

Memo

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To
MetroCount UK

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Subject
Evaluation Bicycle Counts

1 Introduction

In September 2013 Grontmij conducted tests with three bicycle counting systems at Kralingseweg, Rotterdam. Besides the Dinaf count tubes already present at the test location, two other counting systems were deployed for the tests:

- MetroCount MC5720: using piezoelectric strips;
- EcoCounter: using an induction loop glued to the bicycle path.

Videos were taken at the test location on Wednesday 9 Oct 2013 (afternoon) and Thursday 10 Oct 2013 (morning). With these videos the actual traffic passages (the 'reality') can be established and used for the evaluation and comparison of the three counting systems.

In this memo a short description of the evaluation outcomes is presented.

2 Results

Table 3.1 shows the hourly traffic counts as registered by video and by the three counting systems. The general implications are:

- Dinaf registered the highest number of bicycle passages. For some periods the Dinaf count is even higher than reality (as established by video). This is contributed to possible ghost/double registrations in the Dinaf counts. Because the Dinaf data only contain hourly counts, it is not possible to investigate the deviations further.
- MetroCount registered slightly less passages than Dinaf, but the MetroCount results are more agreeable with reality than the Dinaf results are (looking at the magnitudes and variation of the hourly deviations). Further analysis of individual passages shows that when a group of bicycles passed the test location, MetroCount sometimes missed a bicycle.
- EcoCounter showed the biggest deviations from reality (average for the 12 hourly periods: 11.9%). There is further a big fluctuation in the variation from period to period.
- In total for the 12 hourly periods, Dinaf has the smallest variation from reality (1.2%), MetroCount slightly bigger (4.5%). However, the hourly deviations of Dinaf varies greatly from period to period, in comparison to those of MetroCount.

Table 3.2 shows the total traffic counts by the three systems for a whole period of nearly two weeks (from 1 to 13 Oct 2013). The results here indicate that:

- The difference between Dinaf count and MetroCount count is relatively small (less than 2%). Here the Dinaf count is slightly higher than the MetroCount count.

3 Conclusions

In terms of total count, Dinaf shows the smallest deviation. However, the hourly deviations of MetroCount are more stable than Dinaf.

An advantage of MetroCount is that it uses piezoelectric strips which can be buried beneath the road surface, instead of test tubes which are laid above the road surface. This requires less maintenance and also causes no hindrance to the bicycle traffic.



Figure 3.1 Piezoelectric strips of MetroCount

Table 3.1 Hourly traffic counts: comparison the three counting systems with the video observation

Time (hour) \ Direction	Video		Dinaf		EcoCounter		MetroCount		Deviation (%) from video					
	D1	D2	D1	D2	D1	D2	D1	D2	DinafD1	DinafD2	EcoCounterD1	EcoCounterD2	MetroCountD1	MetroCountD2
Wed 9 Oct 2013 13:00	67	109	76	101	52	94	66	100	13.43%	-7.34%	-22.39%	-13.76%	-1.49%	-8.26%
Wed 9 Oct 2013 14:00	59	135	63	139	55	124	61	130	6.78%	2.96%	-6.78%	-8.15%	3.39%	-3.70%
Wed 9 Oct 2013 15:00	111	163	98	167	94	138	101	144	-11.71%	2.45%	-15.32%	-15.34%	-9.01%	-11.66%
Wed 9 Oct 2013 16:00	84	163	84	159	72	142	80	149	0.00%	-2.45%	-14.29%	-12.88%	-4.76%	-8.59%
Wed 9 Oct 2013 17:00	105	184	111	174	101	167	108	176	5.71%	-5.43%	-3.81%	-9.24%	2.86%	-4.35%
Wed 9 Oct 2013 18:00	64	121	62	112	63	110	60	112	-3.13%	-7.44%	-1.56%	-9.09%	-6.25%	-7.44%
Thu 10 Oct 2013 07:00	113	31	114	33	89	31	111	30	0.88%	6.45%	-21.24%	0.00%	-1.77%	-3.23%
Thu 10 Oct 2013 08:00	234	61	207	74	208	58	220	64	-11.54%	21.31%	-11.11%	-4.92%	-5.98%	4.92%
Thu 10 Oct 2013 09:00	82	32	79	33	69	29	78	33	-3.66%	3.13%	-15.85%	-9.38%	-4.88%	3.13%
Thu 10 Oct 2013 10:00	49	20	46	22	44	15	47	20	-6.12%	10.00%	-10.20%	-25.00%	-4.08%	0.00%
Thu 10 Oct 2013 11:00	40	42	44	45	34	37	42	42	10.00%	7.14%	-15.00%	-11.90%	5.00%	0.00%
Thu 10 Oct 2013 12:00	45	51	45	52	39	42	44	50	0.00%	1.96%	-13.33%	-17.65%	-2.22%	-1.96%

Variation within +/- 5% is highlighted in light green.

Table 3.2 Total traffic count: comparison between the three counting systems

Time (hour) \ Direction	Dinaf		EcoCounter		MetroCount	
	D1	D2	D1	D2	D1	D2
from 1 Oct 2013 09:00 to 13 Oct 2013 12:00	14,784	15,500	13,380	13,463	14,687	15,113
Deviation (%) from Dinaf			-9.50%	-13.14%	-0.66%	-2.50%