Cool it!

What's the best way to get motorists to slow down, thereby fighting congestion and pollution, and reducing the severity of accidents? In the Netherlands, average-speed enforcement (also known as section control) has been so effective that it's now being used on provincial roads for the first time, as **David Smith** discovers

For the first time, the Dutch Department of Justice (DoJ) has opted to deploy section control average-speed enforcement systems on dangerous stretches of provincial roads on a large scale. Although the point-to-point camera systems have been used successfully on freeways in the Netherlands since 1997, the DoJ has only used them on a trial basis on provincial roads, on a very small scale. However, the danger for motorists driving on provincial roads – which cover only 6% of the network, but contribute about a quarter of all accidents – has forced the DoJ's hand.

The 20 provincial road sections have been chosen because other traffic calming measures have failed. When accident statistics show the perils of a provincial road, the DoJ's first step is usually to make adjustments, such as making the lines and road markings clearer. The next step is to introduce mobile controls. But sometimes, these strategies fail and the roads continue to be dangerous.

The Netherlands Public Prosecutor's Office, which is the part of the DoJ in charge of this project, believes the time has come to try point-to-point cameras. "We've studied the effectiveness of section control on a dozen stretches of motorways in the Netherlands and the results have been positive. Research shows section control has contributed to reducing accidents, as well as cutting levels of pollution and noise," says Stefan de Bruijn, senior project manager for section control systems at the Netherlands Public Prosecutor's Office (DoJ).

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> **Stefan de Bruijn, senior project manager for section control systems, Netherlands Public Prosecutor's Office**

Selecting roads and vendors

Before selecting 20 suitable roads, the Public Prosecution Service carried out intensive analysis of accident data held by Dutch municipalities and police forces. They are mainly single- and double-carriageway roads with maximum speeds between 80km and 100km (50-60mph). Each section is at

Section control has been in place on Dutch freeways for 21 years

1%

The typical proportion of speed offenses on section control stretches of road, compared with an average 20% baseline

Source: Sensys Gatso

least 1.5km (1 mile) long with few access or exit roads. All 20 roads have high accident and speed violation rates. Common risk factors include access roads, cyclists and other vulnerable road users, and high numbers of trees.

After a tender process, the Public Prosecutor's Office selected two providers, Sensys Gatso and ARS Traffic & Transport Technology, to install, manage and maintain their systems. Each company will take charge of 10 roads, with deployment scheduled to begin in February 2019 and be completed by the end of the year. "We chose the systems after a European-wide tender that ensured we got the best products for a reasonable price," says de Bruijn. "We also wanted to work with more than one provider in order to stimulate product development, so that better systems become available over time. We'll monitor performance of both technologies and when there's a new tender, those results may be taken into account."

The two systems are somewhat different. Sensys Gatso's T-Series platform uses a 20MP camera offering 30fps. The company's tracking radar measures the speed and position of up to 32 vehicles in the coverage area. The unit's integrated wi-fi transmits information to a data analytics platform operating as the back-office enforcement system. Meanwhile, ARS T&TT's SmartCam is a modular ALPR camera solution.

The average-speed enforcement systems will be in operation for a minimum of six years. "The two systems had to do a number of things, including checking for speed 24 hours a day; and recognizing different vehicle categories to determine vehicle speed limits. They also have to recognize the license plates of foreign cars and be almost completely error-free. We had further stipulations around data storage and processing, as well as security," says de Bruijn.

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> **Dr Charles Goldenbeld, researcher, Dutch Institute for Road Safety Research**

Behind the curve?

The decision to install section control on provincial roads is welcome, but a little belated, according to Dr Charles Goldenbeld, a researcher at the Dutch Institute for Road Safety Research (SWOV). He points out section control systems have been on Dutch freeways for 21 years and the evidence for their effectiveness has been mounting over a long period of time. There are now a dozen in operation. "I'm delighted the Ministry of Justice [MoJ] has made the decision, it's just a shame it's been such a long time coming. We advocated section control on provincial roads about 15 years ago. They were reluctant, believing drivers might avoid the cameras by taking alternative roads, but they've realized

now that there are enough suitable provincial roads and it's the best solution. The main alternative of redesigning roads would cost billions of dollars, which unworkable."

Wishful thinking

If money were no object, Goldenbeld would introduce section controls on up to 50 Dutch provincial roads with high accident rates. He says that even if the systems are costly to install and run, they pay for themselves within three or four years. Reducing accidents saves money on healthcare, infrastructure upkeep and police time. One of the funding issues in the Netherlands – as in many countries – is that the ministry paying for the cameras is not always the same ministry that reaps the rewards.

"Road safety is important for governments, but there are always financial considerations. In the Netherlands, we have the MoJ paying for the camera systems, but the Ministry of Infrastructure and Environment is responsible for road safety. Then it's the Ministry of Health that benefits when there are fewer accidents. The best way to operate road safety measures is to get them co-financed by three ministries."

Goldenbeld is an enthusiast for section controls, but only because he has studied the international data for many years. He considers the evidence for section controls to be pretty convincing on a number of levels, citing studies from the UK, Austria, Norway and Australia showing it reduces overall speeds as well as the variability of traffic speeds. "Studies show a high level of compliance because drivers don't want to pay fines. As a result, you get more homogenous speeds along the whole route," Goldenbeld says. The result is a conveyor belt of vehicles traveling at the same speed, with little braking and larger headways. Once vehicles are on the conveyor belt,

The Dutch difference

How the system of speeding enforcement and penalties differs in the Netherlands from other jurisdictions

In the Netherlands, speeding fines are calculated differently to many other European countries. When caught speeding, everybody gets a deduction of 3km/h for speeds below 100km/h (60mph) and 3% above 100km/h. Furthermore, cameras are typically calibrated with a margin of 7km/h for speeds of 80km/h (50mph) and 8km/h for speeds of 100km/h.

What this means in practice is that the cameras on an 80km/h stretch are tuned to 87km/h. But if a driver is caught doing 87km/h, it will be reduced to 84km/h for the purposes of the fine. Both the measured and the corrected speed will be printed on the fine.

Another difference with the UK, and other systems, is that no matter how many speeding

fines a motorist receives, he or she won't be disqualified unless they have been driving very high speeds. This means 40km/h (25mph) more than the speed limit on highways, or 30km/h (19mph) higher on rural roads. Dr Charles Goldenbeld at SWOV says there have been long debates in the Netherlands about whether to introduce a UK-style points system.

"On the one hand, people who can afford to pay a lot of fines don't change their behavior. We had a government minister a few years ago who kept getting caught speeding on his motorbike, but he said publicly that he would keep doing the same thing.

"On the other hand, there is evidence that the effect of a points system wears off after 18 months and it would cost a lot to change the administration processes," he says.

Goldenbeld also says there's a perception in the Netherlands that it's easy to cheat the system by claiming that a friend or relative was driving the car to avoid disqualification. "The same argument applies to speed awareness courses. It's easy to send someone else in your place," he says.

> "Communication with the public is of great importance. Before the systems are implemented, we will be carrying out extensive media campaigns
>
> **Ernst Koelman, spokesman, Netherlands Public Prosecutor's Office**

47%

reduction in crashes after the installation of section control systems on a Rotterdam freeway

Source: SWOV

A reduction in variability of traffic speeds is just one benefit of average-speed cameras

Goldenbeld says, the journey becomes predictable and repeatable. Compared with spot speed cameras, section control reduces the 'surfing effect', where drivers brake on approaching a camera, and accelerate after passing it.

Real results

Evidence from the Netherlands confirms international study findings. Section control on a freeway near Rotterdam with 140,000 vehicles passing through daily found only 1% of offenders contravened the 80km/h (50mph) limit (which had been reduced from 100km/h). The study showed a 47% reduction in all crashes, as well as a 4-6% cut in NO_2 concentrations and a reduction in daily noise of 0.4dB. The air around the road became 10% cleaner than it was before. "Reducing pollution, from emissions and noise, was the main goal of the first section control systems in the Netherlands," says Goldenbeld. "Safety was a secondary goal, but we soon learned what an excellent way it was of controlling speed. The main difference with the new project on the provincial roads is that safety is the goal from the start."

More evidence came from a 2014 thesis analyzing the safety effects of seven section control systems on 14 different roads in the Netherlands. According to the author, Eline W Korthof, a civil engineer from TU Delft faculty, the best results came when section control was combined with speed limit reduction, which was the case on most roads. Mean speed decreased by 16% and speed variance decreased by 41%. The number of serious injuries fell by 37% and the number of casualties dropped by 15%.

An important benefit of section control, Goldenbeld says, is that the public tends to regard it as a fairer method of speed control than less visible methods. A 2009 Dutch study (Poppeliers et al) found 77% of Dutch drivers considered section control acceptable. DoJ research has the figure closer to 90%.

A section control study took place on a freeway near Rotterdam

"When it's clearly communicated with signs saying where it begins and ends, people find visible checks much fairer than invisible ones – you have to be speeding over longer periods rather than for one moment. We also have radar checks in the Netherlands and when drivers don't see where the unit is they get very angry. They hate invisible checks," says Goldenbeld.

The public perception of section controls is important to the MoJ as resentful drivers can quickly begin to suspect the authorities of raking in cash at their expense. Spokesman Ernst Koelman of the DoJ says it will do all it can to avoid becoming what he calls "a rewarding subject for pub talk". The DoJ, he insists, is aware of the importance of good public relations, especially with a system untested on provincial roads. "We believe good communication with the public is of great importance. Before the systems are implemented, we will be carrying out extensive media campaigns. Then, when we install the cameras, we will announce the beginning and end of each section control with large signs on the side of the roads. The MoJ will also publicize the number of fines imposed per system three times a year, so that nothing is hidden from the public."

90%

The reported public support for section control speed enforcement in the Netherlands

Source: Dutch Public Prosecution Service

A portable alternative

Handheld laser devices offer a portable alternative to section control

Laser Technology Inc. (LTI) revolutionized traffic enforcement over 30 years ago with the introduction of the very first laser speed measurement device. This breakthrough enabled law enforcement officers to pinpoint an individual vehicle in dense traffic, while giving them a tool unaffected by radar detectors.

LTI continues to develop technologies that help law enforcement agencies improve safety on the world's roadways. The company offers a full range of laser ranging solutions, including a groundbreaking all-in-one device that helps enforce speed, tailgating, aggressive driving and distracted driving.

LTI's TruCAM II, an all-in-one speed enforcement tool, combines lidar with a built-in digital video camera and is one of the most sophisticated traffic enforcement tools available. It collects and stores a complete chain of video evidence along with a high-resolution image identifying vehicle make, model and license plate number.

The mobile TruCAM II unit has been decades in the making and amplifies the capabilities that made its predecessor, the original TruCAM, one of the most widely used laser enforcement tools in the world. The TruCAM II caters to law enforcers' most pressing demands, which include the need for a quality image that also can be used for fixed installations or mobile speed enforcement.

Easy-to-use, lightweight and with an IP55 rating for professional performance even in bad weather, the TruCAM II's larger LCD backlit screen enables viewing in any lighting condition, and wi-fi, Ethernet and cloud-based capabilities for roadside printing. It also features AdapTec auto-focus and auto-iris for accurate point-and-shoot detection as well as crystal-clear license plate images, day or night.

The included ShareView software allows for remote screen viewing and the ability to send images back to the department.

This lidar unit also integrates with the LTI Blitz software for sending images to another officer down-road during speed enforcement operations or to the FTP server, which can push images to multiple tablets and quickly display the recorded infraction to drivers.

The TruCAM II traffic and speed enforcement laser is one of the most advanced, versatile speed enforcement tools and sets a new standard for effective roadway policing.