

ECONOMIC EFFICIENCY VERSUS PUBLIC CHOICE: THE CASE OF PROPERTY RIGHTS IN ROAD TRAFFIC MANAGEMENT

JONATHAN REMY NASH*

Abstract: This Article argues, using the case of responses to traffic congestion, that public choice theory provides a greater explanation for the emergence of property rights than does economic efficiency. The traditional solution to traffic congestion is to provide new roadway capacity, but that is not an efficient response in that it does not lead to internalization of costs and may actually exacerbate congestion problems by inducing travel that would not have taken place but for the new construction. By contrast, congestion charges, which impose tolls designed to internalize the costs of driving, offer an efficient way to address the problem of congestion. Nonetheless, the continued popularity of providing new roadway capacity turns upon public choice theory. New roadway construction is attractive for politicians as a way to satisfy both constituents generally, and well-organized and powerful interest groups in particular. Although congestion charging regimes tend to be less popular across the board politically, there appears currently to be a shift in position. This Article argues that it is possible for concerns of efficiency to override (or at least to curtail) politics when the inefficiencies of a response grounded in political economy become too large. But at the same time, public choice theory continues to hold considerable sway—the shift toward congestion pricing may require not only pressing efficiency concerns, but also a shift in the political climate.

* Copyright © 2008 Jonathan Remy Nash, Visiting Professor, The University of Chicago Law School, 2007–08; Robert C. Cudd Professor of Environmental Law, Tulane Law School. I am grateful to the following individuals for helpful comments and discussions: Adam Babich, Vicki Been, Oscar Chase, Eric Claeys, Michael Collins, Lee Fennell, Brett Frischmann, Gunther Handl, Shael Herman, Michael Herz, Oliver Houck, Shi-Ling Hsu, F. Scott Kieff, Marjorie Kornhauser, Douglas Kysar, Daryl Levinson, Clarisa Long, Jan Ramberg, Richard Revesz, J.B. Ruhl, Simon Tay, Lucinda Turner, and Elizabeth Winston. I benefited from comments received at presentations at the annual meeting of the Canadian Law and Economics Association, at the annual meeting of the Midwestern Law and Economics Association, at the Eighth Global Conference on Environmental Taxation, at a session of the Energy and Environment seminar at Tulane Law School, before the University of Chicago Law School's Environmental Law Society, and from faculty workshops at Florida State University College of Law and Hofstra Law School. Michael Bartolone, Heather Heilman, Norberto Pagán, and Jaclyn Strassberg provided excellent research assistance.

INTRODUCTION

Two theories on the emergence and development of property rights regimes dominate the current law and economics literature.¹ One is the optimistic idea that economic efficiency drives the definition and resolution of property rights.² The second theory is grounded in public choice and is far more pessimistic.³ On this account, property rights come about when those with the most power in fact want them to come about.⁴ Commentators debate which of these theories, or perhaps more accurately what combination of them, best explains the development of property rights regimes in particular settings.⁵

This Article addresses these questions in the specific setting of the societal response to a growing problem on the nation's roads: traffic congestion.⁶ As land development continues to consume previously unoccupied land, more people drive more vehicles greater distances.⁷ The result is traffic—lots of it.⁸ And lots of traffic has many deleterious effects for society, including time delays, for both people and freight; the magnification of the environmental impact of driving; and, of late, "road rage."⁹

¹ See Saul Levmore, *Two Stories About the Evolution of Property Rights*, 31 J. LEGAL STUD. S421, S423-33 (2002); Thomas W. Merrill, *Explaining Market Mechanisms*, 2000 U. ILL. L. REV. 275, 278-81 (describing competing theories for the development of market-based mechanisms to govern environmental resource management: wealth-maximization theory, based on maximizing Kaldor-Hicks efficiency, and distribution theory, based upon interest groups and politics); see also Katrina Miriam Wyman, *From Fur to Fish: Reconsidering the Evolution of Private Property*, 80 N.Y.U. L. REV. 117, 119-24 (2005) (contrasting the Demsetzian approach with an approach that takes account of the role of political institutions in the development of property rights).

² See Levmore, *supra* note 1, at S423-25; Merrill, *supra* note 1, at 278-80.

³ See Levmore, *supra* note 1, at S425-33; Merrill, *supra* note 1, at 280-81.

⁴ See Levmore, *supra* note 1, at S425-33; Merrill, *supra* note 1, at 280-81.

⁵ See Levmore, *supra* note 1, at S433-50; Merrill, *supra* note 1, at 286-89.

⁶ See *infra* notes 53-433 and accompanying text.

⁷ See, e.g., William W. Buzbee, *Urban Sprawl, Federalism, and the Problem of Institutional Complexity*, 68 FORDHAM L. REV. 57, 71-74 (1999) (discussing the traffic implications of urban sprawl).

⁸ See, e.g., Tirza S. Wahrman, *Breaking the Logjam: The Peak Pricing of Congested Urban Roadways Under the Clean Air Act to Improve Air Quality and Reduce Vehicle Miles Traveled*, DUKE ENVTL. L. & POL'Y F. 181, 181-82 (1998) ("As a nation, we are increasingly stuck in traffic. . . . Traffic congestion has increased rapidly in urban areas where growth in volume of motorists has risen faster than the growth in roadway capacity.").

⁹ See R.H.M. EMMERINK, INFORMATION AND PRICING IN ROAD TRANSPORTATION 3-4 (1998); ROBERT G. MCGILLIVRAY, ON ROAD CONGESTION THEORY 2 (1974); Robert F. Blomquist, *American "Road Rage": A Scary and Tangled Cultural-Legal Pastiche*, 80 NEB. L. REV. 17, 36-37 (2001); Lior Jacob Strahilevitz, *How Changes in Property Regimes Influence Social Norms: Commodifying California's Carpool Lanes*, 75 IND. L.J. 1231, 1237 (2000); Wahrman, *supra* note 8, at 182.

Traffic congestion presents an excellent setting in which to gauge the effectiveness of the competing explanations for the development of property and governance regimes because the two outcomes toward which each alternative moves differ so clearly.¹⁰ The public choice explanation leads to the "solution" of expanding roadway capacity, whereas economic efficiency argues in favor of more market-based regulatory regimes governing roadway access and usage.¹¹ In other words, efficiency argues in favor of greater property rights, while public choice instead advocates for reducing scarcity and thus reducing the demand for property rights.¹²

Because roads are largely supplied to the public at large by the government, congestion tends to be a problem that concerns politicians.¹³ The traditional solution to a congestion problem is simple: build more roads.¹⁴ This can mean the addition of new lanes to existing roadways, or it can mean the construction of entirely new thoroughfares, expressways, and freeways.¹⁵ A more general formulation of this approach is the provision of new roadway capacity.¹⁶

New roadway capacity, however, is not an efficient way to address traffic congestion.¹⁷ Even if congestion is abated, the fact remains that providing roadway capacity fails to address the fundamental underlying economic problem—the ability of roadway users to externalize costs on other roadway users and on society at large.¹⁸ The provision of new roadway capacity does not require or lead to the internalization of

¹⁰ See *infra* notes 148–199 (explaining the application of the public choice theory to traffic), 200–394 (explaining the efficiency of congestion pricing).

¹¹ See *infra* notes 148–394.

¹² See *infra* notes 148–394.

¹³ See LEE MERTZ, U.S. DEP'T OF TRANSP., ORIGINS OF THE INTERSTATE, <http://www.fhwa.dot.gov/infrastructure/origin.pdf> (last visited Mar. 23, 2008) (detailing the history of the federal involvement with the Interstate Highway system); see also Robert Jay Dilger, *TEA-21: Transportation Policy, Pork Barrel Politics, and American Federalism*, 28 *PUBLICUS* 49, 50 (1998) (describing the relative attractiveness of road projects to politicians, and the size and import of congressional transportation committees).

¹⁴ See EMMERINK, *supra* note 9, at 4.

¹⁵ See *infra* notes 148–199 and accompanying text.

¹⁶ See *infra* notes 148–199 and accompanying text.

¹⁷ See Lewis M. Fulton, Robert B. Noland, Daniel J. Meszler & John V. Thomas, *A Statistical Analysis of Induced Travel Effects in the U.S. Mid-Atlantic Region*, 3 *J. TRANSP. & STAT.* 1, 13 (2000) [hereinafter Fulton et al.]; Robert B. Noland & William A. Cowart, *Analysis of Metropolitan Highway Capacity and the Growth in Vehicle Miles of Travel*, 27 *TRANSPORTATION* 363, 387–88 (2000), available at <http://www.cts.cv.ic.ac.uk/documents/publications/iccts00028.pdf>; Robert B. Noland, *Relationship Between Highway Capacity and Induced Vehicle Travel*, 35 *TRANSP. RES. PART A* 47, 70 (2001).

¹⁸ See Wahrman, *supra* note 8, at 196.

costs.¹⁹ As such, it encourages an inefficiently high level of use of the resource.²⁰ Neither does new capacity allocate roadway capacity efficiently to those who value it most.²¹

Moreover, not only is the generation of new roadway capacity not an efficient way to address congestion, over time new capacity may serve to *exacerbate* congestion problems.²² This is because of the phenomenon of "induced travel."²³ Essentially, new roadway capacity may induce additional travel that would not have taken place but for the new construction.²⁴

By contrast, congestion charges offer an efficient way to address the problem of congestion.²⁵ As opposed to simple tolls (which tend to be uniformly priced and are intended simply to finance the maintenance of the roadway or to augment government coffers), congestion charges are, simply put, tolls that are designed to force drivers to internalize the congestion costs that their driving imposes on other drivers.²⁶ By forcing drivers to internalize at least some of the negative externality that they impose by using roadways, a system of congestion charges is likely to reduce roadway usage closer to an efficient level.²⁷ Also, the use of charges is more likely to result in the allocation of the resource of roadway usage to those who value it most.²⁸

Despite its inferiority in terms of efficiency, the provision of new roadway capacity remains by far the more popular option.²⁹ The reason for this can be found by looking to public choice theory.³⁰ On the one

¹⁹ See *infra* notes 148–199 and accompanying text.

²⁰ See *infra* notes 148–199 and accompanying text.

²¹ See *infra* notes 148–199 and accompanying text. It is possible that positive network externalities may outweigh the inefficiencies I identify in the text. As I discuss below, however, relying on these positive externalities to justify new roadway construction as a response to traffic congestion is, at best, dubious. See *infra* notes 141–156 and accompanying text.

²² See Fulton et al., *supra* note 17, at 2.

²³ See *id.* at 2–3.

²⁴ See *id.*

²⁵ See Börje Johansson & Lars-Göran Matisson, *Principles of Road Pricing*, in ROAD PRICING: THEORY, EMPIRICAL ASSESSMENT AND POLICY 7, 7–8 (Börje Johansson & Lars-Göran Matisson eds., 1995) [hereinafter ROAD PRICING].

²⁶ See *id.*

²⁷ See *id.*

²⁸ See *id.*

²⁹ See EMMERINK, *supra* note 9, at 4. See generally U.S. GEN. ACCOUNTING OFFICE, REPORT TO THE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS, U.S. SENATE, DEVELOPING STRATEGIES FOR ENHANCING MOBILITY: A NATIONAL CHALLENGE (2002) [hereinafter GAO, DEVELOPING STRATEGIES], available at <http://www.gao.gov/new.items/d02775.pdf>.

³⁰ See Buzbee, *supra* note 7, at 80; see also Peter T. Kilborn, *In Rural Areas, Interstates Build Their Own Economy*, N.Y. TIMES, July 14, 2001, at A1.

hand, new roadway construction tends to be very attractive for politicians as a way to satisfy both constituents generally and interest groups that tend to be well-organized and powerful.³¹ On the other hand, congestion charging regimes—depending upon the setting in which they are introduced—tend to be less popular across the board politically.³²

A study of the evolution of government responses to traffic congestion provides insight into which theory of the development of property rights regimes—efficiency or public choice—holds sway under particular circumstances.³³ The fact that providing new roadway capacity remains more popular suggests the dominance of the public choice explanation for the development of property rights over the theory grounded in efficiency.³⁴

At the same time, there appears currently to be something of a shift in position.³⁵ In recent years, Congress has authorized pilot congestion charging regimes.³⁶ Moreover, experimentation with congestion pricing programs is growing overseas—including a notable program in London—and a serious proposal for congestion pricing recently emerged to govern and reduce traffic in New York City's central business district.³⁷ Further, President Bush's Secretary of Transportation, Mary Peters, is a strong advocate of congestion pricing.³⁸ This suggests that, though political economy tends to be a powerful force, it is possible for concerns of efficiency to override (or at least to curtail) that force when the inefficiencies of a response grounded in political economy become too large.³⁹

Yet, even in the face of weighty efficiency arguments in favor of congestion pricing, political opposition to such programs remains vital

³¹ See Buzbee, *supra* note 7, at 80 ("Real estate and transportation construction interests have substantial monetary incentives to favor continued government expenditures on the highways . . . that are essential to urban sprawl.").

³² See, e.g., Strahilevitz, *supra* note 9, at 1245–49 (describing objections to congestion pricing); Wahrman, *supra* note 8, at 204 ("Public resistance to congestion pricing is understandable . . .").

³³ See *infra* notes 148–199 and accompanying text.

³⁴ See *infra* notes 179–199 and accompanying text.

³⁵ See, e.g., Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, Pub. L. No. 109-59, § 1604, 119 Stat. 1144, 1249–50 (2005) (codified as amended at 23 U.S.C. § 149 (2000 & Supp. V 2005)) (continuing federal involvement in congestion pricing projects begun in 1991).

³⁶ See *id.*

³⁷ See *infra* notes 251–257, 413–421 and accompanying text.

³⁸ See Matthew L. Wald, *Bush Chooses Transportation Nominee*, N.Y. TIMES, Sept. 6, 2006, at A15.

³⁹ See *id.*

and often successful.⁴⁰ First, although it was not enacted in that form, the Senate considered a bill that would have curtailed the pilot programs, thus showing the continued strength of political opposition to congestion pricing.⁴¹ Second, consider that even in New York City—a relatively politically homogeneous municipality in which reliance upon public transit is already well-established and far exceeds the national norm—opposition to congestion pricing proved strong enough to keep congestion pricing proposals from moving beyond the proposal stage.⁴²

Moreover, political economy also offers an explanation for the present shift toward greater embrace of congestion pricing.⁴³ The frontiers of congestion pricing—that is, those settings where congestion pricing seems to be growing fastest—are, other than heavily urbanized areas where the addition of new roadways is essentially not an option, settings in which new roadway construction will be subject to congestion pricing.⁴⁴ Such an approach blunts political opposition to congestion pricing on the ground that it imposes new fees because existing roadways remain accessible at no charge.⁴⁵ It also draws support from the powerful construction and real estate industries as well as organized labor—all of which tend to benefit from new road construction.⁴⁶ Finally, the introduction of congestion pricing offers a benefit to a small but growing constituency: industries that research and manufacture the technologies used to implement congestion pricing regimes.

Part I of this Article examines the two competing economic explanations for the development of property rights.⁴⁷ Part II presents an

⁴⁰ See, e.g., Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2004, S. 1072, 108th Cong. § 1609(c)(1) (2004) (seeking to repeal the authorization of future value-pricing programs).

⁴¹ See *id.* The same proposal, however, would have allowed the continuation of those programs already in place. See *id.* § 1609(c)(2).

⁴² See, e.g., Andy Newman, *Outside Manhattan, Many Oppose Bloomberg's Traffic Plan*, N.Y. TIMES, June 9, 2007, at B1 (detailing the opposition to a proposal to charge drivers eight dollars to drive in the most congested parts of Manhattan).

⁴³ See Strahilevitz, *supra* note 9, at 1247 (noting that users see themselves as entitled to use freely existing roadways but that congestion pricing receives greater support for newly constructed toll roads).

⁴⁴ See U.S. Dep't of Transp., List of Projects by Type, <http://www.fhwa.dot.gov/policy/otps/projectlist.htm> (last visited Mar. 28, 2008) [hereinafter List of Projects by Type] (listing areas where congestion pricing is under study for new roadway construction).

⁴⁵ See Strahilevitz, *supra* note 9, at 1247.

⁴⁶ See Buzbee, *supra* note 7, at 80 ("Real estate and transportation construction interests have substantial monetary incentives to favor continued government expenditures on the highways . . .").

⁴⁷ See *infra* notes 53–83 and accompanying text.

overview of the economics of roadway usage.⁴⁸ Parts III and IV evaluate the provision of new roadway capacity and congestion charging from the perspectives of efficiency and political economy.⁴⁹ These Parts argue that congestion charges are preferable from an efficiency standpoint but that the provision of new roadway capacity is today much more likely to be the political system's response to congestion problems.⁵⁰ Part V considers whether a recent movement toward greater acceptance of congestion pricing may reflect the ascension of the efficiency theory; it uses New York City's recent flirtation with congestion pricing as a case study.⁵¹ This Article concludes, however, that the public choice account continues to have greater explanatory power.⁵²

I. COMPETING ECONOMIC EXPLANATIONS FOR THE EVOLUTION OF PROPERTY RIGHTS

Commentators have identified two primary reasons for the development of property rights.⁵³ One theory is based upon notions of economic efficiency.⁵⁴ The other is based upon support for property rights development on the part of powerful interest groups.⁵⁵

First, building upon the work of Harold Demsetz,⁵⁶ commentators have argued that economic efficiency drives the development and evo-

⁴⁸ See *infra* notes 84–147 and accompanying text.

⁴⁹ See *infra* notes 148–394 and accompanying text.

⁵⁰ See *infra* notes 148–394 and accompanying text.

⁵¹ See *infra* notes 395–433 and accompanying text.

⁵² See *infra* notes 423–433 and accompanying text.

⁵³ See, e.g., Levmore, *supra* note 1, at S423–33; Merrill, *supra* note 1, at 278–81.

⁵⁴ See Levmore, *supra* note 1, at S423–25; Merrill, *supra* note 1, at 278–80.

⁵⁵ See, e.g., Levmore, *supra* note 1, at S423–33; Merrill, *supra* note 1, at 278–81; see also Wyman, *supra* note 1, at 119–24. Saul Levmore characterizes the efficiency theory, which he refers to as the “transaction-cost” story, as more optimistic than the more pessimistic public choice theory, which he refers to as the “interest-group” story. See Levmore, *supra* note 1, at S432. Thomas Merrill does not seem to afford any greater moral approval to the public choice theory by his use of the monicker “distributional theory.” See Merrill, *supra* note 1, at 280–81. Merrill explains that, because the efficiency theory, which he refers to as the “wealth maximization theory,” looks only to overall societal balance between benefits and costs, it cares only that a surplus of benefits over costs exists, not how that surplus is distributed among societal actors. See *id.* at 278–79. Conversely, the public choice theory takes into account the distribution of assets—indeed, it may generate property rights regimes that “fail to maximize societal wealth.” *Id.* at 280. The distribution that emerges, however, will not be based (at least not reliably) upon equitable considerations, but rather upon the political power of various interest groups. See *id.* (“[Society] will adopt those regimes whose distributional features are most favorable to the groups that can organize most effectively to influence the political process.”).

⁵⁶ See generally Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. 347 (1967).

lution of property rights.⁵⁷ Economic efficiency is measured by total wealth maximization, using a Kaldor-Hicks measure of efficiency.⁵⁸ The notion here is that property rights will be introduced to the extent that, and in a way such that, the benefits derived from delineating and enforcing property rights exceed the attendant costs.⁵⁹ The absence of a property regime (or the absence of a sufficiently mature property regime) may mean that, where a resource is scarce, societal actors engage in "rent dissipation"—wasteful activity to try to capture the economic rents associated with the scarce resource—and that users of the resource are able to externalize costs on others and thus artificially keep their own costs down.⁶⁰ Thus, the introduction of a property regime (or, as appropriate, the introduction of a more mature property regime) offers the benefit of reducing these problems.⁶¹ But the implementation (or upgrade) of a property rights regimes has costs as well, including "the costs of defining property rights, identifying the owners of such rights, and protecting the rights against interference by others."⁶²

The efficiency hypothesis claims that a new property regime will be implemented when the benefits of the new regime outweigh its costs.⁶³ It also claims that an existing property rights regime will be dismantled (and perhaps a less mature regime introduced) when the costs of the regime exceed its benefits.⁶⁴ These claims make it possible to identify several conditions that will determine whether, and when, regimes will be created or dismantled: resource scarcity, externality size, and administration costs.⁶⁵ First, as a resource grows scarcer, it is more likely that a property regime governing the resource will be introduced; conversely, if the resource becomes more readily available, a property regime becomes less necessary.⁶⁶ Second, as the externalities associated with re-

⁵⁷ See, e.g., Merrill, *supra* note 1, at 278-79; Wyman, *supra* note 1, at 117-24.

⁵⁸ See RICHARD A. POSNER, *THE ECONOMICS OF JUSTICE* 88-103 (1981) (explaining the wealth-maximization principle of Kaldor-Hicks efficiency, and differentiating the same from Pareto efficiency).

⁵⁹ See Levmore, *supra* note 1, at S423-25; Merrill, *supra* note 1, at 278-80.

⁶⁰ Merrill, *supra* note 1, at 278.

⁶¹ *Id.*

⁶² *Id.*

⁶³ See Levmore, *supra* note 1, at S424-25.

⁶⁴ See *id.* (noting that the evolution of property rights is not a one-way street and discussing the possibility of property rights regimes devolving).

⁶⁵ See, e.g., Demsetz, *supra* note 56, at 350; Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 5-8; Henry E. Smith, *Exclusion Versus Governance: Two Strategies for Delineating Property Rights*, 31 J. LEGAL STUD. S453, S462-63 (2002).

⁶⁶ See, e.g., Rose, *supra* note 65, at 5-8 (describing how greater scarcity of a resource may prompt environmental regulation).

source use become larger, it becomes more cost-effective to have a property regime, with a property regime becoming less cost-effective as externalities shrink.⁶⁷ Third, a reduction in administrative costs makes a property rights regime more likely; an increase makes one less likely.⁶⁸

A second explanation that commentators offer to explain the development of property rights is grounded upon the theory of public choice.⁶⁹ In general, public choice theory looks at government action as the result of a "market for government action."⁷⁰ Under this model, government actors take steps that are designed to maximize their chances of remaining in power; for legislators, this means taking actions that maximize their reelection chances.⁷¹

The public choice model predicts that government actors will act in response to pressure brought by interest groups.⁷² Interest groups give rise to demand for certain government actions, and government actors offer supply in the form of support for different government actions.⁷³ Thus, an action is more likely to be taken when it is (i) demanded by more, and more powerful, interest groups, and (ii) supported by more, and more powerful, government actors. In the environmental arena, relevant interest groups are likely to be industry actors or groups and environmental interest organizations.⁷⁴

⁶⁷ See, e.g., Demsetz, *supra* note 56, at 350; Smith, *supra* note 65, at S462-63.

⁶⁸ See, e.g., Smith, *supra* note 65, at S464 (noting that "with the invention of barbed wire, [the marginal cost of delineating property rights] shifts down, and we get more activity in delineating and enforcing rights to grazing areas").

⁶⁹ See generally DANIEL A. FARBER & PHILIP P. FRICKEY, *LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION* (1991).

⁷⁰ See *id.*

⁷¹ See generally DAVID R. MAYHEW, *CONGRESS: THE ELECTORAL CONNECTION* (2d ed. 1974).

⁷² See FARBER & FRICKEY, *supra* note 69, at 12-37 (describing the role of interest groups in the political process).

⁷³ See Nathaniel O. Keohane et al., *The Choice of Regulatory Instruments in Environmental Policy*, 22 HARV. ENVTL. L. REV. 313, 325-46 (1998) (describing such a marketplace for environmental regulation).

⁷⁴ Bruce Yandle makes the quintessential argument that environmental regulation is the result of a perhaps surprising alliance between environmental "public interest" organizations and industry, or firms within an industry. See BRUCE YANDLE, *COMMON SENSE AND COMMON LAW FOR THE ENVIRONMENT* 68-82 (1997) (drawing the parallel between the alliance between Baptists and Bootleggers to produce "Sunday Blue Laws" and contrasting the "Baptist and Bootlegger" model with other models of regulation). For an argument that environmental interest organizations act in their own political and economic self-interests, see Todd J. Zywicki, *Environmental Externalities and Political Externalities: The Political Economy of Environmental Regulation and Reform*, 73 TUL. L. REV. 845, 874-88 (1999). For deeper study of environmental organizations from the perspective of political economy, see generally Todd J. Zywicki, *Baptists? The Political Economy of Environmental Interest Groups*, 53 CASE W. RES. L. REV. 315 (2002).

Although it retains a focus on the actions and demands of interest groups, public choice theory does not suggest that government actors will be oblivious to, or act blithely contrary to, the broadly held wishes of their constituents.⁷⁵ Ultimately, for legislators and executives, it is the electorate who decides whether they will remain in power. The question remains how public opinion may reach and influence politicians. First, it is conceivable that "voters sometimes exercise influence in ways that bypass interest groups."⁷⁶ Second, public choice theory recognizes the possibility that public opinion on an issue will be enlisted by "political entrepreneurs."⁷⁷ Political entrepreneurs harness latent public sentiment to achieve particular goals—usually the advancement of the political entrepreneur's career, though perhaps also furthering the public interest.⁷⁸ Note that representatives of special interest organizations—

⁷⁵ See, e.g., FARBER & FRICKEY, *supra* note 69, at 21. After analyzing possible motives for the behavior of legislators, Farber and Frickey conclude that

contemporary political science research concerning interest groups and legislator behavior suggest a complex political world ill fitting any simple formula. To be sure, the national political process appears vulnerable on a variety of fronts, including domination largely by narrow economic interests and reelection posturing by representatives. These concerns are reinforced by [the economic theory of legislation].

Id.

⁷⁶ David B. Spence, *A Public Choice Progressivism, Continued*, 87 CORNELL L. REV. 397, 436 (2002). Spence elucidates:

[P]oliticians can help broader, less wealthy, mass interest groups to overcome [collective action] disadvantages, particularly in higher-salience policy debates. In debates over the kind of high-salience issues that produce major regulatory legislation (the kind that establish an agency's general mission), politicians act as political entrepreneurs, recognizing the political benefits of rallying the unorganized supporters of public interest policy goals. This is the so-called "republican moment" explanation for major regulatory legislation

....

Id. (citation omitted). Note that Spence's explanation of the phenomenon itself credits politicians as "political entrepreneurs." *Id.*; see also *infra* note 77.

⁷⁷ See, e.g., William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 IOWA L. REV. 1, 54 (2003) (noting that political entrepreneurs "emerge when they can advance politically by offering constituents a collective benefit, even where constituents lack sufficient interest to engage in concerted political action"); Clayton P. Gillette, *Plebiscites, Participation, and Collective Action in Local Government Law*, 86 MICH. L. REV. 930, 976 (1988) (referring to a "political entrepreneur" as one "who hopes to enhance his own career through the success of an organization with which he is associated, or by serving as a symbol around which diffuse, nonorganized individuals can coalesce" (citation omitted)); cf. William W. Buzbee, *Standing and the Statutory Universe*, 11 DUKE ENVTL. L. & POL'Y F. 247, 271 (2001) (describing political entrepreneurs as "[p]ublic-spirited or perhaps opportunistic").

⁷⁸ See Gillette, *supra* note 77, at 976.

in furtherance of the purported public interest or otherwise—may act as political entrepreneurs in order to use public opinion to further the agenda of the relevant interest groups.⁷⁹

The question remains open as to which of these theories, or what combination of them, most accurately describes the evolution—or devolution, or lack of evolution—of property rights under which circumstances.⁸⁰ The succeeding Parts analyze this question in the context of property rights in roadway access.⁸¹ These Parts demonstrate that one response to traffic congestion—congestion pricing—is favored under the efficiency theory, whereas another response—the provision of new roadway capacity—is favored under the public choice theory.⁸² Because the congestion pricing solution is a property-based solution whereas new roadway capacity purports to solve the problem by providing more of the resource, thus reducing scarcity, the setting of roadway access is an apt one in which to measure the accuracy of the competing theories at predicting the evolution of property rights.⁸³

II. OVERVIEW OF THE ECONOMICS OF ROADWAY USAGE

A. Roads as an Open-Access Resource

Roads tend to be provided by the government.⁸⁴ The use of most roads, moreover, is provided at no charge to individual users; the roads are funded at taxpayer expense.⁸⁵ Access to most roads is unrestricted.⁸⁶

⁷⁹ See, e.g., Hale E. Sheppard, *The NAFTA Trucking Dispute: Pretexts for Noncompliance and Policy Justifications for U.S. Facilitation of Cross-Border Services*, 11 MINN. J. GLOBAL TRADE 235, 254–56 (2002) (noting ulterior motives of unions—domestic job protection—in opposing opening the United States to trucks from Mexico under the North American Free Trade Agreement by harnessing public opinion against the idea on the ground that the agreement would compromise public safety); *id.* at 256 (noting possible ulterior motive of public interest organization—favoring rails over roads for cargo transportation—for opposing opening the United States to trucks from Mexico); Dale B. Thompson, *Political Obstacles to the Implementation of Emissions Markets: Lessons from RECLAIM*, 40 NAT. RESOURCES J. 645, 664–66 (2000) (discussing the possible role of industry representatives as political entrepreneurs to harness public opinion against application to individuals of a Los Angeles metropolitan area trading scheme designed to control nitrogen and sulfur dioxide emissions).

⁸⁰ See *infra* notes 84–433 and accompanying text (discussing this question as it relates to roadway access).

⁸¹ See *infra* notes 84–433 and accompanying text.

⁸² See *infra* notes 84–433 and accompanying text.

⁸³ See *infra* notes 84–433 and accompanying text.

⁸⁴ This was not always the case. See Robert C. Ellickson, *Property in Land*, 102 YALE L.J. 1315, 1383 (1993) (“Private toll roads were in fact familiar features of the early Nineteenth Century American landscape.”). See generally U.S. DEP’T OF TRANSP., TOLL FACILITIES IN

At low levels of usage, free roads provided by the government fall within the ambit of "public goods."⁸⁷ The classic definition describes

THE UNITED STATES: BRIDGES-ROADS-TUNNELS-FERRIES (2007) [hereinafter TOLL FACILITIES IN THE U.S.], available at <http://www.fhwa.dot.gov/ohim/tollpage/toll2007.pdf> (presenting a history of toll roads in the United States). Richard Epstein has discussed the reasons for the shift away from privately owned toll roads. See Richard A. Epstein, *The Allocation of the Commons: Parking on Public Roads*, 31 J. LEGAL STUD. 515, 522 (2002) ("The state monopoly [over highways] is intended to counteract the Balkanization of transportation services that would necessarily arise if ownership of the highway system were distributed among several private parties, each with the absolute right to exclude others."); see also Ellickson, *supra*, at 1381-85 (describing, in economic terms, the natural evolution of government provision of roads); Levmore, *supra* note 1, at S434-35 (same). But cf. Levmore, *supra* note 1, at S435-36 (providing an alternative, interest-group explanation for the provision and ownership of roads). Although roads provide a benefit for local users, the fact that they also serve a broader societal need suggests that they should be provided by governments at higher levels than local governments. See Roger Nuber, Note, *Federal Highways and Environmental Litigation: Toward a Theory of Public Choice and Administrative Reaction*, 27 HARV. J. ON LEGIS. 229, 237 (1990).

Despite the history of movement away from privately owned roads and the traditional justifications for public ownership of highways, there are some signs of a resurgence in privately owned highways, at least in some areas of the country. See, e.g., Steven Ginsberg, *A Future Free from Gridlock, for a Price: Toll Lane Network Swiftly Taking Form*, WASH. POST, Dec. 12, 2005, at A1 (describing likely construction of network of express lanes in the metropolitan Washington area, "many of which will be built and operated by private firms"); Steven Ginsberg, *Australian Firm Buys Greenway: Company Is Latest to Enter D.C. Market as Privatization Spreads*, WASH. POST, Sept. 1, 2005, at B3 (noting the purchase of a private road in the Washington, D.C., metropolitan area by "a major player . . . at a time when officials are considering privatizing many of the region's roads"); Patrick Jackson & J.L. Miller, *Privatizing Highways: Solution or Setback? Nationwide, Roads Being Leased with Mixed Results*, WILMINGTON NEWS J. (Del.), Nov. 27, 2005, at A1.

⁸⁶ See Ellickson, *supra* note 84, at 1384; Levmore, *supra* note 1, at S434-35 (offering an explanation for government provision of road access at no charge based upon the "expenses associated with toll collection"). Robert C. Ellickson argues:

Public-finance theorists argue that, once a right-of-way has been provided, the marginal costs of accommodating an additional traveler on it are close to zero (at least until the road becomes congested). When this is so, it is socially optimal not to levy tolls. In addition, especially on little traveled ways, the administrative costs of collecting tolls from trip-takers are usually prohibitive.

Ellickson, *supra* note 84, at 1384. Ellickson anticipated that technological development might facilitate toll collection—and even the use of discriminatory pricing. See *id.* at 1384 n.353. Indeed, such technological evolution has come to pass. See Wahrman, *supra* note 8, at 196 ("It is only recently that the concept [of congestion pricing] became administratively feasible with the introduction of electronic tolls and computerized toll cards.").

⁸⁶ See, e.g., 39A C.J.S. *Highways* § 1 (2003) ("The term 'highway' means a way open to all the people without distinction for passage and repassage at their pleasure . . .").

⁸⁷ Cf. Daphna Lewinsohn-Zamir, *Consumer Preferences, Citizen Preferences, and the Provision of Public Goods*, 108 YALE L.J. 377, 377 (1998) (identifying roads as an example of a public good); Emily Sherwin, *Epstein's Property*, 19 QUINNIPIAC L. REV. 697, 701 (2000) (same). See generally Bruce L. Benson, *Are Roads Public Goods, Club Goods, Private Goods, or Common Pools?* (unpublished manuscript on file with author), available at <http://garnet.acns>

public goods as fulfilling two criteria: (1) jointness in supply (or nonrival consumption), meaning that the consumption of the good by one person does not diminish or otherwise interfere with others' consumption of the good; and (2) impossibility of exclusion, meaning that, once the good is in supply, no one can be prevented from consuming the good.⁸⁸ Public roads certainly meet the latter criterion: Once a public road is opened, all members of the public are free to use the road;⁸⁹ they are an open-access resource.⁹⁰ Additionally, the use of the road by relatively few does not diminish or interfere with others' use of the road.⁹¹

This jointness in supply, however, is diminished by higher levels of usage:⁹² the use of the road by large numbers of people may lead to congestion, which will interfere with people's consumption of the good.⁹³ Tirza Wahrman explains:

.fsu.edu/~bbenson/hywys.doc (last visited Apr. 9, 2008) (describing possible economic categorizations of roads).

⁸⁸ E.g., Clayton P. Gillette & Thomas D. Hopkins, *Federal User Fees: A Legal and Economic Analysis*, 67 B.U. L. REV. 795, 801-02 (1987).

⁸⁹ See Shi-Ling Hsu, *A Two-Dimensional Framework for Analyzing Property Rights Regimes*, 36 U.C. DAVIS L. REV. 813, 838 (2003) ("Roads are an imperfect example of [j]oint [u]se because obeying traffic laws is a condition to their use. But for the most part, we have decided that transportation is important enough that there should be no exclusions, which would not be the case if, for example, tolls were imposed to alleviate congestion."); Mark A. Lemley, *Place and Cyberspace*, 91 CAL. L. REV. 521, 534 (2003) ("Roads . . . have some of the characteristics of a public good: it is difficult to exclude nonpaying users.").

⁹⁰ See Ellickson, *supra* note 84, at 1381 (noting the important distinction, ignored by Garrett Hardin, between open-access property, which anyone can enter, and limited-access property, which is open only to a limited portion of the populace); Thomas W. Merrill, *Introduction: The Demsetz Thesis and the Evolution of Property Rights*, 31 J. LEGAL STUD. S331, S335 (2002) (noting the same distinction and observing that it was ignored by Harold Demsetz).

⁹¹ See Wahrman, *supra* note 8, at 196.

⁹² See *infra* Figure 1 (depicting the private costs and social costs curve as collinear until a particular threshold level of trips per hour is reached, indicating that negative externalities do not arise until the threshold level is reached). Mark Hall and John Colombo explain:

Many services that are said to be public goods do not actually face an absolute indivisibility problem. Instead, it is merely difficult or uneconomical to assess each consumer's benefit and, therefore, charge him or her appropriately. For instance, when the government builds a road, it sometimes erects a toll booth to charge the particular drivers who use the road, suggesting that a private good is involved. It is not impossible to do this for every road, but in most circumstances this form of revenue collection is less efficient than simply taxing all residents. Thus, some goods become "public" at one price (or level of production) but not at another.

Mark A. Hall & John D. Colombo, *The Donative Theory of the Charitable Tax Exemption*, 52 OHIO ST. L.J. 1379, 1395 (1991).

⁹³ See Wahrman, *supra* note 8, at 196.

Congestion is a classic negative externality. As additional road users occupy the road, the quality of service provided to all users declines. When drivers use a highway, they do not pay the costs they are imposing on other drivers by adding to their delay. The only "costs" incurred by the single driver are running costs and her own time delay. Traffic should flow smoothly at the speed limit. As traffic increases, however, the eventual addition of one more vehicle will slow the flow and increase the travel time of other vehicles. At this point, congestion begins.⁹⁴

Roads thus do not fall within the definition of a classic public good.⁹⁵ They are, rather, "congestible public goods."⁹⁶ At higher levels of usage, the road is an open-access resource for which use by an individual generates negative externalities on other users.⁹⁷ The externalities arise because of the differential between the costs that individual users see

⁹⁴ *Id.*

⁹⁵ Börje Johansson and Lars-Göran Mattsson explain ways in which roads fall within, and outside, the definition of a classic public good. See Johansson & Mattsson, *supra* note 25, at 9-10. They distinguish between actual use of a road as opposed to a road's potential capacity. See *id.* at 9. Viewed in terms of its capacity, a road "can be appreciated over time as a potential capacity, even by those individuals who do not use it regularly." *Id.*

With respect to use, Johansson and Mattsson explain that "[t]he use of a road is . . . only nonrivalrous within given bounds" (i.e., to the extent that congestion does not develop). *Id.* at 10. As such, only "within limits" can "the normal use of road space . . . be categorised as collective." *Id.*

In analyzing a road's potential capacity, Johansson and Mattsson analogize to a firehouse: just as "[t]he capacity of the fire brigade is kept in readiness," the potential capacity of a road highlights its "insurance aspect" or "readiness feature." *Id.* Moreover, this "potential value" is "not necessarily rivalrous." *Id.* Thus, "road capacity is . . . a public resource with regard to its insurance properties." *Id.*

⁹⁶ *E.g.*, Gillette & Hopkins, *supra* note 88, at 802 n.23 ("[G]oods may have 'public' characteristics without being 'pure' public goods. For instance, congested public goods, like highways or national parks, may exist in which use is nonrival up to a point, although additional users may reduce the enjoyment of other users."); John A. Henning, Jr., Comment, *Mitigating Price Effects with a Housing Linkage Fee*, 78 CAL. L. REV. 721, 743 (1990).

⁹⁷ Even at low levels of roadway usage, driving a vehicle generates pollution that may, in whole or in part, be an externality. To the extent that is the case, however, the externality is the result of driving, not usage of any particular roadway. Congestion itself, however, may exacerbate the amount of pollution generated; the marginal additional pollution is an externality that results from congestion. See *infra* Figure 1; see also Craig N. Oren, *Getting Commuters Out of Their Cars: What Went Wrong?*, 17 STAN. ENVTL. L.J. 141, 201 (1998) (noting that "traffic congestion and air pollution are not entirely congruous problems, and so have different solutions" and that "[t]rip reduction for the sake of congestion relief largely takes the form of shifting employee trips out of a narrow peak period").

and the actual total costs.⁹⁸ As congestion grows, this differential gets larger, meaning that the congestion externality worsens.⁹⁹

B. Roadway Usage and Negative Externalities

The fact that users externalize some of the costs of public roadway usage gives rise to two problems.¹⁰⁰ First, there will likely be an inefficient allocation of the roadway resource.¹⁰¹ The resource will probably not be allocated to those who value it most.¹⁰² Second, the level of road usage will not be efficient.¹⁰³ Because of the negative externalities, the roadways will be overused.¹⁰⁴

The first effect of the negative externality on roadway usage is that the scarce resource of roadway space likely will not be allocated efficiently (i.e., to those who value it most).¹⁰⁵ In the absence of any organized, top-down system, roadway space will probably be allocated on the basis of time and effort, according to a "rule of first capture."¹⁰⁶ Maintaining an open-access free roadway is tantamount to distributing a valuable resource with a price cap of zero. When scarce goods are made available at less than their true cost, a shadow market will develop in

⁹⁸ See EMMERINK, *supra* note 9, at 36.

⁹⁹ Timothy Hau elucidates:

[I]magine a motorist entering a road that is initially traffic-free. . . . As more and more vehicles enter the traffic stream, traffic speed slows, and average travel time increases. However, the cost of an incremental trip to society—the marginal cost—rises faster than its average (time) cost. If that last trip were to be averted, travel time savings to other users on the facility would in fact be reaped

Timothy D. Hau, *A Conceptual Framework for Pricing Congestion and Road Damage*, in ROAD PRICING, *supra* note 25, at 57, 58.

¹⁰⁰ See William M. Landes & Richard A. Posner, *Indefinitely Renewable Copyright*, 70 U. CHI. L. REV. 471, 486 (2003) (distinguishing between technological externalities, which impose a "real cost on third parties," and pecuniary externalities, which simply "alter[] the distribution of wealth," and noting that congestion "could impose either type of externality, or both types").

¹⁰¹ See Hsu, *supra* note 89, at 838.

¹⁰² See *id.*

¹⁰³ See generally Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968) (describing the overconsumption of goods that occurs when the costs of increased consumption are borne by the group but the benefits of consumption are reaped by the consumer).

¹⁰⁴ See *id.*

¹⁰⁵ Hsu, *supra* note 89, at 838 ("[W]hen highways become congested, [j]oint [u]se fails in that allocations of use are not necessarily made in an economically efficient manner.").

¹⁰⁶ See generally *Pierson v. Post*, 3 Cai. 175 (N.Y. Sup. Ct. 1805).

some other form of effective currency.¹⁰⁷ For example, when a popular baseball team makes playoff tickets available to the general public, ticket-purchaser lines often form well in advance of the sale of tickets. This suggests that demand for the ticket outstrips supply (i.e., the tickets are priced below what the standard market would bear) and that, as a consequence, people are willing to bid time (in place of money) in an effort to garner tickets.¹⁰⁸ Similarly, cities often offer street or municipal lot parking at rates far below the rates charged by private parking facilities (perhaps even free of charge);¹⁰⁹ as a consequence, drivers expend considerable time and effort in searching for available metered or free parking.¹¹⁰ In effect, time and effort become the primary commodities according to which the resource is allocated.¹¹¹ An appropriate adaptation of the "rule of first capture" prevails.¹¹²

In the case of roadways, time, presumably, will be the primary factor in allocating the resource.¹¹³ People's demand for roadway space will vary inversely with the time it takes to drive a mile, because "[a]t some level of congestion, any given driver will choose to avoid dealing with that congestion, either by choosing an alternative route or mode, changing the departure time of the trip, selecting a shorter trip to a similar activity, or avoiding the trip entirely."¹¹⁴ For any given level of congestion, then, the drivers who gain access to the resource are those who are willing to accept the drive with that level of congestion.¹¹⁵

But the "rule of first capture," based as it is on expenditures of time and effort, is not likely to achieve an efficient allocation of the re-

¹⁰⁷ See generally GARY S. BECKER, *THE ECONOMIC APPROACH TO HUMAN BEHAVIOR* 5-6 (1976).

¹⁰⁸ Cf. BECKER, *supra* note 107, at 6 (describing "office waiting time for physicians" as "one component of the full price of physician services").

¹⁰⁹ Epstein, *supra* note 84, at S534. Epstein speculates that distributive justice may explain this discrepancy. See *id.* For a discussion of this point in the context of congestion charging, see *infra* notes 371-376, 393 and accompanying text.

Some municipalities offer street parking to neighborhood residents for a fixed, relatively inexpensive fee. For a description of a proposal to introduce such a program in New York City, see John Rosenthal, Op-Ed, *Give Residents a Place to Park*, N.Y. TIMES, Jan. 4, 2004, § 4, at 7.

¹¹⁰ See Epstein, *supra* note 84, at S521-28.

¹¹¹ See *id.*

¹¹² See *id.* at S523-24 (drawing the analogy between the "rule of first capture" in *Pierson v. Post* for foxes, and the allocation of parking spaces).

¹¹³ See Fulton et al., *supra* note 17, at 3.

¹¹⁴ *Id.*

¹¹⁵ See *id.* Drivers might make these decisions on a daily (e.g., what route to take that day and what time to travel) or an overall basis (e.g., where to live), but the point remains the same.

source.¹¹⁶ Economically speaking, each person will decide how much time to put into searching for an inexpensive parking space based upon the relative value of the person's time to the expense of a "full-freight" parking space.¹¹⁷ Thus, an individual who values an inexpensive parking space more than a second individual does may nevertheless not pursue—and, therefore, not obtain—an inexpensive parking space if the second person values her time so much less than the first person values his, such that it is economically rational for the second person, but not the first, to invest considerable time and effort in searching for an inexpensive parking space.¹¹⁸

In the case of roadways, persons who would pay considerable amounts of money to gain access to a relatively uncongested roadway in the end may not use the roadway because it is not worth the investment of time that road usage requires.¹¹⁹ Instead, the resource of roadway usage may go to people who value the resource less, but who also value their time less such that it is worth it to them to expend their (relatively lower valued) time to obtain roadway usage.¹²⁰ In the absence of a private market, the time-based allocations will prevail.¹²¹ Furthermore, there is no easy way for a private market in roadway usage to arise.¹²²

¹¹⁶ See MCGILLIVRAY, *supra* note 9, at 2-3.

¹¹⁷ See BECKER, *supra* note 107, at 6.

¹¹⁸ Conceivably, this situation could be ameliorated through Coasean bargaining, see generally R.H. Coase, *The Problem of Social Cost*, 3 J.L. & ECON. 1 (1960), if the first person were able to bargain with the second person and purchase the parking space for cash. The transaction costs, however, are likely to be prohibitively high in most such circumstances. Cf. MCGILLIVRAY, *supra* note 9, at 2-3 (explaining why time-cost is generally not monetizable).

¹¹⁹ See MCGILLIVRAY, *supra* note 9, at 2-3.

¹²⁰ See *id.*

¹²¹ See *id.* Time-cost is in general not monetizable:

[I]f the [extent of the congestion] queue can be predicted on a daily, weekly, seasonal, or some other basis, people will recognize this and include it in their decision process. For example, if people feel that a given trip will take a half hour longer than other times of the day, with all the attendant woes of stop and go travel, they may conclude that it is not worth going. Congestion in that sense provides its own toll. If everyone knows that the trip will take a half hour longer, only those will go that value the trip above that. But there is no option to trade money for that time. It is gone, and that is that.

Id.

¹²² A private market here is even harder to imagine than in the case of parking spots. Commuter meeting zones may be one example of an attempt in the context of High Occupancy Vehicle lanes.

A second effect of the negative externality on roadway usage is that the level of usage will be inefficiently high.¹²³ At higher levels of usage where congestion occurs, a road is an open-access resource for which use by an individual generates negative externalities on other users.¹²⁴ Commentators have identified such a circumstance as potentially subject to a "tragedy of the commons."¹²⁵ The ability to externalize costs on others gives rise to an incentive to overconsume the resource.¹²⁶ Although individuals—and society generally—would be better off if everyone agreed not to overuse the resource, every individual has an economic incentive to defect and over-consume the resource.¹²⁷ Because individual users are able to externalize some of the costs of roadway usage, individuals use the road who would not use the road were they forced to bear the full, actual costs of their roadway usage.

The critical point is that the costs that an individual roadway user bears (in the absence of congestion charges or some other method of cost-internalization) are less than the actual, total societal costs of that user's usage.¹²⁸ Economic analysis suggests that an individual who is considering using a particular roadway will determine whether to do so based upon a balancing of the marginal benefit derived from using the road (as opposed to the other option(s)) against the marginal costs associated with roadway usage. Prospective users can expect to bear some costs themselves, including travel time, gasoline, oil, and vehicle wear-and-tear.¹²⁹ To the extent that congestion exists, however, prospective users can expect to externalize some of their costs on other users. Thus, we can expect that some users for whom the *actual* marginal costs of roadway usage would outweigh the marginal benefits will choose nonetheless to use the road because of the ability to externalize some costs.

This result is depicted in Figure 1. The aggregate demand curve for roadway usage in the absence of full internalization is represented by curve D as the demand for travel per time interval as a function of cost (including time). D's negative slope reflects the fact that, as a gen-

¹²³ See generally Hardin, *supra* note 103.

¹²⁴ See *id.*

¹²⁵ See *id.*

¹²⁶ See *id.*

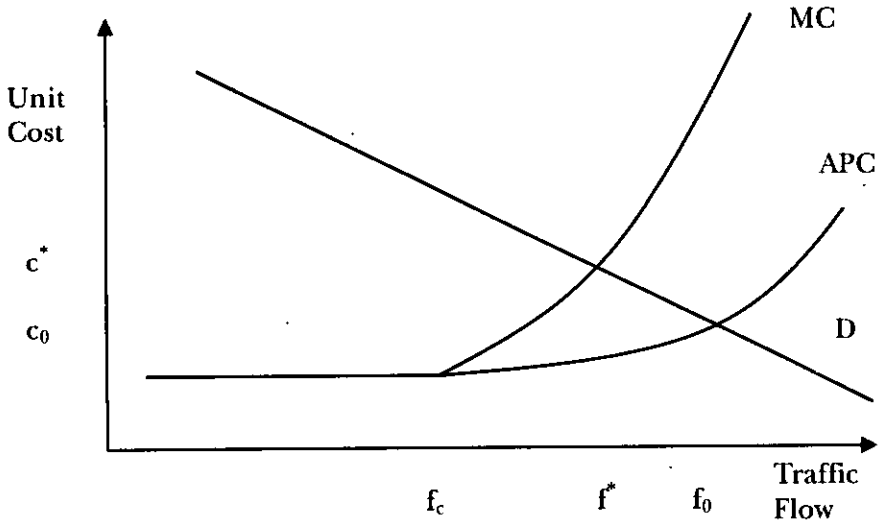
¹²⁷ The likelihood of the undesirable outcome results from the fact that the tragedy of the commons puts individuals in a multiple-player prisoner's dilemma-style game. On the prisoner's dilemma game generally, and on the relation of the prisoner's dilemma to the tragedy of the commons, see DOUGLAS G. BAIRD ET AL., *GAME THEORY AND THE LAW* 33-34 (1994).

¹²⁸ See *infra* note 223 and accompanying text.

¹²⁹ Wahrman, *supra* note 8, at 197.

eral matter, the more costly it is to drive a given distance, the fewer the number of drivers who will actually drive (and the shorter the trips they will tend to take); thus, the amount of traffic volume demanded decreases as the cost of travel increases.¹³⁰

FIGURE 1: Roadway Usage and Congestion



The curve labeled APC represents the average perceived costs to roadway users.¹³¹ Even at low levels of roadway usage (i.e., in the absence of congestion) roadway users experience some costs.¹³² But these costs will remain essentially stable (on a per unit basis) until congestion develops (represented by the relatively flat APC curve to the left of the point f_c , where congestion develops). The presence of congestion increases the costs of driving a given distance: certainly, the time required to drive will increase, and it is likely too that the amounts of gasoline and oil used, and general vehicle wear-and-tear, will increase with the congestion level.¹³³ This is represented by the upward slope of the APC curve to the right of point f_c .

¹³⁰ See *supra* note 114 and accompanying text.

¹³¹ Note that this curve, and the "marginal total cost" curve described below, refer only to variable costs of driving, not the fixed costs (such as automobile ownership). See, e.g., Johansson & Mattsson, *supra* note 25, at 29 tbl.1.3 (distinguishing between fixed and variable costs in this context).

¹³² See *supra* note 129 and accompanying text.

¹³³ See Wahrman, *supra* note 8, at 197.

The curve labeled MC represents the actual marginal costs to roadway users. The MC curve is coextensive with the APC curve for points to the left of f_c , reflecting the notion that actual congestion costs equal perceived congestion costs where there is no congestion externality. The MC curve slopes upward to the right of f_c , for the same reasons that the APC curve does: congestion leads to longer travel times, increased gasoline and oil usage, and greater vehicle wear-and-tear. The MC curve, however, rises more quickly than does the APC curve because the MC curve includes the costs that a new driver's entry has on all drivers.

In the absence of internalization of congestion costs, an equilibrium will be reached at the point where the APC curve intersects the D curve. As depicted in Figure 1, then, the equilibrium will involve a traffic flow of f_0 at a unit cost of c_0 . But if drivers were forced to internalize congestion costs, the equilibrium that then would obtain would be at the intersection of the MC curve and the D curve: there would be traffic flow of f^* at a unit cost of c^* . Note, then, that the absence of internalization has the effect of both increasing the total traffic flow (because $f_0 > f^*$) and decreasing the unit cost each driver faces (because $c_0 < c^*$).¹³⁴

In addition to misallocation of the resource and overusage, both caused by the congestion externality, the congestion externality also introduces some corollary effects.¹³⁵ Congestion delays people and goods from reaching their destinations and increases the frequency of vehicular accidents.¹³⁶ Congestion also imposes costs on the public at large: traffic delays increase the amount of pollution that a vehicular trip generates.¹³⁷ One commentator estimates that "[s]top-and-go driving costs Americans an estimated \$168 billion a year," of which "as much as 15%, or \$25 billion, falls on the public, in time lost by non-motorists (walkers, cyclists, bus passengers) and municipal vehicles."¹³⁸ Congestion is also a source of road rage, which itself can lead to accidents and other conflagrations.¹³⁹ In addition, the artificially low price

¹³⁴ The figure does not capture the first effect of the negative externality: the inefficient allocation of the resource (i.e., that the smaller number of vehicle miles in fact used are probably allocated to different sets of drivers).

¹³⁵ See, e.g., MCGILLIVRAY, *supra* note 9, at 2; Strahilevitz, *supra* note 9, at 1237.

¹³⁶ MCGILLIVRAY, *supra* note 9, at 2 (listing "increased hazard" as a result of congestion); Strahilevitz, *supra* note 9, at 1237.

¹³⁷ Strahilevitz, *supra* note 9, at 1237.

¹³⁸ Charles Komanoff, *Pollution Taxes for Roadway Transportation*, 12 PACE ENVTL. L. REV. 121, 129 (1994).

¹³⁹ Wahrman, *supra* note 8, at 182. *But cf.* Blomquist, *supra* note 9, at 36-37 (critiquing Wahrman for ignoring causes of "road rage" other than traffic congestion). On the general topic of "road rage," see generally Blomquist, *supra* note 9.

of driving (because of the congestion externality) means that government must subsidize mass transit substantially (i.e., even more than it otherwise would have to) in order to induce people to utilize mass transit.¹⁴⁰ In short, the deleterious effects of congestion on drivers, passengers, and society in general are substantial.¹⁴¹

It is possible that, in addition to negative externalities, the provision of roadway capacity may generate positive infrastructure externalities.¹⁴² For example, the availability of roadways (even with congestion) may lead many people to engage in socially beneficial activities that they otherwise might find too costly to undertake.¹⁴³ Indeed, these benefits may accrue even to people who do not themselves directly make use of the road system.¹⁴⁴

Nevertheless, relying upon such positive externalities as an efficiency-based justification for providing more roadway capacity is dubious for two reasons. First, although such positive infrastructure spillovers may be difficult to measure,¹⁴⁵ it is questionable whether they are large enough to outweigh the negative congestion externalities. Commentators most often tout the size of positive infrastructure externalities, and emphasize the extent to which they are often underestimated, in the context of ideas and intellectual property. As these commentators themselves acknowledge, however, ideas are essentially inexhausti-

¹⁴⁰ See Charles J. Goetz, *The Revenue Potential of User-Related Charges in State and Local Governments*, in BROAD-BASED TAXES: NEW OPTIONS AND SOURCES 113, 122–23 (Richard A. Musgrave ed., 1973) (“The relative use of mass transportation versus private vehicular transportation is clearly affected by the respective prices of the two modes of transportation. . . . If . . . vehicular traffic is underpriced, excessive traffic-congestion costs may sensibly be avoided by underpricing the use of mass transportation.”).

¹⁴¹ See, e.g., EMMERINK, *supra* note 9, at 3–4 (“[T]he costs of congestion are too large to be ignored.”).

Beyond clearly deleterious effects, such as those discussed in the text, congestion may have other unanticipated effects on behavior. See, e.g., Francine Parnes, *Business Travel: Gaining Time and Clients While in the Pilot's Seat*, N.Y. TIMES, Dec. 9, 2003, at C8 (noting that “many executives, frustrated by delays at commercial airports and on clogged interstates,” are obtaining pilot licenses and buying private planes in order to “beat the crowds”).

¹⁴² See, e.g., Brett M. Frischmann, *An Economic Theory of Infrastructure and Commons Management*, 89 MINN. L. REV. 917, 970–78 (2005) (describing infrastructure effects, and distinguishing them from network effects).

¹⁴³ See, e.g., Brett M. Frischmann & Barbara van Schewick, *Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo*, 47 JURIMETRICS J. 383, 398 (2007); Brett M. Frischmann, *Evaluating the Demsetzian Trend in Copyright Law*, 3 REV. L. & ECON. 649, 669–70 (2007).

¹⁴⁴ See Frischmann, *supra* note 142, at 973–74.

¹⁴⁵ See *id.* at 975.

ble, while roadways are not.¹⁴⁶ Moreover, although new ideas may continue to be generated without concern, many areas are already so congested that the continued construction of new roadway capacity becomes very costly or even practically impossible. Second, the decision of whether to mandate internalization of congestion externalities does not inform the separate question of whether roadway infrastructure should be publicly financed. Put another way, the implementation of a congestion pricing system would charge users a fee essentially only to the extent of the congestion externality that they impose; government financing of the infrastructure commons, and any positive spillover effects resulting therefrom, could persist.

The next two Parts consider two governmental responses to traffic congestion: the generation of additional roadway capacity and congestion pricing.¹⁴⁷

III. THE DOMINANT RESPONSE TO TRAFFIC CONGESTION: THE GENERATION OF ADDITIONAL ROADWAY CAPACITY

This Part examines the dominant governmental response to traffic congestion: the generation of additional roadway capacity.¹⁴⁸ First, it elucidates ways in which the government might generate roadway capacity.¹⁴⁹ Second, it explains how generating additional roadway capacity may be inefficient.¹⁵⁰ Not only may the provision of new roadway capacity not efficiently reduce traffic congestion, it may under some circumstances worsen it.¹⁵¹ Third, it discusses how, notwithstanding new roadway capacity's efficiency shortcomings, public choice helps to explain its continued dominance as a governmental response.¹⁵²

Roadway capacity can be increased in different ways. First, the government might construct an entirely new roadway. Second, the government might construct new lanes on an existing roadway. Third, the government might convert what previously had served as a "breakdown lane"—that is, a shoulder lane that was designed to be used as a place

¹⁴⁶ See Brett M. Frischmann & Mark A. Lemley, *Spillovers*, 107 COLUM. L. REV. 257, 281 (2007). But see William M. Landes & Richard A. Posner, *Indefinitely Renewable Copyright*, 70 U. CHI. L. REV. 471, 484–88 (2003) (describing how congestion externalities may arise in the context of intellectual property rights).

¹⁴⁷ See *infra* notes 148–394 and accompanying text.

¹⁴⁸ See *infra* notes 148–199 and accompanying text.

¹⁴⁹ See *infra* notes 153–155 and accompanying text.

¹⁵⁰ See *infra* notes 156–178 and accompanying text.

¹⁵¹ See *infra* notes 156–178 and accompanying text.

¹⁵² See *infra* notes 179–199 and accompanying text.

to leave malfunctioning vehicles out of the path of traffic and perhaps also to allow easy passage for police and other emergency vehicles—into a lane usable by ordinary vehicles.¹⁵³ Fourth, the government might have lanes that reverse direction depending upon the extent of traffic flow during different times of day.¹⁵⁴ Fifth, the government might dedicate particular lanes to “express use” (i.e., limited ability to enter into, and leave from, those lanes to the rest of the expressway and other roads).¹⁵⁵

One author has noted that “[t]he traditional instrument to tackle the congestion problem is to build more road infrastructure.”¹⁵⁶ But, for several reasons, the generation of new roadway capacity is not as attractive an option as it at first might seem.¹⁵⁷ First, to the extent that the new capacity does not eliminate, but merely ameliorates somewhat, traffic congestion without reducing externalities, the resource will continue to be overused and not allocated efficiently among users.¹⁵⁸ Second, “the social and environmental consequences of building new roads could be far more severe than the beneficial effects to motorists.”¹⁵⁹ Third, some urban areas are already so developed that it is “physically impossible to enlarge the existing road infrastructure without undue expense.”¹⁶⁰

Fourth, even putting the first two problems to the side, the fundamental justification for providing new roadway capacity—that it at

¹⁵³ For example, the Interstate 95/State Route 128 highway in eastern Massachusetts authorizes the use of the breakdown lane for ordinary traffic from 6:00 to 10:00 a.m. and from 3:00 to 7:00 p.m. every day.

¹⁵⁴ For example, the Connecticut Avenue artery into Washington, D.C., features two lanes that reverse direction: during rush hours, the two lanes go in the direction of heavy traffic flow, while at other times one of the two lanes flows in each direction. The lower level of New York City's Queensboro Bridge used to have five lanes, with the middle lane switching direction during rush hours (some years ago the middle lane was eliminated altogether). Also, the elevated Queens Midtown Expressway portion of the Long Island Expressway features a dedicated “bus lane” (open to commuter buses and taxis with fares) during the morning rush hour. The bus lane uses what is ordinarily one of the three out-bound lanes of the expressway.

¹⁵⁵ For example, Chicago's Dan Ryan Expressway has two express lanes that reverse direction depending upon the time of day. New Jersey features express lanes on portions of the New Jersey Turnpike (at no additional charge) and on portions of Interstate 78 (a free road, both for local and express usage).

¹⁵⁶ EMMERINK, *supra* note 9, at 4; accord GAO, DEVELOPING STRATEGIES, *supra* note 29, at 40.

¹⁵⁷ See, e.g., EMMERINK, *supra* note 9, at 4.

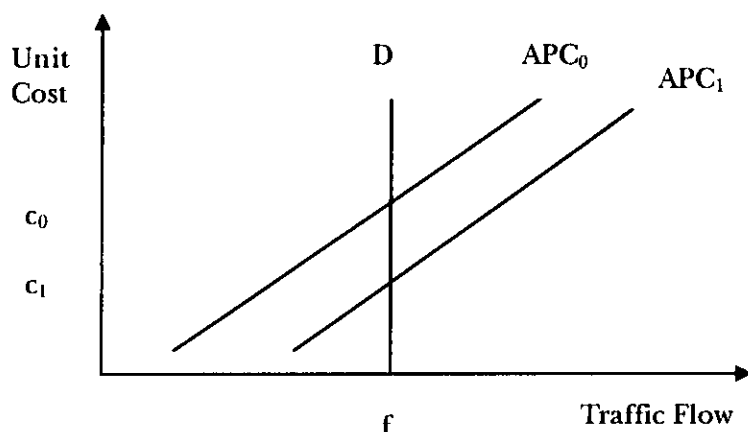
¹⁵⁸ See *supra* notes 105–127 and accompanying text.

¹⁵⁹ EMMERINK, *supra* note 9, at 4 (citation omitted).

¹⁶⁰ *Id.* An exception—probably made possible by a great concentration of power that is probably unrealizable today—was Robert Moses's ability to build roads through existing neighborhoods in New York City. See generally ROBERT A. CARO, THE POWER BROKER (1974).

least ameliorates traffic congestion—is erroneous.¹⁶¹ The logic underlying new road construction rests upon the assumption that demand for travel is essentially a function of demand for economic activities, exogenous to travel capacity (i.e., that demand for travel is substantially inelastic to the time-cost of travel): “Planners have historically considered transportation demand as a derived demand for economic activities and have assumed that travelers will change their behavior as their desire to engage in alternative activities changes over time.”¹⁶² As commentators explain, “[t]his leads to the assertion that capacity increases, including increases in transit capacity, will be effective in reducing congestion and are needed to account for exogenous growth in travel.”¹⁶³ In other words, if travel demand is inelastic in relation to time-cost of travel, then it stands to reason that new roads will reduce congestion.¹⁶⁴ This notion is reflected in Figure 2, which presents an inelastic demand curve, D , and two average perceived cost curves: APC_0 , the initial average perceived cost of roadway usage, and APC_1 , the average perceived cost of roadway usage after new construction. The rightward shift in the APC curve from APC_0 to APC_1 results in a drop in the cost of travel from c_0 to c_1 , whereas traffic flow remains constant at level f .

FIGURE 2: Roadway Usage Under Inelastic Demand



¹⁶¹ Fulton et al., *supra* note 17, at 13.

¹⁶² *Id.* at 2; accord Noland & Cowart, *supra* note 17, at 364.

¹⁶³ Fulton et al., *supra* note 17, at 2.

¹⁶⁴ See *id.*

This result may seem intuitive. In fact, however, recent research findings suggest that it is not the case at all.¹⁶⁵ This is because of the phenomenon of "induced travel."¹⁶⁶

Induced travel is the notion that new road construction spurs new demand for travel, such that in the end, congestion on the newly expanded road system is no better, and indeed perhaps is even worse, than it was before.¹⁶⁷ Lewis Fulton, Robert Noland, Daniel Meszler, and John Thomas conducted a study on vehicle-miles traveled in the mid-Atlantic region of the United States.¹⁶⁸ Their data analysis indicates "a significant relationship between the level of highway capacity . . . and the level of travel."¹⁶⁹

The model described above (and depicted in Figure 2) failed to take into account the "induced travel" phenomenon because that model took a static view: it assumed that the total number of vehicle miles would not change simply upon the construction of new roadways.¹⁷⁰ Instead, as Figure 1 indicated, the demand for travel is probably downward sloping. As such, a rightward shift in the roadway supply curve resulting from new road construction instead should have the effect indicated in Figure 3: though the cost of travel does decrease—from c_0 to c_1 —the decrease will not be as large as it would be if in fact demand for travel were substantially inelastic to roadway supply. Moreover, unlike Figure 2, Figure 3 predicts that new road construction should result in an increase in traffic flow, from f_0 to f_1 .

¹⁶⁵ See *id.* at 13.

¹⁶⁶ See *id.* at 2–3.

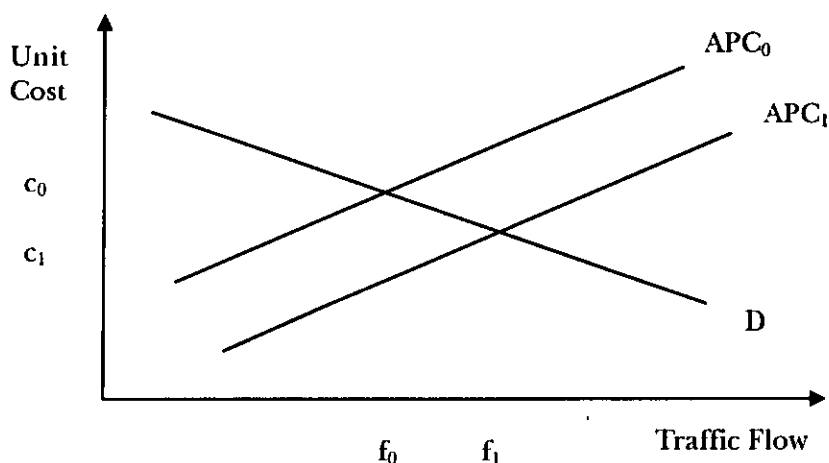
¹⁶⁷ *Id.* The legal academic literature has taken limited notice of induced travel demand. See Salvatore Massa, *Surface Freight Transportation: Accounting for Subsidies in a "Free Market"*, 4 N.Y.U. J. LEGIS. & PUB. POL'Y 285, 330 (2001); Oliver A. Pollard, III, *Smart Growth: The Promise, Politics, and Potential Pitfalls of Emerging Growth Management Strategies*, 19 VA. ENVTL. L.J. 247, 266 n.64 (2000); Gilbert Paul Verbit, *The Urban Transportation Problem*, 124 U. PA. L. REV. 368, 390 (1975).

¹⁶⁸ See generally Fulton et al., *supra* note 17.

¹⁶⁹ *Id.* at 13. The study measures highway capacity in lane-miles and level of travel in daily vehicle-miles traveled. *Id.*

¹⁷⁰ See *id.*

FIGURE 3



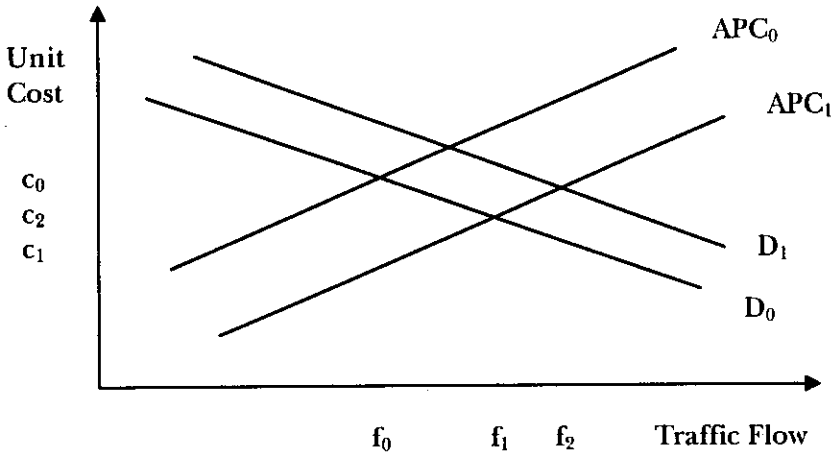
The phenomenon of induced travel has an even more pronounced effect over time.¹⁷¹ Logic suggests that new roadway construction might spur new land development—leading, for example, to more commuters or more businesses to which existing residents commute—and also might create incentives for current residents to purchase additional vehicles.¹⁷² In short, “long term responses to increased access can result in changes in land use patterns, possibly inducing both more and longer trips.”¹⁷³ This could result in an upward shift in the travel demand curve over time, as reflected in Figure 4. With equilibrium now occurring at the intersection of average perceived cost APC_1 and demand curve D_1 , some of the original reduction in cost of travel (from c_0 to c_1) are lost as the time-cost rises to c_2 . Further, traffic flow rises again, this time to level f_2 .

¹⁷¹ See *id.* at 3.

¹⁷² See *id.*

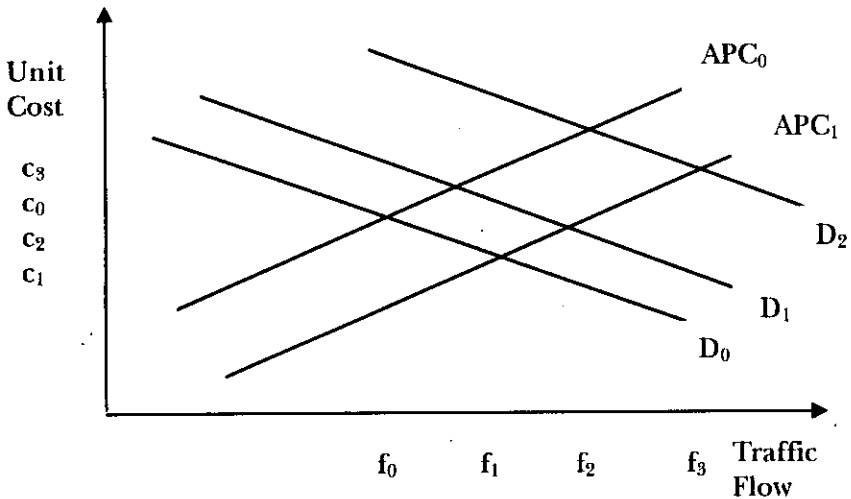
¹⁷³ Fulton et al., *supra* note 17, at 3. On the links between land use, roadways, and congestion, see generally Rachel Weinberger, *The High Cost of Free Highways*, 43 IDAHO L. REV. 475 (2007).

FIGURE 4



Moreover, depending upon the time-elasticity of demand to roadway capacity, the effect of induced travel could be even worse. Assume, as reflected in Figure 5, induced travel over time shifts the demand curve not to D_1 , but rather to D_2 . Now, not only has traffic flow increased to f_3 , well above the original f_0 level, but also the cost of travel is c_3 —higher than the c_0 level that obtained before the new construction. In other words, congestion itself has worsened as a result of the new construction.

FIGURE 5



It is conceivable that the increase in growth that follows road construction is not the result of road construction.¹⁷⁴ It is possible that the growth would have occurred anyway.¹⁷⁵ If that is so, then the new road construction was simply an accurate anticipation of the growth, in which case society is better off with the new construction than it would be without it (as the growth would have happened either way). Recent empirical studies, however, although they are not conclusive, generally suggest otherwise.¹⁷⁶

In sum, the phenomenon of induced travel appears to be an empirically accurate description of the response to new road construction: increased travel demand.¹⁷⁷ As such, new road construction as a pure strategy in response to congestion seems questionable. And, depending upon the extent of elasticity of travel demand to roadway supply, such a pure strategy may be ill-advised, as it may function only to worsen the congestion problem over time.¹⁷⁸

Even though new road construction is not a cost-effective way to address the problem of traffic congestion, it still remains a popular government response to the problem of congestion.¹⁷⁹ Part of the popularity of the new road construction strategy may be due to urban planners' erroneous belief that demand for travel is substantially inelas-

¹⁷⁴ See Patricia L. Mokhtarian et al., *Revisiting the Notion of Induced Traffic Through a Matched-Pairs Study*, 29 *TRANSPORTATION* 193, 214 (2002) (finding no evidence of induced travel demand).

¹⁷⁵ See *id.*

¹⁷⁶ See Fulton et al., *supra* note 17, at 13 (noting that study results "[o]verall . . . provide a strong indication that growth in lane-miles is exogenous and therefore causes the growth in [vehicle-miles traveled]"); Noland & Cowart, *supra* note 17, at 387 (noting that study results "are highly suggestive of a causal linkage" between lane-mile additions and growth in vehicle-miles traveled); Noland, *supra* note 17, at 70 (noting that study results suggest "[o]verall . . . that . . . the induced travel effect is accounting for a quarter of . . . growth" in vehicle-miles traveled); cf. James Traub, *Harvard Radical*, N.Y. TIMES, Aug. 24, 2003 (Magazine), at 28, 32 (describing Harvard President and economist Lawrence Summers' childhood recollection that "if the family . . . was stuck in traffic, one of his parents [both of whom were economists] might ask, 'If there was one more lane, would that eliminate the traffic jam or simply increase the number of drivers who used the road?'"). But see Mokhtarian et al., *supra* note 174, at 214 (using "matched-pairs" technique (i.e., "comparing traffic growth on improved segments against growth on 'similar' unimproved (control) segments") and "finding no evidence of induced [travel] demand"). That travel demand depends upon cost is demonstrated by the increase in New York City bus ridership following the introduction of free transfers to buses from the subways. See Thomas J. Lueck, *New York's Bus Ridership Surges After Long Decline*, N.Y. TIMES, Dec. 22, 1998, at A1 (identifying discounts as one reason for the surge in bus ridership).

¹⁷⁷ See Fulton et al., *supra* note 17, at 3; Noland & Cowart, *supra* note 17, at 387.

¹⁷⁸ See Fulton et al., *supra* note 17, at 3.

¹⁷⁹ See EMMERINK, *supra* note 9, at 4; GAO, *DEVELOPING STRATEGIES*, *supra* note 29, at 40.

tic to the time-cost of travel.¹⁸⁰ Public choice theory, however, offers another, seemingly stronger, reason for government's emphasis on new road construction.

Many societal actors—and, in particular, many societal actors who readily can form cohesive, powerful interest groups—are likely to support new road construction. First, even if economic theory suggests that new road construction may not be effective to combat congestion (and indeed even may worsen it), the fact remains that residents of an area that rely on a congested roadway for their travel needs believe that new construction will reduce congestion.¹⁸¹ Second, industry actors that engage in road construction and real estate construction will support such projects.¹⁸² And because many of those employees are union members, organized labor is likely to support new road construction.

In addition, new road construction is likely to be a financial boon to landowners, businesses, and developers.¹⁸³ For example, the construction of an entirely new road is likely to increase land values along the path of the new road.¹⁸⁴ This will likely lead to increased profits for business owners located along the new road and also likely create work for land developers.¹⁸⁵ The same is likely to be true (though perhaps to a lesser degree) for the addition of new lanes to an existing roadway.

Some societal actors may be opposed to a particular road construction project. For example, business owners along a trafficked highway may oppose the construction of an alternative highway route for fear that the reduction in traffic on the existing route will translate into lost profits.¹⁸⁶ Environmental organizations and organizations that advocate land use planning also may oppose new road construction. It seems likely, however, that in many cases public choice theory would predict

¹⁸⁰ See *supra* notes 162–163 and accompanying text; *supra* Figure 2.

¹⁸¹ This disconnect is between theory and belief can generally be accounted for by two assumptions of economic theory: that “[i]ndividual behavior is rational, based on utility maximisation” and that “[t]here is full information on all costs involved for . . . road users.” See EMMERINK, *supra* note 9, at 37.

¹⁸² Cf. Buzbee, *supra* note 7, at 80; Oliver Houck, *Unfinished Stories*, 73 U. COLO. L. REV. 867, 897–98 (2002) (describing the large industrial interests reliant upon heavy usage of the automobile).

¹⁸³ See, e.g., Kilborn, *supra* note 30.

¹⁸⁴ See *id.*

¹⁸⁵ See *id.*

¹⁸⁶ This opposition may be tempered somewhat by the fact that the reduction in congestion on the original route may actually encourage some people to travel to, and patronize, the existing businesses.

that the many powerful, well-organized special interests that support new road construction would far outweigh the few that oppose it.¹⁸⁷

Government actors are also likely to support new road construction projects.¹⁸⁸ New road construction has been described as the quintessential form of political pork.¹⁸⁹ Politicians can increase their power base by doling out road construction projects.¹⁹⁰ The public is also likely to appreciate the public spending as a boost to the local economy (especially if, as is often the case, the money used to finance the project is from a government level far removed from the local level, i.e., the federal government). Additionally, to the extent that, as noted above, constituents understand (even if erroneously) new road construction to ameliorate congestion, politicians can claim that they are doing something to address the problem of traffic congestion.

When examined through the lens of David Mayhew's reelection-focused approach to political actors,¹⁹¹ the propensity for government to back new road construction becomes even clearer. Mayhew argues that legislators are career politicians motivated substantially by a desire to be repeatedly reelected.¹⁹² Accordingly, he argues that "congressmen must constantly engage in activities related to reelection."¹⁹³ Among the activities that Mayhew identifies that further reelection prospects—and in which legislators therefore reasonably should be expected to engage—is "credit claiming," or, in other words, "acting so as to generate a belief in a relevant political actor (or actors) that one is personally responsible for causing the government, or some unit thereof, to do something that the actor (or actors) considers desirable."¹⁹⁴

¹⁸⁷ See, e.g., Buzbee, *supra* note 7, at 80–81 (noting the interest in government transportation infrastructure of construction agencies and residential, retail, and mall developers).

¹⁸⁸ See, e.g., Dilger, *supra* note 13, at 50.

¹⁸⁹ See *id.*; Michael Lyons, *Political Self-Interest and U.S. Environmental Policy*, 39 NAT. RESOURCES J. 271, 284 (1999); David H. Rosenbloom, 1946: *Framing a Lasting Congressional Response to the Administrative State*, 50 ADMIN. L. REV. 173, 187 (1998).

¹⁹⁰ As Pennsylvania Senator Rick Santorum commented during the Senate debate over the then-pending Safe, Accountable, Flexible and Efficient Transportation Equity Act, "Never get between a congressman and asphalt, because you will always get run over." Christopher Lee, *Highway Bill Passes Senate, Faces Opposition from Bush*, WASH. POST, Feb. 13, 2004, at A4.

¹⁹¹ See generally MAYHEW, *supra* note 71, at 14–17.

¹⁹² See *id.* David R. Mayhew formally restricts his argument to federal legislators, but his arguments in this regard readily translate in at least a fairly robust form to the setting of state and even local legislators today. See *id.* at 13, 25.

¹⁹³ *Id.* at 49.

¹⁹⁴ *Id.* at 52–53. Mayhew identifies two other activities that are likely to lead to reelection: "advertising" and "position taking." See *id.* at 49, 61.

Mayhew expounds that legislators most prevalently engage in credit claiming by doling out "particularized benefits," which satisfy two conditions:

- (1) Each benefit is given out to a specific individual, group, or geographical constituency, the recipient unit being of a scale that allows a single congressman to be recognized (by relevant political actors and other congressmen) as the claimant for the benefit (other congressmen being perceived as indifferent or hostile).
- (2) Each benefit is given out in apparently ad hoc fashion (unlike, say, social security checks) with a congressman apparently having a hand in the allocation.¹⁹⁵

Roadway construction projects provide a clear example of a particularized benefit.¹⁹⁶ A roadway project benefits (or at least appears to benefit) specific individuals: residents who believe that traffic congestion woes will be lessened, road construction firms and workers, and the real estate construction and sales industries.¹⁹⁷ Because roadway construction projects are hardly handed out like social security checks, legislators credibly can claim (where appropriate) that they had a hand in their allocation.¹⁹⁸ In short, the political popularity of highway construction projects is not surprising.

In the end, the pure strategy of new road construction is not a cost-effective way to address the problem of traffic congestion; indeed, it may even be counterproductive in the long run.¹⁹⁹ Nonetheless, public choice theory suggests that it is likely to remain a popular government response to the problem.

IV. THE EFFICIENT RESPONSE TO TRAFFIC CONGESTION: CONGESTION PRICING

Congestion pricing is an efficient, market-based response to the problem of traffic congestion.²⁰⁰ This Part presents an overview of con-

¹⁹⁵ *Id.* at 54.

¹⁹⁶ MAYHEW, *supra* note 71, at 54.

¹⁹⁷ See Buzbee, *supra* note 7, at 80.

¹⁹⁸ See MAYHEW, *supra* note 71, at 54.

¹⁹⁹ See Fulton et al., *supra* note 17, at 3.

²⁰⁰ Market-based approaches to congestion control effectively assign a price to roadway access and then rely upon prospective users to decide whether to pay the price and access the road. In this way, the scarce resource is allocated to those who value it most. See Jonathan Baert Wiener, *Global Environmental Regulation: Instrument Choice in Legal Context*, 108 YALE L.J. 677, 714-15 (1999).

There are two possible market-based approaches other than congestion pricing. First, the converse of congestion pricing is a system that subsidizes travel during less congested periods: "The subsidy acts as a negative tax because failing to abate means incurring the cost of forgoing the subsidy." *Id.* at 726. As such, "[s]ubsidies can in principle achieve cost-effective abatement." *Id.*

The Maryland Transportation Authority experimented with a subsidy-based approach to traffic congestion in 2003. The Authority proposed "to ease Friday afternoon backups for beachgoers at the Chesapeake Bay Bridge by getting private businesses to pay the tolls from 7:00 p.m. Fridays until 7:00 a.m. Saturdays." *No Takers for Tolls-for-Ads Plan*, WASH. POST, Apr. 23, 2003, at B3. In exchange for the toll payments, a sponsoring business was offered the chance to "advertise[] at toll plazas, tollbooths and state traffic Web sites." *Id.* Ultimately, only another branch of state government—the lottery agency—undertook sponsorship. See *Coming and Going: Road Trips Drive Time*, WASH. POST, June 29, 2003, at P1 (noting that free eastbound passage across the bridge was to be available July Fourth, "courtesy of the Maryland Lottery"); Christian Davenport & Anita Huslin, *By All Means, Keep Traffic Moving*, WASH. POST, Aug. 14, 2003, at T2; *No Takers for Tolls-for-Ads Plan*, *supra*.

A more encompassing traffic subsidy proposal, also in the Washington, D.C., metropolitan area, is one designed to reduce traffic across the Woodrow Wilson Bridge. The bridge, which spans the Potomac River between Virginia and Washington, serves as a major commuter artery. Under the program, dubbed "BridgeBucks," participants will receive compensation for *not* taking the bridge. Steven Ginsberg, *Plan to Pay Motorists to Get Off Bridge: Wilson Officials Hope to Ease Jams*, WASH. POST, Jan. 8, 2004, at B1. To be eligible, "drivers must pass through part of the project corridor as they commute to work or school." *Id.* Each participant will receive "the equivalent of \$50 a month in the form of Metro passes or bus passes, or the money will be sent directly to vanpool operators to subsidize the riders' fares." *Id.* The program, which will last for at least one year, will be open to "the first 1,000 commuters who qualify, 500 from Virginia and 500 from Maryland," and will involve "a first-year cost of about \$745,000." *Id.*

Subsidy options are generally disfavored insofar as it seems normatively preferable to charge actors for engaging in an activity that imposes costs on others rather than to pay actors not to engage in the activity. See Wiener, *supra*, at 726. Analogizing to the setting of environmental law, a subsidy-based approach runs afoul of the "polluter pays" principle, a normative notion that urges that pollution costs be borne by those who generate the pollution and associated harm. See Jonathan Remy Nash, *Too Much Market? Conflict Between Tradable Pollution Allowances and the "Polluter Pays" Principle*, 24 HARV. ENVTL. L. REV. 465, 467–80 (2000) (discussing and analyzing various interpretations of the principle); cf. Kenneth J. Button & Erik T. Verhoef, *Introduction to ROAD PRICING, TRAFFIC CONGESTION AND THE ENVIRONMENT: ISSUES OF EFFICIENCY AND SOCIAL FEASIBILITY* 3, 4 (Kenneth J. Button & Erik T. Verhoef eds., 1998) [hereinafter *ROAD PRICING, TRAFFIC CONGESTION AND THE ENVIRONMENT*] (noting that environmental law's "polluter pays principle" has its origins in early treatments of congestion pricing). Given the additional fact of the Maryland program's inability to attract a sponsor other than another government agency, the future for noncongestion subsidy programs does not seem bright. *But cf. infra* note 271 and accompanying text (describing "Fast and Intertwined Regular" lanes regimes as a hybrid between a congestion charge and subsidy system).

One might also think of another possible market-based response to the congestion problem: a tradable roadway access permit regime. See *infra* note 373 (describing a proposal that is somewhat similar to such a system). Congestion pricing is a price-control mechanism; the price-control analog to congestion pricing would be a transferable road access permit system. Assuming similar instrument structure, that the market functions frictionlessly, and that the government's access to information is perfect, both regimes should give rise to the same level of pollution and impose the same cost on polluters. See Wiener, *supra*, at 715.

gestion pricing.²⁰¹ First, it briefly summarizes the theoretical and practical history of congestion pricing.²⁰² Second, it describes in the abstract both the logic underlying a congestion charge system and how such systems can be structured; it identifies two axes along which congestion pricing schemes might be categorized and thus develops a typology of congestion pricing regimes.²⁰³ Next, it describes the current, limited federal role in fostering congestion pricing regimes.²⁰⁴ It then briefly surveys existing congestion pricing regimes, both domestic and foreign, before ending with an examination of the economics and public choice of congestion pricing.²⁰⁵

A. Brief History

Problems of congestion in transportation were the subject of study of early neoclassical economists seeking to shed light on the problem of market failure.²⁰⁶ Arsène Jules Étienne Dupuit undertook to determine the optimal toll for a bridge in 1844.²⁰⁷ Arthur Cecil Pigou²⁰⁸ and Frank Knight²⁰⁹ investigated the problem of roadway congestion in the 1920s. Both of these "spiritual fathers of road pricing" recommended that drivers internalize the external congestion costs that their road usage

Four problems present design challenges for the implementation of a tradable roadway access permit regime. First, because a tradable roadway access permit scheme would cap the total number of vehicles allowed on a given road at a given time, it is possible that some people will simply be unable to purchase roadway access; at least with a congestion pricing scheme, newcomers have the option of paying the charge (even if it is high) and gaining access. Second, for what period of time would a roadway access permit remain valid? Third, where, how, and at what degree of difficulty and cost would people trade the permits? Fourth, how would the system be designed to confront the possibility of traffic "hot spots?" Cf. Jonathan Remy Nash & Richard L. Revesz, *Markets and Geography: Designing Marketable Permit Schemes to Control Local and Regional Pollutants*, 28 *ECOLOGY L.Q.* 569, 580 (2001) (discussing "hot spots" in the context of pollution).

²⁰¹ See *infra* notes 202–394 and accompanying text.

²⁰² See *infra* notes 206–217 and accompanying text.

²⁰³ See *infra* notes 218–273 and accompanying text.

²⁰⁴ See *infra* notes 274–335 and accompanying text.

²⁰⁵ See *infra* notes 336–394 and accompanying text.

²⁰⁶ Button & Verhoef, *supra* note 200, at 4.

²⁰⁷ J. Dupuit, *On the Measurement of the Utility of Public Works*, 8 *ANNALES DES PONTS ET CHAUSSÉES* (2d ser. 1844), reprinted in *TRANSPORT: SELECTED READINGS* 38–43 (Denys Munby ed., R. H. Barback trans., 1968).

²⁰⁸ See A.C. PIGOU, *THE ECONOMICS OF WELFARE* 63 (1920).

²⁰⁹ See F.H. Knight, *Some Fallacies in the Interpretation of Social Cost*, 38 *Q.J. ECON.* 582, 584–85 (1924).

imposed.²¹⁰ Frank Plumpton Ramsey also advocated the use of taxes to address road congestion in 1927.²¹¹

If Pigou and Knight are the "spiritual fathers" of congestion pricing, then Nobel Laureate William Vickrey was "the pioneer in [its] practical application."²¹² Vickrey first suggested congestion pricing in a study commissioned to revamp the New York City subway system.²¹³ He then recommended the use of congestion pricing in the Washington, D.C. area,²¹⁴ testifying before Congress on the matter in 1958.²¹⁵ In the ensuing decades, he wrote numerous articles advocating the use of congestion pricing regimes and explaining how they could be implemented practically.²¹⁶

Despite Vickrey's longstanding and strenuous support, congestion pricing remained only a theoretical construct for many years. The successful implementation of a congestion pricing program in Singapore in the mid-1970s spurred Congress, finally, in 1990 to authorize pilot congestion pricing programs in the United States.²¹⁷ Even now, however, congestion pricing regimes remain clearly the exception rather than the rule.

B. Fundamental Logic and Typology

Congestion pricing is a species of road pricing.²¹⁸ Road pricing has been described as "charging for the direct use of the road."²¹⁹ Fees may be placed on road access for a variety of reasons—including recovery of the cost of constructing the road, recovery of the costs of maintaining

²¹⁰ Button & Verhoef, *supra* note 200, at 4.

²¹¹ See F.P. Ramsey, *A Contribution to the Theory of Taxation*, 37 *ECON. J.* 47, 59 (1927).

²¹² Richard Arnott, *Pricing Urban Transportation: Introduction*, in *PUBLIC ECONOMICS: SELECTED PAPERS BY WILLIAM VICKREY* 271, 271 (Richard Arnott et al. eds., 1994); see also Wahrman, *supra* note 8, at 181 n.* (dedicating article to Vickrey, "an early and lonely champion of congestion pricing").

²¹³ See generally WILLIAM S. VICKREY, *THE REVISION OF THE RAPID TRANSIT FARE STRUCTURE OF THE CITY OF NEW YORK* (1952).

²¹⁴ See Arnott, *supra* note 212, at 272.

²¹⁵ See Strahilevitz, *supra* note 9, at 1249; Wahrman, *supra* note 8, at 182 n.5.

²¹⁶ See, e.g., Arnott, *supra* note 212, at 272-75.

²¹⁷ Strahilevitz, *supra* note 9, at 1249. For a description of the federal role in spurring the development of congestion pricing regimes, see *infra* notes 274-335 and accompanying text.

²¹⁸ See Johansson & Mattsson, *supra* note 25, at 7.

²¹⁹ *Id.* Road pricing itself is a subspecies of the broader category of road user charges—that is, the "spectrum of methods to collect money from road users, e.g. gasoline and vehicle ownership taxes." *Id.*

and upgrading the road,²²⁰ subsidizing mass transportation,²²¹ or simply providing a source of government revenue.²²² Congestion charging envisions the imposition of fees solely as "an instrument to manage travel demand and guide/control traffic flows."²²³ Congestion pricing schemes are generally designed to mandate the internalization of the congestion externality.²²⁴

²²⁰ For example, on the New Jersey Turnpike, "[t]oll for travel between interchanges is determined by the cost of construction and maintenance of the roadway between these points." TRUCK TOLL REPORT 2005 at 15, http://www.nymtc.org/files/Truck_Toll_Report_2005_Part1_Text.pdf (last visited Apr. 9, 2008).

Note that, effective July 9, 2003, the New Jersey Highway Authority (which administered New Jersey's Garden State Parkway) was folded into the New Jersey Turnpike Authority. See 2003 N.J. Sess. Law Serv. ch. 79 (West); Garden State Parkway, <http://www.gspkwy.state.nj.us> (last visited Mar. 9, 2008) (noting that "[e]ffective . . . 2003 all of the duties, obligations and powers of the New Jersey Highway Authority were transferred to the New Jersey Turnpike Authority," and redirecting to <http://www.state.nj.us/turnpike>). A press release from New Jersey's governor proclaims that, as a result, "more money is now available for projects to improve the roads." Press Release, N.J. Tpk. Auth., Governor McGreevey Announces Planned Improvements from Turnpike Authority Consolidation (July 10, 2003), available at <http://www.state.nj.us/turnpike/msgfromgov.htm>.

²²¹ For example, New York's "Bridges and Tunnels" ("B&T") is a "constituent agency of the Metropolitan Transportation Authority." Metro. Transp. Auth., Welcome to MTA Bridges and Tunnels, <http://www.mta.nyc.ny.us/bandt/html/btintro.htm> (last visited Mar. 9, 2008). B&T's "dual role is to operate seven bridges and two tunnels and to provide surplus toll revenues to help support public transit." *Id.* The cross-subsidization of public transit with bridge and tunnel tolls dates back to the 1960s:

By the 1960s the city was becoming choked by automobile congestion and pollution, and the need to restore long neglected subway, bus, and commuter rail systems became apparent. Accordingly, in 1968 the Triborough Bridge and Tunnel Authority was made part of the MTA. Its surplus revenues, previously used to finance new projects for the automobile, were redirected to public transportation. Since that time, bridge and tunnel tolls have contributed more than \$12 billion to subsidize fares and underwrite capital improvements for New York City Transit, the Long Island Rail Road, and the Metro-North Railroad. Total toll revenues, more than \$1 billion annually, and Bridges and Tunnels' Five Year Capital Program will keep its facilities among the best maintained in the region.

Id.

²²² *E.g.*, MCGILLIVRAY, *supra* note 9, at 1 ("Through most of history the justification for [toll charges] has been either to generate income or profit or to pay the costs of providing a facility which smooth[e]s the way for passage.").

²²³ See Johansson & Mattsson, *supra* note 25, at 7–8 ("When road pricing is used as an instrument to manage travel demand and guide/control traffic flows it is called congestion pricing."). To the extent that a fee is imposed for more than one reason, this Article refers to the fee as a "congestion charge" only to the extent that it is imposed to effect internalization of the congestion externality.

²²⁴ See *id.* at 8 ("Road pricing is often introduced as a method to internalise the externalities generated by road use, thereby removing the external effects caused by car drivers.

Congestion pricing regimes seek to remedy the externality of congestion in a straightforward way: by charging drivers for access to the roadways at issue.²²⁵ As detailed below, this seemingly simple definition harbors considerable ambiguity—ambiguity that affords freedom in designing congestion pricing schemes—but the fundamental point remains that congestion pricing regimes seek to mitigate the externality by directly requiring cost internalization.²²⁶

The use of congestion pricing regimes for roadway use is similar to the use of peak pricing regimes for other goods and services with which consumers are already familiar.²²⁷ The benefits of application of peak pricing to roadway access are clear: "Congestion pricing assesses vehicles for the congestion and the time losses they impose on other roadway users. In doing so, congestion pricing can dampen and flatten the demand to use roads, thereby reducing the aggregate loss of drivers' time and also defraying the need to expand road capacity."²²⁸ In addition, congestion pricing "not only sends out the right signals to motorists, but it yields a transfer of resources that could be used by the road authority to enhance community welfare."²²⁹ Also, unlike command-and-control approaches,²³⁰ congestion pricing regimes afford societal actors maximum flexibility in determining their travel itineraries.²³¹

The charges are directed towards the congestion and other road damage externalities caused by motorists.").

²²⁵ See, e.g., Strahilevitz, *supra* note 9, at 1235 (concisely defining "congestion pricing" as "an approach that seeks to decrease congestion by charging motorists tolls that vary based on the levels of traffic congestion at a given time").

²²⁶ See *infra* notes 227–273 and accompanying text.

²²⁷ See Komanoff, *supra* note 138, at 132; Strahilevitz, *supra* note 9, at 1244. For a theoretical overview of peak pricing, see W. KIP VISCUSI ET AL., *ECONOMICS OF REGULATION AND ANTITRUST* 396–403 (2d ed. 1998).

²²⁸ Komanoff, *supra* note 138, at 131.

²²⁹ Timothy D. Hau, *Instruments for Charging Congestion Externalities*, in *ROAD PRICING*, *supra* note 25, at 223, 224.

²³⁰ See *infra* note 397.

²³¹ Harry Richardson and Chang-Hee Bae explain that the options among which individuals may choose under a congestion pricing regime include:

[N]o change in travel behavior (that is, paying the charges); increasing travel (because trip times on formerly congested roads are now reduced); unchanged travel behavior combined with attempts to reduce total automobile costs (for example, keeping vehicle longer, or replacing it with a cheaper or more fuel-efficient vehicle); changing travel behavior with the same level of tripmaking (for example, changing trip time, route, or mode, such as carpools, transit); reduce tripmaking (for example, trip chaining, telecommuting, or simply traveling less); and changes in location (for example, residence, workplace shopping destination).

Congestion pricing structures can be seen to vary along two axes. First, one must determine how the price for road access is determined.²³² Second, one must examine what other options (i.e., substitutes) are available to persons who choose not to pay for road access and how those options are priced.

An understanding of how congestion pricing should theoretically be set is not difficult. As shown in Figure 1 above, the congestion externality arises because of a discrepancy between the "average perceived costs" faced by motorists and the total "marginal costs" to which driving gives rise. It is appropriate to impose a congestion charge sufficient to ensure that drivers in fact take into account the actual total marginal costs.²³³ This means that congestion charges should be set equal to the excess of marginal costs over average perceived costs.²³⁴ Because the purpose of congestion pricing is to internalize the congestion externality, a congestion pricing scheme should impose no charge where there is no congestion.²³⁵ Congestion has a "collective (social) effect" where

Harry W. Richardson & Chang-Hee Christine Bae, *The Equity Impacts of Road Congestion Pricing*, in ROAD PRICING, TRAFFIC CONGESTION AND THE ENVIRONMENT, *supra* note 200, at 247, 247–48.

²³² Peter Jones breaks the pricing question down into finer distinctions:

1. Who should be charged?
2. How much should they pay?
3. Where should they be charged?
4. When should they be charged?
5. How should they be charged?

Peter Jones, *Urban Road Pricing: Public Acceptability and Barriers to Implementation*, in ROAD PRICING, TRAFFIC CONGESTION AND THE ENVIRONMENT, *supra* note 200, at 263, 277; *see id.* at 277–80.

²³³ *See* Hau, *supra* note 99, at 58.

²³⁴ *See id.* ("It is th[e] amount of external congestion cost—or time cost expressed in money terms—that the government ought to charge for. The marginal external cost is the difference between the (short-run) marginal cost and the average (variable) cost of a trip." (citation omitted)); Johansson & Mattsson, *supra* note 25, at 13. *But see* Phil B. Goodwin, *Road Pricing or Transport Planning?*, in ROAD PRICING, *supra* note 25, at 143, 149 (arguing that, though congestion pricing regimes are generally a good idea, actually imposing internalization of congestion costs might not be optimal); Komanoff, *supra* note 138, at 132–33 (arguing that, because "the objective is not necessarily to eliminate all congestion, but to maximize the net benefits from society's economic resources, including not only time but capital invested in roads[,] . . . the appropriate level of congestion pricing is probably far less" than total external congestion costs (citation omitted)).

²³⁵ *See* Johansson & Mattsson, *supra* note 25, at 10–11 (explaining that where "there are no congestion effects . . . there are no efficiency or welfare arguments" in favor of imposing a charge); Komanoff, *supra* note 138, at 132 ("Motorists using uncongested rural roads would not pay congestion fees.").

"marginal social cost is higher and increases faster than the average individual cost."²³⁶

A pure congestion pricing system would take into account the existing traffic conditions and how the new entrant's travel will adversely affect traffic conditions.²³⁷ In theory, then, a congestion pricing scheme should vary price according to the extent to which, on a going-forward basis, the new entrant's driving contributes to congestion.²³⁸ Thus, under the pure approach, the total cost of a trip should depend upon changing traffic conditions during the trip.²³⁹ There is a practical problem here: the total cost of the trip could not be determined in advance.²⁴⁰ Part of the benefit offered by congestion pricing, however, is that prospective roadway users might consider congestion cost associated with a trip in advance. In this sense, it is preferable if the congestion pricing scheme sets a fixed price in advance of the trip.²⁴¹ Thus, practicality may require sacrifice of the purity of a congestion pricing regime.²⁴²

To allow for the establishment of a fixed price for a trip, a congestion pricing scheme can use historical data on traffic patterns to anticipate the externalized cost that one would expect the new entrant's travel to generate. In this sense, setting a congestion charge presents an

²³⁶ Johansson & Mattsson, *supra* note 25, at 11.

²³⁷ See Goodwin, *supra* note 234, at 148.

²³⁸ See *id.*

²³⁹ See *id.*

²⁴⁰ See *id.*

²⁴¹ Note, however, that other variable costs, such as gasoline, oil, and general vehicle wear-and-tear, may vary considerably depending upon traffic conditions. To that extent, drivers often may be forced to decide whether or not to undertake a trip (or to use a particular route) without full knowledge of the total cost of the trip.

²⁴² Phil Goodwin explicates:

[T]here is a balance between theoretical purity and practical usefulness. In principle, the road pricing argument can be extended to show that a vehicle at the front of a queue should be charged more than one at the back, and that charging rates should vary by the minute, or even [the] second, in response to the constantly changing intrusiveness of traffic in urban streets. In practice, there is a limit to how finely it is useful to specify charges—and indeed a strong argument that charges should be predictable, and known to the motorist before a journey is started. The result is that most road pricing exercises plan some sort of simplified system where charges vary by period of the day, and by geographical area or part of the network, but in rather broad bands which therefore necessarily average out some of the potential refinements, and lose the moral high ground of a theoretical optimum.

Goodwin, *supra* note 234, at 148.

easier chore for a regulator than the task of setting a Pigouvian tax in most other settings.

Reliance upon historical data, however, does not resolve the pricing issue.²⁴³ To price a trip properly, the congestion pricing scheme should take into account some aspect of the traveler's journey. There are several ways that this can be achieved. First, the driver somehow might indicate his anticipated route in advance of his trip;²⁴⁴ a problem arises, however, if the driver changes his or her path en route.

Second, the congestion pricing scheme might use distance traveled as a measure of contribution to congestion. Such an approach might entail the system recording the locations at which a driver enters and exits the road subject to pricing and then pricing the trip according to that information.²⁴⁵ The approach also could be achieved by having a device that measures actual distances traveled on the restricted road; data from that device would be obtained by the government and used to price the roadway usage.²⁴⁶

A third possibility would be to use time spent on a road as a proxy for contribution to congestion on the road. Here, the system would record the times at which a driver enters and exits the restricted road.

Each of these possibilities requires the government to obtain data for each driver's trip on each occasion that the driver takes a trip. Technological advances make these possibilities far more feasible than they previously were,²⁴⁷ but nonetheless they remain complex and somewhat

²⁴³ *Id.*

²⁴⁴ This would be akin to a "flight plan" filed by a pilot.

²⁴⁵ Many state toll roads employ pricing systems that, although they are not congestion pricing schemes, vary tolls according to the entrance and exit used by drivers. See *supra* note 220 (discussing the setting of tolls on the New Jersey Turnpike).

²⁴⁶ See generally KIRAN BHATT, ROAD PRICING TECHNOLOGIES: A SURVEY (1974). Such a device would be akin to a meter used by taxicabs in many metropolitan areas.

²⁴⁷ See DANIEL H. COLE, POLLUTION AND PROPERTY 67-84 (2002) (discussing the relationship between technology capabilities and design and development of environmental regulatory tools); Nash & Revesz, *supra* note 200, at 637-50 (describing how computerized pollution dispersion models and the internet can facilitate more nuanced air pollutant permit trading programs); cf. EMMERINK, *supra* note 9, at 45 (Although "the costs of implementing and maintaining a congestion-pricing system should not be underestimated," "recent evidence indicated that, for high density, highly congested regions, these may be relatively low."). Compare BHATT, *supra* note 246, at 7-20 (surveying then-existing technological options), and Goetz, *supra* note 140, at 118 (describing road pricing on trunk highways as "feasible" but pricing city streets as "impractical" "[g]iven the present technology," but also noting that "it is not impossible to imagine the development of electronic monitoring devices that would bring almost-universal road-usage pricing within the realm of practicality"), with Wahrman, *supra* note 8, at 196 (noting that "[i]t is only recently that the concept [of congestion pricing] became administratively feasible with the introduction of electronic tolls and computerized toll cards"). For a discussion of the ethical implications of scientific innovation

costly. Other options exist that are less complex and costly, although they require sacrifice of accuracy in pricing to achieve those ends.

First, a congestion pricing scheme can be simplified by charging a uniform price for use of the road (i.e., by charging on a per use basis, without regard to distance traveled or time spent on the road). To the extent that the pricing system is designed to address congestion, the system still would take into account somehow the extent to which a new entrant contributes to existing congestion conditions. Presumably, such a system would charge all drivers the average congestion price. One might expect, therefore, that drivers of shorter trips would subsidize drivers of longer trips under such a system, with the possible result that short-trip drivers would avoid the road and long-trip drivers would overuse it. Such a distortion might result in inefficiently high congestion levels (at least in the short-term, until pricing caught up with the changed use of the road). In other words, true pricing might lead to adverse selection of roadway users.

Another simplifying step is to use the time of day as a proxy for congestion conditions, without regard to what actual congestion conditions are at any given moment.²⁴⁸ The most common version seen in congestion pricing schemes is simply to price roadway access at a higher rate during prevalent "rush hours."²⁴⁹ For example, the government might charge a higher toll from 6:00 to 10:00 a.m. every weekday morning into a city, and from 4:00 to 8:00 p.m. every weekday evening out of the city.²⁵⁰ Indeed, the city might charge no toll in nonpeak hours. For example, London has recently implemented a congestion pricing scheme for permission to drive in the central city.²⁵¹ The scheme im-

on environmental policy, see generally Carol M. Rose, *Scientific Innovation and Environmental Protection: Some Ethical Considerations*, 32 ENVTL. L. 755 (2002).

²⁴⁸ The idea of using historical congestion data is a more nuanced version of this simplifying step. See *supra* notes 241–247 and accompanying text.

²⁴⁹ See generally MARTIN G. RICHARDS, CONGESTION CHARGING IN LONDON: THE POLICY AND THE POLITICS (2006) (detailing London's scheme of charging motorists to enter the center city during "rush hours").

²⁵⁰ In the public transit context, the "Metrorail" subway system in the Washington, D.C., metropolitan area charges higher fees for travel during morning and evening rush hours. See Wash. Metro. Area Transit Auth., *Fares & Passes*, http://www.wmata.com/riding/hours_fares.cfm#Metrorail%20Fares (2008). William Vickrey originally advocated congestion pricing for use in public transportation—specifically, the New York City subway system. See *supra* note 213 and accompanying text; cf. Patrick Healy, *Rises in Fares and Costs Give Cabbies Mixed Feelings*, N.Y. TIMES, May 3, 2004, at B3 ("Riders [in taxis] will . . . have to pay a new \$1 surcharge from 4:00 to 8:00 p.m. weekdays, a fee intended to draw out more cabs during rush hour.").

²⁵¹ See Transport for London, *Where and When*, <http://www.tfl.gov.uk/tfl/roadusers/congestioncharge/whereandwhen> (last visited Mar. 26, 2008).

poses a flat fee for access to the central city during the hours of 7:00 a.m. to 6:00 p.m. on weekdays; no fee is required during other hours.²⁵²

The second axis along which congestion pricing schemes can be measured is the availability, and pricing, of substitutes. It is possible for all viable substitutes for a congestion-priced road to be themselves subject to congestion pricing (or to some other form of tolls); in the alternative, it is possible for substitute roads (or public transit) to be offered at no cost. This distinction can be used to divide congestion pricing regimes into two categories: regimes that charge for access to particular roads or lanes on a road, and regimes that charge for access to a particular region regardless of the route taken, the latter being known commonly as "cordon-pricing" regimes.²⁵³

The recently enacted congestion pricing regime in London is an example of cordon-pricing.²⁵⁴ Those who choose not to pay for access to the central city during the day have the option of using public transit—which is less expensive, but not free.²⁵⁵ Though some London workers have complained that their circumstances leave them with no viable substitute to paying the central city access fee,²⁵⁶ overall the Lon-

²⁵² *Id.* Exemptions and discounts are available for, among others, residents of the central city, disabled persons, vehicles that seat nine or more, and alternative fuel vehicles. See Transport for London, Discounts and Exemptions, <http://www.tfl.gov.uk/roadusers/congestioncharging/6713.aspx> (last visited Mar. 9, 2008). On the London congestion charge plan, see generally RICHARDS, *supra* note 249.

²⁵³ See U.S. DEP'T OF TRANSP., CONGESTION PRICING: A PRIMER 1 (2006) [hereinafter CONGESTION PRICING], available at <http://www.ops.fhwa.dot.gov/publications/congestionpricing/congestionpricing.pdf>. (defining cordon pricing as "either variable or fixed charges to drive within or into a congested area within a city.").

²⁵⁴ See Transport for London, Charging Zone, <http://www.tfl.gov.uk/roadusers/congestioncharging/6709.aspx> (last visited Mar. 9, 2008) ("Certain vehicles which drive within a clearly defined zone of central London during its hours of operation have to pay a daily Congestion Charge.").

²⁵⁵ Public transit is also not a perfect substitute for roadway access. See Oren, *supra* note 97, at 213–31 (discussing the importance to Americans of driving vehicles, and surveying how that ideal has frustrated attempts to change driving patterns through behavioral modification).

²⁵⁶ For example, workers at a London meat market had argued that they ought not to have to pay the congestion toll "because they come to the market in the middle of the night and go home by midmorning. When their day starts [at] around 3 a.m., they say, little public transportation is available." *London Institutes Its New Anti-Gridlock Toll; Few Problems Are Reported on First Day*, ST. LOUIS POST-DISPATCH, Feb. 18, 2003, at A8. The workers contemplated filing a lawsuit challenging the imposition of the toll, but ultimately agreed not to in return for "assurances given by Ken Livingstone, the Mayor of London, that he would consider introducing a cheaper rate for drivers on low incomes." Ben Webster, *Workers Abandon Charge Challenge*, TIMES (London), Feb. 22, 2003, at 14.

don plan seems to be faring reasonably well and even earning some public accolades.²⁵⁷

The alternative to a cordon-pricing regime is the category of regimes for which vehicles must pay for access to a particular roadway or lanes on a roadway; substitutes, in the form of alternate roadways or other lanes, are available at no cost (and sometimes, as discussed below, are even subsidized²⁵⁸). For example, the San Diego I-15 "FasTrak" pricing scheme charges single-occupant vehicles for access to the road's express lanes.²⁵⁹ But access to the highway's local lanes remains free.²⁶⁰

Regimes that fall under this category may further be broken down into subcategories.²⁶¹ A simple example is a regime that charges drivers for access to a particular roadway.²⁶² Another simple example is a regime that charges drivers for access to particular lanes on a roadway.²⁶³ Often these lanes will be "express lanes" that bypass numerous exits, allowing users of the charged lanes to avoid the additional traffic and entrance and exit ramps that numerous exits generate.²⁶⁴ Along similar lines, access for lanes may be priced where the lanes are designed to avoid areas along the primary roadway where the free lanes suffer bottleneck conditions.²⁶⁵

A hybridization of lane-access pricing occurs where lane access is also permitted to particular vehicles on a basis other than cost.²⁶⁶ An example of this is "HOT lanes" systems.²⁶⁷ According to the U.S. Department of Transportation (the "DOT"),

"HOT" is the acronym for "High Occupancy/Toll." On HOT lanes, low occupancy vehicles are charged a toll, while High-Occupancy Vehicles (HOVs) are allowed to use the lanes free

²⁵⁷ See, e.g., Jill Lawless, *Supporters, Foes Agree: London Traffic Fee Works*, NEW ORLEANS TIMES-PICAYUNE, May 18, 2003, at A23.

²⁵⁸ See *infra* notes 270-273 and accompanying text (discussing "FAIR lanes").

²⁵⁹ Congesting Pricing, *supra* note 253, at 2 (explaining that low occupancy vehicles are charged a toll, while high occupancy vehicles, public transit vehicles, and emergency vehicles are allowed use of the lanes free of charge, or at a reduced rate).

²⁶⁰ See *id.*

²⁶¹ See *id.* at 1-4.

²⁶² See *id.* at 3.

²⁶³ See *id.* at 2.

²⁶⁴ See CONGESTION PRICING, *supra* note 253, at 2.

²⁶⁵ See U.S. Dep't of Transp., Terminology, <http://www.fhwa.dot.gov/policy/otps/terminology.htm> (last visited Mar. 26, 2008) ("Queue jumps are roadway facilities that can be used by drivers paying a toll to bypass points on the transportation network where congestion is typically severe (colloquially, a 'bottleneck').").

²⁶⁶ See CONGESTION PRICING, *supra* note 253, at 2.

²⁶⁷ See *id.*

or at reduced rates. HOT lanes create an additional category of eligibility to use HOV lanes. People can either meet the minimum vehicle passenger requirement—or they can choose to pay a toll to gain access to the HOV lane.²⁶⁸

The San Diego “FasTrak” system is an example of a HOT lanes regime. Interest in such regimes is growing.²⁶⁹

Yet another variant on lane-pricing access is a “FAIR lanes” regime.²⁷⁰ According to the DOT,

The strategy, called “FAIR lanes,” or “Fast and Intertwined Regular” lanes, seeks to alleviate public concerns about conversion of currently free lanes to value-priced lanes. FAIR lanes involve separating congested freeway lanes into two sections—fast lanes and regular lanes—using plastic pylons and striping. The fast lanes would provide improved transit . . . and would be electronically tolled, with tolls set in real time to limit traffic to the free-flowing maximum. . . .

In the regular lanes, constricted flow would continue; however, drivers with electronic toll tags would be compensated with credits that could be used as toll payments on days when they choose to use the fast lanes, or as payment for transit and paratransit services that would be subsidized using toll revenues. The credits would compensate motorists for giving up their right to free use of the lanes converted to fast lanes.²⁷¹

FAIR lanes thus are a hybrid between pure congestion pricing and subsidy regimes.²⁷² The incorporation of a subsidy element may provide an opportunity to ameliorate what some perceive to be equity shortcomings in standard congestion pricing regimes.²⁷³

²⁶⁸ *Id.*

²⁶⁹ *See id.* at 6.

²⁷⁰ *See* U.S. Dep’t of Transp., Public Roads, Along the Road (Nov./Dec. 2001), <http://www.fhrc.gov/pubrds/novdec01/alongnov.htm>.

²⁷¹ *Id.*

²⁷² For a discussion of the use of subsidies to reduce traffic congestion, see *supra* note 200 and accompanying text.

²⁷³ *See infra* notes 368–376, 393 and accompanying text (discussing equity in the context of congestion pricing); *see also supra* notes 256–257 and accompanying text.

C. Current Federal Role in Fostering Congestion Pricing Regimes

Public money to construct roads comes from the federal government and from state governments.²⁷⁴ The "federal-aid highway program" (the "FAHP") is the primary federal source of funds for highway construction.²⁷⁵ It is administered by the DOT's Federal Highway Administration.²⁷⁶ The FAHP is "basically a federally funded state program"²⁷⁷ in which "[m]onies for the federal-aid highway system are provided primarily by the Federal Highway Trust Fund, fueled by taxes on gasoline, motor vehicles, and automotive parts."²⁷⁸ The FAHP provides federal funding to roads within the "federal-aid systems."²⁷⁹ The two federal-aid systems are the "Interstate System"²⁸⁰ and the "National Highway System,"²⁸¹ of which the Interstate System is a component.²⁸²

In fact, the Interstate System constitutes a very small part of all roads—only 4.9% of all federally subsidized roadway miles, and only 1.2% of all total roadway miles in the United States.²⁸³ Still, though In-

²⁷⁴ See, e.g., David R. Fiore & John M. Stafford, *Intermodal Transportation Planning for the Environment: Social, Cultural, and Economic Considerations for an Interdisciplinary Solution for Change*, 23 *TRANSP. L.J.* 237, 251 n.36 (1995).

²⁷⁵ Edward V. A. Kussy, *Wetland and Floodplain Protection and the Federal-Aid Highway Program*, 13 *ENVTL. L.* 161, 164 (1982) ("Although the FAHP represents a relatively small portion of the total highway construction effort, it is still of enormous significance. It is one of the largest and most costly federal construction grant programs.").

²⁷⁶ *Id.*

²⁷⁷ *Id.*

²⁷⁸ Houck, *supra* note 182, at 897 n.176; see also Fiore & Stafford, *supra* note 274, at 251 n.36 ("In FY 1991, the Federal Highway Trust Fund net receipts for motor fuel constituted more than eighty-eight percent of all revenue sources. . . . States similarly depend largely on motor fuel receipts for state and federal highway projects that have matching shares requirements." (citation omitted)).

²⁷⁹ See 23 U.S.C. § 103(a) (2000 & Supp. V 2005) (defining the "Federal-aid systems"); 23 C.F.R. § 470.103 (2007) (same); see also 23 U.S.C. § 101(a)(5) (2000 & Supp. V 2005) ("The term 'Federal-aid highway' means a highway eligible for assistance under this chapter other than a highway classified as a local road or rural minor collector."); 23 C.F.R. § 470.103 ("Federal aid highways means highways on the Federal-aid highway systems and all other public roads not classified as local roads or rural minor collectors.").

²⁸⁰ For the definition of the "Interstate System," see 23 U.S.C. § 103(c); 23 C.F.R. § 470.107(a); see also 23 C.F.R. § 470.111 (procedures governing the Interstate System). For an overview of the Interstate System, see U.S. Dep't of Transp., Dwight D. Eisenhower National System of Interstate and Defense Highways, <http://www.fhwa.dot.gov/programadmin/interstate.cfm> (last visited Mar. 26, 2008).

²⁸¹ For the definition of the "National Highway System," see 23 U.S.C. § 103(b); 23 C.F.R. § 470.107(b); see also 23 C.F.R. § 470.113 (procedures governing the National Highway System).

²⁸² 23 U.S.C. § 103(b)(2)(A) (defining the National Highway System to include the Interstate System); 23 C.F.R. § 470.107(b)(1) (same).

²⁸³ As of October 2002, there were 3,981,670 miles of roads in the United States. See U.S. Dep't of Transp., *PUBLIC ROAD LENGTH—2002: MILES BY OWNERSHIP AND FEDERAL-*

terstate Highways may constitute a relatively small proportion of all roads—and even of all roads in the National Highway System—they represent a far greater portion of the nation's transportation road network than their total mileage might suggest.²⁸⁴ This is because of the role that the Interstate Highway system is designed to fulfill: Interstate Highways are to be “located so as . . . to connect by routes, as direct as practicable, the principal metropolitan areas, cities, and industrial centers.”²⁸⁵ These well-maintained roads carry an inordinate amount of traffic for the mileage they represent.²⁸⁶

Federal law imposes various restrictions on roads that receive federal funding.²⁸⁷ Among them is a restriction on the implementation and maintenance of tolls.²⁸⁸ The existing structure of federal law, under title 23 of the United States Code, is quite hostile to the imposition of

AID HIGHWAYS NATIONAL SUMMARY, available at <http://www.fhwa.dot.gov/policy/ohim/hs02/pdf/hm16.pdf> (last visited Mar. 9, 2008). Of that, 3,079,758 miles were in rural areas, and 901,912 were in urban areas (with 183,502 in small urban areas and 718,410 in urbanized areas). *Id.* Of the total 3,981,670 miles of roads, only 959,324 miles (i.e., just over twenty-four percent of roadway miles) received FAHP funding. *Id.* Of those 959,324 subsidized roadway miles, only 161,539—or 16.8%—are part of the National Highway System. *Id.* The Interstate Highway System consists of 46,748 miles of road, which constitutes 28.9% of the National Highway System, only 4.9% of all federally subsidized roadway miles, and only 1.2% of all total roadway miles in the United States. *Id.*

By comparison, based on 1979 statistics,

The total mileage of all roads and streets in the United States is 3,957,819. Of these, 3,223,710 miles are in rural areas, while 693,786 miles are in municipal areas. Of this total mileage, only 824,832 miles (or 21%) were funded through the FAHP. . . . The interstate system has 42,894 miles, which is 14% of the primary system, 5% of the federal-aid system, and only 1% of all roads in the United States.

Kussy, *supra* note 275, at 164 n.5 (citing U.S. DEP'T OF TRANSP., HIGHWAY STATISTICS—1979 (1980)).

²⁸⁴ See, e.g., 23 U.S.C. § 103(c)(1)(C)(i).

²⁸⁵ *Id.* The statute directs that Interstate Highways are also to be located so as to “serve the national defense,” *id.* § 103(c)(1)(C)(ii), and so as, “to the maximum extent practicable, to connect at suitable border points with routes of continental importance in Canada and Mexico,” *id.* § 103(c)(1)(C)(iii).

²⁸⁶ See, e.g., *Status of the Nation's Highway and Transit Systems: Capital and Maintenance Needs Before the Comm. on Transportation and Infrastructure: Subcomm. on Highways and Transit*, 107th Cong. 64 (2002) (statement of Katherine Siggerud, Acting Director, Physical Infrastructure Issues, Government Accounting Office) (“The [Interstate Highway System] carries over 24 percent of all vehicle miles traveled in the nation, while making up just 2.5 percent of total lane miles.”).

²⁸⁷ See, e.g., 23 U.S.C. § 301 (2000) (barring tolls on roads constructed with federal highway funds).

²⁸⁸ See *id.*

tolls—of any kind—on Interstate Highways.²⁸⁹ Section 301 announces a general rule that bars tolls from roads that are constructed with federal highway funds.²⁹⁰ The section's caption suggests the seriousness with which Congress—presumably in response to perceptions of, if not actual, public opinion—views the subject: "Freedom from tolls."²⁹¹

Despite the breadth of its language and the audacity of its caption, § 301 subjects its toll preclusion rule to the provisions of § 129.²⁹² And § 129 provides a fairly broad exception to § 301's general rule.²⁹³ Though it preserves § 301's general proscription against tolls with respect to highways constituting part of the Interstate System, it otherwise permits the provision of federal funds for toll roads and allows for the introduction of tolls on roads receiving federal funding.²⁹⁴ The provision grandfathers in existing toll segments of the Interstate System, allowing for funding for "reconstructing, resurfacing, restoring, and rehabilitating" such segments.²⁹⁵ As a result, "[a]pproximately 2,900 miles

²⁸⁹ See *id.*

²⁹⁰ See *id.* The provision states: "Except as provided in section 129 of this title with respect to certain toll bridges and toll tunnels, all highways constructed under the provisions of this title shall be free from tolls of all kinds." *Id.*

²⁹¹ *Id.*

²⁹² 23 U.S.C. § 301 (subjecting the bar against tolls to "section 129 of this title with respect to certain toll bridges and toll tunnels").

²⁹³ See 23 U.S.C. § 129 (2000 & Supp. V 2005). The exception to the bar against tolls developed over time:

The Federal-aid highway program, when created in 1916, allowed no use of Federal-aid funds on toll facilities. This position remained unchanged until 1927 when Congress enacted legislation that permitted Federal-aid highway funding to be used to construct toll bridges and approaches. Subsequent legislation provided more flexibility on using Federal-aid highway funds for improvements to toll facilities with the last significant changes being made in 1991 with passage of the Intermodal Surface Transportation Efficiency Act of 1991.

U.S. Dep't of Transp., Federal-Aid Highway Toll Facilities, <http://www.fhwa.dot.gov/programadmin/tollfac.cfm> (last visited Mar. 26, 2008) [hereinafter Federal-Aid Highway Toll Facilities].

²⁹⁴ See 23 U.S.C. § 129(a)(1); *id.* § 129(a)(2)–(5) (setting forth restrictions on funding).

²⁹⁵ See *id.* § 129(a)(1)(B). The DOT explains:

Although the Interstate System is free of tolls for the most part, Congress decided in 1956 to include some toll facilities in the System. Generally, these were major toll roads built or planned before Federal funding for construction of the Interstate System increased significantly in 1956. Inclusion of these toll roads in the Interstate System enhanced connectivity without having to build competing free routes in the same transportation corridors. Additionally, including these toll segments freed highway user tax revenues to develop other non-toll segments of the System sooner.

of toll facilities are included in the 46,730-mile [Interstate] System."²⁹⁶ Until 1991, however, federal law precluded the introduction of new tolls are on the Interstate System.²⁹⁷

The first crack in the statutory bar against new Interstate System tolls was introduced by the 1991 passage of the Intermodal Surface Transportation Efficiency Act ("ISTEA").²⁹⁸ Section 1012(b) of ISTEA, captioned "Congestion Pricing Pilot Program," directed the DOT to "solicit the participation of State and local governments and public authorities for one or more congestion pricing pilot projects"²⁹⁹ and authorized the DOT to approve up to five such projects.³⁰⁰ ISTEA further authorized the introduction of new toll segments on Interstate Highways in three of the pilot projects.³⁰¹

The Transportation Equity Act for the 21st Century ("TEA-21") amended ISTEA's "congestion pricing pilot project" provisions.³⁰² First, TEA-21 replaced the moniker "congestion pricing pilot project" with "value pricing pilot programs."³⁰³ On a substantive level, TEA-21 in-

²⁹⁶ Federal-Aid Highway Toll Facilities, *supra* note 293. For a catalog of toll and nontoll roads, bridges, tunnels, and ferries in the United States, see generally TOLL FACILITIES IN THE U.S., *supra* note 84. For a list of toll bridges and tunnels that are part of the Interstate Highway System, see *id.* at 3. For a list of toll bridges and tunnels outside the Interstate Highway System, see *id.* at 4-8. For a list of toll roads that are part of the Interstate Highway System, see *id.* at 9-12. For a list of toll roads outside the Interstate Highway System, see *id.* at 13-16.

²⁹⁷ See Intermodal Surface Transportation Efficiency Act, Pub. L. No. 102-240, 105 Stat. 1914 (1991) (codified as amended in scattered sections of 23 U.S.C.).

²⁹⁸ *Id.*

²⁹⁹ *Id.* § 1012(b)(1).

³⁰⁰ *Id.* ("The Secretary [of Transportation] may enter into cooperative agreements with as many as 5 . . . State or local governments or public authorities to establish, maintain, and monitor congestion pricing projects.").

³⁰¹ *Id.* § 1012(b)(4) ("Notwithstanding sections 129 and 301 of title 23, United States Code, the Secretary [of Transportation] shall allow the use of tolls on the Interstate System as part of a pilot program under this section, but not on more than 3 of such programs."); see also *id.* § 1012(b)(2) ("Notwithstanding section 129 of title 23, United States Code, the Federal share payable for such [pilot] programs shall be 80 percent.").

³⁰² Transportation Equity Act for the 21st Century, Pub. L. No. 105-178, 112 Stat. 107 (1998) (codified as amended in scattered sections of 23 U.S.C.).

³⁰³ *Id.* § 1216(a)(1)(B)(i), (ii) ("Section 1012(b) of [ISTEA] . . . is amended . . . in paragraph (1) by striking 'congestion' each place it appears and inserting 'value'; and by striking 'projects' each place it appears and inserting 'programs' . . ."); see also *id.*, § 1216(a)(1)(A) (changing the subsection 1012(b)'s heading from "Congestion Pricing Pilot Program" to "Value Pricing Pilot Program"); U.S. Dep't of Transp., Office of Transportation Policy Studies, Value Pricing Pilot Program, <http://www.fhwa.dot.gov/policy/otps/valuepricing.htm> (last visited Mar. 26, 2008) [hereinafter Value Pricing Pilot Program] (stating that the Value Pricing Pilot Program "replaced the Congestion Pricing Pilot Program that was authorized by the Intermodal Surface Transportation Efficiency Act of 1991").

creased the maximum number of value pricing pilot programs from five to fifteen.³⁰⁴ The law also extended the suspension of §§ 129 and 301's bar against new tolls on Interstate Highways to apply not just to three pilot programs but to all of them.³⁰⁵

Importantly, TEA-21 also expanded the possible purview of value pricing pilot programs by allowing them to make use of high-occupancy vehicle ("HOV") lanes.³⁰⁶ Federal law provides that "[a] State agency that has jurisdiction over the operation of a HOV facility shall establish the occupancy requirements of vehicles operating on the facility,"³⁰⁷ but also directs that, "[e]xcept as otherwise provided by this section, no fewer than two occupants per vehicle may be required for use of a HOV facility."³⁰⁸ TEA-21 was the first law to eliminate the minimum two-person HOV vehicle occupancy requirement with respect to value pricing pilot programs.³⁰⁹ This allowed for "HOT lane" congestion pricing programs that, like the San Diego FasTrak program, allow vehicles with fewer than the minimal number of occupants to purchase access to the HOV lanes.³¹⁰

ISTEA further spurred state and local governments to consider the implementation of congestion pricing programs (though not necessarily on Interstate Highways) by directing the creation of state and local

³⁰⁴ Transportation Equity Act for the 21st Century, § 1216(a)(2) ("Section 1012(b)(1) of [ISTEA] is amended in the second sentence by striking '5' and inserting '15.'").

³⁰⁵ *Id.* § 1216(a)(4) ("Section 1012(b)(4) of [ISTEA] is amended by striking 'a pilot program under this section, but not on more than 3 of such programs' and inserting 'any value pricing pilot program under this subsection.'"). Beyond the value pricing pilot programs, TEA-21 created the Interstate System reconstruction rehabilitation pilot program, a limited program that allows for the introduction of new tolls on Interstate Highways "for the purpose of reconstructing and rehabilitating highway corridors that could not otherwise be adequately maintained or functionally improved without the collection of tolls." *Id.* § 1216(b)(1).

³⁰⁶ 23 U.S.C. § 166(a)(1) (2000 & Supp. V 2005).

³⁰⁷ *Id.* An earlier version authorized the "State transportation department [to] establish the occupancy requirements of vehicles operating in high occupancy vehicle lanes." 23 U.S.C. § 102(a) (2000) (repealed by Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, Pub. L. No. 109-59, § 1121(b)(1), 119 Stat. 1144, 1195 (2005)).

³⁰⁸ 23 U.S.C. § 166(a)(2). An earlier version directed that "no fewer than 2 occupants per vehicle may be required." 23 U.S.C. § 102(a).

³⁰⁹ Transportation Equity Act for the 21st Century, § 1216(a)(5) (amending ISTEA section 1012(b)(6) to read: "Notwithstanding section 146(c) of title 23, United States Code, a State may permit vehicles with fewer than 2 occupants to operate in high occupancy vehicle lanes if the vehicles are part of a value pricing pilot program under this subsection."); see Internal Revenue Service Restructuring and Reform Act of 1998, Pub. L. No. 105-206, § 9006(b), 112 Stat. 685, 848 (amending TEA-21 section 1216(a)(5) "by striking '146(c)' and inserting '102(a)'").

³¹⁰ See *supra* notes 259, 268 and accompanying text.

transportation planning units—known as “metropolitan planning organizations” (“MPOs”)³¹¹—and by introducing the Congestion Mitigation and Air Quality Improvement Program (the “CMAQ Program”).³¹² MPOs are to develop transportation plans for urbanized areas, with the overall goal of “maximiz[ing] mobility of people and goods within and through urbanized areas and minimiz[ing] transportation-related fuel consumption and air pollution.”³¹³ Among the factors that MPOs were to consider in generating transportation plans, under the statute as originally enacted, were “[t]he need to relieve congestion and prevent congestion from occurring where it does not yet occur.”³¹⁴ Further, MPOs are to develop long-range transportation plans;³¹⁵ the original wording of the statute called for MPOs to “recommend[] . . . innovative financing techniques to finance needed projects and programs, including such techniques as . . . tolls and congestion pricing.”³¹⁶

TEA-21 revised the ISTEA both to eliminate the mandatory consideration of congestion relief in developing transportation plans³¹⁷ and to delete the express reference to congestion pricing.³¹⁸ Following amendment by TEA-21, the statute directs that long-range transportation plans “[a]ssess capital investment and other measures necessary to . . . make the most efficient use of existing transportation facilities to relieve vehicular congestion and maximize the mobility of people and goods.”³¹⁹ Further, the current statute provides, for transportation management areas—that is, “each urbanized area with a population of over 200,000 individuals”³²⁰—that the “transportation planning process . . . include a congestion management system that provides for effective

³¹¹ See Intermodal Surface Transportation Efficiency Act, Pub. L. No. 102-240, § 1024(a), 105 Stat. 1914, 1955 (1991) (codified as amended at 23 U.S.C. § 134 (2000 & Supp. V 2005)).

³¹² See *id.* § 1008(a) (codified as amended at 23 U.S.C. § 149 (2000 & Supp. V 2005)); The Congestion Mitigation and Air Quality Improvement (CMAQ) Program of the Intermodal Surface Transportation Efficiency Act—Guidance Update, 61 Fed. Reg. 50,890 (1996) [hereinafter CMAQ Program Guidance Update].

³¹³ Intermodal Surface Transportation Efficiency Act, § 1024(a) (“[S]erv[ing] the mobility needs of people and freight and foster[ing] economic growth and development within and between States and urbanized areas, while minimizing transportation-related fuel consumption and air pollution.”).

³¹⁴ *Id.*

³¹⁵ *Id.*

³¹⁶ *Id.*

³¹⁷ Transportation Equity Act for the 21st Century, Pub. L. No. 105-178, § 1203(f), 112 Stat. 107, 174 (1998) (codified as amended at 23 U.S.C. § 134(f) (2000 & Supp. V 2005)).

³¹⁸ *Id.* § 1203(g)(3).

³¹⁹ Intermodal Surface Transportation Efficiency Act, § 1024(a).

³²⁰ 23 U.S.C. § 134(k)(1) (2000 & Supp. V 2005).

management of new and existing transportation facilities eligible for funding."³²¹

The CMAQ Program is designed to encourage transportation planning with an eye not only to improving efficient transportation, but also to improving air quality.³²² Emissions from motor vehicles contribute substantially to air pollution and, in particular, can be a primary reason for a region's inability to comply with national ambient air quality standards ("NAAQS") generated under the Federal Clean Air Act.³²³ The CMAQ Program provides federal funding for state "transportation projects or programs that will contribute to attainment of [the NAAQS], primarily for ozone and carbon monoxide."³²⁴ Regulatory guidance indicates that "travel demand management" is one of the items for which CMAQ Program funds may be made available, and it makes clear that travel demand management includes "road pricing measures."³²⁵

Though value pricing is in its domestic infancy, in 2004, the Senate contemplated eliminating new value pricing programs.³²⁶ A bill would have repealed the authorization for new value pricing programs,³²⁷ although it would have allowed existing programs to continue.³²⁸ Ultimately, in August 2005, Congress enacted a new transportation statute, dubbed the "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users" ("SAFETEA-LU").³²⁹ SAFETEA-LU retains the value pricing program.³³⁰ It also establishes an express lanes dem-

³²¹ Intermodal Surface Transportation Efficiency Act, § 1024(a).

³²² See generally CMAQ Program Guidance Update, *supra* note 312.

³²³ Under the Clean Air Act, the Environmental Protection Agency must generate NAAQS for so-called constituent pollutants. See 42 U.S.C. § 7410 (2000). The states must then develop "state implementation plans" that are designed to regulate in-state sources in such a way as to achieve compliance with the NAAQS. See *id.*

³²⁴ Wahrman, *supra* note 8, at 188 (footnote omitted).

³²⁵ CMAQ Program Guidance Update, *supra* note 312, at 50,895; see also *id.* at 50,896 ("The FHWA and FTA continue to recommend that States and MPOs put together their transportation/air quality programs using complementary measures that simultaneously provide alternatives to [single-occupancy vehicle] travel while reducing demand through pricing, parking management, regulatory or other means.").

³²⁶ See S. 1072, 108th Cong. (2004).

³²⁷ *Id.* § 1609(c)(1) ("Section 1012 of the Intermodal Surface Transportation Efficiency Act . . . is amended by striking subsection (b).").

³²⁸ *Id.* § 1609(c)(2) ("Notwithstanding the amendment made by paragraph (1), the Secretary shall monitor and allow any value pricing program established under a cooperative agreement in effect on the day before the date of enactment of this Act to continue.").

³²⁹ Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, Pub. L. No. 109-59, 119 Stat. 1144 (2005) (codified as amended in scattered sections of 23 U.S.C.).

³³⁰ See *id.* § 1604(a).

onstration program.³³¹ The program calls for the establishment of fifteen toll-collection facilities on the Interstate System with the purpose of either managing congestion, reducing emissions levels, or financing roadway expansion.³³² The tolls to be charged in such programs "may . . . var[y] in price according to time of day or level of traffic, as appropriate to manage congestion or improve air quality."³³³ Further, the statute requires, "for each high occupancy vehicle facility that charges tolls under this subsection, that the tolls vary in price according to time of day or level of traffic, as appropriate to manage congestion or improve air quality."³³⁴

In sum, though federal funding may be provided for toll roads, the availability of federal funding for Interstate Highways—the most important component of the nation's highway network—remains quite circumscribed. The value pricing pilot programs present the possibility of broader use of congestion pricing in the future, although there is some political sentiment to preclude expansion of such programs.³³⁵

D. Existing Congestion Pricing Regimes

This Section presents a brief survey of some current U.S. congestion pricing programs.³³⁶ At the outset, however, it bears noting that several congestion pricing programs abroad—including programs in Singapore, Trondheim, Toronto, and London—have had considerable success.³³⁷ Moreover, as discussed above, the success of one of these programs—the one in Singapore—is at least somewhat responsible for the increased attention paid to congestion pricing regimes domestically,³³⁸ and the success of another program—the fledgling program in

³³¹ See *id.* § 1604(b).

³³² See *id.* § 1604(b)(2).

³³³ *Id.* § 1604(b)(3)(B)(i).

³³⁴ Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, § 1604(b)(3)(B)(ii). The statute further provides that "a State may permit motor vehicles with fewer than two occupants to operate in high occupancy vehicle lanes as part of a variable toll pricing program established under this subsection." *Id.* § 1604(b)(3)(B)(iii).

³³⁵ See *id.* § 1604.

³³⁶ See Value Pricing Pilot Program, *supra* note 303. Note that the projects summarized here are a subset of all value pricing programs; some projects (such as projects that involve parking pricing) do not fall under the rubric of congestion pricing (at least as the terminology is used here).

³³⁷ See, e.g., Strahilevitz, *supra* note 9, at 1249 (noting that the Singapore program is "generally viewed as a successful and efficient way to control traffic congestion").

³³⁸ See *supra* note 217 and accompanying text.

London³³⁹—may bolster prospects for even greater use of congestion pricing domestically.

Toll roads in New Jersey (the New Jersey Turnpike) and California (the San Joaquin Hills Toll Road) currently feature congestion pricing.³⁴⁰ In addition, tolls to cross the Hudson River from New York to New Jersey (via the George Washington Bridge or the Lincoln or Holland Tunnels) and tolls to cross two bridges in Lee County, Florida are subject to congestion pricing.³⁴¹ Plans are being developed to introduce congestion pricing on additional toll roads in Florida, Pennsylvania, Illinois, and Ohio.³⁴²

Domestically, interest in and use of lane-pricing access programs is increasing.³⁴³ Express lanes on an Orange County, California highway are already subject to congestion pricing, and programs are under development to introduce congestion pricing on lanes in other highways in California, Florida, North Carolina, Oregon, Texas, and Washington.³⁴⁴

Interest in development of HOT lanes is especially intense. Besides the San Diego FasTrak program, HOT lanes programs are in effect on two highways in Houston, and in Colorado and Minnesota.³⁴⁵ Proposals to introduce HOT lanes are under development for highways in California, Florida, Georgia, and Washington,³⁴⁶ and are also being considered for highways in Maryland and Virginia.³⁴⁷

No FAIR lanes regimes are currently in use, although plans for FAIR lanes programs are under development for a highway in California.³⁴⁸ Also, although no cordon-pricing regime is in use domestically, a proposal to subject all East River crossings into and out of New York City's Manhattan Island (combined with the existing congestion pricing regime for Hudson River crossings) would, if implemented, create a de facto cordon-pricing regime.³⁴⁹ In 2007, Mayor Michael Bloomberg

³³⁹ See *supra* notes 254–257 and accompanying text.

³⁴⁰ See List of Projects by Type, *supra* note 44.

³⁴¹ See *id.*

³⁴² See *id.*

³⁴³ See *id.*

³⁴⁴ See *id.*

³⁴⁵ See List of Projects by Type, *supra* note 44.

³⁴⁶ See *id.*

³⁴⁷ See Editorial, *HOT Prospects*, WASH. POST, Dec. 29, 2003, at A16.

³⁴⁸ See Value Pricing Pilot Program, *supra* note 303.

³⁴⁹ See *id.*

proposed the introduction of cordon-pricing in southern Manhattan, although the proposal was stymied by political opposition.³⁵⁰

E. Economics and Public Choice of Congestion Pricing

The economic underpinnings of congestion pricing are depicted above, in Figure 1. Essentially, congestion gives rise to an externality because drivers internalize only their own costs, rather than society's actual costs.³⁵¹ Congestion pricing regimes endeavor to remedy this situation by requiring drivers to internalize the costs that otherwise would be externalized.³⁵²

Congestion pricing results in better allocation of the scarce resource of roadway access.³⁵³ It also reduces uneconomic overuse of roads.³⁵⁴ In addition, such programs increase government coffers through congestion pricing revenue.³⁵⁵ Further, congestion pricing "saves society significant amounts of resources in obviating the establishment and maintenance of an oversized infrastructure network . . . [with the] consequence . . . [that] much sought after tax dollars, land and capital would be released for more socially beneficial tasks."³⁵⁶

The economic benefits, and likely success, of congestion pricing regimes seem clear.³⁵⁷ Public choice and political economy considerations, however, are not as favorable to congestion pricing regimes as they are to the provision of new roadway capacity.³⁵⁸ First, consider that congestion regimes, unlike roadway capacity responses, do not, at least currently, receive substantial support from powerful, organized interest groups.³⁵⁹ In particular, the simple imposition of a congestion charging regime offers politicians no support from the construction industry or

³⁵⁰ See *infra* notes 413–421 and accompanying text; see also Marisa Lagos, *City Searches for Traffic Innovations*, S.F. EXAMINER, Nov. 11, 2005, at 5 (discussing the possibility of a cordon congestion pricing program in San Francisco).

³⁵¹ See Wahrman, *supra* note 8, at 196.

³⁵² See *supra* notes 134, 225, and accompanying text. Note that some commentators do not believe that all externalized costs should optimally be internalized. See *supra* note 234.

³⁵³ See Hau, *supra* note 229, at 224; Komanoff, *supra* note 138, at 131; Strahilevitz, *supra* note 9, at 1246.

³⁵⁴ See Komanoff, *supra* note 138, at 131; Strahilevitz, *supra* note 9, at 1246.

³⁵⁵ See Komanoff, *supra* note 138, at 131; Strahilevitz, *supra* note 9, at 1246.

³⁵⁶ Hau, *supra* note 229, at 224.

³⁵⁷ See Strahilevitz, *supra* note 9, at 1246 ("[I]f current estimates are correct, a national shift to congestion pricing would generate societal benefits of \$5 to \$11 billion annually . . .").

³⁵⁸ See Buzbee, *supra* note 7, at 80.

³⁵⁹ But see *infra* note 424 and accompanying text (noting that some environmental organizations have announced support of congestion pricing).

its workers.³⁶⁰ Although there are industries that benefit from implementation of congestion pricing systems—for example, companies that manufacture the transponders on which many of the systems rely—the transportation and real estate construction industries seem to offer the promise of more sizeable, better organized support, perhaps because of the years those industries have had to hone their lobbying and political relations expertise.³⁶¹

Second, consider public reaction to proposals to implement congestion pricing.³⁶² Recall that public choice theory does not render public opinion irrelevant.³⁶³ Public opinion may matter, both because the public may bypass interest groups and make its strong opinion known to government actors, or because interest groups may realize that they can tap into latent public opinion to strengthen their case to legislators.³⁶⁴

In the case of congestion pricing, there is apparently plenty of latent public opinion to tap into.³⁶⁵ Public reaction to congestion pricing tends to be strong and negative.³⁶⁶ In particular, the public is doubtful about congestion pricing for several reasons, including concerns of equity, general opposition to new government fees for items that previously were offered at no charge, concerns over privacy, and concerns over the appropriateness of using market-based regimes to achieve environmental goals.³⁶⁷

Equity concerns underlie many objections to the implementation of congestion pricing programs.³⁶⁸ First, to the extent that revenue from a program is seen only to fill government coffers, drivers, and indeed

³⁶⁰ See Buzbee, *supra* note 7, at 80.

³⁶¹ For a discussion on the possibility that this might change in the future, see *infra* notes 395–433 and accompanying text.

³⁶² See *supra* notes 75–79 and accompanying text.

³⁶³ See *supra* notes 75–79 and accompanying text.

³⁶⁴ See *supra* notes 75–79 and accompanying text.

³⁶⁵ See Jones, *supra* note 232, at 265–69.

³⁶⁶ See *id.*

³⁶⁷ Peter Jones highlights several concerns that the public-at-large tend to express over congestion pricing schemes: (1) drivers have difficulty accepting a "charge for congestion"; (2) the belief that urban road pricing is simply unnecessary; (3) the belief that congestion pricing will not effectively reduce vehicular travel; (4) skepticism about the effectiveness and accuracy of technology underlying congestion pricing; (5) concerns about privacy; (6) concerns that a congestion pricing system based upon a particular "urban boundary" may have substantial effects on areas near that boundary; (7) public perception of congestion pricing as just another tax; and (8) the perception that congestion pricing is, in one way or other, unfair. Jones, *supra* note 232, at 265–69.

³⁶⁸ See, e.g., Peter M. Jones, *Road Pricing: The Public Viewpoint*, in *ROAD PRICING*, *supra* note 25, at 159.

the public at large, may consider the program inequitable.³⁶⁹ Indeed, absent revenue recycling (i.e., government use of the money to improve the transport network), "most travelers will experience net losses as a result of the introduction of road user charging, as for most people who continue to drive [the] resulting time savings will be less than the road user charge and so their consumer surplus will be reduced."³⁷⁰

An additional equity-related point is the perceived distributional impact of a congestion-pricing regime.³⁷¹ The burden of a congestion pricing regime might be seen to fall heavily on poorer people.³⁷² In other words, the regime might be characterized as a regressive tax.³⁷³ Indeed, an efficient allocation of a resource may not always be distributionally fair, and the fact that efficiency should not always be rendered subservient to distributional goals in the transport setting is clear.³⁷⁴ Phil Goodwin observes that "there are some transport policies that *nobody* suggests should be determined by 'willingness-to-pay.'"³⁷⁵ As an example, Goodwin points to the allocation of road space between vehicles and pedestrians, which, he contends, is not seriously the subject of proposed pricing regimes.³⁷⁶

³⁶⁹ See *id.*

³⁷⁰ *Id.* (citation omitted).

³⁷¹ See Jones, *supra* note 232, at 268.

³⁷² See *id.*

³⁷³ See *id.* (noting the public perception of congestion pricing regime as "[j]ust [a]nother [f]orm of [t]axation"). Lior Strahilevitz compares the San Diego I-15 congestion pricing HOV lane program to a tradable pollution permit regime. See Strahilevitz, *supra* note 9, at 1288. But the structure of the program suggests that it is more similar to a tax regime, insofar as no "permit" allowing access to the highway express lanes is actually tradable. A modified system, designed by Peter Jones to address equity concerns, bears greater similarity to a tradable pollution permit regime:

[C]ar owning residents living within the charged area and other selected population groups might be given a number of free Travel Units per month (either using smartcard debiting system, or through an account held by each person). Additional units could be purchased at the standard rate or at a discounted rate (though in principle there could be differences here according to category of user). By taking the idea further and making these free Travel Units available to residents (with and without a car) and openly tradeable, then there would be a further redistribution mechanism from the rich to the poor.

Jones, *supra* note 232, at 281.

³⁷⁴ See Goodwin, *supra* note 234, at 146; Jones, *supra* note 232, at 281.

³⁷⁵ Goodwin, *supra* note 234, at 146.

³⁷⁶ *Id.* Goodwin elucidates:

An example is the division of road space between vehicles and pedestrians. It would be possible to say that the relative width of sidewalk and carriageway should be determined by the amounts that pedestrians and vehicles are willing to contribute, or even more specifically that pedestrian-actuated traffic

Second, to the extent that congestion charges are imposed on roads that previously were free, they may be perceived as a new tax.³⁷⁷ Tax increases are never popular, and "[t]here will inevitably be resistance to paying for something (i.e., road use) which was previously regarded as free at the point of use."³⁷⁸ This opposition will be exacerbated to the extent that the revenues from congestion charging regimes are seen simply to fill government coffers, as explained just above.³⁷⁹

Third, there are concerns about how implementation of congestion pricing would intrude upon privacy.³⁸⁰ Many congestion regimes would rely upon technology that could allow government to track people's whereabouts.³⁸¹

Fourth, many people are uneasy, whether rationally or not, about the use of market-based approaches to regulate the environment.³⁸² And this uneasiness is not absent in the traffic congestion setting.³⁸³ In the context of a broad 1978 study of people's reactions to the use of charges as an environmental regulatory tool, Steven Kelman asked the following question in interviews with environmentalists:

Let's say that a parking surcharge developed as part of a transportation control program reflected the costs a driver

signals should require the insertion of a coin. The logic in one sense is similar to that of road pricing, but it does not command serious consideration. Nor does there exist (as far as I know) an underground of hard-line road pricers biding their time until the moment is right to implement pedestrian charging with push-chair supplements and a penalty for elderly slow walkers.

Id. Goodwin's point clearly has merit, although one might argue that he overstates the case somewhat, in that allocation of public spaces are in fact sometimes divided among different users when supply of the resource becomes insufficient to meet overall demand. For example, public spaces in parks are often divided between cyclists and rollerbladers on the one hand and pedestrians and joggers on the other.

³⁷⁷ See Jones, *supra* note 368, at 159; Strahilevitz, *supra* note 9, at 1248.

³⁷⁸ Jones, *supra* note 368, at 159; see Strahilevitz, *supra* note 9, at 1248 ("Loss-aversion theory tells us that these types of changes are likely to spark strong opposition. Over the years, commuters will increasingly see themselves as entitled to use the roadways that their tax dollars helped build and maintain." (footnotes omitted)). This may be true to a lesser extent for roads which had been flat-rate toll roads but on which a congestion pricing regime now is superimposed (the George Washington Bridge, for example). See *supra* note 341 and accompanying text.

³⁷⁹ See Jones, *supra* note 368, at 159; Strahilevitz, *supra* note 9, at 1248.

³⁸⁰ See Strahilevitz, *supra* note 9, at 1248-49.

³⁸¹ See *id.*

³⁸² See STEVEN KELMAN, WHAT PRICE INCENTIVES? ECONOMISTS AND THE ENVIRONMENT 46-53 (1981).

³⁸³ See, e.g., Jones, *supra* note 232, at 268-79.

imposes on society by driving a car, including the damages from auto pollution. If the surcharge reflected all such costs, would you then feel it was OK for a person to drive his car in the city center as long as he paid the surcharge, or would you still criticize him for not taking available public transportation?³⁸⁴

Of the environmentalists questioned, "[s]ixty-seven percent . . . said they would still criticize the car driver."³⁸⁵

It is possible to address some of these obstacles to the implementation of congestion pricing regimes through education.³⁸⁶ For example, public concerns about the need for, efficacy, and general propriety of congestion pricing regimes might be addressed through education of the public as to the proper working of the regimes.³⁸⁷

Other obstacles might be addressed through structural design choices. For example, concerns over privacy could be ameliorated by officially restricting the possible use of information gathered by virtue of congestion pricing regimes. And the problem of substantial impact on boundary regions could be addressed by designing regimes that do not rely upon boundaries as "on/off switches" for the application of congestion pricing.

The "no new tax" objection also can be addressed structurally, by hypothecating the revenue from the regime (i.e., by promising that the congestion fees gathered will be used in large measure either to improve the highway or transit system or to offset some of the distributional injustices to which the regime might be seen to give rise). Indeed, public support for congestion pricing schemes jumps substantially when the schemes are said to contemplate revenue recy-

³⁸⁴ Steven Kelman, *Economic Incentives and Environmental Policy: Politics, Ideology, and Philosophy*, in *INCENTIVES FOR ENVIRONMENTAL PROTECTION* 291, 314 (Thomas C. Schelling ed., 1983).

³⁸⁵ *Id.*

³⁸⁶ See, e.g., Jones, *supra* note 232, at 269–70.

³⁸⁷ See *id.* Peter Jones argues:

Based on the concerns expressed by the public, it is evident that four general arguments have to be won before road pricing can be introduced into urban areas with majority public support. Namely that:

1. there is a need to take some action to restrain traffic levels;
2. the alternatives to road pricing are ineffective or insufficient;
3. road pricing is a practical and effective measure; and
4. equity concerns can be addressed.

cling.³⁸⁸ Along the lines of Daniel Kahneman and Amos Tversky's "prospect theory"³⁸⁹ and the literature on framing and how mental accounting may affect people's perceptions of various choices,³⁹⁰ it may be that people will more readily accept the "loss" of a "new tax" when they perceive in connection with it a gain in some other area. Another useful structural step is to make the pricing scheme transparent and understandable; this will help people both to understand and accept the program, and to make wise use of the pricing information that the program provides in practice.³⁹¹

Revenue recycling is also an important element of insulating congestion pricing regimes from the charge that they are inequitable.³⁹² Revenue from congestion charges can be used, for example, to maintain existing roads, to improve the mass transportation system for drivers who are priced out of roadway use, or even to subsidize poorer users' use of restricted roadways.³⁹³ Also pertinent to the equity inquiry is whether the advent of congestion pricing leaves reasonable substitutes available to the public at no charge (or at least at a lesser charge).

In the end, however, the mere fact that some of the public's objections to congestion charges might be combated via education (or otherwise) is irrelevant to the public choice inquiry—irrelevant, that is, unless some interest group or political entrepreneur decides to try to undertake the education necessary to shift public opinion and then presumably to make use of the change in public opinion. Thus, even with all these education and design options, public choice theory predicts that the path to implementation of congestion pricing regimes on a broad scale appears to remain an uphill one. Most particularly, indus-

³⁸⁸ See Jones, *supra* note 368, at 168 ("Hypothecating revenues does seem to increase public support [for congestion pricing systems] considerably—if, as a consequence, improvements in transport systems can be achieved. People then feel that they are getting something for their money, either through improvements to the road network or in the alternative methods of travel."); see *id.* at 168–70 (presenting survey results validating this proposition).

³⁸⁹ See, e.g., Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, in CHOICES, VALUES, AND FRAMES 17, 29–44 (Daniel Kahneman & Amos Tversky eds., 2000).

³⁹⁰ See, e.g., Richard H. Thaler, *Mental Accounting Matters*, in CHOICES, VALUES, AND FRAMES, *supra* note 389, at 241, 243–54.

³⁹¹ See Börje Johansson & Lars-Göran Mattsson, *From Theory and Policy Analysis to the Implementation of Road Pricing: The Stockholm Region in the 1990s*, in ROAD PRICING, *supra* note 25, at 181, 185.

³⁹² See, e.g., Richardson & Bae, *supra* note 231, at 248–49.

³⁹³ See *id.* ("Using windshield transponders . . . [congestion] prices could vary with income upon submission of W-2s (that is, official annual payroll summaries) and income tax returns."); *supra* notes 270–273 and accompanying text (discussing FAIR lanes).

try, worker, labor, and (therefore) political support remains substantially in favor of the new roadway construction option.³⁹⁴

V. ECONOMIC AND PUBLIC CHOICE EVALUATION OF NEW ROADWAY CAPACITY AND CONGESTION CHARGES

This Part addresses the question of whether economic efficiency or public choice has greater predictive accuracy in the context of traffic congestion.³⁹⁵ As detailed above, generation of new roadway capacity is likely to be economically inefficient (at least over the long term) but nonetheless likely at present to receive critical support from a public choice perspective; congestion charges are more likely to be economically efficient, but less likely at present to be viable from a public choice perspective.³⁹⁶ Because the provision of new roadway capacity continues to dominate congestion pricing, there is little doubt that the public choice theory has greater weight at present.³⁹⁷ This Part then considers

³⁹⁴ See, e.g., FARBER & FRICKEY, *supra* note 69, at 17–37 (discussing levels of influence in the political process exercised by interest groups).

³⁹⁵ See *infra* notes 396–433 and accompanying text.

³⁹⁶ See *supra* notes 148–394 and accompanying text.

³⁹⁷ There are other governmental responses to the problem of traffic congestion, none of which has either been used as extensively as the provision of new roadway capacity, or has the promise of congestion pricing: (i) other market-based mechanisms, (ii) indirect market-based mechanisms, (iii) land use planning, (iv) behavioral modification, and (v) command-and-control approaches.

On the possibility and drawbacks of market-based instruments other than congestion pricing, see *supra* note 200. Indirect market-based mechanisms include annual vehicle license fees, gasoline taxes, and setting economic parking charges and parking taxes. Hau, *supra* note 229, at 224. Although these instruments may offer benefits and should reduce the total extent to which people drive, they do not directly address the problem of congestion. See *id.*; Jerry L. Mashaw, *The Legal Structure of Frustration: Alternative Strategies for Public Choice Concerning Federally Aided Highway Construction*, 122 U. PA. L. REV. 1, 74 n.247 (1973).

Although land use planning could be a formidable tool to address congestion, it has not been used that way. First, although Congress has sought to impose, indirectly, land use controls on lands near federally designated highways through controls on available funds, see, e.g., 23 U.S.C. §§ 131(b), 136(b) (2000), most land use regulation occurs at the state, and especially the local, level. Land use planning tends to be dominated in the political arena by powerful interest groups, especially those who favor development. See Buzbee, *supra* note 7, at 77–91 (presenting an overview of the political economy of “urban sprawl”); *supra* notes 182–198 and accompanying text (discussing the public choice pressure in favor of development, and, therefore, generally in opposition to land use restrictions). Rarely, moreover, are land use restrictions used to “undo” development as a way to alleviate traffic congestion. Cf. Michael Janofsky, *In Towns That Slowed Growth, Backlash Stirs*, N.Y. TIMES, Feb. 9, 2003 (Magazine), at 20 (“In Colorado, where the economy has sagged for two years, several small towns eager to spur development and increase the local tax base are turning away from growth restrictions.”).

Behavioral modification involves attempts by the government to alter people’s behavior so as to reduce traffic congestion. Often grouped under the title “transportation de-

whether the slight movement toward greater acceptance of congestion pricing might signal a weakening in the public choice explanation and

mand management" ("TDM"), see, e.g., Robert H. Freilich & S. Mark White, *Transportation Congestion and Growth Management: Comprehensive Approaches to Resolving America's Quality of Life Crisis*, 24 LOY. L.A. L. REV. 915, 962-63 (1991) (discussing TDM); Stanley D. Abrams, *Implementing the Adequate Public Facilities Ordinance to Manage Transportation Congestion*, SE11 A.L.I.-A.B.A. CONTINUING LEGAL EDUC. 595, 599-600 (1999) (same), such approaches vary. First, government might request or create incentives to induce businesses to stagger working hours. See 42 U.S.C. § 7511a(d)(1)(B) (2000) (giving states leeway under Clean Air Act to include in attainment plans for severe ozone nonattainment areas requirements that may induce employers to stagger working hours); Michael Herz, *Judicial Textualism Meets Congressional Micromanagement: A Potential Collision in Clean Air Act Interpretation*, 16 HARV. ENVTL. L. REV. 175, 188-92 (1992) (critiquing the prior, more exacting version of § 7511a(d)(1)(B) for its erroneous emphasis on vehicle occupancy as opposed to average ridership); cf. Emmerink, *supra* note 9, at 257-69 (presenting an empirical analysis of worker schedule flexibility). Second, government might attempt to induce individuals to choose public transportation over driving. For example, New York City's TransitChek Program gives employees funds to pay for mass transit tax-free, the employers benefiting as well from reduced payroll taxes. See TransitCenter, Inc., *Take Advantage of Tax Savings for Commuters*, <http://www.transitcenter.com/employees> (last visited Mar. 27, 2008). (Note, however, that the absence of congestion pricing regimes on highways may necessitate greater subsidization of mass transit. See *supra* note 140.) Third, the government might introduce HOV lanes. See *supra* note 268. Fourth, the government might provide information about traffic congestion, allowing individual users to take that information into account in plotting their travel routes, with the hope of overall reductions in congestion. See Emmerink, *supra* note 9, at 9-34. Behavioral modification approaches run into the entrenched American cultural ideal of driving a vehicle. See Oren, *supra* note 97, at 213-31 (discussing the importance to Americans of driving vehicles, and surveying how that ideal has frustrated attempts to change driving patterns through behavioral modification); cf. David W. Dunlap, *Planners Seek More Streets Through Trade Center Site*, N.Y. TIMES, Mar. 2, 2004, at B3 ("One of the underlying principles [of the plan to open more streets to traffic at the former World Trade Center site] is that streets work better when they are filled with cars and trucks. In contrast, pedestrian-only zones, which were once a favored device of planners, can sometimes seem lifeless.").

Finally, command-and-control requirements mandate changes in people's driving behavior. These include the establishment of parking controls, the promotion of employer-based mandatory trip reduction programs, and the implementation of an "odds and evens" license plate vehicle authorization system. Hau, *supra* note 229, at 223. Though command-and-control approaches remain the dominant form of domestic environmental regulation, see, e.g., Richard B. Stewart, *A New Generation of Environmental Regulation*, 29 CAP. U. L. REV. 21, 24-25 (2001), they have been intensely criticized, especially for depriving societal actors of flexibility in complying with governmental goals, see Nash, *supra* note 200, at 486; Stewart, *supra*, at 24-25. The same criticisms apply in the context of traffic congestion. See Hau, *supra* note 229, at 223-24 (comparing command-and-control approaches to "market-based measures" that "permit[] motorists the maximum flexibility of choosing when, where and by what mode they desire to travel"). Beyond that, such programs face the difficult task of overcoming the widespread and robust attitude that driving is a right. Cf. Ann E. Carlson, *Recycling Norms*, 89 CAL. L. REV. 1231, 1295-96 (2001) (drawing on empirical evidence to conclude that the degree to which recycling behavior is convenient may encourage the behavior more than a social norm in favor of the behavior).

a strengthening of the efficiency theory.³⁹⁸ The movement, however, can also be explained on public choice grounds.³⁹⁹ Moreover, the particular contexts in which much of the movement toward congestion pricing is occurring suggest that it is a shift in the relevant interest groups and public opinion, and not a shift in explanatory theory, that underlies the movement toward greater acceptance of congestion pricing.⁴⁰⁰

Because, at present, the efficiency theory predicts an increased reliance on property rights through congestion pricing regimes, whereas the public choice theory does not, the traffic congestion setting provides a natural one in which to measure the predictive accuracy of the theories. As noted above, the generation of new roadway capacity remains the dominant government response to the problem of traffic congestion.⁴⁰¹ The absence of the emergence of property rights—through the implementation of congestion pricing regimes or otherwise—strongly suggests, in turn, that the public choice theory for the evolution of property rights dominates the efficiency theory.

There are signs, however, that the dominance of new roadway capacity may be fading, at least somewhat.⁴⁰² Even if it remains quite popular, and even though opposition to congestion charges remains strong, the fact is that recent years have seen an increase in the implementation of congestion pricing regimes, with even more regimes in the planning stages.⁴⁰³

The shift, albeit perhaps comparatively small at this juncture, suggests that the traditional dominance of the public choice theory is weakening. And, indeed, one might argue that, as traffic congestion has continued to worsen—that is, as the size of the externality has grown—so, too, has pressure grown on government actors to respond to the problem in a more efficient way. This accords with the understanding that the strength of the efficiency theory increases as the size of the externality increases.⁴⁰⁴ In addition, the efficiency theory predicts an increase in property rights as the cost of delineating property rights

³⁹⁸ See *infra* notes 399–433 and accompanying text.

³⁹⁹ See *infra* notes 419–433 and accompanying text.

⁴⁰⁰ See *infra* notes 404–433 and accompanying text.

⁴⁰¹ See *supra* notes 148–199 and accompanying text.

⁴⁰² See *supra* notes 336–350 and accompanying text.

⁴⁰³ See *supra* notes 336–350 and accompanying text.

⁴⁰⁴ See *supra* note 67 and accompanying text; Rose, *supra* note 65, at 8–12 (noting that the scope and complexity of environmental regulation will depend upon the extent to which use of the underlying resource is congested).

drops.⁴⁰⁵ And, indeed, the move toward congestion prices corresponds to drops in the cost of transponders technology and in the time necessary to collect congestion-varied tolls.⁴⁰⁶

With respect to the decrease in influence of the public choice theory, one might argue that road construction was popular among large, powerful interest groups, and they simply co-opted the congestion problem as yet another justification for road construction.⁴⁰⁷ Once the congestion problem becomes "too large," however, the arguments in favor of road construction face competition from economic pressure for a "real" solution to traffic congestion.

That political opposition to congestion pricing remains robust even in the face of strong efficiency pressures to implement such regimes cannot be doubted.⁴⁰⁸ First, despite the success of pilot congestion pricing programs, a bill was considered in the Senate that would have curtailed pilot congestion pricing programs.⁴⁰⁹

Second, if one had to identify a setting in the United States in which congestion pricing would face the least opposition, it would probably be New York City. Politically, the city tends to be quite liberal (at least compared to the rest of the United States),⁴¹⁰ which suggests that one might expect less opposition to congestion pricing on the ground that it imposes a new tax.⁴¹¹ Nowhere else in the United States, moreover, is reliance upon public transit more possible or more strongly

⁴⁰⁵ See *supra* note 68 and accompanying text.

⁴⁰⁶ See, e.g., Jones, *supra* note 232, at 264 (noting that "with rapid development in technology (for example electronic vehicle identification, on- and off-vehicle toll collection and enforcement), [practical constraints are] no longer [an issue] and there are almost limitless possibilities for scheme design").

⁴⁰⁷ See Buzbee, *supra* note 7, at 80; Houck *supra* note 182, at 897-98; Strahilevitz, *supra* note 9, at 1247.

⁴⁰⁸ See, e.g., S. 1072, 108th Cong. (2004); see also *supra* notes 327-328 and accompanying text (referencing S. 1072).

⁴⁰⁹ See *supra* notes 327-328 and accompanying text.

⁴¹⁰ See, e.g., Richard Briffault, *Voting Rights, Home Rule, and Metropolitan Governance: The Secession of Staten Island as a Case Study in the Dilemmas of Local Self-Determination*, 92 COLUM. L. REV. 775, 843 (1992) (noting that Staten Island produces many of the City's Republican elected officials and is "the only borough that frequently votes Republican in municipal elections"); Karen I. Chang, Note, *The Party's Over: Establishing Nonpartisan Municipal Elections in New York City*, 11 J.L. & POL'Y 579, 589 n.55 (2003) ("More than sixty-five percent of all registered voters are members of the Democratic Party. About eighty percent of voters who are registered with a party are registered Democrats." (citation omitted)).

⁴¹¹ On the other hand, objections to congestion pricing grounded in concerns of fairness might be more prevalent.

engrained and accepted by the populace.⁴¹² And the city suffers from tremendous traffic woes.

Even in New York City, however, it has taken Mayor Michael Bloomberg years to advance formally a congestion pricing proposal, the fate of which even now remains uncertain.⁴¹³ The mayor initially backed away from a proposal to charge vehicles that enter Manhattan Island,⁴¹⁴ and in 2007 he finally proposed a cordon-pricing scheme for traffic entering Manhattan south of 86th Street.⁴¹⁵ The plan was received enthusiastically by then-Governor Eliot Spitzer (at least initially) and the U.S. Department of Transportation.⁴¹⁶ Still, political opposition from the "outer boroughs"—that is, those areas of the city where public transit is less accessible and commutes on public transit are longer⁴¹⁷—is strong.⁴¹⁸ Further, state legislators, who had to approve the plan, were tempered;⁴¹⁹ State Assembly Speaker Sheldon Silver was

⁴¹² Patrick McGeehan, *Mass Transit Grows as Commuters' Trip of Choice*, N.Y. TIMES, Sept. 2, 2006, at B1 (citing census data for the conclusion that "[n]o other American city makes half as much use of mass transit").

⁴¹³ See Thomas J. Lueck, *Bloomberg Draws a 25-Year Blueprint for a Greener City*, N.Y. TIMES, Apr. 23, 2007, at B1.

⁴¹⁴ See Sewell Chan, *Driving in Manhattan, You Pay, Under One Traffic Idea*, N.Y. TIMES, Nov. 11, 2005, at B1.

⁴¹⁵ See Lueck, *supra* note 413.

⁴¹⁶ See Danny Hakim & Ray Rivera, *City Traffic Pricing Wins U.S. and Spitzer's Favor*, N.Y. TIMES, June 8, 2007, at A1.

⁴¹⁷ See McGeehan, *supra* note 412 ("New York's reliance on its transit system explains why the boroughs other than Manhattan perennially top the list of American counties with the longest commutes.").

⁴¹⁸ E.g., William Neuman, *Bigger Push for Charging Drivers Who Use the Busiest Streets*, N.Y. TIMES, Nov. 24, 2006, at B1 (identifying "a City Council member who represents some neighborhoods in eastern Queens that are far from subway lines and where residents with jobs in Manhattan are more likely to drive to work" as "[o]ne of the most outspoken opponents of congestion pricing"); Andy Newman, *Outside Manhattan, Many Oppose Bloomberg's Traffic Plan*, N.Y. TIMES, June 9, 2007, at B1. But see Ray Rivera, *Queens Leader Supports Bloomberg's Traffic Plan*, N.Y. TIMES, June 11, 2007, at B3 (noting the support of the chair of the Queens Democratic party for congestion pricing). In the end, it seems that the consolidation that enabled New York City to grow into the great metropolis it is today, see, e.g., William D. Solecki & Robin Leichenko, *Urbanization and the Metropolitan Environment: Lessons from New York and Shanghai*, 48 ENVIRONMENT 8, 15–17 (2006), may also impede the introduction of congestion pricing.

⁴¹⁹ See Nicholas Confessore, *In Legislators' Scrutiny, Traffic Proposal Faces Hard Questioning*, N.Y. TIMES, June 9, 2007, at B4; see also Nicholas Confessore, *Pricing and Partisan Politics*, N.Y. TIMES, June 17, 2007, at B5 ("New York City's outer boroughs and suburbs, hotbeds of anti-pricing sentiment, are also home to many Senate Republicans who are considered vulnerable to a Democratic challenge. But congestion pricing is a key priority for Mr. Bloomberg, a Republican who has donated hundreds of thousands of dollars to Republican senators."). It remains to be seen whether the mayor's decision to leave the Republican party changes this calculus.

critical of the proposal.⁴²⁰ The Mayor did appoint a commission to examine ways to reduce traffic congestion, including the possibility of congestion pricing.⁴²¹ In the end, however, the congestion pricing proposal expired without vote in the State Assembly on the deadline by which it had to be approved in order to secure federal funding.⁴²² Thus, political power vanquished efficiency concerns, even in New York City.

The continued strength—and success—of political opposition to congestion pricing suggests that congestion pricing will emerge not only when congestion becomes bad enough that efficiency concerns become too great to ignore, but also when political interests align behind congestion pricing. Thus, to the extent that there is a shift toward greater implementation of congestion pricing, it is simply the strength of the relevant interest group players, and perhaps public opinion, that is shifting. First, consider the possibility that support for congestion pricing among reasonably powerful interest groups may be growing. As transponder technology continues to flourish generally with respect to toll collection, the transponder industry will continue to grow. And, over time, there is likely to be greater interest on the part of the transponder industry to lobby for expanded use of transponders, including through implementation of congestion pricing regimes. In addition, although environmental groups remain divided on the question,⁴²³ some have endorsed the use of congestion charges.⁴²⁴ It is possible that

⁴²⁰ See, e.g., Danny Hakim, *Silver Challenges Health Benefits Promised in Manhattan Toll Plan*, N.Y. TIMES, June 11, 2007, at B1.

⁴²¹ See Nicholas Confessore, *Spitzer Signs Bill to Put Congestion Pricing Plan on Track*, N.Y. TIMES, July 27, 2007, at B5 (describing a state bill, “[t]he product of a marathon negotiation that concluded July 19,” that “create[s] a 17-member commission to consider different plans for reducing traffic congestion in New York, including the pricing scheme favored by Mr. Bloomberg”); William Neuman, *Members Named for Panel Studying Traffic Pricing Plan*, N.Y. TIMES, Aug. 22, 2007, at B2. Even this small step was sufficient to gain access to some federal funding, although release of the funds is contingent upon a congestion pricing plan being adopted by both the city council and state legislature by March 2008. See William Neuman, *New York to Get U.S. Traffic Aid, but with Catch*, N.Y. TIMES, Aug. 15, 2007, at B1.

⁴²² See Nicholas Confessore, *\$8 Traffic Fee for Manhattan Fails in Albany*, N.Y. TIMES, Apr. 8, 2008, at A1. Prospects for the proposal in the State Senate were not substantially better, despite some support from the Republican leadership. See *id.*

⁴²³ See generally Merrill, *supra* note 1, at 294 (noting the divide among environmental organizations with respect to market-based environmental regulatory instruments and suggesting reasons why some environmental organizations have shifted position to endorse such instruments); cf. Keohane et al., *supra* note 73, at 353–56 (describing the community of environmental organizations as predominantly hostile towards market-based instruments, with a few “outlier[s],” and discussing reasons for this perhaps somewhat counter-intuitive state of affairs).

⁴²⁴ See, e.g., NATURAL RES. DEF. COUNCIL, *DAMAGE REPORT: ENVIRONMENT AND THE 105TH CONGRESS* ch. 4 (1998), available at <http://www.nrdc.org/legislation/damage/>

these groups have offset somewhat the traditional interest group opposition to congestion charging in favor of new roadway capacity; indeed, they may even have used—or may use in the future—education to try to sway public opinion in favor of congestion charges.⁴²⁵ This accords well with President Bush's decision to appoint a transportation secretary who favors expansion of congestion pricing.⁴²⁶

The location of the current frontier for congestion pricing lends credence to the continued strength of the public choice theory. Other than major metropolitan areas, like London and New York, where the congestion externality has worsened and the possibility of introducing new roads is practically impossible, congestion pricing has emerged (to the extent it has emerged at all) in four basic settings: roadways (or bridge or tunnel portions of roadways) that already were subject to tolling, new roadways, new lanes on existing roadways, and HOT lanes.⁴²⁷ The fact that congestion pricing has begun to take hold in these contexts conforms to public choice predictions on several grounds.⁴²⁸ First, the implementation of a congestion pricing regime on a new road or on new lanes on an existing road is not likely to be seen as the imposition of a fee for something that previously was provided for free.⁴²⁹ Thus, public opposition to congestion pricing under such conditions is less intense.⁴³⁰

Second, the fact that new roadway construction will be undertaken means that the support of the transportation and real estate construc-

chap4.asp (citing the "Value Pricing Pilot Program, which will use market-based user fees to help reduce congestion and air pollution and promote energy efficiency," as an example of "positive environmental provisions" in TEA-21); Env'd. Def. Fund, *Congestion Pricing: A Smart Solution for Reducing Traffic in Urban Centers and Busy Corridors*, <http://www.environmentaldefense.org/article.cfm?ContentID=4763> (last visited Mar. 27, 2008).

⁴²⁵ See *supra* note 387 and accompanying text. David King, Michael Manville, and Donald Shoup argue that the support of municipalities also can be harnessed by earmarking funds from freeway congestion pricing for municipal use. See generally David King, Michael Manville & Donald Shoup, *The Political Calculus of Congestion Pricing*, 14 *TRANSP. POL'Y* 111 (2007).

⁴²⁶ See *supra* note 38 and accompanying text.

⁴²⁷ See *supra* notes 340–347 and accompanying text; cf. Johansson & Mattsson, *supra* note 391, at 184–85 (arguing that a congestion pricing regime is most likely to be implemented when presented as a "package" approach). Another possible "package" approach would be to meld new roadway capacity, congestion charging, land use regulation, and impact fees. See *supra* note 397 (describing impact fees as a hybrid between congestion charges and use planning).

⁴²⁸ See Buzbee, *supra* note 7, at 80; Houck, *supra* note 182, at 897–98; Strahilevitz, *supra* note 9, at 1247.

⁴²⁹ See Strahilevitz, *supra* note 9, at 1247.

⁴³⁰ See *id.* ("Notably, . . . congestion pricing for newly constructed toll roads garners significantly higher public support.").

tion industries, their workers, and organized labor should, in large measure, persist.⁴³¹ Congestion pricing would be seen as part-and-parcel with new roadway construction, rather than as a competitor to it.

Third, the fact that only new roadway capacity is to be subject to congestion pricing means that preexisting capacity will remain open to the public at no charge. This will blunt concerns, and objections, about the equitable impact of congestion charging, for there will remain options not subject to congestion pricing that drivers can use.⁴³²

Fourth, it may be that greater public interest in environmental goals will spur support for congestion pricing. Congestion pricing may be seen to be consistent with environmentalism. Support for congestion pricing may increase substantially to the extent that environmental organizations come to accept the use of market-based mechanisms.⁴³³

CONCLUSION

This Article considers the responses that the two economic explanations for the emergence of property rights—the efficiency and public choice theories—predicted in response to scarcity in the resource of roadway access. It demonstrates that, of the two primary governmental responses to the problem of traffic congestion, one—the generation of roadway capacity—is currently favored by the public choice theory for the evolution of property rights, whereas the other—congestion charges—is currently preferred by the efficiency theory. Although congestion pricing is an attractive means by which to combat traffic congestion from an economic perspective, implementation of such regimes is hindered today by their general inability to garner political support. In contrast, the provision of new roadway capacity, though likely ineffective—and perhaps even detrimental—from an efficiency perspective, is likely at present to be a successful strategy in the political arena. This Article also speculates that, though a slight movement toward greater acceptance of congestion pricing might signal that the efficiency theory has overtaken the public choice theory in terms of explanatory power, the better explanation is that it is instead the public choice inputs, and not the explanatory paradigm, that have shifted.

The relative explanatory power of the two theories in the context of traffic congestion provides insight into the more general question of

⁴³¹ See Buzbee, *supra* note 7, at 80; Houck, *supra* note 182, at 897–98.

⁴³² This might not be true in the case of congestion charges being introduced on a new road that is the first and only road in an area.

⁴³³ See *supra* note 424 and accompanying text.

the relative strength of the efficiency and public choice accounts for the development of property rights. The case of traffic congestion strongly suggests that the public choice account has greater predictive accuracy than does the efficiency account, at least at comparatively low levels of resource use congestion. At higher levels of resource use congestion, it appears that greater pressure to move toward a more efficient regime arises. Even then, however, it seems that public choice at least controls the specific nature of the shift toward greater efficiency, if indeed it does not control the shift entirely.