

To calculate the maximum hourly traffic flow at a 2 way shuttle working site

Table 1

Site length (metres)	All-red settings (seconds)
Below 50	5
50-99	10
100-149	15
150-199	20
200-249	25
250-300	30
301-400	35
401-500	40

Table 2

Site length (metres)	Max. green settings (seconds)
30-74	35
75-134	40
135-194	45
195-300	50
301-400	55
401-500	60

Table 3

% HGVs	Max. lane Capacity
5%	1330
10%	1270
15%	1220
20%	1170
25%	1120
30%	1080

- 1) Determine site length (maximum 300m between "WHEN RED LIGHT SHOWS WAIT HERE" signs or 500m for a STOP/GO site).
- 2) Using **Table 1**, determine the All-red/STOP setting, based on the site length.
- 3) Using **Table 2**, determine the maximum green/GO time.
- 4) Calculate cycle time, a single cycle being the total of an All-red/STOP period plus 2 maximum green/GO periods.
- 5) Calculate how many cycles are possible per hour, rounding down to the nearest whole cycle.
- 6) To determine the "lost" capacity during the All-red/STOP periods:
All-red/STOP period (in seconds) x No. of cycles divided by 2. 2 being the number of seconds a vehicle empirically takes to cross the "Stop" line.
- 7) Subtract the number of vehicle per hour from the maximum hourly capacity (see **Table 3**).

Example - based on a site length of 145m and 15% HGVs

- 1) Site length = 145m
- 2) All-red/STOP setting = 15 seconds (**Table 1**)
- 3) Max green/GO time = 45 seconds (**Table 2**)
- 4) Cycle time = 15 + 45 + 45 = 105 seconds
- 5) Cycles per hour = 3600 (number of seconds in an hour) / 105 = 34.28 say 34 cycles
- 6) Lost capacity = (15 x 34)/2 = 255 vehicles per hour
- 7) Max hourly 2 way flow = 1220 (**Table 3**) - 255 = 965 vehicles

Additionally, you need to make adjustments if the carriageway alignment is twisting or on a steep(ish) gradient - twisting and steep alignments reduce throughput. In the example above, if the alignment in the vicinity of the site was "poor", I'd be tempted to reduce the 2 way flow down to as low as, say, 900, if only to be on the safe side.

Once you've arrived at the theoretical maximum hourly 2 way flow through the site, you then need to get the actual traffic flows at the site to determine working windows.

For 3 way site capacity is based on 2 All-red/STOP and 3 max green/GO cycles.
For 4 way site capacity is based on 3 All-red/STOP and 4 max green/GO cycles.