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## Road Safety Lillehammer – Towards Vision Zero

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## Introduction

In Norway approximately 300 persons are killed and 1200 are seriously injured in road traffic accidents annually. The level of effort should be high when it comes to saving lives and preventing mutilation. Therefore, in our endeavours towards road safety, we focus on Vision Zero. Vision Zero is our image of a future situation where nobody is killed or seriously injured in road accidents – a difficult goal to reach. Had the goal been a simple one, a vision would not have been required. The Vision should stimulate development of such measures for accident prevention as are required in order to turn this vision into reality.

## The national demonstration project

### In general

The national demonstration project for Vision Zero has been established in the Lillehammer district. The project will last from 2003 through 2006 and has been given the name Road Safety Lillehammer – Towards Vision Zero. The Norwegian project is based on experience from a Swedish Vision Zero project implemented in the Trollhättan region during 2000-2001.

The project was officially launched by Ms. Torild Skogsholm, Minister of Transport and Communications, on 13 May 2003. The project is implemented by the Norwegian Public Roads Administration in co-operation with the police, Trygg Trafikk (The Norwegian Council for Road Safety), Oppland County and the municipalities Lillehammer, Øyer and Gausdal.

The establishment of a Vision Zero project has been included in the National Budget for 2003. The project is embedded in the National Transport Plan, the Strategic Plan for Road Safety and the National Plan of Action for Road Traffic Safety 2002 – 2011.

### Funding

The project has a total budget of NOK 100 million for the period 2003-2006. The Directorate of Public Roads contributes NOK 75 million and the Norwegian Public Roads Administration - Eastern Region provides NOK 25 million.

The structure of the funding of the parts of the project is as follows:

- Road improvement (incl. traffic regulation)	NOK 67 mill.
- Measures targeting vehicles	NOK 6 mill.
- Measures targeting road users	NOK 7 mill.
- Establishment of communication centre, etc.	NOK 16 mill.
- Administration, etc.	NOK 4 mill.

### The demonstration road

A demonstration road is included in the project. The demonstration road encompasses a total of 32 km of roads in the Lillehammer and Øyer municipalities. Together these roads constitute a loop consisting of a varied selection of roads – thoroughfares, local roads, village and town streets. Euroroute 6 accounts for approximately 20 km; County Road No. 312 and 319, approximately 10 km; municipal roads, less than 2 km of the total.

On the demonstration road it will be possible for individuals and groups to try demonstration vehicles which have different kinds of security technology installed.



the damage the accident causes is. We should take into account that people will always make mistakes, and so we need to adapt roads and vehicles accordingly. Human abilities, along with our limited faculties and skills in traffic situations, should be the basis for all measures taken.

- Use measures in the project that address the entire traffic system, including the road, the vehicle and the road user. The project should demonstrate that several approaches can be employed in order to reduce the number of road fatalities and severe injuries: surveillance measures, information measures and injury reduction measures. Principles are shown in table 1.
- Include the thoroughfare, local roads, village roads and town roads. The demonstration road includes streets with heavy traffic and a large number of pedestrians and cyclists, typical villages (also with substantial tourist traffic), a two-lane, high-standard road, as well as county roads in the form of local roads running parallel to the E6 and used extensively by cyclists and pedestrians.
- Include a mixture of well-known and new measures for accident prevention. This also means a combination of well-known measures used in new settings/dimensions.
- Establish a communication centre focusing on road safety and promoting the project both locally and nationwide. The centre will be established at the Norwegian Road Museum (Norsk vegmuseum), located at Hunderfossen 20 km north of Lillehammer.

*Table 1: Approaches to reducing the number of road fatalities and severe injuries*

	<b>Surveillance measures</b>	<b>Information measures</b>	<b>Injury prevention measures</b>
<b>Targeting the road system</b>	X	X	X
<b>Targeting the vehicles</b>	X	X	X
<b>Targeting the road users</b>	X	X	X

The main challenges of the project are to:

- Render visible different courses of action that can be taken in accident prevention. This also includes focusing on the different consequences associated with various courses of action. For example, constructing a safer road network will entail huge investment, while installing a comprehensive control system will not necessarily be very costly. On the other hand, the latter type of measure can be perceived to entail “costs” in the form of a loss of individual sense of freedom when travelling along the road. It is desirable for the project to generate discussions of these issues.

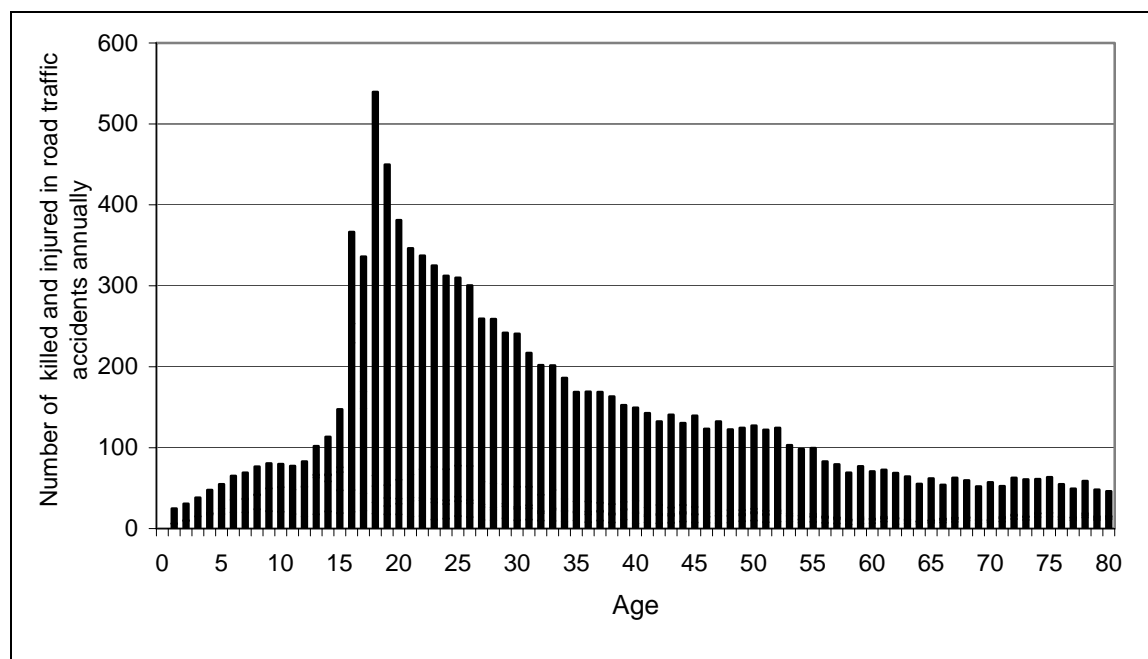
- Demonstrate what can be achieved within a reasonable economic framework. Implemented measures should be transferable so that they can contribute to improvements to road safety nationwide.
- Provide space for new perspectives and encourage research institutions to engage in the project. Several research and development institutions are involved.
- Enhance awareness of road safety issues and provide useful information about the project to visitors and to the population, both locally and nationwide.

### Target groups

The demonstration project targets the following groups:

- all road users – children, young people, adults, senior citizens
- decision-makers
- others who in a professional capacity can contribute to improving road safety

Different instruments must be used in the contact with the various target groups. Reaching the age group 15-24 is of particular interest as this group is especially prone to accidents.



### Evaluation

It is important to gather knowledge and experience from the measures that are initiated. The project is still at an initial stage, but focus has already been put on strategies for follow-up. A number of measurements have been made prior to the implementation of measures, and these will be followed up by investigations subsequent to project completion.

The demonstration road is limited in length. There is therefore an awareness that the different measures may interact and that the effects of individual undertakings may not be measurable. In this case, the project will at any rate serve as inspiration for the development of further ideas and concepts.

Reports and documentation will be compiled as part of the completion of the project during 2006.

## **Project details**

A number of the measures included in the project are in themselves so comprehensive that they can be regarded as separate research projects. This orientation gives only a brief description of the individual measures by way of an example.

### **Measures targeting the road**

Reviews/analyses of the accident profile of the demonstration road have served as a basis for the design and implementation of measures. The main road network, Euroroute 6, is in particular the scene of accidents involving deaths and severe injuries. Accordingly, the project has devoted its main attention to this road. With a view to promoting road safety, emphasis has been given in the implementation of measures to obtaining a pleasing visual impression in addition to adequate design.

### **Measures targeting the entire road network**

Road Safety Inspection: The entire 32 km demonstration road has been reviewed with the aim of identifying and improving inappropriate solutions pertaining to road and roadside design. A comprehensive need for improvement has been identified. The inappropriate design of roadsides along with inadequate solutions for railings and the anchoring of railings are recurring themes. Repair work will be undertaken during 2005.

### **Measures targeting Euroroute 6**

The main focus is directed at motorists since pedestrians and cyclists only use this road to a limited extent.

Central barriers/narrow four-lane road: Comprises the construction of a central barrier over a length of approximately 2,5 km. Around half of this road is to be expanded from two to four lanes. The four-lane road will have a width of 16 metres. In Norway today the minimum requirement for the width of a four-lane road is 20 metres. The road will be completed in the autumn of 2005 and is intended to serve as a reference for future road construction projects. The road will demonstrate that narrower and less costly roads that provide good accessibility can be built without jeopardising road safety. Sweden has gathered positive experience as regards safety on narrow four-lane roads.

Improved winter operation: Focus on operative methods, the selection of equipment for clearing snow and sanding, the selection of level of resource use, and systems for decision-making support to clarify the consequences with regard to driving conditions and circumstances surrounding accidents. This effort should lead to transfer of knowledge and should form the basis for future measures and efforts. A preliminary project was launched during the winter of 2004. Implementation within the framework of the project will be completed during 2006, but the efforts will continue beyond the project period until their final completion during 2008. A comprehensive registration system has been established to record the effects of the measures.

Automatic traffic surveillance including measurement of average speed: Establishment of two photo radar cameras at two points approximately three kilometres apart. The average speed of the individual vehicles travelling from point A to point B is calculated at point B. The system

must satisfy current Norwegian requirements that stipulate that it must be possible to identify all motorists at both points and that any information on motorists who are not speeding must be automatically deleted after passing point B. This solution is intended to produce a more even speed level on the controlled road than that indicated by current automatic traffic surveillance systems. The system will be installed during the summer of 2005.

Central line/road markings: Testing of a combination of a painted central line and machined rumble strips. The solution will consist of a painted central line 0.15 metres wide between two machined rumble strips 0.25 meters wide. The total width will be 0.75-1.0 metre depending on road width. This combination will be used on roads of a width of 8.5-10.0 metres. This measure will increase the distance between the flows of traffic and will provide an adequate safety zone for inattentive motorists heading in the opposite direction to allow them to return to the correct lane. Installation will take place in the autumn of 2005.

Free-text signboards: Testing of free-text signboards intended to provide better information to road users with a view to forestalling traffic accidents. Uses may include reporting of incidents along the demonstration road, alerting of approaching stretches where overtaking is allowed, providing information on temperature, giving overviews of closed mountain passes, etc. Installation and testing will begin in the summer of 2005.

Lighting: Installation of pylons that will bend or have a breaking point in order to reduce damage from a potential impact. Lighting has been installed on those parts of the demonstration road that previously had no lights. Installation will be completed during the autumn of 2004.

### **Measures targeting other parts of the road network**

Along this part of the road network the main focus is directed at simple measures that can provide a better correspondence between the speed limit stated on road signs and the motorists' choice of driving speed. Particular emphasis is given to measures that can improve conditions for pedestrians and cyclists. These measures will be completed during the autumn of 2005 and will include:

- The construction of a 2.5 km footpath/bicycle lane along County Road No. 312 between the villages Granrudmoen and Tingberg.
- Lowering the speed limit from 50 kph to 30 kph in streets with many pedestrians.
- Measures for reducing driving speeds through the use of speed bumps, narrowing the driving lanes and achieving more orderly street parking in the town of Lillehammer.
- Narrowing the driving lanes and increasing the width of the road shoulders on parts of the road network.

During the project period, testing of suggestions for new, simple measures that appear during the process will be facilitated.

### **Vehicles**

A substantial potential for improving safety is found in the installation of new forms of safety equipment in vehicles. For example, it has been calculated that annually in Norway:

- Sixty deaths and 200 cases of severe injury could have been avoided if everybody observed the speed limit.
- Around 50 of those killed in traffic accidents were not wearing seatbelts.

- Around one-third of all motorists killed in accidents are driving under the influence of alcohol.



*Demonstration vehicles*



*Use of alcoloc*

Demonstration vehicles: In the project, safety measures in vehicles are demonstrated by offering test rides in vehicles equipped with ISA (Intelligent Speed Adaption), alcolock (the “breath alcohol ignition interlock device” - BAIID) and computerised logs that register driving patterns. The vehicles used have all been awarded five stars by Euroncap. The project was launched in the summer of 2004.

Alcolocks in public transport: Tests of alcolocks have been undertaken in one of the public transport companies in the town of Lillehammer. Gathering experience of the use of the equipment and the opinions of users are key issues. The project will be launched in the autumn of 2004.

CALM technology: The development and implementation of wireless communication between vehicles and a base station. In the demonstration project, CALM technology is used in conjunction with testing ISA in the demonstration vehicles. This project will be launched during the summer of 2005.

### **Road users and control**

The project comprises three component projects/packages of measures implemented under the auspices of the three main agents for traffic safety in Norway: the police, Trygg Trafikk (The Norwegian Council for Road Safety) and the Norwegian Public Roads Administration. The division of labour is based on recommendations in the “National Plan of Action for Road Traffic Safety 2002-2011”. The police bears the main responsibility for control/monitoring, Safe Traffic for training measures targeting children and young people, and the Norwegian Public Roads Administration for training motorists. Cooperation between these agencies is to be facilitated in order to improve coordination. Establishment of the communication centre “Take a look in the mirror” is incorporated as part of the measures targeting road users, and activities pertaining to road users are coordinated by the centre.

The Norwegian Public Roads Administration: Focus on individually adapted training of motorists. A training programme is being compiled in which the course content and its implementation are adapted to the individual student’s approach to learning (the individual learning style). The working hypothesis is that if training is adapted to the individual style of

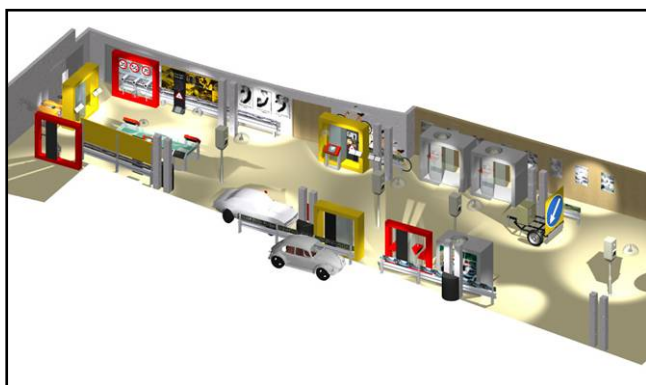
learning, the effects of training will be enhanced and thereby also the opportunities to influence the behaviour of the students after they have obtained a driving licence. The programme originated in Sweden and has been developed by Dr. philos Inger Linderholm (Trivector, Sweden). Young people are divided into four main categories based on their scores in a test, the Driver Attitude Type Evaluator (DATE). The categories describe typical features of a person's behaviour and learning style, allowing for the development of individually adapted educational and didactical approaches, thus making the training an effective instrument for influencing driving behaviour. The project will be launched in the winter of 2005.

Trygg Trafikk - The Norwegian Council for Road Safety: Follow-up of a project package called "Road user – competence – motivation". The project comprises measures targeting nursery schools and schools in the Lillehammer region, as well as organised and non-organised youth. The measures extend over two school years, and will start in the autumn of 2005.

The police: Follow-up of a project package comprising various control measures. The measures included are:

- Testing of radars with number plate recognition and links to penalty registers/databases.
- Surveillance of vehicles from helicopters cooperating with police officers on motorbikes for controlling traffic behaviour at weekends with heavy traffic.
- Achieving improved/more efficient reporting of accidents through more accurate identification of accident sites with the use of GPS, review/improvement of current reporting forms, etc.
- Testing of equipment for the measurement of distances between vehicles.
- More efficient use of equipment for automatic traffic control, through use of photo radar cameras in combination with checkpoints and ordinary patrols.

The communication centre "Take a look in the mirror" will give visitors knowledge of traffic safety through direct experience and learning. The centre is geared towards influencing and interesting its visitors, and should have amenities for road users in all age groups. The centre also organises competitions that have road safety as a theme. For example, in the autumn of 2004 a writing contest was arranged for upper secondary school students. This contest was based on an exhibition of 280 pairs of shoes commemorating the number of fatalities in traffic accidents during 2003. The response to this contest was promising.



*Illustration from the– communication centre*



*280 pairs of shoes - commemorating the number of fatalities in traffic accidents during 2003*

The communication centre is intended to become a permanent traffic safety centre after the completion of the project at the end of 2006.

### Information/communication

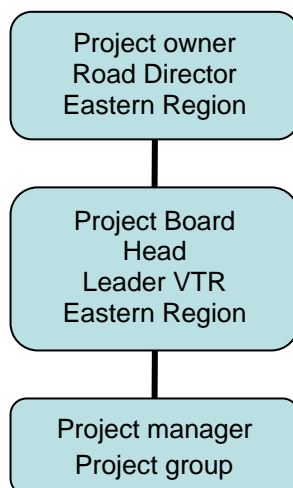
Efforts to publicise the project are currently being undertaken. Examples of media used are:

- Articles in national/local newspapers and several TV channels.
- The establishment of a special website: [www.nullvisjonen.no](http://www.nullvisjonen.no) (written in Norwegian).
- The compilation of brochures and information leaflets.
- The establishment of/participation at stands.

### Organisation

Project organisation is illustrated in following charts.

The project as a whole:



Project group:

