

Road safety effects of small-scale infrastructural measures with emphasis on pedestrian safety

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D-98-14
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Leidschendam, 1998
SWOV Institute for Road Safety Research, The Netherlands

Report documentation

Number: D-98-14
Title: Road safety effects of small-scale infrastructural measures with emphasis on pedestrian safety
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Project number SWOV: 69.868
Client: European Automobile Manufacturers Association ACEA

Contents of the project: This report is the contribution of SWOV to the study carried out in several European countries and organised by the European Automobile Manufacturers Association ACEA. The report contains the results of the analysis of accident data from 173 sites in various Dutch cities before and after small-scale measures were implemented.

Number of pages: 16 + 24 pp.
Published by: SWOV, Leidschendam, 1998

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1. Introduction

This report is the contribution of SWOV to the study carried out in several European countries and organised by the European Automobile Manufacturers Association (ACEA). The report contains the results of the analysis of accident data from 173 sites in various Dutch cities before and after small-scale measures were implemented. The measures concern several types of pedestrian street crossing facilities and 30 km/h speed-limit areas. Particular emphasis is placed on the analysis of pedestrian safety effects.

2. Approach

Three different kinds of data were analysed:

- numbers of accidents, accidents involving pedestrians, and pedestrians injured;
- value of the severity index for injured pedestrians;
- estimates of the FYRR (First Year Rate of Return) for the measures taken on the measure sites, for all persons injured in all accidents and for pedestrians injured in pedestrian involved accidents.

(See the separate data file description for definition of variables.)

The basic approach of the analysis consisted of the comparison of the safety on a measure site in the 'before period' (pre-implementation) to the safety in the 'after period' (post-implementation), adjusted for the safety development on the corresponding control site over the same period.

In the analysis a distinction was made between location measures (43 sites) and area measures (130 sites). The type of infrastructural measures taken on the measure sites (23 different types were applied) is a sound variable in the determination of the effect on safety. The influence of the area type, (i.e. fewer or more traffic and fewer or more pedestrian street crossings), was also studied.

The period considered in the study begins January 1983. For the sites at which area measures were taken it ends December 1991. For the sites at which location measures were taken it ends December 1995. A period of 7 months around the implementation date of the measures at a site is not considered.

3. General results: location measures

Based on aggregated numbers it may be observed from *Table 1A.a* that in the after period 249 accidents were registered at the location measures sites. The total number to be expected on the basis of the individual site's before numbers and the length of the individual site's before and after periods is 293.3 accidents.

Adjusting the difference between these observed and expected numbers of all injury accidents for the general safety development on the control sites, a positive safety effect of the measures is observed. This effect is estimated to be about 6%.

Conversely, the adjusted measures effect on the total number of pedestrian-involved accidents is found to be negative. The effect is estimated to be a reduction in safety of about 23%.

The measures effect on the total number of pedestrians injured is also found to be negative. It amounts to approximately 34%.

The severity index for the pedestrian victims, corrected for the control site's figures, does not appreciably change between the before and after periods, as the level factor of 0.98 for the after period compared to the before period in *Table 1A.b* shows.

The FYRR, as estimated in *Table 1A.c* on the basis of the individual annual victims costs, taking into account the individual safety developments on the control sites, amounts to 11% if all injured road users are considered and to 64% if only considering the injured pedestrians. It is noticeable that the FYRR-value for pedestrians is not negative, whereas still more pedestrians were involved in accidents. This phenomenon may be explained by a severity shift from fatally-injured pedestrians to hospitalised pedestrians. Such a shift does not affect the severity index, but does influence the FYRR value. Obviously, an even larger number of less severely injured pedestrians has caused the positive FYRR-value.

4. General results: area measures

Table 1B.a shows similar preliminary figures for the area measures sites. It indicates that the adjusted overall safety effect of the measures on the number of all accidents is positive and amounts to about 26%.

The adjusted overall safety effect of the area measures is also positive for pedestrians. The measures led to about 27% fewer pedestrian accidents and 21% fewer pedestrians injured.

The severity index for the pedestrian victims, corrected for the control site's figures, has decreased by some 19%, as shown in *Table 1B.b*.

The FYRR does not differ greatly between the 'all accidents' figure and that of pedestrian victims only. Its rather low value amounts to 4% to 5%, as shown in *Table 1B.c*.

5. General results per primary measure type: location measures

Measure type 11: narrowing

As *Table A.a-m.11* shows, the adjusted total number of all injury accidents on the sites after the narrowing measures were taken increased by almost 100%. For the number of pedestrian-involved accidents and for the number of pedestrians injured, the increase amounts to some 50%. It should be noted, however, that the before period numbers in the latter cases are very small and results will therefore be largely uncertain.

After the measures the severity index for pedestrian victims was reduced by some 60%, as shown in *Table A.b-m.11*. However, it should again be noted that, statistically, the number on which this outcome is based is too small to allow reasonable confidence.

Measure type 12: narrowing/small bicycle paths

According to *Table A.a-m.12*, the adjusted overall safety effect of this combination of narrowing with small bicycle paths is positive: the total number of all injury accidents has reduced by some 20%. Conversely, the adjusted effect for pedestrians was negative, since the numbers of pedestrian accidents and pedestrian victims has increased by over 50%. Looking at the figures of *Table A.b-m.12*, the pedestrian severity index also seems to have risen, but once again numbers are too small to draw firm conclusions.

Measure type 19: narrowing/pedestrian waiting strips

With respect to measure type 19, *Tables A.a-* and *A.b-m.19* show that too few accident data are available to enable safety effects to be estimated.

Measure type 31: median island

Applying median islands as single measures seems to have a negative influence on safety. As shown in *Table A.a-m.31*, the numbers of all injury accidents and of pedestrian accidents have increased by some 50% after the measures, whereas the number of pedestrian victims has actually increased by over 70%.

The severity index for pedestrians, however, seems from *Table A.b-m.31* to have dropped by some 40%.

Measure type 32: median island/lanes bending outwards

In combination with outward lane bendings the median islands seem to have generated a lower overall number of accidents, the adjusted effect being a reduction of some 40%, as may be seen from *Table A.a-m.32*. The figures with respect to pedestrians do not allow for any statements regarding effects on safety or severity, because of small numbers.

Measure type 33: median island/axis realignment

Table A.a-m.33 shows that measures of this type may have lowered the overall safety, in that the number of all injury accidents in the after-periods has increased by nearly 150%. However, once again this result is based upon a small number of accidents and is thus inconclusive. This also applies to the severity index, numbers being too small to lead to valid conclusions about pedestrian safety.

Measure type 34: median island/double axis realignment

Table A.a-m.34 shows that also for this type of measures the overall safety seems to have been reduced. The number of all injury accidents has increased by some 70%, but again numbers are small and statistical fluctuation will therefore be considerable.

No effect estimates for pedestrian safety can be given because no pedestrian accidents were recorded.

Measure type 36: median island/bus stop

Once more, safety seems to have fallen after measures of this type were implemented. *Table A.a-m.36* shows that the adjusted overall number of accidents has increased by some 120%, and the situation for pedestrians also seems to have worsened. However, in view of the small (and in some cases zero numbers), the level of reliability of such indications must again be judged as low.

Measure type 52: junction size reduction

Junction size reductions brought about a decrease of almost 20% in the overall number of injury accidents, as *Table A.a-m.52* shows. Nevertheless, the number of pedestrian accidents has increased by over 10%, and the number of injured pedestrians by 25%.

From *Table A.b-m.52* it appears that the severity index for pedestrians may also have increased, but numbers are again too small for any reliable conclusion to be drawn.

Measure type 53: junction median island

The adjusted overall number of injury accidents decreased by almost 60% after this type of measure was implemented, as shown in *Table A.a-m.53*. For pedestrians the safety situation seems to have changed, little although the size of the available database is not sufficient to enable firm conclusions to be drawn.

Measure type 56: roundabout

From *Table A.a-m.56* it will be seen that roundabouts seem to have a positive effect not only on the overall safety but also on the safety of pedestrians. The adjusted overall number of injury accidents decreased by nearly 70%, as did the number of pedestrian accidents and the number of pedestrian victims.

From *Table A.b-m.56* it will be seen that the pedestrian severity index has remained approximately at the same level. However, there is insufficient data to allow statistically significant results.

6. Results per primary measure type: area measures

Measure type 101: 30 km/h signs only

Remarkably, merely placing the 30 km/h signs had a positive effect on the overall safety of the areas concerned. From *Table B.a-m.101* it can be seen that the adjusted number of all injury accidents dropped by almost 40% after the measure was taken. However, the number of pedestrian-involved accidents remained at about the same level, while the number of pedestrian victims increased by over 20%.

At the same time, *Table B.b-m.101* shows that the adjusted severity index for pedestrian victims changed little.

Measure type 102: humps only

Humps also seem to contribute to better safety in the measure areas, as shown by *Table B.a-m.102*. The overall number of injury accidents decreased by almost 10%, while the numbers of pedestrian accidents and pedestrian victims both dropped by some 30%.

On the other hand, *Table B.b-m.102* shows that the pedestrian severity index increased by over 30% after the measures.

Measure type 103: humps/narrowings

In combination with narrowings, the humps seem to generate more positive safety effects. As shown in *Table B.a-m.103*, the overall number of injury accidents decreased by 50% after the measures, while the numbers of pedestrian accidents and pedestrian victims both decreased by almost 60%. Although numbers are very small (occasionally one or even zero), the pedestrian severity index seems to have fallen, as shown in *Table B.b-m.103*.

Measure type 104: humps/axis realignments

No relevant change can be observed in the adjusted overall number of injury accidents after this type of measure was introduced. The numbers of pedestrian accidents and pedestrians injured, however, have both decreased by some 40%, as *Table B.a-m.104* shows.

The severity index, again determined by small numbers of pedestrian victims, seems to have changed little, although any change to be observed would be in the direction of better safety, as shown in *Table B.b-m.104*.

Measure type 105: humps/other measures

After this type of measure, the overall number of injury accidents dropped by about 10%, as shown in *Table B.a-m.105*. Conversely, the numbers of pedestrian accidents and pedestrian victims both seem to have risen markedly, although possibly not as dramatically as the figures suggest because of the very small numbers upon which effect estimations were based.

The small numbers of *Table B.b-m.105* too cause statistically unreliable results for the pedestrian severity index. Any effect to be detected is positive.

Measure type 106: humps/narrowings/axis realignments

From *Table B.a-m.106* it will be seen that the adjusted overall number of injury accidents seems to have fallen by nearly 20% after implementation of measures. However, here again pedestrian safety seems to have worsened. As in the above situation, the severity index for pedestrian victims may have decreased after the measures, according to the adjusted level value of approximately 0.30 compared to the before period, as given in *Table B.b-m.106*.

Measure type 107: humps/narrowings/other measures

Overall, combined measures of this type seem to generate approximately 50% fewer injury accidents, as shown in *Table B.a-m.107*. Given zero numbers of pedestrian accidents and victims in the before and after periods, no conclusion can be drawn regarding pedestrian safety effects.

Measure type 108: humps/axis realignments/other measures

The available numbers as shown in *Table B.a-m.108* upon which to base values of the safety effects of this measure type are too small to allow any estimate to be made.

Measure type 109: humps/narrowings/axis realignments/other measures

This broad package of measures has obvious positive safety effects. As *Table B.a-m.109* shows, the overall number of injury accidents decreased by some 40% after the measures were taken, while the numbers of pedestrian accidents and pedestrian victims have both decreased by over 60%. *Table B.b-m.109* further shows that the pedestrian severity index has also fallen to a level about 30% lower than previously, although the database is again small.

Measure type 110: humps/street closures/narrowings or axis realignments

Like the measures package above, this combination of measures also seems to have generally positive safety effects. Figures are shown in *Table B.a-m.110*. The overall number of injury accidents and the number of pedestrian-involved accidents has dropped by some 50%; the number of pedestrian victims by some 30%.

From *Table B.b-m.110*, although again based on limited data, it may be observed that the pedestrian severity index has fallen to a level of about 60% of pre-implementation levels.

Measure type 111: narrowings or other measures (without humps)

The overall number of accidents dropped since by approximately 30% following the implementation of these measures, as shown in *Table B.a-m.111*. The numbers of pedestrian accidents and pedestrian victims also seem to have dropped, although this result is derived from a statistically low sample. With only one observed pedestrian injured in both the before and the after periods, the severity index cannot be adequately estimated.

Measure type 112: axis realignments/narrowings or other measures (without humps)

Table B.a-m.112 shows that the overall number of injury accidents decreased by some 30% following implementation of the measures. It also suggests that safety for pedestrians has diminished, but numbers are too small for much value to be attached to this conclusion.

7. Conclusions concerning location measures

A summary of all safety results concerning the different types of location measures described above is presented in *Table 3*.

With regard to the numbers of all injury accidents, it can be observed that it appears that about one half of the location measures have contributed positively to traffic safety, whereas the other half has had a negative safety effect. Only the junction measures (types 52, 53 & 56) seem to bring about a consistently lower number of accidents. In the cases where larger effects are observed, however, the results are usually based on little data and are therefore not very reliable.

The overall result of the measures is slightly positive for traffic safety.

With respect to pedestrian safety the situation is worse. Except in case of a roundabout (measure type 56) the numbers of both pedestrian-involved accidents and pedestrian victims increased after the measures were implemented, although it should be noted that effect estimates are rather uncertain because of generally small databases. Due to zero numbers, four out of the eleven types of measures could even not be evaluated.

The overall result of the measures is negative for pedestrian safety.

Although the pedestrian severity index did not change as a result of the measures, there was an obvious shift from fatal to hospitalised injured pedestrians. As indicated above, this resulted in a positive general FYRR-value.

8. Conclusions concerning area measures

Table 3 shows all safety results derived from the different types of area measure described above.

It can be observed that all measure types were coupled with reduced numbers of all injury accidents. (There is one exception with zero initial accidents due to short before period lengths, in which case no effect estimate can be determined). As already mentioned, it is striking that even the simple use of 30 km/h signs in isolation seems to have a considerable positive effect on general safety.

Half of the measure types, although including two types with only one observation, have had a positive effect on pedestrian safety. Because of zero numbers in three other cases, the effect cannot be estimated. In the remaining three cases, including that of 30 km/h signs only, and including a case with again only one observation in the after period, pedestrian safety has worsened.

Nevertheless, the overall safety effect of the area measures is positive for pedestrians.

The pedestrian severity index fell after the measures. As a result the overall value of the FYRR is slightly positive. However, numbers are again too small and hence reliability too limited, to distinguish between the separate effects of the different measure types.

9. Figures per type of area

Looking at area types necessarily entails making a choice between area measures and location measures. Only 27 of the 135 measure sites of the low traffic volume area types A do not belong to the sites where area measures were taken. Conversely, the higher traffic volume area types B exclusively consist of 16 location measures sites.

Table 4 shows the investigation results for each of the area types.

The (mostly area-wide) measures taken at sites of area types A have generally had positive safety effects.

At sites of area type A1 with limited pedestrian street crossing activities, the adjusted number of injury accidents dropped by about 10% after the measures were implemented. At the same time, pedestrian safety also increased. The number of pedestrian-involved accidents dropped by over 20%, the number of pedestrians injured dropped by some 15%.

At measures sites of area type A2 with more pedestrian street crossing activities, the positive safety effects are greater. The adjusted number of all injury accidents fell by about 50% after measures were implemented, whereas the numbers of pedestrian accidents and pedestrian victims both dropped by over 30 %.

In both cases of area types A1 and A2, as derived from *Table 2C*, (although case numbers are admittedly small), the pedestrian severity index has also decreased somewhat after the measures were taken.

As may be expected given the safety effects, *Table 5* shows that the FYRR-value is higher for measures if taken at sites of area type A2 than at sites of area type A1.

Consistent with the results for the location measures in the before period at sites of area types B, the safety effects are more ambiguous.

At measures sites of area type B1 the adjusted number of all injury accidents decreased by some 25%. At the same time, however, the number of pedestrian accidents increased by 25% and the number of pedestrian victims by some 45%, leading to an increase in the pedestrian severity index of nearly 60%.

At sites of area type B2 the measures resulted in a slightly higher number of all injury accidents, whereas the adjusted numbers of pedestrian accidents have risen by some 20% and the number of pedestrian victims by about 25%. Nevertheless, the value of the pedestrian severity index has fallen by about 20%, presumably due to a relatively large increase in the number of slightly injured pedestrians.

In spite of the increase of both the pedestrian accident and victim numbers for the area types B1 and B2, as well as the pedestrian severity index for area type B2, the pedestrian FYRR-values are still strongly positive for both area types, because of the already mentioned shift of numbers of pedestrians killed to more pedestrians hospitalised.

10. General conclusions

It has been possible to compare accident and victim numbers of the after period (post-implementation) with those of the before period-based expected values. At the same time the resulting measures effects could be adjusted for the safety developments on matching control sites where no measures were taken.

Nevertheless, small numbers and the consequent lack of reliability of the effect estimates were a main problem in this research. Valid conclusions can therefore at best be drawn at a more overall and general level. In fact, following a more strictly statistical approach, (although it is not easy to give margins for the used total of expected numbers with any degree of confidence), it is obvious that only a very few results may possibly be adjudged significant at a level of better than 90%.

In the first instance, this relates to the estimated overall measures effect of -26% on the number of all injury accidents at 30 km/h areas. In the case of straightforward χ^2 - testing, with the total actual before number of accidents instead of the total expected number, the then estimated effect of -14% is not statistically significant. With regard to the effect estimation, not using expected numbers has the disadvantage of not taking different lengths of the before periods at the different sites into account. Apart from this, because of different community sizes and therefore quite different control site accident numbers, the total number of control sites accidents will be dominated to some extent by the accident numbers of large communities. This further indicates that the margins for statistical error around the results are large. The second effect found to be of possible significance concerns the overall number of all injury accidents at areas of type A2, which type is strongly confounded with 30 km/h areas, as mentioned. If again the actual before number of accidents is used instead of the expected number, the effect estimate amounts to a significant value of -44%, this value nevertheless being smaller than the original -64%.

The same holds in case of the third effect that was found to be of possible significance. It concerns areas of type B1 and therefore relates to location measures. The estimated measures effect on the overall number of all injury accidents amounts to -36%. If the actual before number of accidents is used instead of the expected number, the value amounts to a significant -38 %. The conclusion is still that the safety results of this study, given the wide confidence margins, have to be interpreted as indications rather than as hard statistical facts.

Within this context, then, it is to be seen that area type measures appear to be much more effective than location type measures. This is true with respect to all injury accidents as well as to pedestrian-involved accidents. It also holds true for the number of pedestrian victims and the severity of pedestrian injuries.

Furthermore, it was found that area-wide measures are more safety-effective if taken at sites with larger volumes of street-crossing pedestrians.

On the other hand, investment costs for area-wide measures are higher. Generally this means that the FYRR has a rather low value.

Finally, it may be stated that data is too limited to allow distinctions to be made between the safety effects of the different types of measures. The FYRR-value in particular is highly sensitive to even minor changes in the small number of road users killed.

Appendix 1 Description of Dutch data file ‘acea97nl.xls’

Filename:	ACEA97NL.XLS.
Filetype:	Microsoft Excel 5.0 for Windows.
Contents:	Dutch traffic injury accident and injured pedestrian data per site for periods before and after safety measure implementation.
Scope:	173 sites and their control locations between 1983 and 1991 or 1995.

COLUMN VARIABLES

A	<i>Serial number</i>
B	<i>Area type</i> A = the before period mean road traffic volume is < 9000 mot.veh/day. B = id. \$ 9000 mot.veh/day. Combined with the site: 1 = less pedestrian street crossings, 2 = more crossings. There are strong (but not too extreme) street crossing reasons for pedestrians. Area types are A1, A2, B1 and B2
C	<i>Primary measure type</i> See paragraph 1.1 of this appendix, ‘Primary measure types’.
D	<i>Implementation date</i> Year & month of implementation of the measure at the location of the measure
E F	<i>Monitoring period</i> Number of months in the before-period and in the after-period. The before-period starting 1/1-1983 and ending three months before the month of implementation of the measure, the after-period starting three months after the month of implementation of the measure and ending for one part of the sites (the BREV-locations) on 31/12-1995, and for the other sites (the 30 km/h areas) 31/12-1991 (i.e. a period of 7 months around the implementation date is not considered). Locations with a before or after-period of less than 2 months are disregarded.
G	<i>Location description</i> Town number with name and sub-number of the area, or name of the street where the measures were implemented. Each measure location has as control location the other part of the town inside the built-up area over the corresponding before and after periods. Thus, traffic developments will be controlled for in the best way. Furthermore, the possible problem of migration of accidents from the measure locations to the control locations will probably not have any important effects on the research results.
H	<i>Population</i> Number of inhabitants of the town (1990).
I J	<i>Speed limits at the measure location, before and after</i>
K L	<i>Estimates of motor traffic flow at the measure location before and after</i> Traffic flow is not always exactly known, in which case an overall estimate is used. If the local authority reported that flow fell (or rose) after the measure the flow estimate was decreased (increased) by 10%.
M N	<i>Numbers of recorded injury accidents before and after</i>

O P	<i>Average injury costs before and after</i> An overall estimate, equal before and after, is determined for the average costs of a traffic injured person; see paragraph 1.2 of this appendix, 'Accident costs'.
Q R	<i>Individual injury costs before and after</i> The average injury costs (O P) are multiplied by the number of injured persons on the site, being a number estimated as 1.2 times the number of accidents (M N); see paragraph 1.2 of this appendix, 'Accident costs'.
S T	<i>Numbers of pedestrian accidents before and after</i> These are accidents in which at least one pedestrian was involved.
U V	<i>Average pedestrian accident costs before and after</i> The individual pedestrian accident costs for the site (W X) are divided by the number of pedestrian accidents (S T).
W X	<i>Individual pedestrian accident costs before and after</i> The number of traffic deaths (AC AT) is multiplied by NLG 1.86 million (the average costs of a traffic death; see paragraph 1.2 of this appendix, 'Accident costs'), added to the number of hospitalised traffic injured persons on the site (AD AU) times NLG 0.28 million, and again added to the number of slightly wounded traffic victims (AE AV) times NLG 0.02 million.
Y	<i>Implementation costs of the measure</i> Pedestrian crossing measures are estimated to cost on average about NLG 0.03 million, except in case of a roundabout (measure 56) which costs NLG 0.10 million, or an extended roundabout which costs NLG 0.20 million. 30 km/h-area measures cost on average about NLG 1.20 per square metre (see Vis, A.A., Dijkstra, A. & Slop, M., 1992: 'Safety effects of 30 km/h zones in the Netherlands'. A.A.P. Vol. 24, No. 1 pp 75-86). This amount is multiplied by the square metre size of the area.
Z	<i>3-year maintenance costs</i> The maintenance costs for the begin period of the infrastructural measures is estimated to be about 1% of the implementation costs (Y) per year (not taking into account the maintenance costs of the infrastructure before or without the measure).
AA	<i>Number of injured pedestrians before</i> The total number of pedestrian deaths (AC), hospitalised injured (AD) and slightly injured pedestrians (AE).
AB	<i>Pedestrian severity index before</i> The sum of pedestrian deaths and hospitalised injured pedestrians (AC+AD) is divided by the total number of dead or injured pedestrians before (AC+AD+AE).
AC-AE	<i>Numbers of pedestrian deaths, hospitalised injured and slightly injured pedestrians before</i> A fatality is a person who has died within 30 days, an in-patient is someone who has been admitted to a hospital for at least one day, all other wounded persons are slightly injured.
AF-AQ	<i>Numbers of injured pedestrians before, according to age and sex</i> In a few cases age or sex was unknown, so the sum is less than the total number of dead and injured pedestrians.
AR	<i>Number of injured pedestrians after</i> The total number of pedestrian deaths (AT), hospitalised injured (AU) and slightly injured pedestrians (AV).
AS	<i>Pedestrian severity index after</i>

	The sum of pedestrian deaths and hospitalised injured pedestrians (AT+AU) is divided by the total number of dead or injured pedestrians after (AT+AU+AV).
AT-AV	<i>Numbers of pedestrian deaths, hospitalised injured and slightly injured pedestrians after</i>
AW-BH	<i>Numbers of injured pedestrians after, according to age and sex</i> In a few cases age or sex was unknown, so the sum is less than the total number of dead and injured pedestrians.
BI BJ	<i>Chi-squared value (one degree margin)</i> For the table of all injury accidents, and for the table of pedestrian-involved injury accidents, that were recorded at the measure location and at its control location before and after the measure was implemented at the measure location (a significant value means that safety developments differ between measure location and control location).
BK BL	<i>K-factor for all injury accidents, and for the pedestrian-involved injury accidents</i> Calculated as the ratio of the numbers on the measure location after and before, compared to this ratio for the control location (a value < 1 means - in case of significant Chi-squared value - that safety on the measure location for the after period is better).
BM BN	<i>FYRR (First Year Rate of Return)</i> Is computed for all injury accidents, and for the pedestrian-involved injury accidents, as the difference between the year mean individual costs of before and after injuries/accidents (Q-R / W-X), compared to the total investment costs including the 3 year maintenance costs of the implemented measure (Y+Z)
BO	<i>Z-score per location</i> Would compare the mean numbers of accidents per unit of time after and before (because of not using the actual numbers in the comparison the score does not have the standard statistical distribution). Besides, the Chi-square test in BI BJ corrects the safety development at the measure location for that at the control location. This Z-score is therefore omitted.
BP	<i>Type of site</i> Code 1 indicates the measure sites, code 2 the control sites
BQ-BS	<i>Expected numbers</i> Instead of the BO column Z-score, in columns BQ BS 'expected' numbers of injury accidents, pedestrian accidents and pedestrians injured are estimated for the after period per location, given the monthly mean numbers for the before period and the number of months in the after period.

1.1. PRIMARY MEASURE TYPES

Pedestrian crossing facilities (BREV-location measures)

(see for technical details appendix ASVV: 12.3 / measure type no.)

<i>measure type no.</i>	<i>measure description</i>
11	narrowing
12	narrowing/small bicycle paths
19	narrowing/pedestrian waiting strips
31	median island
32	median island/lanes bending outwards
33	median island/axis realignment
34	median island/double axis realignment
36	median island/bus stop
52	junction size reduction
53	junction median island
56	roundabout

Area measures (30 km/h area measures)

<i>measures type no.</i>	<i>measure description</i>
101	30 km/h signs only
102	humps only
103	humps/narrowing (compare location measure 11)
104	humps/axis realignments (compare location measures 32, 33 and 34)
105	humps/other measures
106	103+104
107	103+105
108	104+105
109	103+104+105
110	humps/street closures/narrowing or axis realignments
111	narrowing or other measures (without humps)
112	axis realignments/narrowing or other measures (without humps)

1.2. ACCIDENT COSTS

1993-figures NL	costs/injured [NLG x million]	
Costs of deaths	2,327	
Number of deaths	1,252	1.859
Costs of hospitalised injured	5,423	
VOR number of hospitalised injured	11,562	
Total number of hospitalised injured	19,270	0.281
Costs of slightly injured	4,353	
VOR number of slightly injured	36,015	
Total number of slightly injured	180,075	0.024
Total costs	12,103	
Total number of injured	200,597	0.060
	costs per inj.acc [NLG x million]	
Total VOR number of injury accidents	40,218	
Total VOR number of injured	48,990	
Average number of injured per injury accident	1.2	
Total number of injury accidents	167,164	0.072

See:

- Rune Elvik (1996), *A framework for cost-benefit analysis of the Dutch road safety plan*. SWOV, Leidschendam.
- Frank Poppe & Jan Muizelaar (1996), *Financiering van een duurzaam-veilig wegverkeerssysteem*, R-96-49, SWOV, Leidschendam.

* VOR = Accident Records Registration Division of the Directorate-General of Public Works.

1.3. NUMBERS OF SITE AND CONTROL SITE PAIRS

Total 173 pairs of sites

NUMBERS OF SITES	AREA TYPE			
MEASURE TYPE	A1	A2	B1	B2
11	2	3		1
12	4	1		
19		1		
31	1	1	3	3
32	2	1		1
33		2		
34	1			
36	2			1
52	1	4		1
53		1		1
56			2	3
101	10	1		
102	25	1		
103	9			
104	13	1		
105	9			
106	19	3		
107	3			
108	2			
109	9	1		
110	2	2		
111	12	1		
112	6	1		

Appendix 2 Tables

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	138	293,2	249	22	50,8	48	22	50,8	52
real comp.to exp			- 15%			- 6%			+ 2%
comp.to ctl real/exp			- 6%			+ 23%			+ 34%
Total Control sites	42230	89431,5	80751	6487	13981,2	10749	6708	14453,3	11067
real comp.to exp			- 10%			- 23%			- 23%
Total	42368	89724,7	81000	6509	14032,0	10797	6730	14504,2	11119

Table 1 A.a. *Accidents / injured.*

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	3	10	9	0	25	27
Severity index			59%			48%
Reduction comp.to ctl						0,98
Total Control sites	277	2443	3988	275	3459	7333
Severity index			41%			34%
Total	280	2453	3997	275	3484	7360

Table 1 A.b. *Severity.*

	Before ! Adj.After yearly costs of		3 YR	FYRR	
	All injur.	Ped. Injur.	Inv. Costs	All injur.	Ped. Injur.
Total BREV-locations	0,199	1,155	1,792	11%	64%

Table 1 A.c. *First Year Rate of Return.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	242	283,4	200	43	68,2	43	43	68,2	46
Real comp.to exp			- 29%			- 37%			- 33%
Comp.to ctl real/exp			- 26%			- 27%			- 21%
Total Control sites	87704	88060,7	83968	13359	15048,1	13060	13541	15491,6	13293
Real comp.to exp			- 5%			- 13%			- 14%
Total	87946	88344,0	84168	13402	15116,3	13103	13584	15559,8	13339

Table 1 B.a. *Accidents / injured.*

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	1	21	21	0	16	30
Severity index			51%			35%
Reduction comp.to ctl						0,81
Total Control sites	637	4923	7981	375	4215	8703
Severity index			41%			35%
Total	638	4944	8002	375	4231	8733

Table 1 B.b. *Severity.*

	Before ! Adj.After yearly.costs of		3 YR	FYRR	
	All injur.	Ped. Injur.	Inv. Costs	All injur.	Ped. Injur.
Total 30km/h-areas	0,924	1,234	23,879	4%	5%

Table 1 B.c. *First Year Rate of Return.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total measure sites	27	59,1	53	3	6,4	6	3	6,4	7
Real comp.to exp			- 10%			- 6%			+ 9%
Comp.to ctl real/exp			- 2%			+ 26%			+ 46%
Total Control sites	6713	13177,8	11999	667	1325,9	986	686	1365,0	1018
Real comp.to exp			- 9%			- 26%			- 25%
Total	6740	13236,9	12052	670	1332,3	992	689	1371,4	1025

Table 2 A.A1.a. - *Area type A 1 Location measures Accidents / Injured.*

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total measure sites	1	0	2	0	5	2
Severity index			33%			71%
Reduction comp.to ctl						2,44
Total Control sites	22	307	357	49	380	589
Severity index			48%			42%
Total	23	307	359	49	385	591

Table 2 A.A1.b. - *Area type A 1 Location measures Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total measure sites	30	57,6	74	2	3,8	13	2	3,8	13
Real comp.to exp			+ 28%			+ 241%			+ 241%
Comp.to ctl real/exp			+ 25%			+ 263%			+ 266%
Total Control sites	12368	23652,7	24234	1879	3643,0	3423	1947	3774,4	3513
Real comp.to exp			+ 2%			- 6%			- 7%
Total	12398	23710,3	24308	1881	3646,8	3436	1949	3778,2	3526

Table 2 A.A2.a. - Area type A 2 Location measures Accidents / Injured.

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total measure sites	0	1	1	0	7	6
Severity index			50%			54%
Reduction comp.to ctl						1,28
Total Control sites	77	692	1178	79	1084	2350
Severity index			39%			33%
Total	77	693	1179	79	1091	2356

Table 2 A.A2.b - Area type A 2 Location measures Severity.

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total measure sites	31	64,9	38	3	6,4	6	3	6,4	7
Real comp.to exp			- 41%			- 6%			+ 10%
Comp.to ctl real/exp			- 36%			+ 24%			+ 44%
Total Control sites	3232	7043,1	6398	357	786,2	594	367	807,4	613
Real comp.to exp			- 9%			- 24%			- 24%
Total	3263	7108,1	6436	360	792,6	600	370	813,8	620

Table 2 A.B1.a - Area type B 1 Location measures Accidents / injured.

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total measure sites	1	1	1	0	5	2
Severity index			67%			71%
Reduction comp.to ctl						1,08
Total Control sites	12	123	232	21	202	390
Severity index			37%			36%
Total	13	124	233	21	207	392

Table 2 A.B1.b - Area type B 1 Location measures Severity.

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total measure sites	50	111,5	84	14	34,2	23	14	34,2	25
Real comp.to exp			- 25%			- 33%			- 27%
Comp.to ctl real/exp			- 10%			- 4%			+ 5%
Total Control sites	19917	45558,0	38120	3584	8226,1	5746	3708	8506,5	5923
Real comp.to exp			- 16%			- 30%			- 30%
Total	19967	45669,5	38204	3598	8260,3	5769	3722	8540,7	5948

Table 2 A.B2.a - Area type B 2 Location measures Accidents / injured.

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total measure sites	1	8	5	0	8	17
Severity index			64%			32%
Reduction comp.to ctl						0,62
Total Control sites	166	1321	2221	126	1793	4004
Severity index			40%			32%
Total	167	1329	2226	126	1801	4021

Table 2 A.B2.b - Area type B 2 Location measures Severity.

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total measure sites	215	213,1	173	37	56,9	38	37	56,9	41
Real comp.to exp			- 19%			- 33%			- 28%
Comp.to ctl real/exp			- 14%			- 23%			- 16%
Total Control sites	85728	84708,8	80417	13189	14730,1	12733	13365	15140,6	12960
Real comp.to exp			- 5%			- 14%			- 14%
Total	85943	84921,9	80590	13226	14787,0	12771	13402	15197,5	13001

Table 2 B.A1.a - Area type A 1 Area measures Accidents / injured.

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total measure sites	1	18	18	0	16	25
Severity index			51%			39%
Reduction comp.to ctl						0,91
Total Control sites	632	4857	7876	370	4069	8521
Severity index			41%			34%
Total	633	4875	7894	370	4085	8546

Table 2 B.A1.b - Area type A 1 Area measures Severity.

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total measure sites	27	70,2	27	6	11,3	5	6	11,3	5
Real comp.to exp			- 62%			- 56%			- 56%
Comp.to ctl real/exp			- 64%			- 57%			- 53%
Total Control sites	1976	3351,8	3551	170	318,0	327	176	351,0	333
Real comp.to exp			+ 6%			+ 3%			- 5%
Total	2003	3422,1	3578	176	329,3	332	182	362,3	338

Table 2 B.A2.a - Area type A 2 Area measures Accidents / injured.

Numbers	Ped.victims Before			Ped.victims After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total measure sites	0	3	3	0	0	5
Severity index			50%			0%
Reduction comp.to ctl						<
Total Control sites	5	66	105	5	146	182
Severity index			40%			45%
Total	5	69	108	5	146	187

Table 2 B.A2.b - Area type A 2 Area measures Severity.

Measure type	Adjusted measure effect on				FYRR	
	numbers of		severty idx		All injured	Ped. Injured
	All accid.	Ped. Accid.	Ped. Injured	Ped. Injured		
Location measures						
11	+ 95%	+ 54%	+ 52%	0,43	-102%	232%
12	- 21%	+ 54%	+ 54%	>	27%	-127%
19	0%	-	-	-	0%	0%
31	+ 51%	+ 52%	+ 74%	0,62	-93%	331%
32	- 40%	-	-	-	43%	0%
33	+ 145%	+ 9%	+ 8%	1,49	-149%	57%
34	+ 73%	-	-	-	-94%	0%
36	+ 124%	>	>	>	-42%	-57%
52	- 18%	+ 12%	+ 25%	>	42%	-59%
53	- 56%	+ 3%	+ 3%	<	124%	103%
56	- 68%	- 71%	- 70%	1,18	85%	27%
Area measures						
101	- 36%	+ 1%	+ 22%	0,84	7%	1%
102	- 9%	- 31%	- 30%	1,35	4%	4%
103	- 50%	- 58%	- 56%	<	6%	10%
104	- 3%	- 39%	- 40%	0,75	-3%	51%
105	- 12%	+ 338%	+ 335%	<	8%	3%
106	- 18%	+ 204%	+ 205%	0,27	3%	2%
107	- 52%	-	-	-	2%	0%
108	>	-	-	-	-9%	0%
109	- 42%	- 64%	- 64%	0,71	-2%	3%
110	- 51%	- 46%	- 31%	0,59	19%	6%
111	- 29%	- 66%	- 66%	=	3%	0%
112	- 28%	>	>	-	5%	0%

Table 3. Measure type results overview (acea97nl).

Area type	Adjusted measure effect on				FYRR	
	Numbers of		On severty idx		All injured	Ped. Injured
	All accid.	Ped. Accid.	Ped. Injured	Ped. Injured		
A1 loc	- 2%	+ 26%	+ 46%	2,44	9%	70%
A2 loc	+ 25%	+ 263%	+ 266%	1,28	-52%	-56%
B1 loc	- 36%	+ 24%	+ 44%	1,08	63%	122%
B2 loc	- 10%	- 4%	+ 5%	0,62	30%	114%
A1 area	- 14%	- 23%	- 16%	0,91	2%	4%
A2 area	- 64%	- 57%	- 53%	<	43%	23%

Table 4. Area type results overview (acea97nl).

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	10	19,7	32	2	4,8	5	2	4,8	5
Real comp.to exp			+ 62%			+ 5%			+ 5%
Comp.to ctl real/exp			+ 95%			+ 54%			+ 52%
Total Control sites	2885	5197,7	4332	291	520,7	354	301	537,2	370
Real comp.to exp			- 17%			- 32%			- 31%
Total	2895	5217,4	4364	293	525,5	359	303	542,0	375

Table A.a - m.11. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	1	1	0	0	2	3
Severity index			100%			40%
Reduction comp.to ctl						0,43
Total Control sites	7	125	169	3	148	219
Severity index			44%			41%
Total	8	126	169	3	150	222

Table A.b - m.11. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	11	20,7	17	2	3,9	5	2	3,9	5
Real comp.to exp			- 18%			+ 29%			+ 29%
Comp.to ctl real/exp			- 21%			+ 54%			+ 54%
Total Control sites	3207	5836,4	6033	279	507,0	427	288	523,9	439
Real comp.to exp			+ 3%			- 16%			- 16%
Total	3218	5857,1	6050	281	510,9	432	290	527,7	444

Table A.a - m.12. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	0	2	0	4	1
Severity index			0%			80%
Reduction comp.to ctl						>
Total Control sites	12	131	145	28	179	232
Severity index			50%			47%
Total	12	131	147	28	183	233

Table A.b - m.12. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	1	1,9	2	0	0,0	0	0	0,0	0
real comp.to exp			+ 4%			-			-
comp.to ctl real/exp			+ 0%			-			-
Total Control sites	17	32,7	34	1	1,9	3	1	1,9	3
real comp.to exp			+ 4%			+ 56%			+ 56%
TOTAL	18	34,6	36	1	1,9	3	1	1,9	3

Table A.a - m.19 *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	0	0	0	0	0
Severity index			-			-
Reduction comp.to ctl						-
Total Control sites	0	0	1	0	1	2
Severity index			0%			33%
Total	0	0	1	0	1	2

Table A.b - m.19. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	22	52,1	81	6	15,8	20	6	15,8	23
Real comp.to exp			+ 55%			+ 26%			+ 45%
Comp.to ctl real/exp			+ 51%			+ 52%			+ 74%
Total Control sites	6359	14651,0	15093	721	1686,8	1405	741	1733,5	1444
Real comp.to exp			+ 3%			- 17%			- 17%
Total	6381	14703,1	15174	727	1702,6	1425	747	1749,4	1467

Table A.a - m.31. *Accidents / injured.*

Numbers	PED. Before			PED. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	2	4	0	0	13	10
Severity index			100%			57%
Reduction comp.to ctl						0,62
Total Control sites	25	282	434	48	498	898
Severity index			41%			38%
Total	27	286	434	48	511	908

Table A.b - m.31. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	7	19,1	11	0	0,0	0	0	0,0	0
Real comp.to exp			- 42%			-			-
Com.to ctl real/exp			- 40%			-			-
Total Control sites	728	1575,7	1511	78	167,0	128	86	183,3	131
Real comp.to exp			- 4%			- 23%			- 29%
Total	735	1594,7	1522	78	167,0	128	86	183,3	131

Table A.a - m.32. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	0	0	0	0	0
Severity index			-			-
Reduction comp.to ctl						-
Total Control sites	2	41	43	5	62	64
Severity index			50%			51%
Total	2	41	43	5	62	64

Table A.b - m.32. *Severity*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	3	6,0	15	1	2,0	2	1	2,0	2
Real comp.to exp			+ 150%			+ 0%			+ 0%
Comp.to ctl real/exp			+ 145%			+ 9%			+ 8%
Total Control sites	279	558,0	569	35	70,0	64	35	70,0	65
Real comp.to exp			+ 2%			- 9%			- 7%
Total	282	564,0	584	36	72,0	66	36	72,0	67

Table A.a - m.33. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	1	0	0	2	0
Severity index			100%			100%
Reduction comp.to ctl						1,49
Total Control sites	1	15	19	3	17	45
Severity index			46%			31%
Total	1	16	19	3	19	45

Table A.b - m.33. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	2	4,9	11	0	0,0	0	0	0,0	0
Real comp.to exp			+ 123%			-			-
Comp.to ctl real/exp			+ 73%			-			-
Total Control sites	43	106,0	137	6	14,8	7	6	14,8	7
Real comp.to exp			+ 29%			- 53%			- 53%
Total	45	110,9	148	6	14,8	7	6	14,8	7

Table A.a - m.34. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	0	0	0	0	0
Severity index			-			-
Reduction comp.to ctl						-
Total Control sites	0	5	1	0	4	3
Severity index			83%			57%
Total	0	5	1	0	4	3

Table A.b - m.34. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	2	3,5	7	0	0,0	2	0	0,0	2
Real comp.to exp			+ 99%			>			>
Comp.to ctl real/exp			+ 124%			>			>
Total Control sites	2924	5450,5	4843	310	581,0	424	320	600,5	442
Real comp.to exp			- 11%			- 27%			- 26%
Total	2926	5454,1	4850	310	581,0	426	320	600,5	444

Table A.a - m.36. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	0	0	0	1	1
Severity index			-			50%
Reduction comp.to ctl						>
Total Control sites	17	147	156	24	149	269
Severity index			51%			39%
Total	17	147	156	24	150	270

Table A.b - m.36. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	29	63,5	45	4	10,5	9	4	10,5	10
Real comp.to exp			- 29%			- 15%			- 5%
Comp.to ctl real/exp			- 18%			+ 12%			+ 25%
Total Control sites	15274	35177,8	30414	2895	6713,2	5137	2996	6944,2	5285
Real comp.to exp			- 14%			- 23%			- 24%
Total	15303	35241,4	30459	2899	6723,7	5146	3000	6954,7	5295

Table A.a - m.52. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	0	4	0	2	8
Severity index			0%			20%
Reduction comp.to ctl						>
Total Control sites	131	1012	1853	105	1553	3627
Severity index			38%			31%
TOTAL	131	1012	1857	105	1555	3635

Table A.b - m.52 *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	8	15,6	6	2	3,8	3	2	3,8	3
Real comp.to exp			- 62%			- 21%			- 21%
Comp.to ctl real/exp			- 56%			+ 3%			+ 3%
Total Control sites	8275	16367,7	14213	1582	3140,8	2408	1632	3240,0	2478
Real comp.to exp			- 13%			- 23%			- 24%
Total	8283	16383,4	14219	1584	3144,6	2411	1634	3243,8	2481

Table A.a - m.53. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	1	1	0	0	3
Severity index			50%			0%
Reduction comp.to ctl						<
Total Control sites	73	540	1019	46	716	1716
Severity index			38%			31%
Total	73	541	1020	46	716	1719

Table A.b - m.53. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total BREV-locations	43	86,0	22	5	10,0	2	5	10,0	2
Real comp.to exp			- 74%			- 80%			- 80%
Comp.to ctl real/exp			- 68%			- 71%			- 70%
Total Control sites	2239	4478,0	3572	289	578,0	392	302	604,0	403
Real comp.to exp			- 20%			- 32%			- 33%
Total	2282	4564,0	3594	294	588,0	394	307	614,0	405

Table A.a - m.56. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total BREV-locations	0	3	2	0	1	1
Severity index			60%			50%
Reduction comp.to ctl						1,18
Total Control sites	9	145	148	13	132	258
Severity index			51%			36%
Total	9	148	150	13	133	259

Table A.b - m.56. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	22	49,1	32	6	9,5	9	6	9,5	11
Real comp.to exp			- 35%			- 6%			+ 15%
Comp.to ctl real/exp			- 36%			+ 1%			+ 22%
Total Control sites	2085	3726,6	3824	296	460,7	429	302	468,6	443
Real comp.to exp			+ 3%			- 7%			- 5%
Total	2107	3775,7	3856	302	470,2	438	308	478,1	454

Table B.a - m.101 *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	2	4	0	3	8
Severity index			33%			27%
Reduction comp.to ctl						0,84
Total Control sites	31	108	163	18	180	245
Severity index			46%			45%
Total	31	110	167	18	183	253

Table B.b - m.101. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	54	58,1	50	15	26,3	16	15	26,3	16
Real comp.to exp			- 14%			- 39%			- 39%
Comp.to ctl real/exp			- 9%			- 31%			- 30%
Total Control sites	41396	41748,6	39622	6949	7654,4	6760	7150	7924,2	6889
Real comp.to exp			- 5%			- 12%			- 13%
Total	41450	41806,6	39672	6964	7680,6	6776	7165	7950,4	6905

Table B.a - m.102. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	8	7	0	9	7
Severity index			53%			56%
Reduction comp.to ctl						1,35
Total Control sites	357	2616	4177	180	2062	4647
Severity index			42%			33%
Total	357	2624	4184	180	2071	4654

Table B.b - m.102. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	6	8,2	4	1	3,2	1	1	3,2	1
Real comp.to exp			- 51%			- 69%			- 69%
Comp.to ctl real/exp			- 50%			- 58%			- 56%
Total Control sites	1722	1142,4	1113	161	118,1	88	162	123,4	88
Real comp.to exp			- 3%			- 25%			- 29%
Total	1728	1150,5	1117	162	121,3	89	163	126,6	89

Table B.a - m.103. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	1	0	0	0	1
Severity index			100%			0%
Reduction comp.to ctl						<
Total Control sites	8	69	85	6	40	42
Severity index			48%			52%
Total	8	70	85	6	40	43

Table B.b - m.103. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	14	18,3	16	4	6,7	3	4	6,7	3
Real comp.to exp			- 13%			- 55%			- 55%
Comp.to ctl real/exp			- 3%			- 39%			- 40%
Total Control sites	5466	3643,0	3266	600	458,9	340	604	458,7	345
Real comp.to exp			- 10%			- 26%			- 25%
Total	5480	3661,3	3282	604	465,6	343	608	465,4	348

Table B.a - m.104. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	1	1	2	0	1	2
Severity index			50%			33%
Reduction comp.to ctl						0,75
Total Control sites	23	230	351	7	122	216
Severity index			42%			37%
Total	24	231	353	7	123	218

Table B.b - m.104. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	34	13,1	10	2	0,3	1	2	0,3	1
Real comp.to exp			- 23%			+211%			+211%
Comp.to ctl real/exp			- 12%			+338%			+335%
Total Control sites	2731	1772,7	1538	278	207,2	147	277	209,9	150
Real comp.to exp			- 13%			- 29%			- 29%
Total	2765	1785,8	1548	280	207,5	148	279	210,2	151

Table B.a - m.105. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	1	1	0	0	1
Severity index			50%			0%
Reduction comp.to ctl						<
Total Control sites	11	104	162	7	51	92
Severity index			42%			39%
Total	11	105	163	7	51	93

Table B.b - m.105. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	28	39,8	29	3	1,7	4	3	1,7	4
Real comp.to exp			- 27%			+129%			+129%
Comp.to ctl real/exp			- 18%			+204%			+205%
Total Control sites	6233	3679,1	3289	604	372,6	280	611	378,0	283
Real comp.to exp			- 11%			- 25%			- 25%
Total	6261	3718,9	3318	607	374,4	284	614	379,7	287

Table B.a - m.106. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	3	0	0	1	3
Severity index			100%			25%
Reduction comp.to ctl						0,27
Total Control sites	19	273	319	3	124	156
Severity index			48%			45%
Total	19	276	319	3	125	159

Table B.b - m.106. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	22	4,2	2	0	0,0	0	0	0,0	0
Real comp.to exp			- 52%			-			-
Comp.to ctl real/exp			- 52%			-			-
Total Control sites	693	197,9	199	49	15,7	17	46	15,5	17
Real comp.to exp			+ 1%			+ 8%			+ 9%
Total	715	202,0	201	49	15,7	17	46	15,5	17

Table B.a - m.107. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	0	0	0	0	0
Severity index			-			-
Reduction comp.to ctl						-
Total Control sites	2	20	24	3	4	10
Severity index			48%			41%
Total	2	20	24	3	4	10

Table B.b - m.107. *Severity.*

Numbers	Accidents			Ped. accid			Ped. injured		
	Before	Exp. after	After	Before	Exp. after	After	Before	Exp. after	After
Total 30km/h-areas	0	0,0	2	0	0,0	0	0	0,0	0
Rreal comp.to exp			>			-			-
Comp.to ctl real/exp			>			-			-
Total Control sites	57	242,9	289	4	18,2	17	4	18,2	16
Real comp.to exp			+ 19%			- 7%			- 12%
Total	57	242,9	291	4	18,2	17	4	18,2	16

Table B.a - m.108. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	0	0	0	0	0
Severity index			-			-
Reduction comp.to ctl						-
Total Control sites	0	2	2	0	7	9
Severity index			50%			44%
Total	0	2	2	0	7	9

Table B.b - m.108. *Severity.*

Numbers	Accidents			Ped. accid			Ped. injured		
	Before	Exp. after	After	Before	Exp. after	After	Before	Exp. after	After
Total 30km/h-areas	24	34,0	19	6	9,6	3	6	9,6	3
Real comp.to exp			- 44%			- 69%			- 69%
Comp.to ctl real/exp			- 42%			- 64%			- 64%
Total Control sites	16663	15406,6	14901	3104	2985,6	2584	3056	3064,6	2627
Real comp.to exp			- 3%			- 13%			- 14%
Total	16687	15440,6	14920	3110	2995,3	2587	3062	3074,2	2630

Table B.a - m.109. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	3	3	0	1	2
Severity index			50%			33%
Reduction comp.to ctl						0,71
Total Control sites	128	1011	1917	84	837	1706
Severity index			37%			35%
Total	128	1014	1920	84	838	1708

Table B.b - m.109. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	20	29,8	17	5	7,5	4	5	7,5	5
Real comp.to exp			- 43%			- 46%			- 33%
Comp.to ctl real/exp			- 51%			- 46%			- 31%
Total Control sites	1908	1940,8	2270	196	197,2	196	205	206,6	200
Real comp.to exp			+ 17%			- 1%			- 3%
Total	1928	1970,6	2287	201	204,6	200	210	214,1	205

Table B.a - m.110. *Accidents / injured.*

Numbers	PED. Before			PED. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	2	3	0	1	4
Severity index			40%			20%
Reduction comp.to ctl						0,59
Total Control sites	6	85	114	4	71	125
Severity index			44%			38%
Total	6	87	117	4	72	129

Table B.b - m.110. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	10	16,4	11	1	3,4	1	1	3,4	1
Real comp.to exp			- 33%			- 71%			- 71%
Comp.to ctl real/exp			- 29%			- 66%			- 66%
Total Control sites	6824	11966,1	11358	936	2288,9	1976	944	2347,7	2011
Real comp.to exp			- 5%			- 14%			- 14%
Total	6834	11982,6	11369	937	2292,3	1977	945	2351,1	2012

Table B.a - m.111. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	0	1	0	0	1
Severity index			0%			0%
Reduction comp.to ctl						=
Total Control sites	49	328	567	59	635	1317
Severity index			40%			35%
Total	49	328	568	59	635	1318

Table B.b - m.111. *Severity.*

Numbers	Accidents			Ped.accid			Ped.injured		
	Before	Exp.after	After	Before	Exp.after	After	Before	Exp.after	After
Total 30km/h-areas	8	12,5	8	0	0,0	1	0	0,0	1
Real comp.to exp			- 36%			>			>
Comp.to ctl real/exp			- 28%			>			>
Total Control sites	1926	2593,9	2299	182	270,6	226	180	276,2	224
Real comp.to exp			- 11%			- 16%			- 19%
Total	1934	2606,4	2307	182	270,6	227	180	276,2	225

Table B.a - m.112. *Accidents / injured.*

Numbers	Ped. Before			Ped. After		
	Killed	Hospit	Slight	Killed	Hospit	Slight
Total 30km/h-areas	0	0	0	0	0	1
Severity index			-			0%
Reduction comp.to ctl						-
Total Control sites	3	77	100	4	82	138
Severity index			44%			38%
Total	3	77	100	4	82	139

Table B.b - m.112. *Severity.*