De effecten van een duurzaam Veilige inrichting van verblijfsgebieden in de gemeente Enschede

Paul Dekker

Graduation Date:
30 August 2006

Graduation committee:
Martin van Maarseveen
Tillema
Rouwette (Gem. Enschede)

Organisation:
Gemeente Enschede/UT

In the year 2000, the municipality of Enschede started the implementation of a sober lay-out of the project Sustainable Safe in its residential areas. This lay-out is supposed to improve the safety of the road environment. The lay-out consists of establishing a speed limit of 30 km/h within the residential areas, taking measures on the road's most unsafe areas, and implementing so-called gateway constructions on the borders to road environments where a higher speed limit applies. The measures to be taken mostly consist of building speed bumps and plateaus, which should cause a lowering in speed and/or raise the driver's attention to an upcoming dangerous point. In the municipality of Enschede, the number of measures taken with respect to Sustainable Safe has been rather limited up until now. The gateway constructions should be implemented through the use of exit constructions and road signs clearly warning the traffic partakers that they are entering an area where a different speed limit applies. The municipality of Enschede has applied these measures in this manner on several spots, and several exit constructions were already in place in areas where there was a transition to a higher speed limit. However, many transitional spots still consisted of merely a sign and two lines on the road.

Now that the sober lay-out of Sustainable Safe has been completed, it is meant for the residential areas to get a full Sustainable Safe lay-out. However, the execution of this plan costs a lot of money; money the municipality of Enschede does not have available at the moment. This study tries to give some insight into the status of road safety in the residential areas of Enschede, and the effect the implementation of Sustainable Safe (SuSa) has had on the road safety, through the use of five hypotheses. In doing so, this study can help the local council set up a priority list of residential areas that need improvement of road safety. It can also be used to justify certain decisions with respect to the use of the municipality's budget.

The five hypotheses have been tested by means of an accident analysis. First, a database was created in which the accidents with injuries and the accidents with solely material damage were incorporated. The boundaries of the residential areas, as well as the division of the residential areas into quarter structures, have been stipulated in consultation with traffic engineers of the municipality of Enschede. The total road lengths of all areas have been incorporated into the database to be able to determine the number of accidents per kilometre road length. The database also contains all measures taken with respect to SuSa in the years 2000 and 2001, including the number of accidents prior to the implementation of the measures and the number of accidents after the implementation. Finally, traffic counts have been incorporated into the database of intersections on the main arterial roads which open up the residential areas, and the accidents happened on these crossings in the periods 1996-1999 and 2001-2004 have been inventoried.

The collected data was used to analyse whether the road safety in the residential areas had improved as a result of the implementation of SuSa. The different quarter structures have been compared to each other to determine whether this had any influence on the road safety in certain areas, and also to determine what the effect of SuSa was on road safety. The measures taken with SuSa in mind were divided into road section measures and intersection measures and their separate effects on the number of accidents. Next, the residential areas have been ordered in terms of size, and the link between the total road length within a residential area and the number of accidents per kilometre road length has been examined. Finally, the effect of the SuSa lay-out on the main arterial roads which open up the residential areas has been looked at. For this, the road safety on a great number of intersections on these arterial roads has been determined prior to the implementation of SuSa and after the implementation of SuSa, taking possible changes in intensity (number of cars passing an intersection) into account.

What has become clear from this research, is that the number of accidents with injuries and with solely material damage in the residential areas of Enschede has decreased approximately 25% since the implementation of the sober lay-out of SuSa. This result has been obtained by comparing the number of accidents in the period of 1996-1999 to the number of accidents in the period of 2001-2004.

When dividing the residential areas into quarter structures, it are the quarters with a pre-war structure, a lattice structure or a cauliflower structure that show a clear decrease in the number of accidents. The quarters with a tree structure have not been analysed, as these are too new. The residential areas with a ring structure show little to no improvement in road safety. The areas with a pre-war structure and a lattice structure have been qualified as the most road unsafe areas in this research. These are the areas in which the most measures with respect to SuSa have been taken, yet the residential areas with these quarter structures are still the two most road unsafe areas up until now.

The number of accidents on the points where SuSa measures were taken show a decrease of approximately 50%. However, on the referential points where no SuSa measures were taken, the same decrease was found. This is probably due to the SuSa measures taken elsewhere having its impact on these referential points.

The size of a residential area, demonstrated by the total road length within a residential area, appears to have a negative significant relation with the number of accidents per kilometre road length. In other words, the higher the total road length, the more accidents occur per kilometre road length. It is not a very strong link, and it is not found when looking at the residential areas in terms of quarter structures. However, it does indicate that it can't be said without a doubt that larger residential areas are more road safe.

An increase in intensity on the arterial roads has not been found in this research, neither has an increase in number of accidents on the analysed crossings been found. On the other hand, a decrease of the number of accidents per million cars passing an intersection has been found on the intersections between roads from the residential areas and the arterial roads surrounding the residential areas. In other words, the implementation of SuSa measures has improved the road safety on the intersections between roads from the residential areas and the arterial roads.