Sao Paulo, Brazil (2012).*
- ***Expert Witness, Port of Miami's Channel Deepening,** for Natural Resources Defense Council, Inc., New York, USA (2012).*
- ***Port Planner and Shipping Expert, Port of Algeciras Strategic Plan,** for the Port of Algeciras Authority, Spain (2012).*
- ***Expert Witness, Maher Terminals, Elizabeth, NJ, USA,** for Winston & Strawn LLP, Washington DC, USA (2012).*
- ***Expert Witness, Assessment of Capacity Reduction for Non-Containers Cargoes (Bulk & Breakbulk) following Earthquake, Port of St. Vicente, Chile,** for San Vicente Terminal Internacionala, Chile (2011).*
- ***Shipping Expert, Strategic Expansion of Walvis Bay (Namibia) Container Terminal and Transshipment Hub,** for the Namibian Port Authority (NAMPORT), (2011).*
- ***Port Operation Expert, Short-Term Measures to Increase Capacity, National Ports Master Plan Revision for Indonesia,** for the Australian Infrastructure Initiative, Jakarta, Indonesia (2011).*
- ***Project Manager and Shipping Expert, US Inland Waterways Containerships, Vessel Design and National Application,** for the Center for the Commercial Deployment of Transportation Technologies CCDoTT, USA (2011).*
- ***Port Privatization Expert, Port Moin Container Terminal (APM Terminals),* Costa Rica,** for the Ministry of Transport, Costa Rica and Inter-American Bank (2010).*
- ***Port Privatization Expert, Global Port Operators Requirement, New Container Terminal in La Union, El Salvador,** for the International Finance Corporation (part of the World Bank), (2010).*
- ***Shipping Expert, Due Diligence Study, Port Ancon, Peru,** for a Private Investor (2010).*

- ***Port Planner, Capacity Reduction Assessment due to an Earthquake, Port of St. Vicente, Chile,*** *for* San Vicente Terminal Internacionala, Chile *(2010)*.
- ***Team Leader, Truck Staging and Truck Control Program for Lagos Ports,*** *for USAID (2010).*
- ***Project Manager, Operational Assessment of the Ports of Mombasa, Kenya and Dar es Salam, Tanzania,*** for USAID (2010).
- ***Project Manager, Port of Mongla Development Plans, Bangladesh,*** *for the World Bank (2010).*
- ***Expert Witness, Private Ports in USA and UK and their Relationships with Surrounding Communities,*** *for the Port of Los Angeles and Kaye Scholer LLP (2009).*
- ***Port and Intermodal Operations Expert, Operational Assessment of Lagos' Marine and Intermodal Terminals, Lagos, Nigeria,*** for USAID (2009).
- ***Port Planner and Market Research Analyst, Market Assessment and Infrastructure Development Plan, Port of Lake Providence, LA, USA,*** for the Lake Providence Port Commission (2009).
- ***Port Planner and Shipping Analyst, Due Diligence Study, Embraport, Santos, Brazil,*** for Coimex Corporation, Sau Paulo, Brazil to be presented for the Inter-American Bank (2009).
- ***Project Manager and Port Planner, Alternative Development Plans for Central Chile's Ports (San Antonio and Valparaiso), Chile,*** for STI, Chile (2009). *http://www.sanantonioport.cc.cl/html/transparencia/licitEspigon/PlanAlternativo_AsafAshar.pdf*
  http://www.lyd.com/lyd/controls/neochannels/neo_ch4358/deploy/presentacion2.pdf
- ***Port Planner and Intermodal Transportation Analyst, Pre-Feasibility Analysis of the Tehuantepec Land Bridge ("Dry Canal"), Mexico,*** for The States of Veracruz and Oaxaca, Mexico (2008/9).
- ***Port Planner and Business Analyst, Comparative Overview of US Gulf Coast Bulk Ports and Identification of Development Strategies,*** for The Port of South Louisiana, USA (2008).
- ***Port Planner and Shipping, Strategic Master Plan of the Port of Morgan City,*** for The Port of Morgan City Louisiana, USA (2008).
- ***Project Manager and Port Operations Specialist, Capacity Assessment, Port of San Antonio Container Terminal, Chile,*** for STI, Chile (2008).
- ***Shipping Expert and Port Planner, Master Plan Study and Business Plan for Containers, Puerto Quetzal,*** for The Port of Quetzal, Guatemala (2008).
- ***Project Manager, Shipping Expert, Port Planner and Financial Analyst, Viability Assessment of Transshipment Hub in Haiti,*** for private investors (2008).
- ***Reviewer, Start-Up Plan for a Container Terminal, Embraport, Santos, Brazil,*** for Coimex Corporation, Sau Paulo, Brazil (2008).
- ***Shipping and Port Analyst, Feasibility of Feeder and Short Sea Shipping on the US East Coast,*** for Payne Company, New York (2008).
- ***Port Privatization Specialist, Cape Verde Port System***, for the World Bank (2007).
- ***Port Operations and Tariff Specialist, Due Diligence Study for TCBUen, Buenaventura, Colombia,*** for CAF, CABO and West LB Banks (2007)***.***
- ***Project Manager and Transportation Analyst, Intermodal Connectivity of Louisiana Deep-Water Ports, USA*** for the State of Louisiana Department of Transportation, USA (2007)***.***
  http://www.dotd.la.gov/intermodal/marineandrail/documents/A_Comparative_Analysis_of_Intermodal_Ship_to_Rail_Connections_at_Louisiana_Deep_Water_Ports.pdf
- ***Shipping and Port Operations Analyst, Due Diligence Study, Port of Santa Catarina, Brazil,*** for Inter American Bank and West LB Bank (2007).
- ***Shipping and Port Operations Analyst, Due Diligence Study for the Port of Santa Catarina, Brazil,*** for Inter-American Bank and West LB Bank (2007)***.***
- ***Strategic Advisor for Port Development, Port of Cartagena, Colombia,*** for the Port Society of Cartagena, Colombia (2007)***.***
- ***Port and Shipping Analyst, Reorganization of the Maritime Division and Legislative Reform, Ministry of Transport, Abu Dhabi***, for the Abu Dhabi Ministry of Transport United Arab Emirates (2007).
- ***Shipping and Intermodal Transport Analyst, Multi-Modal Logistic Terminal for Fresh Produce, Panama***, for Inter American Bank (2007).
- ***Port Planner and Operations Specialist, A System for Regulating Ports Efficiency and Capacity***, ***Colombia***, for the Federal Department of Transportation & Planning, Colombia (2006).
- ***Port Operations and Shipping Expert, Master Plans of Ports Tema and Takoradi, Ghana***, for Ghana Ports and Harbor Authority, Ghana (2006/8).
- ***Port and Shipping Analyst, Inter-Island Ro/Ro Shipping in the Philippines,*** for The Philippines Development Bank and USAID (2006).
  http://pdf.usaid.gov/pdf_docs/PNADH981.pdf
- ***Port Operations Specialist, Port of Praia Master Plan, Cape Verde,*** for Millennium Commission Corporation, USA (2006).
- ***Concession Contract Advisor, Embraport Container Terminal, Santos, Brazil,*** for Coimex Corporation, Sau Paulo, Brazil (2006).
- ***Project Manager, Review of Panama's Port Law and the System of Concession Fees,*** for the Inter-American Bank (2006).
- ***Project Manager, Financial and Shipping Analyst, Pan American Maritime Highway Ferry (Ro/Ro) System,*** for the Inter-American Bank (2006).
- ***Port Privatization and Development Analyst, Concession Plan for the Port of Callao, Peru***, for the National Port Authority and Office of Private Investment and USAID, Colombia (2006).
- ***Port Planner, Shipping Analyst, and Financial Analyst, Port of Poti's Future Container Terminal, Georgia***, for private investors (2005).
- ***Trade and Transportation System Analyst, Feasibility of Bocas de Cenizas Coal and Container Terminals, Barranquilla, Colombia***, for the Port Society of Boca Cenezia, Colombia (2005).
- ***Port Planner and Shipping Analyst, Embraport Market Study and Conceptual Design, Santos, Brazil***, for Coimex Companies, Brazil (2005/2006).
- ***Barge Transportation Analyst, New Orleans Inner Harbor Lock Rehabilitation Study,*** for the US Army Corps of Engineers (2005/ 2006).
- ***Port Planner, Ro/Ro Terminal, Ust Luga, Russia,*** for Ust Luga Port Company, Russia (2005).
- ***Harbor Navigation Canal, Inner Harbor Lock Investigative Study, New Orleans, USA,*** *for the US Army Corps of Engineer, New Orleans District* (2004).
- ***Port Planner and Shipping Analyst, Feasibility of Inchon Container Terminal, South Korea,*** for private US investors and Korea's Ministry of Fishery and Maritime (2004).

- ***Expert Witness, Costs of Coal Shipping and Port Handling in Florida,*** for Michael Twomey Law Office, Gainesville, FL, USA (2004).
- ***Task Leader, Liner Shipping, Containerized Trade and Port Operations, Strategic Development Plan of Port Quetzal, Guatemala,*** for the Port Quetzal Port Authority (2004).
- ***Port Planner and Financial Analyst, Ust Luga Port's Refrigerated Terminal, Russia,*** for Ust Luga Port Company, Russia (2004).
- ***Port Planner and Shipping Analyst, Ust Luga Ports' Grain Terminal, Russia,*** for Ust Luga Port Company, Russia (2004).
- ***Project Manager and Transportation Planner***, ***Lake Victoria Container-on- Barge Shipping and Terminal, Uganda,*** for of the Haba Group (2004).
- ***Team Leader and Shipping Analyst, Container Demand for Panama Canal following Expansion,*** for the Panama Canal Authority (2003).
- ***Principal Investigator, High Speed Ferries and Coastwise Vessels: Evaluation of Parameters and Markets for Application***, for the Center for the Commercial Deployment of Transportation Technologies, USA (Phase IV, 2003) *http://www.ccdott.org/transfer/projresults/2001/task%203.17/task%203.17_Final%20Report.pdf*
- ***Port Planner and Shipping Analyst, Port of Lake Charles Strategic Plan, Louisiana, USA***, for the Port of Lake Charles Commission (2002).
- ***Shipping Analyst and Port Operations Expert, Port of Manta's Master Plan Study,*** for Port Manta Port Authority, Ecuador (2002).
- ***Principal Investigator, Containership Fleet Forecast for US Ports,*** for the US Chamber of Commerce, USA (2002).
- ***Principal Investigator, High Speed Ferries and Coastwise Vessels: Evaluation of Parameters and Market Applications***, for the Center for the Commercial Deployment of Transportation Technologies*, USA* (Phase III, *2002).http://www.ccdott.org/transfer/projresults/1998/task%203.10/task3.10_3.11.pdf*
- ***Port Organization System Analyst, Privatization of El Salvador Maritime Subsector, El Salvador,*** for the World Bank (2001).
- ***Port Planner and Shipping Analyst, Due Diligence Study, Embraport Container and Grain Terminal, Santos, Brazil,*** for Coimex Corporation, Sau Paulo, Brazil to be presented for the Inter-American Bank(2009).
- ***Shipping System Analyst, Multi-Port Study of C & D Canal, Baltimore, Maryland,*** *for U.S. Army Corps of Engineers* (2000 - 2001).
- ***Port Planner and Financial Analyst, Nicaragua Port Reform and Privatization Plan of the Port of Corinto,*** *for the Inter-American Bank of Development and Nicaragua's National Port Authority* (2000).
- ***Port and Shipping Analyst, Deepwater Outer Continental Shelf Oil & Gas related Infrastructure in the Gulf of Mexico,*** *for U.S. Department of Interior, Mineral Management Service* (2000).
- ***Team Leader and Shipping System Analyst, Evaluation of Alternatives for a Deep-Water Port in Shanghai (Yangshan),*** *for State Development Planning Commission of the Central Government of P. R. China, China* (2000).
- ***Shipping, Port Operations and Facilities Planner, Master Plan for the Port of Gdynia, Poland,*** *for the Gdynia Port Holding, Poland* (1999).
- ***Principal Port Concession Negotiator, Port Bar Concession***, ***Montenegro***, *for Eberhard Trading Corp., Panama (1999).*
- A full list of projects conducted in previous years is available upon request.

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Conferences and special events

- Speaker and Panelist, *"The Impact of Panama Canal on Trade and Transshipment"* **TOC Americas 2015**, Panama City, Panama, October 2015**.ppt**
- Speaker and Panelist, *"Routes to Market: Transshipment Hubs & the Americas Shipping Networks"* **TOC Americas 2014**, Cartagena, Colombia, October 2014**.pdf**
- Speaker and Panelist, *"Berth Productivity";* **Port Productivity Conference of The Journal of Commerce**, Newark, NJ, USA, December 2013**.pdf**
- Discussion Leader, *"Transshipment Hubs vs. Direct Call: What will be the Future Shape of Americas Shipping Networks?",* **TOC Americas 2013**, Miami, USA, October 2013**.pdf**
- Speaker and Panelist, *"Panama vs. Non-Panama Transshipment";* Discussion Leader, *Latin America Port Development ,* **Global Liner Shipping Americas Conference**, Panama City, Panama, May 2013***.pdf***
- Keynote Speaker, *"Ports and Liner Shipping -- Evolutionary Perspective",* **Ports as Gateways***, 2013 Western Ports Conference,* Perth, Australia, May 2013.
- Speaker and Panelist, *"Alternative Development Plans for Port Region V, Chile",* **Sonar Valparaiso**, Valparaiso, Chile, April 2012. *http://www.youtube.com/watch?v=PPZoG2ajpro*
- Main Presenter, *"The Role of the Port of Algeciras",* **Trends in Maritiem Trade, Shipping and Ports***,* a seminar related to The Port of Algeciras Masterplan*,* Algeciras, Spain, February 2012.
- Speaker and Panelist, *"Loss of Capacity following Earthquake"****, Terminal O*****perator Conference (TOC) Americas 2010**, Rio de Janeiro, Brazil, November 2010***.pdf***
- Presenter, "Strategic Issues Facing the Ports of New York/New Jersey and Abu Dhabi/Dubai", **University of New York Lecture Series**, New York and Abu Dhabi, October 2009 and January 2010.
- Speaker and Panelist, *"Impacts of Panama Canal Expansion", and "Masterplan for Central Chile Ports",* **Terminal Operator Conference (TOC) Americas 2009**, Buenos Aires, Argentina, November 2009.
- Speaker and Panelist, "*Alternative Development Plan for Central Chile Ports",* **Terminal Operator Conference (TOC) Americas 2009**, Buenos Aires, Argentina, November 2009.
- Speaker and Panelist, "Strategic, Business Plan for Port Quetzal, Guatemala*",* **Terminal Operator Conference (TOC) Americas 2008**, Long Beach, CA, USA, November 2008.
- Speaker and Panelist, "*Future Trends in West Coast South America Shipping Pattern",* **Terminal Operator Conference (TOC) Americas 2007**, Panama City, Panama, November 2007.
- Speaker and Panelist, "*Global Trends in Shipping and Ports",* **Port Society of Cartagena, Colombia**, with participation of the President of Colombia and Ministers in charge of port development, Cartagena, Colombia, July 2007.
- Panelist, "*Port Performance and Logistic Indicators*", **Global Institute of Logistic Forum**, Atlanta, GA, June 2007.
- Speaker and Panelist, "*Securing the Future Vitality of the Marine Transportation System (MTS) through Cooperative Research"* **7th Marine Transportation System Research & Technology Conference, The National Academy of Science***,* Washington DC, November 2004.
- Speaker, "*Environmental Benefits of Short Sea*" **3rd Short Sea Shipping Conference**, MarAd, New York, NY, October 2004.
- Speaker and Panelist, "*Roundtable 5: How will a Waterborne Intermodal System Work in Practice?"* **JOC Short Sea Shipping Conference,** Hilton Head, GA, April 2004.
- Speaker and Panelist, "*Future Panama Canal Improvements and Impacts on International Trade",* **Annual Transportation Research Board Conference**, TRB / Marine Board (National Academy of Science), Washington DC, January 2003.

- Speaker and Panelist, "*Long-Term Developments in Liner Shipping and the Role of the Port of Colombo, Sri Lanka",* **International Institute of Chartered Shipbrokers 2002 Conference**, Colombo, Sri Lanka, October 2002.
- Speaker and Panelist, *"Pure" Fast Freight Ferries for Coastal Services in the US,* **Ro/Ro 2002 Conference**, Lubek, Germany, June 2002.
- Speaker and Panelist, "*US Port Capacity and Capability",* **Marine Transportation System, Research and Technology Conference**, TRB/Marine Board (National Academy of Science), Washington DC, November 2001.
- Speaker, " *Defining Criteria for Transshipment Hub Ports",* **Terminal Operations Conference (TOC) America 2001 Conference** , Miami, FL, September 2001.
- Chairman, Session on Environmental and Competition Policy; and Commentator; speaker and panelist, "*Controlled Growth of Ports",* Session on Planning for Future Terminal Capacity, **Terminal Operating Conference (TOC) 2001**, Lisbon, Portugal, June 2001
- Speaker and Panelist, *"Fast Coastal Ferries in the U.S.",* **The 17th Fast Ferry Conference** , New Orleans, LA, March 2001.
- Speaker and Panelist, "*Opportunities for Coastal Shipping in the U.S.",* Session on Fast Ferries, **Ferries 2000**, Biloxi, MS, November, 2000.
- Speaker and Panelist, "*The Impact of the Fourth Revolution on Latin America",* The Session on Global Development, **Latin Ports 2000 Conference,** Miami, FL, November, 2000.
- Speaker and Panelist, "*The Fourth Revolution and Expansion Options for the Panama Canal",* Opening Session, **Transportation Research Board, National Science Foundation**, Norfolk, VA, July, 2000.
- Principal Speaker, *Long-Terms Trends in Liner Shipping and Container Ports,* A special presentation and **workshop for Stevedoring Services of America**, ABAM Engineering and the Port of Seattle, Seattle, WA, July, 2000.
- Keynote Speaker, *What Does the 12th Century Portend for Western Hemisphere Ports?* **Ports America Conference 2000**, Maritime Day, Philadelphia, PA, June, 2000.
- Visiting Lecturer, *Long Term Trends in Shipping and Ports*, **The 36th International Seminar on Port Management,** Delft International Institute for Infrastructural, Hydraulic and Environmental Engineering and Delft University of Technology, Delft, The Netherlands, May 2000.
- Speaker and Panelist, *The Prospects for Revival of Coastal Shipping in the U.S.,* **the Permanent International Navigation Association Conference (PIANC) 2000**, Oakland, CA, USA, May 2000.
- Speaker and Panelist: (a) *The Fourth Revolution and Transshipment Potentials for Panama;* and *(b) The Prospects for the Yangshan Port Project)*, Rotterdam, **Terminal Operators Conference (TOC) 2000**, The Netherlands, May 2000.
- Principal Speaker and Discussion Leader, T*he Fourth Revolution and its Impact on the Canal's Expansion Prospects*, **Panama Canal Authority Workshop**, Panama City, Panama, April 3, 2000. Attendees included the Administrator, senior staff, current and former Ministers of the Canal and the Executive Director of Panama Maritime Authority.
- Keynote Speaker*,* **The VIII Congress of Maritime Transport and Ports of The Ports of Spain,** *" Long Term Trend in Container Shipping: Equatorial Round-The-World Services and their Impact on European Ports"*, Algeciras, Spain, November 1999.
- Chairman, **Terminal Operators Conference (TOC) 99**, sessions: (a) *Transshipment -- Emerging Mediterranean Shipping Patterns; and (b) The Intermodal Challenge;* and Presenter*, Long Term Trends in Container Shipping: the Emergence of Equatorial Round-The-World Services and Pure Transshipment Ports,* Genoa, Italy, June 1999.
- Speaker and Panelist, **Container Ports & Terminals Performance in the Intermodal Chain Conference**, "*Standard Port Performance Indicators"*, Amsterdam, The Netherlands, February 1999.
- Chairman, **Terminal Operators Conference (TOC) 98 (Asia)**, session on *Port Investments -- Strategies and Practical Experience in the Middle East and South Asia*, Dubai, October 1998.
- Principal, workshop on **Port Pricing and Finance**, *Organization of American States and U.S. Maritime Administration*, Lima, Peru, June 1998.

- Speaker and Workshop Principal, **Latin Ports '97 Conference**, "*Port Privatization, Operational and Financial Considerations"*, Miami, November 1997 (with Paul Kent).
- An invited participant (by U.S. Secretary of Transportation) in a workshop on **Impacts of Changes in Ship Design on Transportation Infrastructure and Operations**, New York, NY, July 1997.
- Speaker and Panelist, **Terminal Operators Conference (TOC) 97**, "*All-In Port Pricing and Productivity Adjusted Pricing"*, Barcelona, Spain, June 1997.
- Speaker and Panelist, **International Port Development: Financing Port Development Projects**, "*Developing Port Jakarta's Strategic Plan"*, Washington D.C., June 1997.
- Speaker and Panelist, **Terminal Operators Conference (TOC) 96**, "*Evolution in Transshipment Patterns and their Impact on Ports: The Case of Indonesia"*, Hamburg, Germany, April 1996.
- Lecturer, **International Program for Port Management**, *Port Operations, Technology and Performance"*, University of New Orleans, New Orleans, 1996 to 2000.
- Speaker and Panelist, *The Potential for Small Containerships,* **Marine Log: Commercial Shipbuilding USA Conference**, Washington D.C., December 1995.
- Speaker and Discussion Leader, **The Second Annual Conference on Transportation Management**, State University of New York, Maritime College, Port Schuler, NY, May 1995.
- Speaker, **Conference on Russian Port Development**, "*Assessing Capacity of Ports and Terminals*," U.S. Agency for International Development, Washington D.C. September 1994.
- Speaker and Panelist, **The Maritime System of the Americas (Phase II)**, "A*lternative Land and Water Intermodal Options*," U.S. Maritime Administration and Mexico Ministry of Communication, Veracruz, Mexico, July 1994.
- Speaker, **National Commission on Intermodal Transportation (for the U.S. Congress),** *Revival of Coastal Shipping of Freight*, May 1994.
- Speaker and Panelist, **Maritime System of the Americas**, *Vessel Technology and Operations*, U.S. Maritime Administration, New Orleans, March 1993.
- Speaker and Panelist, **Ports '92 Conference of ASCE/PIANC**, *Port Access*, Seattle, WA, July 1992.
- Speaker, **Cargo Systems' 7th Terminal Operation Conference (TOC)**, *Intermodal Transport Systems*, Genoa, Italy, June 1992.
- Speaker and Panelist, **Annual Convention of the National Science Foundation**, **Transportation Research Board**, Intermodal Committee, *Intermodal Yard Capacity*, Washington D.C., January 1992.
- Principal Speaker, **Breakbulk Roundtable** for U.S. Maritime Administration Offices of Technology Assessment and Ports and Intermodal Development, November 1991.
- Speaker, *Port Systems and Barge Terminals,* a 1-week **Regional Seminar on Inland Waterway Transportation in South America**, Buenos Aires, Argentina, October 1991.
- Speaker, ***Privatization Options for the Port of Buenos Aires***, a 2-week workshop, Buenos Aires, Argentine, October 1991. Participants included port representative, shippers, stevedores and lines' representatives from 5 South American countries.
- Speaker, *Future Breakbulk Ports*, **Bulk Transpo 91 -- The Journal of Commerce Conference** Atlanta, GA, June 1991.
- Speaker, *Port and Terminal Capacity* in two **Workshops on Port Privatization** to delegates from South America sponsored by USAID/TDP, June 1991.
- An expert witness and a provider of a deposition to the **Committee on Publics Works and Transportation, U.S. House of Representatives**, on *Overweight Containers*, July 1990.
- Panelist, **Government Shipping Panel, Society for Naval Architects and Marine Engineers (SNAME)**, an industry-government-academia forum, 1990.
- Speaker, *Feasibility of Unitization of Breakbulk Cargoes*, **6th Terminal Operation Conference (TOC) of Cargo System**, Amsterdam, April 1990.
- Panelist, the session on *Trends in Breakbulk and Neobulk Cargo Handling Technology*, the **Annual Convention of the Association of American Port Authorities (AAPA)**, Tampa, Florida, October

1989.

- Panelist, the session on *Intermodal Transportation*, the annual **U.S. Transportation Research Forum** in conjunction with the **Canadian Transportation Research Forum**, Toronto, 1988.
- Speaker and Panelist, *Strategic Planning for Ports*, **World Wide Shipping** in conjunction with the **Port Authority of New York / New Jersey**, New York, 1987.
- Presenter and Panelist, *Productivity of Marine Terminals*, **National Science Foundation** in cooperation with the Maritime Administration, Long Beach, California, 1986.
- Speaker and Panelist, *Potential for Short Sea, River/Ocean Systems in the U.S.*, **The U.S. Maritime Administration**, Washington, D.C., 1985.

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Publications and presentations

- **Big-Ship Terminals, Detaching Waterside from Landside Operations,** *Port Technology*, 2019. **PDF**
- **Functional Approach to the Palestinian Safe Passage between Gaza and the West Bank,** 2019 **PDF**
- **Big Ships and Densification of Container Terminals,** *Port Technology*, 2018. **PDF**
- **Big Ships, Deep Channels and Transfer Terminals**, *Port Technology*, 2018. **PDF**
- **Gaza Port Alternatives (5.0)**, *Gaza Group of Experts, 2018*. **Full Report PDF Short Summary PDF Gaza Island Port** (Hebrew) **PDF**
- **US Army Corp's Cost-Benefit Deepening Review -- Flawed**, *Journal of Commerce*, 2017. **PDF**
- **US Port Capacity**, *Journal of Commerce Annual Review & Outlook 2017*. **PDF**
- **Long-Term Developments of US Ports' Channels**, *Journal of Commerce Annual Review & Outlook 2016*.**PDF**
- Rodrigue, JP and Ashar, A. (2015) **'Transshipment hubs in the New Panamax Era: The role of the Caribbean',** *Journal of Transport Geography,* October 2015. **PDF**
- **Devolution of US Ports' Channels**, *Journal of Commerce Annual Review & Outlook 2015*.**PDF**
- **Impact of Panama Canal and American Marine Highway (Coastal Shipping)**, *Journal of Commerce Annual Review & Outlook 2014*.**PDF** *https://www.joc.com/maritime-news/annual-review-outlook-2014-national-ports-waterways-initiative-university-new-orleans_20140103.html* Expanded version published in *Container Management,* March 2014. **PDF**
- **Dredging - Key Factor for US Container Port Call Strategies**, *Dredging Today.com*, Aug 30, 2013.**PDF**
- **Coastal Shipping and Jones Act**, *The Journal of Commerce Annual Review & Outlook 2013*, February 2013. **PDF** *http://www.joc.com/maritime-news/short-sea-shipping/annual-review-outlook-2013-national-ports-and-waterways-initiative-university-new-orleans_20130207*
- **Alternative Development Plan for Chile's Region V Ports**, *Proceedings of Sonar Valparaiso*, April 2012.**PDF**
- **Revised Fourth Revolution -- Long-Term Trends in Liner Shipping**, *Port Technology International, Fifty-Fifth Edition*, October 2012 pp. 77-93 (expanded version). **PDF**, *WolrdCargo*, March 2013. **PDF**
- **Marine Highway's New Direction (US Short-Sea Shipping)**, *The Journal of Commerce*, Commentary, November 21, 2011 pp. 38-39. **PDF**
- **Paying for Benefits (Modifying the Pricing System for Deep Port Channels)**, *The Journal of Commerce*, Commentary, January 23, 2011 p. 23. **PDF**
- **AAPA Rebuttal**, January 31, 2011 **PDF Response**, February 2, 2011 **PDF**
- **Kent, P. and Ashar, A. (2010) 'Performance Indicators for Regulators'**, *Proceedings of International Journal of Maritime Economics (IJME) Conference, Lisbon,* July 2010, **PDF**
- **An Expanding Brief, (Impact of Panama Canal Expansion)**, *Containerization International*, July 2010, pp.27 - 28. **PDF**
- **The Impact of Panama Canal Expansion**, Proceedings of TOC Americas 2009, November 2009.**PDF**
- **Alternative Development Plan for Central Chile Ports**, Proceedings of TOC Americas 2009, November 2009.**PDF**
- **De-Intermodlization of the Ports of Los Angeles and Long Beach**, *Containerization International*, July 2009 and *The Journal of Commerce*, April 15, 2009 (short version). **PDF**

- **The Inevitability of Change**, Interview in *Container Management,* Latin American Edition, November 2008. **PDF**
- **New Era in Container Shipping (Port of Prince Rupert)***, The Journal of Commerce*, March 3, 2008. **PDF**
- **Executive Commentary: Feedering USEC Ports following Panama Canal Expansion**, *The Journal of Commerce,* 2007 Annual Edition, January 2008. **PDF**
- **Future Trends in West Coast South America Shipping Pattern**, *Proceedings of TOC Americas 2007*, November 2007. **PDF**
- **Sounding Off: All Water Suez vs. Panama**, *Containerization International*, August 2007, pp. 72. **PDF**
- **Executive Viewpoint: Short Sea Shipping in the US**, *The Journal of Commerce 2006 Annual Edition*, December 2006. **PDF**
- **Revolution #4**, *Containerization International*, December 2006, pp. 46 – 48. **PDF**
- **Pure Fast Freight Ferries for Coastal Shipping in the US**, Proceedings of the JOC Short Sea Conference, May 2003 and June 2000. **2004 PDF**, **2000 PDF**
- **Toward New ART Form**, *WorldCargo*, March 2004, pp. 17-18. **PDF**
- **Long-Term Development of US Ports**, TRB Conference on Marine Transportation System, Washington DC, November 2004. **PDF**
- **Reversal of Fortune, Long-Term Forecast for US Ports**, *Containerization International*, January 2004, pp. 58-61. A summary was also published in *WorldCargo*, March 2004. **PDF**
- **User Charges for Port Cost Recovery: the US Harbor Tax Controversy**, *Maritime Economics & Logistics*, Volume IV, No 5, March 2003. **PDF**
- **Revolution Now**, *Containerization International*, January 2002, pp. 56-59. **PDF**
- **Pure Fast Freight Ferries for Coastal Services in the US**, Proceedings of the Ro/Ro 2002 Conference, June 2002. A summary was also published in Le Lloyd Anversois, Paris, France, June 31, 2002.
- **Intermodal, Rail Connection between the West Bank and Gaza**, Interview in *Maariv*, Weekend Magazine, March 30, 2001 (in Hebrew).**PDF**
- **US Ports' Capacity and Capability**, Proceedings of the Marine Transportation System, Research and Technology Conference, TRB / Marine Board (National Academy of Science), Washington DC, November 2001.
- **Comments to: Technological and Economic Implications of Mega-Container Carriers by Hans Payer**, Proceedings of Society for Naval Architects and Marine Engineers (SNAME), September 2001.
- **Defining Criteria for Transshipment Hub Ports**, Proceedings of Terminal Operations Conference (TOC) America 2001 Conference, September 2001.
- **Strategic Pricing in Newly Privatized Ports**, *International Journal of Maritime Economics (IJME)*, Volume III, No1, March 2001. **PDF**
- **Kent, P. and Ashar, A. (2001) 'Port Competition Regulation: A Tool for Monitoring for Anti-Competitive Behavior'**, *International Journal of Maritime Economics (IJME), Volume III, No1*, March 2001. **PDF**
- **A New Revolution Rebuttal**, *Containerization International*, April 2001, p. 4. **PDF**
- **Fast Coastal Ferries in the U.S.**, *Proceedings of the 17th Fast Ferry Conference*, March 2001.
- **The Impact of the Fourth Revolution on Latin America**, *Proceedings of Latin Ports 2000 Conference*, November 2000.
- **The Prospects for the Yangshan Port in Shanghai**, *Proceedings of the Terminal Operations Conference (TOC) 2000*, May 2000.
- **The Fourth Revolution and Transshipment Potentials for Panama Ports Port Productivity,** *Proceedings of the Terminal Operations Conference (TOC) 2000*, May 2000.

- **The Prospects for Revival of Coastal Shipping in the U.S.**, Proceedings of the Permanent International Navigation Association Conference (PIANC) 2000, May 2000.
- **The Fourth Revolution**, *Containerization International*, December 1999, pp. 57 - 61; and 2020 Vision, *Containerization International*, January 2000, pp. 35 - 39. Excerpts of the papers were published in: (a) *Mundo Maritimo* and *El Universal*, Panama, February 2000; (b) *American Association of Port Authorities Advisory*, March 13, 2000; (c) *The Journal of Commerce*, June 5, 2000; (d) *Traffic World*, June 12, pp. 36 - 37; (e) *The Journal of Commerce*, June 19, 2000; (f) *Cargo Systems*, June 2000; (g) *IFW, International Freighting Weekly*, March 5, 2001; and (h) Proceedings of IFEC, International Port Executives Conference, 2002.
- **Port Productivity: a new Emphasis in the Era of Concessions**, *Distribucion Fisica*, No. 22, May 1999, Lima, Peru (together with G. Ayzanoa).
- **Long Term Trends in Container Shipping: Equatorial Round-The-World Services and their Impact on European Ports**, *Proceedings of the VIII Congress of Maritime Transport and Ports,* The Ports of Spain, November 1999.
- **Long Term Trends in Container Shipping: Equatorial Round-The-World Services and their Impact on European Ports**, *Proceedings of the VIII Congress of Maritime Transport and Ports, The Ports of Spain*, November 1999.
- **Long Term Trend in Container Shipping: The Emergence of Equatorial Round-The-World Services and Pure Transshipment Ports**, Proceedings of the Terminal Operations Conference (TOC) 99, June 1999.
- **Misunderstanding the Harbor Tax**, *The Journal of Commerce*, May 26, 1999.
- **A Standard Ship Handling (Stevedoring) Contract**, Proceeding of the Containerport & Terminal Performance in the Intermodal Chain Conference, Amsterdam, The Netherlands, February 1999. A modified version of the paper, titled **Units of Measurement for Productivity and Indicators of Productivity** was included in the book *Container Terminal Productivity*, Cargo Systems, IIR Publications, London, U.K., June 1999.
- **Coastal Shipping of Containers and Trailers in the U.S.**, Proceeding of Permanent International Association of Navigation Congress (PIANC), The Hague, The Netherlands, July 1998.
- **Counting the Moves**, *Port Development International (PDI)*, November 1997, pp. 25 - 29.
- **Port Productivity Revisited**, Proceeding of Terminal Operators Conference (TOC) 97, Barcelona, Spain, June 1997. **Part 1 PDF** , **Part 2 PDF**
- **The Impact of Dredging/Not-Dredging New York Harbor**, *Transportation Quarterly*, ENO Transportation Foundation, winter 1997. Reprints were requested and sent to over 30 ports and transportation organizations in the USA. **Part 1 PDF** , **Part 2 PDF** , **Part 2 PDF**
- **Freight Components in Louisiana's Statewide Intermodal Transportation Plan, Transportation Planning and Land Use at State, Regional, and Local Levels**, Transportation Research Record No. 1552, Washington D.C., November 1996.
- **Evolution in Transshipment Patterns in Containerized Trade and the Emerging Hub Ports**, Proceeding of Terminal Operators Conference (TOC) 96, Hamburg, Germany, April 1996.
- **Freight Components in Louisiana's Statewide Intermodal Transportation Plan**, Transportation Research Board 1996 Proceeding, Washington D.C., January 1996 (with C. Appfel, A. Hochstein, K. Horn and R. McLaughlin).
- **The Potential for Small Containerships**, Commercial Shipbuilding USA Conference Proceeding 1995, Marine Log, Washington D.C., December 1995.
- **Maritime System of the Americas Study**, Permanent International Association of Navigation Congress (PIANC), 1995 (with A. Hochstein and R. McLaughlin).
- **Factor Analysis and Benchmarking Port's Performance**, *Maritime Policy & Management*, University of Wales Publication, United Kingdom, vol. 22, no. 4, 1995.**PDF1 PDF2**
- **Maritime vs. Land Transport Systems between Mid-America and Mexico**, *The Journal of the Transportation Research Forum*, Volume 36, Number 1, 1996, pp. 1 - 16.
- **Stock and Flow Methodology for Calculating Capacity of Cargo Transfer Terminals**, Proceeding of Second Annual Conference on Transportation Management, Sate University of

New York, Maritime College, May 1995 (with G. Ayzanoa). **PDF**

- **Maritime System of the Americas Study**, *PIANC Bulletin*, No 87, 1995, pp. 28 - 35 (with A. Hochstein and R. McLaughlin). **Coastal Shipping for Domestic Freight**, *WWS/Worldwide Shipping*, January 1995, pp. 28-29. An earlier version of the paper was: (a) presented to the National Commission of International Transportation of the U.S. Congress, May 1994; and (b) circulated among all members of U.S. Congress by Congressman James Traficant (D-IL) of the Committee on Public Works and Transportation as a Media Advisory, November 1994. Excerpts of this article also appeared in *The Journal of Commerce* (January 1995), *Pacific Maritime* (January 1995), *Inbound Logistic Magazine* (February 1995), and *German Transport News* (in German, January 1995).
- **FastShip: In-Transit, In-Stock and Inventory Cost**, *The Journal of Commerce*, Trade Section, December 16, 1994. The paper was included in the proceeding of The Economics of Fast Cargo Ships Conference Proceedings, The international Association of Maritime Economist and The Society of Naval Architects and Marine Engineers, Washington D.C., June 1997.
- **Defining Performance Measures for an Intermodal Management System**, *The Journal of Transportation Research Forum*, November 1994 (with P. Stopher, C. Appfel and others). The paper received the 1994 TRF Intermodal Research Award.
- **On-Off Terminal Ship-to-Rail Transfer**, ASCE/PIANC Port's '92 Conference Proceedings, Seattle, July 1992, pp. 108-131.
- **On-Off Terminal Ship-to-Rail Transfer and the All-Rail Terminal**, Cargo Systems, 7th Terminal Operations Conference Papers, June 1992, Genoa, Italy, pp. 101-106. **PDF**
- **Intermodal (Rail) Terminal Capacity -- a Stock & Flow Simulation**, National Science Foundation, Transportation Research Board, Intermodal Committee, Washington D.C., January 1992.
- **The Rise and Fall of Omniport**, *Cargo Systems*, November 1991, pp. 139-143.
- **On Selectivity and Accessibility**, *Cargo Systems*, June 1991, pp. 44-45. **PDF**
- **Productivity, Capacity and Equity in the Port of San Juan**, *WWS/World Wide Shipping*, May 1991. The article was translated into Japanese by Mitsui Corp. and published in *The Journal of Japan Cargo Handling Mechanization Association*, July 1992. **PDF**
- **Planning and Operations of Inland Ports**, United Nations, Economic and Social Commission for Asia and the Pacific (ESCAP), a text book (250 pp.), January 1991.
- **Overweight Containers: Short and Long Term Perspectives**, *WWS/World Wide Shipping*, October 1990, pp. 70 - 73.
- **Dual Hoist Cranes -- Feasibility Assessment**, *WWS/World Wide Shipping*, July 1990, pp. 72 - 74.
- **On-Off Dock Terminal Ship-to-Rail Transfer**, *Maritime Policy & Management*, University of Wales publication, United Kingdom, Volume 17, July 1990. **PDF**
- **Multi-Dimensional Evaluation Methodology for Port Projects**, *WWS/World Wide Shipping*, a series of two articles, April-May 1989, pp. 59 - 62 and June 1989, pp. 29 - 32.
- **Evolutionary Trends in Breakbulk Cargo Handling**, *WWS/World Wide Shipping*, November 1988, pp. 56 - 59.
- **On-Off Dock Intermodal Transfer, The Perplexing Case of Long Beach**, *WWS/ World Wide Shipping*, September 1988, pp. 46 - 51.
- **Strategic Planning for National Port Systems**, International Maritime Seminar on Changes in the World Shipping Environment and Counter Strategies toward the year 2000, Korea Maritime Institute, Seoul, Korea, July 1988 (45 pages, with Dr. A. Hochstein).
- **Prospects for River/Ocean Short Sea Shipping in the U.S.**, a Conference Paper & *Journal of the Transportation Research Forum* publication (with Drs. A. Hochstein and K. Horn), June 1988.
- **Container on Barge Prospects on the Mississippi River**, *WWS/World Ports*, February 1987, pp. 25 - 28.

- **Strategic Port Planning -- the Global Consideration**, a Conference Paper, Ports and Terminals Conference 1987 Publication, sponsored by the Port Authority of New York/New Jersey and WWS/ World Wide Shipping, July 1987.
- **Ports' Strategic Planning - the New Role of Shipping Lines**, *WWS/World Ports*, June 1986, pp. 71 - 74.
- **Capacity Modeling for Container Terminals**, *WWS/World Ports*, January 1986.
- **Container Terminal Productivity and Capacity**, a series of two articles, *WWS/World Ports*, November 1985, pp. 73 - 75, January 1986, 93 - 95. **Part 1 PDF** , **Part 2 PDF**
- **Intermodalism, the Case for On-Dock Operations**, *WWS/World Ports*, March 1984, pp. 78 - 79.
- **Container Crane Pricing -- A Fleet Approach**, *WWS/World Ports*, November 1983, pp. 64 - 66.
- **Container Revolution II -- Twinning the Boxes**, *WWS/World Ports*, May 1983, pp. 33 - 34.
- Several papers were included in the graduate programs of the Center for Marine Studies, Massachusetts Institute of Technology, Cambridge, MA; the Institute of Marine Studies, University of Washington, Seattle, WA; and Texas A & M University, Galveston, TX. One paper (on Omniport Houston) served as a basis for Harvard Business School Case Study. Excerpts of 2 papers were included in *Intermodal Freight Transportation*, ENO Foundation, 1985 and 1995 editions. Media interviews and quotations included in numerous US and foreign newspapers among them: *The Journal of Commerce, New York Times, Los Angeles Times, The Oregonian, USA Today,* and *Herald Tribune*.

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3/2/2020

Review of San Francisco Bay Area Seaport Plan

I Main Findings

Objectives and Scope

The following is a peer review of the sections addressing the future Port of Oakland's capacity in two reports:

- Report A -- 2019-2050 Bay Area Seaport Forecast; and
- Report B -- Expected Demand for Howard Terminal as a Cargo Handling Facility.

The Review is prepared by Asaf Ashar, independent consultant, ports, shipping and intermodal transportation (see: www.asafashar.com). For brevity, the following text refers to Report A as "A" and Report B as "B".

Capacity-Calculation Methodologies

My review is concerned with the methods and results of calculating the future "sustainable capacity" of Port of Oakland's container terminals, with the specific objective of determining these methods adequacy to determine the need for Howard Terminal. The review is conducted according to Guiding Questions posted in the Review Request, dated February 6, 2020 and is confined to the materials included sections of A and B mentioned in the Request.

The capacity calculation method of Oakland without-Howard as conducted by B is more detailed than A's, for the High-Density / With Improvement case, which I consider as most relevant for the long run. B conducts a terminal-by-terminal analysis, including clear definition each terminal's boundaries, counting the number of ground slots which can be fitted within these boundaries, defining the future yard system and respective stacking height. B also defines the dwell time of boxes, an important determinant of capacity. In contrast, A lumps all terminals together, using their aggregate acres as the sole factor for the purpose of calculating capacity. While I am critical of B's methodology (see below), I believe it is more accurate than A's. Also, A appears to select his productivity benchmark based on a sample of terminals excluding the terminal which, in my opinion, is the closest representative of future Oakland terminals, LBCT.

Sufficient Long-Term Capacity without Howard Terminal

The B-calculated capacity for the without Howard case, at 8.72 million TEUs, exceeds the Strong Growth forecast of 7.04 million TEUs by about 1.68 million TEUs, which provides sufficient planning margins in my opinion. **Table 1** below compares the main assumptions and results of A and B.

Table 1: A vs. B Comparison				
Year	**Description**	**Unit**	**A**	**B**
2018	Throughput	TEU	2,537,400	2,537,400
2019	Waterfront Area	Acre	565	565
	Productivity	TEU/Acre	6,061	6,725
	Capacity	TEU	3,424,465	3,799,625
2050	Waterfront Area	Acre	791	765
	Productivity	TEU/Acre	7,112	11,400
	Capacity	TEU	5,625,592	8,721,000
	Forecast - Moderate	TEU	5,187,600	5,187,600
	Forecast - Strong	TEU	7,038,600	7,038,600
2050 productivity is for High Productivity/Improvement				

Howard's Insignificant Impact on Oakland

Howard is a small and currently unused (for ship handling) terminal with about 2,000 ft (1,700 ft in the future) ft of berthage and 50 acres (38 acres in the future) acres of waterfront, backup land. If Howard is rehabilitated and operates as a low-tech, conventional container terminal, its calculated capacity based on the "TEU/Acre", storage-based methodology (see below) would be around 250,000 TEU/year -- less than **5%** of the 2050 Moderate Case Forecast (250,000 / 5,187,600). The difference of 5% in the port capacity credited to Howard is dwarfed when compared to the much wider differences in the two other factors determining the overall port's forecast/capacity or supply/demand situation:

- The difference in productivity assumptions (TEU/Acre) compiled by A (and to a lesser extent B) for the purpose of calculating year 2050 capacity is between 5,264 and 19,429 (A, Exhibit 85), or **370%** (!).

- The difference between Slow and Strong Growth 2050 forecasts is between of 3,8642,435 and 7,038,560 TEUs, or about **180%**;

In light of wide margins assumed in the capacity-determining factors and the forecast range, the impact of Howard on Oakland's future supply/demand situation is quite small and, perhaps, insignificant.

Inefficient and Costly Terminal

Howard is a small standalone terminal, which cannot be consolidated with adjacent terminals. The small footprint of Howard, especially its short berth, limits its usage to small ships and lines, the viability of both for the long future (2050) is dubious. Howard's small dimensions also render infeasible heavy investments required for a major rehabilitation and, especially, installation of modern, automated equipment, without which its operations would be inefficient and costly. Howard terminal could temporarily serve some smaller lines, with its capacity adding to the overall capacity of Oakland. But, in the longer run, the type of low-tech capacity offered by this terminal would be of little utility.

II Capacity Calculation Methodologies

Storage-Based Capacity Methodology

The capacity calculation methodology applied by both A and B relates to the **storage function** of container terminals. It employs a simple, linear formula consisting of two components:

Port Capacity (TEU) = Waterfront Land (Acre) x Land Productivity (TEU/Acre)

The problem with the above formula is that its components are not well defined: (a) what area should be considered as "waterfront"? and (b) how the "productivity" of this waterfront area should be determined?

More specifically, in my opinion, the capacity-calculation formula above as applied by both A and B is too rough for making decisions on the future need for a relatively small terminal, contributing only 5% of Oakland's capacity. To re-emphasize, A carried-out a comprehensive and highly professional masterplan study, which would be more than sufficient to support general planning decisions regarding Oakland's long-term future. B's study is more specific, focusing on Howard terminal itself. Still, in my opinion, both studies do not have the fine "resolution" required to support a decision related to a small, standalone terminal, which only accounts for 5% of Oakland's overall capacity.

Storage Yard's Density and Static Capacity

The capacity formula above relates to the **storage function** of the terminal hence, the relevant area to be taken should be that **directly used for storing containers**, commonly defined as container (storage) yard (CY). The CY of each terminal depends on the terminal's layout, non-CY land-consuming functions included in this layout (e.g., truck/chassis parking) and, to a lesser extent, the specific storage technology selected for the CY. Accordingly, especially for the High Productivity in A and High Density in B cases, there is a need to prepare rough layouts for each of Oakland's future terminals, define and calculates its CY area, calculate the CY's number of ground slots and the maximum and effective stacking height along with the total number of TEU-slots, sometimes called static (holding) capacity.

As already noted above, A does not follow the steps above; there is no breakdown to terminals, with all acres of all terminals lumped together. B does separately assess each terminal and has an implicit referral to a storage technology and respective stacking height (B, p. 9), but it is unclear how B deduces the number Ground Slots from the Gross Area (B., p. 11) for each terminal and what specific technology he assumes. Nevertheless, based on manipulation of B's calculation of Oakland High-Density (future) Capacity, I gather that B assumes effective stacking height ranging from 2.64 (Matson) to 4.25 (OICT), which seems reasonable and, perhaps, even on the conservative side.

Dwell Time and Land Productivity

In addition to static storage capacity, land productivity (TEU/Acre) depends on the number of "turns" that each storage slot is expected to have per year, which is a direct function of the dwell time of boxes in the CY. B assumes a future, average dwell time of 5 days based, presumably on present operations. B modifies the average by adding allowances for peak situations and operational reserves. I assume, although not specified so, that this allowance accounts for bunching in vessel arrivals. The resultant, effective dwell time is 9.62 days (5 x 1.25 / 0.65). Although, again, not supported by data, the assumption of 9.62 days (for all boxes, laden and empty) seems to me reasonable and, perhaps, even conservative for future year-2050 terminals.

Wide Range of Land Productivity Benchmarks

A conducts an extensive, worldwide research to determine the future land productivity of Oakland, yielding a sample of results taken from worldwide terminals. The results demonstrate, however, a very wide range of land productivities, from a low of 6,873 to a high of 24,286 TEU/Acre (A, Exhibit 85). A, as B points out, includes in his productivity calculation a "sustainable @80%" allowance, which he claims to be based on discussions with operators. Still, the purpose a "reserve" of 20% is not specified and I cannot figure out the reason for it (see

prior discussion). In this respect, it is especially unclear to me why there is a need for this 20% reserve in the case of Oakland's OICT, since the data shown relates to the actual throughput of this terminal.

It also is unclear to me why A decides to rule out the Complete Automation case for Oakland in 2050 and only includes High Productivity. The later, presumably, assumes that only a portion of Oakland's future CYs are automated. Another problem associated with A's benchmarks is that the capacity figures in Exhibit 85 are based on those published by terminals, which may be based on terminal berthage and NOT on storage. This issue will be further discussed in the following section on Berthage-Based Capacity.

I fully agree with both A and B that is quite difficult to predict the configuration of container terminals in year 2050, which is at the center of discussion in this Review. Still, as noted before, my own opinion is that LBCT could serve as a good representative for USWC future terminals. The JOC, quoting sources at the Port of Long-Beach, states: "*Overall completion of the terminal, which is being built by the Port of Long Beach, is scheduled for 2022, when it will cover about 306 acres and have a capacity to handle 3.3 million TEU annually.*" (April 30, 2019). This capacity figures (which later on where updated to 3.5 million) and the resultant land productivity seem to be more in line with B (B, p. 10) than A. The respective land productivity, 10,784 TEU/Acre (3,300,000 / 306) is misleading, however. The 306-acre relates to **total** terminal area, which in the case of LBCT includes a large on-dock, intermodal yard taking about 20% of the land area. Since in Oakland all intermodal yards are off-dock (near-dock), the comparable-to-Oakland land productivity of LBCT is about 13,480 TEU/Acre (10,784 / 0.8).

Referring back to the specific case of Howard terminal, it seems that deriving future Oakland's land productivity from a small sample of US and foreign terminals is simply too rough for estimating Oakland's future capacity, especially when the required level of accuracy is 5%.

Future Densification of Yard Storage and Reduction in Dwell Time

The most advanced yard system, defined by A as "Complete Automation" (A, Exhibit 85) and by B as "High Density" (B, p. 9), is based on Automated Stacking Cranes (ASC). ASCs are currently employed in 5 US terminals, 2 on the West Coast (LBCT and TraPac/LA) and 3 on the East Coast (VIG, NIT and GCT) – and in about 50 terminals worldwide. Yet, the ASC technology is still evolving and it is reasonable to expect future increase in density. For example, the common stacking height of present US ASCs is 5, but the height could reach 7 by 2050 (or earlier) – equivalent to an increase of 40% in storage density. A similar increase in stacking height typified the most common storage technology in the US, based on Rubber-Tired Gantry (RTG) yard cranes, whereby the storage height has risen from 4 in the traditional design to 6 in newest ones.

A more impactful changes are expected in the effective dwell time, the second component of the TEU/Acre benchmark, namely a significant reduction. In his assessment of future trends, A already addresses some of these changes:

"Expansion Beyond Phase VI

- *Capacity increase beyond "high productivity" at all terminals could come from:*
- *More aggressive automation (e.g. ASCs and AGVs).*
- *Improved information flow and operational optimization to reduce container dwell times.*
- *Use of off-dock space for "relief" container storage capacity*.
- *Moving empty storage off-dock"* (A, p. 85)

I share with A's opinion that a future radical reduction in dwell time would be enabled by improving the control and communication among shipping lines, terminal operators, and cargo owners. As alluded above by A, future

operations could be based on "peel off" schemes, whereby boxes are transported to off-dock yards in unsorted "blocks" immediately upon discharge from ships (for imports), or just before loading to ships (for exports). Such schemes could result in shortening dwell times for most boxes from the present 5 days assumed by B to 1 – 2 days (B, p.9). A future reduction in dwell time is also discussed by A in the context of automated yard system (A, p. 60)

Based on the above-listed changes in future storage technologies and dwell time, it seems, again, that the benchmark used by B (11,400 TEU/Acre) is a better representative than A's (7,112 TEU/Acre). Moreover, I believe that B's benchmark is on the low side.

Howard vs. Productivity Enhancement

I already noted that the 38-acre, single-berth Howard has limited impact on future Oakland's capacity, in contrast to the crucial impact of boosting productivity in Oakland main terminals. It seems that A expresses similar views stating: "*Oakland's Howard Terminal capacity may be required for container handling under the forecast scenarios, depending on what degree of other* ***productivity improvement*** *is implemented at other terminals."* And: "*moderate container cargo growth through 2050 could probably be handled at Oakland without Howard Terminal or Berths 20-21, but as Exhibit 92 shows Oakland would have little or no room for future growth. Strong container cargo growth would exhaust Oakland's total capacity* ***unless terminals can boost productivity*** *to higher levels than anticipated*." (A, p. 12, my bolding)

To re-emphasize, the contribution to capacity from boosting productivity via terminal reconfiguration and upgrading of equipment and modifying operations is by far more significant than that of Howard. However, it seems that the drive for boosting productivity has largely evaded Oakland thus far, as A notes: "*It is notable that the recent expansion and upgrade of the Oakland TraPac terminal did not include significant automation, unlike the TraPac terminal in Los Angeles"*. (A, p. 60, bottom).

Acres vs. Acres

The implicit assumption in the TEU/Acre-based capacity calculation system, as applied by A's aggregation of the area in all Oakland's terminals, is that all waterfront acres in all terminals are equal in terms of their productivity (or capacity generation potential). Accordingly, adding an acre to OHT, OICT – or Howard – increases Oakland's capacity by the same amount of 7,112 TEUs in the High Productivity case. This is quite a rough assumption, which ignores the size and shape of terminals and ships they are designed to handle. My estimate is that OHT, when designed to handle large ships using new technology, can generate 2 or 3 times more TEUs per acre than Howard, which is geared to handling small ships using traditional technology.

Berthage-Based Capacity Methodology

The ultimate constraint on terminal capacity is its berthage (berth length), where the primary function, the ship-to-shore transfer of boxes, is performed. Accordingly, the main function of a marine terminal is NOT to provide storage for boxes; the storage only fulfils a secondary function, supporting the primary one, that of the berthage. Moreover, the terminal berthage is the "ultimate", physical constraint on terminals' capacity. Unlike the case with storage yard, where boxes can be sent to off-dock storage yards, ships can only be handled on-dock, at the terminal berthage. Likewise, most of the terminal investments are in their berthage and respective water access.

B acknowledges the importance of berth capacity, but claims that "*The capacity across the berth is normally a function of the number of cranes installed and deployed, which is more easily adjusted over time than is the amount of land available to the terminal, and so is not likely to be the long-term constraint*." (B, p. 9). A, in contrast, is more concerned with Oakland's availability of berthage, conducting a comprehensive analysis of

future berth-occupancy level, focusing on the impact of future, larger (and longer) vessels. A's main observation regarding the need for Howard's berthage is: "*Strong growth would require either Berths 20-21 or Howard Terminal's berth space to supplement berths at OICT, TraPac, Ben E. Nutter, and Matson*" (A, p. 107). However, A does not provide any explanation for the method used in calculating berth time such as his assumptions regarding future call size, the number of cranes expected to serve future ships and, especially, the future crane productivity. Apparently, A assumes that current operations and respective berth times of ships will largely remain unchanged, including the present shift structure, whereby ships are not handled during the third shift.

Ship-handling technology is going to play a dominant role in future berth-based capacity, similar to that in storage-based capacity as discussed above. The most significant change will be automation, enabling continuous work round-the-clock and respective shortening of berth time. Other changes, some already seen in LBCT, include tandem-box (dual-hoist) lifting and dual-trolley cranes, resulting in significant enhancement of berth productivity. Hence, I agree with the above-mentioned statement of B; berth capacity in Oakland, as in most terminals, is likely to significantly exceed that of the yard – unless the yard system will be improved to provide a matching capacity to that of the berth.

According to A (A, Exhibit 95), Oakland presently has a total of 22 berths and, excluding Howard, 19 berths, with a total length of 20,135 ft or 6,137 m. The common benchmark for berth capacity, TEU/Berth-m, ranges between 1,500 and 2,500 for today's terminals. For LBCT, according to its website, berth productivity is 2,578 TEU/berth-m (3,300,000 / 1,280). Applying the lower benchmark yields about 9.21 million TEUs of capacity (1,500 x 6,137), quite larger than B's storage-based capacity for the Improvement case of 8.72 million TEUs.

Responses to Guiding Questions

1. A and B use a similar, storage-based methodology, to calculate capacity, except that B's is more detailed, incorporating assumptions on storage density and dwell time of future Oakland's terminals. Still, both A and B methodologies are not sufficiently detailed to provide the fine resolution and level of reliability required for determining the future need for Howard Terminal's capacity.
2. A's capacity estimates are somewhat rough and therefore useful for general planning purposes which, indeed, is their intended purpose. See previous sections for a detailed discussion of potential improvements.
3. B's selected benchmarks are relevant, the most useful of which is LBCT's.
4. The main determinants of capacity in a storage-based methodology are storage density and dwell time, assuming given layouts of terminals. Modifications of terminal layouts, especially incorporating additional backup lands, can also increase storage and overall capacity.
5. I have not visited the Port of Oakland's various terminal sites for preparation of this short, desk-based Review and cannot comment on externalities.
6. I do not foresee a long-term use for Howard Terminal serving as a container terminal based on future technologies required to efficiently handle future ships.