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REGULATORY TRAFFIC JAMS

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I. INTRODUCTION

It is almost a given among regulators and the regulated alike that few parties, if any, are in compliance with all relevant regulations all of the time. What taxpayer does not blanch when receiving notification of an Internal Revenue Service audit? A fine-tooth inspection of any tax return will likely reveal some filing or calculation errors, as will most any searching audit in any highly regulated field, whether securities, insurance, or others. In environmental law, though, the problem of non-compliance seems far more severe. Studies by the General Accounting Office have consistently found significant noncompliance with the Clean Water Act.¹ An EPA "Enforcement Alert" newsletter noted that "when

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1. The General Accounting Office [hereinafter GAO] study found that a remarkable 41% of industrial users were not complying with the pretreatment discharge limits for publicly owned treatment works. Rechtschaffen, *supra* note 3, at 1207-1208, citing U.S. GAO, WATER POLLUTION: IMPROVED MONITORING AND ENFORCEMENT NEEDED FOR TOXIC POLLUTANTS ENTERING SEWERS, GAO/RCED-89-101, at 3 (1989). A later GAO study of EPA compliance data from 1992-1994 revealed that 18-27% of major facilities were in "significant noncompliance." U.S. GAO, WATER POLLUTION: MANY VIOLATIONS HAVE NOT RECEIVED APPROPRIATE ENFORCEMENT ATTENTION, REPORT TO THE RANKING MINORITY MEMBER, COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, U.S. SENATE 1 GAO/RCED-96-23, at 4 (1996), *cited in* David L. Markell, *The Role of*

EPA looks closely at an industry sector, usually it discovers a high rate of noncompliance."² A survey of general counsel at major corporations in the early 1970s, for example, revealed that "two-thirds believed their businesses had operated, at least some time in the prior year, in violation of environmental laws. Nearly seventy percent indicated that they did not believe absolute compliance was achievable."³ And California's guide for prosecution of hazardous materials violations openly admits that "no facility of moderate complexity which handles hazardous materials or wastes . . . can be expected to be in full compliance at all times."⁴

These and many others suggest we have reached an unsettling situation where the regulated community does not believe it is, or can be,

Deterrence Based Enforcement in a "Reinvented" State/Federal Relationship: The Divide Between Theory and Reality, 24 HARV. ENVTL. L. REV. 1, 55 (2000) [hereinafter Markell]. Other studies have also shown very high levels of noncompliance.

Wes Magat and Kip Viscusi's 1990 study of Clean Water Act compliance in the paper industry, which estimated a seventy-five percent compliance rate with effluent limitations. Looking beyond the Clean Water Act context, John Brehm and James Hamilton's 1996 study of compliance with the Emergency Planning and Community Right-to-Know Act of 1986 found similar compliance rates, while an analysis of inspection data by the Massachusetts Department of Environmental Protection in 1997 found that about ten percent of all inspections revealed violations of environmental laws meriting enforcement action. The Environmental Protection Agency's [hereinafter EPA] Sector Facility Indexing Project (SFIP) assembles enforcement data for facilities in several heavy industries including rough measurements of compliance with the Clean Air Act, Clean Water Act, and RCRA. Over eight quarterly periods spanning August 1996 to August 1998, participating facilities averaged at least one "noncompliance event" in 3.8 of those quarterly periods (almost half the time). Not only are all of these studies fairly consistent with one another, they seem consistent with prior EPA estimates of noncompliance rates. David Spence, *The Shadow of the Rational Polluter: Rethinking the Role of Rational Actor Models in Environmental Law*, 89 CALIF. L. REV. 917, 966-967 (2001) [hereinafter Spence].

2. OFFICE OF REGULATORY ENFORCEMENT, U.S. EPA, COMPLIANCE WITH PERMITTING CRITICAL TO CLEAN AIR ACT GOALS: EPA CONCERNED ABOUT NONCOMPLIANCE WITH NEW SOURCE REVIEW REQUIREMENTS, ENFORCEMENT ALERT, at 4 (Jan. 1999), cited in Markell, *supra* note 1, at 57.

3. Clifford Rechtschaffen, *Deterrence vs. Cooperation and the Evolving Theory of Environmental Enforcement*, 71 S. CAL. L. REV. 1181, 1202 (1998) (hereinafter Rechtschaffen). Marianne Lavelle, *Environmental Vise: Law, Compliance*, NAT'L L.J., Aug. 30, 1993, at S1. Almost half said their most time intensive task was determining if their facility was in compliance. To be sure, one needs to regard such admissions of failure with caution. There are obvious, self-serving reasons why regulated industries would be expected to claim full compliance is unachievable. They surely want more lenient treatment when violations are discovered.

4. CALIFORNIA DISTRICT ATTORNEYS ASSOCIATION, THE COMPLETE GUIDE TO HAZARDOUS MATERIALS ENFORCEMENT AND LIABILITY I-1 (1992), quoted in Rechtschaffen, *supra* note 3, at 1202.

in compliance with environmental law. But why? Is environmental law a magnet for corporate scofflaws? Is significant noncompliance inevitable, despite best efforts? And what should be done to address such high levels of noncompliance? As modern environmental law enters its fourth decade, a great deal of introspection is taking place over these issues.⁵

Literature on the behavioral dimension of compliance is dominated by two models, each based on different conceptions over what is happening at the firm level. One school of thought portrays compliance as simply the result of rational actor behavior. Profit-maximizing companies weigh the costs and benefits of complying, and skirt or violate the law based on the bottom line. All noncompliance is voluntary under this model. The competing view is that many companies are "good apples" to the core and would comply at higher rates than experienced but for obstacles put in the way, such as ambiguous regulations, constantly shifting rules, and conflicting mandates. Noncompliance, in this alternative model, has an important voluntary component.

The debate between proponents of these two models goes well beyond simply explaining why firms fail to comply. These models have very different implications for the design of compliance and enforcement policies and, more specifically, the appropriate roles of sanction-backed enforcement and compliance facilitation. In simple terms, the choice between rational actor and good-apple models is equally the choice between stick or carrot strategies of enforcement. While these strategies were literally joined together in a single EPA office in 1993 (when the Office of Enforcement was renamed the Office of Enforcement and Compliance Assurance), in practice sanction and facilitation have more often been portrayed as opposing policies.

Much recent scholarship has argued over which is a more accurate model. In this article, by contrast, we suggest that it may not be enough to know whether companies generally fit the rational polluter model or the good apple model. If, in fact, there are *systemic* obstacles to compliance, what we call "regulatory traffic jams," then for some noncompliance the regulated party's intentions may be largely irrelevant. For both rational polluters and good apples, at least some companies will seek to comply at some level and may face externally-imposed barriers to doing so. Indeed, in two of your authors' experiences providing environmental compliance representation to corporations, they witnessed

5. See, e.g., Rechtschaffen, *supra* note 3; Spence, *supra* note 1; Richard Lazarus, *Meeting the Demands of Integration in the Evolution of Environmental Law: Reforming Environmental Criminal Law*, 83 Geo. L.J. 2407 (1995) [hereinafter Lazarus]; Markell, *supra* note 1.

many instances of good faith efforts to comply that still led to violations.⁶ While we expressly do *not* want to take on the role of apologists for industry, our experiences (and, we believe, those of most people working in the field) make it both intriguing and important to consider the possibility of what might well be considered an oxymoron—"good faith noncompliance"—regulatory violations despite well-funded and well-intended compliance efforts.

The possibility of such involuntary noncompliance, if significant, raises a host of difficult questions. How often does involuntary noncompliance happen? Why does it happen? Does it result in actual harm to the environment? And, more generally, what does it mean for our understanding of compliance and sanction?

In Part II of this article we provide a primer on compliance theory, explaining the dominant models and their implications. In Part III, we explain what a traffic jam model of compliance performance would look like. Moving beyond theory, in Part IV we turn to empirical analysis and inform the noncompliance debate through close examination of two studies. The first study, known as *Root Causes*, was co-sponsored by EPA and the Chemical Manufacturers Association from 1996-1998. It represents one of the most extensive compliance studies to date. The second was a survey we conducted of members of the ABA's Section on Environment, Energy, and Resources Law specifically to address the questions highlighted above. In Part V, we explore the implications of regulatory traffic jams for environmental protection. While our focus is on environmental law, we suspect that our findings may be relevant to other highly regulated fields.

II. A PRIMER ON COMPLIANCE THEORY

As described above, noncompliance appears to have become the norm in the environmental field. But why? Would full compliance be too costly? Are the regulations too difficult to follow? Are there too many rules? Are regulators too lenient? The ultimate goal of compliance theory is to provide insights for how enforcement strategies can best maximize compliance. But one must first seek to understand *why* the actors are failing to comply.

Both the enforcement literature and practice have been dominated by two models. One, which we will call the "rational polluter

6. Prior to academia, Jim Salzman served as the European Environmental Manager for Johnson Wax for four years. J.B. Ruhl was a partner at Fulbright & Jaworski.

model," favors an adversarial, deterrence-based approach. The other, the good apple or "facilitation model," rests on collaborative assistance.

Traditionally, enforcement in the environmental field (as in others) has been based on strategic deterrence. In this model of behavior, the rational actor will comply when it is in his economic self-interest to do so, but will otherwise violate the law. A profit-maximizing company's decision to comply simply comes down to comparing the costs and benefits of noncompliance (i.e., because in some instances crime *does* pay). This notion of regulated behavior rests on the assumption that most noncompliance is due to "bad apples" and, as a result, the appropriate enforcement strategy is one of sanction. Malefactors respond most effectively to punishment.

This approach is so prevalent that it seems obvious to us, whether by imposing fines at a chemical facility or adding points to the license of a speeding driver. Both settings employ a deterrence-based remedy because, this model predicts, only when the sanction is painful enough, and the likelihood of detection high enough, will the regulated party comply.⁷ In the environmental field, the sufficient pain can take any number of forms, ranging from public notice of violations, ineligibility for government contracts, civil penalties and supplemental environmental projects to injunctions or even jail time.⁸ Regardless of the final penalty, though, under this behavioral model it goes without saying that noncompliance is intentional.

With the rational polluter behavioral model as the premise, therefore, the deterrence-based sanction approach to enforcement is inevitable. As Chester Bowles, the famous New Deal administrator, memorably observed: "Twenty percent of the regulated population will automatically comply with any regulation, five percent will attempt to evade it, and the remaining seventy-five percent will comply as long as they think that the five percent will be caught and punished."⁹

7. Jon Silberman breaks out four factors: *certainty* that a violator will be caught, *severity* of the sanction, *celerity* of the apprehension and punishment, and the violator's *perception* of these. Jon Silberman, *Does Environmental Deterrence Work? Evidence and Experience Say Yes, But We Need to Understand How and Why*, 30 ENVTL. L. REP. 10,523, 10,528 (2000) [hereinafter Silberman].

8. Under the Clean Water Act, for example, knowingly endangering others provides for a maximum fine of \$250,000 for individuals and one million dollars for organizations, as well as jail sentences up to 15 years for individuals. 33 U.S.C. 1319(c)(3)(A) (1994).

9. CHESTER BOWLES, *PROMISES TO KEEP: MY YEARS IN PUBLIC LIFE 1941-1969* 25 (1971), *quoted in* Rechtschaffen, *supra* note 3, at 1223. The Supreme Court has endorsed such an approach, as well, stating in *Laidlaw* that it is "reasonable for Congress

Advocates of the rational polluter model may quibble over the appropriate percentages, but their approach is consistent. Enforcement against the critical five percent of bad apples through sanctions (known as “specific deterrence”) will ensure that compliance by the rest (“general deterrence”) will follow. The implication, of course, is that the remaining seventy-five percent, while perhaps not rotten to the core, are certainly willing to skirt the law if they can get away with it.

Evidence of this approach to enforcement is easy to find.¹⁰ The recent rise of criminal sanctions in environmental law demonstrates the desire both to increase compliance and send the message that pollution is serious business.¹¹ EPA’s penalty policy clearly states that penalties must go beyond any economic benefits gained from noncompliance.¹² The agency’s proud publications of enforcement statistics every year—the number of site inspections, suits filed, dollars collected, jail sentences served—is regarded as an important proxy for environmental protection.¹³ Whether EPA or Congress has primarily been responsible for

to conclude that an actual award of civil penalties does in fact bring with it a significant quantum of deterrence over and above what is achieved by the mere prospect of such penalties. A would-be polluter may or may not be dissuaded by the existence of a remedy on the books, but a defendant once hit in its pocketbook will surely think twice before polluting again.” *Friends of the Earth v. Laidlaw Env’tl. Servs.*, 528 U.S. 167, 186 (2000).

10. As Jon Silberman, an EPA Senior Attorney observes, “The principle of deterrence underlies the EPA’s compliance monitoring and enforcement program. It is referenced expressly in virtually every EPA enforcement response and penalty policy, and endorsed in EPA Environmental Appeals Board penalty decisions.” Silberman, *supra* note 7, at 10,523.

11. See generally Lazarus, *supra* note 5 (discussing the standard for criminal prosecution of environmental crimes).

12. In assessing civil penalties, it is EPA policy to capture both the economic benefit of the offending activity to the party and the seriousness of the offense. See, e.g., Clean Air Act, 42 U.S.C. 7413(e) (1994); Clean Water Act, 33 U.S.C. 1319(d) (1994). As David Markell describes,

EPA has long held, and continues to hold, the view that traditional, deterrence-based enforcement is an essential element of an effective environmental regulatory scheme. Key features of this scheme include sufficient compliance monitoring to identify violators, initiating formal enforcement actions against significant violators in a timely and appropriate way, requiring the violator to return to a state of compliance, and imposing monetary sanctions that penalize the violator by requiring it to pay a fine that exceeds its economic gain from the noncompliant activity The policies use the concepts of recoupment of a “benefit component” and collection of a “gravity component” as the tools to achieve this goal.

Markell, *supra* note 1, at 10, 13.

13. In this regard, consider a 1999 EPA press release declaring enforcement records for years of jail time for environmental offenses (208), civil penalties (\$166.7 million),

this emphasis on bean-counting is unclear,¹⁴ but the underlying message is not. More inspections, fines and punishment means better deterrence and, therefore, better enforcement.

In a sense, this leveraged approach seems unavoidable. Consider that, in a good year, EPA will conduct about 22,000 inspections leading to 4000 civil actions; and states (who do the lion's share of enforcement) will conduct 146,000 inspections and 9000 enforcement actions.¹⁵ Impressive numbers, until one realizes that there are roughly eight million regulated parties subject to environmental laws.¹⁶ In other words, a regulated party has about a 2% chance of being inspected (and a 0.16% chance of being sanctioned) in any given year. As with the tax code, where the vast majority of taxpayers face little realistic chance of being audited, establishing a credible deterrent is absolutely necessary. That's why no distinction is made in environmental law between paperwork and emissions violations.¹⁷ The EPA must rely on accurate self-monitoring and reporting by the regulated community.

It is important to note, though, that enforcement statistics may well not closely correlate with other significant measures such as the overall level of compliance with environmental rules and, more important, the reduction of environmental impacts (the real reason for environmental protection, as we will discuss later).¹⁸ Thus a significant assumption of the sanction approach is that its effect will go beyond simply a drop in violations and will lead to broader behavioral changes be-

and injunctive relief (\$3.6 billion, primarily Superfund). Press Release, EPA, EPA Sets Enforcement Records in 1999 (Jan. 19, 2000), *available at* <http://www.epa.gov> (last visited April 11, 2002).

14. In a chicken-or-egg problem, Congressional oversight committees demand statistics from EPA to justify its enforcement budget while EPA generates statistics to defend the need for greater resources.

15. Silberman, *supra* note 7, at 10,523.

16. *Id.*

17. Thus, for example, under the Clean Air Act, EPA may issue fines up to \$25,000 per day per violation for a wide range of permitting violations, including both paperwork requirements and actual emissions violations. *See, e.g.*, 42 U.S.C. 7413(b) (1994).

18. EPA, NATIONAL PERFORMANCE MEASURES STRATEGY 3 (1997), *available at* <http://www.epa.gov/oeca/perfmeas/npmsfinal.html> (last visited April 11, 2002). Recognition of the limitations of a "bean-counting" approach to enforcement led to the study cited above, an effort by EPA to reconsider how it should measure its enforcement activities to reflect more accurately the goals and progress of enforcement. In 2000, the EPA launched a million dollar research program for projects examining the relationship between government enforcement efforts and behavior of the regulated community. EPA is also awarding \$1.8 million in cooperative agreement grants with states to create and use "outcome-based performance measures." Silberman, *supra* note 7, at 10,524, 10,535.

yond compliance, such as adoption of a company audit policy, pollution prevention strategies, and environmental management systems.¹⁹

This description of compliance has not gone unchallenged, however. While the sanction model is based on the assumption of regulating “bad apples,” the competing approach assumes that most companies are “good apples” to the core and would comply at higher rates than experienced but for obstacles put in their way. It’s not hard to imagine why this might be the case and may, in fact, better describe reality than the sanction model.²⁰

The most obvious reason for corporate compliance, of course, is to avoid one or more of the sanctions described above, the “sticks” of deterrence. But it is important to acknowledge, as well, that the senior management of some companies is personally committed to conducting business in an environmentally responsible manner.²¹ Reputation matters, too. Some companies operate in sectors where a poor environmental reputation can harm them in the marketplace or with their shareholders.²² Others manage environmental reputation as a positive business asset for corporate image or marketing.²³ And, finally, a growing number of companies are realizing that high levels of environmental management actually contribute to the bottom line through increased efficiencies.²⁴ There

19. Indeed, the compliance decision of regulated parties is not simply whether or not to comply but the level of compliance above the minimum (the safety buffer), as well. See Silberman at 10,524, 10,526 (citations omitted).

20. As David Spence concludes, the rational polluter approach “fails to explain the behavior of many regulated firms. Because complying with environmental rules is often prohibitively difficult, a significant percentage of noncompliance is neither intentional nor reckless.” Spence, *supra* note 1, at 919.

21. See, e.g., Spence, *supra* note 1, at 969-971.

22. The pictures of drivers cutting up their Exxon charge cards following the oil spill of the Exxon Valdez provides a graphic negative example, as did the intensive public relations effort by McDonalds to persuade customers that its suppliers did not cut down rain forest to graze cattle. See George White, *10,000 Angry Credit Card Holders Deluge Exxon With Plastic*, L.A. TIMES, May 2, 1989, at B1 (discussing disgruntled Exxon customers returning their gas credit cards); Charles Eberling, *Where Big Macs Grow*, N.Y. TIMES, at A22 (discussing the erroneous reports concerning where McDonalds gets their beef).

23. The corporate image of the Body Shop clearly is strengthened by its environmental policies; and, from an unusual quarter, British Petroleum has been promoting its commitments to reduce greenhouse gas emissions and increase investments in solar energy. See Alison Maitland, *Due Recognition Given for Effort: The Environment*, LONDON FINANCIAL TIMES, at 7 (discussing The Body Shop’s reputation for environmental concern, and BP’s surprising reputation for their environmentally friendly policies).

24. See, e.g., GLOBAL ENVIRONMENTAL MANAGEMENT INITIATIVE (GEMI), ENVIRONMENT: VALUE TO THE TOP LINE (2001), available at <http://www.gemi.org/evtl.pdf>

clearly is something to these arguments when one recalls that, despite the well-publicized big penalties by EPA, these are relatively infrequent and the size of most environmental fines is too small, in itself, to change the bottom line profits for most companies.²⁵

So, if many companies have good selfish reasons to comply, why are they so often in noncompliance? Sanction advocates would point out that rational polluters, despite the potential benefits listed above, may still find that crime pays. And, to be sure, no one with experience in environmental protection would deny that there are bad apples out there. Much noncompliance *is* voluntary. One cannot sprinkle pixie dust on bad apples, hold your breath, and wish them to go away. But if they are in the small minority, what about the good apples? It turns out that the reasons for well-intentioned failure are numerous. As many have pointed out, environmental law is complicated. Regulations can be difficult to understand because they are highly technical.²⁶ They may be ambiguous, whether intentionally or because of poor drafting.²⁷ They may appear to contradict other requirements.²⁸ Given the combination, and occasional overlap, of federal, state and local regulation of many polluting activities, this is not hard to imagine. Because of such federalism in practice, as well as EPA's increasing reliance on guidance documents and other nonlegislative rules, the relevant requirements may be hard to find.²⁹ And, finally, there are a lot of rules, and more so for EPA than other agencies.³⁰ Consider that there are over 10,000 pages of *federal* envi-

<http://www.gemi.org/evtl.pdf> (last visited April 11, 2002). GEMI has 39 member companies, describing itself as:

a non-profit organization of leading companies dedicated to fostering environmental, health and safety excellence worldwide through the sharing of tools and information in order for business to help business achieve environmental excellence.

See <http://www.gemi.org/docs/Company.htm> (last visited April 11, 2002).

25. See Rechtschaffen, *supra* note 3, at 1192, citing CLIFFORD S. RUSSELL, WINSTON HARRINGTON & WILLIAM J. VAUGHAN, ENFORCING POLLUTION CONTROL LAWS 43 (1986).

26. See, e.g., Lazarus, *supra* note 5, at 2429-2431.

27. See, e.g., *Inland Steel Co. v. EPA*, 901 F.2d 1419, 1421 (7th Cir. 1990) (where Judge Richard Posner described the Resource Conservation and Recovery Act (RCRA) as "a statutory Cloud Cuckoo Land").

28. Lazarus, *supra* note 5, at 2407 ("Conflict and contradiction are the rule rather than the exception for those hardy enough to go beyond the symbolic rhetoric and promise of environmental policy in an effort to discover the actual terms of the environmental law itself.").

29. See, e.g., Lazarus, *supra* note 5, at 2436-38.

30. CORNELIUS M. KERWIN, RULEMAKING: HOW GOVERNMENT AGENCIES WRITE LAW AND MAKE POLICY 14-20 (CQ Press, 2d ed. 1999). For EPA's reliance on non-legislative rules, see Bryan G. Tabler & Mark E. Shere, *EPA's Practice of Regulation-*

ronmental laws on the books, not including guidance documents and state laws.³¹ When corporate counsels say they can't keep track of all the requirements of compliance, it is not false modesty.³²

If the logical consequence of the rational polluter model is the punitive deterrence of enforcement, the obvious response to the good apple model of behavior is compliance facilitation. Helping regulated parties come into compliance, rather than threatening them to do so, not only seems more appropriate if parties truly want to comply, but equitable as well. After all, compliance facilitation simply asks that government help the good apples overcome obstacles that government largely created in the first place. And practical evidence of this enforcement approach is as easy to find as that for the sanction model.³³ The Clinton Administration launched an effort to reinvent regulation writing, expressing the rules in plain English.³⁴ EPA has dedicated considerable resources to outreach and education efforts, publishing numerous reports such as the *Small Business Ombudsman Update* and 1-800 toll free help

by-Memo, NAT. RESOURCES & ENV'T, Fall 1990, at 3; Robert A. Anthony, "Well, You Want the Permit, Don't You?": Agency Efforts to Make Nonlegislative Documents Bind the Public, 44 ADMIN. L. REV. 31 (1992).

31. J.B. Ruhl, *The Metrics of Constitutional Amendments: And Why Proposed Environmental Quality Amendments Don't Measure Up*, 74 NOTRE DAME L. REV. 245, 281 (1999). See also Henry P. Baer, Jr., *ISO 14000: Potential Compliance and Prevention Guidelines for EPA and DOJ*, 7 FORDHAM ENVTL. L.J. 927, 949 (1996) (stating that the Federal Register contains more than 20,000 pages of environmental regulations). In a law review article written 25 years ago, the former Dean of Stanford Law School, Bayless Manning, coined the term, "hyperlexis," to describe "American's national disease—the pathological condition caused by an overactive law-making gland. Measured by any and every index, our law is exploding. New statutes, regulations, and ordinances are increasing at geometric rates at all levels of government. The same is true of reported decisions by courts and administrative agencies." Bayless Manning, *Hyperlexis: Our National Disease*, 71 NW. U. L. REV. 767 (1977).

32. Indeed, as David Spence has summarized and the Root Causes study, *infra*, note 63, demonstrates:

Few scholars have attempted to measure the role of ignorance directly, at least in systematic ways. Brehm and Hamilton's study of compliance with toxic chemical reporting found that ignorance of the legal requirements accounted for a large portion of the noncompliance with that requirement and was a much stronger predictor of noncompliance than either evasion or the costliness of compliance.

Spence, *supra* note 1, at 972.

33. For a useful survey of EPA's main compliance incentive approaches and compliance assistance strategies (i.e., the Supplemental Environmental Projects (SEPs) Policy, Self-Audit Policy, Small Business Compliance Assurance Policy, compliance assistance tools, and sector notebooks) and see Markell, *supra* note 1, at 13-26.

34. Cindy Skrzyzcki, *Gore's Plain-Spoken Directive: Order Calls for Clarity in Federal Communications*, WASH. POST, June 2, 1998, at A1.

lines. Congressional passage of the Small Business Regulatory Enforcement Fairness Act (SBREFA) requires forgiveness for small violations by small businesses.³⁵ And, over the last decade, at least 23 states have passed laws providing evidentiary privileges or immunity to corporations that uncover and correct violations through internal environmental audits.³⁶ The goal of all these initiatives, and many more, is to rely on carrots rather than sticks, cooperation rather than confrontation, either by education or reducing penalties in exchange for coming into compliance.

Not surprisingly, proponents of the sanction model remain unconvinced. While many scholars and environmental enforcement personnel acknowledge that numerous challenges to compliance like those listed above do exist, they reject any conclusion that reliance on sanctions as the principal compliance-inducing mechanism may be inappropriate.³⁷ As Cliff Rechtschaffen has bluntly observed, "you don't get to drive drunk or hold up a store one time for free."³⁸

In practice, of course, enforcement in the field rarely follows solely the sanction or facilitation approach but, rather, a hybrid depending on the situation.³⁹ To paraphrase Teddy Roosevelt, compliance facilitation may prove effective because the big stick of potential sanction is held at the ready. Officials may work with a company, let it know in

35. Rechtschaffen, *supra* note 3, at 1183-84 (citing Small Business Regulatory Enforcement Fairness Act of 1996, Pub. L. No. 104-121, 223, 110 Stat. 857, 862 (1996)).

36. See Rechtschaffen, *supra* note 3, at 1185.

37. A senior EPA enforcement attorney, for example, says he has regularly encountered the

unstated assumption that environmental noncompliance is somehow 'different' from noncompliance with other laws [Supporters of this view] typically cite one or more of the following rationales in support of this assumption: (1) [U]nlike other lawbreakers who are 'bad' at heart, environmental violators are essentially 'good people'; (2) environmental laws deserve to be broken because they illegitimately encroach on personal freedom and property rights; (3) while the environmental violations themselves are wrong, the activities which lead to environmental violations have social utility and should not be chilled; or (4) environmental laws are prone to being violated accidentally due to their complexity.

Silberman, *supra* note 7, at 10,530.

38. Rechtschaffen, *supra* note 3, at 1242.

39. Often times, EPA officials will sanction a violation through a warning letter rather than a fine. Markell, *supra* note 1, at 13, citing U.S. EPA, OPERATING PRINCIPLES FOR AN INTEGRATED EPA ENFORCEMENT AND COMPLIANCE ASSURANCE PROGRAM 4 (1996). In other cases, fines will be preceded by efforts to ensure the facility operators have been provided compliance assistance. Markell, *supra* note 1, at 13, citing U.S. GAO, ENVIRONMENTAL PROTECTION: EPA'S AND STATES' EFFORTS TO FOCUS STATE ENFORCEMENT PROGRAMS ON RESULTS 14 GAO/RCED-98-113 (1998).

advance that an inspection is coming, and still file penalties for noncompliance.⁴⁰ And there is good evidence that both of these approaches “work.” Studies have demonstrated that compliance at facilities is correlated to the frequency of inspections, and that companies are much more likely to conduct an environmental audit if given advance notice of an inspection.⁴¹ An oft-cited study of the pulp and paper industry, for example, found that “a 10% increase in monitoring activity led to 4% or greater reductions in the average length of time facilities remained in noncompliance.”⁴² Indeed, the recognition that sanctions and compliance assistance should be complementary was a main reason that Carol Browner changed the name of EPA’s Office of Enforcement to the Office of Enforcement and Compliance Assurance.

Thus deterrence-based sanction and compliance facilitation can be, and often are, combined. And, in certain cases, they may not be very useful categories for sorting purposes.⁴³ But make no mistake. They represent very different views of compliance with far-reaching implications for immunity for violations found in self-audits, criminal sanctions, and the very relationship of regulators and regulated parties.⁴⁴ Through the eyes of a sanction-based enforcer, compliance facilitation efforts too often mask examples of agency capture, letting regulated industries off the hook.⁴⁵ Through the lens of compliance facilitation, though, sanc-

40. “EPA will expand its use of integrated strategies [that combine compliance assistance, incentives, monitoring, and enforcement] to address the priorities of the enforcement and compliance assistance program.” EPA, *INNOVATIVE APPROACHES TO ENFORCEMENT AND COMPLIANCE ASSISTANCE: ACTION PLAN FOR INNOVATION*, 300-K-99-003 (Sept. 1999), at 19, *as quoted* in Silberman *supra* note 7, at 10,526. In the EPA’s Compliance Incentive Program for the Industrial Organic Chemical sector, for example, potential targets of enforcement were sent letters in August, 1998, informing them that they could enroll in the program, be assisted with compliance materials, and would have a grace period until January 31, 1999, to conduct audits and disclose violations, which would be accordingly reduced. After this period, EPA would authorize states to increase their inspections of these facilities. Fifty-one facilities participated. Silberman, *supra* note 7, at 10,525.

41. Silberman, *supra* note 7, at 10,531 (citing studies by Price Waterhouse in 1995 and the National Conference of State Legislatures in 1998).

42. Silberman, *supra* note 7, at 10,533 (citing Louis Nadeau, *EPA Effectiveness at Reducing the Duration of Plant-Level Noncompliance*, 34 J. ENVTL. ECON. & MGMT. 54 (1997)).

43. For example, why should compliance to avoid costs of sanction be recognized as the attribute of a rational polluter while compliance to avoid bad public relations is that of a good apple? The same economic incentive is driving both actions.

44. *See, e.g.*, Spence, *supra* note 1, at 985-995. As discussed at the end of Part IV, it also drives much of the current tension between states and EPA over enforcement practices.

45. The case, *Friends of the Earth, Inc. v. Laidlaw Environmental Services, Inc.*, provides the most recent high-profile example. In *Laidlaw*, which ultimately went to the

tions can seem heavy-handed and ineffective. Government resources, many state agencies argue, would be better spent by working with rather than against regulated parties, preventing noncompliance events and saving sanctions for the truly bad apples.⁴⁶ Moreover, the *balance* of sanction versus facilitation remains hotly contested. Thus much of the debate in environmental enforcement today is over which of these models should guide enforcement policy.

This discussion over what motivates compliance is surely important, for it guides the selection of instruments (sanctions or assistance). We suggest, however, that focusing on *why* businesses comply, while necessary, cannot adequately explain the full range of regulated parties' noncompliance. This debate is incomplete unless we also consider why the regulated parties *do not* comply. Put another way, the debate up to now has been missing something. Focusing on two models—sanction and facilitation—to explain noncompliance has left out a third viable model.

III. A SYSTEMS MODEL OF COMPLIANCE PERFORMANCE

If, in fact, there are *systemic* obstacles to compliance that lead in some cases to involuntary noncompliance, it is not enough to know whether companies are bad apples or good apples, or fit the sanction or facilitation model, because in any case they will seek to comply at some

Supreme Court, the defendant had violated its Clean Water Act permit hundreds of times. When a plaintiff served notice that it was bringing a citizen suit, Laidlaw was able to frustrate the citizen suit because the state commenced an enforcement action over the same permit violations. It turns out that "Laidlaw drafted the state agency's complaint, paid the filing fee, and settled the state enforcement action by agreeing to a relatively modest fine and vaguely promising to address the source of the violations." Spence, *supra* note 1, at 940. While this sham was later uncovered and rejected because it was not "diligent prosecution, it is a prime example of how state agencies (who, we will discuss later, favor a compliance approach) can frustrate enforcement efforts.

46. As David Markell describes,

there is a great deal of disagreement over the appropriate government strategies to promote compliance. Many states disagree with EPA's vision that deterrence-based enforcement must be a central part of a government enforcement and compliance program. They urge, instead, that more flexible and regulated party-friendly approaches are superior. They argue that carrots work better than sticks and that enforcement and compliance policy needs to evolve to reflect this reality.

Markell, *supra* note 1, at 110. Others working in the field believe that "traditional enforcement methods can actually stand as a barrier to enhancing regulated entities' understanding of what is required." Bruce M. Diamond, *Confessions of an Environmental Enforcer*, 26 ENVTL. L. REP. 10,253, 10,254 (1996), as quoted in Markell, *supra* note 1, at 4.

level and may face externally imposed barriers to doing so. If noncompliance has both voluntary and involuntary components, how should we think about the involuntary aspects?

To set this out more clearly, let's leave the messy world of environmental enforcement and imagine instead a simple, generic case of noncompliance—a driver exceeding the speed limit. What does compliance theory tell us about why the driver might be speeding and how he should be most effectively brought into compliance?

The sanction model predicts that people speed because they want to get somewhere quickly or they like driving fast *and* they know it's worth their while. Either it is likely they will not be caught or, even if they are pulled over, the fines will not be very big. The chance of detection is low, the chance of serious punishment lower still. The way to slow the driver down is obvious. Because sanctions deter profit-maximizers, we need to make him think twice before zooming down the road—i.e., more traffic cops to catch him and bigger fines once he's caught. And we see this every day on the highway, as whole lanes of traffic hit their brakes in unison once a police car comes into view, and in the marketplace, as radar-detecting "fuzz busters" continue to do a brisk business.⁴⁷

There is another possibility for the driver speeding, as well. The facilitation model suggests that the driver may not realize he's speeding, and would not do so if he were aware of this. Perhaps he thinks the speed limit is 65 miles per hour rather than 55 miles per hour. Perhaps he doesn't realize he's now driving in a school zone. Sanctions might improve the driver's compliance in this case, but we could ensure his compliance without sanctions simply by posting more speed limit signs, flashing "school zone" lights, or building speed bumps, i.e., by facilitating compliance.

These two explanations for the driver's behavior—rational actor and good apple—seem to cover well the likely reasons for driving too fast. In this regard, they provide a useful test case. After all, if the current models of noncompliance work well in describing speeding and provide useful insights for traffic enforcement, they likely describe well the more complicated environmental field, as well.

47. "Fuzzbusters" are readily available to purchase in stores and over the Internet. See, e.g., <http://www.fuzzbusters.com> (last visited April 11, 2002); <http://www.sounddomain.com> (last visited April 11, 2002); <http://www.whistler-radar.com> (last visited April 11, 2002), just to name a few.

Our sense of the models' adequacy may start to change, however, if we flip this example around. Do they have the same predictive power in the case of driving too *slowly*? This related problem can be explained by current models, but not entirely.

Under the rational actor theory, people may drive too slowly because they are uneasy with high speeds or perhaps they are dialing a cell phone number. As above, they do so either because they believe they won't be caught or because the fines for driving too slow aren't very big. Sanctions will deter such profit-maximizing individuals, so we need bigger fines and more cops as a deterrent. And similarly, as above, the compliance facilitation model predicts that people probably do not realize they're driving too slowly. Perhaps the speed limit has changed and they believe they are in a 25-miles-per-hour zone, rather than one with a limit of 45 mph. We may need more speed limit signs to catch their attention.

Consider, though, whether there may be a third possibility for a car driving too slowly—a traffic jam. In this case, the driver is not going too slowly because he thinks he can get away with it or because he did not see the speed limit sign change. Here he's driving too slowly because *everyone else* is driving too slowly. In other words, we need to widen our frame beyond the offending car.

This raises a different kind of problem. The offending behavior is due not to malign intent, confusion, or benign neglect. Even if they wanted to, drivers stuck in a traffic jam couldn't drive faster. Unlike the prior examples, there is an additional impediment to compliance—the systems barrier. It doesn't matter if the drivers are good or bad apples. Here, the party's behavior is determined by what else is happening on the road and with other cars.

It goes without saying that there are significant differences between driving below the speed limit and environmental violations, but the examples share some important similarities. Traffic cops can focus on the fact that a single car is driving too slowly, but neither sanction nor education of the offending driver will make a difference. After all, the rational explanation of a traffic jam is simply that each person is trying to avoid hitting the car in front of them. Knowing this does not help us solve or avoid traffic jams if we only focus on individual drivers. The slow driving only makes sense if considered in its full context and the systemic concerns that created these conditions are addressed (overall number of cars on the road, poor merge lanes, driving conditions, etc.).

Similarly, focusing on a specific environmental violation can be explained simplistically—the facility did not fill out a particular report correctly. But this, we suggest, may risk missing the underlying root cause, particularly if it was not intentional. Is it possible that, just as a car stuck in traffic may drop well below the speed limit despite the driver's best efforts, a regulated party may fail to approach full compliance despite good faith efforts?

To that question, advocates both of the rational polluter/sanction model and of the good apple/facilitation model may simply protest that this analogy doesn't work in the first place. After all, the police don't give tickets for driving too slowly in a traffic jam. That's not against the law.⁴⁸ And to this we respond: Precisely—that's exactly our point! It seems ridiculous to give a ticket to someone in a traffic jam because they were constrained, regardless of their intentions, to drive slowly. But if similar systemic pressures lead to certain types or levels of environmental noncompliance that are not easily explained by other models, should we not regard *these* as regulatory traffic jams, as well, when designing enforcement strategies? While this may run perilously close to

48. Most states regulate minimum speed limits, and regard driving too slow as a violation if it impedes the reasonable progress of other cars. The provisions in Wyoming's law (below) are similar to those in many states.

Minimum speed limits

(a) No person shall drive a motor vehicle at such a slow speed as to impede the normal and reasonable movement of traffic except when reduced speed is necessary for safe operation or in compliance with law.

(b) Whenever the superintendent or local authorities within their respective jurisdictions determine on the basis of an engineering and traffic investigation that slow speeds on any part of a highway consistently impede the normal and reasonable movement of traffic, the superintendent or local authority may determine and declare a minimum speed limit below which no person shall drive a vehicle except when necessary for safe operation or in compliance with law and that limit is effective when posted upon appropriate fixed or variable signs.

WYO. STAT. ANN. § 31-5-304 (LexisNexis 2001).

See also, e.g., Alabama—ALA. CODE § 32-5A-174 (2001); Arizona—ARIZ. REV. STAT. § 28-704 (2001); Arkansas—ARK. CODE ANN. § 27-51-208 (2001); California—CAL. VEH. CODE § 22400 (2001); Colorado—COLO. REV. STAT. ANN. § 42-4-1103 (2001); Connecticut—CONN. GEN. STAT. ANN. § 14-220 (2001); Delaware—21 DEL. CODE ANN. tit. 21 § 4171 (2001); Florida—FLA. STAT. ANN. § 316.183 (2001); Georgia—GA. CODE ANN. § 40-6-184 (2001); Hawaii—HAW. REV. STAT. § 291C-102 (2001); Illinois—625 ILL. COMP. STAT. § 5/11-606 (2001); Indiana—IND. CODE § 9-21-5-8 (2001); Kansas—KAN. STAT. ANN. § 8-1561(2001); Louisiana—LA. REV. STAT. ANN. § 32:63(2001), *cited in* New York v. William G. Beeney, 694 N.Y.S.2d 583 (1999) (County Court, Monroe County, New York).

sounding like an apology for environmental violations, shouldn't we ask ourselves whether some noncompliance in environmental law is more like speeding or traffic jams?

One might argue that the better analogy is mass speeding. If everyone is driving at least five miles over the speed limit, it seems unfair to sanction any particular driver for doing so. The driver is simply following everyone else and slowing down might actually be more dangerous than speeding. We regard this as a poor analogy, though, because it is simply a specific example of the rational actor model. If there are some police visibly parked on the side of the road, rest assured the average speed will quickly become 55 miles per hour.

To even begin to assess value of the traffic jam analogy, we first need to consider what a regulatory traffic jam would look like. One might assume, for example, that a regulatory traffic jam would show up as similar types of violations that occur across the industry. Thus one might imagine that most companies are violating regulation X, regardless of their prior compliance records, corporate ethic, or funding for environmental health and safety programs. That is, whether the companies are good or bad apples has no predictive value because there is no correlation between the violators and their overall compliance rate with Regulation X.

We do *not* consider this an example of a traffic jam, however, because the situation is likely due to the qualities of the regulation itself. Perhaps the regulation is ambiguous, perhaps contradictory or excessively stringent. In any case, the problem can likely be addressed by focusing on the regulation itself.

By contrast, in our view a traffic jam results from systems barriers, not specific regulations. Thus let's imagine we could identify good and bad apples across an industry sector. We can also identify overall compliance rates both for each facility and for the industry sector as a whole. What should we think if we find that across the board there is a relatively high rate of *overall* noncompliance, and only some of it appears to correlate closely with behavioral characteristics associated with earnest compliance efforts? Increasing inspections and penalties allows us to remove the bad apples from the sample size. This lowers the noncompliance rate, but still leaves a significant level of noncompliance. But even with significant compliance facilitation and compliance sanctioning, we are left with a residual noncompliance rate well above what we might expect from background stochastic events. If this were happening, we believe it would provide evidence of a regulatory traffic jam—

noncompliance that cannot be accounted for by the rational actor and good apple models. As Part IV sets out, we believe there is good evidence describing this very situation.

This distinction is more than subtle, for if regulatory traffic jams do occur, neither the rational polluter/sanction model nor the good apple/facilitation model is useful in understanding and addressing the component of noncompliance attributable to the "jam." The rational polluter model is unhelpful in understanding the noncompliance behavior, because the level of noncompliance may well be below that which even a shrewd rational actor would choose in the absence of the systemic jamming effect. Sanctioning their shortfall in compliance would be more than unfair; it would be irrational. And the good apple model is also unhelpful, because it will be difficult to tell good apples from bad and, in any event, conventional facilitation efforts for the good apples, such as education, "hot lines," and clear and concise explanations of the rules, are likely to prove as futile as would explaining to a driver stuck in a traffic jam where the gas pedal is. In short, traffic jams, whether of the transportation or regulation variety, aren't about whether those stuck in them are being rational or are in need of education. Rather, they are about a defect in the system as a whole.

A. *A Systems Primer*

What might account for high levels of background noncompliance that cannot be easily accounted for by the rational actor or good apple models? We believe the answer lies in system effects. It is beyond the scope of this article to explore in detail the impacts of system effects on compliance,⁴⁹ but the paragraphs below set out briefly the major issues raised by diversity and feedback.

The legal system may be regarded as a complex adaptive system because its components interact with one another.⁵⁰ This insight has resulted in an avalanche of scholarship on the application of complex systems theory to the legal system. Authors have used a systems approach to examine corporate law, civic republicanism, constitutional decision

49. We do this in a current work in progress, entitled *The Red Queen, Mozart, and The Administrative State*.

50. See, e.g., JOHN L. CASTI, *COMPLEXIFICATION: EXPLAINING THE PARADOXICAL WORLD THROUGH THE SCIENCE OF SURPRISE* (Harper Collins 1994); JACK COHEN & IAN STEWART, *THE COLLAPSE OF CHAOS: DISCOVERING SIMPLICITY IN A COMPLEX WORLD* (1994); BRIAN GOODWIN, *HOW THE LEOPARD CHANGED ITS SPOTS: THE EVOLUTION OF COMPLEXITY* (1996); JOHN HOLLAND, *HIDDEN ORDER: HOW ADAPTATION BUILDS COMPLEXITY* (Addison-Wesley 1995); STEVEN JOHNSON, *EMERGENCE: THE CONNECTED LIVES OF ANTS, BRAINS, CITIES, AND SOFTWARE* (2001).

making, jurisprudence, private capital raising, and many other fields.⁵¹ System burdens to compliance arise when the various rules are interrelated or have relations to indirect or exogenous variables. In the context of regulated parties, system effects magnify compliance burdens.

Diversity of the components that form the “macroscopic collection” of a system is the backbone of complex system behavior.⁵² An ecosystem provides a classic example. Because the system as a whole depends on no single component for its long-term operation, though, discrete changes have difficult-to-predict consequences on the overall structure of the system. Strengthening one component may weaken another. Complexity theory research suggests that within any complex adaptive system there exist “conflicting constraints” between the different possible combinations of components’ structural traits.⁵³ These constraints limit the degree to which any single trait can be adjusted without influencing, positively or negatively, another trait.⁵⁴

The phenomenon of conflicting constraints is familiar to the legal system, described in legal literature as the “tradeoffs” problem.⁵⁵

51. See, e.g., Hope M. Babcock, *Democracy's Discontent in a Complex World: Can Avalanches, Sandpiles, and Finches Optimize Michael Sandel's Civic Republican Community?*, 85 GEO. L. J. 2085 (1997) (critiquing civic republican political theory using complex systems principles); Vincent Di Lorenzo, *Complexity and Legislative Signatures: Lending Discrimination Laws as a Test Case*, 12 J.L. & POL. 637 (1996) (using chaos theory to evaluate the legislative response to alleged lending discrimination); Thomas Earl Geu, *Chaos, Complexity, and Coevolution: The Web of Law, Management Theory, and Law Related Services at the Millennium*, 65 TENN. L. REV. 925 (1998) (discussing complexity theory in the context of corporate structure, management, and law); J. B. Ruhl, *Complexity Theory as a Paradigm for the Dynamical Law-and-Society System: A Wake-Up Call for Legal Reductionism and the Modern Administrative State*, 45 DUKE L. J. 849 (1996) (using complexity theory to develop a general behavioral model of legal system).

52. See Ricard V. Solé et al., *Phase Transitions and Complex Systems*, COMPLEXITY, No. 4 1995, at 13, 23 (“complex systems find one of their brightest examples in the tropical rainforest”).

53. See STUART KAUFFMAN, *AT HOME IN THE UNIVERSE: THE SEARCH FOR THE LAWS OF SELF-ORGANIZATION AND COMPLEXITY* 169-73 (Oxford Univ. Press 1995).

54. As an example that many of us studied in biology class, the exoskeleton of an ant, for example, presents tremendous advantages at the size of an ant, but if ant size were to increase eventually the proportional weight of the exoskeleton would present the ant's demise.

55. See, e.g., JOHN D. GRAHAM & JONATHAN BAERT WIENER, *RISK VERSUS RISK: TRADEOFFS IN PROTECTING HEALTH AND THE ENVIRONMENT* (1995); Cass R. Sunstein, *Health-Health Tradeoffs*, 63 U. CHI. L. REV. 1533 (1996); Stephen F. Williams, *The Era of Risk-Risk and the Problem of Keeping the APA Up to Date*, 63 U. CHI. L. REV. 1375 (1996); Kip Viscusi, *Corporate Risk Analysis: A Reckless Act?* 52 STAN. L. REV. 547 (2000).

Measures designed to protect imperiled species, for example, have increasingly been identified as threats to private property rights. Complex systems theory shows why, as policies and the number of rules designed to implement them increase in number and diversify in objectives, it becomes more difficult to strengthen rules related to any one policy objective without consequences, positive or negative, to the effectiveness of rules serving other policy objectives. Thus, in the compliance context, it is not hard to imagine situations when compliance with Regulation X frustrates compliance with Regulation Y.⁵⁶ And, more important, when frustrating compliance with Regulation Y makes compliance with Regulation Z harder, but compliance with Regulation Q easier. In other words, there is a cascade effect.

This effect is compounded by positive and negative feedback loops. The response of one component to a particular stimulus can trigger responses from one or several other components, which in turn may trigger responses from yet additional components. When such flows take place in the context of complex adaptive systems, the flows themselves exhibit complex paths known as feedback loops.⁵⁷ Indeed, the very point of having legal rules is to take advantage of the anticipated feedback between the rules and their targeted social problems. Feedback in the form of deterrent or incentive effects, for example, is the intended result of legal initiatives designed to prompt responses from the regulated community.⁵⁸ Such feedback loops can become exponential in effect and thus dominate the system in which they operate.⁵⁹

The increase of rules and different types of requirements thus only increases the likelihood of conflicting constraints. Increasing compliance efforts to meet the incremental regulation will, in a number of

56. J.B. Ruhl, for example, was faced with one such example outside of Austin, Texas. The Soil Conservation Service was telling farmers to cut down cedar trees because the water-thirsty trees were depleting underground aquifers. At the same time, however, the Fish and Wildlife Service regarded such conduct as adverse modification of an endangered songbird that inhabited cedar trees.

57. Adaptation in complex systems is associated with the feedback and feedforward loops made possible by multiple paths of interactions between system components and thus "is an emergent property which spontaneously arises through the interaction of simple components." JAMES GLEICK, *CHAOS: MAKING A NEW SCIENCE* 339 (Penguin Books 1987).

58. This premise, of course, is the underlying thesis of the rational polluter model and its justification of deterrence-based environmental regulation policy. See *Rechtschaffen*, *supra* note 3, at 1186-87; Spence, *supra* note 1, at 937. Virtually every EPA enforcement policy rests on the efficacy of the deterrence feedback loop. See Silberman, note 7, at 10,523.

59. See Douglas S. Robertson and Michael C. Grant, *Feedback and Chaos in Darwinian Evolution*, *COMPLEXITY*, Sept./Oct. 1996, at 10, 12.

cases at least, undermine compliance with yet another existing or future rule. And this becomes even more serious as feedback loops kick in.⁶⁰ As a result, compliance becomes more than simply a matter of distributing resources (i.e., balancing opportunity costs), but truly a problem of understanding complex interactions between responses to one rule and their effect on the options presented under another. In effect, an act designed to comply under one rule may limit the options available to comply elsewhere beyond simply the scarcity of financial resources, and vice versa.

Moreover, the systems costs from diversity and feedback effects are not (and, in practical terms, likely cannot be) captured by *ex ante* economic analysis. While this is roughly analogous to the problem of risk-risk tradeoffs,⁶¹ the likely compliance tradeoffs are far harder to identify so long as rules increase in number and diversify in objectives. Put another way, as the number of rules increases, the potential for system feedback also rises, and the ability to predict the consequences of feedback triggered by any one new rule diminishes.

As a general matter, then, a certain level of indeterminacy in the legal system, whether one believes it is normatively positive or negative in sociolegal effect, is inherent. Compliance is not merely a chain of transaction-cost decisions about whether to comply and how much to invest in the effort. Unlimited good intentions and money to back them up cannot avoid the fact that the options available to confront a particular regulatory compliance problem are influenced by legal doctrines and regulations that may have nothing *directly* to do with the problem at hand. There is no way to avoid the problem of system burdens, because there is no way to have a legal system that does not exhibit properties of a system. Hence, there is no way to demand compliance with the legal system without expecting some level of noncompliance. But systems, to be adaptive, sustaining, and resilient, must exhibit the very properties that can lead to system burdens.

60. One example is the effect land development regulation can have toward, ironically, accelerating land development. See, e.g., David A. Dana, *Natural Preservation and the Race to Develop*, 143 U. PA. L. REV. 655 (1995) (describing the "race to develop.").

61. Much of the tradeoffs literature posits that by using more rigorous risk tradeoff analysis, legal institutions can predict and control for the effects of conflicting constraints. See, e.g., GRAHAM & WIENER, *supra* note 55 (advocating implementing a comprehensive risk tradeoff analysis program for public health and environmental protection laws). Some authors, however, are less sanguine that tradeoff analysis can avoid becoming biased by the way regulation is framed. See, e.g., Lisa Heinzerling, *Regulatory Costs of Mythic Proportions*, 107 Yale L.J. 1981 (1998).

IV. PRACTITIONER PERSPECTIVES ON TRAFFIC JAMS IN ENVIRONMENTAL COMPLIANCE

To a certain extent, our argument to date has resembled Sherlock Holmes' focus on "the dog that didn't bark."⁶² If, upon removing the obvious causes of noncompliance, i.e., violations we would expect under the rational polluter and facilitation models, we are still left with significant noncompliance, then there must be another cause at work. The preceding section proposed a likely suspect—system effects. Without some empirical evidence, however, it is hard to judge whether this argument is helpful insight or misguided musings. To justify the notion of regulatory traffic jams as worthy of serious consideration, we now move beyond informed speculation to harder data.

A. *Root Causes*

The best place to start is with the most comprehensive study to date of environmental compliance behavior, a report known as *Root Causes*.⁶³ This was the result of an unusual alliance. For three years, from 1996-1998, the Chemical Manufacturers Association (CMA) and EPA worked together to understand better the underlying causes of noncompliance. Their joint study sought to identify the key factors behind noncompliance, examine how facilities respond to noncompliance events, and assess the value of environmental management systems.⁶⁴ Unlike previous compliance studies by academics or government officials interviewing companies, this truly was a partnership between regulated and regulator, with CMA encouraging cooperation and frank answers by its member companies.

CMA contacted fifty of its members' facilities that had been parties to environmental enforcement action between 1990 and 1995, explained the *Root Causes* project, and sent them an extensive survey. The identity of the respondents was confidential. Of those contacted, over half (twenty-seven facilities involved in forty-seven actions) returned the surveys. The survey then asked the facilities to categorize each type of

62. In the story, Inspector Gregory asks Sherlock Holmes, "Is there any other point to which you would wish to draw my attention?" Holmes replies, "To the curious incident of the dog in the night-time." Surprised, Gregory responds, "The dog did nothing in the night-time." And Holmes inimitably points out, "That was the curious incident." ARTHUR CONAN DOYLE, *Silver Blaze*, in *SHERLOCK HOLMES SELECTED STORIES* 25 (Oxford University Press ed., 1951).

63. U.S. EPA & CHEMICAL MANUFACTURERS ASS'N, EPA/CMA ROOT CAUSE ANALYSIS PILOT PROJECT: AN INDUSTRY SURVEY (1999), available at <http://es.epa.gov/oeca/ccsmd/rootcause> (last visited April 11, 2002).

64. *Id.* at 6-7.

noncompliance event, select no more than three main reasons for the violation from a range of over 70 potential causes, including “ambiguity of the regulation,” “inadequate compliance funding,” and “insufficient compliance monitoring.”⁶⁵

The types of violations identified were not particularly surprising. The four major categories of noncompliance were “report submissions and reporting,” “permit exceedances,” “operations and maintenance,” and “record keeping.” Any inspector would likely have predicted this. The *causes* given for these violations, though, were both unexpected and instructive.

Overall, the categories of “Regulations and Permits” tied with “Human Error” as the leading root cause of violations. Under the “Regulations and Permits” category, the specific causes of noncompliance were ignorance (“facility unaware of applicability of a regulation”) and interpretation (“inconsistent interpretation of federal regulations”). While surely part of the causal chain of noncompliance, though, these are hardly the *root* causes. The root cause in those cases is whatever it is that makes the regulation ambiguous or the facility unaware.

And what of “Human Error?” It proved to be a key source of trouble for every type of violation. For the category of report submissions and reporting, “Human Error” proved the single most important root cause, accounting for 35% of violations. “Human Error” was the second most important cause of operations and maintenance violations (27%), the top cause for record keeping (38%), and responsible for a significant percentage of physical exceedance violations, as well.⁶⁶ And what did the category of human error include? The category’s three main components were “individual responsibility or professional judgment,” “fatigue,” and “inexperience.”⁶⁷

Surely professional judgment and inexperience are root causes for some violations, but for these to represent the top cause of noncompliance, responsible for more than one-quarter of all violations, beggars belief. What, then, are we to make of these results? Rather than a meaningful explanation for noncompliance, it seems far more likely that *Root Causes* treats the “Human Error” category as a repository for noncompliance events unexplained by the more tangible causes, the assumption being, presumably, that if the regulations were clear and the resources

65. *Id.* at App. C.

66. *Id.* at 14 - 22.

67. *Id.*

for achieving compliance were sufficient, somebody must have simply goofed.⁶⁸

No doubt mistakes happen; yet, according to the *Root Causes* results, goofs are one of the most significant causes of noncompliance. This does not withstand scrutiny. Indeed one might as well call the "Human Error" category, "hobgoblins," instead. Consider that the U.S. chemical industry is arguably the most experienced sector in the country when it comes to environmental compliance. As an industry, chemical plants are subject to all the major pollution statutes and have experienced health, safety and environment departments as well as environmental management systems.⁶⁹ These are sophisticated companies and it is hard to believe the main cause for their violations is simply people screwing up. Indeed, even when facilities identified by EPA as "Environmental Leaders" have *known* well beforehand that they would be inspected (as happened in EPA's Environmental Leadership Program), there still were numerous violations.⁷⁰ Importantly, no causal category

68. The root cause category of Human Error included three causes: "individual responsibility or professional judgment," "fatigue, lack of alertness, distraction," "inexperience, lack of knowledge, lack of technical expertise." *Id.* at App. C-2.

69. Spence, *supra* note 1, at 977 ("the CMA provided its members with a kind of continuous compliance education, making them uncommonly well-versed in the details and nuances of the regulatory scheme").

70. Spence, *supra* note 1, at 954:

One of EPA's pilot programs, the Environmental Leadership Program (ELP), sought to recognize and learn from "environmental leaders," companies whose environmental management and compliance systems were particularly forward thinking and sophisticated. In June 1994, the EPA announced the creation of the ELP and invited proposals for pilot projects that would demonstrate state of the art compliance management systems and produce knowledge that could be transferred to other facilities and settings. The program was limited to companies that: (i) had a good compliance history and sophisticated environmental management systems; (ii) regularly used environmental auditing; (iii) were willing to share their expertise with others; and (iv) would involve both employees and the general public in their environmental management systems. The twelve private facilities selected for the first pilot phase of the program were owned by large, sophisticated organizations with substantial environmental compliance experience.

See also Spence, *supra* note 1, at 975:

During the pilot phase of the ELP, audits were carefully planned in advance and designed to allow participating firms to demonstrate their sophisticated environmental management and auditing systems to the EPA. The audits included regulators and representatives of the firms, and each firm knew ahead of time when the audit would take place and had ample time to prepare. Nevertheless, in nearly every environmental audit performed under the ELP, violations were discovered. Consistent with the special EPA enforcement policy

used in *Root Causes* corresponds explicitly with our concept of a traffic jam from systems effects.

B. ABA Survey

Our second source of data comes from a survey we conducted of randomly-selected environmental law attorneys to detect their level of concern about involuntary noncompliance and to identify its possible sources. We sent our survey to 500 randomly-selected members of the American Bar Association's Section of the Environment, Energy, and Resources (SEER). We chose SEER because it is a prominent forum for leading practitioners of environmental law in private practice, government, academic, and other practice settings.⁷¹

We designed our survey to elicit the respondents' perceptions for three topics relevant to compliance policy.⁷² First, a series of questions

devised for ELP participants, the violations were corrected, and no penalties were imposed. But, the important point is this: even with time to prepare and an incentive to perform well, these sophisticated firms did not achieve perfect compliance.

71. Of the 500 surveys sent, 168 completed surveys were returned. We grouped this respondent population using several personal characteristics called for in the survey's opening questions. First, because of our interest in determining the influence of government work on perceptions of regulatory compliance, we divided respondents into three practice setting categories: (1) those who had spent their entire practice careers representing industry in positions such as private law firms, in-house counsel, or trade associations, which accounted for half of the respondents; (2) those who had spent all or a part of their practice careers in a government position, regardless of other experience, which defined one-third of the respondents; and (3) all others, meaning those who had no government work but also some experiences other than representing industry, such as judicial or academic.

To detect whether the resources of a regulated business affect compliance perceptions, we further subdivided the respondents who currently represent businesses or did so in the past according to the size of client predominantly represented. We based size on Fortune 500 status and number of employees, with categories for large (27 percent), medium (8 percent), small (25 percent), balanced (no predominant client type) (31 percent), and other (9 percent). Finally, because the volume and type of environmental regulation may vary across types of industries, we also characterized the respondents' clients according to four industry sectors: (1) manufacturing; (2) land and resource development; (3) transportation and utilities; and (4) services. Most respondents, it turned out, spanned more than one sector.

The survey was voluntary and responses were anonymous. We greatly appreciate SEER's cooperation in providing the member names and their contact information (SEER did not commission, direct, or in any other way influence the design or implementation of the survey). All funding for the survey and the data analysis was provided by The Florida State University College of Law.

72. Since the responses called for in our survey are clearly ordinal in nature, we used the logistic regression method of statistical analysis for answering various questions of inter-

asked respondents to describe their perceptions of their own ability to assess environmental compliance and of their clients' ability to achieve compliance. Expecting that at least some respondents would report significant levels of noncompliance, another group of questions probed the respondents' perceptions of the institutional effects noncompliance has on businesses. We did so to determine whether respondents would identify effects other than those consistent with the rational actor model, as well as to see whether the respondents believe noncompliance is a serious concern. Turning to the heart of the matter, a group of questions then asked respondents to identify the sources of noncompliance. We closed the survey with questions about the solutions the respondents would recommend for reducing noncompliance, both within businesses and as a matter of policy.

1. Prevalence of Noncompliance

Environmental lawyers representing business clients have the unenviable task, day in and day out, of assessing their clients' level of compliance for past, present, and future activities. We designed a series of questions, limited to respondents who currently represent businesses or did so in the past, to capture what environmental attorneys think about regulation and compliance. We were not surprised to find that, overall, they think compliance is difficult both to assess and to achieve.

With respect to compliance assessment, a significant portion of the respondents said they find the task difficult for paperwork regulations (e.g., record keeping and reporting) and physical violations (e.g., discharge and disposal violations). Indeed, when asked whether they agree with the statement that they can confidently assess absolute levels of compliance, roughly equal numbers agreed and disagreed:

est throughout our study. For example, to determine the influence of government work on perceptions of regulatory compliance, we treated the three practice setting categories as the explanatory variable X , and the responses to perceptions of regulatory compliance were coded on a scale from 1 to k ; for example, 1-5 corresponding to strongly agree, agree, indifferent, disagree and strongly disagree. The score for each question was treated as the response variable Y and the k possible scores of Y are called the response categories. The principal objective of a statistical analysis is to investigate the relationship between the explanatory variable X and the response variable Y . The ordinal nature of the responses leads naturally to statistical models based on the cumulative response probabilities of observing response categories less than or equal to a given score j , when the covariate is X . More specifically, we are interested in investigating the influence of the explanatory variable X on the cumulative response probability up to and including category j . The logistic regression method of examining such relationships involves modeling the logarithm of the odds of the event of observing response categories up to and including category j as a function of the explanatory variable X through a linear regression equation.

	strongly agree	agree	indifferent	disagree	strongly disagree
Paperwork	13	36	12	28	11
Physical	9	38	13	31	9

One factor that may complicate compliance assessment is the sheer number and complexity of the regulations involved. Indeed, the vast majority of respondents said they find keeping track of environmental regulations difficult. None described the task as easy, and only 14 percent found it moderately difficult, whereas 40 percent said it is a difficult task and 43 percent found it very difficult.

As difficult as they believe it is to assess compliance, many respondents also believe businesses often fall short of the goal. When asked how consistently their clients achieved full compliance, a startling number of respondents said they believe their clients did so less than two-thirds of the time:

	always	90 %	66 to 25 %	never	cannot estimate
Paperwork	<1	40	354	11	14
Physical	2	46	28	8	16

Responses to this series of questions on compliance assessment and compliance rates generally held true regardless of the respondent's practice background. Exposure to government work thus did not measurably affect responses. Size and sector of the client base also had no effect on responses.

Another commonly held notion our respondents' answers did not support is that the federal government is the principal source of regulatory overload. Although EPA clearly is the most prominent (and perhaps prolific) environmental agency, a significant majority of the respondents (63 percent) agreed that levels of noncompliance are the same for federal, state, and local regulations. Of those who identified a particular level of regulation as spawning more noncompliance, roughly equal numbers identified federal (19 percent) and state (13 percent) regulations, while local regulations were identified the least (5 percent). What-

ever its source, therefore, noncompliance does not appear to be a problem isolated to a particular level of government regulation. The problem, in other words, is system-wide.

2. Institutional Effects of Noncompliance

We know that it occurs and is hard to assess, but how serious an institutional concern to businesses is the problem of regulatory noncompliance? The rational polluter model predicts that businesses will perceive of noncompliance as simply a cost of doing business, whereas the good apple model suggests that businesses will suffer institutional discordance if noncompliance rates become significant. Our survey results suggest that both models have some explanatory value. First, the vast majority of respondents identified significant institutional costs associated with noncompliance. Respondents agreed or strongly agreed that noncompliance hurts the corporate public image (eighty-five percent), creates friction between businesses and government (eighty-one percent), increases administrative costs (eighty-two percent), and demoralizes company personnel (seventy-four percent). These response rates sound like the worries of good apples. On the other hand, consistent with the rational polluter model, sixty-eight percent of respondents agreed or strongly agreed that noncompliance is simply another business risk to manage. Perhaps the prevailing compliance behavior is that of a rational good apple—concerned about the psychic and other nonpecuniary costs of involuntary noncompliance, but also confronting its consequences as a risk management issue. In any event, very few respondents—only eight and a half percent—agreed that noncompliance is not a significant concern. It is difficult to square these results with the notion that all noncompliance is the result of voluntary, calculated decisions about what is best for the bottom line.

Respondents with at least some government experience tended to rate the demoralizing effects of noncompliance as less significant a consequence, but otherwise conformed with results for the study population as a whole. Client size and sector also had no effect on responses to these questions.

3. Sources of Noncompliance

The respondents generally agree that noncompliance presents an array of institutional harms for businesses. But what, other than the deliberate decision not to comply, causes noncompliance? To explore that question more deeply, we culled explanations for involuntary noncompliance found in the compliance behavior literature, particularly the body

of work developing the good-apple model, and asked our survey population to rate each in terms of its importance in contributing to noncompliance. As shown below, the overwhelming majority of our respondents found many of the factors associated with involuntary noncompliance at least relevant; indeed, most were rated important to very important by a majority of respondents.

	Very Important %	Important %	Relevant %	Minor %	Not significant %
Sheer number of regulations	64	26	7	1	<1
Complexity of regulations	44	36	19	1	0
Ambiguity of regulations	39	32	21	7	1
Too many different and conflicting requirements	36	39	13	8	3
Keeping track of changes in regulations	32	42	22	4	0
Size of business operation	32	40	21	5	2
Agencies relying on informal guidance	25	28	32	14	1
Unpredictability of inspectors	24	21	30	20	5
Too many levels of government authority	16	35	30	16	3
Costs of compliance	13	25	39	22	1

The big surprises, to us at least, were that the most important factor by far was the sheer number of regulations, and that the least important factor was costs of compliance. Most of the literature supporting the good apple model of environmental compliance behavior focuses on the complexity, ambiguity, inconsistency, and fluidity of regulations, qualitative factors that can operate independent of the quantitative number of regulations. We would not have been surprised to find number of regulations scoring roughly the same as these other factors, but to have it rated significantly more important suggests that the *quantity* of regulations has an effect on compliance at least partly independent of the *quality* of the regulations. This suggests that advocates of the good apple behavioral model have been missing an important factor in support of their position that external factors generally drive compliance outcomes.

Given how prominent the "cost of compliance" factor is in environmental policy dialogue generally, the low score that costs of compliance received in the responses was also a curious result. To be sure, cost of compliance was rated as at least relevant by three-quarters of the respondents, but the rational polluter model predicts that cost of compliance should be rated the *most* important factor, as compliance behavior is purely a cost-benefit decision process. Yet almost a quarter of respondents described cost of compliance as of minor or no significance, and its scores for very important and important pale in comparison to the ratings for number of regulations and the factors focusing on qualities of regulation. For us the important message is that, regardless of which model one espouses, the results point strongly toward external sources of noncompliance that are largely outside the control of businesses.

Also of interest for our purposes is that practice background had no significant effect on responses to this set of questions. One might have expected attorneys with government experience to believe the level of regulation is manageable and that compliance behavior is driven primarily by costs of compliance, but they fell in line with private practitioners in ranking number of regulations highest and cost of compliance lowest. Of client characteristics, practitioners representing small clients ranked agency reliance on informal guidance as more important than did other practitioners, but otherwise client size and sector had no significant effect.

C. *Interpreting Results*

No survey can perfectly reflect reality. Questions may be unclear or overbroad. Respondents may lie or, despite best intentions, respond in a self-serving and misleading manner. In our ABA survey, for example,

there surely exists the possibility that some private sector respondents downplayed too much the possibility that costs drive compliance decisions to avoid seeming crass or focused on the bottom line. They may have over-emphasized the importance of the number of rules and their complexity, or the aggressiveness of enforcement efforts, so that non-compliance would seem less culpable.⁷³ On the other hand, respondents in government and who had government practice experience answered no differently on these questions than respondents whose entire practice experience was in the private sector, suggesting that self-serving bias was not a significant factor.

Another hole in the empirical record may be that the category of "human error" in the *Root Causes* study was too broad to enable analysis of what lies behind it. While it may fairly be described as a "residual" noncompliance category, other factors besides regulatory system traffic jams may explain some or all of its incidence. But its incidence was significant—a leading explanation given for noncompliance in many forms—and no other explanations spring immediately to mind.

It is clear, as well, that much (perhaps most) noncompliance in companies can be accounted for by the rational polluter and good apple models. The lack of strong enforcement at the state level, for example, clearly drives a good deal of noncompliance. Over three-quarters of the delegable environmental programs have been taken over by states and, as a result, states carry out about 90% of site inspections nationwide and bring 80-90% of enforcement actions.⁷⁴ But in many cases, EPA, the GAO and environmental groups have alleged, their implementation and enforcement of environmental law have been weak.⁷⁵

73. See, e.g., *Companies Say EPA Enforcement Policy Collides with Voluntary Audit Programs*, DAILY ENV'T REP. (BNA) No. 117, at A-7 (June 21, 1994) (reporting that private attorneys argue that aggressive enforcement can frustrate voluntary compliance initiatives).

74. ECOS, *The Environmental Council of the States*, available at <http://www.sso.org/ecos/>, cited in Markell, *supra* note 1, at 32.

75. This was a major focus of David Markell's article. He found:

1. *Inadequate Monitoring of Regulated Parties* Problems exist in both the quantity and quality of monitoring conducted. For example, in a March 1998 audit the OIG found that "over one-third of the major facilities in New Mexico had not received an inspection in more than 7 years." . . .

2. *Failure to Pursue "Timely and Appropriate" Enforcement Against Significant Air Violators* The OIG identified substantial deficiencies in states' enforcement actions against significant violators ("SVs"). In audits of Pennsylvania, Arkansas, and Texas, for example, the OIG found that "enforcement actions against SVs were not timely." . . .

3. *Failure to Recover Economic Benefit in Appropriate Cases*. In a 1997 air

Nevertheless, even if one discounts the survey responses as a result of respondent self-interest and overbroad categories, and even if one accepts that much noncompliance can be accounted for by the rational polluter and good apple models, the data are still sufficient to establish three important points. First, noncompliance at industrial facilities is the norm, not the exception. And this is the case even at sophisticated facilities with special departments focused on ensuring compliance. Moreover, the rates of noncompliance are significant, beyond what one might expect from stochastic events. Second, complex, externally imposed constraints, largely in the form of qualitative and quantitative characteristics of the regulations themselves, resonate with the practicing bar as a significant obstacle to compliance. Hence the survey results are not consistent with the rational polluter model explanation for most noncompliance. Finally, the *Root Causes* study demonstrates that a good deal of noncompliance cannot be explained by discrete, identifiable causes such as complexity or contradictory regulations. This shows that the good apple model has shortcomings, as well. As our hypothetical in Part III predicted, the data describe a situation where the level of noncompliance cannot be fully accounted for by the rational actor and good apple models. Overall, something else seems to be going on.

V. SPOTTING TRAFFIC JAMS

Even if we assume that regulatory traffic jams exist, is this a practical rather than purely descriptive insight? In fact, it is both. The possibility of regulatory traffic jams suggests that the fundamental premises of conventional compliance theory are incomplete. The addition of a system-level operational factor such as the traffic jam model, it could be expected, will necessarily alter the way in which we conceive of and

enforcement audit of several states and Regions, the OIG noted that EPA "[r]egions and a few delegated agencies used the economic benefit component of penalties to deter companies from violations, in accordance with EPA's Penalty Policy. Most delegated agencies, however, did not consistently consider or appropriately assess the economic benefit . . . we observed that the states are generally much less strict than EPA when administering penalties for RCRA violations."

4. *Inconsistency in the Approaches Used to Pursue Enforcement and Compliance and in the Level of Enforcement Activity.* The 1997 OIG RCRA audit found considerable variability in state performance in the area of enforcement, noting that "there were inconsistent penalty practices between states that can result in inconsistent enforcement of RCRA-regulated facilities from one state to another." . . . The auditors believe, in short, that "it is critical that the enforcement programs within authorized states are at least as strict as the EPA program," and that obtaining strong monetary penalties is a "critical component" of effective environmental enforcement programs.

Markell, *supra* note 1, at 44-47.

address noncompliance. Should an incident of noncompliance be sanctioned, trigger compliance facilitation assistance, or be tolerated? If the sanction is challenged, how should prosecutorial discretion be exercised reasonably? How could regulatory traffic jams be raised as a defense? These are important practical consequences of the regulatory traffic jams model, but evaluating them is complicated by a severe *descriptive* challenge—identifying and defining regulatory traffic jams. Indeed, it is on this descriptive challenge that we focus our closing remarks and recommendations on regulatory traffic jams, not because the practical issues are unimportant or mundane, but rather because description of system-level factors such as regulatory traffic jams is woefully lacking in the field of regulatory compliance theory. This is, we believe, the critical first step toward a more complete picture of the noncompliance problem.

As we mentioned in Part III, the possibility of a third model of noncompliance has important implications for the other dominant models. If regulatory traffic jams do occur, then good and bad apples will become “stuck” in noncompliance, and it won’t matter which they are in terms of compliance responses. If we rely on a bad-apple model, we would respond through a sanction approach, and it would be as irrelevant as writing a ticket to a car stuck in traffic. If we rely on a good-apple model, we would face the same problem. Telling an idling car to step on the gas doesn’t help. Neither sanction nor compliance facilitation will solve a systems problem.

One might reasonably believe that focusing on traffic jams should change the behavior of enforcement officials. But could they recognize a traffic jam when they saw it?

The task of an enforcement official recognizing a traffic jam is deeply problematic for one simple reason—an inspector cannot easily observe all of industry in the absence of a continuous flow of comprehensive, real-time compliance performance data. Put another way, imagine you are a traffic cop and detect a car driving too slowly. You cannot decide whether the driver is caught in a traffic jam, and therefore not culpable, unless you can also look at the cars in front and behind. Indeed in many states driving too slowly is only against the law if it impedes the reasonable progress of other cars. By its very nature, it will always be difficult to pinpoint a systems effect unless the entire system is within the scope of observation. In our example of regulatory traffic jams, we postulated a high level of noncompliance across the industry, despite good faith efforts. But this does not indicate which specific violation may have resulted from a systemic effect any more than observing a local rainstorm can tell us whether it is due to climate change. Surely some

regulated parties would try to excuse noncompliance as “involuntary” and “good faith.” But identifying the real cause is important, because the enforcement responses are different. Thus a key challenge is to determine what factors we would use to identify traffic jam violations and distinguish them from bad-actor noncompliance or good-apple inadvertance. Put another way, one threshold question is whether inspectors can determine that what they observe as noncompliance is in fact the result of a traffic jam.

The short answer is “no,” not in any meaningful sense. Unlike a traffic cop, who might move swiftly on a motorcycle through jammed cars and assume vantage points to view the cause and backed-up cars well into the distance, a regulatory compliance field inspector is to a large extent limited to observing only one or a few “cars” at a time. Noncompliance at that level of detail and pace of observation simply reduces to observation of discrete events. Identifying the patterns and symptoms of an industry-wide regulatory traffic jam is beyond any one person’s capacity under those circumstances. Of course, an experienced inspector may begin to detect patterns over time, to hear and see the same story unfold countless times, to exchange those stories with colleagues, and begin to wonder whether there isn’t some more holistic explanation at work besides “goofs.” But how would he or she confirm that suspicion?

Although much stock has been placed in both of the conventional models of regulatory compliance behavior, in truth, both rest at bottom on behavioral theories that postulate indicia of the respective behavioral trait and then rely for confirmation through the trial and error of policy responses. The two models predict cause and effect: If you do X to this regulated party, Y will follow. The good apple model, for example, rests on prescribed behavioral traits of the good apple, such as adoption of environmental management systems and well-funded corporate compliance efforts, and postulates that a policy of facilitation will work with those traits to improve compliance performance. We “find” good apples under this model when facilitation policies actually do correlate with improved compliance performance (though in the end we can never be sure that true good apple ethic and not the bottom line was the reason). Similarly, the rational polluter model is simply a theory of self-interested economic behavior, one we can test by observing responses to different sanction and incentive policies. When a firm’s behavioral response elides with the model’s prediction, we have identified a rational actor

(though we can never be sure compliance wasn't motivated by sheer good will).⁷⁶

So, how do we "find" regulatory traffic jams? Simple—do it in the same manner, by developing a theory of the behavioral trait and designing policies to test for its presence and adjust for its effects. One reviewer of an early draft of this paper likened our argument to that of astronomers proving the existence of "dark matter" in the universe. Once astronomers have accounted for all known sources of matter, there is still a large amount that must exist but that cannot be located by current sensing technology. Similarly, to date, conventional environmental policy has largely been designed to test, confirm, and react to only the two established, and in large part opposing, behavioral models, both of which operate at firm-specific levels. The EPA and other environmental agencies have only recently begun to consider seriously that they may be part of the problem, and even then with little attention to system-level effects.

Notwithstanding the tremendous amount of attention environmental agencies, policy analysts, and scholars have paid to "regulatory reinvention," it has been pitched primarily as a refinement of the sanction and facilitation models, and thus intended to be channeled through the firm-specific behavioral responses predicted under the rational-polluter and good-apple models. Little attention has been paid to the systems level question. The relevant question under the systems model is whether there is a component of noncompliance that does not respond to sanction and facilitation policies that are intended to illicit firm-specific behavioral responses. To answer this will require (1) identifying instances when sanction and facilitation policies do *not* lead to improvements in compliance performance, (2) doing so on a statistically meaningful basis across industrial sectors and regulatory programs, and (3) testing the effect alternative policy responses have on this identified component of noncompliance. Of course, regulatory agencies will have a disincentive to undertake either task: The first suggests flaws in current policy, the second is a daunting undertaking, the third ventures into the unknown and risks failure.

Indeed, agencies may protest, "why do any of this, instead of squeezing out the final increment of noncompliance by putting more resources into sanction and facilitation?" The answer is that, as we have

76. Indeed, to a certain extent the good and bad apple models are rather arbitrary categories for sorting purposes. Why, for example, should compliance to avoid costs (which is regarded as a bad apple behavior) be considered different than compliance to avoid bad public relations (a good apple motivation)?

demonstrated, this final increment appears to be neither insignificant nor responsive to additional sanction and facilitation resources, even of the reinvented variety. If we believe that solving this increment of “residual” or “unexplained” noncompliance will yield environmental benefits that justify the policy investment (a matter we will assume for these purposes),⁷⁷ the time seems ripe for considering a third possible explanation for its presence—the regulatory traffic jam—and designing appropriate policy responses. Yet nobody has done a very good job of explaining the indicia of a traffic jam, much less describing the problem in these terms.

And what might those policy responses look like? The two conventional behavioral models have their respective policy response models: The rational-polluter model leads to sanction-based policies; the good-apple model leads to facilitation-based policies. Our systems model leads, not surprisingly, to systems-based policies. In the world of transportation, chronic traffic jams pose serious, if not the *most* serious, solution design challenges. Any day’s rush hour traffic jam may be eased by removing a broken-down car from the road, but true gridlock is not so easy to solve. Transportation experts move to system models of traffic flow, road capacity, and other system behavior characteristics. The point is that if the system is the problem, the solution is to change the system—a new interchange, another lane, an alternative route. So, too, it must be in the case of regulatory traffic jams. Viewed from this perspective, the policy implication is that programs such as EPA’s Project XL and other “alternative path” initiatives are on the right track, for they fundamentally alter the manner in which the system behaves.⁷⁸ These and other initiatives drive the creation of environmental management systems—business frameworks that treat ensuring compliance as a systems problem.

We are not by any means proposing innovation for innovation’s

77. This is a huge issue in its own right. The relevance of compliance with environmental regulations as an accurate proxy for environmental protection has long been a contested issue. Unlike with most OSHA regulations, for example, the link between following a record keeping requirement or permit and improved environmental protection is often indirect, at best. As described earlier, however, the reliance on self-monitoring and reporting drives this dependence on creating a paper trail of compliance. At the end of the day, though, the legitimacy of environmental law derives from its protection of health and the natural world through compliance with its many mandates, not the compliance activity itself.

78. See, e.g., Dennis D. Hirsch, *Symposium Introduction: Second Generation Policy And The New Economy*, 29 CAP. U.L. REV. 1 (2001); Dennis D. Hirsch, *Project XL and the Special Case: The EPA's Untold Success Story*, 26 COLUM. J. ENVTL. L. 219 (2001); Richard B. Stewart, *A New Generation Of Environmental Regulation?*, 29 CAP. U.L. REV. 21 (2001).

sake, or for the sake of easing up on industry. We also readily admit that some of the reinvention programs may have created more problems than they sought to remedy.⁷⁹ Rather, as previously noted, the first element in our proposal is the development of far more robust databases and statistical information on the responses of compliance behavior to regulatory policies. Where sanction and facilitation appear not to move compliance performance as their respective models would predict, or do so only inefficiently, then we suggest that testing regulatory system innovations is warranted.

While we suspect the environmental regulation system has reached this point for many industries and programs, we cannot prove it with the empirical evidence at hand. To be fair, though, the existing data on noncompliance overall remains weak, meaning that even the rational actor and good apple models rest on thin empirical ice.⁸⁰ We believe that our traffic jams model rest on sound theoretical foundations, as sound as the rational actor and good apple models. We do not contend that the theory explains all of noncompliance, but neither can the theory supporting either of the other two models. Rather, we contend that using all three models leads to a more complete picture of the various factors leading to regulatory noncompliance. The next step, we therefore urge, is to modify our ongoing empirical research efforts so they ensure meaningful coverage of the complete theory of noncompliance. What is needed, in other words, is a concerted effort to test the effectiveness of all *three* behavioral models of noncompliance and, carefully and deliberately, design regulatory policies that would take advantage of each.

79. See, e.g., Rena I. Steinzor, *Myths of the Reinvented State*, 29 *Cap. U. L. Rev.* 223 (2001).

80. As researchers on compliance theory have described,

Scholarly attention has focused much more on building credible arguments for particular points of view than on evaluating their effectiveness based on actual experience in the field. As a result, there is little in the way of empirical evidence that can be used in deciding which enforcement techniques [approaches based on deterrence or cooperation] are most likely to achieve regulatory goals.

Raymond J. Burby & Robert G. Paterson, *Improving Compliance with State Environmental Regulations*, 12 *J. POL'Y ANALYSIS & MGMT.* 753, 757 (1993) as quoted in Rechtschaffen, *supra* note 3, at 1205. Indeed EPA itself has acknowledged that better data are needed to understand the drivers of compliance and noncompliance. See Silberman, *supra* note 7 (describing the long-range compliance study underway).

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