

ETSC

ShLOW Project proposal

Speed Control by Red-light Compliance
Project for the Netherlands

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1. Introduction

1.1 Main aim

ETSC (European Traffic Safety Council) and its associate partners believe that at every level of society action can be taken to tackle this situation. Speed management is an area of road safety work that has been extensively investigated, and many solutions exist. While political commitment is needed, individuals from all sectors of society can still play a role in demonstrating and implementing these solutions. Using our roads network and being exposed to excessive and illegal speeding by other road users is a daily reality for all of us: after all we are all road users!

With this in mind, the ETSC have set-up a programme named ShLOW which is aimed at tackling specific problems in traffic safety caused by speeding. ShLOW, which stands for: ‘Show me how Slow!’ has enlisted 50 students studying various traffic related subjects in an effort to set-up a wide range of speed-killing initiative throughout Europe.¹

1.2 Programme Goals

The main objectives of ‘ShLOW!’ are threefold: to raise awareness of the consequences of speeding among young individuals and motivate them to become future road safety professionals; to offer them an integrated speed management training course; and to support them in running a small-scale speed management action in their home country. Students develop and try to put in place various measures, from infrastructure solutions, to education campaigns, to vehicle technological improvements.

1.3 Reasoning

Speed is a central issue in road safety. In fact, speed is involved in all accidents: no speed, no accidents. Speed has been found to be a major contributory factor in around 10% of all accidents and in around 30% of the fatal accidents [TRB, 1998]. Both excess speed (exceeding the posted speed limit) and inappropriate speed (faster than the prevailing conditions allow) are important accident causation factors. In addition, speed generally has a positive effect on travel time, which is particularly noticed by

¹ For more information on the ETSC, please see www.etsc.eu

the individual driver, though they are generally not aware of the additional dangers of driving at a higher speed.²

A higher speed increases the likelihood of an accident. The relationship has been generally calculated at a 3% increase of the chance to have an accident for every 1 km/h increase in speed. With this the chance of severe injury or fatality increases if an accident would occur. On average, it is suggested that a 1% change in speed would lead to a 2% change in injury accidents, a 3% change in severe injury accidents and a 4% change in fatal accidents. [Aarts, L. & van Schagen, I., 2006].

Very strong relationships have been established between speed and accident risk: The general relationship holds for all speeds and all roads, but the rate of increase in accident risk varies with initial speed level and road type. In the Netherlands the chance of having a serious accident on provincial roads is above the national average. This has a lot to do with the opportunity to speed, but also the range of different vehicles making use of the roads. Typically the speed limit is exceeded by an average of 45% on provincial roads in the Netherlands [SWOV, 2006]. With all this in mind, it is not surprising that almost 40% of severe accidents with injury or death occur on roads classed as provincial or regional [CBS, 2001]. This gives sufficient cause to take initiative to reduce speeding on these roads.

² Adapted from various sources on erso.eu

2. Project Goals & Objectives

The project

As part of the ShLOW programme this project is proposed to reduce speeding on (rural) provincial roads in the Netherlands. As stated in this proposal, speeding on rural roads in the Netherlands forms a hefty challenge for law enforcers and local authorities. The manner of approach that is proposed in this project focuses on the use of traffic signals to enforce speed limits. This project is to be set-up in one (or possibly two) locations as a pilot project to test the results of the proposed measure.

Goal

The main goal is to test the effectiveness of the proposed measure in reducing the speed of vehicles down to the level of the maximum speed limit and hence eliminating speeding.

Target

The general target is elimination of speeding or at the very least to achieve an extreme reduction of speeding on the pilot location and influence the generic driving behaviour of drivers. The change in driving behaviour is envisaged to change habit from 'speeding is normal here' to 'I must remain within the speed limit'.

Specific Objective

For the given target a specific objective is given of a reduction of 90% of speed limit violations by vehicles.

3. The traffic measure

3.1 Explanation: Traffic measure

For the ShLOW programme I propose a project based on the use of traffic lights to deter vehicles from violating the speed limit. If a vehicle would approach the traffic lights at a speed above the pre-set speed (naturally above the speed limit), the vehicle is warned by means of a matrix sign that he/she is speeding and if the driver continues to speed, the approaching traffic signal will turn to red.

The diagram here below demonstrates the method in practice:

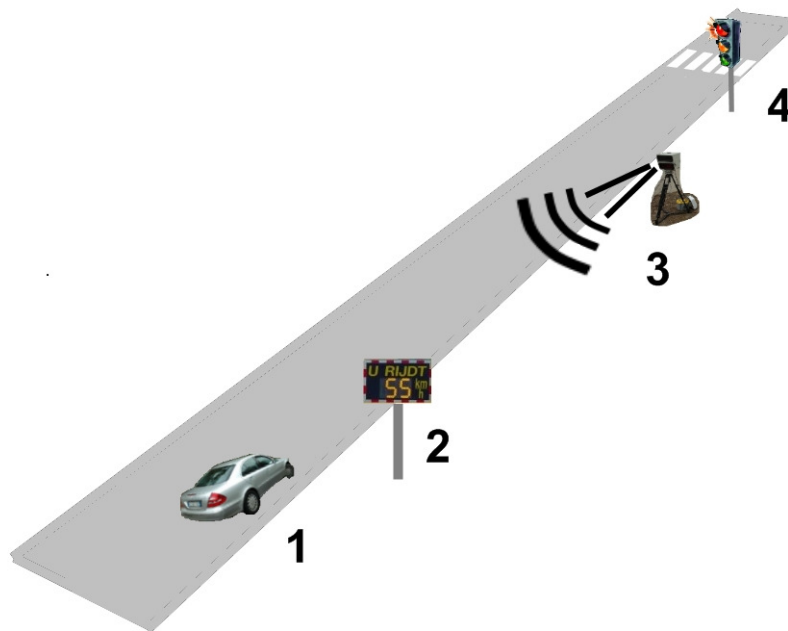


Figure: a schematic working of the traffic safety measure

1. Car approaches the measure area and passes a sign with the speed limit and is informed of the infrastructure measure.
2. If the driver is given his current speed when reaching the matrix board and is warned if they are speeding.
3. further down the route a speed detector measure the speed. If this is above a set level, a signal will be passed to the traffic signal.
4. If the driver is above the set speed limit, the traffic signal will turn red for a set time forcing the driver to slow or stop.

There are number of variables involved as can be seen from the diagram. These are:

- Distance between matrix board-warning sign and traffic signal
- Speed excess threshold for red-light sequence activation
- Use of red-light camera enforcement

These variables are not elaborated on further in this project proposal, but can be found in the project plan, which will be produced shortly following the formal approval.

The fact that a driver is warned in advance gives them information to choose themselves to slow down. Therefore only drivers who deliberately break the speed limit will be halted at the red light. The hope is that drivers will learn that if they continue to speed on the specific road that this will only result in a longer travel time, rather than being quicker. The advantage of speeding is therefore eliminated.

3.2 Envisaged area for implementation

This speed reduction measure is envisaged to be used on sections of (rural) roads where a limited traffic through put is present, where (extreme) speeding occurs regularly and where speed has a particular effect on traffic safety. The sections in this paragraph explain the target area for this measure and conclude with a basic conditional question.

Limited traffic: The use of this measure is aimed for areas with limited traffic flows, due to the fact that the systems works to slow traffic by effectively stopping offenders and counteracts the positives of travelling at a higher speed. However if a large amount of traffic is present, not only the offenders will be disadvantaged, but also the traffic in the vicinity of the offender. Furthermore by hindering and slowing offenders (and other traffic) the capacity of the road will be reduced, which could have the possibility to create congestion of busy roads. Therefore the target road type is a road with a limited throughput, but where speeding occurs regularly. *Question: which road throughput is ideal and possible for this measure?*

Regular speeding: Such a measure is designed to reduce speeding voluntarily or otherwise by force. As many research papers and projects have shown, speeding is a serious danger for road traffic safety. The prevention of speeding therefore has a positive effect on road traffic safety. However the measure is only implementable where speeding occurs. *Question: what level and severity of speeding is needed to make this measure feasible?*

Speed has a particular negative effect: Although high speed and speeding is a danger for road traffic safety, this is the case to a larger or lower extent depending on the location. Approaching towns, where many people live and cross the road, junctions, where traffic conflicts can occur, or at dangerous points on a road, such as a sharp or unsighted bend, the effect of speeding is often multiplied. In situations as these, special attention must be spent on reducing speeding. Therefore these locations are more suited for the implementation of this measure. *Question: Specifically which type of road locations are most suited for implementation?*

3.3 Theory behind the measure

The underlying theory behind the use of traffic signals to reduce speeding and increase safety is the influence of the compliance rate. Throughout the Netherlands the speed limit compliance rate is approximately 60-80% and for provincial road in rural surroundings this compliance level is a mere 50%-60% [Van Schagen, Wegman & Roszbach, 2004]. On the other hand the compliance rate for red lights in the Netherlands is a nationwide at a level of 99%³.

This traffic safety measure aims to make use of the red-light compliance rate to force driver to bring their speed limit compliance rate up to similar levels. When a driver chooses to continue to exceed the speed limit they will encounter a red light at which they will be required to stop. With almost all drivers respecting red light signals in the Netherlands, it is expected that the red light compliance rate will have a positive effect on the speed limit compliance.

³ Source: Ministry of the Attorney General in the Netherlands (*Openbaar Ministerie*)

3.4 Opportunities

The implementation of this speed control measure brings a number of opportunities. These are all connected to the predicted capability to be able to reduce the extent of speeding where implemented. With almost 40% of serious accidents on rural roads claiming many lives every year, the main opportunity is to greatly reduce the amount of deaths and serious injuries due to speeding. Speeding is proved⁴ to cause accidents and when an accident occurs to greatly increase the chance of serious injury or death. Levels of speeding are expected to drop due to the implementation of this measure. However one cannot accurately predict the generic effect, as this will vary per location.

3.5 Necessities

For the physical implementation of the project, certain pieces of equipment need to be in place or need to be constructed. This primarily includes the visible infrastructure, such as the matrix-board, the radars and the traffic signals. In most cases the speed radars and matrix-boards will need to be assembled. The traffic signal installation will, in most cases already be present, and will therefore only require minor adjustments in the programming to accommodate the measure. Other equipment needed is restricted to the necessary wiring between the installations and camera's to register the compliance rate before, during and after the trial.

3.6 Participants

A number of organisations are involved aiding the implementation of the project. These can be split into two groups: the initiative takers and the implementers.

In the initiative takers group are the organisations, which are at the basis for the programme of which this project is a part. Also advisory organisations linked to the initiative are part of this group.

- **ETSC**

The European Safety Counsel is the main initiative taker for the ShLOW programme and offers a wide range of support, including political and technical expertise.

⁴ A large number of studies has proven this

- **SWOV**

The Dutch national road safety institute and is active in the area of traffic safety research. The institute is also a partner organisation of the ETSC and advises Dutch government among others on the traffic safety issues.

- **TU Delft**

The Delft University of Technology is a participating institute of learning for the ShLOW programme. At the university a wide range of traffic related issues are researched including traffic safety subjects. A number of experts in the field are available for technical and procedural support in the project.

On the implementers side are the authorities and/or organisations that are involved in the physical implementation of the project measure, either through planning, financing and/or as responsible authority.

- **Local municipality**

The proposed project will be put forward to a number of local authorities as a possible solution to speeding on certain roads. These authorities will be responsible for the physical implementation. Planning of the project can be carried out in conjunction with the project initiator, Simeon Calvert. Financing of the project will also fall under the responsibilities of the participating authority.

- **External financiers**

Besides the local authority, external sources of finance will be sought for the project, as to increase the attractiveness for implementation. Primarily this will be sought in the form of government grants or subsidies. However private investment may also be among the possibilities.

At this moment the participants on the 'implementer' side are as yet not confirmed.

3.7 Reference Projects

Portugal

The idea of using traffic signals to enforce speed is not new. For a number of years the Portuguese road authorities have been using a similar measure to prevent drivers speeding on main provincial. By using traffic signal installations which doubled as controlled pedestrian crossings, drivers exceeding the speed limit by a preset amount would be met by a red light as they approach the traffic signals and would therefore be forced to stop. The initial results show promising results, as can be read in research performed by [Margarida C. Coelho, Tiago L. Farias and Nagui M. Roupail, 2005].

4. Project Approach

In the course of this project, a number of phases will take place. The approach for the implementation and execution of the project is explained in this chapter. After approval of this project proposal the phases as described below can be run through. Each phase is described and the envisaged result is given.

Phase A: Survey pilot locations

The assessment of possible locations for the implementation of this project is a first step to be undertaken. This involves not only seeking out local authorities who have specific roads under their jurisdiction with speed problems, but also involves seeking out local groups which have taken an initiative to protest speeding in their area. These local groups will in a lot of cases already be known to local authorities and can act as extra pressure for the implementation of the pilot-project in their area.

The result of this phase is a shortlist of locations and local authorities along with groups allied against speeding in these places.

Phase B: Survey incentives for implementation

It is hoped that many local authorities will be willing to act to improve traffic safety. However when their own resources become involved, further incentives will be needed. The primary incentive should be their willingness to improve road traffic safety and act in the interests of their inhabitants. With the publications of the Mobility Policy Documents by the Dutch ministry of Public Works, local authorities are required to pay special attention to road traffic safety. This can be brought to their attention as this measure works within the guidelines, and probably their own plans, to increase safety on the roads. Further financial incentives in the form of governmental grants and/or subsidies will be looked into. If a local authority has the possibility to be seen to be improving road safety at a minimal cost, this will act as an enormous incentive for implementation. Another incentive is also the good-will factor that can be created, especially towards local action groups campaigning for better road safety.

This phase will result in an overview of incentives for local authorities and hopefully some possibilities to offer financial backing through governmental grants or subsidies.

Phase C: Draw-up specific project-plan

When plausible locations and specific incentives have been surveyed, a project-plan will be drawn up which can be presented to the chosen local authorities. In this plan, the project will be explained, the necessity of the project and other relevant information. With this plan the local authority will have the necessary information to help them make a decision to be part of the project and implement it.

Therefore the results of this phase is a short, but detailed and clear paper which can be used to convince local authorities of the necessity to be involved in the project.

Phase D: Produce PR-material

To aid the promotion of the project when approaching both potential supporting organisations and local authorities, promotional material will be produced. This material will give a short, though decisive overview of the project in mainly a visual manner with text where necessary. It is proposed to have a short film describing the workings of the measure and to have two leaflets. One leaflet is an informational leaflet with details of the measure and the working, the other is a more general speed safety leaflet linked to the measure for gathering support for the road safety measure.

Phase D: Approach action groups and local authorities

Prior to contacting the selected local authorities in relation to the implementation of the project, contact will be sought with relevant action groups. These will be groups active in the geographical area with the goals to improve traffic safety or who else how have an interest in the implementation of the proposed measure. Having these organisations backing the project can be used as extra leverage when talking to the local authorities.

The next step is to officially approach local authorities with the proposal for the implementation of the proposed road traffic safety measure. Previous to this, initial contact will be sought through a tentative letter to the relevant department. By doing this, a local authority has the opportunity to take the initiative, which shows good will from their side and makes working together a more attractive option. Furthermore the

local authorities will be informed and will have had a chance to let themselves be informed, meaning that the official approach will not as a surprise.

This phase has a number of subparts and therefore sub-results. Firstly a coalition will be formed of relevant organisation and groups, from which pressure can be exerted if and when necessary. Furthermore it is sighted a number of local authorities will have been contacted and one or more will be willing to pursue implementation of the project in their municipality.

Phase E: Initiate Project-plan

Once partner municipalities have been found willing to take on the project and financing is in place, the plan can be further implemented. This may mean drawing up the necessary documents in cooperation with the municipality. From there on the plan can be implemented in the physical infrastructure. Along the project location traffic information and data will be registered before the measure is introduced as to have reference data with which can be compared with the data retrieved during and after the project. The installation of the absent equipment will be left to the local authority to have installed. Once this is in place, registration of speed and red-light compliance can commence.

The result of this phase is to have agreements in place with the participating authority and have the placement of the necessary equipment undertaken. The process of registration of traffic data will commence and will be processed.

Phase F: Analyse collected data and produce final conclusions

Once the pilot project time comes to an end, the data collected during and after the trial will be processed and analysed. The analysis will primarily focus on the speed of vehicles and to which extent speeding has changed during and after the trial set-up. The outcome of the analysis should give good insights into the effectiveness of the measure and should lead to recommendations on future possibilities. The choice to continue the measure or to halt it after the project is left to the relevant local authority.

The results of the analysis will offer insight into the effectiveness of the measure and will be compiled in a report as stated in the following phase.

Phase G: Write final report

To conclude the project, a report will be compiled explaining the road traffic safety measure, giving and explaining the results and offering conclusions and recommendations. This report will be a complete summary, which will give insight into the results of the project for the benefit of the participating authorities, organisations and the ETSC. Other traffic organisations and research institutes will also be given access to the results and, if applicable, encouraged to pursue further research into the measure.

The final report will be a specific and concise report on the project and will show the effects of the implemented traffic safety measure.

5. Cost and Time plan

As there are no direct funds available through the ETSC and/or European Commission funding for the project will be primarily sought from the participating local authority. External ways of funding will also be sought. Furthermore it is necessary to have a tight time plan to allow the measure to be implemented and surveyed before the end of the ShLOW project. Further information on the costs and planning are given in the following paragraphs.

5.1 Costs

The costs for the project should be met primarily by the participating local authority. All local municipalities have budgets for traffic and infrastructure, with most also having a budget for traffic safety. Since 2007 the National Mobility Policy Document has been at the heart of most provincial and regional plans for traffic and infrastructure development. In this document attention is spent on the need to maintain a base level of traffic safety and to try to improve on the current levels in the future. With this in mind, many local authorities are obliged to invest in traffic safety.

However with the Policy Document's implementation, a review was performed of financing of traffic safety initiatives, which allows for local authorities to apply for grants and/or subsidies for the initiatives. The use of these financing options can have a positive effect on the chances of a successful implementation of the measure.

Besides governmental support, it may also be possible to seek private financial backing. However this is not seen as a main objective, as this may take more time and resources than it might provide.

At this moment an estimate for the costs of the physical infrastructure being implemented at a location where traffic signals are already present is at 2000-4000 Euros. This however is merely an estimate and also strongly depends on the setup specifications and labour costs need also be added. A more precise cost assessment will be made in the coming weeks.

5.2 Time planning

The time scale of the project is from May until the end of the 2009. In this time the project should be setup, initiated and results should be available.

For more details of the project planning see appendix B.

Appendix A: Bibliography

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Appendix B: Project Planning

			MAY		JUNE				JULY				AUGUST				SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER				JANUARY			
	Time necessary	Projected dates	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	1	2
Project set-up	4 weeks	may-june																																		
Survey incentives	2 weeks	june																																		
Survey possible locations	2 weeks	june-july																																		
Produce PR-material	2 weeks	june-july																																		
Approach & Convince local authorities	8 weeks	july-aug																																		
Initiate project plan*	(8-12 weeks)	sept-nov																																		
Analyse collected data	4 weeks	nov-dec																																		
Write final report	2 weeks	dec-jan																																		