Solution

1. The guessed LB and UB for a parameter are usually orders of magnitude apart, and the geometric mean gives a more reasonable estimate because it provides a logarithmic average as compared to a arithmetic average.
2. Since the number of NF is fixed in the p-median problem, adding the fixed cost to the objective function only adds a constant amount and does not affect the solution.
3. The unit of time over which demand is specified should have no impact on the results, which is only true if the fractional component is used (e.g., it should make no difference if you specify demand annually or weekly, but rounding weekly demand may result in zero demand for most weeks).
4.

	Class	250	
	MC	95.71	$
	wt	70	lb
	cu	20	ft^3
		25	cartons
	qLB	1750	lb
	q	0.875	ton
	qB	1	ton
	OD(i)	126.12	$/cwt
	OD(i+1)	102.1	$/cwt
	OD_i*20*q	2207.1	$
	OD_i_1*20*qB	2042	$
	TC_LTL (Czar, no disc)	2042	$
	PPI_LTL	182.9	
	s	3.5	lb/ft^3
	d	691	mi
	qLTL	0.875	ton
	rLTL	3.367819	$/ton-mi
	TC_LTL	2036.268	$

5.

	Current	Optimal		
PPI_TL	138.6	138.6		Prod Price Index for TL
Kwt	25	25	ton	Physical weight capacity
Kcu	2750	2750	ft^3	Effective cube capacity
s	9	9	lb/ft^3	Density
d	650	650	mi	Distance
r	2.699124	2.699124	$/mi	TL rev per loaded tr-mi
qmax	12.375	12.375	ton	Max payload
MC_TL	60.73028	60.73028	$	Min charge TL
f	300	300	ton/yr	Annual demand
v	15000	15000	$/ton	Value per ton
h	0.3	0.3	1/yr	Inventory carrying rate
a	1	1		Inventory fraction
Freezer	1250	2403.311	ft^3	Shipment cube
q	5.625	10.8149	ton	Shipment size
TC	93,570	48,667	$	Transport Cost
IC	25,313	48,667	$	Inventory Cost
TLC	118,882	97,334	$	Total Logistics Cost
Can save	$ 21,548	per year		
by addiing	1153.311	ft^3 of freezer space		

6.

	A	B	A&B	A+B							
Kwt	25	25	25	ton			Pct	f	nFTL	w	cum w
Kcu	2750	2750	2750	cu ft		Albuquerque	0.35	140	16.54545	16.54545	16.54545
wt	25	80		lb							
cu	5	4		ft3		Amarillo	0.2	80	9.454545	12	28.54545
s	5	20	6.153846	lb/ft3		Amarillo	B	100	4	4	32.54545
qmax	6.875	25	8.461538	ton		Memphis	0.3	120	14.18182	14.18182	46.72727
f	300	100	400	ton		Nashville	A	300	35.45455	35.45455	82.18182
ud	24000	2500				Greensboro	0.15	60	7.090909	12	94.18182
							1	W=		94.18182	
								W/2=		47.09091	
								nMIN=		12	