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Automated Road Traffic Enforcement: Regulation, Governance and Use

A review

Dr Adam Snow
Liverpool Hope University
October 2017

The Royal Automobile Club Foundation for Motoring Ltd is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users. The Foundation publishes independent and authoritative research with which it promotes informed debate and advocates policy in the interest of the responsible motorist.

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About the Author

Dr Adam Snow is a lecturer in criminology at Liverpool Hope University. His research expertise lies in the field of road traffic, road safety and parking enforcement. He has produced research reports for a variety of organisations that are involved in parking enforcement and road traffic regulation. His most recent work involved examining (with colleagues from the University of Birmingham) public perceptions of the Traffic Penalty Tribunal's online case management system. His research examines public expectations and experiences of regulation and punishment, and the perceived legitimacy of such enforcement systems.

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Disclaimer

This report has been prepared for the RAC Foundation by Dr Adam Snow (Liverpool Hope University). Any errors or omissions are the author's sole responsibility. The report content reflects the views of the author and not necessarily those of the RAC Foundation or those who offered a peer review or comments on the draft report.

Contents

List of Figures

List of Tables

List of Abbreviations

ACPO	The Association of Chief Police Officers (now NPCC)
ANPR	automatic number plate recognition
BAC	blood alcohol concentration
CBE	Cross-Border Exchange
CEO	civilian enforcement officer
DfT	Department for Transport
DPE	decriminalised parking enforcement
DVLA	Driver and Vehicle Licensing Agency
DVSA	Driver and Vehicle Standards Agency
ETSC	European Transport Safety Council
EUCARIS	EUropean CAR and driving licence Information System
FPN	fixed penalty notice
FTE	full-time equivalent
HGV	heavy goods vehicle
LGA	Local Government Association
LLP	late licensing penalty
MEV	mobile enforcement vehicle
NDORS	National Driver Offender Retraining Scheme
NPCC	The National Police Chiefs' Council
NSAC	National Speed Awareness Course
NSCP	National Safety Camera Programme
OTSP	on-the-spot penalty
PCN	Penalty Charge Notice
RTA	Road Traffic Act (used only for RTA 1988)
RTOA	Road Traffic Offenders Act (used only for RTOA 1988)
RTRA	Road Traffic Regulation Act 1984
TMA	Traffic Management Act 2004
TSC	Transport Select Committee
WDU	'What's Driving Us?' (NDORS course offered to motorists involved in a non-collision road traffic incident)

Foreword

Technological advancement has brought about incalculable benefits for us, both as individuals and for society as a whole, making our lives easier, healthier, happier and more productive.

But the very technologies that help enhance modern life can also create fresh challenges as a result of the ways we choose to use them. Our views of what uses are and aren't acceptable change over time.

So it is with the technology developed to assist with road traffic law enforcement. By using equipment such as breathalysers and 'drugalysers', police officers are able swiftly and indisputably to establish whether a driver has strayed beyond the permissible legal limits.

But how do we feel about technology that works independently? Speed cameras in their many guises immediately spring to mind: often requested by householders worried for the safety of their streets – but often viewed with suspicion by drivers who see the revenue from fixed penalty notices racking up.

We wanted to take a close look at the implications of automation in the area of traffic enforcement becoming yet more widespread. With police force budgets under huge pressure, there must be a temptation to see automation not merely as a way of augmenting capability but as a substitute for it – one which releases officers to pursue other duties.

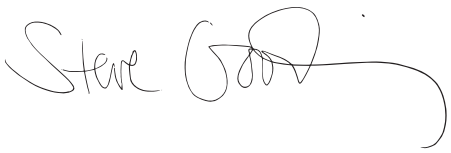
So, as a first step, we commissioned Dr Adam Snow, a criminologist who is expert in the fields of road traffic, road safety and parking enforcement, to write this report exploring the deployment of automation to date, the legal framework that governs its operation, and the scope for police and highway authorities to go further.

There are some clear messages:

- the legal framework exists to accommodate far greater use of automatic technology to enforce traffic offences than is presently the case;
- as camera accuracy has improved, the costs of such technology have continued to tumble;
- the systems that manage big data can link driver licence, vehicle keeper, insurance and MOT records in the blink of an eye.

This all begs a bigger question: is the present brake on further deployment of automated enforcement less about cost, and more about the public acceptability of these systems? We'll be exploring that question in a future report.

Steve Gooding



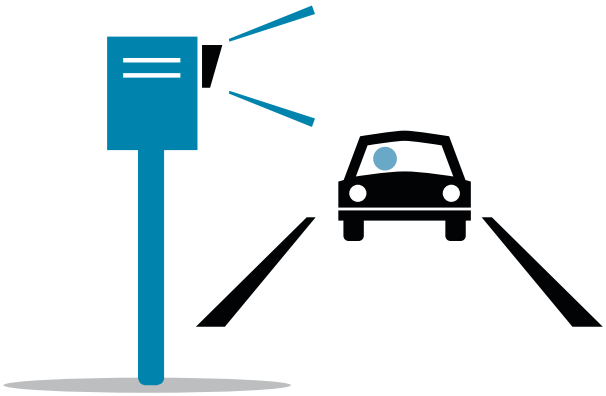
Director, RAC Foundation

Between 2010 and 2014, full-time-equivalent officers in road traffic policing **decreased by 23%**

In 1960, there were **16,921** fixed penalty notices (FPNs) issued, for **two** offences.

In 1991, there were **5.65 million** FPNs issued, for **37** offences.

In 2011, there were **9.85 million** On The Spot Penalties (OTSP) issued, for **79** police-enforced moving traffic offences and **15** local authority-enforced traffic offences*.



In **2011, 52%** of FPNs were camera-detected. In **2015** it was **74%**.

4.71 million private parking penalties, a **three-fold** increase since **2012**.

* The penalty regime has changed over time, which limits the comparative assessment for penalty notice figures. See section 2.5 for an explanation of reforms to the penalty structure since 1991.

Executive Summary

Road traffic enforcement has two essential aims: public safety and the efficient management of the road network (which includes the parking of vehicles on the road network). Enforcement aimed at promoting these twin aims is certainly viewed as problematic, from the perspective of both enforcement officers and the public.

For the public, the linking of money (as penalties and fines) with enforcement creates the potential for a breakdown of trust, particularly where the traffic management aim is concerned (although even the public safety remit is not free from concern in this regard). It is the essential similarity of the punishment – in terms of process (typically the on-the-spot penalty) and the actual amount of the penalty – between offences relating to traffic management and those concerning road safety that creates this potential for public concern. When activities which differ widely in the level of risk they entail and/or potential of harm they can cause are punished in the same fashion (and frequently using the same methods of automated enforcement), this to a certain extent offends our sense of proportionality and of substantive justice[1].

As regards the problems for enforcement professionals, automation seems to promise much in the way of addressing the age-old challenge of effectiveness (as measured by cost, compliance and deterrence). Officers no longer need be physically present to enforce road traffic laws, thus reducing *cost*. Furthermore, far more offenders can be caught, and processed, through automated means, leading to greater *compliance* and increased *deterrence*. However, these same professionals also need to maintain a sufficient level of public support (and legitimacy) to operate effectively and ensure compliance (that is, compliance as a matter of course/habit rather than through fear/deterrence alone) with road traffic regulations. This report seeks to explore this difficult balance by highlighting the development of automation in road traffic enforcement, and seeks to explore where we might be going with such enforcement.

Research into the use of automated enforcement of road traffic regulations is at a nascent stage. A number of scholars across the social sciences and in the legal field are beginning to grapple with the increased challenges that it poses. The primary challenge for such enforcement has related to how increasing automation has impacted upon conceptions of fairness for motorists and other road users. This report is a preliminary investigation into the extent to which we have come to rely on automated enforcement in the road traffic/safety context, and how possible future reliance on the technology might develop. Although this report does not examine the issue of fairness directly, it undoubtedly forms an important background context for the public acceptance of automated enforcement. What a fair and just enforcement system looks like depends upon many factors involving both procedural elements of justice (how people are treated within the system) and substantive elements (the fairness of outcomes from the system). The discussion below teases out some potential

1 Substantive justice here relates to the extent to which people judge the fairness of the outcome of the process (i.e. whether they were fined of not) rather than the intrinsic fairness of the process itself (the way they are treated throughout the process)

problems relating to perceptions of fairness within the system, but does not address them directly. At present, we have some indications of what the 'fairness' issues seem to be, but further study is needed to develop our understanding of what they actually are, and crucially, how they can be addressed within an automated enforcement regime.

This research maps how automation has played a key role in the development of modern road traffic and road safety enforcement. The research shows that there has been increasing automation of punishment, with the development of an out-of-court penalty system and an increasing reliance on automated technology to capture instances of offending – so much so that approximately 11.5 million out-of-court penalties are issued each year in respect of problematic motoring, and a significant proportion of these penalties are captured through camera technology. As the report highlights, certain offences – such as speeding – rely heavily on the use of automatic number plate recognition (ANPR) systems: over 70% of all police fixed penalty notices issued in 2015 involved an offence captured by camera (and for speeding offences that figure is over 90%). The austerity agenda has increased this reliance on automation, with the reduction (and in some police forces the complete removal) of dedicated road traffic police officers. Local authority (LA) enforcement, on the other hand, has seen, as a consequence of deliberate government policy, a reduction in the reliance on automated means of enforcement. To a certain extent this may be a justified response to the perceived lack of genuine concern for public safety in a majority of LA road traffic enforcement (particularly off-street parking). However, LAs do exercise enforcement powers in relation to road safety (even simple parking can be a road safety concern when a vehicle is left in a dangerous position), and the near-blanket ban on ANPR camera enforcement in such circumstances is not logically defensible.

Public opinion has, from the outset, played an important part in the debate about the extent to which enforcement should rely on automation. There may be sound technological and safety reasons for increasing reliance on automation, but without the support of the public, the system is likely to engender feelings of distrust and illegitimacy. We can see, from LA regulation of parking and from traffic regulation, that fears of improper and illegitimate use of technology (and powers) can lead to widespread delegitimisation of important public policy. Indeed, it may not even be LA enforcement that leads to such feelings; instead, the operation of companies in enforcement of parking on private land may be leading to a cross-contamination of illegitimacy and distrust between public and private operators. This also has the potential to affect police road traffic enforcement, where similar methods (i.e. ANPR) are used to capture wrongdoing, particularly where instances of alleged wrongdoing are decontextualised and stripped of all the surrounding circumstances in favour of a simple, single picture (or series of pictures) originating from a camera.

It seems reasonably clear, at present, that the level of public support is difficult to gauge. Certainly, in the abstract, there is public support for automated road traffic enforcement where there are safety concerns. However, such support can dissipate quite quickly when drivers' experiences differ significantly from the expectations of perfection that they have of automated methods of enforcement. The motoring public may be in favour of road safety enforcement to the extent that each instance of wrongdoing represents an actual instance of harm; when, however, the instance represents merely an increased risk of harm in the

abstract (which is the case with fixed camera speeding enforcement), then support starts to reduce. The challenge for authorities is to understand the views of the motoring public in this complex area of regulation, and to then decide (or at least examine the issue of) what form legitimate enforcement should (or could) take in the field of road safety.

As regards road traffic regulation and public support, as stated above, there is not enough reliable data available at present to shed light on the public's opinion on automated enforcement. Anecdotal evidence exists which suggests that the public are wary of the use of automated enforcement in LAs, and of the reasons for its use. It is very doubtful, in particular, that there is much public support for extending ANPR enforcement to LA car parks. Given the hostile media and the poor practices – questionably managed incentive schemes and targets, for example – of some LAs (or commissioned providers), and not forgetting the impact of the actions of the private sector in the realm of parking on private land, there is a long way to go before the generalised sense of distrust of parking enforcement is successfully countered.

That being said, the camera opens the possibility for far more effective management of the road network than that possible by human means alone. It holds out the potential for cheaper and more effective control of the flows of traffic in those areas (the pinch points) in our towns and cities where intelligent traffic systems can plan and direct the great (and ever-increasing) weight of traffic. Exactly where the human element (drivers, traffic managers, police officers, civilian enforcement officers (CEOs), pedestrians, etc.) fits into this management of an essentially chaotic system is a matter for public debate. With the increasing automation of all things related to road traffic (not just enforcement), we are at risk of losing the human element of transport. There are both negatives and positives in such an approach; in terms of enforcement, the positive is the removal of traditional notions of bias. Cameras care not for colour, religion, race, gender, and so on. However, the camera cannot provide discretion (and common sense, one dare say) or show the same level of care and concern that a human officer can. What the public want –and what the enforcement authorities can offer, in this regard – requires further study and public debate. At present, as Chapter 3 demonstrates, the human, in enforcement authorities, is becoming an increasing rarity. With austerity, and associated tight controls on police budgets, dedicated road traffic police officers are becoming something of a rarity.

Even where the human is still present in the enforcement authority, technological automation is becoming increasingly embedded as part of policing practice (in its widest sense). Officers increasingly rely on technological gadgets that constrain their discretion and remove difficult issues of proof of offending from interactions with citizens. The mobile phone, handheld computer, breathalyser kit and the like can provide him or her with a handy – and easy – technological solution to the tricky problem of proving an offence. Of course, simply by using such a device, the officer's discretion to ignore such offending (for potentially perfectly valid and just reasons – with the possible exception of drink-driving) or deal with it by way of a warning is lessening. This reduction in officer discretion (whether police or CEO) is typically perceived as the officer lacking common sense (see Snow, 2015) and can potentially lead to further delegitimisation of the both the law and the organisation enforcing it. Again, understanding public concerns, and how authorities can address these concerns, merits further study.

The focus on enforcement, throughout this report, should not be taken to mean that automation is always about punishing recalcitrant motorists. Automation can also facilitate compliance with road safety and traffic management objectives, whether that be through smart mobile technology that links with other road users to provide real-time (big) data solutions to traffic (and safety) problems, or by means of more simple devices which limit speed or prevent driving in certain circumstances. In this report, concerned as it is with automated enforcement, the prevention of driving through automated means is also examined, as authorities have been actively looking at technological solutions which prevent recidivist driving offenders from causing further danger. The so-called ignition interlock systems permit or prevent a vehicle from starting depending on a range of factors, such as blood alcohol content for recidivist drunk drivers, seat belt engagement and mobile phone use. This report finds limited support for these systems in England and Wales, and that they are unlikely to be adopted in the very near future, although the European Commission, in combination with the European Transport Safety Council, has, on the basis of on a number of trials, been strongly promoting alcohol interlocks (in combination with motorist re-education courses) as a solution to the drink-drive problem.

Whilst this report examines the current and potential future use of automated enforcement, it is worth noting, as Dodge and Kitchin (2007) do, that the process of automation (at least as regards the physical processes) is not spatially uniform. The deployment of 'smart motorways', with the cost and inconvenience of their installation, is not a uniform response of government, but is a partial one with stretches of road still subject to traditional methods of management and control. Furthermore, the non-motorway network, although increasingly adopting automated means of management, is not at the same stage of monitoring and development. Dodge and Kitchin call these locations 'unwired places' (2007: 273): they are spaces where the regulation of the road is largely free of automated monitoring for enforcement purposes. This spatial differentiation can be seen in the wide variation in the uptake, and use, of automated methods of enforcement, as examined in Chapter 3. Automated enforcement is partial, and at certain locations extensive; this report has sought to map its current and potential future use.

1. Introduction

The enforcement of road traffic offending can be broadly split, according to the underlying rationales, into two distinct types: enforcement aimed at ensuring road safety, and enforcement aimed at regulating the use of roads (and car parks). This is a coarse distinction, and some cases straddle both categories. For example, parking one's car on a public road can be both an inconvenience to other users and, at times, a clear danger to both other road users and pedestrians. In relation to road safety traffic enforcement, offences that are regulated according to risk mean that drivers who cause no actual harm but are deemed to constitute a 'risk of harm' are penalised. It is worth bearing this distinction in mind when reading this report, as it is fair to say that support for automation in road traffic enforcement is likely to be consequential upon the underlying justifications for the road traffic regulation in question. As will be discussed later in this report, support for automated camera enforcement is stronger when it comes to road safety-related enforcement (presumably because of the underlying risk to life / danger of personal injury) than it is in relation to road traffic regulation.

In 2014/15 (the latest year for which statistics are available at the time of writing), there were 11,955,218[2] financial out-of-court disposals (in which the crime or offence is dealt with without requiring a prosecution in court) for traffic-related offending. This figure consists of all Penalty Charge Notices (PCNs) issued by local authorities (LAs) (10,293,484), all fixed penalty notices (FPNs) issued by the police (1,016,827), late licensing penalties (LLPs) and out-of-court settlements[3] issued by the Driver and Vehicle Licensing Agency (DVLA) (480,790 LLPs, and 161,117 out-of-court settlements), and heavy goods vehicle (HGV) levy offence FPNs issued by the Driver and Vehicle Standards Agency (DVSA) (3,000). The notices listed above are all issued by (or on behalf of) governmental bodies (LAs, the police or other quasi-governmental bodies).

Private institutions have also used similar penalties, primarily to control parking on private land, albeit neither for road safety nor for road traffic regulation purposes. These private providers are under no obligation to collect and publish statistics on the number of such penalties issued (other than for the benefit of their shareholders). However, in recent years there is evidence that this number has begun to increase. The RAC Foundation recently estimated that 4.71 million private penalties had been issued, which represents a threefold increase since 2012.[4] There has been increasing anecdotal evidence that backlashes against automated enforcement may be, in part, due to the increasing use of such methods in private parking enforcement.

This report focuses generally on the use, and potential increased use, of automated enforcement for purposes related to public law. It would, however, be remiss to ignore the private parking issue, so throughout the report, where appropriate, the situation of the private sector will be examined to determine its effect on public law enforcement.[5]

Nearly 12 million notices were issued in 2014/15 – this represents a serious amount of regulatory 'offending', and it requires a significant investment in enforcement to capture and process this number of offenders. To put it into context, the total number of sentences handed out by the criminal courts in the year ending March 2015 amounted to a tenth of this number, 1.2 million, covering offences from murder to TV licence evasion. The Health and Safety Executive, which also conducts public safety enforcement in the workplace, issued 11,403 notices and prosecuted 696 cases. It is worth bearing in mind that this is in a context in which there are more injuries and illnesses related to work than there are injured on the roads (although the number of people killed on the road, at 1,730 (Lloyd et al., 2016), far exceeds the number of deaths at work, which total 144 (HSE, 2016)).

In recent years, enforcement agencies have been turning to automation to assist in the management, capture and processing of road traffic offending. This report examines the use

2 Unfortunately, the reporting periods for the out-of-court disposals offered do not always overlap. The reporting period for police-issued FPNs is April–March, as it is for PCNs for local authorities; LLPs issued by the DVSA are reported for the calendar year, whereas HGV levy offence penalties run from June 2014 – June 2015. Out-of-court settlements issued by the DVLA run from October 2014 to June 2015.

3 These are fixed penalties set at £30 plus 1.5 × the outstanding vehicle tax rate.

4 The statistics are based on requests to the DVLA from private parking companies for driver information, which it is presumed were used for parking charge notices (RAC Foundation, 2017).

5 Of course, private companies are increasingly being relied upon to enforce local authority parking. Throughout this report, unless specifically mentioned, local authority parking enforcement relates to both in-house enforcement and tendered private company enforcement of local authority regulations. The appeals and enforcement structure is identical (through the Traffic Penalty Tribunal and the civil courts): all that differentiates the two is who is doing the actual enforcement – although, of course, the profit motive of private firms conducting such activity makes the relationship interesting and complex.

of automation in such enforcement. It is a preliminary examination of the current extent and likely future rollout of automation in road traffic regulation/control. The report starts with a brief history of automation of punishment to elicit possible explanations for the use (and expansion in use) of automated means of enforcement. Following this, the current extent of automated camera enforcement will be discussed, and an examination made of regional variations, which can also give indications as to the likely future direction in which automation is going. In the final section, the potential future of automated enforcement will discussed; drawing on the previous two sections, and government policy, it will suggest the likely short-term and long-term development of automation in the field of road traffic enforcement.

The use of automated enforcement generally conjures up images of the archetypal yellow Gatso speed cameras. However, with the increasing development of technology, automated enforcement now covers a much broader range of motoring offending/transgression. Speed cameras still account for a sizeable proportion of automated road traffic enforcement; however, other methods are now increasing, including red-light enforcement and the use of car dash-mounted automatic number plate recognition (ANPR) systems. Furthermore, LAs are increasingly looking to technology such as bus lane cameras and ANPR parking systems to provide cost-effective solutions to their road traffic regulation responsibilities. Finally, the use of automated enforcement has also become somewhat democratised, with the spread of dash- and helmet-mounted action cameras (and the sharing of footage on social networks), leading to ever-greater potential for automated (and crowd-sourced) enforcement.[6] The proliferation of technological solutions for road traffic regulation (in terms of enforcement and enforcement processing) has the potential to produce a vast increase in the number of enforcement captures, but at the moment we do not know at what cost.

ANPR has been instrumental in the growth of traffic regulation. From its first use in the 1980s in the Dartford Tunnel (Hansard: House of Commons, 1983) as an intelligence gathering tool, it has grown through the National Safety Camera Partnership (NSCP) (Wells, 2012), and beyond, to become the primary means by which speeding and traffic light offences are enforced.

Although the acronym 'ANPR' suggests a uniformity of use, there are many different ANPR systems in use by the police, LAs and private enforcement bodies. The ANPR cameras read vehicle number plates using optical character recognition software, and record the date, time and location of these reads, instantaneously cross-matching the number plates with information held on various databases (Haines & Wells, 2012). In police road traffic enforcement, the ANPR camera will link with both the DVLA and the Police National Computer to provide intelligence and enforcement opportunities. LA and private parking enforcement use of ANPR, although constrained by legislation, typically searches and retrieves data from the DVLA's vehicles database, in order to process the enforcement ticket. This form of automation is, in terms of the number of penalty notices issued, the most common form of sanctioning for road policing. As will be discussed below, enforcement by ANPR outstrips the traditional method of issuing a notice by the roadside quite significantly, and is the typical means through which a driver will be sanctioned.

6 The private sector has also sought to exploit the power of crowd-sourcing enforcement through incentives to capture parked cars on private land, by offering £10 payments (Pitt, 2017).

Thus far the reader might be forgiven for thinking that automation is solely a matter of advanced technology. However, the development of the punishment system for the minor end of road traffic regulatory offending (and other parts of the criminal justice system too, according to a recent MOJ consultation (MOJ, 2016)) has been subject to increasing automation in terms of the way in which punishment is administered and imposed. As the Chapter 2 demonstrates, the development of the FPN, and the administrative processes surrounding it, arose from a series of steps within the justice system that have focused on routinising and automating punishment.

It should be noted, at the outset, that a coherent assessment of road traffic enforcement (including its automation) is difficult owing to a number of factors. The split between LA and police enforcement is perhaps relatively settled, although increasingly local councils are taking over functions regarding moving traffic that would traditionally have been the exclusive purview of the police (e.g. waiting in a box junction). As will be discussed below, such changes to the respective functions of the police and LAs have much to do with increasing the effectiveness (by reducing the administrative burden) on police forces and the criminal justice system. Thus, the idea that LA enforcement is 'parking' enforcement and that the police enforce 'moving traffic' is an antiquated idea. Increasingly, LAs are taking over these functions (in addition to which other governmental bodies, such as DVSA and DVLA, are taking on forms of traffic enforcement), but the question remains whether the training and attitudes of police officers are being transferred along with the responsibilities.

Furthermore, the split (in law) between the Greater London Authorities and the rest of England and Wales complicates the legal picture, with different legislation applying at different times throughout the history of LA 'parking' enforcement (for example, the decriminalisation[7] of parking enforcement in 1991 for Greater London Authorities, and in 2004 for the rest of England and Wales[8]). Even allowing for this split, the local nature of LAs also complicates the picture further, with neighbouring authorities adopting decriminalisation powers and automation at different times. It should therefore be borne in mind when discussing road traffic enforcement that it is, by and large, a 'local' issue. Certainly, there will be commonalities of approach – the desire to increase effectiveness, to streamline and to obtain value for money may lead to a certain level of uniformity – but it remains the case that enforcement decisions are essentially local decisions – that is, of course, unless there is a clear national policy, as with the removal of ANPR enforcement for all but a few offences in the LA enforcement sector.

Taking the above into consideration this report therefore seeks to examine both the commonalities and the particularities in the automated enforcement of road traffic regulation that impact on where we are going with automated enforcement.

7 'Decriminalisation' refers, in the road traffic and parking context, to the powers contained within the Traffic Management Act 2004. The Act removed parking offences from the criminal law for authorities that adopted its provisions, setting up in its place a civil appellate system and, in the event of ultimate non-payment, providing for recovery through the civil (county) courts.
8 Authorities outside London could, nevertheless, operate decriminalised parking enforcement under the Road Traffic Act 1991 if they adopted the provisions of the Act through a Permitted Parking and Special Parking Area Order. The first authorities to do so were Winchester, Oxfordshire, Maidstone, Buckinghamshire and Watford (NPAS, 2000).

1.1 Automation

Before examining the historical, contemporary and future development of automated enforcement, it is important to distinguish between the types of automation that are discussed in this report. There are number of ways in which the concept of automated enforcement can be understood. Perhaps the most in-depth theoretical treatment of automated enforcement (and perhaps the most automated version) in the realm of road traffic is O'Malley's idea of simulated justice and telemetric policing (O'Malley, 2010). O'Malley paints the picture thus (ibid.: 765):

> "In many jurisdictions, I may be fined for speeding, or illegally parking, or being on a freeway without a pass, or running a red light – by nobody. The infringement may be registered by a police officer, but even that is becoming less common. Increasingly, infringements are registered electronically either from a bar code implanted in my vehicle or from a digital photograph of the vehicle registration number… I am policed, judged and sanctioned but no one has seen me, nor have I been 'sensed' in any human way. In key respects, I have not been there: my electronic trace has been there and that is what registers for the purposes of governance. This is simulated justice…"

This 'perfect' system of automation, at present, exists only potentially for a select number of offences – typically speeding, running a red light, and the decriminalised moving traffic offences of driving in a bus lane and waiting in a box junction. Here a camera takes a picture of the vehicle and, using its on-board ANPR system, matches that vehicle against the DVLA register of vehicle owners. Certain systems can then auto-generate the case file and letter / conditional offer of a fixed penalty, which only needs signing on behalf of the relevant LA / police officer. This is what O'Malley means by "simulated justice" – indeed, but for the demerit points on the licence, the whole process is stripped of any individual interactions (should the recipient choose to pay instantly). In such a system the penalty resembles, as O'Malley has noted elsewhere, "just another bill, not an occasion for moralized commentary" (O'Malley, 2009: 108).

Automation, in the sense of "the technique of making an apparatus, a process, or a system operate automatically" (Merriam-Webster Dictionary, undated), can also be seen in the wider process through which road traffic law has developed, specifically the withdrawal of the courts and court processes, for a great range of motoring offences. The law now operates in a system that is highly routinised and, following a transgression, operates virtually automatically until such time as a penalty is paid (not necessarily by the transgressor).[9]

A further form of automation in the road traffic context is the development of systems which rely on technology to remove the discretionary human element from enforcement. This form of automation relies on a synthesis of technology and human input to capture and

9 The system is, of course, not unconcerned about so-called 'point-swaps' cases, where drivers attempt to avoid penalty points by nominating another person as the driver at the time of the offence. Although the justice system might not care who pays the fine (family, friends, employers or whoever), it will certainly care about on whose licence the penalty points go.

process those who breach motoring regulations. Typical instances of this style of automated enforcement are the use of breathalysers by the police to prove a case of drink-driving, and handheld devices used by civilian enforcement officers (CEOs) that help keep track of parking transgressions and ensure that the evidence is robust and independent. In effect, the technology combines with human input to reduce human (discretionary) judgement in favour of a more independent and objective evidential approach.

A final understanding of automation in road traffic regulation relates to methods for preventing breaches of regulation before they are committed. In this final category, speed limiters and ignition devices which prevent a car from operating in certain conditions are two examples that have the capacity to ensure that road traffic law is complied with automatically. In the parking sector, methods for preventing a breach of requirements may also be developed that facilitate compliance rather than simply making automation a tool to make enforcement more effective/efficient.[10]

Thus, there are four types of automated enforcement that are discussed in this research:

1. streamlined enforcement procedures;
2. technologically facilitated enforcement;
3. full automation; and
4. enforcement using automation as a facilitative device.

In the next section, which examines the history of automating motoring enforcement, the wider understanding of automated enforcement is analysed, specifically the streamlining of enforcement processes such that upon a transgression being witnessed (by human or by technology), the process inevitably leads to punishment being imposed.

10 It is fair to say that, at present, automated technological developments seem to be almost exclusively focused on making enforcement more efficient rather than on preventative measures, although one could argue that parking apps that issue text reminders of overstay may be an example of automation facilitating compliance rather than assisting punishment.

2. A History of Automated Motoring Punishment – Streamlining Enforcement Procedures

The first speed limits were introduced in 1865 under the Locomotive Act. The Act set speed limits on road-going 'locomotives' of 4 mph in the open countryside and 2 mph in towns (Plowden, 1971). At the same time a concern was growing, particularly in the metropolis, about the danger to pedestrians from carriage drivers operating in a "wanton and furious" manner (Hansard: House of Lords, 1860). This opened a debate, that continues to this day, between prescriptive regulations which target behaviour, regardless of the risk of harm (e.g. speeding[11]) and those that target behaviour where the risk of harm is manifest (e.g. dangerous driving).

11 This is not to deny, of course, the fact that evidence demonstrating that speeding is a general risk clearly exists (see Allsop, 2010; Tay, 2010; Wilson et al., 2010; amongst many others).

The law on speeding represents an operationalisation of the concept of safety, rather than an actual specific concern with safe driving. With speeding offences, as Wells states, speed limits "represent the demarcation of 'safe' (and legal) from 'dangerous' (and illegal) behaviour" (Wells, 2012: 23). This demarcation takes place regardless of the actual level of risk of harm posed by the individual speeding motorist.[12] This automatisation of the law, whereby the speed limit acts as a proxy for 'safe' or 'non-harmful' driving regardless of the actual level of harm caused (or the potential for it), lends itself nicely to a technological (and automated) procedure for capture and enforcement.

The debate over the risk of harm versus the actual harm caused reached its zenith in 1930, with the motoring lobby convincing Parliament that speed limits, in themselves, were dangerous. Accordingly, Parliament passed the Road Traffic Act 1930 which abolished all speed limits in favour of a focus on the standard of driving (Corbett, 2003). It was felt by Parliament, at the time, that speed limits contributed to crashes and that it was safer to allow drivers to set responsible limits for the conditions themselves (Emsley, 1993). The victory for the motoring lobby was short-lived, however, and speed limits were reintroduced in 1934 under the Transport Act 1934 (Corbett, 2003). The debate still continues (recent examples include the 'Twenty's Plenty' debate and the discussion of the motorway speed limit), with the Association of British Drivers recently stating "the widespread use of enforcement technology has led to large numbers of prosecutions of essentially safe drivers" (cited in TSC, 2016: 12). Furthermore it argues "that the increasing use of technology in lieu of roads police has led to speeding offences being given 'greater importance than they deserve' due to being relatively easy to measure" (ibid.). However it seems unlikely that there will be significant change in this regard in the near future, primarily because there is a great deal of scientific consensus on the positive contribution that speed limits make to road safety (see Box & Bayliss, 2012; Cameron & Elvik, 2010; Elvik, Christensen and Amundsen, et al., 2004; Pilkington & Kinra, 2005; WHO, 2013).

2.1 The motor car and driver

As Wells sets out, during the growth of modern car ownership "an increasing number of authors… were beginning to write not just about the car as a technological development but about its social, political and criminological significance" (2012: 26). The motor vehicle's significance lay not just in the rapid growth of ownership, but the impact which that had on law enforcement.

Motoring crime, set in its social context, became something less than a crime, but not so minor that nothing needed to be done about it. On the one hand, as Emsley states, there was the 'whiggish view of law making… that the motor vehicle presented a problem in need of solution' (1993: 358). On the other hand, the punishment process that developed for minor motoring crime can be seen as a compromise between the problem of increased car ownership and the difficulty of criminalising increasing numbers of 'normal' people (Emsley,

12 It is, however, worth noting that speed limits are increasingly being set with reference to pedestrian safety – research demonstrates a clear link between speed limits and severity of pedestrian injury (WHO, 2013), and indicates a pressing need for road safety intervention.

1993). The normalisation of ownership of motor vehicles, the spread of this ownership across class boundaries, and the fact that "the driving public has become an electoral force to be reckoned with" (Corbett, 2003: 33) together led to inevitable trade-offs between the view of the law as combating crime and its perception as combating the motoring public.

One key interest group in this development was the social elite, and its role in developing motoring offences (particularly speeding and its enforcement) is of interest. O'Malley argues, like Emsley, that the impact on the court (and justice system) of the rise of the motor vehicle in the early twentieth century put little extra pressure on the courts (2009: 99). Instead, the involvement of the socially elite motor-vehicle-owning class in legislative drafting, and lobbying, meant that "speeding fines were already being administratively bureaucratized: distanced from denunciation in court and regarded as applicable to offences that were only debatably 'criminal'" (ibid.: 100).

Through a series of Home Office circulars, the police and Home Office had already championed the use of pleas by post, where the driver of the vehicle did not have to appear in court. As O'Malley states, these procedures "eroded the moral and denunciatory ceremonial of court and introduced a more bureaucratic form of justice" (ibid.: 99). Motoring crime was not real crime at all, but an administrative matter – one that could be dealt with on paper rather than requiring the offender's presence. There was a sense in which courts, and the justice system, were operating as if motoring crime could be resolved by a gentlemen's agreement.

Another possible driver for the bureaucratisation (and automatisation) of the process, and consequently the lack of denunciatory court pronouncements is, as Plowden states, that police officers "dislike[d] enforcing road safety partly because of their discomfort at having to deal with an offender who so often will not 'come quietly'" (1971: 393). Emsley points out that one way round this particular legal/sociological phenomenon was to label those who did not conform to motoring laws as 'road hogs', which "by identifying scapegoats, adds legitimacy to the law by its implication that the law is designed to deal with outsiders who threaten society" (1993: 380). However at the same time, Emsley argues, "there could be no simple response to the problem since a whole series of interest groups were involved" (ibid.: 381).

Automatisation had already been a factor in enforcing speed limits prior to the 1930 Transport Act, and indeed the first instance of a technological device – the humble watch – had been allowed into evidence to prove a case of speeding in 1906 (Fisher, 1957). The constable merely measured a set distance and then timed the motorist over that distance; this was then allowed into evidence through the policeman's statement. The use of innovative approaches to speed-trap enforcement had been tried across a Western world struggling to keep up with the problems created by the motor car. In 1903, in the State of New York, USA, three police officers disguised as tree trunks and equipped with a stopwatch and telephone operated one of the first recognised speed traps. Fisher explains (Fisher, 1957: 263):

> "As a speeding car passed the first station the policeman telephoned the time to the officer in the next tree, who set his stop watch accordingly and computed the speed. If it was above the limit he phoned the officer in the third tree who lowered a pole across the road. When the boom was lowered on him the driver stopped and was warned about his speed."

The victory for speed limit campaigners in the Transport Act 1934 resulted in the law taking a decisive (and now seemingly irrevocable) step into the automatisation of enforcing societal laws. No longer did the police have to prove that the driving of the motorist fell below accepted standards of carelessness: instead, an offence could automatically be proved if an imposed limit was exceeded. This took away the subjective element of the law in favour of an automatic application of the law based on objective scientific calculations (the speed of an object, as determined by measuring the time taken to travel a set distance).

Throughout the following century, this process of incremental change in police procedures increased the automation of punishment for road traffic offending. The changes documented below arose generally as a result of complaints from police forces about the regulatory burden of dealing with drivers' intransigence in accepting the punishment.

2.2 Changing procedures to deal with problematic motoring

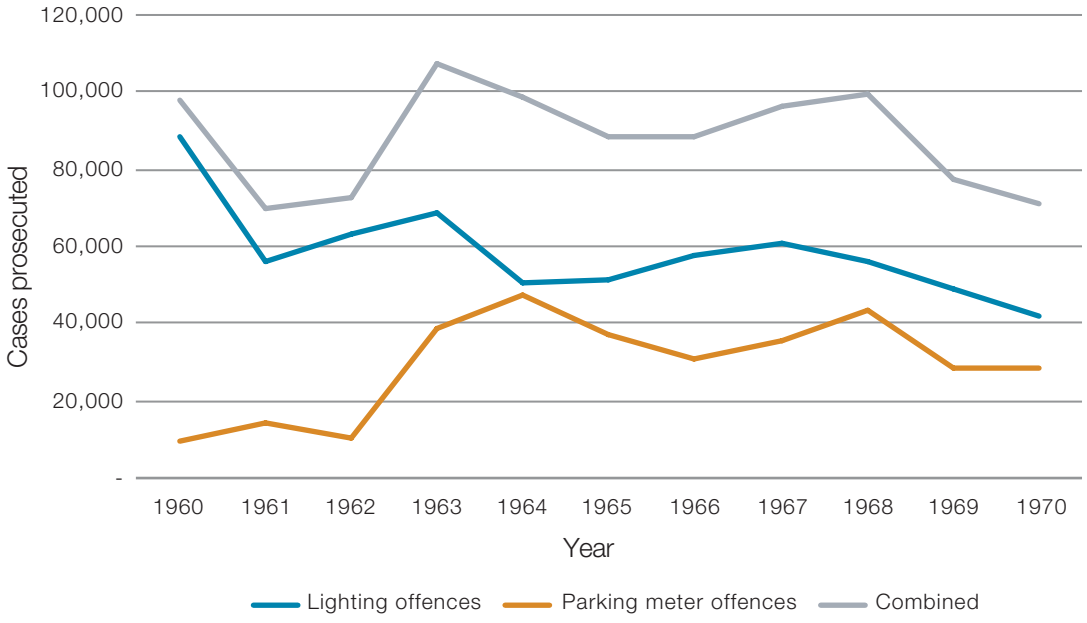
The absence of a defendant at trial for motoring offences first gained official recognition in a 1923 Home Office circular – the motorist was merely convicted in their absence. A further 1954 circular advised magistrates that defendants no longer had to attend court to formally plead guilty, thus further automating punishment where the driver need not even attend to accept their fine. The next automation of punishment for motoring offending came in 1960, with the creation of an out-of-court disposal, the on-the-spot penalty (OTSP), which ensured that the driver did not have to attend court at all (or even be convicted).

Just two offences were included in the first round of FPNs under the Road Traffic and Road Improvements Act 1960, namely inadequate lighting at night and non-payment of a parking meter charge. It is interesting to note that since the outset of the fixed penalty regime, both road safety and parking regulation have attracted a similar punishment (an on-the-spot fine). There are certainly substantive fairness issues that can be raised about the imposition of a similar penalty for seemingly differing levels of culpability (for instance overstaying on parking meter is clearly less of a danger / less serious than safely illuminating one's vehicle). However, culpability and/or underlying rationales were not the main factors underlying the fact that these two offences were dealt with via an OTSP. Rather, the penalties for these two specific offences were introduced on the basis of a perceived inability of the courts to deal with them, and to relieve the police from the burden of prosecuting such cases (Hansard: House of Commons, 1960). Of course, in introducing the OTSPs, the government was also keen to ensure that the punishment imposed was not too onerous or unjust (or at least not so unjust as to lead to mass non-payment – a goal which proved hard to attain, as discussed below.).

The initial introduction of FPNs in 1960 resulted in a 37% decrease in 'inadequate lighting' offences prosecuted at the magistrates' court, but at the same time resulted in a 50% net increase in prosecutions at the magistrates court for parking meter offences. Overall however, in the first full year of the policy, there was a 29% total reduction in the number of prosecutions for these two offences, suggesting some success in reducing the burden on magistrates' courts. Over the next ten years the number of prosecutions fluctuated (see Figure 2.1). In the case of lighting offences there was a general downward trend (perhaps as lighting technology on cars became more reliable), whereas parking meter offences increased quite significantly (possibly due to the widespread expansion of the technology, combined with the motoring public's distaste for them).

Overall there was an increase in the number of these (parking meter) cases prosecuted at the magistrates' court during the 1960s, somewhat undermining the efficiency claims made for the system.

Figure 2.1: Court prosecutions, in England and Wales, for fixed penalty notice (FPN) offences for the first ten years of FPN operation



Source: Data extrapolated from "Offences Relating to Motor Vehicles" HMSO, years 1961-1971

From just 16,921 notices in 1960, by 1970 over one million notices were being issued each year.[13] Unfortunately, such statistics are not available from 1970. However, they were included in the 1971 return to Parliament on motoring offences (Home Office, 1971), which showed that of the 1.9 million FPNs issued, 1.7 million were for parking and waiting offences, and 95,565 were for the inadequate lighting offence. Had the fixed penalty system

13 By the end of the decade, the OTSP system had been expanded by the Road Traffic Regulation Act 1967 to include the offences of disregarding prescribed routes and non-payment of excise licence. However, the number of notices issued for these extra offences was comparatively low, amounting to approximately 10% of all FPNs issued (Home Office, 1971).

not been in place, it is highly doubtful that the courts could have dealt with this level of offending, and it is also debatable whether this many enforcement actions would have taken place.

From these humble beginnings, the system of OTSPs went on to expand significantly, so that by 1986 (the year in which *moving* traffic violations – which include speeding, failing to obey traffic lights, motorway offences and neglect of pedestrian rights – punishable by police-issued FPNs were introduced), just under five million motoring FPNs were being issued each year. Throughout the period of these developments, a concern with police efficiency was the dominant motivator for making changes to the law. The old ways of doing things, through the courts with a defendant and police officer present, were felt to be cumbersome and a drain on resources (see Snow, 2015). Incremental changes to the system of on-the-spot fines and the process through which recalcitrant defendants were dealt with also followed, which further automatised the system of punishing wayward motorists.

2.3 Increasing automation of the punishment process

The removal of FPN offence cases from court did not come without problems. Although it created an administrative system to deal with bulk offending, that system required its own rules to police as well as creating its own productivity problems. The first such problem tackled by legislation (the Road Traffic Act 1974) was resolved by a measure that was aimed not at irresponsible drivers, but at owners of motor vehicles. Although the FPN was aimed at tackling problematic parking behaviour, a significant problem with this approach was that, although cars carried registration marks, these related to the vehicle owner, and often there was no evidence as to the identity of the *driver*. This resulted in significant numbers of unpaid FPNs, and failed prosecutions, since a vital element of the case – the driver's identity – could not be proved. Between 1960 and 1974, 23 million FPNs had been issued, of which one third were not paid (Hansard: House of Commons, 1974).

The deeming of responsibility of car *owners* for such offences represented another step towards automation of punishment. This process was enacted by the Road Traffic Act 1974, which sought to reduce the burden of chasing unpaid penalties (because the driver could not be identified) by making the owner liable for FPNs regardless of who was driving, unless the owner could show that the car was being driven without consent. Thus, the onus of proving who was driving the vehicle switched from the prosecuting authorities to the vehicle owner. The owner had to prove that they had not (or at the least raise doubt that they had) consented to the vehicle being used.[14]

When this proved to be inadequate to reduce the regulatory burden on the police, another Transport Act (1982) was introduced, ensuring that FPNs issued by police officers would

14 At present this issue is dealt with under section 172 of Road Traffic Act 1988, which places a duty on the vehicle keeper to tell the police who was driving at the time of the suspected offence. Failing to notify the police is an offence (and an exemption to the privilege against self-incrimination: see O'Halloran and Francis v. UK 15809/02, (2008)). This is rarely a problem for other European jurisdictions, since these states rely on owner rather than driver liability. The European Transport Safety Council recommended in 2011 (ETSC, 2011) that EU member states should all adopt owner/keeper liability; it is unlikely that this will happen in the UK for the foreseeable future, given the embeddedness of the current legislative regime, although it would certainly increase the ability of the police to use 100% automated sanctioning.

no longer have to be followed up by court proceedings. Instead the unpaid penalty would increase by 50% and be registered as a court fine, as if magistrates had imposed the penalty directly. This automatisation of the penalty did not apply to FPNs issued by traffic wardens (nor penalty notices imposed by an LA). Instead, unpaid penalties issued by these authorities had to be prosecuted through the magistrates' court. This makes a certain degree of sense, given the split between the road safety ethos of police enforcement and the traffic management philosophy of LA enforcement (although, as noted above, this split is sometimes hard to sustain in practice, particularly where parking enforcement – and LA moving traffic enforcement – involves dealing with vehicles which imperil road safety).

One can see a clear theme emerging from the development of road traffic regulation: the concern to make the system more efficient and automated, in order to reduce the burden on the police, and the courts – although not at this stage at least on LAs, who still had to use the prosecution route. Whether such reductions in regulatory burden actually occurred is open to doubt. Previous research the author conducted (Snow (2015)) suggests that with the introduction of fixed penalties (across a range of areas of law) there was an increased burden (in terms of number of cases and overall costs) on both the courts and police service. It is only with the decriminalisation process of parking and waiting offences (Road Traffic Act 1991 and Transport Act 2004) that actual large-scale reductions are seen in the work facing both the police and courts for problematic motoring. Far from the overall burden reducing, however, it was simply shifted from police authorities (and the courts) to LAs, who took on the responsibility for enforcing parking offences.

Therefore, from a historical perspective, if one wants to chart the likely future trajectory of automatisation of the enforcement process, one needs to be sensitive to complaints from the courts and police service of being overworked or overburdened by offence types, and claims about the deterrent efficacy of the automated process. Automatisation has, to date, followed a predictable pattern of police concern about being overrun by cases that would be better dealt with through streamlined procedures. Furthermore, one cannot ignore the possible increased compliance that comes with increasing automatisation, since cameras can provide a level of enforcement that human policing cannot. The promise of constant surveillance no doubt has an impact also on the overall deterrent levels of the law, in terms of the certainty of capture, and thus automation provides a double benefit for enforcement authorities: it provides an increased capability to catch those who break the law, and does so in a way that is cheaper (and easier) to administer. (Whether automation results in increased compliance is certainly debatable and beyond the present scope of this research).

2.4 Parking and decriminalisation

In 1991, under the Road Traffic Act of that year, there was a move away from using the criminal justice system to deal with parking offences. This Act introduced the concept of decriminalised parking enforcement (DPE) in London; it no longer used the criminal law (i.e. parking offences in London ceased to be criminal offences), and removed the magistrates' court from the adjudication of unpaid parking OTSPs. The Act introduced the Penalty

Charge Notice (PCN) which could be issued for breach of parking requirements in Greater London. The Act also created an independent appellate structure, separate from the court service.[15] The Traffic Management Act 2004 (TMA) extended this process of DPE to the rest of England and Wales. The 2004 Act did not mandate that all LAs operate a system of DPE; instead it was a matter for each LA to adopt the provisions of the Act. At the time of writing 345 LAs have adopted such powers, with a further 26 still operating under the criminal law contained in the Road Traffic Regulation Act 1984.

There is still an important geographical split between London authorities and the rest of England and Wales. At present, authorities in England and Wales, outside of London, do not have the power, under Part 6 of the TMA, to issue PCNs for the (moving traffic) offence of failing to comply with a road sign. Schedule 7, Part 4, Para 9 of the TMA lists the traffic signs that could be subject to enforcement if Part 6 were adopted across England and Wales.

There are 29 signs that can potentially be enforced by LAs:

- Vehicular traffic must proceed in the direction indicated by the arrow
- Vehicular traffic must turn ahead in the direction indicated by the arrow
- Vehicular traffic must comply with the requirements in regulation 15
- No right turn for vehicular traffic
- No left turn for vehicular traffic
- No U-turns for vehicular traffic
- Priority must be given to vehicles from the opposite direction
- No entry for vehicular traffic (when the restriction or prohibition is one that may be indicated by another traffic sign subject to civil enforcement)
- All vehicles prohibited except non-mechanically propelled vehicles being pushed by pedestrians
- Entry to pedestrian zone restricted (alternative types)
- Entry to and waiting in pedestrian zone restricted (alternative types)
- Entry to and waiting in pedestrian zone restricted (variable message sign)
- Motor vehicles prohibited
- Motor vehicles except solo motor cycles prohibited
- Solo motor cycles prohibited
- Goods vehicles exceeding the maximum gross weight indicated on the goods vehicle symbol prohibited
- One-way traffic
- Buses prohibited
- Route for use by buses and pedal cycles only
- Route for use by tramcars only
- Route for use by pedal cycles only
- Route for use by pedal cycles and pedestrians only

15 Prior to 1999, authorities outside London could adopt the decriminalised process under the Road Traffic Act 1991, but appeals had to be made to the London Parking Appeals Service. This changed into a dual appellate system in 1999, with the creation of the National Parking Adjudication Service for offences outside London, and the London Parking Appeals Service for those within London (Road Traffic (Parking Adjudicators) (England and Wales) Regulations 1999/1918). The Traffic Management Act 2004 formalised the current system of traffic regulation by way of OTSP, by providing for 'civil enforcement of traffic contraventions' both inside and outside London. There is still a dual appellate structure; inside London the relevant appellate body is the Parking and Traffic Appeals Service (PATAS), and outside London the Traffic Penalty Tribunal (TPT).

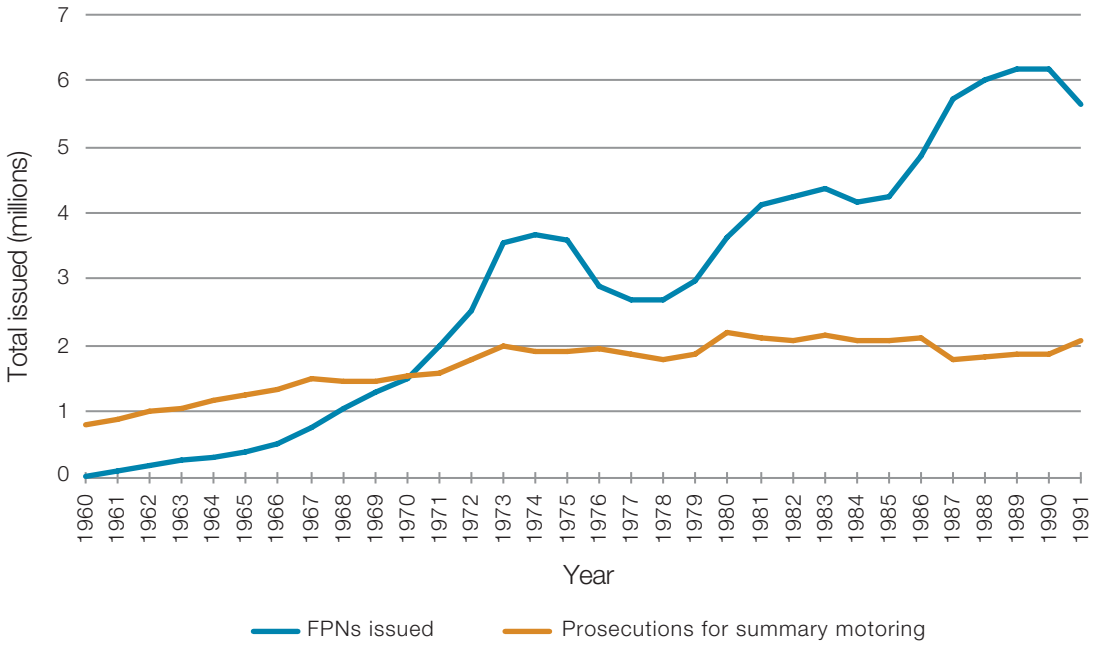
- Route comprising two ways, for use by pedal cycles only and by pedestrians only
- With-flow bus lane which pedal cycles and taxis may also use ahead
- With-flow bus lane which pedal cycles may also use
- With-flow cycle lane
- Contraflow bus lane
- Contraflow cycle lane
- Box junction markings

This extensive list of traffic regulations potentially enforceable by a PCN is certainly capable of being enforced through automated means, although what the streets would look like with a proliferation of cameras and enforcement warning signs is a significant issue. The likelihood of Part 6 of the Act being implemented across England and Wales is discussed later in this report.

2.5 Road traffic enforcement post-1991

The growth of motoring regulation by FPN can therefore be split into two distinct phases: prior to 1991, FPNs were issued jointly by police officers and traffic wardens for a range of offences, and post-1991 there was a split system. Figure 2.2 gives some indication of how the simple Road Traffic and Road Improvements Act 1960 had morphed, by 1991, into a complex and wide-ranging system of motoring regulation. From just 16,921 FPNs issued in 1960 for two offences, the system had grown by 1991 to one which generated 5.65 million FPNs issued annually for 37 offences.

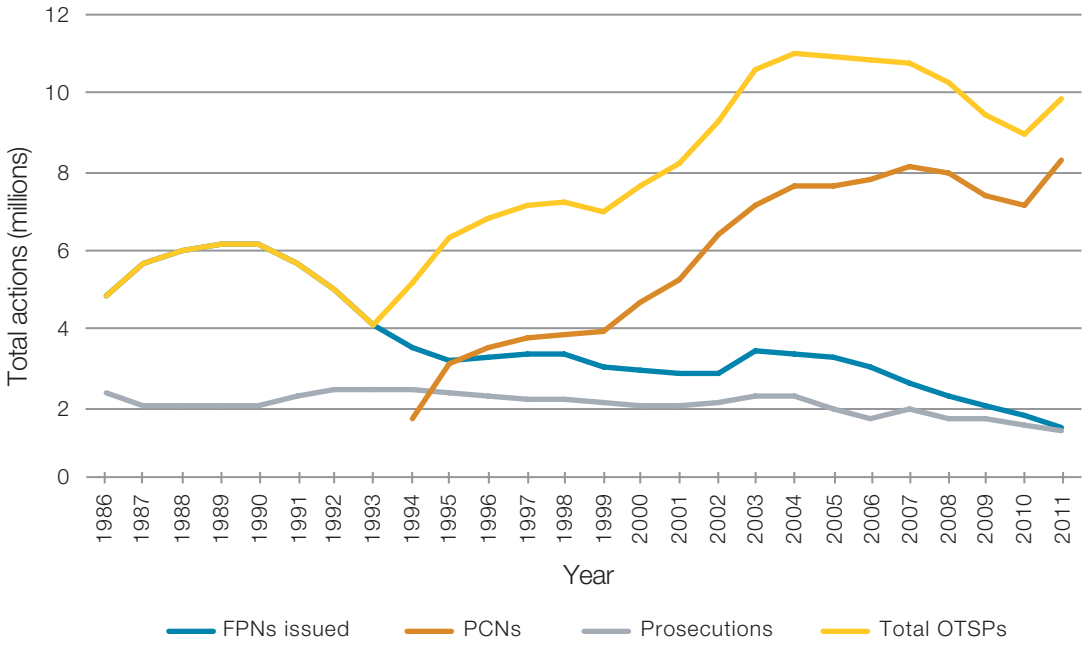
Figure 2.2 On-the-spot penalties and summary proceedings issued for motoring, 1960–91



Source: Data extrapolated from "Offences Relating to Motor Vehicles" HMSO, years 1961-1992"

The post-1991 reforms, as discussed above, bifurcated enforcement of road traffic regulation into the more serious moving traffic violations enforced by the police, and the more minor parking violations enforced by LAs (although LAs also enforce moving traffic parking violations, such as driving through a bus lane). Figure 2.3 shows the number of FPNs and prosecutions in respect of problematic motoring up to 2011, the last date for which such comparisons can be made (from 2011 onwards, the Home Office switched from counting the number of summary motoring offences to the number of defendants proceeded against in respect of summary motoring). In the last year for which statistics are available on a like-for-like basis, 9,852,248 OTSPs had been issued for problematic motoring. These OTSP were issued in respect of 79 police-enforced moving traffic offences and 15 separate categories of LA traffic offences (or civil offence if the authority operates under the TMA.)

Figure 2.3: Total fixed penalty notices, parking charge notices and prosecutions for motoring offences/regulations, 1986–2011



Source: Data extrapolated from "Offences Relating to Motor Vehicles" HMSO, years 1961-2006; "Motoring and breath test statistics England and Wales", MOJ, years 2006-2010; "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2012; "Report of the Adjudicators", Traffic Penalty Tribunal (Previously NPAS), years 1999-2010; "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010-2012; "Parking enforcement statistics" London Councils, years 2006-2012.

Reflecting on the changes to punishment procedure and its linking with road traffic, it should come as little surprise that the law has developed in the way it has. Wells and Savigar (forthcoming) note how the concept of 'acceleration' (Rosa and Scheuerman, 2013) explains the development of traffic enforcement. The changes in law identified above demonstrate a desire from those who develop policy to increase the speed of operation, and reduce the administrative burden, of the punishment system. In short, the law is accelerating towards an automated system of punishment, which has as its zenith the use of the automated enforcement device. According to Rosa and Scheuerman we "pursue novel, purportedly time-saving technological devices in order to tackle the imperatives of an increasingly hectic everyday life" (cited in Wells and Savigar, forthcoming). It should not come as a surprise that government looks to such technology also to solve its problems and manage hectic everyday offending/regulatory breaches. Indeed, the Ministry of Justice is, at present, also turning towards the idea of automation for the total court solution. It plans to continue with so-called 'automatic online conviction and statutory standard penalty' (MOJ, 2016) procedures, which allow defendants in railway fare evasion, tram fare evasion, and possession of unlicensed rod and line offences to plead guilty online. According to the Government's response to its consultation (MOJ, 2017), road traffic offences have also been highlighted as potential future offences to be given the same treatment. This raises the possibility that O'Malley (2010) is correct in his predictions, and road traffic enforcement

will be fully automated (from transgression to conviction) and telemetric. It is possible that no human hand, or eye, will even be involved in the whole process of punishment. With the advance of the motorcar and its impact on the social fabric of our geography, health and culture, it is unsurprising that we reach out for technological devices to enable us to keep up with the increasing pressures that contemporary life brings.

The changes to the enforcement process all highlight the particularly thorny problem of regulating a class of people (drivers) who are not used to being seen as a problem for the legal system. There is growing evidence of a body of resistance to automating enforcement (O'Malley, 2011); however, the contemporary debate about automation (particularly as touching speed cameras (see Wells, 2012)) should be set in its historical context. Corbett (2003) traces how legal challenge frequently follows developments in road traffic regulation. Whether it be drink-driving or speeding, motorists seem quite keen on mounting legal challenges to changes in law and enforcement practices. The legitimacy of road traffic regulation (whether for safety or road traffic concerns), and its ability to maintain and foster public support, will certainly continue to be a key challenge in the future, as indeed it has been thus far.

It can be clearly seen, then, that there is a desire to increase the effectiveness of the law by taking measures to streamline and automate processes that act as blocks on effective enforcement. Of course the underlying effectiveness of the law, in terms of both compliance and motivation to comply, seems (given the sheer scale of transgression) to be rather in doubt. At the same time as the procedure for imposing punishment was being streamlined, a more-or-less, automated system for capturing transgression was being developed.

3. Automated Enforcement – Current Practice

3.1 Police automated enforcement

3.1.1 Police camera enforcement and public opinion

The Road Traffic Act 1991 partially incorporated the recommendations of the 1988 North Report (DoT, 1988) that "modern camera technology should play a greater role in the context of traffic law enforcement" (Hooke, Knox and Portas, 1996: 3). Just two offences were identified as being capable of / suitable for camera enforcement: driving in excess of the speed limit, and running a red light. Only speeding offences were included at the outset, in section 20 of the Road Traffic Offenders Act 1991. The White Paper *The Road User and the Law* (DoT, 1988) did contain a proposal to include neglect of traffic lights within the automated scheme, but this idea was abandoned at the time. Neglect of traffic signals (driving through a red light) was added to the list of offences capable of camera enforcement in 1997, through the Road Traffic Offenders (Additional

Offences and Prescribed Devices) Order 1997/384. Since then a number of new offences have been added to the camera enforcement provision; these include:

- contravening or failing to comply with an order or regulations made under either of those Parts relating to the use of an area of road which is described as a bus lane or a route for use by buses only (Road Traffic (Additional Offences and Prescribed Devices) Order 2001/1814 (Bus Lanes));
- an offence under section 29(1) of the Vehicle Excise and Registration Act 1994 (using or keeping an unlicensed vehicle on a public road) (Road Traffic Offenders (Additional Offences) Order 2014/260); and
- an offence under section 11(1) of the HGV Road User Levy Act 2013 (using or keeping heavy goods vehicle if levy not paid) Road Traffic Offenders (Additional Offences) Order 2014/260.

As will be discussed below, the use of automated camera enforcement has been primarily directed at speeding motorists. It is little surprise therefore that the main debate about the acceptability of camera enforcement has focused on this offence (Wells, 2012; Corbett, 2003).

Relatively early in the development, and rollout, of these automated means of enforcement, it was decided that public acceptance was one of three pillars against which the effectiveness of cameras would be judged. In a 1996 report for the Home Office, Hooke et al. investigated "whether there was any 'public hostility' to the new technology, as this could have represented a major cost. There was no evidence that this was a factor" (Hooke, Knox and Portas, 1996: 22). As Wells notes, "the inclusion of this latter aspect as a potential cost or benefit suggests that, even at this early stage, the acceptability of cameras was considered to be as important as their effectiveness in producing a policy that could be considered 'successful'" (Wells, 2012: 45).

Furthermore, in the 2003 evaluation of the two-year cost recovery programme for speed and red light cameras, public opinion was still a factor in assessing the effectiveness of the pilot. The report found, like Hooke et al., that "the level of public support for the use of cameras has been consistently high with 80% of people questioned agreeing with the statement that 'cameras are meant to encourage drivers to keep to the limits not punish them'" (Gains et al., 2004: iv). The four-year evaluation of the National Safety Camera Programme in 2005 also found similar high levels of support for speed and red-light cameras (Gains et al., 2005: 7):

> "The level of public support for the use of cameras has been consistently high with **82%** of people questioned agreeing with the statement that 'the use of safety cameras should be supported as a method of reducing casualties'. From the public attitude surveys there was strong evidence that there was overall positive support for the use of cameras and this stemmed from the belief that the cameras were in place to save lives – **71%** of people surveyed agreed that the primary use of cameras was to save lives."

The RAC Foundation commissioned a wide-ranging review into the effectiveness of speed cameras in 2010. As part of this review it examined the state of public opinion on road safety

cameras. Although it found some regional variations in partnership areas, overwhelmingly the speed and traffic light cameras seem to have been received very positively, and continue to be seen this way (Allsop, 2010). The AA, in conjunction with Populus, conducts regular polls of drivers chosen from an online motoring public opinion panel. In its reports it has found consistent support for the use of speed cameras, ranging from 77–82% (AA 2015; AA 2016), although in its more recent February 2017 report it found that 75% of motorists preferred to see a greater reliance on traffic police and less reliance on cameras (AA, 2017).

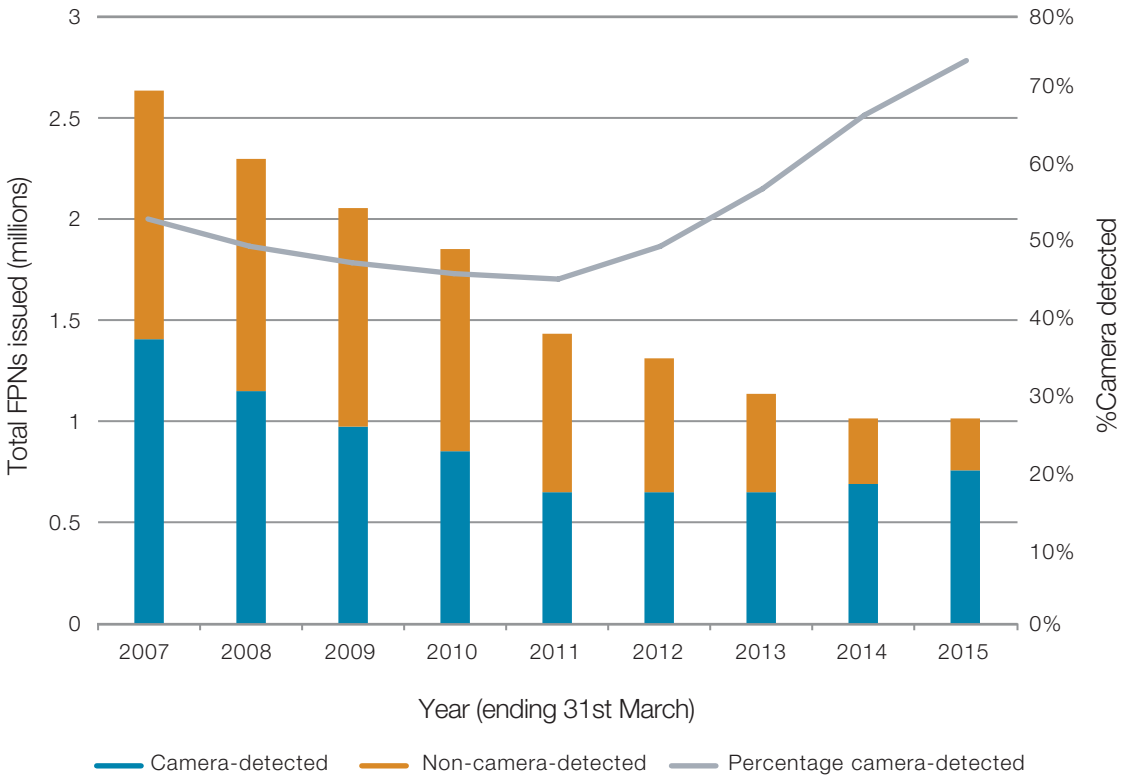
However, this general sense of acceptance was not reflected in media coverage, which repeatedly sought to question the rationale for camera use, implying (indeed, often asserting) that it was a revenue-raising device unfairly penalising otherwise safe and responsible drivers. Both broadsheets (see, for example, Jamieson, 2017) and tabloids (see, for example, Greenwood, 2015) alike ran campaigns citing camera-generated income as evidence of a 'war on motorists', skipping somewhat lightly over the fact that the only people paying the penalties were those motorists who had, in fact, broken the law. This accusation was not helped by the Treasury's agreement to a 'netting off' (or hypothecation) process under which the penalty income was fed back to safety camera partnerships to fund yet further enforcement activity. The hypothecation process viewed through one lens could be seen as a virtuous circle, increasing the police's ability to enforce the law. However, viewed through another more cynical lens, the lack of penalty income (owing to insufficient numbers of motorists breaking the law) could result in no safety camera partnerships, and thus – so the argument went – camera partnerships had a vested interest in increasing penalty income (perhaps where safety was not an obvious concern). Whether this actually happened is debatable, and beyond the scope of this research; however, it is fair to say that an impression of the latter was created and promoted by certain sections of the news media.

It is therefore perhaps unsurprising that the Coalition Government of 2010–15 focused so much effort on "ending the war on the motorist". During the Coalition's period in office, a number of policy pronouncements had the stated aim of "ending the war on the motorist" – see Pickles (2011) and Mike Penning reported in McCarthy, (2010), who expressly referred to "ending the war on the motorist" by ending central funding for fixed speed cameras. Furthermore, Philip Hammond (the then Transport Secretary) stated that "we need to rebalance road safety enforcement away from a narrow focus on camera-enforced speed policing" (Hansard: House of Commons, 2011). In that regard, the Coalition Government's *Strategic Framework for Road Safety* (2011) saw the educational option, as an alternative to an FPN, as the way forward. It is crucial to note that, despite what was implied in Parliament by the Transport Secretary, there was still an acknowledgement of a role for cameras for use by the then Highways Agency (now Highways England) "using technology, such as fixed, mobile and average speed cameras, to control speed on the network and ANPR to identify and tackle dangerous vehicles and drivers" (DfT, 2011: 44).

3.1.2 Police automated enforcement

Since 1991, as discussed above, police authorities have used cameras to enforce both speeding and traffic light offences, and it is fair to say that the camera has increased in importance as an enforcement tool, especially over the past six years.

Figure 3.1: Total fixed penalty notices issued each year, and the proportion that were issued by way of camera enforcement



Source: Data extrapolated from "Motoring and breath test statistics England and Wales", MOJ, years 2006-2010; "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2016.

As can be seen from Figure 3.1 the camera has become the predominant means for police-enforced road traffic. With the ending of the NSCP (next section 3.1.3) in 2007/8 we can see small continued reductions in the proportion to which enforcement cameras contributed to the overall number of FPNs until 2011. Following this, the camera soon becomes the primary means through which road traffic policing (the enforcement side) is carried out. Across all police forces in 2015, 74% of all FPNs issued were camera-detected, a significant growth since 2011, when 52% of all FPNs issued were camera-detected.

Perhaps the main driver for the increase in the importance of automation has been the real-terms reductions in police budgets. Although standard enforcement cameras[16] may be expensive to purchase and maintain, they are a cost-effective means of enforcing road safety (Gains et al., 2005) and in a period of austerity the camera holds out the possibility of providing an effective road safety enforcement device at reduced cost to police forces, with their tight budgets. Indeed, the cost of installation and maintenance of the new generation of average speed cameras has drastically reduced in price, from £1.5 million per mile in 2000 to £100,000 per mile in 2016 (Owen, Ursachi and Allsop, 2016). Furthermore, with the

16 This refers to those producing film rather than digital evidence

advent of digital recording and 3G connections (and later iterations of mobile communication technology), today's speed cameras are cheaper than ever.

Over the period 2011–16, the time at which we see the increasing dominance of camera enforcement in road safety, police budgets were reducing (by 22%) in real terms (Johnston & Politowski, 2016). As will be discussed below, reducing police budgets have led to a reduction in the number of traffic police officers across a number of forces.

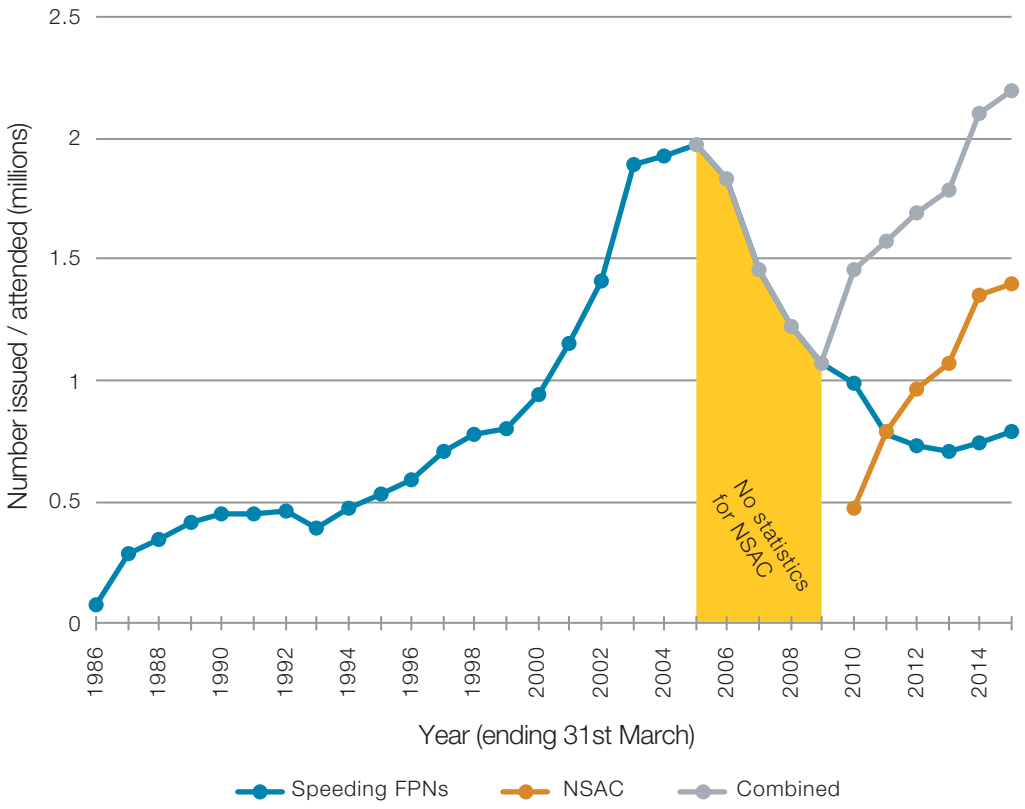
3.1.3 Speeding

The policing of speed has, as discussed in Chapter 1, had something of a chequered history. From 2001, following the then New Labour Government's *Tomorrow's Roads: Safer for Everyone* (DETR, 2000), the NSCP scheme was introduced. The programme allowed safety camera partnerships to retain the income generated by enforcement cameras to spend on road safety enforcement (hypothecation). Following introduction of the policy there was a flurry of enforcement activity which relied heavily on speed cameras, so much so that during the policy's life cycle (hypothecation was discontinued in 2008) over 11.5 million speeding offences had been detected (Wells, 2012).

It is difficult to judge what has happened to the statistics on speeding since the NSCP as, at the same time as it was being discontinued, the National Speed Awareness Course (NSAC)[17] was starting to take off. Thus, we do not know whether the recorded incidence of a reduction of speeding FPNs is as a result of switching the cameras off / ending hypothecation, or merely a diversion into speed awareness courses. Based on NSAC statistics over the last five years (see figure 3.2) it would suggest that diversion rather than reduction is occurring, but this may not be the case.

17 This report does not attempt to analyse the 'effectiveness' of the NSAC, or of awareness courses in general. NDORS has evaluated the scheme (Brainbox Research, 2011), and further evaluations of the various awareness courses now on offer are ongoing at the DFT.

Figure 3.2 Comparison of the number of fixed penalty notices issued for speeding and the number of speed awareness courses attended



Source: Data extrapolated from "Offences Relating to Motor Vehicles" HMSO, years 1961-2006; "Motoring and breath test statistics England and Wales", MOJ, years 2006-2010; "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2016; and "Trends and Statistics" NDORS, (n.d.) https://ndors.org.uk/trends-stats/

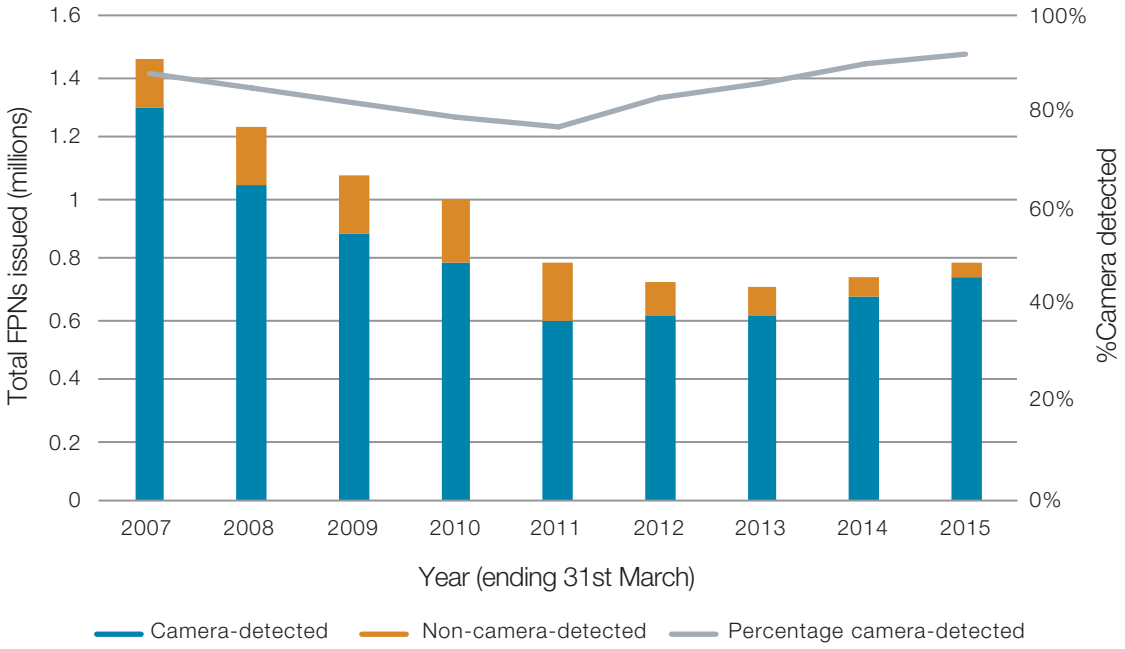
The above chart shows the number of FPNs issued for speeding and NSACs attended for the years 1986–2015. Between 2005 and 2009 there were no published statistics on the number of NSACs attended, as not all police authorities had adopted the NSAC during this period. In Figure 3.2, the area shaded yellow demonstrates the period of uncertainty about the number of speeding offences officially sanctioned, given that the NSAC data was not included within official returns. The grey line shows the combined number of FPNs issued and NSACs attended for the years 2005–15 (albeit with no data for NSACs between 2005–9).

There were eight police forces, by 2005, that had adopted the NSAC: Lancashire, Staffordshire, Humberside, Gloucestershire, Northamptonshire, Lincolnshire, Thames Valley, and Avon and Somerset (Hansard: House of Commons, 2005). The rest of the country was still operating under the fixed penalty system, and if we compare the change in FPNs issued across these eight NSAC forces between 2004 and 2005 with those the equivalent in the rest of the country, we see that the NSAC counties decreased in terms of the number of FPNs issued, with a reduction of 17%, whereas the rest of the country saw a small increase in FPNs of 1% (Home Office, 2011). This clearly suggests that, rather than decreasing enforcement, the NSAC merely diverts enforcement into the awareness course route.

Speeding and camera enforcement

Speeding enforcement has become dominated by automated means. Figure 3.3 shows the relative proportions of automated and traditional police enforcement of speed limits. As can be seen, the proportion of camera enforcement has remained relatively static, with predictable reductions during the period 2007–11 with the ending of the NSCP funding ring-fencing and the national take-up of the NSAC. It is certainly true to say that the camera has been the predominant method for enforcing speed limits: in 2015, 92% of all speeding FPNs were issued by camera.

Figure 3.3 Total fixed penalty notices issued for speeding, and the percentage that are enforced by a camera



Source: Data extrapolated from "Motoring and breath test statistics England and Wales", MOJ, years 2006-2010 and "Police powers and procedures England and Wales statistics", Home Office, years 2011–2016

The increasing reliance on the automated camera to enforce road traffic laws, post-2011, is hardly surprising, since the number of dedicated road traffic police officers was reducing quite sharply during this period (a year-on-year average reduction of 6% between 2011 and 2014). Between 2010 and 2014 there was a reduction of 23% in the number of full-time equivalent (FTE) police officers exercising traffic functions (Hansard: House of Commons, 2016).

Table 3.1: Number of full-time equivalent (FTE) road traffic police officers

FTE road traffic police officers					
2010	**2011**	**2012**	**2013**	**2014**	**2015**
5,635	5,316	4,868	4,675	4,356	5,220*

Source: HC Deb, 27 June 2016, cW 40656 retrieved from http://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2016-06-15/40656/

* The sudden jump between 2014 and 2015 does not necessarily mean that the government sought to increase the number of FTE road traffic officers. The Home Office explained the situation thus: "reclassification of roles within a force can lead to fluctuations in the number of officers in a particular role. This is particularly apparent between 2014 and 2015" (HC Deb, 27 June 2016, cW 40656)

Forces hit particularly hard by this reduction were Devon and Cornwall (who had no full-time traffic officers for the period March 2012 to March 2013) and Essex, which saw a reduction of 71% in the number of traffic officers. These two forces, for the period 1999–2010 (the time at which road traffic enforcement was at its highest in terms of FPNs issued) were the second and fourth highest issuers of FPNs. In the following five years (during the austerity period), Essex dropped to 5th place (from 2nd), whereas Devon and Cornwall dropped to 27th (from 4th).

Table 3.1 shows the effect, in proportion of camera-enforced FPNs, of the reduction of road traffic officers.

Table 3.2: Reduction in the number of FTE road traffic officers in Devon and Cornwall and Essex and the changing proportion of camera detected offences

		2009	2010	2011	2012	2013	2014	2015
Devon and Cornwall	**Total FPNs**	64,429	56,509	23,678	21,415	15,827	17,315	17,526
	Camera detections	19,565	18,043	10,852	11,219	10,744	14,291	14,829
	% Camera-enforced	**30%**	**32%**	**46%**	**52%**	**68%**	**83%**	**85%**
Essex	**Total FPNs**	73,322	83,978	53,962	49,367	39,770	34,180	43,179
	Camera detections	27,320	20,243	17,770	21,615	18,750	23,223	31,742
	% Camera-enforced	**37%**	**24%**	**33%**	**44%**	**47%**	**68%**	**74%**

Source: Data extrapolated from "Police powers and procedures England and Wales statistics", Home Office, years 2011-2016

In these two police authorities, there was a virtual withdrawal of non-automated means of enforcement (as measured in FPNs issued). In Devon and Cornwall only 2,697 non-camera-detected offences were punished via FPN in 2015 as opposed to 12,826 in 2011, and this is in a situation in which speeding offences increased in number from 2011 to 2015. Likewise, in Essex the number of non-automated FPNs reduced markedly from 36,192 to 11,437 between 2011 and 2015. At the local level, despite the desire to move away from camera enforcement, Table 3.2 clearly demonstrates an increasing reliance on cameras to enforce

motoring regulations. What the above statistics demonstrate is that camera-enforced policing remains the overwhelmingly favoured approach, and that although the number of penalties have reduced this is largely due to the rise of the speed awareness course alternative.

It should not come as a surprise that with increasing fiscal pressure, police forces search for ever more cost-effective ways to maintain a level of enforcement. Thus, as physical police manpower decreases, one would expect there to be an increasing reliance on automated means to fill that gap.

It should be noted that an important caveat needs to be given regarding the above statistics. There are no national statistics on the relative proportion of camera-enforced violations that result in an awareness course being attended. It is highly likely that speeding offences that lead to a speed awareness course are more commonly captured by camera rather than police officer, although there are no statistics available to address this point.

3.1.4 Red light enforcement

As with the speed camera, it is difficult to assess the impact that ending the NSCP (and funding hypothecation) had on the enforcement of red-light running. Once again the growth of awareness courses for red-light running complicates the picture. The 'What's Driving Us?' (WDU) course is the national course provided under the National Driver Offender Retraining Scheme (NDORS) for the offence of neglect of traffic directions. As can be seen from Table 3.3, a sizeable proportion of red-light offences are diverted from the FPN into the awareness course.

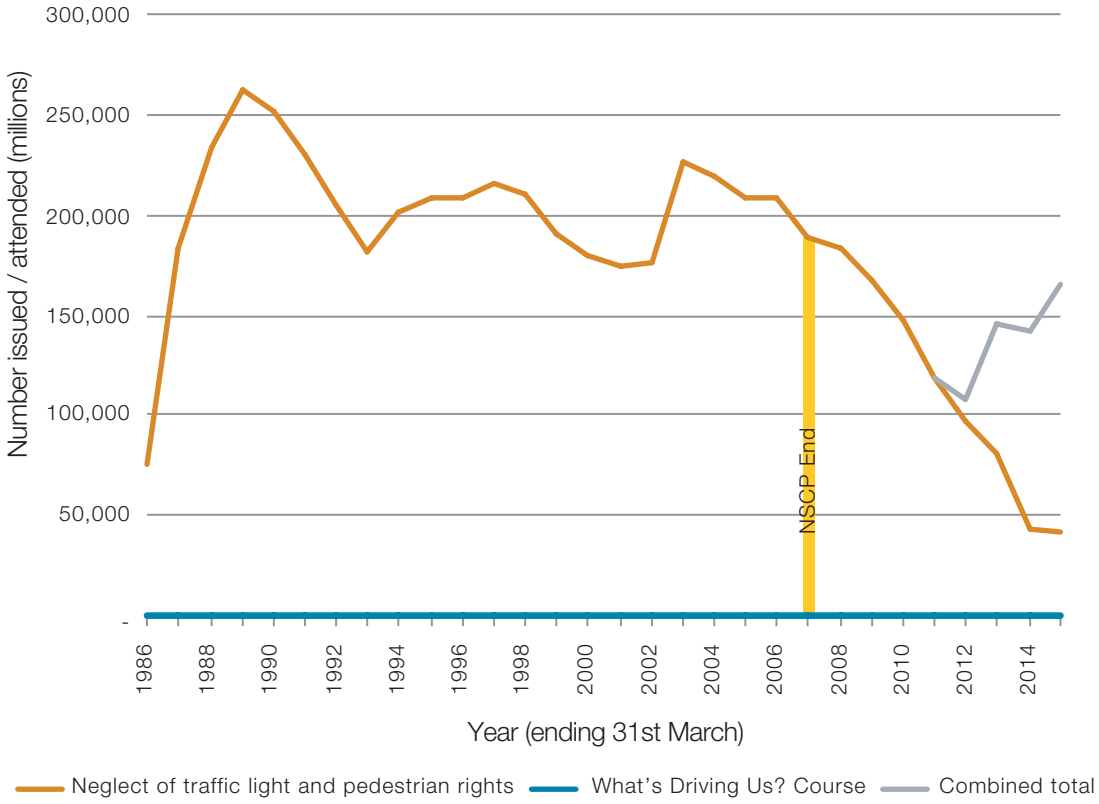
Table 3.3: Fixed penalty notices (FPNs) and awareness courses for red-light running

Calendar year	FPNs	WDU (awareness course)	WDU as % of all
2010	148,179	–	–
2011	118,361	–	–
2012	97,134	10,724	10%
2013	80,999	65,031	45%
2014	42,738	99,668	70%
2015	41,863	123,397	75%

Source: Data extrapolated from "Trends and Statistics" NDORS, (n.d.) and "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2016

Figure 3.4 charts the use of FPNs for red-light offences over the last 30 years. Again, a small drop in issuing occurs, which is then followed by a steady increase as the awareness course is rolled out nationally.

Figure 3.4: Rate of fixed penalty notice issue and awareness courses attended ('What's Driving Us') for the offence of neglecting traffic lights

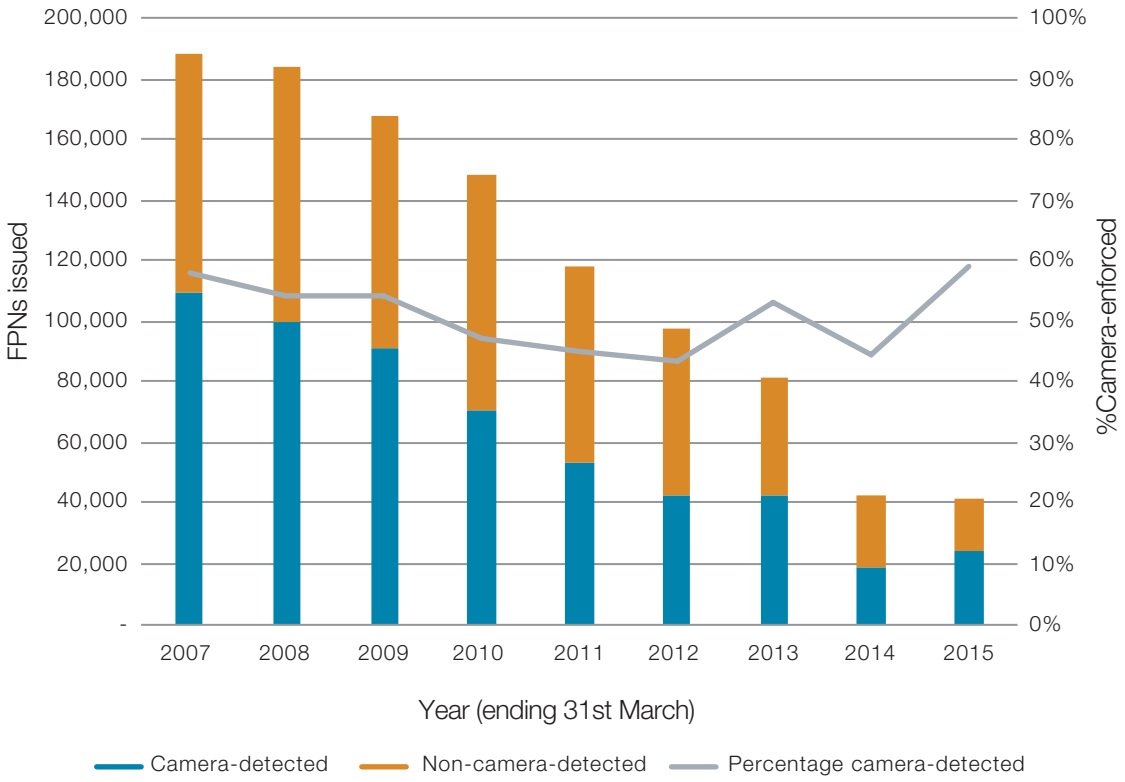


Source: Data extrapolated from "Offences Relating to Motor Vehicles" HMSO, years 1987-2006; "Motoring and breath test statistics England and Wales", MOJ, years 2006-2010; "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2016; and "Trends and Statistics" NDORS, (n.d.)

Much like the NSAC, the WDU has become the primary means of enforcement, supplanting the FPN. This is certainly in line with Government policy during the Coalition period, as the 2011 *Strategic Framework For Road Safety* spoke of "increasing the range and use of educational courses that can be offered in the place of fixed penalty notices" (DfT, 2011: 9). This has certainly occurred.

In contrast to the situation for speeding, when it comes to red-light offending, camera enforcement has not been the predominant method for enforcement, although once more austerity, and the reduction of road traffic officers, has resulted in an increase in the proportion of camera enforcement, as Figure 3.5 demonstrates.

Figure 3.5: Percentage of red-light offences that are enforced by a camera



Source: Data extrapolated from "Motoring and breath test statistics England and Wales", MOJ, years 2006-2010 and "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2016

It is worth noting again, as with speed camera enforcement, that there is wide regional variation in the use of camera enforcement in respect of red-light offences. Indeed, even at police force level there is a wide variation in the extent to which automated enforcement is used to capture traffic light neglect, and the extent to which automation is used to enforce speeding. For example, West Yorkshire Police in 2015, which has a high proportion of speeding offences captured by enforcement camera (95% of all speeding FPNs, 31,883) detects only 19% of red-light offences by camera (217 FPNs). Similarly, Avon and Somerset captured 98% (43,903 FPNs) of all speeding instances in 2015 by automatic means, but only 31% of red-light transgressions in this way (255 FPNs).

As discussed above, the large-scale reduction of road traffic police in both Essex and Devon and Cornwall also had an impact on red-light enforcement (see Table 3.4), although in Essex the effect seems to be minimal (due in large part to the pre-existing bias in favour of automated red-light enforcement). Again, it is worth noting the reduction in the number of offences overall with red light enforcement between 2007 and 2015, the extent to which the reduction in FTE road traffic officers contributed to this fall is, at present, unknown but is likely to have had some effect.

Table 3.4: Neglect-of-traffic-light offending in Devon and Cornwall and Essex police force areas

		2009	2010	2011	2012	2013	2014	2015
Devon and Cornwall	Total Red Light FPNs	7,411	7,100	2,273	1,934	1,509	1,147	760
	Camera detections	2,788	2,607	1103	895	1105	930	602
	% Camera-enforced	**38%**	**37%**	**49%**	**46%**	**73%**	**81%**	**79%**
Essex	Total Red Light FPNs	6,456	5,344	3,751	5,862	2,698	1034	738
	Camera detections	5,251	2,317	2,585	4,855	1,708	819	567
	% Camera-enforced	**81%**	**43%**	**69%**	**82%**	**57%**	**79%**	**77%**

Source: Data extrapolated from "Motoring and breath test statistics England and Wales", MOJ, years 2006-2010; "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2016

Predictably, the complete withdrawal of road traffic police officers from Devon and Cornwall from March 2012 for a year saw a jump in the proportion of camera enforcement for red-light offences, from 46% to 73%, a level of reliance on automated means of enforcement that continues. With Essex police the situation fluctuates seemingly year by year, and it is difficult to draw conclusions from the data about the reduction in traffic police and the enforcement of red-light offences. It is possible that, unlike speeding enforcement, red-light offending is more likely to enforced by general police officers, as they do not need to rely on sophisticated calibrated machinery to conclusively prove the offence (unlike speeding). A general police officer on vehicle patrol can enforce red-light running with little requirement for technological assistance.

3.2 Local authority automated enforcement

The first use of automated methods of enforcement by LAs began in December 1995. Driving in a bus lane was the first offence to be dealt with in this way. Originally dealt with through a warning to the motorist, issuing a PCN soon became the main method of enforcement under the London Local Authorities Act 1996, and in 1997 the first enforcement device (the ANPR camera) was prescribed for this purpose under section 20 of the Road Traffic Offenders Act (RTOA) 1988.

3.2.1 Parking enforcement and public opinion

The enforcement of parking regulations (and moving traffic transgressions such as bus lane and box junction enforcement) by camera has less public acceptance. To a certain extent, it is difficult to make an in-depth analysis of public opinion on parking enforcement owing to the overwhelming similarity between public and private parking enforcement – that is to say, it is difficult to understand whether complaints about parking relate to experiences with LA enforcement or parking on private land. This has become more difficult still with the

growth of private parking enforcement after the Protection of Freedoms Act 2012, and in particular the use of ANPR camera enforcement on private land. Logic would suggest that the enforcement of traffic regulation by LAs has more support (because of the public benefit remit, generally lower penalty amounts and terrible press for some private providers) than private enforcement, but one cannot discount the actions of some private providers (the so-called 'cowboy clampers') over the years, and the impact that this must have had on the perception of all parking enforcement.

The limited evidence of public opinion on parking enforcement that is available (mostly from LA surveys) suggests there is a majority in favour of it, and in particular of camera enforcement. A 2004 survey for the then Association of London Government (now "London Councils") found that 67% of Londoners thought parking enforcement should stay the same or get more robust (TSC, 2005). An opinion survey of 1,000 adults carried out by RNS International and commissioned by the CCTV User Group[18] found that 76% supported the use of CCTV for bus lane and parking enforcement. The Coalition Government's consultation on changes to LA parking enforcement (the restriction on CCTV use) found an almost equal split between those who thought LA enforcement was being operated fairly or reasonably and those who didn't (there was a very small – one person! – majority who thought parking enforcement was fair) (DfT, 2014). Despite this split in opinion, in relation to CCTV enforcement in particular, the responses to the consultation were overwhelmingly against a government ban on the use of CCTV for enforcement by LAs (ibid., 7). Once again, then, ANPR and CCTV for public parking enforcement was a 'war' that had public support, but clearly not support from central government.

This is not to suggest that LA parking enforcement is always viewed in a positive light – certainly a vast amount of anecdotal evidence exists (in the form of newspaper reports, newspaper comment, and online blogs etc.) suggesting a real concern with how parking enforcement is operated by LAs. It is quite surprising that there exists only limited national survey data on public attitudes to parking enforcement, a situation which needs correcting.

The Coalition Government's "ending of the war on the motorist" was, in many ways, a culmination of negative press reports about revenue raising, troubling practices within certain LAs (incentivisation schemes (BBC News, 2014)) and the increasing use of automated means to punish parking transgressions. It is possible that this led to a desire to retreat from automated enforcement in the policing sector owing to a spread of perceived illegitimacy from camera parking enforcement to *all* camera enforcement on the road (although, interestingly, the Coalition proved reluctant to penalise enforcement by ANPR on parking on private land). It is possible that this is evidence for what Jonsson, Greve & Fujiwara-Greve call a "contagion of legitimacy loss" (2009: 196). They claim that an institution's legitimacy is linked by association with that of similar organisations, and not simply ones that are in some way related to the organisation that has acted with perceived illegitimacy. Thus, ANPR enforcement has perhaps been de-legitimised for both the police and LAs because of the perceived illegitimacy of parking enforcement on both public and private land.

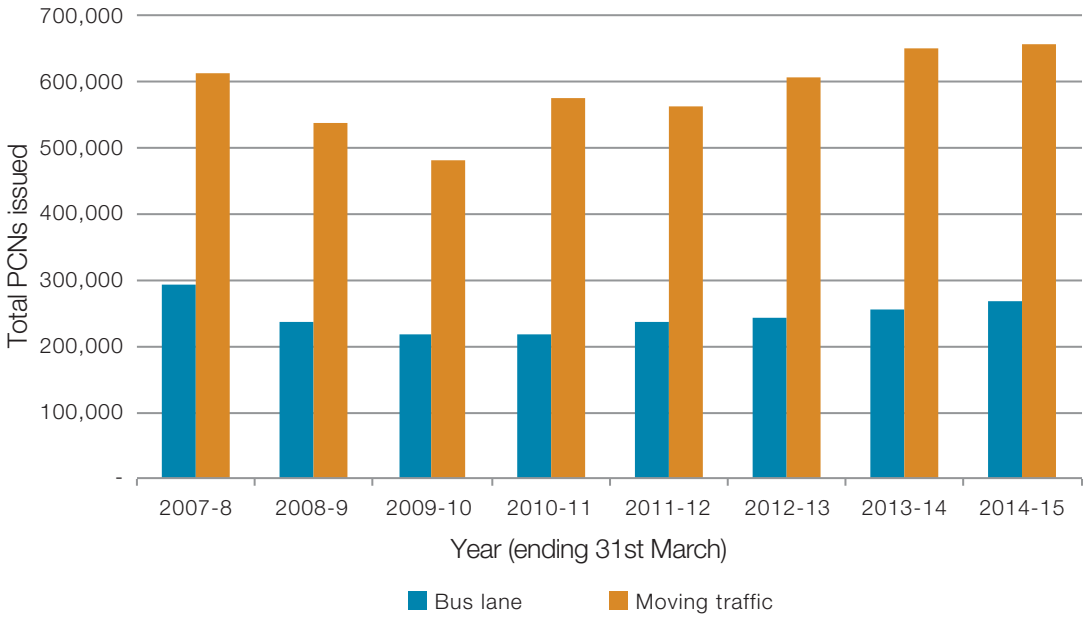
18 CCTV User Group: a membership organisation for all involved with CCTV management and other control room systems (www.cctvusergroup.com).

3.2.2 Bus lanes and moving traffic enforcement

During the early stages of bus lane cameras, enforcement was split between the Metropolitan Police and London LAs. In the first 18 months of camera enforcement (December 1998 to June 2000), 9,543 notices of intended prosecutions were issued by the police. In contrast, in the first year of London LA enforcement, 57,000 PCNs and warning letters were issued (this was for April 1999 to April 2000). By 2002, the enforcement of bus lane infringements in London had grown to 290,231 PCNs issued (London Councils, 2008). From this limited data set it would seem that automation in the hands of LAs can deal with far more transgressions than the police are able to handle; indeed, the total number of PCNs issued each year (both automated and non-automated) far outstrips the number of FPNs issued by all police forces in England and Wales.[19]

It is difficult to meaningfully analyse the statistics for bus lane and moving traffic enforcement in LA areas, since every year more LAs adopt relevant bus lane and moving traffic enforcement powers. This is especially so with LAs outside Greater London. Any year-on-year changes in both types of enforcement are therefore likely to reflect the increase in the number of authorities adopting these powers, rather than changes in practice (such as a greater reliance on automation in any one authority). Figure 3.6 and Figure 3.7 below show the changes in bus lane and moving traffic PCN issuing in Greater London (Figure 3.6) and bus lane PCN issuing outside London (Figure 3.7).

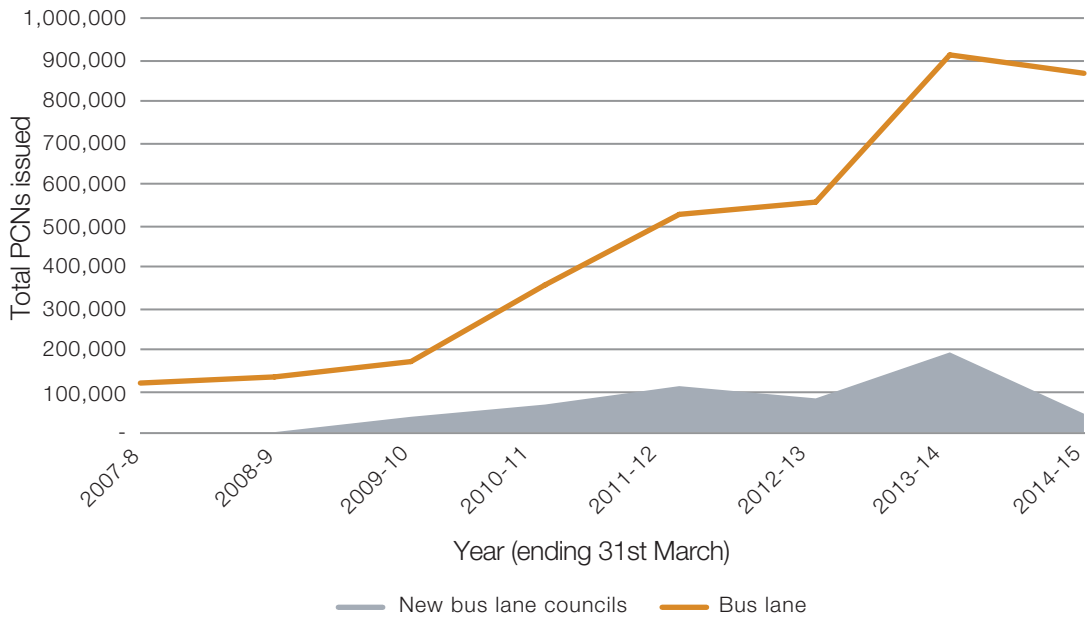
Figure 3.6: Total Penalty Charge Notices issued for bus lane and moving traffic violations in Greater London, year ending March



Source: Data extrapolated from "Parking enforcement statistics" London Councils, years 2006-2012.

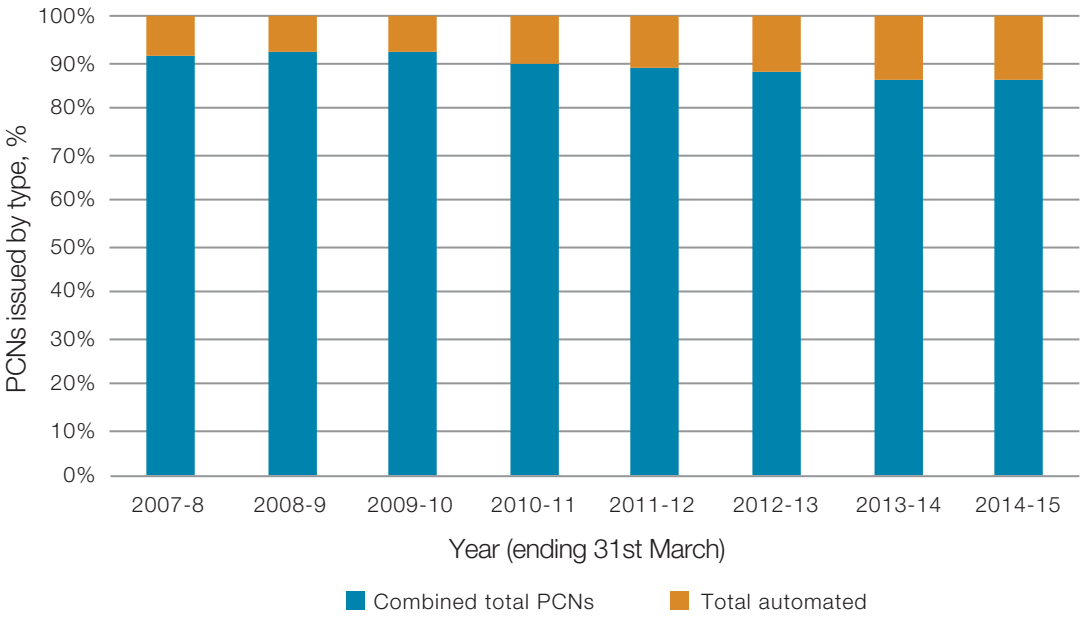
19 For 2014–15 the comparable figures are: 10,721,789 PCNs issued, by comparison with 3,823,937 FPNs and awareness courses together (2,420,382 FPNs plus 1,403,555 awareness courses).

Figure 3.7: Total bus lane Penalty Charge Notices issued outside Greater London and total issued by councils adopting bus lane powers year ending March



Source: Data extrapolated from "Report of the Adjudicators", Traffic Penalty Tribunal (Previously NPAS), years 2008-2010; "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010-2016

Figure 3.8: Proportion of Penalty Charge Notices (PCNs) issued, and those issued by automated means



Source: Data extrapolated from "Report of the Adjudicators", Traffic Penalty Tribunal (Previously NPAS), years 2008-2010; "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010-2016, "Parking enforcement statistics" London Councils, years 2006-2016.

As can be seen from Figure 3.6, bus lane enforcement appears to be relatively static across the period April 2007–March 2015, although there is a slight growth in moving traffic enforcement (a 1% increase) in the latest statistics (2014–15). Outside Greater London (Figure 3.7), there appears to be a fairly substantial increase in bus lane enforcement (the orange line) over the period 2013–14, above that which can be attributed to new authorities adopting bus lane powers (grey shaded area). Again, however, it must be noted that the adoption of bus lane enforcement can come at any time of the year, and so an increased PCN issuing rate may owe more to bedding in of bus lane enforcement than to any increased enforcement per se. What is not in doubt, as Figure 3.8 demonstrates, is that automated means of PCN enforcement are becoming proportionally more important, from 9% of all PCNs in 2007–8 to 17% in 2014–15. However, this may not be the true figure, as the use of so-called 'CCTV spy camera cars' or mobile enforcement vehicles (MEVs) are not differentiated from ordinary PCNs in official statistics. It follows that in order to get a true picture of the extent of automated enforcement, the contribution of MEVs needs to be examined, which is what we now address.

3.2.3 Mobile vehicle enforcement

Examining the effect of MEVs, i.e. spy cars, on LA parking enforcement is difficult. Few councils separate keep separate records of PCNs issued by MEVs and PCNs issued by CEO, making it impossible to know the true figure of automation at an LA level. Certainly, with the changes brought on by the Civil Enforcement of Parking Contravention (England) General (Amendment No. 2) Regulations 2015, which curtailed the use of CCTV evidence for parking contraventions, the level of automated enforcement is likely to have come down in LA areas. Previously, LAs could issue PCNs by post using CCTV/ANPR evidence (provided the CCTV was an approved device). Under the 2007 Civil Enforcement of Parking Contravention (England) General Regulations (2007 Regulations), ANPR devices could be used to enforce both on-street and off-street parking where it was impractical to issue a PCN (regulation 10(1) b & c, 2007 Regulations).

There are few statistics on the number of MEV PCNs issued; very few authorities separate the PCN issue statistics to this level of detail, instead providing figures on the number of PCNs issued for specific regulations. A Big Brother Watch report in 2010 identified 31 councils using an MEV (although only 24 LAs had been found to issue PCNs through the vehicle[20]). During that period, those 24 LAs issued a combined total of 187,993 PCNs through the MEV; the combined total of all PCNs issued during this period for those 24 authorities was 2,803,857. Thus, the MEV accounted for just 7% of all PCNs, although it should be noted that there was significant variation in the percentage contribution of MEV PCNs amongst the LAs (see Table 3.5) – from a high of 48% in Havering to a low of 0.6% in Redbridge.[21]

20 Five identified authorities provided no data, and in a further two, trials of an MEV were just beginning.
21 Although Camden is listed as the (proportionately) lowest-issuing authority in the list, the statistics for MEV enforcement in Camden cover the period 1 February 2010 to 31 March 2010.

Table 3.5: The number of Penalty Charge Notices (PCNs) issued by MEV-using local authorities, 2009–10

Local authority	MEV-issued PCNs	Total PCNs[22]	% MEV-issued
Barking and Dagenham	14,851	65,282	22.7%
Basildon	1,843	10,059	18.3%
Bexley	8,733	54,138	16.1%
Bolton	1,631	28,244	5.8%
Bromley	2,105	70,652	3.0%
Camden(*)	1,363	318,477	0.4%
Croydon	3,924	110,894	3.5%
Enfield	9,648	91,184	10.6%
Haringey	7,746	161,587	4.8%
Havering	18,602	38,434	48.4%
Islington	1,648	178,889	0.9%
Lambeth	34,016	187,901	18.1%
Lewisham	3,378	51,183	6.6%
Manchester	4,294	127,149	3.4%
Medway	16,129	45,709	35.3%
Newham	19,394	184,696	10.5%
Redbridge	651	104,130	0.6%
Richmond Upon Thames	12,305	84,295	14.6%
Southwark	1,204	107,851	1.1%
Sutton	206	26,387	0.8%
Tower Hamlets	3,724	82,799	4.5%
Wandsworth	3,303	153,666	2.1%
Westminster	14,217	485,319	2.9%
Wirral	3,078	34,932	8.8%
Total	**187,993**	**2,803,857**	**6.7%**

Source: Data Extrapolated from Big Brother Watch, 2010 and "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010
Note: (*) Statistics are from February 2010.

It is worth bearing in mind the speculative nature of these statistics. MEVs were in their infancy, and a number of authorities were trialling the vehicle, and did not report the date of commencement of MEV operation, meaning that some of the statistics may only represent a portion of the whole year's use.

Big Brother Watch carried out a second survey of LAs in 2014 (Big Brother Watch, 2014), which asked for the number of MEV-issued PCNs between the period March 2009 and March 2013. Again, we can plot the number of PCNs issued over this period to see what

22 Total PCN statistics are gathered from the annual reports of PATAS and the Traffic Penalty Tribunal.

proportion are issued by MEVs. The data is contained in Table 3.6 (Greater London) and Table 3.7 (England and Wales, excluding London).

Table 3.6: MEV-issued Penalty Charge Notices (PCNs) (as a percentage of total), Greater London Authorities, March 2009 to March 2013

Local authority in London	MEV-issued PCNs	Total PCNs	% MEV-issued
Barking & Dagenham	68,093	221,969	31%
Bexley	22,058	206,321	11%
Brent	30,305	420,467	7%
Bromley	13,937	325,334	4%
Camden	26,645	1,075,244	2%
City of London	3,999	216,288	2%
Croydon	16,875	421,032	4%
Enfield	4,266	324,751	1%
Hackney	23,873	339,870	7%
Haringey	36,678	664,553	6%
Havering	109,298	162,211	67%
Hounslow	8,900	518,218	2%
Kingston	33,230	203,815	16%
Lambeth	44,659	621,232	7%
Lewisham	22,686	203,791	11%
Merton	25,167	187,847	13%
Newham	59,003	750,451	8%
Redbridge	48,443	415,288	12%
Richmond	38,634	280,963	14%
Southwark	26,253	374,233	7%
Sutton	32,589	116,196	28%
Tower Hamlets	2,157	396,077	1%
Wandsworth	28,759	638,357	5%
Westminster	51,229	1,867,163	3%
Total	**777,736**	**10,951,671**	**7%**

Source: Data extrapolated from Big Brother Watch, 2014 and "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010-2013

As can be seen from Table 3.6 there was wide variation in the uptake of MEV PCN issuing across Greater London, with Havering having the highest proportion of PCNs issued by an MEV (67% of all PCNs issued) and Tower Hamlets providing the lowest with just 1%. Nine London LAs had no MEV during this period. The mean average for MEV PCN issuing was 7%.

The situation outside London is remarkably similar as Table 3.7 demonstrates. Again, the average rate of MEV PCN issuing was just 6% of the total of all PCNs.

Table 3.7: MEV-issued Penalty Charge Notices (PCNs) in England and Wales (excluding Greater London), March 2009 to March 2013

Local authority	MEV-issued PCNs	Total PCNs	% MEV-issued
Barnsley	1,730	31,281	6%
Bedford	7,715	101,842	8%
Birmingham	8,518	529,098	2%
Bolton	14,652	108,712	13%
Bournemouth	13,716	108,440	13%
Bristol	10,599	298,278	4%
Bury	20,484	78,268	26%
Cheshire West	1,445	84,818	2%
Hartlepool	3,420	29,404	12%
Liverpool	2,354	281,921	1%
Luton	1,454	131,901	1%
Manchester	258	530,042	0%
Medway	58,548	184,369	32%
North Tyneside	3,531	58,452	6%
Nottingham	676	246,019	0%
Oldham	1,384	99,035	1%
Peterborough	7,026	64,991	11%
Plymouth	18,021	148,703	12%
Poole	2,426	75,321	3%
Reading	2,005	179,453	1%
South Tyneside	3,873	46,060	8%
Southend-on-Sea	15,254	156,231	10%
Stoke on Trent	16,274	86,932	19%
Torbay	2,410	137,202	2%
Wirral	7,513	116,794	6%
Wolverhampton	51	84,590	0%
Total	**225,337**	**3,998,157**	**6%**

Source: Data extrapolated from Big Brother Watch, 2014 and "Parking enforcement statistics" London Councils, years 20010-2014

As can be seen from Tables 3.5, 3.6 and 3.7, several authorities had very low issue rates for MEV PCNs during the 2009–10 period (Table 3.5). It may be that this period is the point at which the use of MEVs began to increase – again, statistics obtained by Big Brother Watch in 2014 can help us understand the development of MEV PCN issuing post-March 2010. In its report *Traffic Spies*, Big Brother Watch (2014) collected statistics on the number of PCNs issued by MEVs across all LAs in England and Wales for the period March 2009 to March 2013. The MEV PCNs for 2009–10 can then be subtracted from the number of issued for

the period 2009–13 obtained from the original *Drive-by Spies* (Big Brother Watch, 2010) report, and the resulting figures, which relate to 2010–13, then compared with the number of PCNs issued by those authorities with relevant data for that period. The statistics are reported in Table 3.8, and show that the mean of all authorities has grown over the period 2010–13, suggesting an increased reliance on automated enforcement at the expense of non-automated, albeit a relatively small increase (0.5%) (MEV mean enforced % 2010/13 minus MEV mean enforced % 2009/10). The statistics also highlight that London Councils dominated the uptake of MEV enforcement.

Table 3.8: MEV-issued Penalty Charge Notices (PCNs) and the % MEV-issued, 2010–13

Local authority	(A) MEV 2009–10	(B) MEV 2009–13	(B)–(A) MEV 2010–13	PCNs 2010–13	% MEV-enforced 2010–13
Barking and Dagenham	14,851	68,093	53,242	156,687	34.0%
Bexley	8,733	22,058	13,325	152,183	8.8%
Bolton	1,631	14,652	13,021	80,468	16.2%
Bromley	2,105	13,937	11,832	254,682	4.6%
Camden	1,363	26,645	25,282	756,767	3.3%
Croydon	3,924	16,875	12,951	421,032	3.1%
Enfield (*)	9,648	4,266	–5,382	324,751	-
Haringey	7,746	36,678	28,932	502,966	5.8%
Havering	18,602	109,298	90,696	123,777	73.3%
Lambeth	34,016	44,659	10,643	433,331	2.5%
Lewisham	3,378	22,686	19,308	152,608	12.7%
Manchester (*)	4,294	258	–4,036	402,893	-
Medway	16,129	58,548	42,419	138,660	30.6%
Newham	19,394	59,003	39,609	565,755	7.0%
Redbridge	651	48,443	47,792	311,158	15.4%
Richmond upon Thames	12,305	38,634	26,329	196,668	13.4%
Southwark	1,204	26,253	25,049	266,382	9.4%
Sutton	206	32,589	32,383	89,809	36.1%
Tower Hamlets (*)	3,724	2,157	–1,567	313,278	-
Wandsworth	3,303	28,759	25,456	484,691	5.3%
Westminster	14,217	51,229	37,012	1,381,844	2.7%
Wirral	3,078	7,513	4,435	81,862	5.2%
Total	**184,502**	**733,233**	**548,731**	**7,592,252**	**7.2%**

Source: Data extrapolated from Big Brother Watch, 2010 and 2014; "Parking enforcement statistics" London Councils, years 20010-2014 and "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010-2013

Note: * Data incongruence between 2010 and 2014 Big Brother Watch reports

If the MEV was part of the 'war on motorists' that the Coalition Government claimed it was, then it played only a limited part in the war. The 'war on motorists' was, it seems, being fought overwhelmingly by conventional means, by CEOs issuing PCNs on the street or in public car parks.

With the above data we can begin to build a picture of the extent to which automated enforcement contributed to all parking enforcement across LAs by including both bus lane enforcement and moving traffic enforcement in Greater London. The data is reported in Table 3.9.

Table 3.9: Automated enforcement in local authorities

Local authority	2010–13 MEV	2010–13 bus lane	2010–13 moving traffic (London)	Total automated	2010–13 PCNs	% automated
Barking and Dagenham	53,242	44,336	76,156	173,734	277,179	63%
Bexley	13,325	0	–	13,325	152,183	9%
Bolton	13,021	0	–	13,021	80,468	16%
Bromley	11,832	16,962	–	28,794	271,644	11%
Camden	25,282	54,237	130,360	209,879	941,364	22%
Croydon	12,951	4,038	19,118	36,107	333,294	11%
Enfield (*)	–5,382	5,814	17,097	17,529	256,478	7%
Haringey	28,932	14,561	48,136	91,629	565,723	16%
Havering	90,696	0	–	90,696	123,777	73%
Lambeth	10,643	67,053	89,196	166,892	589,580	28%
Lewisham	19,308	30,381	3,717	53,406	186,706	29%
Manchester (*)	–4,036	117,269	–	113,233	402,893	28%
Medway	42,419	30,438	–	72,857	138,660	53%
Newham	39,609	16,753	47,927	104,289	630,435	17%
Redbridge	47,792	0	25,160	72,952	336,318	22%
Richmond upon Thames	26,329	15,498	–	41,827	212,166	20%
Southwark	25,049	2,659	32,443	60,151	301,484	20%
Sutton	32,383	0	–	32,383	89,809	36%
Tower Hamlets (*)	–1,567	9,196	4,778	12,407	327,252	4%
Wandsworth	25,456	6,048	51,942	83,446	525,991	16%
Westminster	37,012	11	39,526	76,549	1,421,381	5%
Wirral	4,435	0		4,435	81,862	5%
Total	**548,731**	**435,254**	**585,556**	**1,569,541**	**8,246,647**	**19%**

Source: Data extrapolated from Big Brother Watch, 2010 and 2014; "Parking enforcement statistics" London Councils, years 20010-2014 and "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010-2013

Note: (*) Data incongruence between 2010 and 2014 Big Brother Watch reports

We can see from Table 3.9 that there is a great deal of variation in the contribution that automated enforcement makes to parking enforcement, from 73% in the London Borough of Havering, down to just 4% in Tower Hamlets. Overall, however, we can see that, for these authorities, the average contribution of automated enforcement was approximately 19% of PCNs issued. It should be noted that this level of automation took place during a period of contraction in the number of PCNs being issued by these authorities, as Table 3.10 demonstrates. Thus, rather than increasing the number of PCNs being issued by LAs, automation instead merely led to a change in the way in which certain offences were enforced. It should also be noted that during this two-year period, while PCNs reduced by 4.2% in these authorities, the number of vehicles on the road increased by 1% (although this is a national figure) (DfT, 2017a). The number of PCNs issued across all authorities between 2010 and 2013 also increased by 1%.

Table 3.10: Total of all Penalty Charge Notices (PCNs) issued by local authorities who had use of MEVs from 2009

Local authority	2010–11	2011–12	2012–13
Barking and Dagenham	102,437	94,496	80,246
Bexley	54,031	50,155	47,997
Bolton	26,952	27,408	26,108
Bromley	89,412	90,180	92,052
Camden	350,490	330,763	260,111
Croydon	114,530	110,321	108,443
Enfield	85,421	86,703	84,354
Haringey	177,164	189,546	199,013
Havering	37,420	47,001	39,356
Lambeth	201,743	196,274	191,563
Lewisham	59,755	64,315	62,636
Manchester	125,811	137,430	139,652
Medway	54,089	47,352	37,219
Newham	212,452	221,220	196,763
Redbridge	111,805	111,297	113,216
Richmond Upon Thames	74,831	64,532	72,803
Southwark	100,615	98,747	102,122
Sutton	23,266	31,705	34,838
Tower Hamlets	99,973	110,277	117,002
Wandsworth	171,468	183,558	170,965
Westminster	471,737	492,881	456,763
Wirral	29,090	27,740	25,032
Total	**2,774,492**	**2,813,901**	**2,658,254**
Percentage change, 2010/11–2012/13			**–4.2%**

Source: Data extrapolated from; "Parking enforcement statistics" London Councils, years 20010-2014 and "Annual Statistics Report, Traffic Penalty Tribunal", Traffic Penalty Tribunal, years 2010-2014

With the then Coalition Government's determination to "end the war on the motorist", the Civil Enforcement of Parking Contravention (England) General (Amendment No. 2) Regulations 2015 amended the circumstances in which CCTV evidence could be used for parking enforcement. At present, under the 2015 regulations, CCTV enforcement can only be used for on-street parking enforcement (regulation 9 of the amended regulations limits off-street enforcement to PCNs personally issued by a CEO) and only in the following limited circumstances:

- a vehicle is stationary in a bus lane;
- a vehicle is stationary in a bus stop clearway or bus stand clearway;
- a vehicle is stationary in a zigzag-lined no-waiting area outside a school entrance; or
- a vehicle is stationary on a red route.

The list of offences is a mixed collection of both safety (zigzag lines) and traffic regulation concerns (bus and red routes), although quite why it is legitimate to enforce zigzag lines outside a school entrance but not at the pedestrian crossing (potentially a short distance down the road) is not at all clear – with the present situation appearing confusing (and somewhat ridiculous). So, far from automation of enforcement being reserved for clear public safety concerns, LAs are still entitled to use automated enforcement to manage traffic flow (although only in well-defined areas), yet are prohibited from using it where clear public safety concerns might arise. This is a largely irrational state of affairs, and the Government should revisit the issue, particularly where public safety is concerned.

It is too early to tell what effect these changes (relating to MEVs and CCTV use) will have, since there are no published statistics for March 2015 to March 2016 (at the time of writing). It would be surprising if there has not been an effect on the statistics, especially where LAs may have made staffing decisions based on the availability of an MEV, but it is too early to tell.

Although the 2015 regulations removed the power to issue PCNs by post for all but the limited DPE offences listed above, it should be noted that they make no mention of using the enforcement vehicles (or indeed any ANPR enforcement equipment for that matter) to facilitate enforcement. There is anecdotal evidence to suggest that some LAs may integrate, or plan to integrate, MEVs and ANPR-equipped static CCTV into enforcement monitoring/ planning. In its simplest guise, LAs may legally use the vehicle to send messages to mobile CEOs directing them where enforcement is needed. Whilst this may not be as efficient as actually using the fully digitally linked ANPR capabilities of MEVs (and static CCTV), it does have the potential to provide increased efficiency compared with the traditional CEO inspection model. Perhaps LAs should consider this approach for those regulations addressing road safety, rather than focusing on the (perhaps easier to prove) traffic management / parking regulations. This form of enforcement, 'smart monitoring', is certainly a likely future development should the 2015 regulations continue.

At present the use of automated enforcement by LAs is in a rather confusing state. There is a clear difference in rationale and underpinning ethos between regulations aimed at securing public safety on our roads on the one hand, and those securing the efficient flow of traffic on the other. Whilst the latter is a vitally important public concern, it is likely that heavy

enforcement aimed at traffic regulation will lead to concerns about legitimacy, particularly where there are limited or no safety concerns (e.g. in the case of off-street parking). At present, the policy on automated enforcement in LAs is not coherent, and creates a space for significant public concern and distrust. In particular, the blanket ban on the use of automated ANPR where there are clear public safety issues (e.g. zigzag lines leading to a level crossing or dangerously parked vehicles) seems irrational in a situation in which such egregious disrespect for public safety is not sanctioned with the same amount of regularity as, for instance, straying (even accidentally) into a bus lane.

Again, anecdotal evidence, from discussions the author has had with parking enforcement managers from across the country, suggests that lobbying is still ongoing regarding the 2015 regulations, particularly in relation to zigzag markings approaching a pedestrian crossing and (potentially) allowing ANPR off-street parking enforcement (in a similar fashion to that provided by private parking operators, such as Parking Eye, Advanced Parking, Park Direct UK and many others). It is fair to say that, given the current political climate, this latter proposal is likely to meet stiff resistance both within government and amongst motorists.

4. Automatic Enforcement – the Future

To begin mapping the future of automated enforcement we can examine the current legal framework of road traffic regulation to suggest potential candidate offences for future automation (i.e. using technological solutions). In what follows, the regulation of moving traffic is subject to analysis to find potential candidate offences from amongst both fully automated offences and those that are likely to involve a high degree of automated facilitation in the enforcement of the regulation. Moving traffic has been chosen as, at present, there is scope to increase the number of offences subject to automation. Again, the split between LA and police enforcement is important, as, in the current political climate, it seems there is greater scope for full automation in the policing context rather than in the LA context, as the discussion in the previous chapters has highlighted. Therefore, the future of automation in the LA sector is largely settled, for the immediate future at least, in moving away from full automation, although there appears to be scope for increasing the extent to which CEOs rely on technology to facilitate their enforcement.

4.1 Legislative analysis

There are three main pieces of primary legislation that govern the policing of road traffic: the Road Traffic Act (RTA) 1988, the Road Traffic Offenders Act (RTOA) 1988 and the Road Traffic (Consequential Provisions) Act 1988.

The RTA 1988 (and its subsequent amendments) is a comprehensive piece of legislation that governs the regulation of moving road traffic, including vehicle construction and use, driving, licensing of drivers, road safety and the general powers of the police to enforce the above.

The RTOA 1988 deals with the consequences of offending by motorists, and sets out the procedures and rules that must be followed by the police in enforcing the RTA 1988, including enforcement by camera device.

The Road Traffic (Consequential Provisions) Act 1988 ensures that the above two acts are the primary acts for dealing with moving road traffic regulation and any previous enactments should be read as if they are contained within the above to acts.

Of the three, the RTOA 1988 is the primary piece of legislation for the analysis that follows – not only does it control the use of CCTV/ANPR devices in road traffic enforcement (section 20) but it also provides the scheme of FPNs operated by the police in Schedule 3. Immediate future developments in the use of automated enforcement are likely to come from this list of offences (Schedule 3 is replicated in Appendix C), since they do not require a court appearance, and hence adjudication, in the imposition of a penalty/punishment. At present, 70 moving traffic offences are on the FPN scheme and these have each been analysed to test their potential for automated enforcement in the future. At present 34 offences are, or could possibly be, enforced through automated means. Nine of these offences are currently enforced through automated means, and they are coloured orange in Table 4.1. The remaining 25 are capable of being enforced with present technology, although the desirability of such enforcement, from both the government and public perspective, is questionable.

As can be seen from Table 4.1, there are two forms of automation that can be used to enforce the relevant regulations: ANPR camera, and some form of ignition interlock system. The Road Safety Act 2006 amended the RTA 1988 and introduced into the 1988 act the idea of an interlock enforcement mechanism for the offences involving driving under the influence of alcohol (Sections 3A(1) a, b & c, 4, 5(1), 7(6) and 7A(6) of the RTA 1988).

The Road Safety Act 2006 contained a proposal to introduce an automated interlock system to regulate, and control, recidivist drink-driving. The alcohol ignition interlock “has intrigued road safety professionals since the 1960s” (Beirness, Clayton and Vanlaar, 2008: 8), but it is only in relatively recent times, with the development of breathalysing hardware and its virtual 100% capture record, that the system has been taken seriously (ibid.). The modern alcohol ignition interlock operates by taking samples of a driver’s breath, prior to starting the motor vehicle, and disabling the ignition system if the blood alcohol concentration (BAC) exceeds

a permitted amount.[23] There seems no reason why ignition interlocks, cannot, as a matter of technological development, be used for a number of the offences listed in Table 4.1. Although deciding whether an offence should be dealt with by way of ignition interlocks requires consideration of wider issues than merely whether it is technically possible (e.g. fairness, reliability etc…)

As can be seen from Table 4.1, the offences that can be dealt with by way of ANPR-automated enforcement are all strict liability offences, or 'state of affairs' cases, which means that simple facts can prove the case, without the need to determine something as uncertain as the mental intention of the driver. The offences are generally either "using", "keeping" "leaving" or "breaching" some requirement that can be proved without inquiring into the accused's state of mind. Thus, fully automated enforcement methods can be used, as little judgement is required on the part of the enforcement agency (in most cases the police) to assess whether the offence has been committed; the camera and linked software can effectively do the work of a police officer. The interlock offences noted in the list, on the other hand, generally relate to activities that drivers/owners are required to perform prior to engaging in driving or using the vehicle in some way. For instance, for the offence of not wearing a seat belt the system could require a positive action (engaging the seatbelt), by the driver before allowing the vehicle to start (see under the heading 'Seat belts' in section 4.1.1 for more on this particular offence).

23 The future of alcohol ignition interlocks is discussed further under the heading 'Drink-driving' in section 4.1.1.

Table 4.1: Current fixed penalty notice offences that are capable of automated enforcement

Offences capable of automated enforcement			
Legislation	**Description**	**Type**	**Current enforcement**
Offences under the Goods Vehicles (Community Authorisations) Regulations 1992			
Regulation 3 of the Goods Vehicles (Community Authorisations) Regulations 1992	Using goods vehicle without Community authorisation.	ANPR	No
Regulation 3 of the Public Service Vehicles (Community Licences) Regulations 1999	Using public service vehicle on road without Community licence.	ANPR	No
Offences under the HGV Road User Levy Act 2013			
Section 11 of the HGV Road User levy Act 2013	Using or keeping heavy goods vehicle if HGV road user levy not paid.	ANPR	No
Offences under the Road Traffic Act 1988 (RTA)			
RTA section 47	Using, etc., vehicle without required test certificate being in force.	ANPR	No
RTA section 143	Using motor vehicle while uninsured or unsecured against third party risks.	ANPR	No
RTA section 35	Failure to comply with traffic directions.	ANPR	No
RTA section 36	Failure to comply with traffic signs.	ANPR	Yes
RTA section 19	Parking a heavy commercial vehicle on verge or footway.	ANPR	No
RTA section 22	Leaving vehicle in dangerous position.	ANPR	No
RTA section 18(3)	Breach of regulations relating to head-worn appliances (eye protectors) for use on motor cycles.	ANPR	No
RTA section 16	Breach of regulations relating to protective headgear for motor cycle drivers and passengers.	ANPR	Potential for drivers of motorcycles
RTA section 14	Breach of regulations requiring wearing of seat belts.	ANPR/Interlock	Potential for drivers
Offences under the Road Traffic Regulation Act 1984 (RTRA)			
RTRA section 89(1)	Speeding offences under RTRA and other Acts.	ANPR	Yes
RTRA section 88(7)	Driving a motor vehicle in contravention of an order imposing a minimum speed limit under section 88(1)(b).	ANPR	Yes

Offences capable of automated enforcement			
Legislation	**Description**	**Type**	**Current enforcement**
RTRA section 35A(1)	Breach of an order regulating the use, etc., of a parking place provided by a local authority, but only where the offence is committed in relation to a parking place provided on a road.	ANPR	Prohibited at present for local authorities (2015 Regulations)
RTRA section 47(1)	Breach of a provision of a parking place designation order and other offences committed in relation to a parking place designated by such an order, except any offence of failing to pay an excess charge within the meaning of section 46.	ANPR	No
RTRA section 53(5)	Using vehicle in contravention of any provision of a parking place designation order having effect by virtue of section 53(1)(a) (inclusion of certain traffic regulation provisions).	ANPR	No
RTRA section 53(6)	Breach of a provision of a parking place designation order having effect by virtue of section 53(1)(b) (use of any part of a road for parking without charge).	ANPR	No
RTRA section 20(5)	Driving a vehicle in contravention of order prohibiting or restricting driving vehicles on certain classes of roads.	ANPR	No
RTRA section 17(4)	Wrongful use of special road.	ANPR	Yes in relation to speed restriction
RTRA section 18(3)	Using a vehicle in contravention of provision for one-way traffic on trunk road.	ANPR	No
RTRA section 16(1)	Using a vehicle in contravention of temporary prohibition or restriction of traffic in case of execution of works, etc.	ANPR	Yes in relation to speed restriction
RTRA section 13	Breach of experimental traffic scheme regulations in Greater London.	ANPR	Yes in relation to bus lane, box junction and Red Route
RTRA section 5(1)	Using a vehicle in contravention of a traffic regulation order outside Greater London.	ANPR	Yes in relation to bus lane, box junction and Red Route
RTRA section 8(1)	Breach of traffic regulation order in Greater London.	ANPR	Yes in relation to bus lane, box junction and Red Route
RTRA section 11	Breach of experimental traffic order.	ANPR	Yes in relation to bus lane, box junction and Red Route

Offences capable of automated enforcement			
Legislation	**Description**	**Type**	**Current enforcement**
Offences under the Highways Act 1980			
Section 137 of the Highways Act 1980	Obstructing a highway, but only where the offence is committed in respect of a vehicle.	ANPR	No
Offences under the Greater London Council (General Powers) Act 1974			
Section 15 of the Greater London Council (General Powers) Act 1974	Parking vehicles on footways, verges, etc.	ANPR	No
Offences under the Road Traffic (Foreign Vehicles) Act 1972			
Section 3(1) of the Road Traffic (Foreign Vehicles) Act 1972	Driving, etc., foreign goods vehicle or foreign public service vehicle in contravention of prohibition etc.	ANPR	No
Offences under the Transport Act 1968			
Section 96(11) of the Transport Act 1968	Contravention of any requirement of domestic drivers' hours code.	ANPR/Interlock	No
Section 96(11A) of the Transport Act 1968	Contravention of any requirement of applicable Community rules as to periods of driving, etc.	ANPR/Interlock	No
Section 97(1) of the Transport Act 1968	Using vehicle in contravention of requirements relating to installation, use or repair of recording equipment in accordance with European Community Recording Equipment Regulations.	Interlock	No
Section 72 of the Highways Act 1835	Driving on the footway.	ANPR	No
Offences under the Parks Regulation (Amendment) Act 1926			
Section 2(1) Parks Regulation (Amendment) Act 1926	Breach of parks regulations but only where the offence is committed in relation to regulation 4(27) (driving or riding a trade vehicle), 4(28) (exceeding speed limit) or 4(30) (unauthorised waiting by a vehicle or leaving a vehicle unattended) of the Royal and other Parks and Gardens Regulations 1977.	ANPR	No

Source: Extrapolated from Schedule 3 Road Traffic Offenders Act 1988

4.1.1 Policing priorities 2015–20: the 'fatal four'

The National Police Chiefs' Council (NPCC) five-year strategy (2015–2020) (NPCC, n.d.) for road safety sees automation and technology as central to enforcement practice in the future. Across all four of its strategic objectives ('Safe', 'Secure', 'Effective' and 'Efficient'), technology is seen as a priority, either directly or by implication. The **Safe** objective requires "utilising appropriate technology to reduce the numbers of persons killed or seriously injured on UK roads" (NPCC, 2015: 3). The **Secure** objective demands the "use of automatic number plate recognition (ANPR) to detect and disrupt those criminals who use the road" (ibid.). The **Effective** objective asks for engagement with partnerships to "deliver a safer and more secure *network road* approach" (ibid.: 4, emphasis added). Finally, the **Efficient** objective, although not mentioning technology directly, talks of road policing being "innovative and flexible in our approach, using effective communications to help deliver cost-effective solutions to harm reduction" (ibid.). Furthermore, in its evidence to the Transport Select Committee (TSC) on Road Safety Law and its Enforcement, the NPCC saw future opportunities for technology and automation, stating that road policing would "make even better use of technology to achieve compliance with roads safety legislation" (NPCC, 2015, section 5.4). Technology and automation is therefore likely to be central to police enforcement, which should come as no surprise given the current, and likely future, pressure on police budgets.

The main priority for police road traffic enforcement at present is to focus on the so-called 'fatal four': drink- and drug-driving, speeding, not wearing a seat belt, and using a mobile phone whilst driving (TSC, 2016). These offences are, thus, the most likely targets (in addition to the general range of communication and education campaigns) for future automation in the short to medium term. In the following sections each offence is examined in turn to look at the potential for automated solutions in enforcement.

Drink-driving

Drink-driving is an offence that has, throughout its history, been automatised, in the sense described in the historical review section. Procedures for proving a drink-driving case have been streamlined to such an extent that the offence (since the Road Safety Act 1967 and the introduction of roadside a breathalyser test) is now largely proved, and the enforcement facilitated, through technology – although it is not a fully automated system, in that it requires a police officer to administer the test. Once a positive breath sample is given the process of enforcement begins, and generally leads inevitably to an automatic sentence of suspension of the accused's driving licence.

As was the case with speeding enforcement through automated means, the introduction of the breathalyser was not universally welcomed by motorists, and led to a "raft of case law that tried to expose legal loopholes and challenged the reliability of the new breathalyser and the procedures themselves (Black, 1993)" (Corbett, 2003: 76). This is another example of the resistance by drivers to automation of enforcement that has been a factor throughout all road traffic automated systems. As discussed above, such systems eventually gain a majority of public support, though it is a long and difficult process. Drivers are, seemingly,

suspicious of developments in enforcement, and such suspicion typically revolves around the issue of trust, and in particular trusting the motives of the enforcing authority (as well as the science behind the enforcement intervention).

There is no doubt, however, that drink-driving continues to be a problem for the UK, as well as for the rest of Europe. Approximately a quarter of all road fatalities are due to drivers under the influence of alcohol (COWI et al., 2014). In Great Britain, according to the latest statistics, that figure is lower, at 13% (and has remained relatively static for the previous ten years, with a high of 18% in 2006 (DfT, 2017b)), although Great Britain still has the highest blood alcohol threshold in Europe. The European Transport Safety Council (ETSC) have been leading the calls for greater enforcement (and integration of technology) in the fight against drink-driving. They recommend that states should have a minimum level of enforcement such that one in five of the driving population should be checked each year. Furthermore, they also recommend that states should introduce alcohol interlock schemes for recidivist and professional drivers in the first instance, and for all drivers in the longer term (ETSC, 2012).

As discussed above, proposals to implement an ignition interlock system for recidivist drink-drivers were contained within the Road Safety Act 2006. Ultimately the idea was not carried forward owing to the fact that "the costs of implementing and enforcing a scheme are likely to be disproportionate" (Hansard, 2013). This followed a report, commissioned by the Department for Transport (DfT) to investigate the usefulness, acceptability and impact on lifestyle of these devices.

Alcohol ignition interlock devices work according to the following (Clayton & Beirness, 2008: 9):

> "Every time an attempt is made to start the vehicle, the driver is required to blow into a small breath-testing instrument that is wired directly to the vehicle's ignition system. If the device detects alcohol in excess of the threshold value, which can be set at different values, the vehicle will not start. The typical value in current use is 0.02% (20 mg alcohol/100 ml blood)."

Alcohol ignition interlocks are used widely in a number of American states and Canada, and they are also used in several European states including; Sweden, Denmark, Finland, The Netherlands and Belgium (ETSC, 2012).

Clayton and Beirness (2008) conducted an international review of alcohol ignition interlocks and found that take-up of the device was low, with typically less than 10% of all eligible offenders choosing to participate in the scheme. Most systems allowed the offender to choose to participate in the programme (and charged an ongoing fee) in return for a reduction in the length of their driving ban (although there are harsher regimes). Clayton & Beirness found that uptake varied dependent upon the consequence of not installing such a device – for instance in Indiana (USA) the threat of jail as an alternative led to a 70% take-up. In more liberal Quebec, the promise of a reduced length of mandatory suspension likewise increased uptake, although at the significantly lesser level of 20%. The evidence for the alcohol ignition interlock UK pilot was mixed, at best. The pilot study found negligible impact

on drinking behaviour, which was a significant risk factor in recidivism, but the system was nevertheless well regarded by most participants. However, there was also a significant attrition rate for study participants, with 43% of them failing to complete the full 12 months, which suggests that there is support for the alcohol ignition interlock *in principle* but a clear dislike for the operation of the system *in practice*. (Beirness, Clayton and Vanlaar, 2008). Added to this, the financial costs, which can be significant for the motorist (where they are expected to bear the cost) in terms of fitting, maintenance, removal and the extra cost on their motor insurance (Clayton & Beirness 2008), led the Government to reject implementing the legislation on a wider scale.

It is unlikely therefore that the alcohol ignition interlock will be taken forward any time soon, especially given the success of the drink-driving rehabilitation scheme (Inwood et al., 2007) and anti-drink-driving campaigns (Angle et al., 2009; DfT, 2011). Nevertheless, the European Commission is continuing to monitor (and promote) interlock programmes. Furthermore, the ETSC continues to highlight the effectiveness of ignition interlocks providing they are combined with rehabilitation programmes (ETSC, 2016a). It is worth bearing in mind, as identified above, that if the system does gain police support and is seen as a means of reducing police bureaucracy and increasing efficiency, the interlock may yet be resurrected; the evidence from Europe, however, is mixed in this regard. The ignition interlock scheme in the Netherlands "had a severe impact on the workload of the National Vehicle Authority, the Central Office of Driving Certification and the department of the Public Prosecutor. However, it did not result in a higher workload for the police" (ETSC, 2016a: 14).

However, a possible development in drink-driving enforcement is for the BAC limit to be lowered to bring it in line with most other European states, rather than an increase in automated enforcement. The European Commission has long pushed for a harmonised 0.5 BAC limit across Member States (Commission Recommendation (2001/C48/02)). More recently the Local Government Association (LGA) and Fire and Rescue authorities have begun lobbying for a similar reduction to 0.5 BAC (LGA, 2017); at present the level is 0.8. In the EU only Malta has a similar level (and they plan to reduce that limit to 0.5 shortly (Xuereb, 2017), while all other European nations have a reduced level of 0.5, 0.2 or in some cases zero (ETSC, 2016b). Just how long the Government can withstand this pressure is an open question.

Speeding

Certainly, the enforcement of speeding will continue to be primarily, if not completely, automated. As the TSC notes, "If enforcement is going to be effective as the number of dedicated road policing officers continues to fall, the use of technology is essential. Speed cameras are an important and effective part of the technology toolkit." (TSC, 2016: 13).

Average speed cameras have been existence on the road network since 2000 (starting in Nottingham) and they consist of tracking a vehicle over a distance to obtain the average speed of the vehicle. Owen, Ursachi and Allsop (2016) have examined the effectiveness of average speed cameras and do find some very positive results, suggesting a 36.4% reduction in fatalities and serious collisions, and a 16% reduction in all personal injury collisions. The authors also caution, however, that such effects may be due to a higher incidence of collisions in the period leading up to the study, rather than as a result of

installing the average speed camera (a potential "regression to the mean" effect) (2016: 23). The authors also found that when using analysis methods that are typically employed by the police and road safety partnerships, there was a reduction of 50% in serious and fatal collisions, and a 25% reduction in personal injury collisions (ibid.). It is thus likely that such agencies will continue to increase reliance on average speed cameras, given the evidence in favour of them.

The TSC report also sees an expanded role for average speed cameras, as they are seen to be more publicly acceptable than fixed cameras, and more effective as well (TSC, 2016: 12) (a point reinforced by Owen et al.'s study). In regard to public acceptability, Wells notes the average speed camera has a greater ability to focus the driver on his or her driving over a period, rather than concentrating on the single snapshot associated with the older Gatso-style cameras. She states (Wells, 2012: 178):

> "Gatso-type cameras ha[ve] often been criticised for capturing isolated moments at isolated locations, which itself is a major factor in some drivers feeling that their whole self has not been fairly represented or judged."

The average speed camera has the potential to provide the contextual background to an incidence of speeding which should mitigate some of the perceived harshness of the single-instance cameras – although how far this will actually alleviate driver complaints is open to doubt, as the history of motoring regulation demonstrates that resistance to technological developments is a common feature in the reaction to all innovation.

The Government, in its response to the TSC report, also agreed that "average speed cameras make a positive contribution to speed limit compliance" (Hansard: House of Commons, 2016: 2). Therefore it is likely that average speed cameras will continue to be used, and may even replace fixed cameras in the longer term.

The TSC also recommends increasing the transparency of funding, and ensuring that the placing of cameras is for legitimate purposes and not for revenue raising. These are certainly not new suggestions – indeed, they have been made repeatedly throughout the years in relation to any form of automated road traffic enforcement (see TSC 2004, 2006, 2016). As points of principle they are perfectly correct and legitimate; in practice, though, it is doubtful whether much will change, and certainly not at the level of perceptions at which the TSC operates. Road safety partnerships currently publish such data, and at an individual camera level. Whilst a reiteration of the principle of openness is to be welcomed, its practical effectiveness in combating the idea that cameras are revenue raising devices is likely to be illusory.

Seat belts

As part of its CARS 2020 action plan, the European Commission has a priority of ensuring that all motor vehicles are fitted with seat belt reminders (warning lights that illuminate when a seat belt has not been engaged) (EC, 2012). Such reminders use technology to facilitate compliance with safety objectives (and legal requirements), although they do not affect the

operability of the vehicle (unlike an interlock system). Such warnings 'nudge' (Thaler and Sunstein, 2009) drivers towards the regulatory standard (to wear a seat belt), rather than forcing them to do so.

Despite such nudges, many drivers (and passengers) still fail to wear their seat belt when driving (or being driven). The number of fixed penalties issued for this offence in 2015 was 19,808, although this still represents a substantial downwards trend (an 89% reduction) in the five years between 2010 (151,838 seat belt FPNs) and 2015 (19,808 seat belt FPNs). Clearly there is still a hard core of drivers that the seat belt safety message has yet to reach. Similarly to the drink-driving situation, the technological enforcement solution proposed for seat belt use has been the seat belt ignition interlock, which works in a similar fashion to the alcohol ignition interlock, by preventing motor vehicle ignition unless a seat belt is worn by the driver.

Seat belt interlocking systems are not new, having been in existence in some form since 1973, when the first US federal standard, no. 208, mandated that newly manufactured cars had to have a belt system that prevented a car starting unless the belt was engaged (i.e. extended more than 4 inches from the normal position) (Robertson, 1975). The system was not universally accepted and, after public resistance, the federal standard was withdrawn (Brovold et al., 2007).

The TSC has rejected the idea of introducing seat belt interlocks, on the basis that assurance/evidence has yet to be provided to satisfy the public that "it would not interfere with normal, legal use of the car, that the existing exemptions (to the law) [e.g. emergency service use etc] are replicated in the technology, and that unjust costs will not be passed to consumers" (TSC, 2016: 17). Once again, the cost of the system and its likely resistance are barriers against the likelihood of this form of automated facilitation being adopted any time soon. More likely, in this regard, is an increasing use of current ANPR DVD systems to provide evidence of driving without a seat belt (and travelling as a passenger unsecured), as mentioned above. Of course, this will have resourcing consequences for police forces, as it requires physical viewing of the DVD to assess whether the offence has been committed, although, following the 2011 guidance from The Association of Chief Police Officers (ACPO) on outsourcing (see below), this may not be too resource intensive, providing there are appropriate safeguards in place as regard section 75 of the RTOA 1988 (whereby a *constable* must have reason to believe that a fixed penalty offence has been committed).

Mobile phone use

As for illegal mobile phone use, again, automated enforcement seems a tenable solution for dealing with this offence. The TSC have recommended that research should be funded to investigate "the development and effective deployment of technology to detect illegal mobile phone use while driving" (TSC, 2016: 18). Quite how such a system would work with the pervasiveness of mobile technology and the increasing integration of Wi-Fi and mobile data into in-car systems is open to question. Certainly technology has been used to detect mobile phone use, as well as failure to wear a seat belt. Kent and Medway Safety Camera Partnership have used mobile camera vans to detect both offences, since they provide sufficient clarity through high-quality DVD recordings to witness them both (KMSCP, 2009).

However, this still requires a significant amount police officer input to review the evidence before deciding whether to issue the penalty, in contrast to dealing with speed and red-light running offences, which requires very limited input – typically nothing more than signing the letter containing the notice / speed awareness course offer.

Norfolk County Council has used an automated detection system for mobile phone use which operated in the same way as a speed indication device (Browne, 2015).[24] Its effectiveness, however, was clearly seen to be open to question when the Road Safety Manager for Norfolk stated "[t]he system can't detect whether it's a passenger using a phone in a vehicle or whether a hands-free device is being used" (ibid.). Clearly there is a long development phase yet to be completed before enforcement takes place with this type of system.

4.1.2 A note on the Transport Act 1968 – tachograph enforcement

Although not one of the 'fatal four', road traffic regulation relating to HGVs is potentially an area of increasing concern, as the number of people killed or seriously injured by HGVs is rising (DfT, 2016). Breach of regulations regarding drivers' hours could possibly be subject to interlock systems (as noted in Table 4.1) which prevent operation of the vehicle if the driver has failed to comply with drivers' hours' conditions under the Transport Act 1968 (and associated EU regulations). In this regard, there are proposals to increase the sophistication of tachograph technology and enforcement by using smart devices.

EU Regulation 165/2014 mandates the fitting of smart tachographs in all vehicles over 3.5 tonnes that transport goods or people (nine or more including the driver) which are registered on or after 15 June 2019. The new generation of smart tachographs must be connected to a satellite navigation system that is capable of being read remotely by enforcement agencies. The regulation gives Member States a period of 15 years for enforcement agencies to be equipped with the remote reading equipment.

The Government has incorporated the legislation into UK law in Statutory Instrument 248/2016 the Passenger and Goods Vehicles (Tachographs) (Amendment) Regulations. Breach of the regulations is an offence that, in the first instance, will attract an FPN under the RTOA 1988. EU Regulation 165/2014 mandates that enforcement is carried out at the "roadside" (Article 9(8)), rather than remotely, and thus fully automated enforcement, in the form of static sensors and automated checks, are not to be used. Therefore, there will be no remote issuing of penalty notices by post; enforcement should be carried out by an authorised officer at the roadside, at least for the foreseeable future. Certainly, there are justifications for this approach, given the wider road safety concerns in operating large good vehicles and the potential increased danger that such vehicles pose (by reason of their size). Whether this provision (article 9(8)) can withstand the pressure to fully automate the process that may inevitably arise, as the smart tachograph develops, is questionable. Certainly, the panoply of safety checks that the DVSA and the police can carry out at the roadside can counter this pressure, and the smart tachograph may be seen as an intelligence, rather than enforcement, tool. How the Brexit process will affect these regulations (and

24 A speed indication device is a roadside notice that indicates to the driver their current speed and whether they are breaching the speed limit (typically by displaying a smiley or sad face emoji).

prohibitions on fully automated enforcement) is unknown (The government's Great Repeal Bill White Paper suggests that most, if not all, of EU law will be transferred directly into UK law). Nevertheless, as noted above, there may still be valid reasons for rejecting such fully automated enforcement.

However, with technological development and Brexit, there is no reason why this provision cannot (which is not to say it definitely should) be enforced through static checks and remote enforcement (much in the same way as with speed cameras). At present, EU Regulation 165/2014 prohibits this; whether it can continue to do so, particularly in a situation where the numbers killed or seriously injured by a HGV are rising (DfT, 2016), is debatable, and the issue may be revisited either at the European level, or at the national level following Brexit.

It is possible, therefore, that tachograph-based offences could become fully automated by linking ANPR CCTV with smart tachograph systems, to provide instant readings that can prove an offence without officer judgement. An alternative approach may be to mandate some form of interlocking system requiring data linking with the smart tachograph to prevent breaches of HGV and PSV (public service vehicle) driving regulations, using a preventative method rather than enforcement after the offence has been committed.

4.1.3 Outsourcing

The ability of automation to provide positive (and certain) evidence of a road traffic offence has, to a large extent, taken the policing out of the hands of road traffic police officers. There is no real need for policing expertise in interpreting the footage of transgression – it can, should the police force decide, be dealt with automatically with no input from a police officer, and merely require the physical act of placing an automated letter in the physical post.[25] Furthermore, the partnership approach to traffic camera enforcement also does away with the need for police officers to be engaged in discussion of camera siting and policy, since that too can be a matter for specialised data analysis through either software or a data analyst. When this is combined with the austerity measures that have been forced on police forces, and the inevitable pressure on police budgets that result (HMIC, 2017), it is not surprising that some forces may consider outsourcing.

ACPO have produced guidance on outsourcing for police forces which finds few obstacles to outsourcing safety camera offence processing and operational functions (ACPO, 2011). Given developments in outsourcing in other areas of criminal justice policy (prisons and probation), the question has to be asked as to whether ANPR enforcement will remain a matter for the public police force, or can be transferred to private policing organisations. At present, the extent of outsourcing in safety camera enforcement is unknown, as it is a matter for each individual force and there are thus no national statistics. However, the police use of outsourcing has been on the increase (Ayling & Grabosky, 2006). The evidence

25 Notwithstanding this, ACPO guidance requires a 'dip sampling' process to be in place, so that a portion of offences are witnessed by a police officer to satisfy section 75(1) of the Road Traffic Offenders Act (Conditional Offer of a Fixed Penalty Notice), which allows a Conditional Offer of Fixed Penalty where "a constable has reason to believe that a fixed penalty offence has been committed". (ACPO, 2011). Moreover, it is possible that in future this step may not even be necessary if electronic service of documents were to become the norm. Such a system is straying very close to O'Malley's vision of telemetric policing.

of outsourcing in other areas of the criminal justice system (particularly the Prison and Probation Service) is not overwhelmingly positive (see HM Inspectorate of Probation, 2016a and 2016b), and police authorities should be wary of such an approach, particularly given the problems identified in other areas of the system.

4.1.4 Local authorities

Camera enforcement

At present, it is unlikely that automated enforcement will expand, in terms of the offences subject to automation, given the 2015 CCTV parking enforcement regulations. However, to a certain extent the process of outsourcing (discussed in the previous section) has already begun, with the decriminalisation of parking offences and of moving traffic offences (such as bus lane and box junction enforcement). Therefore, there may be opportunities for transferring further police-enforced offences to LA decriminalised enforcement.

The TSC's 2015 report on Road Traffic Law Enforcement recommended that the Government should implement Part 6 of the TMA (discussed above) as regards moving traffic offences. Currently such offences are enforced by London LAs under separate legislation, with the PCNs issued for these offences representing 14% of all PCNs issued in London (London Tribunals, 2000–2016). Clearly there is scope here to increase, quite significantly, the number of automated PCNs, should Part 6 of the TMA be implemented for authorities outside London. Section 73(2)d of the Traffic Management Act would allow decriminalised enforcement for the offence of failing to comply with the indication given by a traffic sign. There are 29 types of signs that could be enforced under Schedule 7, Part 4, Para 9 of the Act (for a full list of signs please see section 2.5 of this report).

It should be noted that each of these offence types[26] is essentially a state-of-affairs / strict liability offence, and as such is capable of being witnessed instantly without the need to take into consideration circumstances surrounding the offence. Thus, each of them is capable of being enforced through static CCTV, although this would require a proliferation of cameras and signs on the high street, which the Coalition Government was certainly keen to avoid (McLoughlin, 2013). Clearly if Part 6 of the TMA is to be fully implemented, then LA-automated enforcement is likely to increase significantly.

LAs are overwhelmingly in support of implementing section 73(2) d (TSC, 2016: 31). At present, however, this is unlikely, and indeed the Government response to the TSC's report, relying on fears of "revenue raising", was to reject the proposal. It stated

> "The Government remains to be convinced about the case for giving all authorities the powers to enforce moving traffic contraventions and the Government is not keen to see local authorities installing a raft of new cameras on yellow box junctions and elsewhere to issue PCNs for moving traffic contraventions." (Hansard: House of Commons, 2016: 15)

26 Although there is only one offence, viz. failing to comply with the indication given by a traffic sign contrary to section 36 of the Road Traffic Act 1988, the offence can be committed in a myriad of ways, depending on the sign that has been ignored.

At present, therefore, there is unlikely to be much movement on this front, although the LGA and PATROL (Parking and Traffic Regulations Outside London) may continue to lobby for this section to be implemented.

4.1.5 A note on cross-border enforcement

A significant challenge to automated enforcement in the policing context is the need to prove driver, rather than owner, liability. For British-registered vehicles this is relatively uncomplicated owing to section 172 of the RTA 1988, which requires the keeper of the vehicle to specify who was driving – failure to do so is an offence. However, in relation to foreign-registered vehicles, the situation is more complex since such vehicles are not registered with the DVLA (or the DVA in the case of Northern Ireland), thus making it difficult to trace and punish recalcitrant drivers. There has been European co-operation on this point, allowing for automated means to obtain the information from the home state of the registered vehicle.

The Cross-Border Enforcement Directive creates a process of cross-border information exchange using automation to obtain the details of vehicle owners/drivers not registered in the state in which they have committed a road safety offence. The Directive facilitates information exchange in relation to eight offences:

- speeding
- failing to use a seat belt
- failing to stop at a red traffic light
- drink-driving
- drug-driving
- not wearing a crash helmet
- using a forbidden lane
- use of a mobile phone device whilst driving.

The majority of these are, at present, police-enforced offences, although using a forbidden lane could include driving in a bus lane, and could thus be enforced by an LA under administrative rather than criminal law.

This Directive has a complex procedural history, with an adverse ruling from the European Court of Justice (European Commission v European Council, C 43/12) against the European Council and Parliament in their implementation of rules on cross-border enforcement for “crime and disorder” purposes. The European Court of Justice noted that a Directive for “road safety” purposes was not technically a measure “in relation to the prevention, detection and investigation of criminal offences” under Article 87(2) of the TFEU (Treaty on the Functioning of the European Union) treaty. As a result, a new Directive (Directive 2015/413) was drafted and implemented under Article 91(1), relating specifically to road safety, although the previous Directive (2011/82/EU) continued to have effect until the 2015 Directive was enacted. The Directive imposed a deadline for implementation of the end of 2015, although the UK was exempted (along with Ireland and Denmark) until the end of 2017. The UK has subsequently introduced legislation (The Road Vehicles (Registration and Licensing) (Amendment) Regulations 2017/554) to give effect to the Directive.

The European Commission has indicated that it may support extending the list of offences subject to cross-border enforcement to include: not keeping a sufficient distance from the vehicle in front, dangerous overtaking, and dangerous parking (EC, 2016). The Commission also discussed possible harmonisation of standards (including type-approval procedures and calibration of devices) for automated cameras across the EU, but rejected the idea as a "non-justified interference in Member States'" enforcement policy choices (EC, 2016: 7) and added that this would continue to be the case unless there was evidence of a significant impact on road safety or cross-border enforcement (ibid.).

EUCARIS/CBE (the system for performing the cross-border checks: **EU**ropean **CAR** and driving licence **I**nformation **S**ystem / **C**ross-**B**order **E**xchange) has been subject to a number of problems, the main one being a lack of implementation of the Directive and poor use of equipment (Frisani, Zamboni and Monteiro, 2016). In particular, five Member States that had implemented the Directive failed to perform any outgoing searches on foreign-registered vehicles. Furthermore, the European Commission found that "it appears that less than half of the total number of offences committed by non-resident offenders are followed by a search with the application" (ibid.: 201).

Whilst this 'back office' process is not technically automated enforcement per se, it does create a streamlined enforcement procedure and, at present, the Government seems quite keen on the potential capabilities of the system for providing a level playing field of enforcement (Hansard: House of Commons, 2017). However, there are a number of significant challenges to implementing the Directive fully into UK law. Of course Brexit is perhaps the most pressing challenge to all EU-related co-operation in the field of road safety enforcement, and whether access will still be permitted post-Brexit will no doubt rely on the outcome of the Brexit negotiations. Furthermore, as highlighted above, the legal position of requiring driver details from the owner of the vehicle, under section 172 of the RTA 1988, is not replicated in a number of European jurisdictions. Thus the receiving state for a request may only be able to give the details of the vehicle owner but not the driver at the time of the offence, since they have no powers of compulsion. The Parliamentary Under Secretary of State for Transport until 15 June 2017, Andrew Jones MP, has stated that negotiations are ongoing in this regard with the European Commission, although it is unlikely to come to fruition, given the protection against self-incrimination in other European jurisdictions.

5. Conclusions

Automation in the enforcement of road traffic regulations has a long history. Enforcement has, to a large extent, been routinised, and has led to near-automatic imposition of punishment once a transgression has been witnessed. Just how much further, in terms of automation, this process can go is difficult to assess. It is possible that a fully "telemetric" and "simulated justice" (O'Malley, 2009) approach could be the next logical step. Motorists may, in the future, make payments on account, or in advance, that could be deducted the instant a road traffic transgression is witnessed. The withdrawal of the paper licence makes this process easier, as no longer will a driver have to surrender their licence to have it endorsed – it can be done automatically. The technology is no doubt already there; however, as a society we are probably not yet ready to accept this approach (indeed there are valid moral and political arguments against it), and we are thus left with incremental development of automated enforcement. The likely future direction, at least in the short term, is a heavier reliance on cameras and sophisticated sensors, either for carrying out enforcement or for facilitating it.

At present, it seems, public policy is stuck between embracing the shiny new promise of technology and the intuitive perceptions of ministers (and citizens) that wide-ranging automated enforcement (without clear and obvious justifications for each offence) is untrustworthy, illegitimate and solely conducted to raise revenue. To counter these claims, authorities need to focus on, at the very least, the issue of whether enforcement is necessary in each particular instance, whether such enforcement needs to be automated, and – if it really does – how the process of punishment can be fair and appropriate, given the nature of the transgression. Figuring out what legitimate enforcement looks like in a system of increasing reliance on automation is an immediate requirement.

Dodge and Kitchin, in their very perceptive study of the automatic management of the road, note an important, although frequently overlooked, idea relating to road traffic enforcement (and controversy). They state (Dodge and Kitchin, 2007: 265):

> "The long-held myth of the 'freedom of the road' has never fully been a reality, with driving being subject to various forms of state regulation that have sought to self-discipline drivers through threat of direct disciplining."

The challenge, and the subject for debate, as the future unfolds, is to what extent we can retain a modicum of 'freedom' on the road, while balancing it against the need to regulate our behaviour – for the benefit of ourselves, of other road users, and of pedestrians.

Appendix A: Police Service Strength – Full-Time Equivalent (FTE) Road Traffic Officers 2012–15

Table A.1: Police service strength – FTE road traffic officers by police force area, 2012–15

	2012	2013	2014	2015
Avon and Somerset	130	101	96	62
Bedfordshire	52	47	46	47
Cambridgeshire	86	85	76	72
Cheshire	109	106	89	119
Cleveland	102	100	92	88
Cumbria	84	87	82	87
Derbyshire	75	69	65	64
Devon and Cornwall	0	0	57	88
Dorset	52	50	47	54
Durham	93	90	83	69
Dyfed-Powys	78	81	77	80
Essex	229	217	76	148
Gloucestershire	60	53	48	45
Greater Manchester	282	284	248	226
Gwent	72	73	60	62
Hampshire	159	150	145	150
Hertfordshire	124	110	99	91
Humberside	110	103	96	83
Kent	124	112	101	94
Lancashire	155	145	142	113
Leicestershire	73	67	66	62
Lincolnshire	71	71	71	65
London, City of	31	24	25	24

	2012	2013	2014	2015
Merseyside	161	148	136	127
Metropolitan Police	331	306	264	1,433
Norfolk	100	96	95	91
Northamptonshire	61	59	59	38
Northumbria	170	144	151	144
North Wales	69	67	70	68
North Yorkshire	99	85	96	92
Nottinghamshire	36	16	15	13
South Wales	131	125	130	122
South Yorkshire	118	107	111	93
Staffordshire	52	58	49	47
Suffolk	56	92	88	89
Surrey	94	99	96	94
Sussex	150	144	139	143
Thames Valley	207	209	203	204
Warwickshire	25	39	37	35
West Mercia	83	83	80	70
West Midlands	276	286	282	264
West Yorkshire	236	238	225	22
Wiltshire	66	50	44	40
England and Wales	**4,868**	**4,675**	**4,356**	**5,220**

Source: Data extrapolated from Police Workforce, England and Wales March 2013 to 2016 retrieved from https://www.gov.uk/government/collections/police-workforce-england-and-wales

Appendix B: Percentage of Camera-Enforced Fixed Penalty Notices by Police Force Area

Table B.1: Percentage of camera-enforced fixed penalty notice (FPNs) by police force area, 2010–15

Police Force Area		2011	2012	2013	2014	2015
Avon and Somerset	Total FPNs	43,374	42,326	36,494	47,766	49,148
	Total camera-detected	20,014	24,405	25,367	40,294	44,158
	% camera-detected	**46%**	**58%**	**70%**	**84%**	**90%**
Bedfordshire	Total FPNs	13,448	15,396	15,154	15,923	14,647
	Total camera-detected	8,348	10,471	12,178	13,775	12,900
	% camera-detected	**62%**	**68%**	**80%**	**87%**	**88%**
Cambridgeshire	Total FPNs	24,705	29,515	19,320	21,545	19,218
	Total camera-detected	9,977	12,020	5,519	12,935	12,697
	% camera-detected	**40%**	**41%**	**29%**	**60%**	**66%**
Cheshire	Total FPNs	33,678	30,116	23,757	21,055	21,324
	Total camera-detected	14,395	13,538	10,427	13,318	13,812
	% camera-detected	**43%**	**45%**	**44%**	**63%**	**65%**
City of London	Total FPNs	6,273	6,337	4,342	2,923	1,967
	Total camera-detected	4,102	4,735	2,952	1,453	738
	% camera-detected	**65%**	**75%**	**68%**	**50%**	**38%**

Police Force Area		2011	2012	2013	2014	2015
Cleveland	Total FPNs	11,552	9,728	8,198	4,461	4,038
	Total camera-detected	4,855	4,442	2,965	1,837	2,623
	% camera-detected	**42%**	**46%**	**36%**	**41%**	**65%**
Cumbria	Total FPNs	19,286	19,225	15,405	13,792	13,633
	Total camera-detected	12,852	13,947	11,364	11,376	12,177
	% camera-detected	**67%**	**73%**	**74%**	**82%**	**89%**
Derbyshire	Total FPNs	10,834	9,815	9,863	14,119	10,533
	Total camera-detected	5,132	6,386	8,379	12,623	8,971
	% camera-detected	**47%**	**65%**	**85%**	**89%**	**85%**
Devon and Cornwall	Total FPNs	23,678	21,415	15,827	17,315	17,526
	Total camera-detected	10,852	11,219	10,744	14,291	14,829
	% camera-detected	**46%**	**52%**	**68%**	**83%**	**85%**
Dorset	Total FPNs	34,969	27,478	26,244	21,270	22,289
	Total camera-detected	21,331	18,462	19,816	16,372	18,123
	% camera-detected	**61%**	**67%**	**76%**	**77%**	**81%**
Durham	Total FPNs	8,951	5,449	4,904	2,786	2,970
	Total camera-detected	3,547	2,118	1,818	1,726	1,762
	% camera-detected	**40%**	**39%**	**37%**	**62%**	**59%**
Dyfed-Powys	Total FPNs	14,233	12,411	10,892	5,081	4,293
	Total camera-detected	0	0	0	0	0
	% camera-detected	**0%**	**0%**	**0%**	**0%**	**0%**
Essex	Total FPNs	53,963	49,367	39,770	34,180	43,179
	Total camera-detected	17,770	21,615	18,750	23,223	31,742
	% camera-detected	**33%**	**44%**	**47%**	**68%**	**74%**
Gloucestershire	Total FPNs	9,761	8,797	7,515	8,555	7,912
	Total camera-detected	4,714	5,213	5,142	7,101	6,151
	% camera-detected	**48%**	**59%**	**68%**	**83%**	**78%**

Police Force Area		2011	2012	2013	2014	2015
Greater Manchester	Total FPNs	61,601	73,584	38,424	31,119	38,726
	Total camera-detected	36,964	36,251	21,635	23,211	33,122
	% camera-detected	**60%**	**49%**	**56%**	**75%**	**86%**
Gwent	Total FPNs	16,052	15,809	8,931	7,802	5,770
	Total camera-detected	0	0	0	0	0
	% camera-detected	**0%**	**0%**	**0%**	**0%**	**0%**
Hampshire	Total FPNs	43,197	44,994	34,439	33,989	36,989
	Total camera-detected	23,559	27,200	20,649	20,028	23,330
	% camera-detected	**55%**	**60%**	**60%**	**59%**	**63%**
Hertfordshire	Total FPNs	33,763	29,004	19,491	20,556	27,750
	Total camera-detected	16,812	14,970	11,161	13,990	23,088
	% camera-detected	**50%**	**52%**	**57%**	**68%**	**83%**
Humberside	Total FPNs	29,791	24,590	23,239	20,642	20,847
	Total camera-detected	14,691	13,897	17,047	15,805	16,516
	% camera-detected	**49%**	**57%**	**73%**	**77%**	**79%**
Kent	Total FPNs	34,200	28,757	27,683	21,494	19,663
	Total camera-detected	14,282	16,283	21,868	18,160	16,137
	% camera-detected	**42%**	**57%**	**79%**	**84%**	**82%**
Lancashire	Total FPNs	45,312	33,230	23,662	24,385	25,957
	Total camera-detected	15,778	14,239	15,661	20,329	22,029
	% camera-detected	**35%**	**43%**	**66%**	**83%**	**85%**
Leicestershire	Total FPNs	27,881	19,459	17,636	16,617	13,760
	Total camera-detected	17,920	12,070	12,602	13,558	11,506
	% camera-detected	**64%**	**62%**	**71%**	**82%**	**84%**
Lincolnshire	Total FPNs	32,964	29,897	20,163	20,032	17,541
	Total camera-detected	14,933	16,875	16,018	15,489	15,220
	% camera-detected	**45%**	**56%**	**79%**	**77%**	**87%**

Police Force Area		2011	2012	2013	2014	2015
Merseyside	Total FPNs	56,846	51,665	31,178	26,192	23,334
	Total camera-detected	11,871	13,531	12,653	11,352	13,689
	% camera-detected	**21%**	**26%**	**41%**	**43%**	**59%**
Metropolitan Police	Total FPNs	136,363	126,171	149,389	113,267	86,398
	Total camera-detected	26,691	27,458	27,186	28,111	32,541
	% camera-detected	**20%**	**22%**	**18%**	**25%**	**38%**
Norfolk	Total FPNs	28,868	21,007	21,340	21,922	26,662
	Total camera-detected	10,535	10,011	12,712	14,338	19,243
	% camera-detected	**36%**	**48%**	**60%**	**65%**	**72%**
North Wales	Total FPNs	16,316	20,064	20,188	18,546	17,108
	Total camera-detected	8,470	9,050	10,008	13,438	14,051
	% camera-detected	**52%**	**45%**	**50%**	**72%**	**82%**
North Yorkshire	Total FPNs	20,490	17,763	20,936	19,740	26,958
	Total camera-detected	4,741	5,810	13,218	13,975	23,017
	% camera-detected	**23%**	**33%**	**63%**	**71%**	**85%**
Northamptonshire	Total FPNs	15,504	12,197	11,459	14,948	20,283
	Total camera-detected	8,588	7,414	7,816	12,374	17,551
	% camera-detected	**55%**	**61%**	**68%**	**83%**	**87%**
Northumbria	Total FPNs	30,572	34,205	37,129	25,222	22,177
	Total camera-detected	21,679	26,695	31,638	22,003	19,927
	% camera-detected	**71%**	**78%**	**85%**	**87%**	**90%**
Nottinghamshire	Total FPNs	36,653	32,204	28,629	31,621	31,082
	Total camera-detected	28,091	21,260	23,855	26,875	27,912
	% camera-detected	**77%**	**66%**	**83%**	**85%**	**90%**
South Wales	Total FPNs	18,330	10,270	5,406	5,131	3,460
	Total camera-detected	0	0	0	0	0
	% camera-detected	**0%**	**0%**	**0%**	**0%**	**0%**

Police Force Area		2011	2012	2013	2014	2015
South Yorkshire	Total FPNs	33,181	22,018	25,622	18,196	21,099
	Total camera-detected	13,580	10,491	16,764	12,456	15,642
	% camera-detected	**41%**	**48%**	**65%**	**68%**	**74%**
Staffordshire	Total FPNs	15,601	16,462	23,687	18,310	15,521
	Total camera-detected	11,216	12,697	21,011	16,534	13,386
	% camera-detected	**72%**	**77%**	**89%**	**90%**	**86%**
Suffolk	Total FPNs	36,639	29,951	28,260	25,953	10,816
	Total camera-detected	17,088	12,877	13,041	11,031	3,166
	% camera-detected	**47%**	**43%**	**46%**	**43%**	**29%**
Surrey	Total FPNs	34,350	31,025	26,262	24,346	34,411
	Total camera-detected	18,688	19,123	18,296	16,735	26,848
	% camera-detected	**54%**	**62%**	**70%**	**69%**	**78%**
Sussex	Total FPNs	51,860	43,711	24,513	23,301	26,105
	Total camera-detected	23,178	19,219	15,494	16,145	18,586
	% camera-detected	**45%**	**44%**	**63%**	**69%**	**71%**
Thames Valley	Total FPNs	63,614	54,987	69,546	63,115	64,124
	Total camera-detected	39,644	32,485	48,589	44,176	46,824
	% camera-detected	**62%**	**59%**	**70%**	**70%**	**73%**
Warwickshire	Total FPNs	16,636	17,652	15,921	12,555	16,247
	Total camera-detected	13,057	14,104	14,152	10,988	14,507
	% camera-detected	**78%**	**80%**	**89%**	**88%**	**89%**
West Mercia	Total FPNs	34,839	32,414	32,861	37,179	32,600
	Total camera-detected	25,253	28,410	28,198	33,177	28,452
	% camera-detected	**72%**	**88%**	**86%**	**89%**	**87%**
West Midlands	Total FPNs	52,046	44,717	35,095	17,210	15,220
	Total camera-detected	20,608	18,969	19,114	12,133	9,918
	% camera-detected	**40%**	**42%**	**54%**	**70%**	**65%**

Police Force Area		2011	2012	2013	2014	2015
West Yorkshire	Total FPNs	61,890	59,863	42,624	32,422	43,968
	Total camera-detected	26,047	27,973	17,862	20,210	32,100
	% camera-detected	**42%**	**47%**	**42%**	**62%**	**73%**
Wiltshire	Total FPNs	14,173	10,541	11,981	5,505	3,692
	Total camera-detected	0	0	0	0	0
	% camera-detected	**0%**	**0%**	**0%**	**0%**	**0%**
Wales Road Casualty Reduction Partnership	Total FPNs	31,547	33,468	31,151	40,264	35,882
	Total camera-detected	31,547	33,468	31,151	40,264	35,882
	% camera-detected	**100%**	**100%**	100%	100%	100%

Source: Data extrapolated from "Police powers and procedures England and Wales statistics", Home Office, years 2011 -2016

Appendix C: Schedule 3 of the Road Traffic Offenders Act 1988

Legislation	Description of Offence
Offences under the Parks Regulation (Amendment) Act 1926	
Section 2(1)	Breach of parks regulations but only where the offence is committed in relation to regulation 4(27) (driving or riding a trade vehicle), 4(28) (exceeding speed limit) or 4(30) (unauthorised waiting by a vehicle or leaving a vehicle unattended) of the Royal and other Parks and Gardens Regulations 1977
Offences under the Highways Act 1835 and the Roads (Scotland) Act 1984	
Section 72 of the Highways Act 1835	Driving on the footway.
	Cycling on the footway.
Section 129(5) of the Roads (Scotland) Act 1984	Driving on the footway.
Offences under the Transport Act 1968 (c.73)	
Section 96(11) of the Transport Act 1968	Contravention of any requirement of domestic drivers' hours code.
Section 96(11A) of that Act.	Contravention of any requirement of applicable Community rules as to periods of driving, etc.
Section 97(1) of that Act.	Using vehicle in contravention of requirements relating to installation, use or repair of recording equipment in accordance with Community Recording Equipment Regulation
Section 98(4) of that Act.	Contravention of regulations made under section 98 or any requirement as to books, records or documents of applicable Community rules.
Section 99(4) of that Act.	Failing to comply with requirements relating to inspection of records or obstructing an officer, but only insofar as the offence relates to: —
	(i) failing to comply with any requirement under section 99(1)(a); or
	(ii) obstructing an officer in exercise of powers under section 99(2)(a) or section 99(3).
Section 99ZD (1) of that Act.	Failing to comply with requirements relating to inspection of recording equipment or records (whether electronic or hard copy) made by or stored on recording equipment except where that offence is committed by: —
	(i) failing to sign a hard copy of downloaded data when required to do so under section 99ZC (1); or
	(ii) obstructing an officer in exercise of powers under section 99ZF.
Section 99C of that Act.	Failure to comply with prohibition or direction in relation to driving vehicle.

Legislation	Description of Offence
Offence under the Road Traffic (Foreign Vehicles) Act 1972 (c.27)	
Section 3(1) of the Road Traffic (Foreign Vehicles) Act 1972.	Driving, etc., foreign goods vehicle or foreign public service vehicle in contravention of prohibition etc.
Offence under the Greater London Council (General Powers) Act 1974 (c. xxiv)	
Section 15 of the Greater London Council (General Powers) Act 1974.	Parking vehicles on footways, verges, etc.
Offence under the Highways Act 1980 (c. 66)	
Section 137 of the Highways Act 1980.	Obstructing a highway, but only where the offence is committed in respect of a vehicle.
Offence under the Public Passenger Vehicles Act 1981 (c.14)	
Section 12(5) of the Public Passenger Vehicles Act 1981.	Using public service vehicle on road except under PSV operators' licence.
Offences under the Road Traffic Regulation Act 1984 (RTRA) (c. 27)	
RTRA section 5(1)	Using a vehicle in contravention of a traffic regulation order outside Greater London.
RTRA section 8(1)	Breach of traffic regulation order in Greater London.
RTRA section 11	Breach of experimental traffic order.
RTRA section 13	Breach of experimental traffic scheme regulations in Greater London.
RTRA section 16(1)	Using a vehicle in contravention of temporary prohibition or restriction of traffic in case of execution of works, etc.
RTRA section 17(4)	Wrongful use of special road.
RTRA section 18(3)	Using a vehicle in contravention of provision for one-way traffic on trunk road.
RTRA section 20(5)	Driving a vehicle in contravention of order prohibiting or restricting driving vehicles on certain classes of roads.
RTRA section 25(5)	Breach of pedestrian crossing regulations, except an offence in respect of a moving motor vehicle other than a contravention of regulations 23, 24, 25 and 26 of the Zebra, Pelican and Puffin Pedestrian Crossings Regulations and General Directions 1997.
RTRA section 29(3)	Using a vehicle in contravention of a street playground order.
RTRA section 35A (1)	Breach of an order regulating the use, etc., of a parking place provided by a local authority, but only where the offence is committed in relation to a parking place provided on a road.
RTRA section 47(1)	Breach of a provision of a parking place designation order and other offences committed in relation to a parking place designated by such an order, except any offence of failing to pay an excess charge within the meaning of section 46.
RTRA section 53(5)	Using vehicle in contravention of any provision of a parking place designation order having effect by virtue of section 53(1)(a) (inclusion of certain traffic regulation provisions).
RTRA section 53(6)	Breach of a provision of a parking place designation order having effect by virtue of section 53(1)(b) (use of any part of a road for parking without charge).
RTRA section 88(7)	Driving a motor vehicle in contravention of an order imposing a minimum speed limit under section 88(1)(b).
RTRA section 89(1)	Speeding offences under RTRA and other Acts.

Legislation	Description of Offence
Offences under the Road Transport (International Passenger Services) Regulations 1984 (Statutory Instrument 1984/748)	
Regulation 19(1) of the Road Transport (International Passenger Services) Regulations 1984	Using vehicle for Community regulated carriage of passengers by road otherwise than in accordance with authorisation or certificate, etc.
Regulation 19(2) of those Regulations	Using vehicle for ASOR (Agreement on the International Carriage of Passengers by Road by means of Occasional Coach and Bus Services) regulated or Community regulated carriage of passengers by road without having correctly completed passenger waybill or without carrying top copy of waybill on vehicle throughout journey
Offences under the Road Traffic Act 1988 (RTA) (c. 52)	
RTA section 3	Driving mechanically propelled vehicle on a road or other public place without due care and attention, or without reasonable consideration.
RTA section 14	Breach of regulations requiring wearing of seat belts.
RTA section 15(2)	Breach of restriction on carrying children in the front of vehicles.
RTA section 15(4)	Breach of restriction on carrying children in the rear of vehicles.
RTA section 16	Breach of regulations relating to protective headgear for motor cycle drivers and passengers.
RTA section 18(3)	Breach of regulations relating to head-worn appliances (eye protectors) for use on motor cycles.
RTA section 19	Parking a heavy commercial vehicle on verge or footway.
RTA section 22	Leaving vehicle in dangerous position.
RTA section 23	Unlawful carrying of passengers on motor cycles.
RTA section 24	Carrying more than one person on a pedal cycle.
RTA section 34	Driving mechanically propelled vehicle elsewhere than on a road.
RTA section 35	Failure to comply with traffic directions.
RTA section 36	Failure to comply with traffic signs.
RTA section 40A	Using vehicle in dangerous condition etc.
RTA section 41A	Breach of requirement as to brakes, steering-gear or tyres.
RTA section 41B	Breach of requirement as to weight: goods and passenger vehicles.
RTA section 41D	Breach of requirement as to control of vehicle, mobile telephone etc.
RTA section 42	Breach of other construction and use requirements.
RTA section 47	Using, etc, vehicle without required test certificate being in force.
RTA section 71(1)	Driving, etc., vehicle in contravention of prohibition on driving it as being unfit for service or overloaded, or failing to comply with direction to remove a vehicle found overloaded.
RTA section 87(1)	Driving vehicle otherwise than in accordance with requisite licence.
RTA section 143	Using motor vehicle while uninsured or unsecured against third party risks.
RTA section 163	Failure to stop vehicle on being so required.
RTA section 172	Failure of person keeping vehicle and others to give the police information as to identity of driver, etc., in the case of certain offences.

Legislation	Description of Offence
Offence under Road Traffic Offenders Act 1988 (RTOA)	
RTOA Section 90D (6)	Driving, etc., vehicle in contravention of prohibition on driving, or failing to comply with direction to remove vehicle on failure to make a financial penalty deposit payment.] 25
Offences under the Goods Vehicles (Community Authorisations) Regulations 1992 (Statutory Instrument 1992/3077)	
Regulation 3 of the Goods Vehicles (Community Authorisations) Regulations 1992	Using goods vehicle without Community authorisation
Regulation 7 of those Regulations.	Using vehicle under Community authorisation in contravention of conditions governing authorisation.
Offences under the Vehicle Excise and Registration Act 1994 (c.22)	
Section 34 of that Act	Using trade licence for unauthorised purposes or in unauthorised circumstances, etc.
Section 42 of that Act.	Driving or keeping a vehicle without required registration mark.
Section 43 of that Act	Driving or keeping a vehicle with registration mark obscured etc.
Section 43C of that Act	Using an incorrectly registered vehicle.
Section 59 of that Act	Failure to fix prescribed registration mark to a vehicle in accordance with regulations made under section 23(4)(a) of that Act.
Offences under the Goods Vehicles (Licensing of Operators) Act 1995 (c. 23)	
Section 2(5) of the Goods Vehicles (Licensing of Operators) Act 1995	Using goods vehicle on road for carriage of goods except under operator's licence.
Offences under the Public Service Vehicles (Community Licences) Regulations 1999 (Statutory Instrument 1999/1322)	
Regulation 3 of the Public Service Vehicles (Community Licences) Regulations 1999	Using public service vehicle on road without Community licence.
Regulation 7 of those Regulations	Using public service vehicle under Community licence in contravention of conditions governing use of licence.
Offences under the Road Transport (Passenger Vehicles Cabotage) Regulations 1999 (Statutory Instrument 1999/3413)	
Regulation 3 of the Road Transport (Passenger Vehicles Cabotage) Regulations 1999	Using vehicle on road for UK cabotage operations without Community licence.
Regulation 4 of those Regulations	Using vehicle on road for UK cabotage operations without control document.
Regulation 7(1) of those Regulations	Driver failing to produce Community licence on request when vehicle required to have licence on board.
Regulation 7(3) of those Regulations	Driver failing to produce control document on request when vehicle required to have control document on board.
Offence under the Vehicle Drivers (Certificates of Professional Competence) Regulations 2007(Statutory Instrument 2007/605)	
Regulation 11(7) of the Vehicle Drivers (Certificates of Professional Competence) Regulations 2007	Driver of relevant vehicle failing to produce on request evidence or document required to be carried under regulation 11(1), (3) or (5).
Offence under the HGV Road User Levy Act 2013	
Section 11 of the HGV Road User Levy Act 2013	Using or keeping heavy goods vehicle if HGV road user levy not paid.

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A note on statistical sources

The statistical sources for the data in this research were all drawn from publicly available material; where not specifically mentioned in the text or the references, the statistics were drawn from the sources below. This data was then consolidated in a spreadsheet, and analysis was conducted by the author of this report by cross-comparing the various databases of published statistics in order to produce the tables and figures in this report.

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