

Report on the Use of Safety Cameras

Membership of the Expert Group

Mr Brendan Callaghan (Chairperson)
Principal Officer, Crime 1 Division
Department of Justice, Equality and Law Reform

Mr John Weafer
Principal Officer,
Department of Transport

Ms Ann Cody
Assistant Principal Officer
Department of Transport

Mr John Farrelly (Alternate: Superintendent Tom Murphy)
Chief Superintendent,
Garda National Traffic Bureau

Mr Declan O'Brien (Alternate: Inspector Michael Brosnan)
Superintendent,
Garda National Traffic Bureau

Mr Harry Cullen (Alternate: Ms Ann McDermott)
Senior Project Manager
National Roads Authority

Mr Finbarr Crowley
Consultant, formerly of National Roads Authority

Ms Oonagh McPhillips (Secretary from December 2003 to July 2004)
Assistant Principal, Crime 1 Division
Department of Justice, Equality and Law Reform

Ms Pauline Waters (Secretary from July 2004 onwards) (Alternate: Mr Damien Ward)
Assistant Principal, Crime 1 Division
Department of Justice, Equality and Law Reform

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Executive Summary

The objective of a safety camera project is to reduce the number of speed related collisions by:

1. increasing compliance with speed limits across the entire road network;
2. reducing the speed of vehicles at locations that have a speed related collision history; and
3. acting as a deterrent to driving at excessive speeds.

The use of camera technology will result in increased volumes of detections of traffic offences thereby achieving greater general deterrence (section 2.1).

The Government Road Safety Strategy 2004-2006 (page 25 of Strategy) proposes that “An Garda Síochána will enter into arrangements for the engagement of a private sector concern for the purpose of the provision and operation of a nationwide programme for the detection of speeding offences” (section 3.1).

For any safety camera project to be successful, the public must recognise that its purpose is to save lives and is not related to revenue collection (section 4).

The operation of safety cameras is more appropriate for a private service provider than for the Garda for a number of reasons: the Garda Síochána cannot achieve critical mass in terms of enforcement; private service provider personnel will require mainly technical training; it would be efficient to transfer the risk represented by advances in the technology to a private service provider; and it would also be more efficient for a private provider rather than the Garda to provide back office capability such as processing camera detections and issuing fixed charge notices as these are not core policing matters (section 5).

Proportionality The cameras will be used to increase compliance with speed limits across the entire road network; and to reduce the speed of vehicles at locations that either have a speed related collision history or are of a type where a higher than expected frequency of collisions may be expected to occur; and by so doing increase road safety (section 6.1).

Fixed Site or Mobile Camera Units Because of the characteristics of the State’s road network, the use of mobile cameras is the practical approach, although the use of fixed cameras may be relevant at a small number of locations, for example, at a limited number of motorway and dual carriageway locations with a previous history of speed related collisions and at collision locations where a limit has been reached in engineering improvements (section 6.2 and Appendix).

Covert or Overt Both methods will be used, as the mobile cameras will be capable of operating in either fashion. The decision on how a camera will operate at a particular site will be decided by the Garda Síochána. In the first year, 20% of observations should be overt and 80% covert, with this mix to be reviewed after the first year of operation (section 6.3 and Appendix).

Site Selection (See Appendix) The National Roads Authority (NRA) have analysed the road accident database for speed related accidents in order to link speed checks to where and when speed related accidents are happening.

The result is a matrix of proposals to link speed checks to speed related accidents:

- More speed checks at weekends than on weekdays;
- More speed checks between midnight and 03.00 than at other times;
- Motorways and dual carriageways to have less than 3% of speed checks;
- 50% of the speed checks on national roads and 50% on non-national roads;
- Urban national and rural roads should have a higher proportion of camera hours;
- 15 - 20% of checks on Heavy Goods Vehicles (HGVs).

Site selection will be made by the Office of Safety Camera Management (see below).

Number of Sites The project will commence with approximately 500-600 locations countrywide (about 15-20 locations per local authority). The number of locations will be increased as necessary to get the road safety result sought (section 6.5 and Appendix).

Funding Initially, when the outsourced service is fully functional, the revenue from speeding fixed charges will be considerable - prospectively €70 million per annum. However, as driver compliance increases, this will decrease, but it is anticipated that it will continue to exceed the cost of operating the system. Having obtained the views of the Garda Síochána, it is the view of the working group that payments to the private provider and increased Garda costs should be met from an appropriate increase in the Garda Vote (section 6.6).

Processing

A number of options are possible. It is recommended that the private operator's processing office would also process Garda non-intercept speeding detections. In the longer term the private operator's processing office could take over all the work of the Garda National Processing Office in addition to processing the operator's speeding detections (section 6.7).

The Garda Síochána would monitor evidential issues by the assignment of Garda personnel to the private operator's processing office.

Legislative Changes It will be necessary to provide authority for non-Garda personnel to operate safety cameras and process their output (sections 6.8 and 6.9).

Design and Execution of Speed Management Process The Appendix sets out the detailed design and execution of a speed management programme (section 7).

Organisational Model

The Garda Síochána will be responsible for the project. The project will be managed at three levels:

Safety Camera Supervisory Board chaired by an Assistant Commissioner. It will establish:

- the criteria for enforcement site locations;
- enforcement tolerance levels;
- setting and monitoring of performance indicators and quality standards (section 8.1).

Office for Safety Camera Management headed by a Garda Superintendent. It will manage the day-to-day running of the project, such as:

- financial control;
- reporting;
- monitoring of operations;
- communications;
- site selection;
- consultation
- performance management.

Its performance indicators/targets should be:

- number of vehicles checked;
- number of offences detected;
- rate of capture of images of offending vehicles;
- rate of issue of fixed charge notices.

It will report to the Safety Camera Supervisory Board (section 8.2).

Private Operator The private operator will:

- provide mobile safety camera units; camera operators; and a processing system to view images;
- identify vehicles;
- issue fixed charge notices and nomination notices (to enable the registered owner of a vehicle to nominate the driver when the offence was committed if not the registered driver);
- identify notices not paid;
- where payment is not made, prepare a prosecution file for the Garda Síochána;
- submit management reports to the Garda Síochána;
- facilitate enforcement site location inspections (section 8.3).

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1. Working Group

A working group on speed cameras under the chair of the Department of Justice, Equality and Law Reform was established on 17 December 2003 and set for itself the following terms of reference (as amended at the meeting of 8 January 2004).

The working group on speed cameras shall:

1. Inform itself on the equipment and processes used by An Garda Síochána to gather information on speeding by road users and how such information is and will be used to penalise speeding drivers;
2. Examine what elements might be outsourced by An Garda Síochána to third party provider(s), including the purchase and maintenance of equipment and the carrying out of processes such as the viewing of images and the issuing of fixed charge notices;
3. Examine the interface between the operation of elements outsourced and the operations of An Garda Síochána, in particular, the operation of the Fixed Charge Processing System and the facilities for payment of fixed charges associated with it;
4. Examine what changes would be necessary to enable those elements to be outsourced, including:
 - (i) Legislative changes;
 - (ii) How there might be Garda Síochána and other input into such matters as the type of equipment (including digital equipment) to be used by a service provider, the location of the equipment, performance criteria and monitoring requirements;
5. Examine how public support for the changes might be ensured, and
6. Make recommendations to the Ministers for Justice, Equality and Law Reform and Transport on:
 - (a) how the speeding targets set out in the revised Road Safety Strategy are to be met;
 - (b) how An Garda Síochána would operate their retained speed detection capacity; and
 - (c) guidelines for deciding the location and operation of cameras

as the basis on which a joint Memorandum for Government will be prepared.

2. Focus on Speed

While safety cameras can be used to detect a number of different road traffic offences the focus in this report is on the detection of excessive speed offences.

The Government Road Strategy 2004 to 2006 states:

Based on the deployment of additional enforcement assets through the engagement of private sector camera operations and the continued high level of direct Garda enforcement, it is envisaged that by the completion of the period of the Strategy, at least 50% of the overall vehicle fleet will pass through a speed check each month. As the national fleet of registered vehicles numbers over 1.85 million, this will require an annual number of checks of approximately 11.1 million. (Department of Transport 2004, page 25).

2.1 Objectives for a Safety Camera Project (Speed Enforcement)

The objective of a safety camera project is to reduce the number of speed related collisions and therefore save lives by:

1. increasing compliance with speed limits across the entire road network;
2. reducing the speed of vehicles at locations that have a speed related collision history; and
3. acting as a deterrent to driving at excessive speeds.

The use of a comprehensive safety camera project will have a significant effect in decreasing speeding levels which will directly reduce the rate of fatalities and serious injuries from collisions on our roads (Newstead and Cameron, 2003, PA Consulting 2004).

2.2 The Effect of Speed

The consequences of excessive vehicle speed affect road safety in three ways – by increasing:

1. the risk of having a collision, because of the reduced time available for a driver to respond to hazards;
2. the impact of collisions; and
3. the risk of death and severity of injuries in a collision.

2.3 The Use of Enforcement to Reduce Speed

The accepted model for improving road safety is based on the integration of education, engineering and enforcement. It is believed that road users will improve their conduct when informed of and educated in the dangers of inappropriate behaviour.

Deaths and injuries on the road will decrease as vehicles and the roads become safer. When road users ignore both educational and engineering initiatives, then reliance must be placed on enforcement.

The use of enforcement to enhance road user behaviour is effective in two ways (Cameron et al, 2003). A road user who commits an offence will generally be deterred from committing further offences once he/she has been apprehended. This is referred to as 'specific deterrence'.

Road users who are aware that other road users are being detected will refrain from offending themselves. This is known as 'general deterrence'.

3. Traditional Traffic Law Enforcement

Traditional traffic law enforcement is based on an 'intercept'. A police officer detects a road traffic offence, stops the vehicle and either issues a fixed charge notice (previously known as a fine on the spot) or instigates a criminal proceeding by issuing a summons to the driver.

Intercept detections are effective in achieving both specific and general deterrence (Zaal, 1994). A police officer could also deal with an offender whom he/she did not intercept, if the number of the offending vehicle is known and procedures are in place to establish the driver's identity.

3.1 The Need for Automation

In respect of speed traditional traffic law enforcement is insufficient to achieve effective speed compliance by all road users. The number of police officers that are required to intercept sufficient offenders to create real 'general deterrence' is greater than any police organisation can allocate to traffic policing.

"The problem with traditional enforcement methods is that [the] limited policing resources available, as compared to the relatively high number of speeding motorists, results in a low perceived risk of apprehension." (Zaal, 1994).

In Ireland the Gardaí have to operate on 95,000 kilometres of roads, of which 91% are classified as rural. Over 1.8 million vehicles are registered in the State and travel these roads along with thousands of foreign registered vehicles that enter the State. There are 2.5 million licence holders in Ireland. Therefore using traditional traffic law enforcement methods the Gardaí could never achieve effective speed compliance by intercept methods.

The solution to this problem of traditional traffic law enforcement is the use of automated technology. Automated methods to enforce traffic legislation have been used internationally over the last 15 years. The use of camera technology in particular will result in increased volumes in detections of traffic offenders, thereby achieving greater general deterrence.

Turner, S. and Polk, A. (1998) define automated enforcement as:

"... the use of image capture technology to monitor and enforce traffic control laws, regulations, or restrictions. Where enabling legislation authorizes the use of automated enforcement, the image capture technology negates the need for a police officer to directly witness a traffic offense."

Automated enforcement therefore has several advantages over traditional enforcement. For example the Accident Compensation Corporation in New Zealand in 2000 identified these advantages as:

1. They increase the probability of detection without overextending front-line police resources, since police do not have to spend long periods of time detecting and apprehending speeders. This also means that the 'enforcement pause' is eliminated, that is, the device does not need temporarily to cease operation while the speeding driver is apprehended.
2. They increase road users' perceptions of the risk of getting caught, through direct observation, associated publicity and/or receiving a ticket when they were unaware they had been detected. Hence, the devices have a higher deterrence effect.
3. They increase the perception of fairness of enforcement by taking 'officer discretion' out of the equation.
4. They have been reported to lead to fewer disputes by motorists regarding their fines and hence provide a more efficient ticketing and payment process.
5. They can be used in locations where patrol vehicles cannot be safely and effectively deployed.

The need for increased automation of traffic law enforcement is recognised in the Road Safety Strategy 2004 – 2006 which proposes that:

... An Garda Síochána will enter into arrangements for the engagement of a private sector concern for the purpose of the provision and operation of a nationwide programme for the detection of speeding offences. (Department of Transport 2004, page 25)

4. Public Perception

The success of any safety camera project will be a high level of compliance by all road users with the traffic laws. The public must accept that the project is genuinely to increase road safety and is carried out for the proper reasons. The perception must be that safety cameras save lives and do not relate to revenue collection.

The Irish public have indicated that they support an increase in traffic law enforcement and support the use of safety cameras. Eighty five percent of those surveyed stated that they supported increased traffic law enforcement, and eighty seven percent were in favour of automated enforcement methods (SARTRE 2004).

Experience in the United Kingdom, Australia and New Zealand has shown that the public acceptance of safety cameras for the detection of speeding offence increases after such a project is implemented (ARRB Transport Research 2001, Corbett and Simon 1999).

5. The Private Operation of a Safety Camera Project

Gardaí spend two years training at the Garda College. The focus of such training is on the interpersonal skills used every day in work dealing with the general public. The operation of a safety camera requires no interpersonal skills.

Therefore a third party provider will carry out the operation of safety cameras by non-Garda personnel who require mainly technical training and can operate safety cameras successfully. The use of private operators is now commonplace in the UK, USA and Australia.

The use of automated technology has greatly improved the effectiveness of traffic law enforcement in the detection of speeding offences. However the operation of such automated equipment does not require the use of skills possessed by police officers. The operation of such equipment by highly trained police officers is undesirable and unnecessary.

A second reason why An Garda Síochána should not carry out safety camera operation is that advances are constantly being made in development of detection technology. Equipment that is up to date today will be quickly superseded in the near future. It would be efficient for the Gardaí to transfer the risk of advances in safety camera technology to a private operator.

Safety cameras are only effective if the back office system is in place to support their use. Currently the Gardaí have to process manually the limited number of camera related speed offences they detect. (The Gardaí operate eight mobile camera units.)

Camera detections are based on the image of an offending vehicle. Using the registered number of the vehicle, the Garda member will obtain the name of the registered owner when he/she accesses the National Vehicle File.

A fixed charge notice including a nomination notice is sent to the owner who can either pay the fixed charge or nominate the driver of the vehicle when the detection was made. Where an owner nominates another driver, the Garda will send a fixed charge notice to the person concerned. Gardaí using a manual procedure currently carry out these processes.

This procedure will be more efficient if an information technology processing system is established. There are again no skills requirements that need to be carried out by a Garda member, and a third party provider should provide the service. The provision of such services by a third party service provider is in line with the Road Safety Strategy 2004 – 2006.

6. Issues Pertinent to a Safety Camera Project

There are a number of issues that have been considered when examining the feasibility of implementing an effective safety camera project operated by a private sector concern. These issues are discussed in general terms here and in more detail in the Appendix.

6.1 Proportionality

The replacement of Gardaí carrying out traffic enforcement duties by automated technology has to be carefully considered. The focus for the use of widespread technology has to be dealing with a specific problem (Government White Paper 2004) and not be a revenue collection exercise.

The specific objective for the use of safety cameras is:

- to increase compliance with speed limits across the entire road network; and
- to reduce the speed of vehicles at locations that either have a speed related collision history or are of a type where a higher than expected frequency of collisions may be expected to occur.

The concentration on these objectives will weaken any argument that the use of safety cameras in Ireland is focused on anything but a strategic goal to decrease deaths and serious injuries on the roads. There is no other objective. The use of such cameras will primarily act as a deterrent, but will otherwise provide effective, proportionate and dissuasive sanctions (EU Commission 2003).

6.2 Fixed Site or Mobile Camera Units

The use of mobile camera units is the practical approach to automatic traffic enforcement for excessive speeding in Ireland. The use of fixed cameras may be relevant at a small number of locations but the focus will be primarily on the installation of mobile units.

The use of mobile units is suitable in Ireland primarily because of the road network in the State. The Irish road network has the following three characteristics which make mobile units effective:

1. The vast majority of Irish roads are classified as 'rural'. Rural roads account for 91% of our roads compared to the EU average of 70%. The proportion of Irish roads which are rural is far greater than in the United Kingdom, where only 46% are so classified (ICL Consulting 2003).
2. Sixty percent of speed related fatal collisions and seventy percent of speed related serious injury collisions occur on regional and local roads (National Roads Authority, 2004).

3. The volume of traffic on the vast majority of Irish roads is low with an Average Annual Daily Traffic of only 309 on local roads, rising to 2,350 on regional roads. The overall average is only 1,000.

A good case could be made for using fixed cameras at a limited number of motorway and dual carriageway locations with a previous history of speed related collisions and at collision locations where a limit has been reached in engineering improvements.

In situations where mobile cameras are used, the camera type will depend on evidential requirements.

6.3 Covert v Overt

Research on the methods used for mobile camera units indicates that both overt and covert enforcement programmes are perceived as potentially resulting in positive outcomes. In relation to general speed enforcement, it is believed that more overt programmes would slow people down more effectively. In relation to speed camera enforcement, it is believed that more covert programmes would detect more speeding drivers (Senserrick).

It has been found that overt programmes influence the larger number of law-abiding drivers and covert the drivers who tend to offend. Overt programmes have the greatest impact on heavily trafficked routes.

The safety cameras project in Ireland will combine both methods, as mobile safety camera units will be capable of operating in either a covert or overt fashion. The decision as to how a unit will operate at a particular site will be decided by An Garda Síochána (Department of Transport, 2004).

Some overt observations should be taken, particularly on motorways and dual carriageways and in some locations on roads with hard shoulders. At other locations, covert will be found to be more suitable. In the first year, say 20% of observations should be overt and 80% covert. The overt versus covert mix should be reviewed by Office for Safety Camera Management (see section 8.2) after the first year of operation of the new privatised speed camera system. The vehicles to be used in the speed camera programme should be capable of being used for overt and for covert detection. Experience in Queensland suggests that the progression over time should be from overt to covert.

Variable message signs such as speed indicator signs could be used in support of the camera strategy.

6.4 Criteria for Site Selection

The selection of enforcement sites for mobile safety camera units is the most important operational feature of the project. There must be a strategic approach to ensure the effectiveness of the safety cameras project (NZ Comptroller and Auditor General, 2002). Selection of sites has to be correct and precise, and the driving public must be convinced of the reason for choosing each and every site.

An Garda Síochána with the assistance of the National Road Authority will identify sites that meet specific criteria. These criteria and a risk matrix are presented in the Appendix and described in the Executive Summary of the Appendix.

Once a site is identified the following will be the procedure:

1. The private operator will carry out a speed survey over a specific time period at the site. If the 85th percentile speed is above the actual speed limit (ie. 15% of drivers exceed the speed limit) the site will be considered for enforcement. If the 85th percentile speed is below the actual speed limit, the Gardaí will propose to the local authority that it consider reviewing the actual speed limit;
2. Once a site is selected by the Gardaí on the basis of the speed survey, consultations will take place between the local Garda District Officer and the local authority as to the feasibility of choosing the site for safety camera cameras enforcement;
3. After six months of speed camera enforcement the private operator will carry out another speed survey. Based on the findings of this survey, enforcement at this site will be reduced or increased on the instruction of the Gardaí.

6.5 Number of Sites

It is very difficult to anticipate the number of enforcement sites prior to the establishment of the project. For that reason an office to be known as the Office for Safety Camera Management (see 8.2 below) will be established six months before the commencement of a contract with a private service provider to provide mobile camera units. The number of sites to begin with will be determined by the application of the methodology in the Appendix.

6.6 Funding

To retain public support for the safety camera project there will be no linkage to the revenue that may be collected as fixed charges or court fines. The project must always focus on its primary objective of reducing excessive speed and thereby reducing death and serious injury.

Initially the revenue from speeding fixed charges will outweigh the costs substantially. With a potential 1.1 million detections (10% of checks) and the likelihood that 80% of detected drivers will pay the charge of €80 initially, the prospective annual income could be as high as €70 million. The moneys collected from the fixed charges are accounted for as Extra Exchequer Receipts and are paid directly to the Paymaster General. There will also be revenue from court imposed fines. However as the project begins to have an effect the revenues generated will fall off dramatically as driver compliance increases. Nevertheless, it is anticipated that even in later years the revenue generated would exceed the cost of operating this scheme.

The real benefits will be in the number of lives saved and the increased economic production of those who otherwise would have died or suffered life-changing injuries.

If, by 2010, the number for fatalities in Ireland was reduced in line with the EU Commission's target of reducing deaths by 50%, the savings could be in the region of €234 million (Draft Economic Evaluation of the Government Strategy for Road Safety 1998 – 2002, Goodbody Economic Consultants, December 2004).

Having obtained the views of the Garda Síochána, it is the view of the working group that the full cost of providing a safety camera project should be paid from the Garda Vote, which should be increased by the required amount to run the safety camera project annually. This should include payments to a private operator, which would include meeting the project's running costs, and the provision of Garda resources required to manage the project.

6.7 Processing

The effectiveness of any safety cameras project is based on the provision of an efficient back office processing system. Such a system can be provided by a private sector operator. There should only be a limited role for the Gardaí in such a system. As a back office processing system deals with matters that are potentially evidential in court prosecutions, that Garda role would be to monitor the quality of notices, images, statements, etc by the assignment of Garda personnel.

There are four options as to how back office processing might be incorporated into a safety camera project:

Option 1

The planned Garda National Processing Office (Garda NPO) will process all intercept and cameras image speeding offences detected by the Gardaí. In this option the private operator would send all images of detected vehicles to the Garda NPO where they would be processed in the same way as vehicles detected by the Gardaí.

The disadvantage of this system is that the volume of offences detected would be far higher than the present expected volume for the Garda NPO. If the Road Safety Strategy 2004 – 2006 target of 11.1 million vehicle checks is realised, the number of offences detected could be 1.1 million (10%).

Option 2

The second option is that the private operator would set up their own processing office to deal with their detections. This private operated processing office would view the detection images, identify registered owners from the National Vehicle File and send out fixed charge notices including nomination documents to offending drivers. These notices would be identical to those issued by the Garda NPO. Where a fixed charge notice was not paid, the private operator would produce a file containing all the evidence required for a Garda to prosecute the offender in court.

The private operated processing office would provide management information reports to An Garda Síochána on a monthly basis. A member of An Garda Síochána would be allocated to this office to ensure the evidential quality of all the processes in the office.

Option 3

The third option would be similar to option 2, except that the private operated processing office would also process detection images detected by the Garda Síochána camera units. The Garda Síochána would retain a safety camera capacity (eight units) but would have substantially lower volumes than the private operator. It would be make sense and reduce the resources required at the Garda NPO if a private operator carried out the processing of the Garda Síochána images.

Option 4

The final option is that a private sector operator would take over the Garda NPO and process both Garda and private detections, both intercept and camera. This office would again be supported by a member of An Garda Síochána to ensure the evidential quality of all the processes in the office.

In the medium term implementation of option 3 should be pursued, and this option should form the basis of any tendering contract for a private safety camera operator. In the longer term, option 4 should be pursued as it would free up the maximum of Garda resources. However, it would require significant elaboration. For example, staff, assets, facilities and computer system (FCPS) would come under the control of the private service provider. In addition, regard would have to be made to the proposed decentralisation of the Garda NPO to Thurles.

6.8 Immediate Legislative Changes

The development of an effective safety camera project will require legislative changes to allow for the efficient running of the system, by providing authority for non-Garda personnel to operate safety cameras, certify images of offences and issue fixed charge and nomination notices.

6.9 Longer Term Changes

Longer term, the system will run more efficiently when the ability to identify vehicles registered outside the State, by providing access to out-of-State vehicle databases through inter-governmental agreements, is addressed.

....

6.10 Other Offences

While the focus of this report is on detecting excessive speeding offences, there is potential for the additional use of cameras and other technology to assist in the detection of a range of other traffic offences. The scope for such use is already provided for in the Road Traffic Acts.

7. Design and Execution of the Speed Management Process

The Appendix deals with the detailed design and execution of a speed management programme. It sets out criteria for the selection of times when and locations where measurements are carried out, based on collision risk, and presents a matrix for the design of the programme.

8. An Organisational Model

The safety camera project, to be effective and to operate with the support of all road users, must be:

1. Transparent;
2. Accountable;
3. Reassuring to the public;
4. Effective; and
5. Fair.

An Garda Síochána, as the traffic law enforcement agency in the State, will be responsible for the safety cameras project. When the Garda Síochána Bill is enacted, the Garda Commissioner, as the Accounting Officer, will be responsible for the project before the Public Accounts Committee. Until enactment, the Secretary General of the Department of Justice, Equality and Law Reform will remain Accounting Officer. The Commissioner is the business owner of the project.

The safety camera project will operate at three levels, as follows:

1. Safety Camera Supervisory Board
2. Office for Safety Camera Management
3. Private Operator.

8.1 Safety Camera Supervisory Board

The Safety Camera Supervisory Board will oversee the safety camera project. This Board will be chaired by a member of An Garda Síochána not below the rank of an Assistant Commissioner.

The Board will consist of the Chief Superintendent, Garda National Traffic Bureau, and may include representatives from other key stakeholders approved by the Commissioner. The Board will meet the Office for Safety Camera Management quarterly.

The Board will establish the performance management aspects of the project.

It will ratify:

- the criteria for enforcement site locations;
- tolerance levels (enforcement thresholds);
- setting and monitoring of performance indicators; and
- quality standards.

8.2 Office for Safety Camera Management (OSCAM)

The Office for Safety Camera Management will manage the day-to-day running of the project. In line with the Road Safety Strategy 2004 – 2006:

... the overall performance criteria to be applied to its operation will be determined by the Gardaí and ... these will be guided by the use of camera detection facilities at locations where the Gardaí determine that there is an established or prospective accident risk. (Department of Transport, 2004, page 25).

A Garda Superintendent with the requisite support staff will head the Office. It is recommended that a skills audit be carried out to determine the staffing requirements.

The Office will be responsible for:

- Financial control;
- Reporting;
- Monitoring of operations;
- Communications;
- Site Selection;
- Consultation; and
- Performance Management.

The Office will report to the Safety Camera Supervisory Board on a quarterly basis or when either the chair of the Board requires a meeting or the Office Superintendent requests one.

The establishment of the Office will be vital in establishing an effective safety camera project. It is important that the Office is provided with the required resources to function. The funding for the overall safety camera project should be inclusive of the costs of running the Office. It should be established at least three months prior to the commencement of the private service provider's operations. This would allow for the identification of suitable enforcement sites and to establish performance and quality criteria for the private operator.

The performance indicators/targets should be:

1. Number of vehicles checked (the Road Safety Strategy specifies 11.1 million checks per year by the end of the Strategy);
2. Number of offences detected;
3. Capture images of offending vehicles at a rate of 90%;
4. Issue fixed charge notices for at least 80% of images of offending images captured.

A percentage of images will be lost due to poor quality of image, registration numbers obscured due to dirty or false number plates, deliberate attempts to avoid detection, vehicles obscuring other vehicles and non national/foreign registered vehicles.

8.3 Private Operator

A private operator will provide:

- Mobile safety camera units containing:
 - Speed detection equipment that is type approved by the UK Home Office or equivalent and approved by the Garda Commissioner in accordance with the provisions of section 21 of the Road Traffic Act 2002;
 - Equipment to count the number of vehicles checked by each mobile safety camera unit;
 - Equipment capable of measuring speeds at enforcement site locations pre and post selection.
- Human resources to operate mobile safety camera units;
- A processing system that can:
 - View images of detected vehicles;
 - Automatically read registered numbers on vehicles and match them with details in the National Vehicle File;
 - Issue fixed charge notices including nomination documents in the exact same legal format as those issued by the Garda National Processing Office;
 - Issue Fixed Charge Notices in the exact same legal format as those issued by the Garda National Processing Office where a registered owner has nominated a driver;
 - Link to the FCPS payment provider to establish whether a payment has been received;
 - Where a payment has not been received, prepare a prosecution file for An Garda Síochána. This file will include details of the offence and calibration of the equipment, statements, photographs and copies of notices;
 - Submit management reports to the Office for Safety Camera Management on a monthly basis;
 - Attend Safety Camera Supervisory Board meetings as required;
 - Permit enforcement site location inspections by Garda Divisional Traffic Unit Inspectors who will report back to the Superintendent, Office for Safety Camera Management.

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APPENDIX
THE DESIGN AND EXECUTION OF THE SPEED MEASUREMENT
PROCESS

Executive Summary (Design and Management of Speed Management Process)

Based on the deployment of additional enforcement assets through the engagement of private sector camera operations and the continued high level of direct Garda enforcement, it is envisaged that by the completion of the period of the Strategy at least 50% of the overall vehicle fleet will pass through a speed check each month. As the national fleet of registered vehicles numbers over 1.85 million, this will require an annual number of checks of approximately 11.1million.

One of the most important considerations of any speed camera programme is that it should be defensible in the eyes of the public in order to win public support for the measures.

To this end the NRA have analysed the road accident database for speed related accidents in order to link speed checks to where and when the speed related accidents are happening. Some of the parameters used to identify locations are:

- Location of speed related accident clusters;
- Road type;
- Time of day;
- Day of week;
- Vehicle type involved in the accidents.

The result is a matrix of proposals to link speed checks to speed related accidents:

- More speed checks at weekends than on weekdays (Sundays 19-25%, Saturdays 16-20%, Fridays 14-18% of all checks);
- More speed checks between midnight and 03.00 than at other times (10 to 20% of all checks);
- Motorways and dual carriageways to have less than 3% of speed checks;
- As national roads have nearly 50% of fatal accidents, 50% of the speed checks on national roads and 50% on non-national roads;
- Urban national and rural roads should have a higher proportion of camera hours because of 'vulnerable' road users and high transgression rates on both road types;
- As HGVs are involved in about 20% of all fatal accidents, 15 - 20% of checks on HGVs;
- Commence with approximately 500-600 locations countrywide, about 15-20 locations per local authority. Increase the number of locations as necessary to get the road safety result we require;
- 11 million speed checks annually;
- 20% overt and 80% covert initially.

The application of the procedures recommended in section 4.5 below (Selection of Measurement Sites) will result in the generation of a list of safety camera

measurement sites from the location and other information supplied by the National Roads Authority.

1. Principles Governing the Design

- The proportion of measurements by time of day, day of week and road class shall reflect accident risk as set out in road accident data.
- The selection of locations shall reflect risk, either directly because the location itself exhibits a high-risk profile or indirectly because the location is representative of a high-risk category of road or group of locations.

2. Data Managed by NRA

2.1 The National Road Accident Data file

The National Road Accident Database is compiled by the NRA, based on Garda accident report forms, and is a digital record of all injury accidents on public roads that are both reported to, and recorded by, members of An Garda Síochána. The database contains information pertaining to the detailed circumstances of the accident, as well as to both the vehicles and the persons involved. The accident database is available in a consistent format from 1996-2003¹.

The database also contains information pertaining to the opinion of the investigating Garda as to any driver actions that may have contributed to the occurrence of the accident. Included in this list is 'exceeded safe speed', which allows us to focus on 'speed related' road accidents.

For the purposes of this paper, 'speed related' accidents were selected and the national road accident database was interrogated in order to find the distribution of speed-related accidents by time of day, day of week and road type, in order to ensure that checks are targeted at the times, day of week and road types when and where speed-related accidents tend to occur.

2.2 Speed Surveys

The NRA has carried out a number of surveys of 'free speeds' on both national and non-national roads (see NRA 2003b, NRA 2000a and NRA 2000b). The information contained in each report includes:

- a) 50th and 85th percentile free speeds by road and vehicle type
- b) average free-speeds by road and vehicle type
- c) percentage exceeding speed limits by road and vehicle type.

The speed surveys can be used to indicate which road types are more likely to have 'speed problems' and therefore require a relatively higher level of speed enforcement.

¹ In 1995, there was a (major) change in the information provided in the accident report forms.

2.3 Traffic Volume Data

The Transportation Section of the NRA compiles traffic flow information for both the national and non-national road network. To achieve this, it operates a total of 107 permanent traffic counters and performs 'manual' counts at regular intervals on sections of road with no permanent counter.

On the basis of this, the NRA publishes an annual report on Traffic Flows on National Roads (see NRA 2003c) and commissions periodic reports on Vehicle Kilometres of Travel in Ireland (see TRL, 2002).

3. When and Where is Speed Related Risk Realised?

3.1 Time of occurrence of speed related accidents

In order to find out when speed-related accidents occur, the national road accident database was interrogated. Speed-related accidents, defined as accidents where a driver was, in the opinion of the investigating Garda, 'exceed[ing] safe speed' occurring in 2001 and 2002 were selected following which the day of week was cross-tabulated against the time of day. The results, presented in graphical format are shown in Chart 3.1.1. The darker areas in the chart show the time of day/day of week where speed related accidents are most prevalent. A particular concentration can be noted in the early hours of Saturday and Sunday morning as well as generally during p.m. peak times Monday through Sunday.

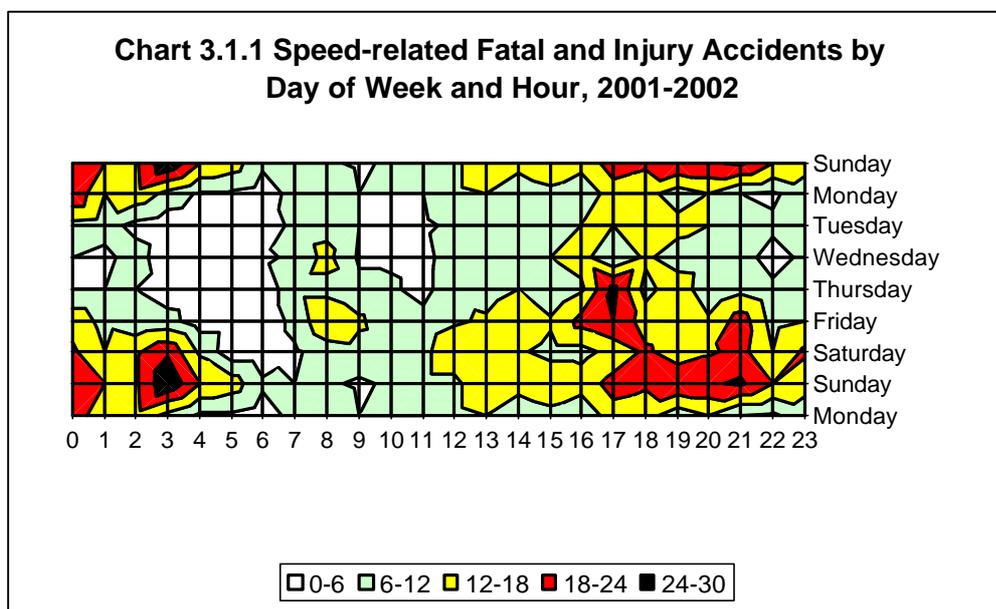


Table 3.1.2 shows the time of occurrence of all speed related fatal or injury accidents of traffic volume generally. As can be seen from the table (and chart above), there is a particular concentration of speed related injury accidents during the night, with for example the hours between midnight and 3.00 am accounting for 14 per cent of fatal accidents but only 2 per cent of traffic volume. By way of contrast, only 8 per cent of

speed related accidents occur between 9.00 am and 12.00 am, while this time period accounts for 17 per cent of traffic volume.

Table 3.1.2: *Time of Day of both Traffic Volume and Fatal/Injury Accidents*

Hour	% of all speed-related fatal/injury accidents	% of vehicle kilometres of travel
00.00 - 02.59	14	2
03.00 - 05.59	8	2
06.00 - 08.59	9	14
09.00 - 11.59	8	17
12.00 - 14.59	14	19
15.00 - 17.59	16	22
18.00 - 20.59	17	17
21.00 - 23.59	14	7
All	100	100

2001-2002

Table 3.1.3: *Day of Week of Fatal/Injury Speed Related Accidents (2001-2002)*

Day	% of all speed related fatal/injury accidents
Monday	13
Tuesday	10
Wednesday	10
Thursday	11
Friday	16
Saturday	18
Sunday	22
All	100

Table 3.1.3 (above) shows the percentage of all speed-related fatal/injury accidents that occurred in 2001 or 2002 by day of week. Saturday (18%) and Sunday (22%) accounted for the highest percentage of all speed-related accidents. Tuesday and Wednesday accounted for the smallest proportion of speed-related accidents.

3.2 Road Network in Ireland

There are approximately 5,400 km of national roads in Ireland split almost evenly between national primary roads and national secondary roads. There are approximately 800 km of urban national roads, 125 km of motorway and 228 km of dual carriageway national roads (as of 31/12/2001). Rural single carriageway roads account for the majority (almost 80%) of the national road network. In addition, there are approximately 11,700 km of regional roads and 77,700 km of local roads (see Table 3.2.1).

Table 3.2.1 *Length of Road Network in Ireland (as of 31/12/2001)*

	Length (km)
Urban National [Primary and Secondary] Roads	804
Rural National Roads - Motorway	125
Rural National Roads - Dual Carriageway	228
Rural National Primary Roads - Single Carriageway	1,934
Rural National Secondary Roads - Single Carriageway	2,325
Rural National Roads - 'Other'	87
Regional Roads	11,690
Local Roads	77,655

Ireland has a relatively low population density relative to other EU countries, having fewer persons per sq. km than all other EU countries bar Scandinavia (Norway, Sweden and Finland) (see Table 3.2.2).

Table 3.2.2 *Comparison of Population Density (Persons per sq. km, 2001)*

Country	Total population 2001	Population per sq. km. (2001)
Japan	127,034,900	336.2
United Kingdom	58,800,000	242.1
Germany	82,333,000	230.6
Italy	57,948,000	192.3
Switzerland	7,231,000	175.1
Denmark	5,359,000	124.4
EMU average	305,128,500	121.6
Portugal	10,024,000	109.0
France	59,190,600	107.3
Austria	8,132,000	97.0
Spain	41,117,000	81.3
Greece	10,590,870	80.3
Ireland	3,839,000	54.6
World	6,128,957,000	45.8
United States	285,318,000	29.6
Sweden	8,894,000	19.8
Finland	5,188,000	15.3
Norway	4,513,000	13.9

Source: World Bank World Development Indicators, 2001.

Given the relatively low population density and high levels of concentration in a relatively small number of urban areas, it is obvious that traffic volumes on Irish roads will be relatively low in comparison with many other EU countries.

Traffic volumes thus tend to be lower than many EU neighbours and are concentrated on the national primary network, which has the highest Annual Average Daily Traffic (AADT) - approx 12,000 in 2001 (see Table 3.2.3). National secondary roads have

lower AADT (approx. 4,000) with regional roads and local roads having lower traffic volumes still. Within each road category there are wide ranges of AADT with roads either in, around or between major urban areas (in particular Dublin, Cork, Galway and Limerick) tending to have the highest AADT and rural roads distant from major urban centres the lowest.

In addition to having the highest AADT, national primary roads also have the highest proportion of traffic volume (34.3% in 2001), followed in turn by regional (28.6%), local (24.8%) and national secondary roads (12.3%).

Table 3.2.3: *Average Annual Daily Traffic by Road Type, 2001*

	National Primary	National Secondary Roads	Regional	Local Roads	All Roads
Percentage of Total Traffic Volume	34.3	12.3	28.6	24.8	100
Average AADT 2001	11,889	4,212	2,350	306	1,009

Source: Derived from Vehicle Kilometres of Travel, TRL, 2002.

3.3 Percentage of accidents and speeding rates by road type

National roads, which tend to have lower accident rates than non-national roads, account for 40% of all fatal, 35% of all speed related fatal and 30% of all speed related injury accidents despite having nearly half (47.8%) of the total traffic volume (see Table 3.3.1).

In 13.1% of all injury accidents that occur on urban national roads, the driver of a vehicle involved in the accident is deemed to have 'exceeded safe speed'. This road type accounts for 9% of 'speed related' accidents and 10.4% of traffic volume. Evidence gathered from speed surveys carried out in 2002 indicates that speeding is a problem on these road types, with cars in 40 mph zones travelling at an average free speed of 48 mph and with 82% of cars breaking posted speed limits.²

Transgression rates are much lower on motorways, with an average of 24% of cars breaking the 70mph speed limit in 2002. The average speed on this road type is 66mph, or 4mph under the speed limit. Motorways account for 3.3% of traffic volume and less than 0.2% of speed related injury accidents.

Car transgression rates are higher for dual carriageways (43%) than for motorways (24%). However, dual carriageways also account for a lower proportion of speed related injury accidents (<2%) than they do of overall traffic volume (4.4%).

Transgression rates on rural national secondary roads are relatively low – in the 2002 survey, only 16% of cars on this road type were found to have been breaking the speed limit. This road type accounts for approximately 10% of national traffic

² The 2002 survey also showed that 99% of cars broke the speed limit in 30mph zones on urban arterial roads, with 94% of cars on urban nationals at 30mph signs and 68% of cars in urban residential areas doing likewise.

volume each year, but 14% of fatal speed related accidents, 10% of fatal accidents and 9% of speed related injury accidents.

Car transgression rates on both regional and county roads are low, measuring 10% and 7% in the 2002 survey, as the average speed on each road type (50mph and 43mph, respectively) is dramatically lower than the general speed limit of 60mph on these roads. Despite low observed speed transgression rates, according to Garda accident report forms, these road types account for a higher proportion of speed related accidents than of traffic volume in general.

This situation is partly explained by higher accident rates on these roads, which would generally be designed and maintained to a lower standard than national roads. It is also partly attributable to the difference between what, in the opinion of the investigating Garda, constitutes 'exceeding safe speed' and actually exceeding the speed limit, that is, there may be accidents where all drivers are travelling less than the posted limit but where at least one driver is in the opinion of the Garda 'exceeding *safe speed*'.

Table 3.3.1 *Percentage of Accidents and Transgression Rates by road type, 2001-2**

	% Fatal Accidents	% of Fatal Related Accidents	% of speed injury related accidents	% of injury accidents which involved speeding	% of Vehicle Kilometres of Travel****	Average Car Speed (mph)	Cars transgressing speed limits (%)
Total All National Roads of which:	40.1	35.1	30.0	15	47.6	-	-
Urban National Roads	6.2	5.2	9.0	13.1	10.4	48***	82***
Rural National - Motorway	0.7	0.5	0.2	9.3	3.3	66	24
Rural National - Dual Carriageway	1.8	1.0	1.9	16.3	4.4	59	43
Rural NP - Single C/way	19.8	14.4	9.7	13.4	18.6	60	44
Rural NS - Single C/way	10.3	13.9	8.6	21.1	10.0	51	16
Rural National - 'Other' *	1.1	0.0	0.6	15.2	0.9	-	-
Regional Roads	59.9**	64.9**	70**	12.4**	28.1	50	10
Local roads	59.9**	64.9**	70**	12.4**	24.3	43	7

- Speeding rates refer to 2002 data.
- ** Regional and Local roads combined.
- *** Refers to Urban National Roads in 40 mph zone.

- **** Based on TRL, 2003 and information derived from the national road needs study database. National Motorway speed limit = 70mph. Source: NRA National Road Accident Database and NRA, 2003b.

3.4 Vehicle Classes and Risk

In 2001-2, goods vehicle accidents accounted for a quarter of all fatal accidents (see Table 3.4.1) and for approximately 18 per cent of vehicle kilometres of travel³.

Speeding was a factor in 13.7 per cent of all fatal and injury road accidents involving a goods vehicle in 2001-2 and in 12.9 per cent of accidents not involving a goods vehicle. NCT tests show that on second test 24% of HGVs failed the test, with have a defective tachograph being the main issue.

Table 3.4.1 Goods Vehicle Accidents, 2001-2002

		Non-Speeding	Speeding	Speeding Accident (% of total)
Not a Goods Vehicle				
Accident	Fatal	359	166	31.6
	Serious	1,162	332	22.2
	Minor	8,152	940	10.3
	Total	9,673	1,438	12.9
Goods Vehicle				
Accident	Fatal	153	28	15.5
	Serious	299	68	18.5
	Minor	1,640	235	12.5
	Total	2,092	331	13.7

4. Design of the Speed Measurement Process: Recommendations

4.1 How many locations?

The second Road Safety Strategy has as a target that ultimately there be 11.1 million speeding checks annually. In order to enable this target to be met, the following recommendations are made:

- Approximately 500 to 600 locations should be identified for the country as a whole initially. This is in line with international practice and implies 15 to 20 locations per local authority.
- Each location should be used for observations on average approximately once a week at different times.
- The period of observation at each location should be of between one and three hours duration.

³ See NRA, 2001.

4.2 Time of Day and Day of Week

Based on the evidence relating to accident occurrence and traffic volume, tentative suggestions in relation to the proportion of speed camera hours that should occur in each time period are also made in Table 4.2.1. Given that accidents between the hours of 00.00 am and 03.00 a.m. account for 14% of all speed-related accidents, it is recommended that for the outsourced camera strategy, this time period should account for between 10 and 20 per cent of all speed camera hours.

Table 4.2.1: *Recommended Time of Day of Camera Hours*

Hour	% of all speed-related fatal/injury accidents*	% of Vehicle Kilometres of Travel**	Suggested percentage of speed camera hours
00.00 - 02.59	14	2	10 – 20
03.00 - 05.59	8	2	04 – 12
06.00 - 08.59	9	14	06 – 12
09.00 - 11.59	10	17	05 – 11
12.00 - 14.59	11	19	12 – 16
15.00 - 17.59	12	22	14 – 18
18.00 - 20.59	13	17	15 – 19
21.00 - 23.59	14	7	12 – 16
All	100	100	100

Table 4.2.2 shows the recommendations vis-à-vis the percentage of total speed camera hours that each day of week should account for. Broadly speaking, more speed camera measurements should be undertaken on Fridays, Saturdays and Sundays than on other days of the week, with a recommended 19 – 25 per cent of all speed camera hours to occur on Sundays, 16-20 per cent on Saturdays and 14-18 per cent on Fridays.

Table 4.2.2: *Recommended Proportion of Speed Camera Hours to occur on each Day of Week*

Day	% of all speed-related Fatal Injury Accidents	Suggested percentage of speed camera hours
Monday	13	11 – 15
Tuesday	10	08 – 12
Wednesday	10	08 – 12
Thursday	11	09 – 13
Friday	16	14 – 18
Saturday	18	16 – 20
Sunday	22	19 – 25
All	100	100

4.3. Road Type

While speed-related road accidents are not confined to any one road type – and are thus a network-wide problem, requiring a network-wide enforcement strategy response - they are more prevalent on some road types than others. Table 4.3.1 shows the recommended proportions of speed camera hours that each road type should account for.

National roads account for 40% of all fatal accidents, 35% of speed-related fatal accidents and approximately 48% of traffic volume. Noting the proportions of cars on national roads that exceed the speed limit, we recommend that approximately one half of camera hours are on national roads. We are recommending that both urban national roads and rural national primary roads account for a higher proportion of camera hours than they do of traffic volume owing to the presence of ‘vulnerable’ road users (on urban nationals) and high transgression rates on both road types. We are recommending that the proportion of camera hours accounted for by both dual carriageways and motorways be less than their share of traffic volume, as these road types generally have lower accident rates than other road types and they account for a very small share of speed related accidents.

Non-national roads should account for approximately 50% of speed camera hours. Regional and local roads jointly account for 60% of fatal accidents, 65% of speed related fatal accidents and 70% of speed related injury accidents. According to the 2002 speed survey however, car speed transgression rates are much lower on these road types than on national roads. One must however bear in mind that the metrication of the speed limit, which was implemented on 20 January, 2005, led to the general speed limits on rural regional and rural local roads falling to 80 kilometres per hour and, in the absence of increased enforcement levels, transgression rates are almost certain to rise as a result.

Regional roads account for a higher share of camera hours, as both transgression rates and speeding rates are higher on regional as opposed to local roads.

Table 4.3.1: *Recommendation relating to camera hours by road type*

	Recommended Percentage of Speed Camera hours
Total All National Roads	~ 50%
of which,	
Urban National Roads	~ 14%
Rural National – Motorway	~ 2%
Rural National - Dual Carriageway	~ 2%
Rural NP - Single Carriageway	~ 20%
Rural NS - Single Carriageway	~ 10%
Rural National – Other	~ 2%
Regional Roads	~ 30%
Local Roads	~ 20%

4.4 Vehicle Type

We recommend that, in line with the proportion of all accidents that involve goods vehicles, approximately 15% to 20% of total speed camera hours be on goods vehicles.

4.5 Selection of Measurement Sites

- NRA will initially provide maps, lists and Map Info identities for sections of national road with a very high incidence of speeding accidents and for sections with a high incidence of speeding. Maps, lists and identities will also be provided for sections of non-national road.
- The Office for Safety Camera Management (OSCAM) shall survey the 1 km. length of road straddling the section, or a 1 km. length within the section, note the road type, ensure the suitability of the 1 km. section as an observation section, designate the section if suitable, and identify the precise observation point by grid reference number.
- The criteria for suitability shall be based both on health and safety regulations and on fairness to other drivers. Measurement sites should:
 - be safe for passing traffic, operator and equipment;
 - not cause any impediment to the free flow of traffic;
 - not be within 5 km. in a built up area or 10 km. in a rural area of another operating camera;
 - not be on a bend or a serious gradient;
 - not be within 200 metres of a speed restriction or de-restriction sign signalling a change to the speed zone;
 - not be on a section where it is very difficult for a driver to ascertain which speed zone applies.
- When all of the risk related sections have been surveyed and selected, OSCAM shall, in consultation with NRA, local authority and Gardaí select further sections within each road type to provide the required percentage of safety camera hours recommended in Table 4.3.1. These sections shall be surveyed for suitability as above.
- A list of local road locations may be drawn up by reference to the Road Safety Together Working Groups and other concerned parties in each local authority. Such groups can apply for up to 20% of total camera hours designated to their local authority to be assigned to these locations.
- The application of the above procedures will result in the generation of a list of safety camera measurement sites from the location and other data supplied by the National Roads Authority.

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