ICASES

International Comparison of Automated Speed Enforcement Systems

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INTRODUCTION[1]

[1] Author: Laurent CARNIS, april 2012.

-1- The Research Framework

1.1. The context

Speed is a major contributor to both the occurrence of road accidents (TRB 1998) and their level of seriousness. While figures vary from one country to another, speed is involved in at least a quarter of all traffic accidents, and is thus a significant factor in the subsequent socioeconomic costs.

In France the National Interdepartmental Road Safety Observatory (ONISR) has estimated this socioeconomic cost at some 23 billion euros for 2010 alone—1.3% of the GDP (ONISR 2010). This situation has led the authorities to devise and implement public road safety policies.

Governments can take many different forms of action with regard to road safety. They can draw up public relations policies, take steps to improve driver education and training, modify and enhance infrastructures, and regulate vehicle upkeep and compliance with standards (Mignot and Mizzi 2011). More coercive measures can also be taken through a clearly defined policy of enforcement and sanctioning.

The French government opted for a system of automated speed enforcement (ASE) in 2002, and by late 2003 some 100 detection devices were in place on the country's freeway network. The system thus became operational, with France joining the club of countries that had already been using such automated devices for several years.

1.2. A change requiring analysis and interpretation

This setting-up of an ASE system represented a major shift in public road safety policy, a significant change in the approach to dealing with offenders, and notable institutional innovation.

A major shift in public road safety policy in that recourse to ASE necessarily leads to a foregrounding—or at the very least a reinforcing—of deterrence. A change in the policy of detection and sanctioning in that automation modifies the ways of proceeding and the organizations involved, and permits a substantial increase in the number of checks carried out and offenses detected and sanctioned: in France the number of speeding offenses detected rose by almost 800% in 9 years. And lastly notable institutional innovation in that it involved the establishing of new organizational procedures; the possible creation of dedicated organizations or the reorganization of existing administrative entities; changes to or adaptation of the relevant legislation; and new forms of intervention and coordination between the parties concerned.

Thus an International Comparison of Automatic Speed Enforcement Systems (ICASES) appears a logical means of comprehending and rendering more comprehensible these interrelated changes.

1.3. Producing new knowledge useful to decision-makers

This research also provides answers to new questions, even if the authorities already have answers of their own and have their prior knowledge of various ASE systems to fall back on. Some of the available research on the French program deals with the issues of social and professional acceptability, and has looked into the circumstances affecting implementation at local level (Eyssartier and Hamelin 2010; Ragot 2006; Hamelin et al, 2006). Other research has focused on the institutional aspect and the effectiveness of ASE programs, sometimes on a comparative basis (Carnis 2010, 2008a, 2007). However, a governance-related approach now seems essential (Carnis 2008b) to an understanding of the changes effected at the institutional, strategic and operational levels (Carnis 2009).

The results of this research also draw on the substantial feedback now available. The duration of service of the various systems studied means that we now have partial answers to early speculation about how each program would turn out. The French program will soon be ten years old, while the others considered here go back even further, and this distancing factor is useful to the researcher in that it helps to distinguish between fundamental trends and ephemeral, topical issues. True, new theories about ASE programs continue to appear, but the material and information now

available mean that the researcher is better equipped for carrying out analysis and coming up with explanatory notions that can no longer be dismissed as pure supposition.

This research is also intended to be useful to decision-makers. It sets out not only to determine best practices, but also to identify innovative procedures in both the strategies used and the problem-solving process some programs face. At the same time there is no intention here of proposing solutions; the goal is to offer findings which decision-makers may at some point be able to appropriate.

-2- Objectives and methods of the research

2.1. An approach via the study of institutional arrangements

This research proposes a systematic analysis of ASE programs by considering them as specific institutional arrangements (Carnis 2010). Any ASE program involves administrative structuring of the action to be taken and of the relevant institutionalized systems. It is based on checking systems which are themselves centered on speed cameras and the circumstances determining their use (the reference here is to French detection methods). Should there be no dedicated administrative structure, only the term "system" can be meaningful, although this does not imply the absence of a specific institutional arrangement. Indeed, as in Switzerland, the lack of a dedicated administrative structure may constitute the specificity of the institutional arrangement. Only the degree of formalization differs and requires explanation here. These ASE programs or systems can be analyzed as structures with three interrelated levels: operational enforcement modalities; the organizational framework of the ASE program; the institutional context.

The aim, then, is to understand the reasons for the adoption of these programs by looking into their relationship with the structure of their respective systems of governance. These systems of governance can be taken as the set of rules for the program's functioning and the relationships established between different actors who have a stake in the same *issue* and who intervene in a more or less organized way (Wood and Shearing 2007).

The operational and strategic modalities are not always clearly stated—or even understood—by the authorities[2] who decide on implementation of the programs. Even so, they govern the effects obtained in terms of deterring offenders and of the road toll.

[2] The existence of different decision-making levels can lead to problems of information availability and interpretation, as well as of coordination. Moreover conflicts about aims and means can arise both between the organizations managing the program and with other stakeholders in the system of

The operational framework can be defined as the set of modalities of implementation of the enforcement operations. It includes both actual practice and the processes laid down by the bodies in charge of implementation and management. The operational framework includes the selection criteria for enforcement locations (Have they been defined? What are they?); the existence of an operational guide for effecting enforcement checks; and the functional modalities of the system itself (degree of automation, centralization or decentralization of the system, use of fixed or mobile devices, etc.). *The issue here is knowing who does what and how.*

The strategic framework has to do with the strategic decisions taken by the authorities. These concern, among other things, the choice of device—fixed, mobile, combined—together with signaling and marking, and location (accident spots, dangerous spots, speed issues). Strategic emphases also concern the choices made regarding enforcement frequency (number of devices used, duration of functioning, etc.) and the choice of road types (highway, freeway, etc.) These emphases may also aim at producing deterrence that is either general (for all drivers) or specific (for offenders), and either local (focused on the enforcement zone) or widespread (covering the whole of the road network). In brief *the point is to determine the intermediate objectives being sought. And also to identify the organizations involved and determine their role.*

Comparison between operational modalities and strategic emphases can enable recognition of the contradictions between these two levels, an understanding of the internal consistency of the system, and identification of points of tension during the setting-up and implementation phases.

Adopting North's definition (1990), we can consider the institution as a set of "rules of the game" functioning in the social sphere. Consequently institutions as a whole shape a specific institutional order. The system of governance can then be interpreted as a specific arrangement of interactions that includes institutional constraints (and is linked to an institutional order) and whose functional logic, being calculated to achieve certain goals, thus produces regulatory modalities.[3]

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governance. These difficulties have to do with issues specific to politics and the architecture of choice, to borrow the terms used by Jones (2001).

[3] The major questions of effectiveness and efficiency are not dealt with here.

Application of this approach to ASE programs leads us to consider these programs as specific institutions producing efficiency via effective application of speed limits (Carnis 2010). Thus these institutions allow generation of both economic gains (by reducing social costs) and equity (each offender is treated equally by the judicial process). However, each enforcement program is part of a specific institutional order. As an institution, it belongs to an overarching institutional order: in other words, it is a subsystem of another system (transport, road safety policy?). Thus the program can be directed by the Ministry of Transport, or of Justice, or of the Interior. It may also use administrative personnel from the private sector within a framework of subcontracting (mail, computer processing of offenses), and may even entrust them with the operation of mobile devices (Carnis 2009). Within these programs the police may play a more or less important role. They may be wholly or partially responsible for the system; may function with others on a partnership basis; or may be completely excluded. Generally speaking, the aim will be to determine the key actors either taking part directly or involved in other ways. Advocacy groups representing drivers or road accident victims may influence both the system's operational modalities and its strategic emphases. Similarly, the role of insurance companies and the way losses are indemnified must also be taken into consideration. Lastly, the judicial framework can be decisive in boosting or constraining the efficiency of the enforcement system. Study of the system of governance must lead to *identification of the actors involved in the implementation of this public policy, together with definition of the rules of the game and of the constraints these same actors work under*. Also at stake is *identification of the relationships between the various participants: their intensity (high, low, nonexistent), their type (cooperation, opposition, alliance) and their interconnection within the system*. Finally, this research consists in a study of the interconnection between operational and strategic rationales within an institutional order.

2.2. The comparative approach

The comparative approach facilitates the highlighting of a diversity of ways of doing things. Different operational modalities are at work and the authorities lay down different strategic emphases according to various systems of governance.

The intention here is not to focus solely on diversity in terms of each level of analysis, but to produce a more integrative study by comparing the simultaneous

interconnection of the three aspects. Two given systems of automated enforcement may be based on similar operational modalities while obeying different logical strategies. Conversely, similar logical strategies may find expression in different operational modalities induced by the characteristics of the respective systems of governance. The Swiss case is extremely interesting here. The intention is not solely to explain the specific arrangements of operational and strategic rationales simply in terms of the institutional dynamic, but also to reach a clear understanding of the interconnection between the three levels. It cannot be excluded that relatively similar systems of governance result in different operational and strategic modalities: historical and institutional contingency cannot be ignored.

The proposed comparative approach uses a systematic study of national ASE systems. Comparison will allow not only identification of diversity (strategies aimed at different goals, for example), but also the pinpointing of certain recurrent ways of doing things (training of police personnel in use of the devices, etc.). In this way it will enable understanding of possible interconnections and incompatible combinations. In brief, it should then be feasible to define sound practices and look into the preconditions for their institutional implementation.

The international comparison approach used here does not consist exclusively of empirical analysis of a series of cases; it must also enable lesson-drawing on the preconditions for the implementation of public policy and the functional modalities of road safety governance systems. Four locations have been used: French-speaking Switzerland, France, Queensland (Australia) and Norway. The choice of cases to be studied takes account of the *cultural* characteristics of the different countries, their political organization, and readiness of access. Nor, it should be mentioned, is France used a point of reference: each country plays its own, equal part in the comparison.

2.3. The case study method

The method used for studying the four localities in question is the case study (Yin 2009). The authors have thus utilized a number of different sources as a means of understanding the system of governance underlying the different ASE programs.

In each case the scientific literature has been meticulously collated and studied. We also made use of available administrative documentation and sometimes of gray literature.

However, our research was not restricted to documents relating to the administrative and political organization of the systems in question. It was also necessary to obtain more quantitative information so as to retrace important background data (changes to the road toll, travel dynamics, etc.) as well as details of the functioning of ASE programs and systems (the number of infractions detected, rates of speed limit violations, etc.) Cross-referencing of these quantitative and qualitative data helped with prioritizing certain issues, as well as with assessing the importance of certain features.

Each case study involved in-the-field investigation, the aim being to meet key actors in the ASE program or system. We did not set out to meet all the actors, but rather to obtain concrete information that could not have been found in the literature. These visits allowed for semi-directive interviews with people in positions of responsibility, direct actors, and others who were well acquainted with the system. It was important to avoid excessively eulogistic presentations of the programs and systems, to which end we were in search of critical information uninfluenced by official discourse.

Our visits also allowed "participatory observation." We were able to observe actual speed enforcement operations, and to attend more or less technical presentations of the functioning of programs and systems (deployment, photo processing, etc.) as well as of equipment (specially equipped cars) and checking devices. The aim here was to avoid overly general analyses based solely on a program or a system: more local points of view were also important.

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CHAPTER 1

THE CAMERA DETECTED OFFENCE PROGRAM IN QUEENSLAND[4]

[4] Author: Laurent CARNIS, december 2011.

Section 1

Contextual dynamism and institutional singularities

1.1. A dynamic Australian state makes up lost ground in road safety

Queensland is the second largest Australian state in terms of area and the third largest in terms of population. In recent years economic and demographic growth have made the state's people more mobile and this has had a negative effect on road safety.

The state's road toll has been dropping regularly since the late 1960s, but the level plateaus out from time to time and for many years compared badly with that of the other Australian states. This lack of success stimulated the authorities to take energetic measures, including the launching of an ASE program. This was an especially appropriate step in that over 50% of all road accidents in the state involved speed and alcohol.

1.2. Planning and strategic emphases: the safe system philosophy

Queensland's "Safe4life" action plan drew on a view of road safety as a system requiring direct intervention if it was to be improved. And so the decision was taken to work at producing a "safe system."

In practical terms this meant an evidence-based policy: intervention had to be founded on identification and description of the factors contributing to accidents and possible ways of countering them. This also required equitable intervention (so as to limit the drawbacks), adoption of innovative approaches, a collaborative and responsive system for those taking action, and accountability for all those actively concerned. Action taken had to be simultaneously proactive, cost effective and broad-based.[5]

At the operational level the strategy consists in defining areas of intervention and their priorities (Transport and Main Roads 2010b; Jurewicz 2010). The measures are

[5] This means that road safety intervention can be a multifaceted affair involving the fields of public health, education and safety.

designed within the frameworks of partnerships in which actor responsibility is clearly stated and performance is measured according to specific criteria.

1.3. The parliamentary committee game or why the political side is so important

Queensland was a latecomer to the ASE club. It was not until 1994, after a parliamentary committee had discussed the timeliness of using mobile checking devices, that a decision was taken—one hedged about with precautions and recommendations. In 2010 a further parliamentary committee proposed the use of fixed speed cameras and laid down the conditions of their use. The work of these two commissions determined the functioning of the ASE program as it is now applied in Queensland.

1.4. Researcher involvement and evaluation practices

A further institutional singularity in Queensland is the role accorded academic research within ASE institutional interplay. Research circles are involved at two levels: the first consists of support and systematic participation within the framework of regular evaluations of the impact of the system on the road toll (this also includes calling in researchers from other states); the second has to do with regular production of research into road safety and speed-related matters that can aid public-sector decision-makers. Most of this work is carried out by CARRS-Q, the Centre for Accident Research and Road Safety at the Queensland University of Technology (QUT). The studies these researchers carry out on speed and speed limit enforcement mean they are regularly invited to appear in the media—press, radio, TV[6]—where they enjoy expert status. The contribution of researchers to public debate is thus very real, as was confirmed by the inclusion of a report on the effects of fixed speed cameras on road safety in the parliamentary hearings.[7] Thus researchers enjoy a respected place in the system of governance of road safety and ASE.

[6] Interview with CARRS-Q researcher Andry Rakotonirainy, carried out in Paris on 12 July 2012.
[7] Queensland Government Submission (2010), *Inquiry into the road safety benefits of fixed speed cameras*, submission no. 43, Queensland Government, by David Soole, Barry Watson and Judy Fleiter, 43 pp.

Section 2

Speed camera automation as an institutional response to road toll challenges

2.1. From awareness to action

The first step towards launching the ASE program in Queensland came with the 1994 *Travelsafe Committee* report and its proposal for the use of (exclusively) mobile checking devices. Not only did the report advocate an ASE program; in addition, its recommendations would shape the program's functional modalities (Parliamentary Travelsafe Committee 1994a). It notably called for such preliminary measures as an overall review of speed limits on the state's road network—to be completed within the year—and the necessary modifications to existing legislation. A public information campaign explaining the aims, use and functioning of the ASE was also advocated, together with a moratorium during which offenders would be let off with a warning. The new tool was also part of a general speed limit enforcement strategy. The committee suggested a minimum of 90 devices, which only members of the police forth would be authorized to use; the operational side was to be the responsibility of the Queensland Police Service and would be subject to regular audits. The report specified that the choice of enforcement sites should take account of the road toll background; sites should also reflect citizen demand, with 25% of them in urban areas. Furthermore, the list of sites should be regularly revised and ratified by a local committee comprising representatives of the police force, local government, the Department of Transportation, residents and the RACQ road users association. The suggested strategy was one of random checks based on the list of ratified sites. The committee also advocated the signaling of enforcement zones both on and near the sites in question. Checks would be carried out from police cars and an "amount of tolerance" of 10 kph was suggested. As regards sanctions, a license points system was recommended that would make the sanction equivalent to that applicable in the case of "manual" enforcement of the speed limit. "Owner onus"—the presumption that the guilty party was the owner of the

vehicle—applied, and a special sanction suggested for fleet owners. The committee stressed the need for rapid, accurate processing of infringements, and recommended using the accrued revenue for non-recurrent road safety projects.

2.2. 1997-2007: the system goes into action

The use of the first 15 mobile ASE devices in Queensland was given the official go-ahead for 1 May 1997 (Walsh and Wessling 1999, p. 80). The ultimate aim was 45 such devices producing 75,000 hours of checks per annum. The initial choice went exclusively to mobile speed cameras operating out of marked police cars, together with signaling of the enforcement site. The signals were set up after the site. The sites were randomly chosen from a previously validated list, their number being some 4500.[8]

Thus official strategic choices were for checks both signaled and random, with the sole method being mobile enforcement. The program remained limited in extent, even if there was an increase during its final years. The intended strategy was one of general deterrence: drivers were to be given the impression that their speed could be checked "anywhere, anytime."

2.3. 2007-2010: implementing a new strategy

In February 2006, at the instigation of Premier Peter Beattie, the Queensland government organized a road safety summit. The reason advanced for the summit was the sharp rise in road accidents during the Christmas holidays, and among the suggestions was the dual possibility of no longer signaling the presence of speed cameras and of using fixed versions (Carnis et al. 2008).

In the course of 2007 three initial fixed-device sites were designated. Six more were to come, together with two others located in tunnels (Queensland Government 2010). The choices were determined by established accident risks. Looking ahead to the introduction of digital technology, the authorities also planned installation of two red light/speed cameras, two more fixed devices and use of "point to point" speed cameras

[8] Interviews carried out on 15 December 2010 at the Queensland Police Service's Traffic Camera Office in Brisbane. It should be noted that the Queensland Police Service's annual report for 2011 mentions 5000 enforcement sites, while our interview with the Department of Transport and Main Roads provided a figure of 3500.

that measure a vehicle's average speed between two points. The fixed cameras would be indicated by at least two signs, one of them 1 kilometer before the detection zone.

It was also decided that some 30% of mobile device speed checking hours would henceforth be carried out without signals. Intended to make enforcement more unpredictable, this was a major modification of the strategy laid down in 1997.

After the submission of the Economic Development Committee's report in 2010, Premier Beattie's successor Anna Bligh confirmed both initiatives: fixed cameras would be used for speed checking, but the system would also include non-signaled mobile devices. These measures were accompanied by others relating to driver blood-alcohol levels[9] and the overall approach was presented to the public as determined, energetic action on the part of the government.

As of now the Camera Detected Offence Program (CDOP) comprises some 40 cameras functioning randomly on preselected sites. The program also includes 14 cameras functioning full-time.

2.4. The Camera Detected Offence Program: concerted action

ASE in Queensland is jointly directed by the Department of Transportation and Main Roads (DTMR) and the Queensland Police Service (QPS), with clearly defined prerogatives for each body. Department of Transportation plays an essential part, in that it lays down the strategic priorities for road safety policy at national level. It also has a direct role in the ASE program, with responsibilities in terms of detection strategy, legislation and the regulation of checks: accuracy of the devices, calibration, and maintenance. It is also in charge of policy marketing and evaluation of communication effectiveness regarding the system, and it supervises the issuing of driver licenses and demerit points.

The role of the QPS is equally essential to the functioning of the detection program and the application of the rules. The police are in charge of the operational part of the system, which includes the purchasing, setting-up and functioning of cameras, training of operators, and overall implementation: deployment of cameras and

[9] Personal communication from M. Cameron, 16 June 2010.

manpower, changes of film, processing of the resultant images, and the issuing of penalty notifications.

The third actor is the Justice Department, which intervenes when driving offense cases are brought before the court, when fines are not paid, and when speeding offense decisions are challenged.

The system also includes internal committees—executive management committee, executive camera committee, operational policy planning committee—which coordinate the work of the different actors at all levels, transmitting grassroots information upwards so as to improve overall functioning and ensuring that changes in directorial emphasis are transmitted to the lower echelons.[10]

The organization of the ASE program suggests that the Queensland model is a joint action program[11] and a mixed model giving a predominant role to the Department of Transportation and Main Roads regarding strategic emphases and to the police force in terms of operational modalities.

2.5. Revenue management

The Transport Operations (Road Use Management) Act of 1995 stipulates that excess revenue generated by the program is to be used for road safety purposes. The functioning and upkeep of the system are thus ensured by the income accruing from fines, with the surplus going into road safety education, accident victim rehabilitation and improvements to the state's road network. However, this spending cannot be recurrent: no project may be financed by the program more than once.

In the course of the last financial year the program generated almost 70 million Australian dollars, of which operational expenses account for 40-50%. Thus, with a considerable part of the revenue generated going into road safety action, the authorities are able to stress that the program is not an additional form of taxation. Although this has not prevented denunciation of the program as a "cash cow", the decision to use the surplus income in this way has helped make the program acceptable to the public and

[10] Interviews carried out on 15 December 2010 at the Queensland Police Service's Traffic Camera Office.
[11] "This program is a joint partnership between the Queensland Police Service (QPS) and Department of Transportation and Main Roads (TMR)". Personal communication from W. Anderson, Senior Manager TMR, 28 June 2010.

represents both a significant facet of Queensland's ASE system and an aid to understanding its underlying governance.

2.6. Governance evaluation data: shared responsibility and a balanced system

How are we to interpret the Queensland ASE system? Institutionally speaking the state parliament plays a crucial role as political catalyst, both in taking the initiative and in laying down the functional modalities. In this respect the system bears the clear stamp of the way democracy works in Australia. Parliament aims at meeting as well as possible the need to reduce the road toll, while seeking not to alienate the citizenry and road users. The role of the executive seems relatively minor, even if the initiatives of Premiers Beattie and Bligh might appear to suggest the contrary. In fact parliament itself took over the matter via the work of its committees. The democratic influence is also clear when we look into the preconditions for speed camera deployment, use of accrued income, and performance evaluation. The organizations involved at operational level are answerable for their actions.

The two main bodies jointly managing the ASE program are the Queensland Police Service and the Department of Transportation and Main Roads. The division of labor sees the strategic emphases in the hands of the DTMR, while the operational side is essentially dealt with by the QPS.

Selection of potential speed camera sites is carried out via broad-based dialogue between local government and the road users' association. This mode of selection highlights the importance accorded to local deployment conditions: the need for local participation in the process and also for the involvement of civil society. This cooperation between local decision makers is also an intelligent means of gaining community support and increasing the program's status via networking of parents' associations, technical specialists, etc., while at the same time avoiding the alienation that can result from inappropriate, over-centralized decisions.

Every year the DTMR carries out a survey of ASE acceptability. Without going into the statistics in detail, it can be said that the system has the support of a large part of the population.

Limiting our analysis of governance to these factors might give the impression that the ASE program faces no resistance at all. However, a close reading of the hearings before the parliamentary committee in 1997 makes it clear that there is marked opposition from professional transport circles such as the Queensland Road Transport Association (Parliamentary Travelsafe Committee 1994h, p. 288 ff.). The same opposition was noted during the parliamentary enquiry of 2010, with many people writing in to express personal stances that were largely unfavorable. The critique put forward by the National Motorists Association Australia (NMAA) would seem to be both the most plausible and the most hostile.

At the same time road user attitudes are not uniform, as indicated by the viewpoint of the Royal Auto Club of Queensland (RACQ, 2010), which supports the fixed camera program as part of the fight against speeding, is in favor of signaling for camera sites, and calls for appropriate training for the police involved.

Research confirms the existence of real opposition. It shows that road users are not well disposed towards concealed ASE and want processing of detected offenses to be rapid (Soole et al. 2008). They also criticize the system for a lack of transparency which for them inspires mistrust. They express a feeling of being trapped by a system they regard as a means of creating extra revenue for the state. Their comments also make it clear that the size of camera signs, camera visibility and margins of tolerance are essential to public acceptance of the program. There is, too, a preference for visible, "manual" checks, with the exception of those in the vicinity of schools, where concealment is accepted as necessary. Manual enforcement seems to them to have a higher deterrence value and includes face to face contact with a police officer, which can allow for negotiation and the possibility of being let of with a warning in cases of attenuating circumstances.

The similarity of road user demands to both the recommendations of the parliamentary committee and the main features of the system would seem to imply a certain politicization of the ASE issue, and one that is reflected in the media.[12] Commercial TV is more inclined to criticize the program, adopting a "populist" editorial

[12] Interview carried out with Andry Rakotonirainy in Paris on 12 July 2012. In conversation with police officers at the Australasian Road Safety Education, Research and Policing Conference in Perth, Western Australia in November 2011, I received confirmation of media partiality with regard to speed cameras. A more detailed study of this point could prove interesting.

line, which is also the case with certain newspapers.[13] In addition, there are websites which set out to inform road users, but sometimes resort to undermining the system with defective information.[14]

Deployment of a ASE program in Queensland can be interpreted as a political response to a bad road safety record. In less than 15 years the authorities have come up with a structured response in the form of specialist institutions and a program that has taken on a steadily higher profile over time, even if it still functions on a modest scale. Parliament-instigated and with supporters across the spectrum, the program remains the consensual outcome of a fragile political balance. To a certain extent the strategy of signaling camera sites, testing before large-scale implementation, and systematic evaluation, reflects the current political configuration.

Even if the system is a centralized one, local, deliberative input into the choice of sites and the policy of accountability highlight the democratic aspect of a measure intended as an overall community response to the road accident problem.

[13] For example, the reader can consult the various articles on the subject in the Brisbane *Courier Mail* (www.couriermail.com.au).
[14] www.policespeedcameras.info

Section 3
The operational side: a police matter?

3.1. The Camera Detected Offence Program

During the fiscal year 2010-11[15] the QPS deployed mobile ASE devices on 5280 sites in the framework of 21,416 speed detection operations. The average rate of detection per hour of surveillance is some 4.15 infringements, with an average rate of detection of 7.06 infringements per 1000 vehicles. In the course of the exercise the police carried out 75,621 hours of detection, of which 74,580 were financed by CDOP, the Camera Detected Offence Program (QPS 2011, p. 47). It should also be stressed that each year the QPS allocates between 200-220,000 hours to speed detection outside the ASE program. In addition the police force organizes targeted short-term operations which sometimes use ASE equipment.

In 2010 the number of speeding offenses picked up by mobile cameras represented some 80% of all infringements detected by the ASE program.

During the fiscal year in question fixed cameras were in operation for about 70,000 hours. This gives an overall figure of more than 360,000 hours of detection effected by the QPS.

Analysis of the spread of offenses detected by the ASE program shows that speed limit violations of less than 20 kph accounted for 94% of the total. The percentage of violations in excess of 31 kph, which thus come under the heading of major, is 0.8%. Thus the great majority of speeding violations picked up by ASE cameras are minor: the system has had the required deterrent effect.

[15] The Australian fiscal year runs from 1 July – 30 June.

3.2. Choosing detection locations

After a study of speed practices in the area, detection sites are decided on at meetings of local Speed Advisory Accident Committees (SMACs), which bring together the various institutional partners—QPS, DTMR, RACQ, local government—to consider the usefulness of speed camera surveillance. If the SMAC decides in favor of checks using ASE technology, the location is put up for validation by a national committee. Once validated, the site is integrated into a database covering all sites eligible for ASE use. The database is regularly updated and modified: new locations can be added and others removed from the list.

The basic criterion for site eligibility is the accident rate and its documented history: there must have been at least five accidents in the vicinity, although the actual distance varies according to whether the site is urban or rural.[16] An additional constraint for fixed speed cameras is that they can only be installed in areas where the speed limit is over 60 kph, unless there is a school nearby. The program also has room for secondary criteria, such as justified complaints from residents about excessively fast driving and the competence of decision makers, and can include temporary installations in the event of road works.

The QPS has its own matrix incorporating the different variables, together with a algorithm[17] allowing for random selection of camera locations. At the outset the operator has a list of three possible sites, in the event of one of them proving unsuitable. Once his task has been completed, he draws up a report explaining any obstacles that may have arisen.

The choice of camera locations is thus based on random selection of sites jointly validated by the different contributors to the system of governance, with the accident rate as the prime consideration.

[16] We were unable to obtain more precise data on this point.
[17] Because the composition of the matrix and the algorithm is confidential, we were not able to obtain any further information, but it appears to have been submitted to appropriate experts for scientific validation.

3.3. The Traffic Camera Office (TCO): where the images are processed

The TCO processes filmed recordings of infringements within an average of 14 days, and ensures their storage for 10 years. The authorities use such computer applications as the *Traffic Scheduling and Reporting System* (TSRS) and the *Traffic Return Analysis and Complaints Systems* (TRACS), which enable monitoring of operator activity and better selection of target areas.

3.4. System operators

Automatic speed cameras are the key component in the ASE system and are deployed by specially trained police officers. In the course of the accreditation process for becoming an "authorized operator", they take courses given by an "authorized instructor", who has himself been specially trained. After their training, officers are regularly tested as to their ability to carry out the necessary tasks. Thus the ASE system is staffed by trained professionals with a sound knowledge of speed detection activities. It is up to the authorities to ensure the compliance and the caliber of the detection operations, and as part of this policy the detection devices are checked annually.

Currently the state has 800 authorized operators, some of whom have been drawn from QPS Traffic Safety Units while others come from other branches of the police force. Of these 800 an estimated 400 work regularly, providing 5 to 6 hours of enforcement per week, for which they volunteer. Because these hours are not a basic part of their métier, they are counted as overtime. Meanwhile the QPS ensures that operators do not work too many hours, both because there is additional fatigue associated with this kind of work and because the task must not encroach on the officer's regular duties. The use of officers to staff the ASE program must not be detrimental to the police force's other missions.[18]

A second notable feature is the "traffic manual", a guide to traffic related policing which provides comprehensive coverage of the ASE system: its organization, deployment rules, selection and approval of detection sites, and the regulations regarding the choice of personnel and equipment. Without going into the manual in detail, it should be emphasized that this is the core document for the use of speed

[18] Information gathered during the interview carried out at the TCO in Brisbane on 15 December 2010.

detection devices; as such it represents a relatively high degree of formalization of ASE operational modalities, one which reflects the advanced institutionalization of the program's organizational side. This formalization probably reflects the authorities' determination to equip themselves with a functionally irreproachable ASE program—to ensure that supposed offenders are in fact guilty and to avoid unwarranted prosecutions—but also a form of prudence, given the fragile political consensus regarding usage conditions of an ASE system for monitoring the driving behavior of citizens.

3.5. Sanctions and the sanctioning process

The principle of proportionality governs the sanctions schedule decided upon by the authorities in Queensland. Offenders accumulate demerit points, with a total of 12 points leading to suspension of the driver license. In addition the "owner onus" principle holds the owner responsible for any infringement committed with his vehicle. Two other principles round off the sanctions policy: infringements committed by working drivers who have not been declared by name by their employers entail an especially heavy fine; and repeated speeding offenses are punished by a doubling of demerit points.

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CHAPTER 2

THE FRENCH AUTOMATED SPEED ENFORCEMENT PROGRAM[19]

[19] Author: Laurent CARNIS, March 2012.

Section 1

Environmental context and institutional framework

1.1. The challenges of territorial complexity

Notable aspects of the Automated Speed Enforcement (ASE) situation in France are the size of the national territory, the extent of its road and freeway networks, and the variations in its regulations and accident rates. These features demand significant, appropriate resources if a credible enforcement policy is to be put into effect. In addition, the level of car ownership and the size and mobility of the population point up the magnitude of the traffic flows to be monitored and the special place the car occupies in French society. The country also has to come to terms with a territorial and administrative complexity involving a host of very different actors, as well as a range of organizational approaches and ways of doing things that can be difficult to coordinate.

1.2. Adverse road toll statistics and an inadequate enforcement policy: the triggers for public sector intervention

Despite a notable fall in the accident rate since 2000, France's road safety performance is relatively unsatisfactory compared to that of other European countries. The rules of the road are under-observed and enforcement falls short of what is needed. This combination of poor road safety performance and inadequate enforcement are two important factors in any understanding of ASE deployment in France.

1.3. Policy and the political

Speed limit enforcement is not only a matter of road safety policy, it is also an issue with political implications. Indeed, it may be primarily a matter of politics and political will. Implementation of the ASE program seems highly revealing in this respect.

2001 saw the beginnings of a debate concerning the effect of the traditional presidential driving offenses amnesty on the road toll. In addition to academic discussion of the magnitude of this effect (Bergel et al. 2002), the debate helped bring the subject firmly into the political arena and obliged presidential candidates to take a stand on the matter. While it cannot be said that road safety was a vital plank in party platforms, the debate did open up political opportunities which were seized upon by then president Jacques Chirac.

In his 14th July 2002 speech to the nation, the newly re-elected Chirac outlined three major projects for his five-year mandate, one of which was road safety. The same year brought the announcement of the deployment of an ASE program in France, with the president calling for "a break with past practice" and denouncing both the "road safety scandal" and the "barbaric behavior of some drivers" (Carnis 2011a). His Prime Minister Jean-Pierre Raffarin also threw himself into "the battle against road hazards", which he condemned as a "national affliction."

Throughout the new five-year term, the potent verbal and visual arsenal brought to bear by president and government alike was backed up by solid commitment. New laws and tougher sanctions were voted as the ASE program went steadily ahead. The first automated speed cameras became operational in October 2003.

The results in terms of the accident rate can be considered a major achievement for the mandate. The fact that backing was coming from the highest level gave the new policy special status and contributed substantially to its effective implementation, while at the same time generating a ratchet effect in terms of the motivation of those involved.

Elected in 2007, President Nicolas Sarkozy pursued matters with further deployments of speed cameras and a stated target of no more than 3000 annual road deaths by 2012. He reaffirmed his support for the new road safety policy in the face of opposition from parliamentarians of his own party, and continued to do so even when it became evident that reduction of the road toll was losing its impetus.

Since 2002, then, there has been support for the policy from the country's highest echelons. This commitment has aided both deployment and expansion of the ASE program and can be considered a significant factor in the implementation of the initial

policy. However, this presidential and governmental commitment led to a form of relinquishment, not to say confiscation, of the speed detection issue, at the expense not only of parliament and its elected representatives, but also of such deliberative bodies as the CNSR, the National Road Safety Council. This direct management of the ASE system thus led to gradual exclusion of the opinions of parliamentarians and criticisms from road users. This situation was highlighted by the opposition of certain parliamentarians, then organized interest groups, to the measures proposed by the Interdepartmental Road Safety Committee (CISR) on 11 May 2011.

In France deployment of the ASE program has benefited from state support at the highest level. This support was a prerequisite for success. Nonetheless, ongoing extension of the program has gradually led to unified opposition, growing discontent and the transformation of the issue into a political matter. From its initial phase as a largely unpolitical instrument of public policy, the program has gradually turned into a politically exploited artifact. In this respect, what at first was strength has come to look more and more like a weakness.

1.4. The framework for action: lack of a strategy and steadily increasing sanctions

A salient feature of the French system is the absence of a strategic framework and a philosophy of action applicable over a period of several years. To put it briefly, there is no multiannual planning strategy for road safety action whose aims are governed by performance criteria and whose responsibilities are clearly established and allotted to specific organizations.

This absence of strategic planning in no way means that road safety policy as such is unstructured or that the necessary tools for taking action are lacking. In that it interrelates current strands of thinking about broad issues, the annual *Etats Généraux* of the various actors in the safety and security field is one means of injecting fresh impetus and motivating actors in favor of road safety.

Another tool for management and action in the field is the Interdepartmental Road Safety Committees (CISR). These committees exist to define road safety policy and monitor its application. However, the definitions in question are national in scope and often fail to take local implementation issues into consideration, whence the regular

appeals launched at the *Etats Généraux*. Moreover the policy includes no long-term perspective, defines no organizational modalities or resources utilizable for achieving the stated goals, and provides no means for checking that the goals have been attained. In brief, this is a situation in which "general aims" are seen basically in terms of legislative intervention: the standard tool is the judicial norm.

Other identifiable structural components are the 3000 killed-maximum goal, integration via tools such as ASE and local measures embodied in guideline documents and road safety action plans drawn up by the country's *départements*.

This all adds up to a relatively rudimentary strategic framework whose sole basis is reduction of the number of road deaths, when it might also have taken account of the number of injured and hospitalized, or adopted a composite approach. It is also inadequate in that it contains no intermediate goals for embodying the national objective via interventions that are targeted, enforced, evaluated and maybe indicative of a need for adjustment. This absence of intermediate measures is characteristic not only of the resources, but also of the actors themselves, in that there is no clear attribution of the exact responsibilities and expected performances of local and central actors. As a result the absence of a strategic framework gives rise to problems of coordination not only between different intervention levels, but also in respect of the policy to be implemented (Chomienne 2008). This explains in part the emphasis on tools enabling centralization of intervention and on the dominance of the legal norm. In terms of its organizational structure and advanced automation the ASE method matches this rational perfectly (Carnis and Hamelin 2007b).

A further aspect of the framework for action that contributes to an understanding of the implementation of the ASE program is a policy strongly marked by penalties for offenders. Without going exhaustively into the measures taken since 2002 (Carnis 2011a, pp. 453-454), road safety policy has been characterized by increased sanctions (for speeds of more than 50 kph over the limit, for example, together with the creation of misdemeanors), increased enforcement (saliva tests, red light cameras), and definition of new offenses, such as use of mobile phones while driving. Deployment of the ASE program fits with the policy of increasingly heavy penalties for offenders and at the same time reinforces it.

1.5. Monitoring and evaluation of the program

A striking feature of the French ASE program is the lack of independent evaluation practices. This lack raises a number of questions as to monitoring of the system, how malfunctions might be corrected, and the role of research.

The French ASE system has been subjected to regular internal evaluations, whose conclusions have not been made public and so remain confidential. This makes it difficult to know what the recommendations were, and the situation highlights a lack of transparency as far as citizens and road users are concerned.

Two separate evaluations have been conducted on two different questions. The first was carried out by the National Interdepartmental Road Safety Observatory (ONISR - *Observatoire National Interministériel de Sécurité Routière*) under its then general secretary Jean Chapelon. The Chapelon Report (2006) looked into the program's production during its first two years (2003-05). A second evaluation was undertaken in 2009 by the General Commission for Sustainable Development (CGDD - *Commissariat général du développement durable*), its aim being to establish the program's socioeconomic efficiency. The subsequent report concluded that the program was working efficiently.

These two evaluations are a significant source of information, but they remain the work of government departments responsible to the ministry in charge of the program itself. The immediate consequence of this is a reduction of the evaluation process's level of independence and restrictions on the possibility of drawing up criticisms of the program.

In addition to the lack of information to help the authorities manage the program and correct any malfunctions that might arise, the absence of evaluation means that there are no real monitoring and regulation mechanisms outside the system. Strictly speaking there is no accountability process to show to citizens and road users. This is not to say that there is no regulation mechanism; simply that monitoring and regulation mechanisms are not defined in the actual program rules and that they are beyond the reach of the public.

In concrete terms, these mechanisms seem to be rooted exclusively in the administrative sphere. The Court of Auditors, which monitors the spending of public money, carries out the regular inspections mentioned above: these are intended, among other things to verify the functioning of the sanctions chain, the issuing and execution of contracts, and cost-checking. [20] These inspections testify to official prudence with regard to the innovation of automated enforcement and sanctions, as well as to the sensitivity of a policy aimed at confronting mass infringements and, by extension, the automobile and its user (AutoMoto 2004).

Regulatory mechanisms are also put into practice via parliamentary monitoring of the program's annual funding and its financial performance. The main defect of this tracking by the nation's elected representatives is that it approaches the ASE program in essentially financial terms, an emphasis that leads to operational strategy and road safety issues being relegated to the background and conditioned by financial constraints.

[20] Interview with J-M. Gessner, secretary-general of the National Agency for Automated Processing of Traffic Violations, 9 February 2012.

Section 2

The French ASE program:

An evolving institution and networked deterrence

2.1. An evolving institution: institutionalization, diversification, and specialization

The first automated speed cameras were inaugurated at La Ville-du-Bois on 27 October 2003 by Minister for the Interior Nicolas Sarkozy and Minister for Transport Gilles de Robien.[21] Early in the year tests had been run on a number of sites, with results that convinced the authorities of the value of the program (Carnis 2008b). By the end of 2003 some 70 devices were in place as part of an initial total of 100. This was intended to be followed by installation of 500 additional devices each year, and thus a total of 4500 by the end of 2012.

Deployment of the ASE in France went hand in hand with real institutional dynamism. The Interdepartmental Task Force for Automated Speed Enforcement (MICSA) was in place by 12 February 2003, its mission being to ensure that installation of the first 1000 devices went off smoothly; but also, and most importantly, "to design and construct a completely automated system of infringement processing, from the recording off the offense through to legal recourse for drivers who requested it."[22] Flexibility was the keynote for this body, which drew its responsibilities from four different ministries: the Interior, Finance, Justice, and Transportation. This interdepartmental character was a major feature of the initial system. The MICSA task force's work was summed up in a report that enabled the designing of the program in respect of judicial safeguards, handling of information, processing of fines, the deployment of the first devices, and analysis of the funding of the system (MICSA 2003).

[21] Press kit: *Lancement du contrôle automatisé par Nicolas Sarkozy et Gilles de Robien, RN 20 La Ville-du-Bois 27 octobre 2003.*
[22] Press kit: *Contrôle Sanction Automatisé*, June 2003.

ASE policy took shape gradually and was given institutional status by the creation of the Direction for the Interdepartmental Automatic Enforcement Project (DPICA) in July 2003. The task force became a department, with the accent on monitoring—the sanctions aspect had been removed from its remit. Under the direction of a *Préfet*, it was charged with ensuring appropriate deployment of new detection devices, maintenance of existing ones, and handling the processing of infringements, henceforth centralized at the National Processing Center in Rennes.

January 2010 saw the creation of the Department of Automated Enforcement (DCA), in charge of the deployment of detection devices: issuing of purchase contracts, accreditation, installation, etc.[23] The new body coexisted until March 2011 with DPICA, which disappeared with the formation of the National Agency for Automated Infringement Processing (ANTAI),[24] an administratively and financial autonomous public administrative establishment (EPA). This change led to definitive institutionalization of the ASE program, with a department on one hand and the EPA on the other. It also did away with the interdepartmental aspect of the initial institutional architecture, this shift being confirmed by the assigning of management of road safety and ANTAI to the Ministry of the Interior (MIOMCTI). This new arrangement was also the upshot of all sorts of negotiations and power plays between ministries, with a balance of power apparently established for the moment: deployment strategy for the Ministry of Transport and application of the legislation for the Ministry of the Interior.

These changes have led to an *administrative institutionalization* of ASE management: a stable, efficient architecture at once organizational (creation of the National Processing Center), technical (digitization and automated processing all along the line), legal (depositing of fines when offenses are under challenge, etc.), and financial (creation of a Special Purpose Account). This architecture remains open-ended, however, having enabled deployment of a considerable number of automated speed cameras.

The second big change in the development of France's ASE program is its ongoing *diversification*. The first automated devices were aimed solely at speed limit

[23] Interview with Aurélien Wattez, Deputy Director DPICA, 23 February 2010.
[24] Agence France Press, "PV: agence nationale automatisée créée", 31 March 2011. *Journal Officiel de la République Française*, 31 mars 2011.

enforcement, even if road traffic violence legislation made provision for enforcement at level crossings and red lights. Those first devices included both fixed and mobile versions, the latter able to be used both inside and outside a police car. Currently the greater part of the devices used are speed cameras, although cameras also began to be installed at signalized interserctions in 2009 and level crossings in 2010. The system has also been expanded to include "point to point" average speed devices, while on-board mobile devices for speed checking in moving traffic, temporary enforcement near road works, and deployment of warning cameras are included in the finance legislation for 2012. This diversification is not limited to the technology and the devices used for speed limit enforcement, for it also covers such other infringements as red light running and the processing of offenses: one of ANTAI's missions consists in processing the digital "tickets", and the body can now be seen as a processing platform for all digitally recorded infringements, not just those relating to speeding and parking. ANTAI thus has the potential to become a service provider for big transport companies and infrastructure managers, a protean diversification that also signals a specific institutional dynamic.

The third major change is an increasing *specialization* of functions. This trend has culminated in the present structure, in that the DCA takes care of deploying the devices and defining the enforcement strategy in compliance with the guidelines of its supervising ministry. Subsequently the installation of warning cameras from 2011 onwards was made a DCA task by ministerial decision. The distribution of roles is also evident in the allocation of missions to ANTAI, which deals with automated processing of violations, device maintenance, and offender information (sending out violation notices, replying to mail, etc.). Coordination between the two bodies is carried out on a monthly basis by steering committees overseen by the Prefect.

2.2. Network-centric deterrence and strategic shifts

France's ASE program is characterized by a *mixed deployment strategy* and a *hybrid mode of deterrence* (Carnis 2011c, p.18). The authorities opted for combining the types of devices used, a decision that reflects an unwillingness to gamble on a single form of deterrence and its tendency to produce *local deterrence* in terms of speed violations. Fixed devices are especially relevant in this regard, especially for lowering excessive speed in the vicinity of high-risk infrastructures such as bridges and tunnels

and specific zones such as schools and heavy-traffic areas. Mobile devices, on the other hand, generate *global deterrence*, in that they can be moved to different locations in which traffic is less heavy and thus conducive to high speeds. The hybrid character of deterrence hinges on the way the devices are used: signaling of fixed devices (which is to be abolished in the wake of CISR decisions taken in May 2011, and the use of unmarked cars specially equipped for mobile devices. The signaling of enforcement zones—on the ministry's website, in the specialist press, and on road signs—both warns the driver and influences his driving habits. The goal here is to produce *general deterrence*, to act preventively and even play an educational role. Hidden devices are intended to produce *specific deterrence* and to penalize offenders with sanctions.

At present there are some 3000 automated speed cameras in operation, more than two-thirds of which are fixed. If we include red light surveillance devices, the total is close to 3700 for the whole of France, with the gridding of the national territory meaning that any road user, whatever route he takes, is going to have his speed checked at least once. Without going into the details of this "network-centric" deterrence (Carnis 2011c, p. 19; Carnis 2010, p. 414), it should be said that it is founded on numerous systems enabling mass detection of violations and large-scale processing capacity. These systems are interconnected by a uniform processing treatment within the same program. The facilities are part of the same network—the same organization—and their functioning generates a network of which road users are conscious; the result is that detection and sanction by this kind of system comes to be less the product of a facility—an enforcement device—than the expression of the automated program, of the organization underpinning the facility. This protean deterrence is the outcome of an technocentric organization, whose highly centralized nature is explicable in terms of the architecture chosen to implement the program and revolving around the DCA and ANTAI. It has also been made possible by the technological choices involved, with fixed devices linked directly to the National Processing Center, and mobile devices whose information is transmitted to the same center without any processing by the police or the gendarmerie. In addition, recourse to digitization and specific software has enabled a high degree of automation of the entire sanctions chain (Carnis 2009).[25] The functional modalities of its organization also reflect the way the program was thought out, that is to say the priority given to its technical and technological makeup (CERTU 2001; MICSA

[25] This aspect was first emphasized in Carnis (2005), and restated in Carnis (2009).

2003; Carte Blanche Conseil 2003). In brief, the structuring of current governance of the French ASE program is first and foremost that of a *highly focused technical and technological governance*.

2.3. Remarkable results

The French ASE program's performances fall into three categories. In operational terms it has enabled a substantial increase in detection of road user offenses—an increase of 800% since 2002—and mass processing of these violations. In terms of intermediate aims, road user behavior relative to speed limits has improved markedly; for example truly major violations have all but disappeared. Lastly the road toll has shown an improvement not seen since the 1970s, with a 45% fall in the number of deaths since 2002.

2.4. The financial stakes

The functioning of the French ASE program costs some 200 million euros annually, while incomings for recent fiscal years are close to 600 million. Via the Special Purpose Account mentioned above, part of this revenue funds maintenance and extension of the program. The balance is passed on to the country's départements and municipalities, and to the Association for Funding Transport Infrastructures in France (AFITF), for improvements to transport infrastructures.

2.5. Resistance to the system

Despite the good results obtained with regard to the road toll, the French program still has to face resistance from various actors resorting to different strategies. These contestation strategies function at various levels and are part of a movement aimed at destabilizing the system.

The first form of resistance lies in the limits to user acceptance of speed limits. While the drop in average speeds and the number of major violations has been very marked, this cannot conceal the fact that on parts of the road network the rate of violations in excess of 10 kph can represent one-third of all drivers of private cars. There is also strong resistance from motorcyclists, whose rate of violations in excess of 10 kph is over 70% in built-up areas and 50% on highways and *department* (county) roads

(ONISR 2011, pp. 207-09). The impact of the program is also limited by driving strategies that consist in avoiding enforcement. Moreover drivers make use of technological innovations—GPS, mobile phone applications, speed camera detection—to dodge enforcement devices.[26]

While driver resistance thus uses legal means—adaptation of driving speed—it can also take the form of non-violent illegal action and even, sometimes, actual vandalism.

Another form of contestation takes place at legal level, with newsworthy lawyers in the front rank. Apart from necessary defense of the rights of road users, these challenges bear on the reliability of the detection devices, the legality of the checks, and the processing of violations. In short the goal is more to undermine the credibility of a system seen as ideologically unacceptable by taking advantage of offenders and sometimes by masking pecuniary interests with the high principles of justice.

A section of the automobile press regularly attacks the program, as do certain road user associations who defend their interests by denouncing it as a "cash cow".

Political representatives are another source of resistance: certain parliamentarians stood out against the Interdepartmental Road Safety Committee in 2011, fearing that the measures it proposed would backfire electorally.

Thus the sources of resistance are many—politicians, community associations, road users, citizens, industrialists—with the methods including legal action, violence, citizen initiatives, the ballot box, etc. These different actors all contribute in their own way to shaping the system of ASE governance in France, as do the actors involved in the program and in defining its strategy.

[26] Angélique Négroni (2008), "Les détecteurs de radars sont à la mode", www.lefigaro.fr, 28 January 2008.

Section 3

ASE in operation in France

Centralization and local adaptations

3.1. Organization of the ASE program in France: centralization, advanced automation, and complexity

The ASE program is highly centralized in strategic and decision-making terms: centralization both of strategy and violation processing, even if two bodies now share these functions. Before this separation of roles between the DCA and ANTAI, both functions were handled by the DPICA.

At the same time centralization of the program does not mean that local considerations are totally ignored. This centralization consists in carrying out a nationwide policy that is uniform in terms of both its functioning—the same program everywhere, the same detection devices, direct link to the same processing center—and the treatment it metes out: a driver sanctioned in Paris will be treated no differently from one in Marseille. Relations with the local level are partially determined by the *Préfet* (Prefect)—with regard to suggestion of sites—and he himself is in contact with local stakeholders in the road safety field. Local implementation of national policy also finds expression in the use of the police and the gendarmerie for mobile speed camera work which embodies both national goals and local constraints.

A further vital characteristic of the program is its high degree of automation. Digitization and computer applications enable large-scale detection and sanctioning of offenders within the framework of a watertight penal process. One result of this advanced automation is a distancing of driver from the person monitoring his behavior. It also involves reduction of the role of judges, who are no longer involved if the driver decides not to contest his sanction. From monitoring through sanctions, the human

element has almost totally vanished.[27] In a way the ASE system has unified several penal functions.

Lastly the ASE program has proved its organizational mettle—calling for tenders, deployment, functioning, maintenance—in respect of close to 4000 devices dealing with different kinds of violations (speeding, red lights, level crossings) and subject to ongoing technological evolution. It represents unrelenting joint work by several ministers and even if the interdepartmental side is less marked since the take-over by the Ministry of the Interior, the program has shown itself capable of associating private enterprise (the software for the National Processing Center, computer management, manufacture of the devices) with public sector actors (a network of scientists and technicians, ministries, *Préfets*, decentralized departments, municipalities, *départements*, the police) to form what is, overall, a fairly consistent, efficient whole. In this respect the ASE program represents a "small organizational revolution" whose success was initially far from certain.

3.2. Are speed cameras in the right places?

An ongoing issue is that of the choice of camera sites. In various circulars the government has specified the selection criteria for these sites, which principally include: the risk of accidents; a demonstrable link between accidents and excessive speed; difficulty in carrying out "traditional" detection procedures; accessibility; geometrical characteristics of the road in question; specific types of sites, such as tunnels and bridges; and establishment of a detection rationale for a given itinerary.

Choice of camera sites is also affected by physical and spatial constraints, organizational questions and local considerations.

Where mobile cameras are concerned, location hinges on "shared implicit knowledge," the knowledge being that of the officer carrying out the operation in his area of jurisdiction while being monitored by his superiors.

[27] At the same time human presence remains necessary to ensure the functioning and upkeep of the devices, management of the computer programs, and the legality of the processing.

3.3. Sanctions policy: efficiency at the expense of justice?

The sanctions policy for ASE-detected speeding violations is based on two mechanisms ensuring a remarkable degree of effectiveness. The first is the flat-rate nature of the fines, which presents the enormous advantage of standardizing the penalty while at the same time enabling automated mass processing. This method has made possible the policy of large-scale detection and sanctioning, together with a rapid penal response—processing of the infringement within a week of its occurrence. At the same, though, automation has led to the abandoning of individual sanctioning, even if legal recourse does exist and challenges are still possible.

The second mechanism is that of the depositing of fines, which makes any contestation subject to prior full payment of the penalty. This tends to reduce the number of challenges. The authorities' objective here is to avoid saturation of the courts and the system itself by challenges too numerous for the program to deal with.

This systematic quest for efficiency, however, has only been rendered feasible by abandonment of the individual penalty and by bending the principles of justice slightly; for even if deposit of the fine is not a sanction, it involves forcible payment of a sum of money on the basis of a presumption of guilt when the car owner has not yet been recognized as having committed an offense.[28]

3.4. Operational implementation: ambiguous effects

Our initial in-the-field research at the beginning of the ASE program suggested real keenness on the part of law enforcement personnel engaged with road safety (Carnis 2009). They saw the status of their mission enhanced by presidential commitment, provision of new enforcement devices and innovative means of intervention.

The enthusiasm of those first years has doubtless declined somewhat, but police officers still see ASE as possessing major advantages: a sharp increase in the number of detection locations and the hours devoted to speed limit enforcement. The devices are flexible in terms of use, which means rapid changes of detection sites and ready

[28] Olivier Razemon (2007) "Les radars piégés par les fausses plaques", *Le Monde*, 19 August 2007, www.lemonde.fr

adaptation to shifts in accident patterns. Police officers also acknowledge that ASE has simplified the "administrative" side of their work and substantially diminished the penal response period. Because of their practical side, the devices have made checking less dangerous and given access to new traffic surveillance sites formerly excluded for safety reasons. Yet another advantage of the ASE program is that it has put an end to the widespread leniency practices that undermined the effectiveness of enforcement policies.

At the same time the program is the target of certain police criticisms. It is claimed that the devices were designed without consultation with those who would have to use them: because of its weight the material requires two officers to set it up for work outside the car. In addition, recurrent technical problems sometimes become annoying and can lead to cancellation of an enforcement operation.

ASE has changed police habits, and this is not always appreciated by police officers. The new method is sometimes seen as selling police skills short, as in the loss of contact with the driver and the subsequent impossibility of explaining the nature of his offense to him.

Malfunctions and implementation difficulties being an inherent part of any system, the ASE program would seem overall to be an appreciated shift within its field. However certain issues remain to be dealt with: coordination with automatic reading of license plates, checking of unlicensed and uninsured drivers, and strategic questions specific to law enforcement personnel as "police on the road" and not solely "police of the road."

3.5. Implementing a newly organized enforcement policy

In adopting an ASE program the French authorities not only equipped themselves with a new, effective enforcement and sanction tool; institutionalization of the program via the DCA and ANTAI also led to lasting modification of the architecture of road safety enforcement in France. The new architecture concerns the modalities of speed limit enforcement, with a division of labor between its enforcement and sanction sections.

Moreover, the introduction of automated devices brought change to previous practice in terms of enforcement. Henceforth enforcement falls into three categories: the

first involving some 2100 fixed detection devices; the second involving automated mobile devices; and the third involving interceptive on-road checks by police and the gendarmerie.

This complementary, three-pronged functioning means a range of different interventions where road users are concerned. For the authorities the three categories combined represent a "kind of portfolio" of road safety measures. At the same time the categories are not equal in scope: traditional, manual checks account for 10% of the total, with fixed speed cameras accounting for more than half and mobile devices for a little over a third.

The same three-part structure has taken shape at organizational level. The ASE program ensures management of all the activity generated by fixed cameras, as well as sanction processing in the case of mobile ones. In the urban context the police handle both mobile and traditional enforcement, while the gendarmerie performs a similar function in periurban and rural areas. Thus involvement of the forces of law and order in operational missions using automated speed cameras brings inner consistency to enforcement policy by incorporating police organization activity into that of ASE. What happens is that traditional speed limit enforcement adapts to the intervention of automated devices, by which, as a result, it is partially but not totally conditioned.

The move to automation of road safety violations, the restructuring of strategic activities for speed limit enforcement initiated by ASE, and coordination between the organizations associated with this enforcement have combined to form a new and lasting division of labor in road safety enforcement.

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CHAPTER 3

AUTOMATED SPEED ENFORCEMENT IN NORWAY[29]

[29] Authors: Laurent Carnis and Ariane Dupont, March 2012.

Section 1

Norway: a young nation facing many challenges

1.1. Coming to terms with a difficult context

Norway faces a number of challenges due to its area, climatic difficulties that influence the road toll, its rugged, fjord-dotted landscape, and the many islands that demand specific infrastructures such as tunnels. The population is mainly concentrated in large urban centers in the south of the country, with the country's demographic evolution marked by growing urbanization and population movement towards the south. Even so, this is a relatively unpopulated country in terms of its area.

1.2. Administrative organization and political system: the constraints of the local

Administrative organization revolves essentially around the *fylke* or county: there are 27 of them, divided up into 5 regions or *Landsdeler*. The municipality (*kommuner*) is the political level closest to the citizenry. Since the 1930s the central state has evolved into the key actor, a knowledge of local political echelons is essential to an understanding of the implementation of public policies. This is especially true of the municipalities, which thus have to be coordinated.

1.3. A dynamic economy and a prosperous society

Over the last two decades the Norwegian economy has seen substantial, ongoing growth due to its oil and gas resources. The resultant wealth has made it one of the world's richest countries, and this has led to large-scale investment in transport infrastructures and a growth in car ownership which have had their effect on the road toll.

1.4. A sound road safety situation and an innovative strategic emphasis

Compared to other European countries, Norway has a satisfactory road safety record: the accident rate has dropped sharply over the last ten years, but on average

accidents have become more serious, forcing the authorities to take steps. Speed is a major factor in road accidents, with violations running at a high level.

"Vision Zero" is the official policy governing action in the road safety field. The measures taken are part of a negotiated national plan which brings together the principal actors in the field and lays down a set of goals subject to monitoring in terms of results.

1.5.Involvement of research, and evaluative practices

Researchers in Norway produce a variety of information usable by political decision-makers, with whom they have a specific relationship, notably with regard to public road safety policy. Nonetheless, while the work of researchers is appreciated and respected, their role in decision-making remains strictly peripheral.

Section 2

Automated speed limit enforcement as an institutional response to road safety issues

2.1 ASE in Norway: a long-established strategy

Norway put its first automated speed cameras into operation in 1988 (Elvik 1997), although the earliest tests had been carried out during the 1970s.[30] From the outset the goal was more efficient speed limit enforcement in economic terms: this meant compensating for a shortage of police resources while achieving positive road toll results, an aim that has not changed today. The early research by Elvik indicates that savings obtained by the use of the system are some 124 million Norwegian kroner (Elvik 1997, p. 18).

The first devices to be used were fixed, spot speed measurement cameras. Their presence was signaled to motorists, but this was sometimes a subterfuge, since the cameras were not always loaded with film. In 1995 the program comprised some 65 sites, a figure that had risen to 250 in 2003 (Elvik 2006). This was because the authorities decided to boost their enforcement efforts considerably, and sought to reduce violations by pushing up the flat-rate fines (which do not entail withdrawal of license points). According to Elvik, however, this policy has proved ineffective in terms of reducing driving speeds.

In 2009 a new system was introduced on a test basis: checking of speeds by road section or average speed. In 2011 three such sections of 9-10 kilometers were covered, with this point-to-point speed camera method intended as an experiment eventually leading to more extensive use. The outcome was that the authorities opted for a total of some 40 sections, 8 of which were created in 2012.[31]

[30] Interview with Ann Beate Budalen, 26 November 2011, in Oslo.
[31] Email correspondence with Ann Beate Budalen (February 2012)

The number of fixed automatic cameras in Norway was 365 in 2008 and this had risen very slightly to 371 early in 2012.

Photo 1: Fixed ASE Speed Camera in Norway

(Source: Carnis 2011)

The Norwegian system has four main features. Firstly it has been around for over 20 years and it can be said that to a certain extent Norwegian drivers have learned to live with it. Secondly, it has evolved over time, although it lacks diversity: red light cameras, for example, have been abandoned. It is built around fixed cameras—mobile automatic speed enforcement is not used—and the use of the point-to-point average speed method can be seen as extension of the classical fixed camera approach. Thirdly, it functions on a small scale, and given its age it has shown relatively little change. Fourthly and lastly, organization of speed limit enforcement in Norway hinges on three strategies:

• Manual enforcement by local police using laser guns at spots considered high-risk locations. However the volume of this type of enforcement is decreasing.

• Automated fixed speed cameras at sites considered high-risk, and where enforcement volume is being increased by installation of additional devices.

• Interceptive on-road enforcement by the Traffic Police (*trafikk politi*), with a volume that remains stable.

2.2. Responsibilities shared by two bodies: coordinated action taken at local and regional level

Organization of the ASE system revolves around two major bodies at national level—the *Statens Vegvesen* or Norwegian Public Roads Administration (NPRA) and Norwegian Police Service—together with their subsidiary structures at local level, which decide on enforcement sites.

These two organizations share ASE deployment and implementation. While this cooperation is not institutionalized within any official program, there is a steering committee which decides on the strategy to be adopted, deployment of cameras, and the ASE program in general. It is made up of the NPRA, the Directorate of Police, and other organizations. A working group comprising the two major bodies has also been set up to deal with technical and operational problems. The NPRA is responsible to the Ministry of Transport and the National Police Service to the Ministry of Justice.

The NPRA decides on the conditions of use of the system, drawing up speed legislation criteria in collaboration with the police to ensure uniform functioning in the various regions. It is also in charge of the installation and maintenance of technical equipment, recording of infringements, collection of speed limit violation data and analysis of the photographs.

The National Police Service chooses enforcement locations, lists infringements and sends out fine notifications to offenders.

The NPRA ensures the financing of the system in terms of the purchase and operating costs of the devices. However, both bodies are involved in the technical innovation process. In brief, the NPRA is responsible for the financing and operational functioning of the system, which makes it a key actor; while the police body is in charge of enforcement procedure, application of the law, and the sanction. Nonetheless the system seems to be based on close cooperation between the two, and the police's

manifest interest in ASE can be explained by the time it saves and the greater number of checks it makes possible.

Thus the organization of the system is based on a balanced division of labor, this balance being decided on by the different ministries according to their prerogatives.

The NPRA deals with the technical and legal aspects and matters relating to people's privacy. It also decides on possible camera locations according to a set of interrelated criteria including driving speed practices, the number and seriousness of accidents, and the intended average speed for the zone in question. Some of the criteria are unofficial, as is the average number of speed checks to be carried out. The NPRA champions ASE as part of a national road safety strategy promulgated at national level. The objectives and budgetary resources allocated to road safety and, more precisely, to ASE are jointly defined by the ministries of Transport and Justice, then passed on to the NPRA and the National Police Service.

The role of the police in this system is not a subordinate one. They have the ultimate say in choosing the sites of fixed speed cameras and also play an active part in processing infringements, and this from the moment when the photo is taken. Their role is a vital one in terms of the judicial aspect of speeding violations.

Nonetheless there has been a transfer of responsibilities, for all photos are now sent to Lillestrøm for checking the legal validity of the pursuit, then processed at a single center. This center then forwards the prosecution documents to local police stations, from where a "speeding ticket" is sent to the offending driver. This change can be explained by technological innovations which have increased the system's level of automation.

While the significance of national actors in the functioning of Norway's ASE program is beyond dispute, the system is not a centralized one: it presupposes, in fact, sound coordination with and between local NPRA agencies—especially with regard to road and camera maintenance, camera calibration, and lens cleaning—and local police departments for deciding on camera sites and putting the system into operation. Thus implementation and operational intervention are local matters, not only where camera installation and upkeep are concerned, but also in terms of the administrative and

judicial sides. Without the cooperation and goodwill of the local agencies the system could not function.

The importance of the local dimension reflects the political organization of the country as a whole, with its emphasis on the counties and municipalities. The danger here is co-option of the system by municipal and other local authorities, but the system seems to have a built-in protection mechanism in this respect, in the form of a decision-making procedure they are not part of: the installation of a camera cannot be called for by municipal or county political authorities, nor by residents, and the agencies that actually make the decisions issue regular reminders to local populations that the ASE system exists to reduce the accident rate, not traffic noise.

There is, however, an exception to the principle of definitive decisions being taken by local agencies: tunnels, and in particular those under the sea. Even in cases where there have been no accidents, it has been decided at national level to ensure tunnel safety by setting up fixed speed cameras: in Oslo, for example, there are few cameras in operation, except in the tunnel. One of the authorities' goals is that every tunnel in the country should be equipped with speed-detection equipment by 2020. This reflects a lesson drawn from local deterrence: targeted production of speed violation deterrence for critical infrastructures which are potential sources of major consequences in the form of accidents.

Thus there exists a dual dialog: between the NPRA and the National Police Service on the one hand, and between local NPRA agencies and police on the other. Here a distinction must be made between the national and local levels of decision-making and operation. Strategy and resources are laid down at national level, but implementation in respect of both the NPRA and the police is "decided" and put into effect locally. The NPRA and the police share decisions as to sites and monitoring of speed infringements. The NPRA finances the system, chooses the technology and draws up the list of locations seen as desirable for fixed cameras, working on the basis of accident statistics. It also plays its part in the allocation of the budget within the counties. The national NPRA receives funding for ASE from the ministries of Transport and Justice, and this is redistributed to local NPRA agencies, which undertake to order, install and operate cameras (on a full-time or part-time basis) at locations approved at national level and in agreement with the local police. The agencies have a degree of autonomy in choosing to

use part of these funds for other purposes, such as road maintenance and accident-prevention measures. Similarly, the National Police Service gives its approval to camera sites chosen by the NPRA, but it is the local police who decide whether or not to provide the funding necessary for recording violations and the issuing of fines and other sanctions.

2.3. Technology and deployment: systemic constraints

Norway has only fixed speed cameras: semi-mobile and mobile systems have not been used there. The number of enforcement sites was 371 at the beginning of 2012, which represents an increase of over 20% in two years. In recent years, however, the trend is to stabilization of the number of fixed cameras. There is a certain ambiguity to the term "enforcement device", and "enforcement site" is also used; the implication is that "device" does not necessarily indicate an operational device; in reality not all devices are operational and those that are often function only on a part-time basis. At the present time only 50% function regularly, while the others operate for only a few hours. This situation points up problems which the enforcement system has to come to terms with. The Norwegian devices take photos of offenders as they approach, using piezoelectric sensors to measure speed. The limited use of the devices is in part, but not solely, due to problems with the technology: one of the reasons given is the upkeep cost for the cameras, and "putting them on standby" is seen as method of regulation of the system when the site in question no longer meets accident reduction criteria. In brief, a fixed device has the disadvantage of sometimes being rendered superfluous by a change in the infrastructure or the accident rate. The use of fixed devices, whose technology is sometimes outdated and costly, is clearly both an operational constraint and a strategic weapon.

The program also has to come to terms with other issues regarding point-to-point enforcement. The police have called attention to the legal difficulties this strategy can create: in this respect, for example, it must be remembered that the guilty party is the driver and not the owner of the car.

Point-to-point detection requires a good-quality photo at points A and B, i.e. at the point of entry into the system and at the exit. In addition, the A and B photos have to be stored, which means keeping the photos of all users, including those who are

committing no infringement. Moreover, this system can increase the danger of accidents, for some road users are going to drive more slowly on the enforcement section, and this can cause other users to pass dangerously. There remain, too, many legal problems, notably the storage of photos of users guilty of no violation. The installation of point-to-point ASE can also run into legal trouble regarding respect for individuals' private life.

There are four criteria for camera installation prior to a site being chosen: the amount of traffic, driving speeds, the number of accidents recorded, and a specific request from the police. These criteria are subject to no standardization or specifications (level of seriousness of accidents, thresholds, etc.), just as there are no criteria, either, for deciding on the shutdown of fixed camera sites. All of this means that the local knowledge and the intervention of local police agencies play an important part in regulation of the system. Our research has not enabled us to go any further into this crucial point. These internal regulation mechanisms are to be added to those mentioned above.

There is no official NPRA map of speed cameras in Norway as a whole: the authorities have refused to issue one. On the other hand there is a legal obligation to signal the presence of a fixed speed camera: at least 3 kilometers in advance of the site, on both sides of the road, and repeatedly. Thus the road user knows that he is approaching an enforcement zone. He can also find the relevant information on websites specifying the location of speed cameras. It is probably this ease of location that explains the relative acceptance of fixed speed cameras (90% standard devices, 10% point-to-point). Where point-to-point sections are concerned, it is planned to place illuminated information panels halfway along the section as a reminder to drivers that they are traversing an enforcement zone.

The authorities' readiness to signal cameras and to set them up in particular close to tunnels is part of a strategy aimed at prevention rather than penalization.

2.4. The financial aspect

The cost of a speed camera is 1 million Norwegian kroner (126,000 euros), of which half is the price of the device itself. The explanation lies in the need, for legal reasons, to produce high quality photos. The remainder goes into the functioning of the

device. The upshot of the high purchase price and the expense of keeping them running is that relatively few devices are in service at any one time. In 2006 the program is estimated to have cost 100 million kroner, including 50 million for the National Police Service, 40 million for the NPRA, and 6 million for the agency that collects the fines.

There are no precise figures on revenue accruing from fines; or we were not able to access them[32]. This situation would seem to reflect a lack of centralized information. There are two disadvantages to this absence of analytical accountancy tools: the first is the lack of an economic efficiency referential that would enable calculation of the system's optimal size and thus of its limitations; it is difficult, too, to determine the financial soundness of the system itself and to perform the necessary arbitrage between investment in new devices and the demands of maintenance.

The second disadvantage is that there is no way of calculating if the system pays for itself. The lack of financial transparency means there can be no knowing which agencies bear the cost and which ones benefit, the result being that the financial mechanisms at work can give rise to organizational obstacles. As things stand, the system hinges on budgetary choices by three agencies which may or may not agree as to the system's future. In this respect the partial functioning of certain devices can be interpreted as a regulatory response to the agencies' limited budgets. For the local agencies, any increase in the number of detection devices means more work and greater demands, while for police officers it means an extra workload without the addition of any personnel.[33] This makes non-use of the equipment a means for limiting the work imposed on local police agencies. Here the lack of dedicated funding represents a clear curb both on expansion of the system and on more intensive use which certain parties may be opposed to.

[32] According to Elvik, the revenue accruing from fines issued by speed cameras in 2006 was 391 million NOK. Personal correspondence, 22nd October 2012.

[33] Interview with J. Guttormsen, 28 November 2010, in Oslo.

Section 3

The operational aspect: unequal emphasis on the role of the different police forces

3.1. ASE: role and activity of local police forces

The police play a crucial part in operational implementation of the system. However, the significant autonomy of local police forces can limit its effectiveness via various kinds of informal regulatory measures: refusal to install a device, deliberately protracted identification of offenders and issuing of fines, and restricted use of cameras already in place. In addition, the rise of ASE has led to a reduction in traditional enforcement by the police.[34] The situation is that local police forces are having to cope with budget cuts that make road safety a secondary consideration; at the same time ASE is not greatly appreciated by police officers in that it cuts them off from the citizenry and their other road safety duties, and restricts them to unrewarding administrative tasks. In brief, localism has become an affliction for the Norwegian system.

3.2. Role and activity of the police in speed limit enforcement

Norway has a specialist Traffic Police force, the *trafikk politi*, whose work is vital to the business of speed limit enforcement. The Traffic Police provide road safety backup for local police forces; oddly, though, they have no connection with ASE, whose operation has been entrusted to the local agencies. Nonetheless, the work of this specialist force is on the whole much appreciated by the population.

[34] Interview with Rune Elvik, November 2010.

Photograph 2: Norwegian Traffic Police Car

(Source: Carnis 2011)

3.3. Speed limit enforcement: a priority or just another road safety measure?

Engagement with and control of inappropriate driving behaviors are a major issue for the Norwegian authorities, as in made clear in national road safety strategy and intervention procedures (Elvik 2007). However, despite the setting up of an ASE program, the violation rate remains high, although more so in the countryside than in the cities.

Norway counts on its local police forces and its Traffic Police for road safety action. The police have various types of equipment at their disposal, with the ASE system considered an additional means of official speed behavior regulation. However, the system is not a core tool either for road safety policy or for combating excessive driving speeds.

The role of the ASE system is a highly relative one. When a road safety problem is reported—identification of a high accident-risk location, for example—a set of measures

is decided on: the first is always improvement of the infrastructure in question, with speed limit checks always considered a secondary, temporary measure. This probably reflects the "Vision Zero" philosophy, which gives action on infrastructure priority over action on driving behavior.

To sum up, ASE is seen as a complementary speed limit enforcement tool available to the relevant bodies at specific times. Not considered a core part of the speed limit enforcement system, it functions as a means of regulating driver behavior and checking major violations. It must adapt to existing organizations and tools, rather than the opposite. Part of the local police strategy may consist in no longer using a device and making no effort to redeploy it. In face to face interviews the grassroots actors have also admitted that, in Oslo in particular, once the objectives have been attained in terms of the number of checks and violations, the police stop checking. In addition, traditional manual enforcement is often used to back up road safety campaigns; this kind of enforcement offers significant flexibility from the point of view of geographical allocation of resources and in terms of the need to show the flag.

ASE is most definitely seen as a complement to manual enforcement, which is regarded as the priority form of intervention. The Traffic Police prefer the point-to-point method, which leads to speed reductions over a longer distance and cuts back avoidance possibilities for road users. Another method is the use of unmarked cars. The Traffic Police advocate a combination of this method—for detecting major infringements—with the presence of marked police cars as a visible demonstration of enforcement. In this respect, too, ASE has certain limitations, with its checking zones being generously signaled. In addition, the rate of speeding violations picked up by ASE devices is less than 1%.

According to the Traffic Police, their own measures make speed enforcement credible and visible for road users, the unstated implication being that ASE fails to drive the point home. It would seem that ASE can be easily avoided by road users, but at the same time such vital infrastructures as tunnels represent appropriate sites for application of the system.

The Traffic Police effect no interventions on freeways, this kind of operation being too dangerous. There exists, in fact, an unofficial division of roads to be checked

for speeding infractions: the Traffic Police take charge of freeways and national highways, while the local police deal with secondary roads. In practical terms, while the local police have the necessary equipment, they carry out very few enforcement operations: they have other priorities and are not always willing to risk the hostility of the local population. In other words, local police forces would seem to be independent of local political authorities, while at the same time they are subject to local disapprobation and social pressure. Thus the constraints of localism find expression in mechanisms of social censure.

Nonetheless, the Traffic Police do take action on secondary road black spots; and this dual intervention inevitably generates interaction and a strictly relative level of cooperation.

3.4. Sanctions and technical difficulties

In Norway speed limit violations are a "criminal" act sanctioned by fines and penalty points. The sanction depends on the seriousness of the violation, and a driver loses his license when he has accumulated 8 penalty points. A warning is issued when a total of 6 penalty points is reached.

The income accruing from payment of fines goes into general revenue at state level. There is no dedicated fund for the use of this money.

In Norway the driver of the car, and not the owner, is held responsible for speeding violations. Identification of the driver calls for high quality photography and a corresponding level of technical excellence.

3.5. ASE functioning: evaluation data

In 2005 only 0.25% of vehicles checked by cameras were in violation of the speed limit. This figure had dropped to 0.16% by 2009 and 0.15% by 2010. These statistics raise the issue of the real effectiveness of the ASE system: as our interlocutors suggest, these violations are more likely the result of driver error than of a real intention to break the speed limit. This seemingly limited level of effectiveness thus raises the question of the usefulness of installing and maintaining such a costly system.

Lastly, according to a Traffic Police investigation in 2006, 45% of people involved in fatal road accidents were already known to the police for other criminal acts whose seriousness far outstripped that of their driving violations. Manual enforcement can provide the opportunity to apprehend these individuals. These statistics would seem to validate to a certain extent police officers' interest in coupling road safety and public safety and in focusing their attention on Traffic Police-style activities.

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CHAPTER 4

AUTOMATED SPEED ENFORCEMENT SYSTEMS IN THREE FRENCH- SPEAKING CANTONS IN SWITZERLAND[35]

[35] Authors: Laurent CARNIS et Manuel RAMOS, April 2012.

Section 1

The Confederation counts

1.1. A demographically diverse confederation

Switzerland is a federation made up of 26 cantons, and out of the enormous diversity this represents we have opted for a focus on 3 cantons—Geneva, Vaud and Lausanne—which are quite different in terms of population density and demographic dynamics.

1.2. Car ownership and road infrastructures

Switzerland has a high proportion of car ownership and a relatively dense road network. Administration of the road system reflects the country's political organization, with three distinct levels of responsibility: federal, cantonal, and municipal. The last of these is the most highly developed. The Confederation is in charge of main roads and freeways.

1.3. A sound road safety balance sheet

Since the 1970s road safety has shown a steady improvement and Switzerland is now among Europe's leaders in the field. 2010 saw the country's lowest-ever number of fatalities.

1.4. Speed and driving infringement issues: cantonal characteristics

The statistics indicate that speed is a likely contributing factor in 20% of accidents and 35% of fatalities. This makes it a serious issue for the authorities in their efforts to improve safety on non-urban roads. Young drivers are a significant part of the problem, and the number of violations remains high.

1.5. The Swiss context: increased speed limit enforcement

The need to deal with speed limit infractions is something the Swiss authorities cannot ignore if they are to reduce the road accident rate. As a consequence they have increased the number of speed checking devices, and this has been reflected in the number of vehicles checked and violations recorded. Moreover, both the population as a whole and the authorities are calling for still greater enforcement. Checks are mainly carried out in urban settings, which in fact have a relatively low accident rate compared to other road networks.

The statistics thus indicate increased recourse to fixed speed cameras used in an urban context. However this emphasis on an essentially urban enforcement strategy can appear somewhat paradoxical, given that speeding and accident rates are most marked in non-urban zones.

Section 2

Local police in a federal framework

2.1. VISION ZERO: a federal strategy subject to local constraints

Responsibility for road safety is subject to a division of labor between the Confederation and the cantons. The Confederation is currently working on a global strategy and a national road safety policy, while the cantons' executive responsibilities mean local implementation. The same applies to automated speed enforcement.

Switzerland's federal road safety agenda is based on the "VISION ZERO" action program, which declares fatal and serious accidents totally unacceptable (BPA 2002). Adoption of VISION ZERO has led to an overall policy whose fundamental emphasis is on prevention rather than penalization (BPA 2006). Combating speeding violations plays a limited part in this strategy.

Preparation of the program involved wide-ranging consultation between key road safety actors, yet local actors showed a certain coolness towards the idea, feeling largely uninvolved in its modes of application. In addition private road users' associations and various interest groups play a significant part in road safety action, this being partly due to the absence of an overarching administrative context. The guiding principle here is "participatory federalism."

2.2. A diverse police mosaic

In Switzerland policing responsibilities are divided between the federal and cantonal levels. With regard to public order, safety and compliance with the law, each canton is a sovereign entity within its own jurisdiction and has its own police force. The resultant diversity is such that some authors have spoken of a "federalist mosaic" (Bolle and Knoepfler 2000, p. 109).

In the three cantons under study, a similar architecture of police tasks has been identified, divided between a gendarmerie and a criminal brigade. Each of these police forces has a distinct history and internal organization and enjoys real autonomy in terms of road safety intervention.

This cantonal arrangement means that police officers are closely acquainted with the population and the territory. While not exactly *community* police, at local level they provide road safety services that ensure a good relationship with residents and politicians (Bolle and Knoepfler 2000). An attentively proactive approach means they are well informed about traffic safety expectations, especially where the speed issue is concerned.

2.3. Policing models in relation to their contexts

Analysis of ASE systems in the cantons of Geneva, Vaud and Lausanne reveals a degree of convergence in ways of working, despite some obvious differences.

First of all, these are ASE systems, not institutionalized programs in their own right. Each of the systems studied is part of the workings of a police force which is not

solely dedicated to it. Furthermore, each system is independent. This independence also applies in the case of several systems within the same canton.

Secondly, these systems can be described as policing models. The police force in question is not only in charge of their operational deployment: it also chooses its detection devices, ensures the legality of the procedure through certification and appropriate training, and deals with camera maintenance and infringement processing. Officer motivation and commitment are crucial to the sound functioning of the system, especially since automation is not total. The systems, moreover, are on a small scale: the number of devices is limited, even in comparison with the size of the population, this being partly—but not wholly—explicable by the fact that all tasks are carried out by the police force itself.

2.4. Deterrence strategy: combining penalization and prevention

Despite the different ways of doing things in the three cantons, certain common features emerge in relation to deterrence. Overall the systems studied are based on a mix of detection technologies. The police forces use fixed and mobile speed cameras, as well as laser guns. In the urban context fixed speed cameras are sometimes used in tandem with red light checks.

Another shared feature is the absence of a defined detection strategy. Mobile checks are carried out using marked and unmarked police cars. In some cases the installment of devices is given deliberate visibility: the intention here is to affirm the credibility of the system via a perceptible police presence, but also to demonstrate the rendering of a public service. Camera locations are sometimes but not always indicated, and our interviews suggest a certain ambivalence on this point: the official discourse

implies that signaling is prohibited, while in practice—in Geneva, for example—warning signs are to be seen. A preference for random checks is also indicated by the fact that enforcement sites are not automatically equipped with a speed camera—a rotation principle applies—and so a given site may not necessarily be operational. In addition, a "decoy" system is used by leaving decommissioned sites on the network.

A vital aspect of police strategy consists in meeting a social requirement and ensuring that the principle of equity applies to speed limit enforcement. This does not mean equality in terms of the likelihood of a check, but rather equal benefit from a service funded by the taxpayer. This aspect needs to be put into perspective given the pressing demands by some politicians for ASE devices or an enhanced police presence in their electorates. Nor does this attempt at equity imply any kind of equality in the attribution of funding: contracts for services may be intended to meet extra demand for checking, with financial input reflecting specific detection needs.

The equity criterion does not suffice on its own to explain the strategy. The police have to deal, for example, with traffic flow issues: in Lausanne this involves coping with the trucks that constantly cross the city, while the cantonal police in Vaud have responsibility for a large-scale freeway facility. To some extent the determination to achieve checking credibility via gridding of freeways and main roads explains the number of devices on these networks, which do not actually produce the most accidents. For the same reason there are numerous devices in the cities. There seems to be a dual interaction taking place here: the choice of fixed speed cameras, with its reduction in the costly use of police personnel, means they have to be set up in places with dense traffic flows; this constraint is reinforced by the impossibility of intercepting offenders in dense traffic situations for which the use of fixed devices seems appropriate.

A final factor needing to be taken into account for an understanding of police strategy is the implementation of prevention policies. Traffic managers insist on the need to sanction driving behavior that puts the lives of others in danger, but at the same time refuse to make penalization a principle in its own right.

A preventive approach is also part of the numerous police communication campaigns at both cantonal and federal level. This approach is reflected, too, in the choice of checking sites and modes of use. Sometimes enforcement is visible—notably in the case of mobile checks—so as to attract attention and demonstrate to the public that the police are actively present. However, the police will sometimes refuse to install checking facilities, despite requests from a municipality, when they see improvement of the infrastructure as the appropriate response. It should be noted, though, that certain police forces do not subscribe to this point of view and undertake ASE interventions aimed solely at penalizing offenders without actually affecting the accident rate.

The ASE strategy adopted in these three cantons points up a complex equilibrium and a variety of influencing factors. The demands of residents and politicians have to be balanced out against the realities of road traffic. Deployment also aims at a balance between the need to sanction violations and a primary emphasis on prevention. The goals, then, are: to modify unsuitable driving behavior, sanction dangerous driving, avoid an inappropriately punitive approach, and earn revenue for the canton. In the cases under study the strategic choices seem to reflect the lack of real development of the systems and of rules for the use of detection methods; this may be partially explicable in terms of the limited resources of the system and the fact that speed cameras are part of a much broader range of intervention possibilities. This latter

observation is less true for the police in Vaud, who have to manage a larger-scale system and a more extensive road network.

Section 3

Constraints on implementation of local systems

3.1. Operational principles for ASE systems in French-speaking Switzerland

Are ASE operating principles identical in each canton? Do they share the same features? Analysis of the criteria for choosing enforcement sites, signaling of sites and the equipment used can provide some of the answers to these questions.

At operational level certain common features can be identified. The systems are small-scale, even if there are plans for future expansion. There are some twenty devices of many different kinds; this reflects both successive purchasing policies and technological advances. Both the choosing of sites and signaling betray a absence of any real formalization: policy is ambiguous and the lack of specific intervention guidelines is very clear. Where location is concerned, police emphasis is on reducing the accident rate, but traffic conditions and financial factors often lead to a choice of the busiest, most accident-free roads. As for deterrence, the police have opted for pairings of enforcement devices: fixed and mobile, speed and red light. The decoy strategy is also used, serving as a means of combining budgetary constraints with the need to maximize deterrence.

3.2. Sophisticated automated processing of violations: the Vaud cantonal police

Every Swiss canton has its own ASE system based on specific modes of operation. In some of them the cantonal system coexists with others managed by the municipalities. The level of automation varies, and in some communes covers only the checking procedure.

The ASE system used by the Vaud cantonal police would appear to be the most sophisticated in terms of formalization and automation. Its size partially explains this, with economies of scale being sought via careful organization. This will probably be the model for other cantons when the scope of their own systems increases and reform of police services is complete.

3.3. Is penalization a truly effective policy?

The principles of the sanctions system are laid down in the traffic circulation legislation *(LCR 741 01)*, which is complemented by the enforcement regulations (AOC 741 51 and OCR). Federal law defines the broad outlines, while jurisprudence determines actual legal practice.

The nature and extent of the sanction depend on the seriousness of the offense: the driver may suffer a legal sanction, which can in some cases be coupled with an administrative one. For the most serious offenses the sanction can involve imprisonment. The legal penalty for minor speeding infringements is a flat-rate fine; these account for 90% of the cases not leading to administrative proceedings. Major offenses (*dénonciations en préfecture*) constitute 8% of the total and offenses serious enough to be considered as crimes, 2%.

Switzerland has not adopted the license points system. However, an administrative penalty takes the form of a warning or withdrawal of the driving license, depending on the type of road on which the offense was committed. The minimum period of withdrawal of a driver license is one month.

Adoption of a prior offenses system now means that the authorities automatically consider the offender's driving record before settling on a penalty. Without going into all

the details of this system, it should be pointed out that in cases of repeated breaches, the law makes allowance for indefinite withdrawal of a driver's license and assessment by a traffic psychologist, who then submits a report.

The Swiss system displays a degree of flexibility in its issuing of warnings and possible adjustments of sanctions for professional reasons. At the same time treatment of recidivists and those committing serious infractions can be extremely severe.

In deciding on an administrative penalty, the authorities take account of specific factors: the nature and seriousness of the offense, the driver's record, the date of issue of the license,[36] professional needs and the possible effect of the sanction.[37] Thus penalties can be considered on an individual basis, although this practice applies only to the most serious speed limit infractions. Automation of enforcement, then, does not exclude individualization of penalties, but the latter extends to only 10% of violations—the most serious ones, when they give rise to creation of an administrative file. It does not cover minor speed infringements, which are dealt with by flat-rate fines. These latter, however, are quite high compared to those applying under the French system.

Increased severity of sanctions has mainly affected repeated offenders and drivers guilty of criminal acts. The most serious offenses are punished by withdrawal of the driving license, partly because of the lack of a points system and of any intermediate penalties. The warning remains an alternative means of alerting the driver to the consequences of his act. Recourse to psychological assessment for recidivists adds a medical dimension to the penal question, the implication being that repeated offenses are pathological. It should also be stressed that the authorities try to find an individual,

[36] In the case of no offenses during 10 years or more since the issuing of the license, the driver's good standing will be taken into account.
[37] The consideration here is how the offender will be affected by the penalty. If, for example, he lives in the country and has no other means of transport, withdrawal of his driving license becomes a tricky matter.

appropriate response in the case of the gravest violations, but this practice does not apply to those sanctioned by a flat-rate fine. Automation of enforcement and mass processing significantly reduce the scope for individualized sanctioning, but do not render it totally impossible.

3.4. Funding of ASE systems

All the systems under study display the same characteristics in terms of funding and use of subsequent revenue. The income generated by ASE systems goes into the cantonal or municipal coffers, so in this respect it fuels the overall budget. There is no dedicated fund for these payments. One consequence of this is that there is no self-funding for ASE systems, while another has to do with the lack of transparency regarding the financial input for the cantons, especially in a situation involving several systems. This does not mean there is no way of knowing just how much revenue is generated, but this information is not subject to centralization or systematic communication, and this rules out any cost accounting approach.

ASE funding modalities differ from canton to canton. In Geneva the police have to make repeated requests for increases in the number of detection devices, and these may or may not be met. The annual budget of 500,000 Swiss francs has to cover equipment and maintenance costs for 46 municipalities. Personnel-related expenses are covered out of the police force budget.

At municipal level—in the City of Lausanne, which runs its own system—annual income is estimated at 6 million Swiss francs, plus another 3 million paid to the canton (*dénonciations à la Préfecture*). Purchase of a speed camera costs 140,000 francs, maintenance some 70,000 francs, and miscellaneous spending by personnel a further

110,000 francs or so. While all funding has to be provided by the municipality, only the income from flat-rate fines is paid to it.

The six large cities in the canton of Vaud are said to generate revenue from their ASE systems equivalent to that earned by the rest of the canton: somewhere between 26 and 30 million Swiss francs.[38] This income is a financial godsend and may explain why close to 40 municipalities have made requests to the canton for installation of a detection device.

Municipalities without their own police force can nonetheless equip themselves with fixed speed cameras. Subject to the granting of cantonal permission, installation entails assuming full responsibility for all equipment and personnel costs. The cost of the devices used by police forces in the canton of Vaud, as declared by the Lausanne municipal police, is close to 100,000 Swiss francs.

Revenue is shared with the canton on a 50/50 basis over five years, during which the costs of the device have to be amortized. All revenue subsequent to this period goes directly to the canton. These drastic financial preconditions aim at discouraging communes from making requests for ASE on purely financial grounds, the upshot being a limited number of financially viable devices. This system is much criticized by mayors and municipalities, who feel unjustly constrained in their use of ASE.

In fact these financial stipulations reflect financial considerations on the part of the canton, which later has to meet the personnel costs relating to use of ASE devices and so seeks to avoid any financial risk. A perverse side effect is to make installation of

[38] Interview with Captain Rossi in Lausanne, 20 May 2010.

devices feasible only on roads where traffic is dense—at least 2000 vehicles per day—to the detriment of high-risk zones.

Requests for device installation from the cantonal police have to be seen in this narrow context, in which every request requires the drawing up of a detailed application for approval firstly by a committee, then by Parliament. All of which considerably hampers extension of the ASE system.

In the canton of Neuchâtel there is no automatic guarantee of funding. All requests for devices must be addressed to the canton. Purchases can be made by the municipalities, but also by the Neuchâtel police. Given the current restructuring of the police service and the service contracts system, funding conditions vary and depend on the type of device in question.

In the case of ASE devices managed by the Neuchâtel police in the municipalities, revenue is shared 50/50 with the commune. In addition, however, the municipality must pay a "management fee" of 3-5% of the income. Revenue from sanctions generated by mobile devices and fixed cameras not managed by the canton—municipal devices, as in the City of Neuchâtel—is shared equally between canton and municipality. The explanation for this sharing of receipts is that the canton deals with major violations and their administrative processing. In the case of the mobile cameras used by the Neuchâtel police, all revenue goes to the canton within the framework of additional, unscheduled checks and those carried out on freeways. In the case of enforcement operations carried out under contract, the split is once again 50/50. Here the municipalities benefit from the product of the enforcement activity, and this enables them to finance their own checking system.

Depending on the canton, funding arrangements mean that the majority of devices are financed by the municipalities, while the revenue from fines is subject to systematic sharing between municipality and canton. In all cases the cantonal police force partially finances the functioning of the ASE device out of its own budget, which in turn is provided by the canton. These funding conditions have the notable effect of hampering extension of the systems. The sharing of income between the municipalities and the canton highlights the importance of the financial side in relation to speed camera use, which can prove a source of revenue for some municipalities. The conditions of the split are more or less favorable for the municipalities: more in the canton of Neuchâtel than in Vaud, which seeks to avoid deployment of devices intended solely to generate income. Paradoxically, this constraint in the canton of Vaud leads to an emphasis on sites generating significant revenue. This focus on the financial aspect signals both the cantons' political determination to control municipal activity in the ASE domain and the absence of evaluative practices regarding the economic side, i.e. the relationship between revenue earned and accident reduction. This evaluative shortfall was stressed by Switzerland's Accident Prevention Office (BPA) with regard to road safety strategy in general, together with a recommendation that part of the income from flat-rate fines be allocated to road safety action (BPA 2002, p. 119).

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CONCLUSION[39]

[39] Author: Laurent Carnis, july 2012.

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ASE: Diversity revealed

Analysis via the governance structure of ASE programs brings to light all sorts of diversity. There is no single way of working. Each case reveals its singularity, its own institutional structure, and implementation of a specific form of governance.

This institutional variety raises various issues. Why so much diversity within a method using relatively sophisticated technology and largely based on the same enforcement technique? Why does recourse to the same technological solution not lead to greater harmonization of practice?

Part of the answer lies in the operational context of each ASE system. These are sociotechnical systems which must come to terms with a specific setting and institutional environment (Axelrod and Cohen 1999; Buckley 1967). In other words, the systems are different because their institutional environment is different. This institutional diversity can be seen in the use of specific forms of organization and operational practices. In addition a kind of interlocking process takes place: the institutional framework acts on the organizational modalities which in turn influence the operational practices. At the same time we must not overemphasize this aspect, given that interplay between actors and the functional constraints of different organizations also engender degrees of freedom (Saussois 2007; Rojot 2003; Crozier and Friedberg 1977).

1.1. Diversity of context and equivocally influential factors

In respect of the road toll, there are clear differences of effectiveness—fatality rate per head or per kilometer covered—between Switzerland and Norway on the one hand, and France and Queensland on the other. The first two belong to the group of better-performing countries in road accident terms, while the performances of the two others are mediocre. Of the four countries under study, only France is faced with more than 1000 annual fatalities, so the scale of intervention required is not the same. The

relatively lackluster results for France (as compared to other European countries) and Queensland (as compared to the other Australian states) played a significant part in the decision to set up an ASE system. By contrast, the good results for Switzerland and Norway can explain in part the lesser degree of interest in such a system.

Demographic diversity is a further factor. France has the largest population of the four, the three others having approximately only a tenth of the French figure. Population density is especially low in Queensland and Norway, but both have a rate of urban concentration that structures accident-related issues. In addition, Queensland's positive demographic dynamic contributes to the number of drivers using the road network and in turn to the accident rate.

The area of the countries also emerges as a marker. France, Queensland and Norway are big, while Switzerland is small by comparison. The size of a country determines to a certain extent the size of the road and freeway networks to be monitored; this is particularly true of France, whose many kilometers of both all have to be kept under police surveillance. Switzerland, however, is an excellent example of the opposite situation, in that spatial constraints limit the extent of the network. Thus there is less territory to be monitored, while the concentration of traffic flows makes targeted enforcement easier.

Climate and geography also play a significant part. Norway's northern climate, jagged coastlines, and numerous tunnels are all decisive factors in terms of both mobility and speed limit enforcement. Queensland, on the other hand, is marked by a hot climate and a large territory that can make checks difficult and hamper centralized data collection and supervision of system operators. The more temperate climates of France and Switzerland rule out these difficulties.

Furthermore, the dynamism of the national economy helps structure road accident issues. Queensland's mineral wealth is generating growth that attracts new residents and so increases the number of vehicles on the roads. Likewise, Norway's subterranean energy resources have enriched the country's inhabitants; this has led in turn to expansion and improved upkeep of the road network, and to ownership of better-quality cars. In both countries economic development has influenced accident statistics, positively in Norway, but less so in Queensland. Economic growth has had less

impact in France and Switzerland, even if Switzerland is one of the richest countries in the world.

The political context would seem to be a crucial factor in both France and Queensland, where deployment of an ASE system was made possible by the intervention of politicians. Commitment by France's president and, to a lesser extent, parliamentary and prime-ministerial action in Queensland, were major factors in the decision to use ASE. This marked political input is not to be seen in Switzerland and Norway, although this does not mean that the system is unaffected by political considerations.

Evaluative practices, too, are highly diverse. There are none in Switzerland: the systems in use are not evaluated and, as far as we can tell, there are no links with the world of academic research. Evaluation does take place in Norway, but the role of researchers in the decision-making process is a peripheral one, despite the fact that the decision-makers seek their expert advice. The French program relies very little on the country's researchers, and much more on the technical expertise network: in other words, the ASE program is seen more as a technical than a sociotechnical system (Carnis 2009). The situation in Queensland is marked by a regular, formalized, independent approach to evaluation (Carnis 2008). Research circles play an important part as suppliers of impartial expertise that enables improvement of the program's functioning.

The way road safety policy is structured can also be a crucial driving force. Queensland is remarkable in this respect, in that road safety action is part of a pluriannual planning framework in which task-sharing is clearly defined, performances are evaluated and accountability is built-in. Road safety policy is also a feature of the development of the "safe system" and with Vision Zero Norway has also adopted a pluriannual planning approach as part of an overall system. France and Switzerland, by contrast, are counterexamples: Switzerland has decided to adopt a national road safety policy inspired by Vision Zero, but resistance from the local powers that be means it has not been applied at local level. France has no pluriannual planning framework and no underlying philosophy of action, which can give the impression that measures are taken piecemeal, in response to public opinion, or are simply a kind of improvisation.

1.2. Different organizational rationales

It is clear that the political-administrative context shapes the way the systems are organized. In Norway and Switzerland local power structures thus enjoy considerable influence. Norway's municipalities and counties are crucial political echelons, which largely explain the local nature of ASE organization in that country. A relatively similar situation structures ASE management in Switzerland, with simultaneous intervention by municipalities and cantons. In Norway, by contrast, while the government lays down the main guidelines, local management hampers implementation. In Switzerland the Confederation's legislative powers mean it establishes a uniform framework for action, but the actual operation of the system is controlled by both the cantons and the municipalities, who sometimes share executive power in this respect. In the case of Switzerland the federal framework is flexible enough to leave broad local scope for action, which means a certain operational and institutional dynamism. A further outcome is great diversity within the cantons.

In this respect the French and Queensland programs appear centralized. This is most evident in the case of France, where a uniform program is applied to the entire national territory. True, the system has to deal with local constraints, but the centralized state carries enormous weight. Centralization is also marked in Queensland, even if allowances have to be made for town and metropolitan centers, which are brought into the ambit of the system in an intelligent way. The advantage of centralization lies in a harmonization of practices that can enable equality of treatment for all users. The drawback can be insensitivity to demands coming from the local level and the imposition of practices that are sometimes inappropriate. To sum up, harmonization of practices can engender a lack of flexibility and even a form of operational rigidity.

There are differences, too, in the organizational models adopted by the countries in question. The Swiss model is police-based: the police force is the core actor, which means there has to be real commitment by officers, who have numerous responsibilities. In the three other cases, the models are mixed, systematically associating the Ministry of Transport and the police. The Ministry of Transport lays down the strategy, while the police force wields operational power. This division of labor demands very close cooperation and sound coordination mechanisms. In the case of France, most

responsibilities regarding road safety are now held by the Ministry of the Interior, which is tending towards a police-based model.

Lastly, modes of operation are part of a more or less formalized framework. In Switzerland and Norway there is no ASE program as such: instead, systems are entrusted to non-dedicated organizations, these being mostly police forces or even local bodies, as in Norway. France and Queensland share the characteristic of having created formalized, dedicated structures for the systems, which can thus accurately be described as programs. These systems have their own administrative structures, which are accountable and must meet precise requirements as to their functioning.

Financial considerations are critical to any understanding of the way these systems function. Norway and Switzerland present relatively similar situations: funding comes directly from the central government or the canton, while accrued income goes into the state's general revenue. There is no dedicated funding, which de facto leads to a separation between accrued revenue and equipment and maintenance spending. Intentionally or otherwise, to a certain extent this form of organization restricts expansion of the systems. The French program enjoys dedicated funding through a Special Purpose Account, as a result of an exception to the general principle governing public finances. Funding of the upkeep and expansion of the system comes from the revenue accruing from fines; the surplus is shared out among different actors, but is not necessarily dedicated to road safety action. The Queensland program is self-financing on the basis of the revenue accruing from fines. What makes this system innovative is that surplus income finances non-recurrent road safety projects. Dedicated funding doubtless facilitates maintenance and expansion of the program, but also contains the seeds of an unchecked expansion exceeding the requirements of rational allocation of resources. In this respect monitoring by parliament is an absolute necessity.

1.3. Diverse operational practices

Operational practices depend in part on the size of the systems. The Swiss systems are characterized by their smallness, involving only twenty or so devices, and so do not demand a large-scale organizational structure. This judgment, however, must be seen in context, given that the unit of analysis used is the canton.

The Norwegian system comprises 375 enforcement locations. This means a more extensive system than in Switzerland, but this too must be put into context, as not all the sites are functioning. Random use of enforcement sites means that the number of operational ones is in fact much lower.

Queensland has 4500 sites, with 45 cameras reported as being used in rotation. The emphasis is more on hours of enforcement, the aim being an annual total of 75,000. Recently it was decided to augment the program with 10 or so fixed cameras.

In this respect the French program looms largest, the aim being a total, very soon, of 4500 devices. At present over 3000 speed cameras are in operation, or 3700 if red light cameras are included. This must obviously be considered in relation to the area and the number of drivers, both being larger in France than in the other three countries.

Strategically speaking, the differences are just as striking. The French system seems particularly advanced compared to the other three. The determination to systematically grid the road network, install cameras according to a rationale of routes followed, establish a balance between fixed and mobile devices, and utilize relatively uniform cameras, indicates a quite sophisticated strategic design. This seems paradoxical in that overall road safety policy in France is not nearly as structured as this. Similarly, formalization of the program in Queensland has led to no clear definition of strategy, the initial deployment having most likely been influenced by political constraints and public acceptance levels. As for Switzerland and Norway, the functioning of the system draws on no clearly stated strategy. This came about in Switzerland through the lack of a national policy combined with management by the cantons. In Norway this strategic shortfall reflects the fact that ASE is considered only one means among others of enforcing speed limits.

With regard to the technology involved, the cases under study mostly put an emphasis on the combining of fixed and mobile devices. Some ASE systems use manual laser guns and devices that check both speed and red light behaviors. The Queensland system initially relied solely on mobile checks, but has recently been diversified by the introduction of fixed devices. Norway stands out here as the only country to use fixed devices exclusively. It should be noted that for police forces ASE is an additional means of enforcement and does not necessarily lead to reduction of manual checks. These

forms of intervention are, in fact, complementary: ASE provides mass processing, while "traditional" interception helps identify the most dangerous drivers and detect other offenses as well.

What determines installation of speed cameras? The French, Swiss and Norwegian systems use criteria relating to the accident rate, technical constraints, and regulation of excess speed, but these are neither specified nor formalized. In certain Swiss cantons the funding mechanisms makes the financial aspect a significant criterion. Only Queensland applies clearly specified, formalized criteria to deciding whether or not a given site is eligible for installation of a speed camera. With the sole exception of Queensland, the criteria remain relatively vague.[40] This vagueness enables flexibility of checking and management at local level, but it also introduces inefficiency factors. In practice the right choice of site is vital to any significant reduction of the accident rate; so it remains extremely paradoxical that there should be no precise criteria for the installation of such technologically sophisticated equipment.

To signal or not to signal? This issue, too, gives rise to a diversity of responses. Overall, official policy consists in a balanced approach to indicating enforcement zones. Fixed camera sites are signaled in Norway, while manual checks involve the use of both marked and unmarked police cars. Swiss federal legislation imposes no obligations and no prohibitions. In general enforcement areas are not indicated, but in practice the use of police cars and signs means that checks can sometimes be signaled without this becoming the rule. In Queensland, where ASE checks are signaled, it was recently decided to experiment with not indicating some enforcement areas. In France mobile cameras were not signaled, while there was a uniform system of signaling for fixed devices. More recently the government decided to end the signaling of fixed cameras, but in practice some are still signaled while others are preceded by speed warning devices. This, however, is a transitional phase.

Use of speed cameras requires certification of personnel together with accreditation and regular checking of devices as guarantees of legality and sound functioning. These features are common to all the systems investigated, but in Switzerland operator certification is required for each type of camera: an operator using

[40] In Norway the authorities have an assessment matrix, but it was not communicated to us.

two types must have double certification. Great care is brought to the training of operators in Switzerland. In Queensland police officers are given similar but less detailed training, but the primary emphasis is always on the use of devices in the field. Formalization of their conditions of use is due to the need to standardize operator practices over an enormous area and to ensure enforcement whose quality reflects the political issues involved; not to mention the fact that the system basically relies on mobile devices whose use requires police participation.

As for sanctions, automation demands simplification of the action taken against offenders. In this respect all four countries have adopted a system of flat-rate fines for violations up to a certain level of seriousness. The amount of the fine varies according to the extent of the speeding involved, and can also vary from one country to another. Any real comparison, however, would require correlation of purchasing power in the countries concerned. Switzerland has no points system for driving licenses, while the others have systems of loss of points or accumulation of demerit points.[41] Switzerland displays a certain inventiveness in this regard: for repeated or particularly serious offenses the lack of a points system can lead to immediate withdrawal of the offender's driving license, and in certain case to psychological follow-up.

Subsequent to an offense, the owner of the vehicle is presumed guilty in Queensland and France. In Norway and Switzerland the driver is responsible, and so has to be identified. An immediate consequence of this is the need for sophisticated photography equipment. In all the cases under study great care is brought to accurate identification of the offender, given the impact a sanction can have on personal, family and professional life. This protection of individual rights is a marked feature of the systems in Switzerland and Queensland. In Norway official concern for the rights of the driver has become evident with the deployment of the point-to-point or "average speed" enforcement system.

Analysis of ASE systems reveals considerable diversity in ways of doing things. Institutional design, organizational framework and in-the-field practices all play their part in shaping the different systems. Nonetheless, these convergences do not suggest the existence of major models or typologies, and so we are faced with real cultural

[41] This raises the issue of the cognitive implications of the loss of good points or the gaining of bad points.

diversity in that these systems actually reflect values, beliefs, ways of thinking, and practices specific to the populations in question. The systems also point up the institutional and contextual diversity of their settings.

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Identifying sound practices?

The preceding section has highlighted a broad diversity within ASE systems, a diversity that runs through all levels of governance, institutional, organizational, and operational. Even so, can we not identify sound practices?

This identification raises two major problems. The first is the need for a yardstick that makes one way of doing things better than the others. But how to establish this yardstick? And does it really exist? The second problem arises out of the context of the particular way of doing things. This latter may be a sound practice in that it has been implemented in a specific institutional context and according to specific organizational arrangements, but it may turn out to be ineffective in another setting. Moreover, there is always the possibility that one sound practice can clash with another. This involves issues relating to institutional imports and exports that have not been looked into here.

For the purposes of this research, a sound practice will be considered as a way of doing things which, after analysis, *appeared* to us a component of performance given the levels of analysis brought into play. In this respect, it represents a structural element of the ASE system and thus of the three levels of governance identified, even if the practice only becomes clear at one of these levels.

2.1. A philosophy of action and the need for planned intervention.

The Norwegian and Queensland cases are interesting in this respect, with their respective uses of Vision Zero and the "safe system". This philosophy of intervention allows for consistency in the system of action via creation of mechanisms and procedures of coordination/cooperation between actors in the road safety field. Recourse to an approach that formalizes each participant's action is inevitably accompanied by pluriannual planning procedures—definition of aims, evaluation of performances, etc.—which facilitate actor motivation and coordination. Adopting a

philosophy of action enables structuring of the system of governance and road safety while contributing to its continuity.

2.2. The importance of defining and implementing a strategy

The French ASE program is a good example of the implementation of a balanced strategy using fixed and mobile devices, and signaling/non-signaling. Efforts towards the gridding of the road and freeway network, together with a camera deployment that takes account of a route-based rationale have enabled the construction of effective network-centric deterrence. Gradual, ongoing deployment has led to the institutionalization of the program as a major contribution to both road safety and a substantial reduction in the accident rate.

2.3. Dedicated funding for system continuity

Funding conditions for ASE systems are important as means of ensuring not only their continued existence, but also their upkeep and possible expansion. Seen in this light, creation of a dedicated fund is a major element. The case of Queensland is particularly instructive in this regard: the existence of a dedicated fund ensures the financial continuity of the system by creating not only a self-financing mechanism, but also a political one by rendering the system more socially acceptable. This kind of fund obliges the authorities not only to disclose the financial results of the system, thereby restricting installation of unnecessary cameras, but also to state clearly how the revenue generated is going to be used. The use of this revenue for non-recurrent road safety measures is an interesting idea in that the surplus goes towards projects that justify the aims of the program—reduction of the accident rate and its consequences—without being fed into general state revenue.

2.4. Developing evaluation practices

The Australian example also compels recognition in this respect. Evaluation practices are vital to deciding whether or not the policy being implemented is achieving its goals. They also enable comparison of the efforts made by the population and the associated advantages, and the taking of corrective action where necessary. Introduction of evaluation practices also involves laying down performance criteria and a more formalized structuring of the relationship between the stakeholders. In addition,

carrying out evaluations leads to thinking about the role to be accorded to those who produce the research; but also, more generally, about the utilization of that research. Evaluation practices must be part of a broader framework of transparency and communication with the public, one that enables an overview of the policy in question for both citizens and their political representatives.

2.5. Integrating local practices and constraints

Switzerland's political organization is interesting and intriguing. The country's ASE systems are structured by the level of executive power wielded by local bodies—the municipalities and cantons. In Switzerland this local emphasis seems to be no obstacle to the deployment of ASE systems; on the contrary, it is a source of institutional diversity which provides real flexibility of functioning and better adaptation to local requirements and constraints. In this respect the local model offers the possibility of appropriate responses and an escape from forcible standardization of practices. Cantonal and municipal systems constitute authentic alternatives to national programs, which sometimes turn out to be ill adapted to local circumstances and are often excessively inflexible.

2.6. Sophisticated automation: a source of real benefits

Automation of speed enforcement provides an effective response to the challenges both of massive speed limit violations and the judicial and administrative processing they require. Sophisticated automation of the processing chain offers the advantages of mass output, rapid sanctioning, fewer mistakes of identification (compared to an entirely manual system) and reduction of personnel costs, notably for the hours worked by the police. The French ASE program illustrates this sound practice with a near-total automation of the enforcement-sanction chain which has earned credibility for the policy while ensuring equity of treatment for all offenders.

2.7. Police commitment: a necessity for the sound functioning of an ASE system

The various systems in use in Switzerland highlight police involvement at all levels. This commitment takes the form of intensive training of police officers with a view to making them ASE specialists, and is also to be found in the choice and design of the tools they have to use in the course of their work. Rather than have this new tool

imposed on him, the police officer must personally appropriate it: the device must be adapted to the context of police intervention, rather than the officer being forced to adapt it himself. In the interests of greater efficiency, this Swiss characteristic could perhaps be usefully backed up by an information system enabling checking of police officer performance and feedback on enforcement activity. This would prevent police involvement from leading to sectional practices that could gradually get out of control.

2.8. Penalize—but prevent, too

Norway adopted an interesting stance in opting at the outset for ASE as a tool complementary to other forms of speed limit enforcement. Obviously ASE aims at sanctioning offenders, but above all at prevention. The setting up of cameras near tunnels is evidence of this: the intention is not to systematically check and sanction drivers, but to prompt them to slow down on certain parts of the road network given the considerable risks they run in doing otherwise. This preventive emphasis is also visible in the other countries studied, especially Switzerland, but in France and Queensland is more the outcome of a balance between social and political constraints.

2.9. Sanctions policy

Introduction of an ASE system raises the level of surveillance and detection of offending drivers. In a purely mechanical way it increases the likelihood of being sanctioned. In addition, the capacity to identify and process an enormous number of violations raises the issue of the technical possibility of adapting the sanction to the offender. The flat-rate fine system is a response to the great mass of minor speeding infractions. However, ASE presents challenges in terms of individualized processing of violations that may even go so far as to fall into the category of criminal acts. Given the number of infractions committed, this could produce bottlenecks in the courts, but the Swiss systems demonstrate that this problem is not insoluble. The Swiss cantons demonstrate real inventiveness in their sanctions policy by obliging certain offenders whose behavior is considered a public danger to undergo psychological follow-up. Queensland has likewise shown originality in modulating fines for companies who do not name the offending driver, and for violations committed in specific places or at specific times. And Switzerland is planning a warning system that will come into effect

with the first minor infraction. It could be said, then, that implementation of ASE should not exclude a degree of flexibility in the resultant sanctions.

2.10. The need to protect the rights of the individual

The automation of enforcement inherent in ASE leads to a certain standardization of sanctions. Emphasis on rapid processing of the photos means the system (which sometimes demonstrates a lack of good faith in this regard) does not readily lend itself to challenge by offenders or to pursuance of cases in court. Nonetheless it seems absolutely essential that processing procedures should be extremely reliable, while still giving the driver the chance to contest the alleged violation and making it easier for him to do so. The Swiss systems and the Australian program seem especially attentive to the quality of their processing, and show an awareness of the irremediable impact a judicial error can have on the life of the person concerned. This need for quality in terms of judicial processing calls for sophisticated technology and regular checks of the procedures involved. In order to avoid attempts at judicial deviousness, all additional costs incurred should be met by the driver in the event of his being found guilty in court; on the other hand, he should not have to pay his fine (with a surcharge) until his guilt has been established.

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