MetroCount®
Traffic Data Specialists

Traffic Gap Analysis

Many traffic manouvres require the road user (e.g. driver, rider or pedestrian) to select a break in the traffic stream that will enable them to move safely. Some examples include pedestrians crossing a street or drivers entering a priority road from a side road. This behaviour is known as **"gap acceptance"**.

The degree of difficulty that the driver faces in completing a manoeuvre successfully depends on three factors:

- the size of the time headway requires to complete the manoeuvre;
- the number and size of time headways that are available in the traffic stream;
- the priority of the move relative to all other traffic movements.

Analytical methods are available to model gap acceptance with assumed distributions of traffic gaps and human behaviour. The models predict the likelihood of delay and probable duration. They typically define gaps of various duration for different manoeuvres. Accordingly, they establish the **"critical gap"** (t_a) as the minimum space required for the road user to make his/her move. Pedestrians do not usually join a queue to cross a road. As soon as an acceptable gap (or critical gap) occurs, all pedestrians are able to cross together. On the other hand, vehicles have to queue at a stopline and take their turn to move. In traffic analysis, this car sequence is measured by the parameter **"follow up headway"** (t_f). If we assume that the queue of minor stream vehicles is not exausted, in practice this implies that:

- gaps less than t_a will not be used;
- gaps between t_a and $t_a + t_f$ will be used by one minor stream vehicle;
- gaps between t_a and $t_a + 2t_f$ will be used by two minor stream vehicles, and so on.

MetroCount Gap Analysis

MetroCount users are able to directly measure the gaps, no modelling required. This is due to the particular way that we store traffic data. By time-stamping every axle event, MetroCount tube or piezo counters provide information on the exact position of each axle on the road and thus, easily depict traffic gaps.

Event Count Reports

Along with its host of speed and class reports, the MetroCount Traffic Executive® software provides "event counts", tallied from only one sensor. Your time-stamped axle data and the MTE® functionalities make it easy to use typical gap parameters and count the number of gaps.

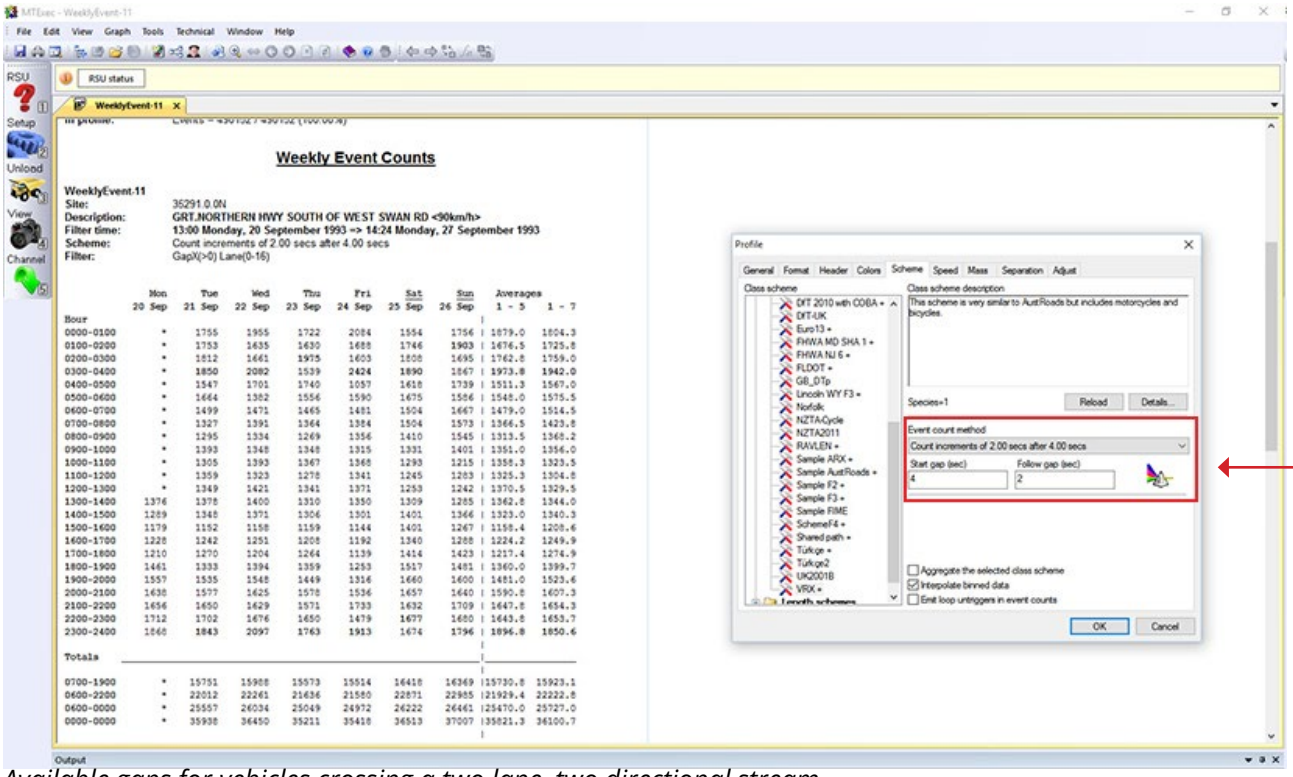
Table: Critical acceptance gaps and follow-up headways at unsignalised intersections

	Critical Acceptance Gap (t_a)	Follow-up Headway (t_f)
Crossing manoeuvres		
Two-directional stream		
2 lanes	5	3
4 lanes	8	5
One-directional stream		
2 lanes	4	2
3 lanes	6	3
4 lanes	8	4
Turning manoeuvre into the far-side flow (i.e. left turn - Europe, USA; right turn- Australia, UK)		
Across single lane flow		
Good turning conditions	4	2
Difficult turning conditions	5	3
Across 2 lane flow	5	3
Across 3 lane flow	6	4

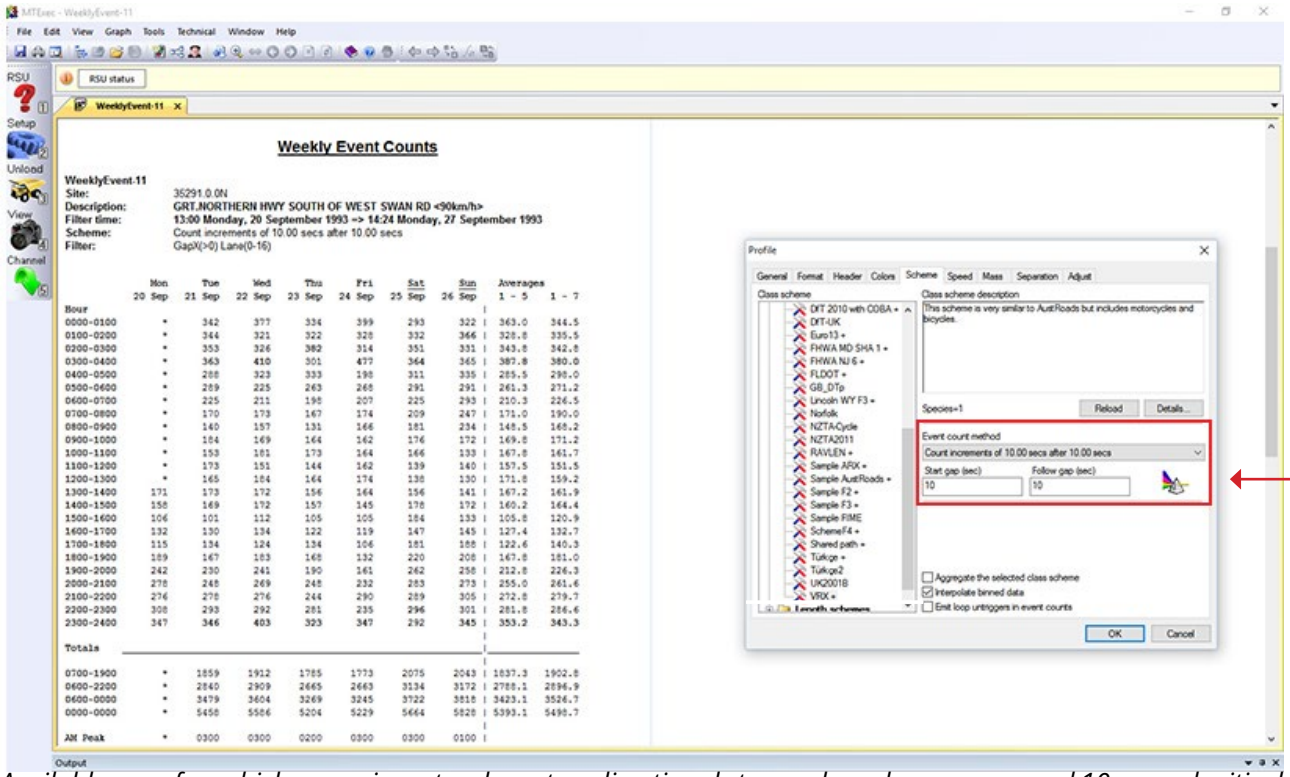
Note: The listed values for t_a and t_f assume good sight distances and reasonable grades. Allowance should be made for extraordinary conditions.
Values required for turns into the near-side flow become very large if it is assumed that through traffic is not impeded, and most drivers would not wait for such gaps. Judgement needs to be exercised to select appropriate gap criteria for turns into the near-side flow.

Adapted from NAASRA 1988 Guide to Traffic Engineering Practice Part 1 and Part 5.

Gap Analysis Examples



Available gaps for vehicles crossing a two lane, two directional stream



Same data, different gap criteria

Available gaps for vehicles crossing a two lane, two directional stream, based on an assumed 10 second critical acceptance gap

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