BIRAL   Beer Integrated Re-Engineering & Advanced Logistics

It is proposed a Logistics Network for Beer Production based on the attached figure & tables.

The Logistics Flows are going by using different kind of Trucks; the maximum driving time 9 h/day in average, or 11 h/day if next day is compensated down to 7h over this duration it required to have a second driver, increasing cost around 12 Euro/h for the whole voyage. Please consider the cost of the whole travel including the return to the starting point, otherwise consider accommodation cost (extra ~100 Euro/day) Trucks could only travel Mon-Friday

Production Sites/Factories (F) could deliver bottles through Warehouses (W) or directly to Customers (U) by using Pack8 or Pack12; , F and U operates Mon-Sunday, W operates Mon-Sunday, but if the operation is further reduced it could corresponds to a saving in fixed costs around 7% per each day out.

Please address the following Issues:
A) Define the Logistics flows from each Factory to each Warehouse and/or Customer in current situation
B) Define the truck fleet in terms of type and missions to satisfy these logistics flows by accepting a A2C (order today delivery within two days) service level
C) Quantify current costs, revenues and profits, including logistics handling, logistics storage (assume 10% of good value for storage level as warehouse fee), transportations, fixed and variable production costs, etc.
D) Identify and Quantify current sale losses, if present in the scenario
E) Evaluate the quality of the service in terms of Customer Satisfaction and Delivery Time for each U
H) Create Ranking List of Potential Actions to Re-Engineer and Improve the Logistics Network
F) Propose a change in Production Planning, Warehouse (Open/Close), Flows to improve profits and reduce costs
G) Propose a solution that allows to deliver the goods A2B (goods to the U within 24h from the order) and estimate corresponding costs

Please adopt estimations and hypotheses to cover missing data & info and mention them and sources.

Production		B1	B2	B3	B4	
	F1	28,624	35,337	-	-	bottles/day
	F2			7,096	-	bottles/day
	F3	-	-	-	26,443	bottles/day

Unitary Costs		B1	B2	B3	B4	
	F1	2.00	2.20	-	-	Euro/bottle
	F2			2.40	-	Euro/bottle
	F3	-	-	-	0.75	Euro/bottle

Max Storage		B1	B2	B3	B4		Fixed Cost [Euro]
127,000	F1	57,000	70,000	-	-	bottles	1,500,000
14,000	F2	-	-	14,000	-	bottles	1,100,000
264,000	F3	-	-	-	264,000	bottles	1,000,000
232,500	W1	34,200	31,500	8,400	158,400	bottles	250,000.00
342,000	W2	68,400	63,000	12,600	198,000	bottles	300,000.00
116,250	W3	17,100	15,750	4,200	79,200	bottles	200,000.00
87,187	W4	12,825	11,812	3,150	59,400	bottles	180,000.00
52,312	W5	7,695	7,087	1,890	35,640	bottles	120,000.00

Possibility to reorganize the storage of bottles among different types respecting Total

Packaging	bottles/pack	packs/Level	Levels/Pallet	Pallets/Truck A	Pallets/Truck B	Pallets/Truck C
Pck8	8	16	5	32	24	5
Pck12	12	12	5	32	24	5

Handling Time				
	1 min/pallet	or	30 '/level or pack	from truck
	2 min/pallet	or	60 '/level or pack	in warehouse

Transportaton

	Fee		Max Speed		Access to Load/Unload Area
Truck A	1.4 Euro/km		80 km/h		5 min
Truck B	1.3 Euro/km		80 km/h		5 min
Truck C	0.7 Euro/km		130 km/h		5 min

Average Commercial speed between 30 and 60 km/h

Demand

	B1	B2	B3	B4		STD on Total
U1	2,724	3,138	1,068	2,298	[bottles/day]	234
U2	2,724	3,126	1,044	2,262	[bottles/day]	234
U3	2,994	3,432	1,104	2,436	[bottles/day]	249
U4	4,092	4,692	1,422	3,282	[bottles/day]	324
U5	3,534	4,026	1,188	2,754	[bottles/day]	282
U6	1,596	1,746	492	1,080	[bottles/day]	144
U7	1,032	1,068	258	570	[bottles/day]	102
U8	930	1,170	114	1,506	[bottles/day]	120
U9	1,650	2,238	258	3,156	[bottles/day]	195
U10	720	732	48	2,076	[bottles/day]	117
U11	1,440	1,890	168	2,808	[bottles/day]	174
U12	552	486	6	1,632	[bottles/day]	96
U13	396	270	42	1,152	[bottles/day]	81
U14	516	432	30	1,776	[bottles/day]	99
U15	504	414	66	1,836	[bottles/day]	99
U16	618	588	162	2,430	[bottles/day]	120

Pricing

	B1	B2	B3	B4	
U1	2.40	2.80	4.00	1.20	Euro/bottle
U2	2.40	2.80	4.00	1.20	Euro/bottle
U3	2.40	2.80	4.00	1.20	Euro/bottle
U4	2.40	2.80	4.00	1.20	Euro/bottle
U5	2.40	2.80	4.00	1.20	Euro/bottle
U6	2.40	2.80	4.00	1.20	Euro/bottle
U7	2.40	2.80	4.00	1.20	Euro/bottle
U8	2.00	2.40	3.40	1.00	Euro/bottle
U9	2.40	2.80	4.00	1.20	Euro/bottle
U10	2.00	2.40	3.40	1.00	Euro/bottle
U11	2.00	2.40	3.40	1.00	Euro/bottle
U12	2.00	2.40	3.40	1.00	Euro/bottle
U13	2.00	2.40	3.40	1.00	Euro/bottle
U14	2.00	2.40	3.40	1.00	Euro/bottle
U15	2.00	2.40	3.40	1.00	Euro/bottle
U16	2.00	2.40	3.40	1.00	Euro/bottle

Factory

Centralized Deliveries

Handling for Loading

Truck

Travelling

Handling for Unloading

Handling for Storing

Warehouse

Handling for Recovery

Handling for Loading

Truck

Travelling

Handling for Unloading

Customer

Direct Deliveries

Handling for Loading

Truck

Travelling

Handling for Unloading

All distances are in km