Estimating Commercial Ship Life Cycle Cost & Required Freight Rate (3-Port Model)



SPAR Associates, I

This is another of SPAR's *ESTI-MATE* Cost Models. It focuses on life cycle costs for commercial ships and estimating the required freight rates for a user-defined trade route and operational characteristics.

For the life cycle costs, annual estimates are generated for

- Capital financing and return on equity;
- •Salvage/resale
- Insurance
- Administration
- Supplies and crew

When the user defines details of the trade route (average voyage scenario of speeds and distances), the Cost Model estimates costs for
•Fuel
•Port & drayage.

The Cost Model develops the Required Freight Rate (RFR) on the basis of unit (trailer, TEU, passenger, etc.) voyage cost, tonnage, and/or equivalent statute land miles (if applicable).

Typical Breakdown of Annual Costs for a High-Speed Commercial Trailer Ship



12/21/2012

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Basic Hierarchy of Life Cycle Costs



Defining Transit Route Distance per Leg of the Route



Defining Transit Route Speed per Leg of the Route



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Defining Transit Route Time in Hours per Leg of the Route



Defining Transit Route Fuel Consumption per Leg of the Route



Defining Basic Components of Capital Cost

	Special Note:	User may er	nter/modify	gray cells with	bold red cha	racters:		
			Example:	9999				
	This worksheet, "C	entral Data" pro	ovides general rou	ute & operations s	pecifications.			
	The worksheet "Ro	oute Specs" defir	nes operations pa	rameters per leg a	nd port of call for	each train ca	r.	
	User input to "Rou	te Specs" define	s for each train ca	ar cargo loading/ur	loading & total p	ort time at ea	ch port only.	
Enter Ship I	Name/Description:		13,000 TEU LNG-	Fueled Containers	hip (U. of Mich)			
			LOA	366.00	m			
			Draft	15.20	m			
			GRT		mt			
			DWT	129,500	mt			
	Number of	like ships built	for train (max 8):	1				
		Tota	al Price per Ship:	\$ 246,668,576				
		Total Price	+ Risk per Ship:	\$ 246,668,576				
			% Risk Allowed	0%				

	Genera	al Trad	e Rout	e Speci	fication	าร					
			Port Names								
	Port A	Port NY Contain	ner Terminal								
	Port B	Panama Canal									
	Port C	Shanghai, China	1								
		Nominal		SouthBound	NorthBound	SouthBound	NorthBound	Drayage	Drayage	Pilot	
Routes	NM	Kts	Fuel mt/Hr	Hours	Hours	Fuel mt fuel	Fuel mt fuel	RT Miles	5/Mile/Traile	\$/8-hr Day	Tug \$/Leg
Port NY Container Terminal			2.409	108.00		260.21					4320
Leg 1 - Local River Transit						-	-			\$ 2,000.00	
Leg 2 - River/Sea Buoy Transit	10.0	5	17.880	2.00	2.00	35.76	35.76				
Leg 3 - Ocean Transit	1,952.0	24	17.880	81.33	81.33	1,454.24	1,454.24				
Connect/Disconnect						-	-				
Leg 4 - River/Sea Buoy Transit	10.0	5	17.880	2.00	2.00	35.76	35.76				
Leg 5 - Local River Transit	46.0	5	17.880	9.20	9.20	164.50	164.50			\$ 2,000.00	
Panama Canal						-	-				
Leg 6 - Local River Transit	10.0	5	17.880	2.00	2.00	35.76	35.76			\$ 2,000.00	
Leg 7 or Bypass Ocean Transit	11,823.0	24	17.880	492.63	492.63	8,808.14	8,808.14				
Leg 8 - Ocean Transit						-	-				
Leg 9 - River/Sea Buoy Transit	10.0	5	17.880	2.00	2.00	35.76	35.76				
Leg 10 - Local River Transit						-	-				
Shanghai, China			2.409		108.00		260.21				
NOTE	: Above fuel rates n	nay be entered a:	s function of kts .	699.16	699.16	Total mt:	21,660.24				
Port fi	uel consumption ra	tes must be ente	red only as mt/Hr	Hrs RT	1,398.32	1	10,830.12	mt one-way			
NOTE: Make sure at-sea fue	l rate <u>includes any</u>	fuel for generato	ors running at sea	Days RT	58.26		11,649.00	mt capacity	(26,000 m3)		
	LNG Est. 2012	Fuel Cost	\$ 725.00	\$/mt	CargoValue	\$75,000	/Unit				
		Wt Trailer	20.43	MT/Trailer	HMT	0.125%	only applies	to import, not	export		
		Wt Water	1	ST		100.00%	% Non-Empty				
		Wt TEU	9.96	MT/TEU							

	Genera	al Carg	o Spec	ification	<u>15</u>									
		Load	at Port			Un-Load a	it Port							
									Statute	Nautical				
		Full	Empty			Full	Empty	Total	Miles from	Miles from		Containers	Trailers Left	Containers Left
South Bound	Trailers	Containers	Containers	Total Containers	Trailers	Containers	Containers	Containers	Prior Port	Prior Port	Trailers Unload	Unload	Onboard	Onboard
Port NY Container Terminal		13000		13000		13000		13000			-	13,000		
Panama Canal											-	-	-	13,000
Shanghai, China		13000		13000		13000		13000			-	13,000	-	-
Panama Canal											-	-	-	13,000
Port NY Container Terminal														
TOTALS	0	26000	0	26000	0	26000	0	26000					left onboard= left o	ver from last port + tot
NET (LOAD-UNLOAD)	0	0	0	0		1	x HMT	= (Trailers + F	ull Containers)/(Total Trailer:	s + Containers)			
								Assumes all t	railers are ful	l				
	-	- Total Trailer Miles/RT			0	Trailers/RT		-	Trailers/annu	ım				
	-	- Total Container Miles/RT			26000	Containers/R	т	158,419	Containers/a	nnum				
	If containers are stored on board on cassettes,													
	enter numeric n	enter numeric number of containers per cassette			lf cassettes are no	t used, enter z	ero							

					Passed Thru		
	Prior Leg Stat		Container	Passed Thru	Containers	Trailer	Container
South Bound	Miles	Trailer Miles	Miles	Trailers Miles	Miles	Miles/RT	Miles/RT
Port NY Container Terminal	-	-	-	-	-	-	-
Panama Canal	-	-	-	-	-	-	-
Shanghai, China	-	-	-	-	-	-	-
Panama Canal	-	-	-	-	-	-	-
Port NY Container Terminal				-	-		
TOTALS	al loaded last p	ort - total unlo	aded this port			-	-
NET (LOAD-UNLOAD)							

Equity & Financing Terms

	Rate		per annum	vveighted Av	erage (Cost of Ca	er of Years	15.00%	Optional	
Owner's	Equity Portion:	20.0%				Estimate	ed Tax Rate	35.00%	Optional	
Anticipate	ed Life of Ship:	25	Years							
Salvage/Sale Va	lue at Life End:	0.33%	or							
Salvage/Sale Va	lue at Life End:	\$ 5,000,000								
R	eturn on Equity	28.00%	25	Years						
Financin	g Interest Rate	8.00%	25	Years	Financ	cing Option	ns: Enter			
Fir	nancing Option:	0	Equal Annual P	mt Mort.	"0" = E	Equal Annu	ual Payment I	Mortgage		
					"1"=4	Annual Prir	ncpial Payme	nt + Interest	on	
					кета	aining Princ	lipai.			



Comparing Financing Terms

Average Operating Costs

	Current Year	2012								
	Crew Size	20	This is crew siz	te, not necessari	ily acccomn	nodations si	ze that may	include gue	sts	
	Crew Sets	2								
Average Cre	w Cost/Annum	\$ 112,500								
	Insurance	\$ -	0.30%	Build Cost						
Maintena	ance & Repairs	S -	0.75%	Build Cost						
Man	agement Costs	\$ -	0.45%	Build Cost						
Lubes	s, Oils & Stores	S -	0.80%	Build Cost						
	Other	S -	0.10%	Build Cost						
A	nnual Laydays:	10	Days							
Maintenance, Repa	airs & Weather)									
						Default c	ost percentag	ges provided b	y Rosello & Pe	rakis,
Insurance = 1.5*D	WT+0.003*Ship	Value				The Sue	7 May SS" Ma	rine Technol	20 Containers	11p.
Great Lakes Marit	ime Transportat	tion Teacher Inst	itute, 2006			1110 000			099, 000000120	
\$ 740,006	Annual Insuran	ice	0.30%	5						
\$ 246,668,576	Ship Value			-				0.75%		

Estimating Propulsion Power Curve





							NOI	RTH BOUND					
PORT A Fees			\$ 41,734	Rate	Rate			Rate		Rated	Minimum		Total
Port Ship Services & Fees			Variables	(Manual)	Default	UoM		Used		Cost	(Manual)		\$ Cost
Pilotage based on Draft		FT Draft	21.98	-1	\$ 12.50	FT Draft	s	-	\$	-		\$	-
Pilotage based on GRT		GRT	33,000.00	-1	\$ 0.0280	GRT	s	-	\$	-		s	-
Tugs		FT LOA	591.54	-1	\$ 2,025.00	Annual Fee ¹	s	-	\$	-		\$	-
Handling Lines In & Out		Trailers	144.00		\$ -		\$	-	\$	-		\$	-
Mooring Fee		STONS/Trailer	22.05	-1	\$ -		\$	-	\$	-		\$	-
Dockage		Containers	155.00		\$ 9.77	FT LOA/Day	\$	9.77	\$	5,777.93		\$	5,777.93
Tolls	R	ound Trips/Yr	41.16		\$ -		s	-	s	-		s	-
Sanitary Waste Removal		Days/Port Call	1.00		\$ 1,125.00	Annual Fee ¹	s	1,125.00	s	27.33		s	27.33
Oil Waste Removal		Hrs/Port Call	8.00		\$ 1,125.00	Annual Fee ¹	s	1,125.00	s	27.33		s	27.33
Stevedoing Services					\$ 1,700.00	Annual Fee ¹	s	1,700.00	s	41.30		s	41.30
Fresh Water		STON Water	1.00		\$ 4.70	STON Water	s	4.70	s	4.70	\$ 69.20	s	69.20
Fresh Water Hookup	Equiv	CUFT Water	31.20		\$ 50.66	Port Call	s	50.66	\$	1,580.59		S	1,580.59
	Equiv	GALs Water	239.81										
Cruise Ships		NOTE		Cruise Ship									
Harbor Master Cruise Ships		NOTE:		-1	\$ 26.52	GRT	\$	-	s	-		\$	-
Agency Fees		1. Manua	llv enter	-1	\$ -		s	-	s	-		s	-
		port rate	5 (&										
Cargo Ships - Trailers		, minimum	ns) in gray	Trailer Cargo									
Harbor Master Cargo Ships		cells only		-1	\$ 26.52	GRT	s	-	s	-		S	-
Cargo Warfage - Trailers					\$ 2.48	STON/Trailer	s	2.48	\$	357.12		\$	357.12
Loading/Unloading Costs - Trailers		2. To turn	off a port		\$ 78.65	Trailers	\$	78.65	\$	11,325.60		\$	11,325.60
Outside Storage Trailers (2 days)		cost item	, enter a -1		\$ 3.60	Trailers	\$	3.60	\$	518.40		\$	518.40
Security Surcharge		coll	nuarrate		\$ 2.90	FT LOA/Day	\$	2.90	\$	1,715.47		\$	1,715.47
Customs Inspections including Warehousing		Cen.		-1	\$ -		\$	-	\$	-		\$	-
Cargo Ships - Containers				Container Cargo									
Harbor Master Cargo Ships				-1	\$ 26.52	GRT	\$	-	S	-		\$	-
Cargo Warfage - Containers					\$ 23.20	Container	\$	23.20	\$	3,596.00		\$	3,596.00
Loading/Unloading Costs - Containers				-1	\$ 100.00	Container	\$	-	s	-		\$	-
Loading/Unloading Costs - Container Casettes					\$ 150.00	2 Container Casset	\$	150.00	s	11,625.00		\$	11,625.00
Outside Storage Containers (2 Days)					\$ 2.50	Container	\$	2.50	\$	387.50		\$	387.50
Security Surcharge					\$ 5.75	Container	\$	5.75	\$	891.25		\$	891.25
Customs Inspections including Warehousing				-1	\$ 187.50	Container	\$	-	\$	-		\$	-
				Miscellaneous									
Other Port Expenses					10%	Total Port \$		10%	S	3,794.00		\$	3,794.00
										TOTAL CO	ST OF PORT CALL	\$	41,734

Panama Canal F	Fees					
http://www.ag	enco.com/html	/TransitCostCal	cula	ator.aspx		
		ESCAP Study Dat	a			
		Shanghai				
	TEUs	2000 US\$	20	00 US\$/TEU		
3000	1000	\$ 84,033	\$	84.03	40,000	GRT
1100	600	\$ 44,054	\$	73.42	98,000	GRT
		Average	\$	78.73	69,000	GRT
		Year	201	2/Year Esc.		
		2000		1.4021		
		Estimated 2012\$	\$	110.38	per TEU	
			s	2,869,948		

There are three methods for determining <u>fuel consumption</u> in metric tons for each leg of the trade route.

- The first method allows entries of estimate kW expended each leg (including electric generation in port) for each (if multiple) propulsion system for the ship. The cost model computes the tons of fuel consumed by multiplying the kW by the leg hours and the specific fuel consumption coefficient (SFC).
- 2. The second method estimates the propulsion kW based on the speed. The "Power Curve" worksheet builds an approximate second order speed-power curve (Figure 3.1-4) using the ship design's maximum kW propulsion power versus maximum hull speed. This method most likely cannot develop an accurate kW for the transit leg speed if there are multiple propulsion systems in use. A manual entry for the specific fuel consumption coefficient is required for the model to compute tones consumed over the hours of operation over the transit leg period of time.
- The third method allows the tons of fuel consumption to be computed off-line from the cost model and entered in the gray cell labeled "Manually Entered Propulsion Fuel MTONs."

	Cassettes	Roun	d Trip Trans	sport Scenario		Cassettes	Round Trip Tran	sport Scenario		Cassettes		Round Trip Tran	sport Scenario
	0					0				0			
		Sou	uth Bound	North Bound			South Bound	North Bound				South Bound	North Bound
	Port A					Leg 4 - From Sea Buoy				Leg 8 - Ocean Transit	t		0
	Unload Cargo					Speed (Kts)	5	5		Distance (NIX)			
	Payloa	d (t)				Distance (NM)	10	10		Distance (NM)		0	0
7	Trai	ilers	0			Total Hrs	2.00	2.00		I otal Hrs		-	
	Contair	ners	13000		_	Leg Fuel t/Hr	17,880	17.880	_	Leg Fuel t/Hr		-	-
	Dravage S	S	-			Lea Fuel Cost \$	\$ 25,926	\$ 25,926		Leg Fuel Cost \$		<u> </u>	<u> </u>
	Load Cargo					Leg Tug Assist \$	\$ -	\$ -		Leg Tug Assist \$		S -	5 -
	Pavloa	d (t) b				Leg Pilot Cost \$	¢	¢ i					
	Trai	ilers	0			Log Hist cost a	. -	•		Leg 9 - From Sea Buc	<u>v</u>		
	Contair	hers	13000			Leg 5 Diver				Speed (Kts)		5	5
	Dravage \$	s	15000		Ť	Speed (Kte)	5	5		Distance (NM)		10	10
	Total Port Hrs		108.00			Distance (NM)	3	3		Total Hrs		2.00	2.00
	Port Dave		4.50		_	Total Hrs	40	40	_	Leg Fuel t/Hr		17.880	17.880
	Port Tug Appint S		4 220 00			Total His	9.20	9.20		Leg Fuel Cost \$		\$ 25,926	\$ 25,926
	Fort Tug Assist 5	•	4,320.00			Leg Fuel Unit	17.000	17.000		Leg Tug Assist \$		S -	S -
	Port Cost \$	Ş	3,736,003			Leg Fuel Cost \$	\$ 119,260	\$ 119,260		Leg Pilot Cost \$		S -	S -
	Habor Maint. Tax	\$	1,218,750			Leg Tug Assist \$	<u> </u>	5 -					
	Fuel Port t/Hr		2.409			Leg Pilot Cost \$	\$ 2,000	\$ 2,000		Leg 10 - River			
	Fuel Port Cost \$	S	188,651		•				•	Speed (Kts)		0	0
						PORTB				Distance (NM)		0	0
	Leg 1 - River				_	Unload Cargo			_	Total Hrs		-	-
	Speed (Kts)		0	0		Payload (t)				Leg Fuel t/Hr		-	-
_	Distance (NM)		0	0		Trailers	0	0		Leg Fuel Cost \$		S -	S -
	Total Leg Hrs		-	-		Containers	0	0		Leg Tug Assist \$		S -	S -
	Leg Fuel t/Hr		-	-		Dravage \$				Leg Pilot Cost \$		S -	S -
	Leg Fuel Cost \$	\$	-	\$ -		Load Cargo						-	
	Leg Tug Assist \$	\$	-	\$ -		Pavload (t)			Ť	POPTO			
	Leg Pilot Cost \$	\$	2,000	\$ 2,000		Trailers	0	0		FURIC			
						Containers	0	0		Unload Cargo			
	Leg 2 - To Sea Buoy					Dravage \$				P	ayload (t)		
	Speed (Kts)		5	5		Total Port Hrs					Trailers		0
	Distance (NM)		10	10		Port Days				C	ontainers		13000
	Total Leg Hrs		2.00	2.00	•	Port Tug Assist \$	¢	¢		Drayage \$			s -
	Lea Fuel t/Hr		17.880	17.880		Part Cast C	¢ 1.000.700	¢ 1 000 700		Load Cargo			
	Leg Fuel Cost \$	s	25,926	\$ 25,926	-	Port Cost a	Ş 1,090,788	\$ 1,090,788		Pa	ayload (t)		
	Lea Tua Assist \$	S	-	\$ -		Habor Maint, Tax	ş -	ş -			Trailers		0
	Leg Pilot Cost \$	Ś	-	\$ -		Port Fuel t/Hr	-	-		C	ontainers		13000
				-		Port Fuel Cost \$	s -	5 -		Drayage \$			
-	Leg 3 - Ocean Transit									Total Port Hrs			108.00
	Speed (Kts)		24	24		Leg 6 - River				Port Days			4.50
-	Distance (NM)		1952	1952		Speed (Kts)	5	5		Port Tug Assist \$			\$ -
7	Total Hrs		81.33	81.33		Distance (NM)	10	10		Port Cost \$			\$ 2,869,948
	Lea Fuel t/Hr		17.880	17,880	-	Total Leg Hrs	2.00	2.00		Habor Maint, Tax			s -
	Leg Fuel Cost S	S	1 054 324	\$ 1,054,324		Leg Fuel t/Hr	17.880	17.880		Port Fuel t/Hr			2,409
	Leg Tug Assist \$	ŝ	-	\$ -		Leg Fuel Cost \$	\$ 25,926	\$ 25,926		Port Fuel Cost \$			\$ 188.651
	,	-		-		Leg Tug Assist \$	S -	S -		and the second	-	_	
	Ocean Disconnect/Connect	ct				Leg Pilot Cost \$	\$ 2,000	\$ 2,000					
	Hours	-	-	-									
	Fuel t/Hr		-	-		Leg 7 - To Sea Buoy							
	Fuel Cost \$	S	-	S -		Speed (Kts)	24	24	5	Immar	VO	t 2_D	ort
-	Tug Assist \$	s	-	\$ -		Distance (NM)	11823	11823	50	innar	yu	J-J-F	JIL
		-		-		Total Hrs	492.63	492.63			-		
						Leg Fuel t/Hr	17.880	17.880		1/2	10	20	
						Leg Fuel Cost \$	\$ 6,385,898	\$ 6,385,898		VO	Vd	<u>z</u> e	
						Leg Tug Assist \$	5 -	5 -	and in case of the local division in which the local division in t	the summer of the local division of the loca			
	12/21/2012					Leg Pilot Cost \$	ş -	5 -					20
						JI AN ASSULIC	111						

Summary of Cargo Transfers

		Total	Total	Net Onboard
North Bound		Trailers-L	Trailers Unloaded	Trailers
F	Port A	-	-	-
F	Port B	-	-	-
F	Port C	-	-	-
South Bound				
F	Port C	-	-	-
F	Port B	-	-	-
F	Port A	-	-	-
		-	-	-
				Remaining Onboa
		Total	Total	Net Onboard
North Bound		Containe	Containers Unload	Containers
F	Port A	13,000	13,000	-
F	Port B	-	-	-
F	Port C	-	-	-
South Bound				
F	Port C	13,000	13,000	-
F	Port B	-	-	-
F	Port A	-	-	-
		26,000	26,000	-
				Remaining Onboa

The Cost Model Generates a Variety of Tabular & Graphical Reports

Report Indicating Required Freight Rates per Type of Cargo Transported

		SHIP SPECS							
LOA			366.00	m					
Draft			15.20	m					
GRT	•		-	mt					
DWT	s	129,500	129,500.00	mt					
	-								
Total Price per Ship:	S	246,668,576	246,668,576.00						
Total Price + Risk per Ship:	S	246,668,576	246,668,576.00						
% Risk Allowed	<u> </u>		0.00%	5					
Net Owner's Asset Value	S	246.668.576	\$ 246,668,576						
Owner's Equity Portion:	S	49,333,715	\$ 49,333,715						
Financed Portion:	S	197,334,861	\$ 197,334,861						
Finance Interest Rate				8.00%	Equal Annual Pm	nt Mort.			
Financing Years				25					
Total Cost of Money per Ship:	S	264,817,360	\$ 264,817,360						
Asset Value + Cost of Money:	S	511,485,936	\$ 511,485,936		If MARAD T	itle XI, Own	er's Equity mu	st be a	
	-				minimum o	f100%-87.5	%=12.5%: oth	erwise	
					hanks may	oquire 20%	,		
Anticipated Life of Ship:			25	Years	Daliksinayi	equire 2070			
Salvage/Sale Value at Life End:			\$ 5,000,000						
	-		• -,,		 Financing w 	/Title XI loai	n guarantees i	will lower	
Average annual capital cost over life of the					interest rate	e (try 5.5%).	Higher Owne	r's Equity,	
ship:	S	20,259,437	\$ 20,259,437		lower the in	terest rate	charged.		
							Ŭ		
Crew Size			20						
Crew Sets			2						
Av. Crew Cost/Annum			\$ 112,500		\$ 118,757	Average from	MARAD 9-11 St	udy	
Total Crew Cost per Annum:	S	4,500,000	\$ 4,500,000		Use of foreign c	rew, wages w	rill be lower.		
	_								
Ship's Summary:									
Laydays & Repair Days per Annum	1	10	Days						
Total Hours per Round Trip		1,398	Hours						
Total Days per Round Trip		58.26	Days						
Total Round Trips per Annum:		6.09	Trips	-					
Trailers/Round Trip		-	Trailers						
Trailers per Annum:	-	-	Trailers	0.0%	Total Units				
Payload MTONs Trailers per Annum:		-	MTONs	0.0%	Total Units				
Containers/Round Trip		26,000	Containers						
Containers per Annum	1	158,419	Containers	100.0%	Total Units				
Payload MTONs Containers per Annum:	-	1,578,097	MTONs	100.0%	Total Units				
Units (Trailers + Containers) per Annum:		158,419	Units						
Payload Units per Annum:	-	1,578,097	MTONs	-					
Trailer Miles per Round Trip:		-	Trailer Miles	-					
Trailer Miles per Annum:	-	-	Trailer Miles	-					
Container Miles per Round Trip:		-	Container Miles	-					
Container Miles per Annum:	-	-	Container Miles	-					
Payload Units Miles per Annum:		-	Unit Miles						
Metric Tonnes Fuel per Round Trip:		21,660.24	(stioasR /	<u>∖</u> SSOCI ∂2 5€	Ber MITON LNG	i			
Metric Tonnes Fuel ner Annum:	1	131 977	MTONs	1					

12/21/2012

				Tra	ilers&Conta	iner	s) Freigh		
Annual Cost Breakdown:		% Annual Exp.	% Build Cost		per Unit per Unit M				
Capital Financing Cost	\$ 20,259,437	10.9%	8.2%	\$	127.89	s	12.84		
Annual Return on Equity	\$ 13,813,440	7.4%	5.6%	\$	87.20	S	8.75		
Fuel Cost	\$ 95,683,109	51.4%	38.8%	\$	603.99	S	60.63		
Crew Cost	\$ 4,500,000	2.4%	1.8%	\$	28.41	\$	2.85		
Door-to-Dock Drayage Tranport Costs	\$ -	0.0%	0.0%	\$	-	S	-		
Port Costs	\$ 36,897,074	19.8%	15.0%	s	232.91	s	23.38		
Panama Canal Fees	\$ 2,181,576	1.2%	0.9%	\$	13.77	S	1.38		
Pilot Costs	\$ 71,023	0.0%	0.0%	\$	0.45	S	0.05		
Insurance	\$ 578,053	0.3%	0.2%	\$	3.65	\$	0.37		
Maintenance & Repairs	\$ 1,695,890	0.9%	0.7%	\$	10.71	S	1.07		
Management Costs	\$ 1,017,534	0.5%	0.4%	\$	6.42	S	0.64		
Lubes, Oils & Stores	\$ 1,953,781	1.0%	0.8%	\$	12.33	s	1.24		
Harbor Maintenance Tax	\$ 7,425,893	4.0%	3.0%	\$	46.88	S	4.71		
Other	\$ 246,669	0.1%	0.1%	\$	1.56	S	0.16		
Total Annualized Costs (Non-DCF)	\$ 186,323,478	100.0%	75.5%	\$	1,176.14	\$	118.07		

Annual Maintenance & Operations Cost: \$186,323,478.



Annual Maintenance & Operations Cost: \$186,323,478.



Average Unit (Trailers + Containers) Transport Cost: \$1176.



Average Transport Cost/MTON Payload: \$118.07



User Caution

Users of a cost model are cautioned that it is intended to provide only an estimate of cost information. There are limits to the capabilities of these calculations beyond which results may not be accurate.

The data provided in the cost model is not a substitute for judgment, analysis and sound estimating practice. The cost model is an aid in developing an informed opinion of cost. If you are using the cost model as your sole cost authority for contract bids, you are reading more into the cost model than what has been intended.

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