

































































-rom	to	chart s	showing	g flow r	ates ( <i>l</i> a	oads/hi
and tr	av	el dista	ances (	<i>m</i> ) as r	ate/dis	tance
То		1	2	3	4	5
From	1	0	9/50	5/120	6/205	0
	2	0	0	0	0	9/80
	3	0	0	0	2/85	3/170
	4	0	0	0	0	8/85
	5	0	0	0	0	0









## Example

AGVs travel counterclockwise around the loop to deliver loads from load station to unload station. Loading time is 0.75 min, and unloading time is 0.5 min. It is desired to determine how many vehicles are required to satisfy demand for this layout of 40 del./hr. Loaded vehicle velocity is assumed to be 50 m/min., when it is unloaded velocity increases to 60 m/min. Other measures are as follows: Availability = 0.95, Traffic factor = 0.90 and operator efficiency does not apply, so E=1.0



Solution  $T_{L} = 0.75 \text{ min.}$   $T_{U} = 0.50 \text{ min.}$   $L_{d} = 80 \text{ m}$   $L_{e} = 110 \text{ m}$   $v_{c} = 50 \text{ m/min.}$   $v_{e} = 60 \text{ m/min.}$   $T_{c} = 0.75 + (80 / 50) + 0.50 + (110 / 60) = 4.68 \text{ min.}$   $R_{f} = 40 \text{ del./hr.}$  WL = 40(4.68) = 187.2 min./hr per vehicle AT = 60(0.95)(0.90) = 51.3 min./hr per vehicle $n_{c} = 187.2 / 51.3 = 3.64 \approx 4 \text{ vehciles}$ 



















