

# VARIABLE SPEED LIMIT TRIALS







## Variable speed limits

The Swedish National Road Administration (SNRA) is launching a trial project on variable speed limits for five years between 2003 and 2007. 18 locations have been chosen for these trials. Variable speed limits mean that the maximum permitted speed is not fixed, but varies according to the traffic situation. Speed limits could vary from 30 km/h through 120 km/h, in 10 km/h steps. Similar systems have previously been successfully tested in several other countries, including Finland and the UK. Trials with recommended speed limits in Sweden have been carried out in two tunnels in Göteborg, on the E4 highway through Stockholm, the E22 highway in Blekinge, and the Sälen highway in Dalarna, all with positive results. The project is essentially about increasing acceptance for, and compliance with, speed restrictions, which is expected to improve accessibility, road safety and environmental conditions.

## Road traffic safety

About 500 people are killed on Swedish roads every year. Tens of thousands are injured. Even if statistics show that the number of fatal accidents is decreasing, 500 killed in road traffic is still not an acceptable level. This is why we have adopted Vision Zero – the new approach set by Parliament at the end of the 1990s. Vision Zero entails not accepting any road fatalities nor serious injuries – that we must strive for a society where there are no road traffic casualties.

### **Speed limits**

Vision Zero requires a complete review of factors that influence road traffic safety. One factor is speed in relation to the traffic situation. Many serious accidents could be avoided or alleviated if drivers would adapt speed to suit the traffic situation. Most people are aware of this, but few act accordingly. One explanation for high speeds on



Today, speed limits are always the same, regardless of weather and traffic situation. However, trials with variable speed limits could change this established system.

Swedish roads could be that speed limits are fixed. A 90 km/h road is always a 90 km/h road, regardless of road conditions. Many road-users tend to drive at the highest permitted speed, even if they should reduce speed because of rain, rush-hour traffic or poor visibility. It is also quite common that drivers exceed speed limits when traffic conditions are more favourable. Now, the SNRA has decided to test variable speed limits as part of its striving to create the best possible conditions for road traffic. We believe that more drivers will comply with speed limits if they are variable – if they change depending on the traffic situation. By 2007 we will know if this is the case.

#### Where will we be testing variable speed limits?

Weather conditions and rush-hour traffic are not the only factors to consider. We have chosen a series of different traffic situations where we believe variable speed limits may change attitudes and behaviour of road-users, and thus improve road safety, increase accessibility and reduce environmental impact.

- In queue build-up and dense traffic
- When a bus joins a roadway
- At slip roads, junctions and left turns
- In poor weather or road conditions
- When children arrive or leave school

## VARIABLE SPEED LIMITS IN PRACTICE





Figure 1

## Information on vehicles and weather conditions

Different types of technical equipment will be installed at the various trial locations. Sensors in the roadway will register the number of vehicles and when vehicles pass. Movement detectors will register smaller vehicles, such as bicycles and mopeds. Weather stations will monitor temperature, precipitation, and road condition. At some locations the road will be monitored with video cameras. Data from this equipment are usually processed automatically (figure 2). The speed limit may then be changed and displayed based on pre-set limit values. Information is also sent to an SNRA traffic information centre (figure 1), where staff may decide on and display the best maximum speed limit based on the conditions, particularly weather.



Figure 2. When a vehicle on a side road approaches the junction, the speed limit is reduced automatically from 90 km/h to 70km/h in both directions. When a vehicle is turning left, the limit is reduced to 70 km/h – but only for oncoming traffic.



## Two types of signs

There are two types of variable speed limit signs, both digitally variable. The most common sign displays electronically a "statutory speed limit", with the same meaning as a fixed speed limit sign. At a few trial locations signs are being tested that show "recommended speed limits". At these locations it is still the standard speed limit signs that are legally binding. The variable signs offer in these cases only a recommendation.

## Targets, measurements, evaluation

Variable speed limits may in the long-term lead to greater acceptance and understanding of speed restrictions. The trials will show if this is the case. In addition, they will provide important insight into traffic law applications and will help developing roadside equipment technology in the best way possible. Measurements will be made before, during and after the trials – not only at trial locations, but also at control locations on roads nearby.

These tests will establish if the trials influence roaduser behaviour outside the trial area. All measurements will be evaluated using a scientific model, making possible a high-quality effect analysis within the three areas: road safety, environment and accessibility.



Statutory speed limit



**Recommended speed limit** 

## VARIABLE SPEED LIMITS WILL BE TESTED AT THE



#### 1. Highway 582 – Alvik (SW Luleå)

Why variable speed limits? Children pass the road on their way to and from school.

Speed (recommended): Lowest: 30 km/h. Highest: 50 km/h.

Trial period: Autumn 2004–2007.

#### 2. Highway 627 - Bodbyn (W Umeå)

Why variable speed limits? To increase safety for pedestrians/bus passengers using the road.

Speed: Lowest: 40 km/h. Highest: 70 km/h. Trial period: 2005–2007.

#### 3. Highway E4 - Junction with a pedestrian route south of Sundsvall

**Why variable speed limits?** Difficult for pedestrians to cross – and for vehicles to join the highway.

Speed: Lowest: 40 km/h. Highest: 70 km/h. Trial period: 2005–2007.

#### 4. Highway E4 - Western approach to Hudiksvall

**Why variable speed limits?** A junction where heavy lorries find it difficult to join and exit the highway.

Speed: Lowest: 70 km/h. Highest: 110 km/h.

Trial period: 2005–2007.

#### 5. Highway E4 - Gästrikland (Gävle-Axmartavlan junction)

**Why variable speed limits?** Heavy volume of traffic, queues and difficult conditions during winter months.

**Speed (recommended):** Lowest: 50 km/h. Highest: 110 km/h.

Trial period: 2005–2007.

#### 6. Highway E18 - Västmanland (Västjädra-Skälby)

Why variable speed limits? Heavy volume of traffic with queues and risk of rear-end collisions. Periods of poor visibility and hazardous road conditions.

Speed: Lowest: 50 km/h. Highest: 110 km/h.

Trial period: 2005–2007.

#### 7. Highway E4/E20 – Södertälje–Stockholm

Why variable speed limits? Many accidents as a result of high traffic intensity and substantial differences in speed. Speed: Lowest: 70 km/h. Highest: 110 km/h. Trial period: 2006–2007.

#### 8. Highway E6 – Uddevalla bridge

**Why variable speed limits?** Periods of strong side winds and a risk of falling ice from bridge cables and pylons.

**Speed:** Lowest: 50 km/h. Highest: 110 km/h. **Trial period:** 2005–2007.

#### 9. Highway 45 - Götaleden (Göteborg)

Why variable speed limits? Risk for queues. Speed: Lowest: 30 km/h. Highest: 70 km/h. Trial period: 2005–2007.

#### 10. Highway E6 - Tingstad tunnel (Göteborg)

Why variable speed limits? Large traffic flow with queues and rear-end accidents.

Speed: Lowest: 30 km/h. Highest: 70 km/h.

Trial period: Spring 2004-2007.

#### 11. Highway E6 – Mölndal

Why variable speed limits? Narrow lanes combined with heavy volumes of traffic during rush hour.

**Speed (recommended):** Lowest: 30 km/h. Highest: 90 km/h.

Trial period: Autumn 2004–2007.

#### 12. Highway E6 - Halland (Skottorp-Morup)

**Why variable speed limits?** A high quality motorway that allows high speeds – in good weather and normal traffic conditions.

Speed: Lowest: 60 km/h. Highest: 120 km/h.

Trial period: 2005-2007.

#### 13. Highway 137 – Öland bridge

Why variable speed limits? Narrow lanes with varying volumes of traffic and periods of bad weather and strong winds.

Speed: Lowest: 50 km/h. Highest: 90 km/h.

Trial period: Summer 2005–2007.

#### 14. Highway E22 – Blekinge (Åryd–Ronneby W)

Why variable speed limits? Numerous collisions with the central safety barrier. A stretch of road with widely varying weather conditions and risk for slippery conditions.

Speed: Lowest: 50 km/h. Highest: 110 km/h.

Trial period: Summer 2004–2007.

#### 15. Highway 21 - Vanneberga (E Vinslöv)

Why variable speed limits? A crossing where speeds should be reduced for safety and accessibility reasons when vehicles approach from side roads or turn left off the main highway.

Speed: Lowest: 50 km/h. Highest: 90 km/h.

Trial period: Summer 2004–2007.

#### 16. Highway E22/17 - Fogdarp (W Hörby)

Why variable speed limits? A crossing where speeds should be reduced for safety and accessibility reasons when vehicles approach from side roads or turn left off the main highway.

Speed: Lowest: 60 km/h. Highest: 90 km/h.

Trial period: Summer 2004–2007.

#### 17. Highway 11 - Kyrkheddinge (E Staffanstorp)

Why variable speed limits? High speeds make it difficult for buses to rejoin the highway from bus stops, and for other traffic to join the highway from slip roads.

Speed: Lowest: 50 km/h. Highest: 90 km/h.

Trial period: October 2003–2007.

#### 18. Highway E65 - Lemmeströ (E Svedala)

Why variable speed limits? A crossing where speeds should be reduced for safety and accessibility reasons when vehicles approach from side roads or turn left off the main highway.

Speed: Lowest: 60 km/h. Highest: 90 km/h.

Trial period: Summer 2004–2007.



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