

Solution

1. Add 1 to the LB

Little's Law

$$\text{Frequency (TH)} = \frac{WIP}{CT} = \frac{3 \text{ bus/circuit}}{45 \text{ min/circuit}} = \frac{1}{15} \text{ bus/min, Headway} = \frac{1}{\text{Freq.}} = 15 \text{ min/bus}$$

2.

$$\text{Estimated wait time} = \sqrt{LB \times UB} = \sqrt{\frac{15}{2}} \times 15 = 10.61 \text{ min}$$

Geo. Mean

Parameter		LB		UB	Estimate	
Cube per Truckload					3000	(ft ³ /TL)
Cube per order	$(2*2*2)/12^3 =$	0.00463	$4*5*10 =$	200	0.96225	(ft ³ /order)
Number of lanes operating		1		10	3.162278	(lanes)
Orders per lane-hr		10		60	24.4949	(orders/lane-hr)
Operating hours per day					15	(hr/day)
Analysis						
Orders per day	(lanes) x (orders/lane-hr) x (hr/day) =				1161.895	(orders/day)
Cube per day	(ft ³ /order) x (orders/day) =				1118.034	(ft ³ /day)
TL per Day	(ft ³ /day)/(ft ³ /TL) =				0.372678	(TL/day)
Days between TL	1/(TL/day) =				2.683282	(day/TL)
TL per Week	(TL/day) x 7 =				2.608746	(TL/wk)

3.

Rounding: keep fraction