

Solution

	Periodic			
	qmax	15.3542	ton	Max payload
	f	150	ton/yr	Annual demand
	n	9.76933514	per yr	
	TC_FTL	18141.63	\$	
	a	1		Inventory fraction
	v	90000	\$/ton	Value per ton
	h	0.3	1/yr	Inventory carrying rate
	IC_FTL	414562.5	\$	
(1)	TLC_FTL	432704.127	\$	TLC Full Truckload
	t_max	0.08	yr/TL	1-month interval constraint
	n_min	12.00	TL/yr	
	q1mo	12.50	ton	
	TC_1mo	22283.96	\$	
	IC_1mo	337500.00	\$	
(2)	TLC_1mo	359783.965	\$	TLC 1-mo interval constraint
	q*TL	3.2120	ton	Optimal TL size
	TC_TL	86722.7662	\$	
	IC_TL	86722.7662	\$	
(3)	TLC*_TL	173445.532	\$	TLC Optimal TL
	rLTL	1.33881879	\$/ton-mi	
	TC_LTL	138166.1	\$	
	IC_LTL	22490.23	\$	
(4)	TLC*_LTL	160656.33	\$	TLC Optimal LTL
	q*LTL	0.83297144	ton	Optimal LTL size

2	PPI_TL	138.6	Jul 18 (P	Prod Price Index for TL
3	PPI_LTL	182.9	Jul 18 (P	Prod Price Index for LTL
4	Kwt	25	ton	Physical weight capacity
5	Kcu	2750	ft^3	Effective cube capacity
6	unit cube	6	ft^3	
7	unit weight	67	lb	
8	unit value	=E7*E32/2000	\$	
9	s	=E7/E6	lb/ft^3	Density
10	d	688	mi	Distance
11	r	=2*(E2/102.7)	\$/mi	TL rev per loaded tr-mi
23	MC_TL	=(E11/2)*45	\$	Min charge TL
24	MC_LTL	=(E3/104.2)*(45+E10^(28/19)/1625)	\$	Min charge LTL
25	Periodic			
26	qmax	=MIN(E4,E9*E5/2000)	ton	Max payload
27	f	150	ton/yr	Annual demand
28	n	=E27/E26	per yr	
30	TC_FTL	=E28*E11*E10	\$	
31	a	1		Inventory fraction
32	v	90000	\$/ton	Value per ton
33	h	0.3	1/yr	Inventory carrying rate
34	IC_FTL	=E31*E32*E33*E26	\$	
35	(1) TLC_FTL	=E30 + E34	\$	TLC Full Truckload
36	t_max	=1/12	yr/TL	1-month interval constraint
37	n_min	=1/E36	TL/yr	
38	TC_1mo	=MAX(E28,E37)*E11*E10	\$	
39	IC_1mo	=E31*E32*E33*E27/MAX(E28,E37)	\$	
40	(2) TLC_1mo	=E38+E39	\$	TLC 1-mo interval constraint
41	q*TL	=MIN(SQRT(((E27*MAX(E11*E10,E23))/(E31*E32*E33)),E26)	ton	Optimal TL size
42	TC_TL	=(E27/E41)*MAX(E11*E10,E13)	\$	
43	IC_TL	=E31*E33*E32*E41	\$	
44	(3) TLC*TL	=E42 + E43	\$	TLC Optimal TL
45	rLTL	=E3*(((E9^2)/8+14)/((E50*(1/7)*E10^(15/29)-7/2)*(E9^2+2*E9+14)))	\$/ton-mi	
46	TC_LTL	=E27*MAX(E10*E45,E24/E50)	\$	
47	IC_LTL	=E31*E32*E33*E50	\$	
48	(4) TLC*LTL	=E46+E47	\$	TLC Optimal LTL
49	qLTLmax	=MIN(5,650*E9/2000)	ton	
50	q*LTL	0.832971444189039	ton	Optimal LTL size