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***Economic Efficiency versus Public Choice:
The Case of Property Rights in
Road Traffic Management***

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

Jonathan Remy Nash[†]

This Article argues, using the case of responses to traffic congestion, that public choice provides a greater explanation for the emergence of property rights than does economic efficiency. While the traditional solution to traffic congestion is to provide new roadway capacity, that is not an efficient response in that it does not lead to internalization of costs. Moreover, over time new capacity may serve to exacerbate congestion problems: New roadway capacity may induce additional travel that would not have taken place but for the new construction. By contrast, congestion charges—that is, imposing tolls designed to force drivers to internalize the costs that their driving imposes on other drivers—offer an efficient way to address the problem of congestion. The continued popularity, despite this, of providing new roadway capacity turns upon public choice theory. New roadway construction tends to be very attractive for politicians as a way to satisfy both constituents generally, as well as interest groups that tend to be well-organized and powerful. In contrast, congestion charging regimes tend to be less popular across the board politically. At present, there appears currently to be something of a shift in position. Experimentation with congestion pricing programs is growing overseas—including a notable program in London—and a serious proposal for New York City’s central business district. This Article thus argues that, while 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. At the same time, public choice 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, as evidenced by backlash against New York City’s proposal.

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I. INTRODUCTION

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

In this Article, I address these questions in the specific setting of the societal response to traffic congestion. Traffic congestion is a growing problem on the nation's roads. As land development continues to consume more and more previously unoccupied land, more people drive more vehicles greater distances. The result is traffic—lots of it. And lots of traffic has many deleterious effects for society. There are time delays—for both people and freight. Congestion also magnifies the environmental impact of driving. And, of late, congestion has come to be recognized as a source of “road rage.”

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. The public choice explanation leads to the “solution” of expanding roadway capacity, while economic efficiency argues in favor of more market-based regulatory regimes governing roadway access and usage. In other words, efficiency argues in favor of greater property rights, while public choice instead advocates reducing scarcity and thus reducing the demand for property rights.

Because roads are largely supplied to the public-at-large by the government, congestion tends to be a problem that concerns politicians. The traditional solution to a congestion problem is

simple: Build more roads. This can mean the addition of new lanes to existing roadways, or it can mean the construction of entirely new thoroughfares, expressways, and freeways. A more general formulation of this approach is the provision of new roadway capacity.

New roadway capacity is not an efficient way to address traffic congestion. 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. The provision of new roadway capacity does not require or lead to the internalization of costs. As such, it encourages an inefficiently high level of use of the resource. Neither does new capacity allocate roadway capacity efficiently, to those who value it most.

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. This is because of the phenomenon of “induced travel.” Essentially, new roadway capacity may induce additional travel that would not have taken place but for the new construction.

By contrast, congestion charges offer an efficient way to address the problem of congestion. As opposed to simple tolls (which tend to be uniformly priced and that 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. 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. 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.

Despite their inferiority in terms of efficiency, the provision of new roadway capacity remains by far the more popular option. The reason for this can be found by looking to public choice theory. New roadway construction tends to be very attractive for politicians as a way to satisfy both constituents generally, as well as interest groups that tend to be well-organized and powerful. 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.

A study the evolution of government responses to traffic congestion provides insight into which story of the development of property rights regimes—efficiency or public choice—holds sway under particular circumstances. 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 story grounded in efficiency.

At the same time, there appears currently to be something of a shift in position. In recent years, Congress has authorized pilot congestion charging regimes. Moreover, experimentation with congestion pricing programs is growing overseas—including a notable program in London—and a serious proposal for congestion pricing has emerged to govern and reduce traffic on New York City’s central business district.¹ Further, President Bush’s Secretary of Transportation—Mary Peters—is a strong advocate of congestion pricing.² This suggests that, while 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.

¹ See *infra* notes 126-129 and accompanying text; *infra* note 234-241 and accompanying text.

² See Matthew Wald, *Bush Chooses Transportation Nominee*, N.Y. TIMES, Sept. 6, 2006, at A15.

Yet, even in the face of weighty efficiency arguments in favor of congestion pricing, political opposition to such programs remains vital and often successful. First, although it was not enacted in that form—the fact that, this late date and despite the success of pilot congestion pricing programs—a bill was considered in the Senate that would have curtailed the pilot programs shows the continued strength of political opposition to congestion pricing.³ 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 remains strong enough to keep congestion pricing proposals from moving quickly beyond the proposal stage.

Moreover, political economy also offers an explanation for the present shift toward greater embrace of congestion pricing. 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—are settings in which new roadway construction will be subject to congestion pricing. Such an approach blunts political opposition to congestion pricing on the ground that it imposes new fees, since existing roadways remain accessible at no charge. 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. 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.

This Article proceeds as follows. In Part II, I discuss in some greater detail the two competing economic explanations for the development of property rights. In Part III, I present an overview of the economics of roadway usage.

In Parts IV and V, I evaluate the provision of new roadway capacity and congestion charging from the perspectives of efficiency and political economy. I 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. In Part VI, I consider whether a slight movement, of late, toward greater acceptance of congestion pricing may reflect the ascension of the efficiency story; I use New York City's recent flirtation with congestion pricing as a case study. I conclude, however, that the public choice account continues to have greater explanatory power.

II. COMPETING ECONOMIC EXPLANATIONS FOR THE EVOLUTION OF PROPERTY RIGHTS

Commentators have identified two primary reasons for the development of property rights. One theory is based upon notions of economic efficiency. The other is based upon support for property rights development on the part of powerful interest groups.⁴

³ See *infra* notes 182-183 and accompanying text.

⁴ See, e.g., Saul Levmore, *Two Stories About the Evolution of Property Rights*, 31 J.L. STUD. S421, S423-33 (2002); Thomas W. Merrill, *Explaining Market Mechanisms*, 2000 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).

Saul Levmore characterizes the efficiency story—to which he refers as the “transaction-cost” story—as more optimistic than the more pessimistic public choice story—to which he refers as the “interest-group” story. See Levmore, *supra*, at S432. Thomas Merrill does not seem to afford any greater moral approval to the public choice story by his use of the monicker “distributional theory.” Merrill explains that, because the efficiency story—to which he

First, building upon the work of Harold Demsetz,⁵ commentators have argued that economic efficiency drives the development and evolution of property rights. Economic efficiency is measured by total wealth maximization—that is, using a Kaldor-Hicks measure of efficiency. 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. The absence of a property regime (or the absence of a sufficiently mature property regime) may mean, where a resource is scarce, that societal actors engage in “rent dissipation”—that is, wasteful activity to try to capture the economic rents associated with the scarce resource⁶—and that users of the resource are able to externalize costs on others and thus artificially keep their own costs down.⁷ 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. 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.”⁸

The efficiency hypothesis claims that a new property regime will be implemented when the benefits of the new regime outweigh its costs. 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.⁹ 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. 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.¹⁰ Second, as the externalities associated with resource use become larger, it becomes more cost-effective to have a property regime, with a property regime less cost-effective as externalities shrink.¹¹ Third, a reduction in administrative costs makes a property rights regime more likely; an increase makes one less likely.¹²

A second explanation that commentators offer to explain the development of property rights is grounded upon the theory of public choice.¹³ In general, public choice theory looks at government action as the result of a “market for government action.” Under this model,

refers 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* Merrill, *supra*, at 278-79. Conversely, the public choice story takes into account the distribution of assets—indeed, it may generate property rights regimes that “fail to maximize societal wealth,” *id.* at 280—but the distribution that emerges 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.”).

⁵ *See* Harold Demsetz, *Toward a Theory of Property Rights*, 57 AM. ECON. REV. PAP. & PROC. 347 (1967).

⁶ Merrill, *supra* note 4, at 278.

⁷ *Id.*

⁸ *Id.*

⁹ *See* Levmore, *supra* note 4, at S424-25 (noting that the evolution of property rights is not a one-way street, and discussing the possibility of property rights regimes devolving).

¹⁰ *See, e.g.*, Carol M. Rose, *Rethinking Environmental Controls: Management Strategies for Common Resources*, 1991 DUKE L.J. 1, 5-8 (describing how greater scarcity of a resource may prompt environmental regulation).

¹¹ *See, e.g.*, Demsetz, *supra* note 5, at 350; Henry E. Smith, *Exclusion versus Governance: Two Strategies for Delineating Property Rights*, 31 J.L. STUD. 453, 462-63 (2002).

¹² *See, e.g.*, Smith, *supra* note 11, at 464 (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”).

¹³ *See generally* DANIEL FARBER & PHILIP FRICKEY, *LAW AND PUBLIC CHOICE: A CRITICAL INTRODUCTION* (1991).

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.¹⁴

The public choice model predicts that government actors will act in response to pressure brought by interest groups. Interest groups give rise to demand for certain government actions, and government actors offer supply in the form of support for different government actions.¹⁵ 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.¹⁶

While 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. 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.”¹⁷ Second, public choice theory recognizes the possibility that public opinion on an issue will be enlisted by “political entrepreneurs.”¹⁸ Political entrepreneurs harness latent public sentiment to achieve particular goals—usually seen as furthering his or own career, though perhaps also furthering the public interest. Note that representatives of special interest organizations—in 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.¹⁹

¹⁴ See generally DAVID R. MAYHEW, CONGRESS: THE ELECTORAL CONNECTION (1974).

¹⁵ See Nathaniel O. Keohane, Richard L. Revesz & Robert N. Stavins, 22 HARV. ENVTL. L. REV. 313, 325-47 (1998) (describing such a marketplace for environmental regulation).

¹⁶ For 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 68-79 (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-interest, see Todd J. Zywicki, *Environmental Externalities and Political Externalities: The Political Economy of Environmental Regulation and Reform*, 73 TUL. L. REV. 845 (1999). For deeper study of environmental organizations from the perspective of political economy, see Todd J. Zywicki, *Baptists? The Political Economy of Environmental Interest Groups*, 53 CASE W. L. REV. 315 (2002).

¹⁷ 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.* (footnote omitted). Note that Spence’s explanation of the phenomenon itself credits politicians as “political entrepreneurs,” see *infra* note 18.

¹⁸ See, e.g., 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” (footnote omitted)); 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”); 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”).

¹⁹ See, e.g., 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

The question remains open as to which of these stories—or what combination of them—most accurately describes the evolution—or devolution, or lack of evolution—of property rights under which circumstances. In the succeeding Parts, I analyze this question in the context of property rights in roadway access. It turns out that one response to traffic congestion—congestion pricing—is favored under the efficiency story, while another response—the provision of new roadway capacity—is favored under the public choice story. Because the congestion pricing solution is a property-based solution while new roadway capacity (which 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 stories at predicting the evolution of property rights.

III. OVERVIEW OF THE ECONOMICS OF ROADWAY USAGE

A. Roads as an Open Access Resource

Roads tend to be provided by the government.²⁰ The use of most roads, moreover, is provided at no charge to individual users; the roads are funded at taxpayer expense.²¹ Access is unrestricted.²²

trading scheme designed to control nitrogen and sulfur dioxide emissions); 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—in seeking domestic job protection—in opposing opening the United States to trucks from Mexico under NAFTA 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).

²⁰ 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 also FEDERAL HIGHWAY ADMINISTRATION, TOLL FACILITIES IN THE UNITED STATES: BRIDGES – TUNNELS – ROADS – FERRIES iii-iv (June 2003) (available at www.fhwa.dot.gov/ohim/tollpage.htm) (presenting a history of toll roads in the United States).

For discussion of 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.L. STUD. S515, S522 (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 generally Ellickson, *supra*, at 1381-85 (describing, in economic terms, the natural evolution of government provision of roads); Levmore, *supra* note 4, at S434-35 (same); but cf. *id.* 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 Nober, Note, *Federal Highways and Environmental Litigation: Toward a Theory of Public Choice and Administrative Reaction*, 27 HARV. J. ON LEGIS. 229, 237 (1990).

Despite history 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., Patrick Jackson & J.L. Miller, *Privatizing Highways: Solution or Setback? Nationwide, Roads Being Leased with Mixed Results*, WILMINGTON NEWS JOURNAL, Nov. 27, 2005, at 3; Steven Ginsburg, *Tolls Soon Could Be Core of Commute; Express 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 Ginsburg, *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”).

²¹ See Ellickson, *supra* note 20, at 1384 (“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.”); Levmore, *supra* note 4, at S434-35 (offering an explanation for government provision of road access at no charge based upon the “expenses associated with toll collection”). Ellickson anticipated that technological development might facilitate toll collection—and even the use of discriminatory pricing. See Ellickson, *supra* note 20, at 1384 n.353. And, indeed, such

At low levels of usage, free roads provided by the government fall within the ambit of “public goods.”²³ The classic definition describes public goods as fulfilling two criteria: 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 impossibility of exclusion—meaning that, once the good is in supply, no one can be prevented from consuming the good.²⁴ Public roads certainly meet the latter criterion: Once a public road is opened, all members of the public are free to use the road,²⁵ they are an open-access resource.²⁶ And, the use of the road by relatively few does not diminish or interfere with others’ use of the road.

But the former criterion—jointness in supply—is not met for higher levels of usage:²⁷ The use of the road by large numbers of people may lead to congestion, which will interfere with people’s consumption of the good. Tirza Wahrman explains:

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.²⁸

technological evolution has come to pass. See 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*, 8 DUKE ENVTL. L. & POL’Y F. 181, 196 (1998) (“It is only recently that the concept [of congestion pricing] became administratively feasible with the introduction of electronic tolls and computerized toll cards.”).

²² 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 . . .”).

²³ 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, 700 (2000) (same).

²⁴ 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).

²⁵ 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, *Cyberspace*, 91 CAL. L. REV. 521, 534 (2001) (“Roads . . . have some of the characteristics of a public good: it is difficult to exclude nonpaying users.”).

²⁶ See Ellickson, *supra* note 20, at 1381 (noting the important distinction, ignored by Garrett Hardin, between open-access property that anyone can enter, and limited-access property that 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.L. STUD. S331, S335 (2002) (noting the same distinction, and observing that it was ignored by Harold Demsetz).

²⁷ See *infra* Figure 1 (graph depicts 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).

²⁸ Wahrman, *supra* note 21, at 196.

Roads thus do not fall within the definition of a classic public good.²⁹ They are, rather, “congestible public goods.”³⁰ At higher levels of usage, the road is an open-access resource for which use by an individual generates negative externalities on other users.³¹ The externality arises because of the differential between the costs that individual users see and the actual total costs. As congestion grows, this differential gets larger, meaning that the congestion externality worsens.³²

B. Roadway Usage and Negative Externalities

The fact that users externalize some of the costs of public roadway usage gives rise to two problems.³³ First, there will likely be an inefficient allocation of the roadway resource. The resource will probably not be allocated to those who value it most. Second, the level of road usage is not efficient. Because of the negative externalities, the roadways are overused.

First, the scarce resource of roadway space likely will not be allocated efficiently, to those who value it most.³⁴ 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.”³⁵ Maintaining an open-access free roadway is tantamount to distributing a valuable resource with a

²⁹ Börje Johansson and Lars-Göran Mattsson explain ways in which roads fall within, and outside, the definition of a classic public good. See Börje Johansson & Lars-Göran Mattsson, *Principles of Road Pricing*, in ROAD PRICING: THEORY, EMPIRICAL ASSESSMENT AND POLICY 7, 9-10 (Börje Johansson & Lars-Göran Mattsson eds., 1995) [hereinafter ROAD PRICING]. 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,” *id.*, 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.*

³⁰ E.g., Gillette & Hopkins, *supra* note 24, 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).

³¹ Even at low levels of roadway usage, driving a vehicle generates pollution that may, in whole or in part, be an externality. But, to the extent that is the case, the externality is the result of driving, not usage of any particular roadway. However, congestion itself may exacerbate the amount of pollution generated; the marginal additional pollution is an externality that results from congestion. See *infra* Fig. 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”; “[t]rip reduction for the sake of congestion relief largely takes the form of shifting employee trips out of a narrow peak period”).

³² 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 29, at 57, 58.

³³ 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”).

³⁴ Hsu, *supra* note 25, 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.”).

³⁵ See generally *Pierson v. Post*, 3 Cai. R. 75, 2 Am. Dec. 264 (N.Y. Sup. Ct. 1805).

price cap of zero. When scarce goods are made available at less than their true cost, a shadow market will develop in some other form of effective currency.³⁶ 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.³⁷ 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.³⁸ 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),³⁹ as a consequence, drivers expend considerable time and effort in searching for available metered or free parking.⁴⁰ In effect, time and effort become the primary commodities according to which the resource is allocated. An appropriate adaptation of the “rule of first capture” prevails.⁴¹

In the case of roadways, time, presumably, will be the primary factor in allocating the resource. People’s demand for roadway space will vary inversely with the time it takes to drive a mile, since “[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.”⁴² 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.⁴³

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 resource. 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.⁴⁴ Thus, an individual who values an inexpensive parking space more than a second individual may nevertheless not pursue—and therefore not obtain—an inexpensive parking space if the second person values her time so much less than first person values his, such that it is economically rational for the first person, but not the second, to invest considerable time and effort in searching for an inexpensive parking space.⁴⁵

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

³⁶ See generally GARY BECKER, *THE ECONOMIC APPROACH TO HUMAN BEHAVIOR* 5-6 (1976).

³⁷ Stephen Lynch, *Angels Fans Rally for Playoff Tickets*, ORANGE COUNTY REG., Sept. 22, 2002, at 1 (“[M]ost of the [Anaheim Angels’] first-game playoff tickets went to fans who lined up for at least 24 hours.”).

³⁸ Cf. BECKER, *supra* note 36, at 6 (describing “office waiting time for physicians” as “one component of the full price of physician services”).

³⁹ Epstein, *supra* note 20, at S534. Epstein speculates that distributive justice may explain this discrepancy. See *id.* I return to this point below, in the context of congestion charging, see *infra* notes 210-213, 224, 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, *Give Residents a Place to Park*, N.Y. TIMES, Jan. 4, 2004, sec. 4, at 7.

⁴⁰ See Epstein, *supra* note 20, at S521-28.

⁴¹ See *id.* at S523-24 (drawing the analogy between the “rule of first capture” in *Pierson* for foxes, and the allocation of parking spaces).

⁴² 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. & STATISTICS 1, 3 (2000).

⁴³ Drivers might make these decisions on a daily—e.g., what route to take that day and what time to travel—or overall basis—e.g., where to live. But the overall point remains the same.

⁴⁴ See BECKER, *supra* note 36, at 6 (footnote omitted).

⁴⁵ 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. But the transactions costs are likely to be prohibitively high in most such circumstances. Cf. *infra* note 46 (explaining why time-cost is generally not monetizable).

worth the investment of time that road usage requires. 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. In the absence of a private market, the time-based allocations will prevail.⁴⁶ And there is no easy way for a private market in roadway usage to arise.⁴⁷

A second effect of the negative externality on roadway usage is that the level of usage will be inefficiently high. 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. Commentators have identified such a circumstance as potentially subject to a “tragedy of the commons.”⁴⁸ The ability to externalize costs on others gives rise to an incentive to overconsume the resource. 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 overconsume the resource.⁴⁹ Because individual users experience 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 sees (in the absence of congestion charges or some other method of cost-internalization) is less than the actual, total societal costs of that user’s usage.⁵⁰ Economic analysis suggests that an individual who is considering using a particular roadway will determine whether or not 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.⁵¹ But, to the extent that congestion exists, 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 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 general 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.⁵²

⁴⁶ 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 away money for that time. It is gone, and that is that.

ROBERT G. MCGILLIVRAY, ON ROAD CONGESTION THEORY 2-3 (1974).

⁴⁷ 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 HOV lanes.

⁴⁸ See Garrett Hardin, *The Tragedy of the Commons*, 168 SCIENCE 1243 (1968).

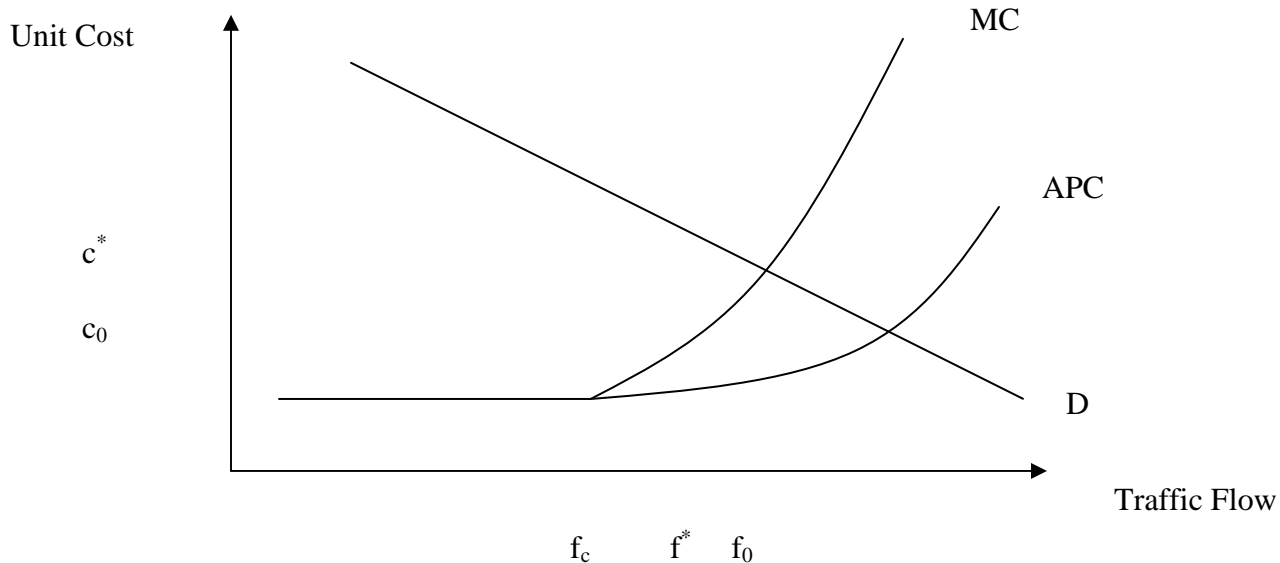
⁴⁹ The likelihood of the undesirable outcome results from the fact that the tragedy of the commons puts individuals in a multiple-player prisoner’s dilemma-style game. On the prisoner’s dilemma game generally, and on the relation of the prisoner’s dilemma to the tragedy of the commons, see DOUGLAS G. BAIRD, ROBERT H. GERTNER & RANDAL C. PICKER, GAME THEORY AND THE LAW 33-34 (1994).

⁵⁰ See *supra* text accompanying note 28.

⁵¹ Wahrman, *supra* note 21, at 197.

⁵² See *supra* text accompanying note 42.

FIGURE 1: Roadway Usage and Congestion



The curve labeled “APC” represents the average perceived costs to roadway users.⁵³ Even at low levels of roadway usage—i.e., in the absence of congestion—roadway users experience some costs.⁵⁴ 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.⁵⁵ This is represented by the upward slope of the APC curve to the right of point f_c .

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. But the MC curve rises more quickly than does the APC curve, since 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 demand for travel curve. As depicted in Figure 1, then, the equilibrium will involve a traffic flow of f_0 at a unit cost of c_0 .⁵⁶ However, 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 demand for travel curve: There would be traffic flow f^* at a

⁵³ 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 29, at 29 tbl. 1.3 (distinguishing between fixed and variable costs in this context).

⁵⁴ See *supra* text accompanying note 51.

⁵⁵ See Wahrman, *supra* note 21, at 197.

⁵⁶ See Fulton et al., *supra* note 42, at 3.

unit cost of c^* . Note, then, that the absence of internalization has the effect of both increasing the total traffic flow (since $f_0 > f^*$) and decreasing the unit cost each driver faces (since $c_0 < c^*$).⁵⁷

In addition to misallocation of the resource and overusage to which the congestion externality gives rise, the congestion externality also introduces some corollary effects. Congestion delays people and goods from reaching their destinations, and increases the frequency of vehicular accidents.⁵⁸ Congestion also imposes costs on the public-at-large: traffic delays increase the amount of pollution that a vehicular trip generates.⁵⁹ One commentator estimates that “[s]top-and-go driving costs Americans an estimated \$168 billion a year,”⁶⁰ 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.”⁶¹ Congestion is also a source of road rage, which itself can lead to accidents and other conflagrations.⁶² In addition, the artificially low price 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.⁶³ In short, the deleterious effects of congestion on drivers, passengers, and society in general, are substantial.⁶⁴

In the next two Parts, I consider two governmental responses to traffic congestion: the generation of additional roadway capacity and congestion pricing.

⁵⁷ 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.

⁵⁸ Lior Jacob Strahilevitz, *How Changes in Property Regimes Influence Social Norms: Commodifying California’s Carpool Lanes*, 75 IND. L.J. 1231, 1237 (2000); MCGILLIVRAY, *supra* note 46, at 2 (listing “increased hazard” as a result of congestion).

⁵⁹ Strahilevitz, *supra* note 58, at 1237.

⁶⁰ Charles Komanoff, *Pollution Taxes for Roadway Transportation*, 12 PACE ENVTL. L. REV. 121, 129 (1994).

⁶¹ *Id.*

⁶² Wahrman, *supra* note 21, at 182; *but cf.* Robert F. Blomquist, “Road Rage”: A Scary and Tangled Cultural-Legal Pastiche, 80 NEB. L. REV. 17, 36-37 (2001) (critiquing Wahrman for ignoring causes of “road rage” other than traffic congestion). On the general topic of “road rage,” see Blomquist, *supra*.

⁶³ 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.”).

⁶⁴ See, e.g., R.H.M. EMMERINK, INFORMATION AND PRICING IN ROAD TRANSPORTATION 3-4 (1997) ([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”).

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

In this Part, I consider the dominant governmental response to traffic congestion: the generation of additional roadway capacity. First, I elucidate ways in which the government might generate roadway capacity. Second, I explain how generating additional roadway capacity may be inefficient. Not only may the provision of new roadway capacity not efficiently reduce traffic congestion, it may under some circumstances worsen it. Third, I discuss how, notwithstanding new roadway capacity's efficiency shortcomings, public choice helps to explain its continued dominance as a governmental response.

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 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.⁶⁵ Fourth, the government might have lanes that reverse direction depending upon the extent of traffic flow during different times of day.⁶⁶ 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.⁶⁷

"The traditional instrument to tackle the congestion problem is to build more road infrastructure."⁶⁸ But, for several reasons, the generation of new roadway capacity is not as attractive an option as it at first might seem. 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.⁶⁹ Second, "the social and environmental consequences of building new roads could be far more severe than the beneficial effects to motorists."⁷⁰ Third, some urban areas are already so developed that it is "physically impossible to enlarge the existing road infrastructure without undue expense."⁷¹

Fourth, even putting the first two problems to the side, the fundamental justification for providing new roadway capacity—that it at least ameliorates traffic congestion—is erroneous. The logic underlying new road construction rests upon the assumption that demand for travel is

⁶⁵ 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.

⁶⁶ For example, the Connecticut Avenue artery into Washington 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 in Queens 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 outbound lanes of the expressway.

⁶⁷ 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).

⁶⁸ EMMERINK, *supra* note 64, at 4; accord GAO, SURFACE AND MARITIME TRANSPORTATION—DEVELOPING STRATEGIES FOR ENHANCING MOBILITY: A NATIONAL CHALLENGE 40 (2002) (GAO-02-0775).

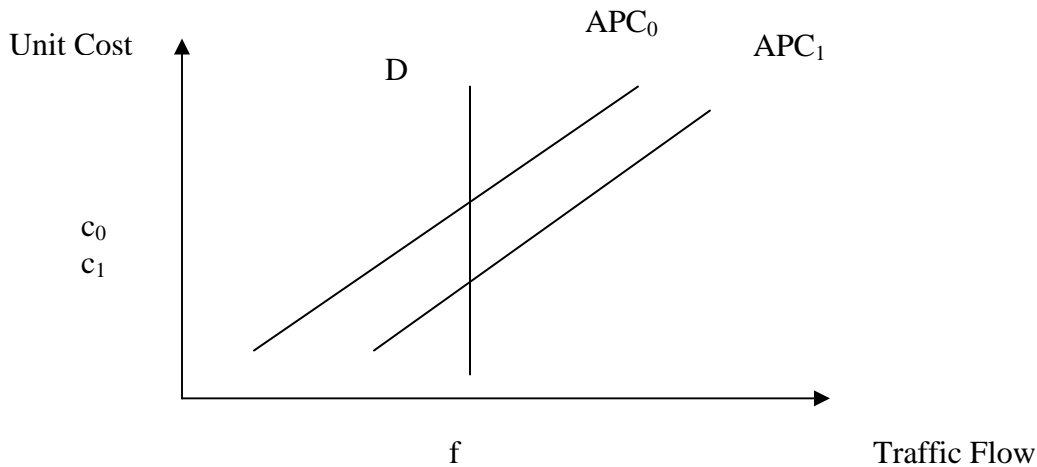
⁶⁹ See *supra* notes 34-49 and accompanying text.

⁷⁰ EMMERINK, *supra* note 64, at 4

⁷¹ *Id.* An exception—probably made possible by a great concentration of power, 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).

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.”⁷² As commentators explain, “This 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.”⁷³ 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. 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 APC curve from APC_0 to APC_1 results in a drop in the cost of travel from c_0 to c_1 , while traffic flow remains constant at level f .

FIGURE 2: Roadway Usage under Inelastic Demand



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

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 even worse, than it was before.⁷⁴ 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. Their data analysis indicates “a significant relationship between the level of highway capacity . . . and the level of travel.”⁷⁵

⁷² Fulton et al., *supra* note 42, at 2; accord Robert B. Noland & William A. Cowart, *Analysis of Metropolitan Highway Capacity and the Growth in Vehicle Miles of Travel*, 27 *TRANSP.* 363, 364 (2000).

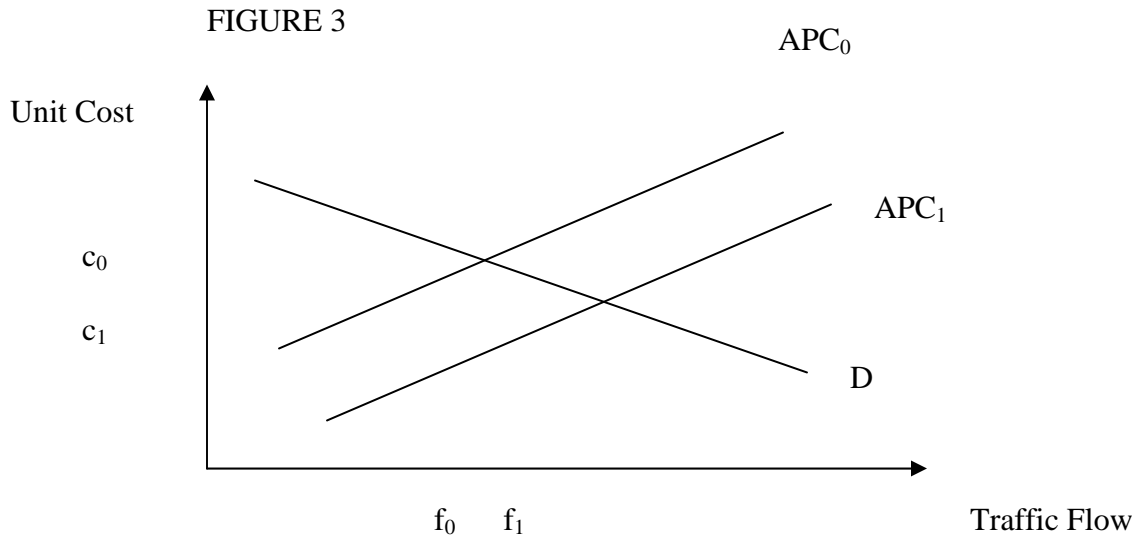
⁷³ Fulton et al., *supra* note 42, at 2.

⁷⁴ Fulton et al., *supra* note 42, at 2.

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. L. & PUB. POL’Y* 285, 331 (2000-2001); 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).

⁷⁵ Fulton et al., *supra* note 42, at 13. The study measures highway capacity in lane-miles and level of travel in daily vehicle-miles traveled. *Id.*

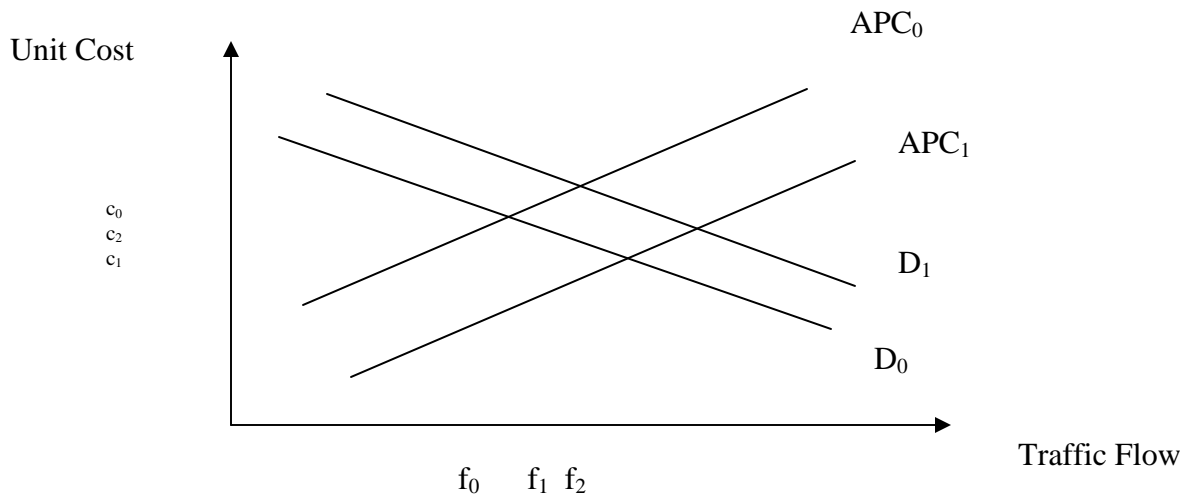
The model described above (and depicted in Figure 2) failed to take into account the “induced travel” phenomenon because that model took a static view: It assumed that the total number of vehicle miles would not change simply upon the construction of new roadways. Instead, as Figure 1 indicated, the 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: While 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 .



The phenomenon of induced travel has an even more pronounced effect over time. 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. In short, “long term responses to increased access can result in changes in land use patterns, possibly inducing both more and longer trips.”⁷⁶ 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 APC₁ and demand curve D₂, 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 .

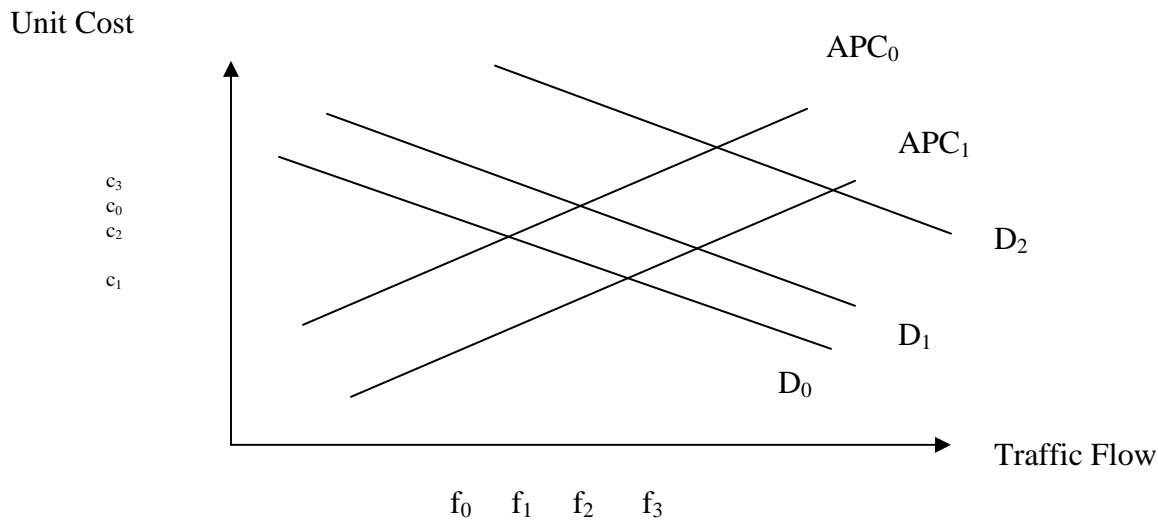
⁷⁶ Fulton et al., *supra* note 42, at 3. On the links between land use, roadways, and congestion, see generally Rachel Weinberger, *The High Cost of Free Freeways*, 43 IDAHO L. REV. 475 (2007).

FIGURE 4



Moreover, depending upon the time-elasticity of demand to roadway capacity, the effect of induced travel could be even worse. Let's say that, as reflected in Figure 5, induced travel over time shifts the demand curve not to D_2 , but rather to D_3 . 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. It is possible that the growth would have occurred anyway. 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 (since the growth

would have happened either way). But, although they are not conclusive, recent empirical studies generally suggest otherwise.⁷⁷

In sum, the phenomenon of induced travel appears to be an empirically accurate description of the response to new road construction: increased travel demand. 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 well may be quite ill advised—since it may function only to worsen the congestion problem over time.

Even if 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. Part of the popularity of the new road construction strategy may be due to urban planners' erroneous belief that demand for travel was substantially inelastic to the time-cost of travel.⁷⁸ But public choice theory 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, power 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 will believe that the new construction will reduce congestion. Second, industry actors that engage in road construction, and real estate construction, will support such projects.⁷⁹ The same is true for those employed in the road and real estate construction industries. And, since 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. For example, the construction of an entirely new road is likely to increase land values along the path of the new road. This will likely lead to increased profits for

⁷⁷ See Fulton et al., *supra* note 42, 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]”); Robert B. Noland & William A. Cowart, *Analysis of Metropolitan Highway Capacity and the Growth in Vehicle Miles of Travel*, 27 *TRANSP.* 363, 387 (2000) (study results “are highly suggestive of a causal linkage” between lane mile additions and growth in vehicle-miles traveled); Robert B. Noland, *Relationships Between Highway Capacity and Induced Vehicle Travel*, 35 *TRANSP. RES. PART A* 47, 70 (2001) (study results suggests “[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 MAGAZINE*, Aug. 24, 2003, 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* Patricia L. Mokhtarian, Francisco J. Samaniego, Robert H. Shumway & Neil H. Willits, *Revisiting the Notion of Induced Traffic Through a Matched-Pairs Study*, 29 *TRANSP.* 193, 199, 214 (2002) (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 introduction of free transfers to buses from the subways. *See* Thomas J. Lueck, *New York Bus Ridership Surges After Long Decline*, *N.Y. TIMES*, Dec. 22, 1998, at A2 (identifying discounts as one reason for the surge in bus ridership).

⁷⁸ *See supra* notes 72-73 and accompanying text, and Fig. 2.

⁷⁹ Cf. William W. Buzbee, *Urban Sprawl, Federalism, and the Problem of Institutional Complexity*, 68 *FORDHAM L. REV.* 57, 80 (1999) (“Real estate and transportation construction interests have substantial monetary incentives to favor continued government expenditures on the highways . . . that are essential to urban sprawl.”); 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).

business owners located along the new road, and also likely create work for land developers.⁸⁰ 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.⁸¹ Environmental organizations and organizations that advocate land use planning also may oppose new road construction. But it seems likely that in many cases public choice theory would predict that the many powerful, well-organized special interests that support new road construction would far outweigh the few that oppose it.

Government actors are also likely to support new road construction projects. New road construction has been described as the quintessential form of political pork.⁸² Politicians can increase their power base by doling out road construction projects.⁸³ 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, especially the federal government). And, 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,⁸⁴ 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.⁸⁵ Accordingly, he argues, "congressmen must constantly engage in activities related to reelection."⁸⁶ Among the activities that Mayhew identifies that further reelection prospects—and in which legislators therefore reasonably should be expected to engage—is "credit claiming," i.e., "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."⁸⁷

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

⁸⁰ See, e.g., Peter T. Kilborn, *In Rural Areas, Interstates Build Their Own Economy*, N.Y. TIMES, July 14, 2001, at A1.

⁸¹ 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.

⁸² See, e.g., Robert Jay Dilger, *TEA-21: Transportation Policy, Pork Barrel Politics, and American Federalism*, 28 PUBLIUS 49, 50 (1998); 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).

⁸³ As Pennsylvania Senator Rick Santorum commented during the Senate debate over the then-pending SAFETEA highway bill, "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.

⁸⁴ See MAYHEW, *supra* note 14.

⁸⁵ See *id.* at 14-17.

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

⁸⁶ *Id.* at 49.

⁸⁷ *Id.* at 52-53. Mayhew identifies two other activities that are likely to lead to reelection: "advertising," see *id.* at 49, and "position taking," see *id.* at 61.

(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.⁸⁸

Roadway construction projects provide a clear example of a particularized benefit. A roadway project benefits (or at least appears to benefit) specific individuals—both residents who believe that traffic congestion woes will be lessened, and road construction firms and workers, as well as the real estate construction and sales industries. And, since 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. In short, the political popularity of highway construction projects is not surprising.

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

V. THE EFFICIENT RESPONSE TO TRAFFIC CONGESTION: CONGESTION PRICING

Congestion pricing is an efficient, market-based response to the problem of traffic congestion.⁸⁹ In this Part, I present an overview of congestion pricing. First, I briefly summarize

⁸⁸ *Id.* at 54.

⁸⁹ Market-based approaches to congestion control effectively assign a price to roadway access, and then rely upon prospective users to decide whether or not 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 p.m. Fridays until 7 a.m. Saturdays.” *Metro: 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 *id.*; *Travel – 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 4th, “courtesy of the Maryland Lottery”); Christian Davenport & Anita Huslin, *Arundel Notebook: By All Means, Keep Traffic Moving*, WASH. POST, Aug. 14, 2003, at T2.

A more encompassing traffic subsidy proposal, also in the Washington metropolitan area, is one designed to reduce traffic across the Woodrow Wilson Bridge. The bridge, which spans the Potomac between Virginia and Washington, serves a major commuter artery. Under the program, dubbed “BridgeBucks,” participants will receive compensation for not taking the bridge. Steven Ginsburg, *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”

the theoretical and practical history of congestion pricing. Second, I describe in the abstract the logic underlying a congestion charge system, and describe in the abstract how such systems can be structured; I identify two axes along which congestion pricing schemes might be categorized, and thus develop a typology of congestion pricing regimes. Next, I describe the current, limited federal role in fostering congestion pricing regimes. I then briefly survey existing congestion pricing regimes, both domestic and foreign.

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.⁹⁰ Arsène Jules Étienne Dupuit undertook to determine the optimal toll for a bridge in 1844.⁹¹ The problem of roadway congested was investigated by both Arthur Cecil Pigou⁹² and Frank Knight⁹³ in the 1920s. Both these “spiritual fathers of road pricing”⁹⁴ recommended that drivers internalize the external congestion costs that they road usage imposed. Frank Plumpton Ramsey also advocated the use of taxes to address road congestion in 1927.⁹⁵

If Pigou and Knight are the “spiritual fathers” of congestion pricing, then Nobel Laureate William Vickrey was “the pioneer in [its] practical application.”⁹⁶ Vickrey first suggested

principle, a normative notion that urges that pollution costs be borne by those who generate the pollution and associated harm. See generally 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, in ROAD PRICING, TRAFFIC CONGESTION AND THE ENVIRONMENT: ISSUES OF EFFICIENCY AND SOCIAL FEASIBILITY* 3, at 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. supra* text accompanying note 149 (describing FAIR lanes regimes as a hybrid between a congestion charge and subsidy system).

One might also think of a third possible market-based response to the congestion problem: a tradable roadway access permit regime. See *infra* note 211 (describing a proposal that is somewhat similar to such a system). Congestion pricing is a price-control mechanism; the price-control analog to the 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.

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).

⁹⁰ Button & Verhoef, *supra* note 89, at 4.

⁹¹ J. Dupuit, *On the Measurement of the Utility of Public Works*, ANNALES DES PONTS ET CHAUSSÉES (vol. 8, 2d ser.) (1844), reprinted in TRANSPORT: SELECTED READINGS (D. Munby ed., 1968).

⁹² See A. C. PIGOU, *THE ECONOMICS OF WELFARE* 163 (1920).

⁹³ See F. H. Knight, *Some Fallacies in the Interpretation of Social Cost*, 38 Q.J. ECON. 582 (1924).

⁹⁴ Button & Verhoef, *Introduction, supra* note 89, at 4.

⁹⁵ See F. P. Ramsey, *A Contribution to the Theory of Taxation*, 37 ECON. J. 47, 59 (1927).

⁹⁶ 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 21, at 181 n.* (article dedicated to Vickrey, “an early and lonely champion of congestion pricing”).

congestion pricing in a study commissioned to revamp the New York City subway system.⁹⁷ He then recommended the use of congestion pricing in the Washington, D.C. area,⁹⁸ testifying before Congress on the matter in 1958.⁹⁹ In the ensuing decades, he would write numerous articles advocating the use of congestion pricing regimes, and explaining how they could practically be implemented.¹⁰⁰

Despite Vickrey's longstanding and strenuous support, congestion pricing remained 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.¹⁰¹ 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. "Road pricing refers to charging for the direct use of the road."¹⁰² Fees may be placed on road access for a variety reasons—including recovery of the cost of constructing the road, recovery of the costs of maintaining and upgrading the road,¹⁰³ to subsidize mass transportation,¹⁰⁴ or simply as a source of government revenue.¹⁰⁵ Congestion charging envisions the imposition of fees solely as "an instrument to manage travel

⁹⁷ See WILLIAM S. VICKREY, *THE REVISION OF THE RAPID TRANSIT FARE STRUCTURE OF THE CITY OF NEW YORK* (1952).

⁹⁸ See Arnott, *supra* note 96, at 272.

⁹⁹ See Strahilevitz, *supra* note 58, at 1249; Wahrman, *supra* note 21, at 182 n.5.

¹⁰⁰ See, e.g., Arnott, *supra* note 96, at 272-75.

¹⁰¹ Strahilevitz, *supra* note 58, at 1249. I describe the federal role in spurring the development of congestion pricing regimes below. See *infra* Part V.C.

¹⁰² Johansson & Mattsson, *supra* note 29, at 7. 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.*

¹⁰³ For example, on the New Jersey Turnpike, "[t]olls for travels between interchanges are determined by the cost of construction and maintenance between those points." New Jersey Turnpike Authority, *Welcome to the New Jersey Turnpike: A Brief Tour ...* 6 (available at www.state.nj.us/turnpike/tpbook.pdf (visited Aug. 30, 2003)); see *id.* at 9-10 (section entitled "Your Tolls at Work" that describes projects financed by tolls that have been undertaken to improve the Turnpike).

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 N.J. P.L. 2003 c. 79 (May 27, 2003); www.gspkwy.state.nj.us/ (visited Aug. 30, 2003). A press release from New Jersey's governor proclaims that, as a result, "more money is now available for projects to improve the roads." www.state.nj.us/turnpike/msgfromgov.htm (visited Aug. 30, 2003).

¹⁰⁴ For example, New York's MTA Bridges and Tunnels ("B&T") is a "constituent agency of the Metropolitan Transportation Authority." MTA, *Welcome to MTA Bridges and Tunnels*, www.mta.nyc.ny.us/bandt/html/btintro.htm (visited Dec. 3, 2005). 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 \$5.6 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 \$750 million annually, and Bridges and Tunnels' Five Year Capital Program will keep its facilities among the best maintained in the region.

Id.

¹⁰⁵ E.g., MCGILLIVRAY, *supra* note 46, 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." (emphasis in original)).

demand and guide/control traffic flows.”¹⁰⁶ Congestion pricing schemes are generally designed to mandate the internalization of the congestion externality.¹⁰⁷

Congestion pricing regimes seek to remedy the externality of congestion in a straightforward way—by charging drivers for access to the roadways at issue.¹⁰⁸ As I explain 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.

The use of congestion pricing regimes for roadway use is similar to the use of peak pricing regimes with which consumers are already familiar for other goods and services.¹⁰⁹ 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.”¹¹⁰ 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.”¹¹¹ Also, unlike command-and-control approaches,¹¹² congestion pricing regimes afford societal actors maximum flexibility in determining their travel itineraries.¹¹³

Congestion pricing structures can be seen to vary along two axes. First, one must determine how the price for road access is determined.¹¹⁴ Second, one must examine what other

¹⁰⁶ See Johansson & Mattsson, *supra* note 29, 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, I refer to the fee as a “congestion charge” only to the extent that it is imposed to effect internalization of the congestion externality.

¹⁰⁷ 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. The charges are directed towards the congestion and other road damage externalities caused by motorists.”).

¹⁰⁸ See, e.g., Strahilevitz, *supra* note 58, 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”).

¹⁰⁹ See *id.* at 1244; Komanoff, *supra* note 60, at 132. For a theoretical overview of peak pricing, see W. KIP VISCUSI, JOHN M. VERNON & JOSEPH E. HARRINGTON, JR., *ECONOMICS OF REGULATION AND ANTITRUST* 396-403 (2d ed.1998).

¹¹⁰ Komanoff, *supra* note 60, at 131.

¹¹¹ Timothy D. Hau, *Instruments for Charging Congestion Externalities*, in *ROAD PRICING*, *supra* note 29, at 223, 224.

¹¹² See *infra* text accompanying note 226.

¹¹³ Harry Richardson & Chang-Hee Bae explain that the options among which individuals may choose under a congestion pricing regime include:

no 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).

Harry W. Richardson & Chang-Hee Christine Bae, *The Equity Impacts of Road Congestion Pricing*, in *ROAD PRICING, TRAFFIC CONGESTION AND THE ENVIRONMENT*, *supra* note 89, at 247, 247-48.

¹¹⁴ 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?

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. This means that congestion charges should be set equal to the excess of marginal costs over average perceived costs.¹¹⁵ Since the purpose of congestion pricing is to internalize the congestion externality, a congestion pricing scheme should impose no charge where there is no congestion.¹¹⁶ Congestion has a “collective (social) effect” where “marginal social cost is higher and increases faster than the average individual cost.”¹¹⁷

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. 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. Thus, under the pure approach, the total cost of a trip should depend upon changing traffic conditions during the trip. There is a practical problem here: The total cost of the trip could not be determined in advance. But part of the benefit offered by congestion pricing 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.¹¹⁸ Thus, practicality may require sacrifice of some of the purity of a congestion pricing regime.¹¹⁹

In order 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

Peter Jones, *Urban Road Pricing: Public Acceptability and Barriers to Implementation*, in ROAD PRICING, TRAFFIC CONGESTION AND THE ENVIRONMENT, *supra* note 89, at 263, 277; *see id.* at 277-80.

¹¹⁵ See Johansson & Mattsson, *supra* note 29, at 13; Hau, *supra* note 32, at 58 (“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.” (emphasis in original; footnote omitted)). *But see* Komanoff, *supra* note 60, 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 (footnote omitted)); Phil B. Goodwin, *Road Pricing or Transport Planning?*, in ROAD PRICING, *supra* note 29, at 143, 149 (arguing that, while congestion pricing regimes are in general a good idea, actually imposing internalization of congestion costs might not be optimal).

¹¹⁶ See Johansson & Mattsson, *supra* note 29, at 10-11 (Where “there are no congestion effects . . . there are no efficiency or welfare arguments” in favor of imposing a charge.); Komanoff, *supra* note 60, at 132 (“Motorists using uncongested rural roads would not pay congestion fees.”).

¹¹⁷ Johansson & Mattsson, *supra* note 29, at 11.

¹¹⁸ 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.

¹¹⁹ 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 115, at 148.

would expect the new entrant's travel to generate. In this sense, setting a congestion charge presents an easier chore for a regulator than the task of setting a Pigouvian tax in most other settings.

But reliance upon historical data does not resolve the pricing issue. In order properly to price a trip, 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 trip¹²⁰; 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.¹²¹ The approach also could be achieved by having a device that measures actual distances traveled on the restricted road¹²²; data from that device would be obtained by the government and used to price the roadway usage.

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 in respect of each driver's trip on each occasion that the driver takes a trip. While technological advances make these possibilities far more feasible than they previously were,¹²³ nonetheless they remain complex and somewhat 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

¹²⁰ This would be akin to a "flight plan" filed by a pilot.

¹²¹ Many state toll roads employ pricing systems that, while not congestion pricing schemes, vary tolls according to the entrance and exit used by drivers. See *supra* note 103 (discussing the setting of tolls on the New Jersey Turnpike).

¹²² See KIRAN BHATT, ROAD PRICING TECHNOLOGIES: A SURVEY (1974). Such a device would be akin to a meter used by taxicabs in many metropolitan areas.

¹²³ Compare *id.* at 7-20 (surveying then-existing technological options) and Goetz, *supra* note 63, 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 21, 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."); cf. EMMERINK, *supra* note 64, 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."). See also DANIEL H. COLE, PROPERTY AND POLLUTION ch. 4 (2002) (discussing the relationship between technology capabilities and design and development of environmental regulatory tools); Nash & Revesz, *supra* note 89, at 637-50 (describing how computerized pollution dispersion models and the internet can facilitate more nuanced air pollutant permit trading programs). For a discussion of the ethical implications of scientific innovation on environmental policy, see Carol M. Rose, *Scientific Innovation and Environmental Protection: Some Ethical Considerations*, 32 ENVTL. L. 755 (2002).

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.¹²⁴ The most common version seen in congestion pricing scheme is simply to price roadway access at a higher rate during prevalent “rush hours.” For example, the government might charge a higher toll from 6:00 to 10:00 every weekday morning into a city, and from 4:00 to 8:00 every weekday evening out of the city.¹²⁵ Indeed, the city might charge no toll in non-peak hours. For example, the city of London has recently implemented a congestion pricing scheme for permission to drive in the central city. The scheme imposes a flat fee for access to the central city during the hours of 7:00 a.m. to 6:30 p.m. on weekdays; no fee is required during other hours.¹²⁶

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.

The recently enacted congestion pricing regime in London is an example of cordon-pricing. 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.¹²⁷ While some London workers have complained that their circumstances leave them with no viable substitute to paying the

¹²⁴ The idea of using historical congestion data is a more nuanced version of this simplifying step. *See supra* text accompanying notes 118-199.

¹²⁵ 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* www.wmata.com/riding/hours_fares.cfm#Metrorail%20Fares (visited Sept. 19, 2007). William Vickrey originally advocated congestion pricing for use in public transportation—specifically, the New York City subway system. *See supra* text accompanying note 97. *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 p.m. to 8 p.m. weekdays, a fee intended to draw out more cabs during rush hour.”).

¹²⁶ Transport for London, *Congestion charging . . . where and when does it operate?*, www.cclondon.com/infosearch/dynamicPages/WF_ZoneCheck_W.aspx (visited Sept. 19, 2007). 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, *Congestion Charging . . . Exemptions and Discounts*, www.cclondon.com/exemptions.shtml (visited Sept. 19, 2007).

On the London congestion charge plan generally, see MARTIN RICHARDS, *CONGESTION CHARGING IN LONDON: THE POLICY AND THE POLITICS* (2005).

¹²⁷ Public transit is also not a perfect substitute for roadway access. *See* Oren, *supra* note 31, at 212-31 (discussing the importance to Americans of driving vehicles, and surveying how that ideal has frustrated attempts to change driving patterns through behavioral modification).

central city access fee,¹²⁸ overall the London plan seems to be faring reasonably well and even earning some public accolades.¹²⁹

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 I discuss below, even subsidized¹³⁰). For example, the San Diego I-15 “FasTrak” pricing scheme charges single-occupant vehicles for access to the road’s express lanes.¹³¹ But access to the highway’s local lanes remains free.

Regimes that fall under this category may further be broken down into subcategories. A simple example is a regime that charges drivers for access to a particular roadway. Another simple example is a regime that charges drivers for access to particular lanes on a roadway. 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. 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.¹³²

A hybridization of lane-access pricing occurs where lane access is also permitted to particular vehicles on a basis other than cost. An example of this is “HOT lanes” systems.

“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 or at a discounted toll rate. HOT lanes create an additional category of eligibility for people wanting 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.¹³³

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

Yet another variant on lane-pricing access is a “FAIR lanes” regime.

“Fast and Intertwined Regular Lanes” or “FAIR lanes” involves separating freeway lanes, typically using plastic pylons and striping, into two sections: “fast” lanes and “regular” lanes. The fast lanes would be electronically tolled express lanes where tolls may change dynamically to manage demand. In the

¹²⁸ 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*, THE TIMES OF LONDON, Feb. 22, 2003, at 14.

¹²⁹ See, e.g., Jill Lawless, *Supporters, Foes Agree: London Traffic Fee Works*, N.O. TIMES-PICAYUNE, May 18, 2003, at A23.

¹³⁰ See *infra* text accompanying notes 134-136 (discussion of “FAIR lanes”).

¹³¹ Vehicles with two or more occupants may use the express lanes at no charge.

¹³² See Federal Highway Administration, *Terminology* (available at <http://www.fhwa.dot.gov/policy/otps/terminology.htm> (last modified Sept. 21, 2005)) (“**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’).”).

¹³³ *Id.*

regular lanes, constricted flow would continue, but drivers with transponders would be compensated with credits. Credits could be used as toll payments on days when they choose to use the fast lanes, or as payment for transit, paratransit or parking at commuter park-and-ride lots in the corridor.¹³⁴

FAIR lanes thus are a hybrid between pure congestion pricing and subsidy regimes.¹³⁵ The incorporation of a subsidy element may provide an opportunity to ameliorate what some perceive to be equity shortcomings in standard congestion pricing regimes.¹³⁶

C. Current Federal Role in Fostering Congestion Pricing Regimes

Public money to construct roads comes from the federal government, as well as from state governments.¹³⁷ The “federal-aid highway program” (“FAHP”) is the primary federal source of funds for highway construction.¹³⁸ It is administered by the Department of Transportation’s Federal Highway Administration.¹³⁹ The FAHP is “basically a federally funded state program.”¹⁴⁰ “Monies 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.”¹⁴¹ The FAHP provides federal funding to roads within the “federal-aid systems.”¹⁴² The two federal-aid systems are the “Interstate System”¹⁴³ and the “National Highway System,”¹⁴⁴ of which the Interstate System is a component.¹⁴⁵

In fact, the Interstate System constitutes a very small part of all roads—only 4.9 percent of all federally subsidized roadway miles, and only 1.2 percent of all total roadway miles in the United States.¹⁴⁶ Still, though Interstate Highways may constitute a relatively small proportion of

¹³⁴ *Id.*

¹³⁵ I discuss the use of subsidies to reduce traffic congestion below, *see supra* note 89.

¹³⁶ *See infra* notes 210-213, 224, and accompanying text (discussing equity in the context of congestion pricing); *see also supra* notes 128-129 and accompanying text.

¹³⁷ *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).

¹³⁸ Edward V.A. Kussy, *Wetland and Floodplain Protection and the Federal-Aid Highway Program*, 13 *ENVTL. L.* 161, 164 (1982). *See id.* (“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.”).

¹³⁹ *Id.*

¹⁴⁰ *Id.*

¹⁴¹ Houck, *supra* note 79, at 897 n.176. *See also* Fiore & Stafford, *supra* note 137, at 251 n.36 (1995) (“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)).

¹⁴² *See* 23 U.S.C. § 103(a) (defining the “Federal-aid systems”); 47 C.F.R. § 470.103 (same). *See also* 23 U.S.C. § 101(a)(5) (“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.”).

¹⁴³ For the definition of the “Interstate System,” *see* 23 U.S.C. § 103(c); 47 C.F.R. § 470.107(a); *see also* 47 C.F.R. § 470.111 (procedures governing the Interstate System). For an overview of the Interstate System, *see* Federal Highway Administration, *Dwight D. Eisenhower National System of Interstate and Defense Highways*, available at www.fhwa.dot.gov/programadmin/interstate.html (visited Dec. 3, 2005).

¹⁴⁴ For the definition of the “National Highway System,” *see* 23 U.S.C. § 103(b); 47 C.F.R. § 470.107(b); *see also* 47 C.F.R. § 470.113 (procedures governing the National Highway System).

¹⁴⁵ 23 U.S.C. § 103(b)(2)(A) (defining the National Highway System to include the Interstate System; 47 C.F.R. § 470.107(b)(1) (same)).

¹⁴⁶ As of October 2002, there were 3,981,670 miles of roads in the United States. *See* Federal Highway Administration, *Public Road Length – 2002: Miles by Ownership and Federal-Aid Highways National Summary*

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. 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.”¹⁴⁷ These well-maintained roads carry an inordinate amount of traffic for the mileage they represent.

Federal law imposes various restrictions on roads that receive federal funding. Among them is a restriction on the implementation and maintenance of tolls. The existing structure of federal law, under Title 23 of the United States Code, is quite hostile to the imposition of tolls—of any kind—on interstate highways. Section 301 announces a general rule that bars tolls from roads that are constructed with federal highway funds.¹⁴⁸ 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.”¹⁴⁹

Despite the breadth of its language and the audacity of its caption, section 301 subjects its toll preclusion rule to the provisions of section 129.¹⁵⁰ And that section provides a fairly broad exception to section 301’s general rule.¹⁵¹ Though it preserves section 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 does not disallow the introduction of tolls on roads receiving federal funding.¹⁵² The provision grandfathers in existing toll segments of the interstate system, allowing for funding for “reconstructing, resurfacing, restoring, and

(available at www.fhwa.dot.gov/policy/ohim/hs02/pdf/hm16.pdf) (visited Dec. 3, 2005). Of that, 3,079,758 miles are in rural areas while 901,912 were in urban areas (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 worth of road—i.e., just over 24 percent of roadway miles—received FAHP funding. *Id.* Of those 959,324 subsidized roadway miles, only 161,539—or 16.8 percent—are part of the National Highway System. *Id.* The Interstate Highway System consists of 46,748 miles of road, which constitutes 28.9 percent of the National Highway System, only 4.9 percent of all federally subsidized roadway miles, and only 1.2 percent 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 138, at 164 n.5 (citing FED. HIGHWAY ADMIN., U.S. DEP’T OF TRANSP., HIGHWAY STATISTICS—1979 (1980)).

¹⁴⁷ 23 U.S.C. § 103(c)(1)(C)(i). 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).

¹⁴⁸ 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.” 23 U.S.C. § 301.

¹⁴⁹ *Id.*

¹⁵⁰ *Id.* (subjecting the bar against tolls to “section 129 of this title with respect to certain toll bridges and toll tunnels”).

¹⁵¹ *See id.* § 129. 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.

Federal Highway Administration, *Federal-Aid Highway Toll Facilities*, available at www.fhwa.dot.gov/programadmin/tollfac.html (visited Dec. 3, 2005).

¹⁵² *See* 23 U.S.C. § 129(a)(1); *id.* § 129(a)(2)-(5) (setting forth restrictions on funding).

rehabilitating” such segments.¹⁵³ As a result, “[a]pproximately 2,900 miles of toll facilities are included in the 46,730-mile [Interstate] System.”¹⁵⁴ But, until 1991, federal law precluded the introduction of new tolls on the Interstate System.

The first crack in the statutory bar against new Interstate System tolls was introduced by the 1991 passage of the Intermodal Surface Transportation Efficiency Act¹⁵⁵ (ISTEA). Section 1012(b) of ISTEA, captioned “Congestion Pricing Pilot Program,” directed the Department of Transportation to “solicit the participation of State and local governments and public authorities for one or more congestion pricing pilot projects,”¹⁵⁶ and authorized the Department to approve up to five such projects.¹⁵⁷ ISTEA further authorized the introduction of new toll segments on Interstate Highways in respect of three of the pilot projects.¹⁵⁸

The Transportation Equity Act for the 21st Century¹⁵⁹ (“TEA-21”) amended ISTEA’s “congestion pricing pilot project” provisions. First, TEA-21 replaced the moniker “congestion pricing pilot project” with “value pricing pilot programs.”¹⁶⁰ On a substantive level, TEA-21 increased the maximum number of value pricing pilot programs from five to fifteen.¹⁶¹ The law also extended the suspension of sections 129 and 301’s bar against new tolls on Interstate Highways to apply not just to three pilot programs, but to all of them.¹⁶²

¹⁵³ See *id.* § 129(a)(1)(B).

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.

Federal Highway Administration, *supra* note 151.

¹⁵⁴ Federal Highway Administration, *supra* note 151. For a catalog of toll and non-toll roads, bridges, tunnels, and ferries in the United States, see FEDERAL HIGHWAY ADMINISTRATION, *supra* note 20. 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.

¹⁵⁵ Pub. L. 102-240, 105 Stat. 1914 (Dec. 18, 1991) (codified, as amended, at 23 U.S.C. §§ 100-501).

¹⁵⁶ ISTEA § 1012(b)(1), 105 Stat. at 1938.

¹⁵⁷ *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.”).

¹⁵⁸ *Id.* § 1012(b)(4), 105 Stat. at 1938 (“Notwithstanding section 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.” (codified at 23 U.S.C. § 149 note.); see also *id.* § 1012(b)(2), 105 Stat. at 1938 (“Notwithstanding section 129 of title 23, United States Code, the Federal share payable for such [pilot] programs shall be 80 percent.”).

¹⁵⁹ Pub. L. 105-178, 112 Stat. 107 (June 9, 1998).

¹⁶⁰ TEA-21 § 1216(a)(1)(B)(i), (ii), 112 Stat. at 211 (“Section 1012(b) of [ISTEA] . . . is amended . . . (B) in paragraph (1)—(i) by striking ‘congestion’ each place it appears and inserting ‘value’; and (ii) by striking ‘projects’ each time it appears and inserting ‘programs’”); see also *id.* § 1216(a)(1)(A), 112 Stat. at 211 (changing the subsection 1012(b)’s heading from “CONGESTION PRICING PILOT PROGRAM” to “VALUE PRICING PILOT PROGRAM”); Office of Transportation Policy Studies, *Value Pricing Pilot Program*, www.fhwa.dot.gov/policy/otps/valuepricing.htm (last modified Mar. 14, 2006) (The Value Pricing Pilot Program “replaces the Congestion Pricing Pilot Program that was authorized by the Intermodal Surface Transportation Efficiency Act of 1991.”).

¹⁶¹ TEA-21 § 1216(a)(2), 112 Stat. at 211 (“Section 1012(b)(1) of [ISTEA] is amended in the second sentence by striking ‘5’ and inserting ‘15’.”).

¹⁶² *Id.* § 1216(a)(4), 112 Stat. at 211 (“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

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. Federal law authorizes “[a] State agency that has jurisdiction over the operation of a HOV facility shall establish the occupancy requirements of vehicles operating on the facility,”¹⁶³ 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.”¹⁶⁴ TEA-21 was the first law to eliminate the minimum two-person HOV vehicle occupancy requirement with respect to value pricing pilot programs.¹⁶⁵ 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 otherwise to justify HOV lane access to purchase access to the HOV lanes.¹⁶⁶

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 transportation planning units—known as “metropolitan planning organizations” or “MPOs”¹⁶⁷—and by introducing the Congestion Mitigation and Air Quality Improvement Program (“CMAQ Program”).¹⁶⁸ MPOs are to develop transportation plans for urbanized areas,¹⁶⁹ with the overall goal of “serv[ing] the mobility needs of people and freight and foster economic growth and development within and through urbanized areas, while minimizing transportation-related fuel consumption and air pollution.”¹⁷⁰ Among the factors that MPOs were to consider in develop in generating transportation plans, under the statute as originally enacted, was “[t]he need to relieve congestion and prevent congestion from occurring where it does not yet occur.”¹⁷¹ Further, MPOs are to develop long-range transportation plans;¹⁷² 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.”¹⁷³

TEA-21 revised the statute both to eliminate the mandatory consideration of congestion relief in developing transportation plans,¹⁷⁴ and to delete the express reference to congestion

reconstructing and rehabilitating highway corridors that could not otherwise be adequately maintained or functionally improved without the collection of tolls.” 23 U.S.C. § 129 note. *See generally* TEA-21 § 1216(b).

¹⁶³ 23 U.S.C. § 166(a)(1). An earlier version authorized “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 (Aug. 10, 2005)).

¹⁶⁴ 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) (2000) (repealed by *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users*, Pub. L. 109-59, § 1121(b)(1), 119 Stat. 1144, 1195 (Aug. 10, 2005)).

¹⁶⁵ TEA-21 § 1216(a)(5), 112 Stat. at 211-12 (amending ISTEA § 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, § 9006(b), Pub. L. 105-206, 112 Stat. 685 (July 22, 1998) (amending TEA-21 § 1216(a)(5) “by striking ‘146(c)’ and inserting ‘102(a)’”).

¹⁶⁶ *See supra* notes 131, 133, and accompanying text.

¹⁶⁷ *See* ISTEA § 1024(a), 105 Stat. at 1955 (codified, as amended, at 23 U.S.C. § 134).

¹⁶⁸ *See* ISTEA § 1008(a), 105 Stat. at 1932 (codified, as amended, at 23 U.S.C. § 149); *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*”].

¹⁶⁹ 23 U.S.C. § 134(a)(2).

¹⁷⁰ *Id.* § 134(a)(1).

¹⁷¹ *Id.* § 134(f)(2).

¹⁷² *Id.* § 134(g).

¹⁷³ *Id.* § 134(g)(2).

¹⁷⁴ TEA-21 § 1203(f), 112 Stat. at 174.

pricing.¹⁷⁵ 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.”¹⁷⁶ Further, the current statute provides, for transportation management areas—that is, “each urbanized area with a population of over 200,000 individuals”¹⁷⁷—that “transportation planning process . . . include a congestion management system that provides for effective management of new and existing transportation facilities eligible for funding. . . .”¹⁷⁸

The CMAQ Program is designed to encourage transportation planning with an eye not only to improving efficient transportation, but also to improving air quality. 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.¹⁷⁹ 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.”¹⁸⁰ Regulatory guidance indicates that “travel demand management” is one of the items for which CMAQ Program funds may be made available, and makes clear that travel demand management includes “road pricing measures.”¹⁸¹

Though value pricing is in its domestic infancy, the Senate in 2004 at one point contemplated eliminating new value pricing programs. The bill would have repealed the authorization for new value pricing programs,¹⁸² although it would have allowed existing programs to continue.¹⁸³ Ultimately, the Congress in August 2005 enacted a new transportation bill, dubbed the “Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users,”¹⁸⁴ or “SAFETEA-LU.” SAFETEA-LU retains the value pricing program.¹⁸⁵ It also establishes an “express lanes demonstration program.”¹⁸⁶ 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.¹⁸⁷ 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.”¹⁸⁸ Further, the statute requires, “for each high occupancy vehicle facility that charges tolls under this subsection, that the tolls vary in

¹⁷⁵ *Id.* § 1203(g)(3), 112 Stat. at 174-75.

¹⁷⁶ 23 U.S.C. § 134(g)(2)(C)(ii) (2000).

¹⁷⁷ *Id.* § 134(i)(1).

¹⁷⁸ *Id.* § 134(i)(3).

¹⁷⁹ Under the Clean Air Act, the EPA must generate NAAQS for so-called constituent pollutants. 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* 42 U.S.C. § 7410.

¹⁸⁰ Wahrman, *supra* note 21, at 188 (footnote omitted).

¹⁸¹ *CMAQ Program Guidance Update*, *supra* note 168, 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.”).

¹⁸² S. 1072, 108th Cong., 2d Sess., § 1609(c)(1) (Feb. 12, 2004) (“Section 1012 of the Intermodal Surface Transportation Efficiency Act . . . is amended by striking subsection (b).”).

¹⁸³ *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.”).

¹⁸⁴ Pub. L. No. 109-59, 119 Stat. 1144 (Aug. 10, 2005).

¹⁸⁵ *See id.* § 1604(a), 119 Stat. at 1249-50.

¹⁸⁶ *See id.* § 1604(b), 119 Stat. at 1250-53.

¹⁸⁷ *See id.* § 1604(b)(2), 119 Stat. at 1250.

¹⁸⁸ *Id.* § 1604(b)(3)(B)(i), 119 Stat. at 1251.

price according to time of day or level of traffic, as appropriate to manage congestion or improve air quality.”¹⁸⁹

In sum, while 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.

D. Existing Congestion Pricing Regimes

In this Section, I present a brief survey of some current U.S. congestion pricing programs.¹⁹⁰ At the outset, however, it bears noting that several congestion pricing programs abroad—including, notably, programs in Singapore, Trondheim, Toronto, and London—have had considerable success. Moreover, as I have 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,¹⁹¹ while the success of another program—the fledgling program in London¹⁹²—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.¹⁹³ 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.¹⁹⁴ Plans are being developed to introduce congestion pricing on additional toll roads in Florida, Pennsylvania, Illinois, and Ohio.¹⁹⁵

Domestically, interest in and use of lane-pricing access programs is increasing. 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 highways in California, Florida, North Carolina, Oregon, Texas, and Washington.¹⁹⁶

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.¹⁹⁷ Proposals to introduce HOT lanes are under development for highways in California, Florida, Georgia, and Washington,¹⁹⁸ and are also being considered for highways in Maryland and Virginia.¹⁹⁹

¹⁸⁹ *Id.* § 1604(b)(3)(B)(ii), 119 Stat. at 1251. 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), 119 Stat. at 1251.

¹⁹⁰ See Federal Highway Administration, *List of Projects by Type* (available at <http://www.fhwa.dot.gov/policy/otps/projectlist.htm> (last modified Aug. 10, 2007)). Note that the projects I summarize 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 I use the terminology here).

¹⁹¹ See *supra* text accompanying note 101.

¹⁹² See *supra* notes 127-129 and accompanying text.

¹⁹³ See Federal Highway Administration, *supra* note 191.

¹⁹⁴ See *id.*

¹⁹⁵ See *id.*

¹⁹⁶ See *id.*

¹⁹⁷ See *id.*

¹⁹⁸ See *id.*

¹⁹⁹ See *Editorial: HOT Prospects*, WASH. POST, Dec. 29, 2003, at A16.

No FAIR lanes regimes are currently in use, although plans for FAIR lanes programs are under development for a highway in California.²⁰⁰ 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.²⁰¹ This year, Mayor Michael Bloomberg has proposed the introduction of cordon congestion pricing in southern Manhattan, although the proposal has been somewhat stymied by political opposition.²⁰²

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. Congestion pricing regimes endeavor to remedy this situation by requiring drivers to internalize the costs that otherwise would be externalized.²⁰³

Congestion pricing results in better allocation of the scarce resource of roadway access. It also reduces uneconomic overuse of roads. In addition, such programs increases government coffers through congestion pricing revenue. Further, congestion pricing also "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."²⁰⁴

The economic benefits, and likely success, of congestion pricing regimes seem clear.²⁰⁵ But public choice and political economy considerations are not as favorable to congestion pricing regimes as they are to the provision of new roadway capacity. First, consider that congestion regimes, unlike roadway capacity responses, do not, at least currently, receive substantial support from powerful, organized interest groups.²⁰⁶ In particular, the simple imposition of a congestion charging regime offers politicians no support from the construction industry or its workers. While 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.²⁰⁷

Second, consider public reaction to proposals to implement congestion pricing. Recall that public choice theory does not render irrelevant public opinion. Public opinion may matter, both because the public may somehow may bypass interest groups and make its strong opinion

²⁰⁰ See Federal Highway Administration, *supra* note 191.

²⁰¹ See *id.*

²⁰² See *infra* notes 234-241 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).

²⁰³ See *supra* notes 56-57, 108, and accompanying text. Note that some commentators do not believe that all externalized costs should optimally be internalized. See *supra* note 115.

²⁰⁴ Hau, *supra* note 111, at 224.

²⁰⁵ See Strahilevitz, *supra* note 58, at 1246 ("[I]f current estimates are correct, a national shift to congestion pricing would generate societal benefits of \$5 to \$11 billion annually. . . .").

²⁰⁶ But see *infra* note 243 and accompanying text (noting that some environmental organizations have announced support of congestion pricing).

²⁰⁷ Below, I discuss the possibility that this might change in the future. See *infra* Part VI.

know to government actors, or because interest groups may realize that they can tap into latent public opinion to strengthen their case to legislators.²⁰⁸

In the case, of congestion pricing, there is apparently plenty of latent public opinion into which to tap. Public reaction to congestion pricing tends to be rather strongly negative. 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.²⁰⁹

Equity concerns underlie many objections to the implementation of congestion pricing programs. First, to the extent that revenue from a program is seen only to fill government coffers, drivers, and indeed the public at large, may consider the program inequitable. Indeed, absent revenue recycling (i.e., government use of the money to improve the transport network), “most travellers 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.”²¹⁰

A second equity-related point is the perceived distributional impact of a congestion-pricing regime. The burden of a congestion pricing regime might be seen to fall heavily on poorer people. In other words, the regime might be characterized as a regressive tax.²¹¹ 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. Phil Goodwin observes that “there are some transport policies that *nobody* suggests should be determined by ‘willingness-to-pay’.”²¹² 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.²¹³

²⁰⁸ See *supra* text accompanying notes 17-19.

²⁰⁹ Peter Jones highlights several concerns that the public-at-large tend to express over congestion pricing schemes: (i) drivers have difficulty accepting a “charge for congestion”; (ii) the belief that urban road pricing is simply unnecessary; (iii) the belief that congestion pricing will not effectively reduce vehicular travel; (iv) skepticism about the effectiveness and accuracy of technology underlying congestion pricing; (v) concerns about privacy; (vi) concerns that a congestion pricing system based upon a particular “urban boundary” may have substantial effects on areas near that boundary; (vii) public perception of congestion pricing as just another tax; and (viii) the perception that congestion pricing is, in one way or other, unfair. Jones, *supra* note 114, at 265-69.

²¹⁰ Peter M. Jones, *Road Pricing: The Public Viewpoint*, in ROAD PRICING, *supra* note 29, at 159, 159 (citation omitted).

²¹¹ See Jones, *supra* note 114, at 268 (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 58, at 1288. However, 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 114, at 281.

²¹² Goodwin, *supra* note 115, at 146 (emphasis in original).

²¹³ 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

Second, to the extent that congestion charges are imposed on roads that previously were free, they may be perceived as a new tax. 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”²¹⁴ 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.

Third, there are concerns about how implementation of congestion pricing would intrude upon privacy. Many congestion regimes would rely upon technology that could allow government to track people’s whereabouts.²¹⁵

Fourth, many people are uneasy, whether rationally or not, about the use of market-based approaches to regulate the environment.²¹⁶ And this uneasiness is not absent in the traffic congestion setting. 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 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?²¹⁷

Of the environmentalists questioned, “[s]ixty-seven percent . . . said they would still criticize the car driver”²¹⁸

It is possible to address some of these obstacles to implementation of congestion pricing regimes through education. 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.²¹⁹

vehicles are willing to contribute, or even more specifically that pedestrian-actuated traffic 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.

²¹⁴ Jones, *supra* note 210, at 159. See Strahilevitz, *supra* note 58, 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* text accompanying note 194).

²¹⁵ See Strahilevitz, *supra* note 58, at 1248-49.

²¹⁶ See generally STEVEN KELMAN, WHAT PRICE INCENTIVES? ECONOMISTS AND THE ENVIRONMENT 46-53 (1981).

²¹⁷ Steven Kelman, *Economic Incentives and Environmental Policy: Politics, Ideology, and Philosophy*, in INCENTIVES FOR ENVIRONMENTAL PROTECTION 291, 314 (Thomas C. Schelling ed., 1983).

²¹⁸ *Id.*

²¹⁹ 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:

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 recycling.²²⁰ Along the lines of Daniel Kahneman and Amos Tversky’s “prospect theory,”²²¹ and the literature on framing and how mental accounting may affect people’s perceptions of various choices,²²² 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;²²³ 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.

Revenue recycling is also an important element of insulating congestion pricing regimes from the charge that they are inequitable. 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.²²⁴ 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 necessary education in order 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, industry, worker, labor, and

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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.

Jones, *supra* note 114, at 269-70.

²²⁰ See Jones, *supra* note 210, 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).

²²¹ See, e.g., Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, in CHOICES, VALUES, AND FRAMES 17 (Daniel Kahneman & Amos Tversky eds., 2000).

²²² See, e.g., Richard H. Thaler, *Mental Accounting Matters*, in CHOICES, VALUES, AND FRAMES, *supra* note 221, at 241.

²²³ 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 29, at 181, 185.

²²⁴ See Richardson & Bae, *supra* note 113, at 248-49 (“Using windshield transponders . . . , [congestion] prices could vary with income upon submission of W-2s (that is, official payroll summaries) and income tax returns.”); *supra* notes 134-136 and accompanying text (discussing FAIR lanes).

(therefore) political support remains substantially in favor of the new roadway construction option.

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

In this Part, I turn to the question of whether economic efficiency or public choice has greater predictive accuracy in the context of traffic congestion. I earlier showed that 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, and also that congestion charges are more likely to be economically efficient, but less likely at present to be viable from a public choice perspective.²²⁵ Because the provision of new roadway capacity continues to dominate congestion pricing,²²⁶ I have little trouble concluding that the public choice

²²⁵ See *supra* Parts IV, V.

²²⁶ 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. First, there are market-based instruments other than congestion pricing. See *supra* note 89.

Land use planning is another possible response to problems of traffic congestion. Land use regulation generally occurs at the state, and especially the local, level, although Congress has to a limited extent sought to impose, indirectly, land use controls on lands near federally-financed highways, through controls on the availability of funds. For example, the full federal highway funding is conditioned on a state implementing programs to restrict billboard advertising near highways, see 23 U.S.C. § 131(b), as well as programs to restrict the presence of outdoor junkyards near highways, see *id.* § 136(b). Land use planning tends to be particularly dominated in the political arena by powerful interest groups, especially those who favor development. See *supra* note 80 and accompanying text (discussing the public choice pressure in favor of development, and therefore generally in opposition to land use restrictions); Buzbee, *supra* note 79, at 77-91 (presenting an overview of the political economy of “urban sprawl”). 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, sec. 1, 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.”). Land use restrictions are of little use in combating traffic congestion in the short run. While they may be used to constrain the further development of congestion in the long run, they are unlikely practically to offer a complete solution to traffic congestion problems. (I discuss below in this footnote the possible use of impact fees, which function in connection with land use controls and providing new roadway capacity.)

Another possible governmental response to traffic congestion is behavior modification—that is, attempts by the government to alter people’s behavior so as to reduce traffic congestion. Often grouped under the title “transportation demand management” or “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 ALI-ABA 595 (1999), such attempts can take different forms. First, the government might, whether through incentives or simply requests, attempt to induce businesses to stagger working hours so as to reduce rush hour congestion. For example, the Clean Air Act authorizes states leeway to include in attainment plans for severe ozone nonattainment areas requirements that may induce employers to stagger working hours. See 42 U.S.C. § 7511a(d)(1)(B); see also 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 section 7511a(d)(1)(B) for its erroneous emphasis on vehicle occupancy as opposed to average ridership); Oren, *supra* note 31, at 143-45 (describing the short-lived, unsuccessful life of the prior version of section 7511a(d)(1)(B)); EMMERINK, *supra* note 64, at 257-69 (presenting an empirical analysis of worker schedule flexibility). Second, the government might attempt to induce individuals to choose public transportation over driving as a means of transportation. For example, under the TransitChek program in New York City, administered by TransitCenter, Inc. (a non-profit corporation), employers give employees funds to pay for mass transit tax-free; the employers obtain a tax advantage in terms of reduced payroll taxes. See TransitCenter, Inc., *TransitChek: Company Benefits*, www.transitcenter.com/benefits/tc_co/overview.htm (visited Dec. 3, 2005). (Note, however, that the absence of congestion pricing regimes on highways may necessitate greater subsidization of mass transit. See *supra* note 63.) Third, the government might restrict access to certain lanes to automobiles that are occupied by a certain minimum number of persons (so-called “high-occupancy vehicle” or “HOV” lanes, or “carpool” lanes); government might also arrange for meeting points to reduce transactions costs of forming a carpool.. 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 possibility of overall reductions in congestion. See generally EMMERINK,

supra note 64, at 9-34. Behavioral modification approaches run into the entrenched American cultural ideal of driving a vehicle. *See supra* note 80 (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, *Planner 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.”). For this reason, behavioral modification that is not directly supported by adequate monetary incentives is unlikely to succeed in substantially ameliorating traffic congestion.

Government might take a more forceful hand in trying to achieve behavioral modification by enacting programs that (at least facially) mandate changes in people’s driving behavior. Among these “command-and-control” approaches—so-called because the government centrally commands and controls societal actors’ behavior—are 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 111, at 223. Command-and-control regimes remain the dominant form of domestic environmental regulation, despite intense criticism of such regimes from the academy. *See, e.g.*, Richard B. Stewart, *A New Generation of Environmental Regulation?*, 29 CAP. U. L. REV. 21, 21, 24-25 (2001). Perhaps the greatest shortcoming of command-and-control regulation is that it unnecessarily deprives societal actors of flexibility in complying with governmental goals. *See id.*; Nash, *supra* note 89, at 486. This lack of flexibility means that societal actors will have to engage in particular behavior to comply with the government mandate even if other behavior would be less onerous and costly and still achieve the government’s goal. Similar criticism can be lodged against command-and-control approaches in the congestion context. Such approaches also unnecessarily restrain societal actors’ flexibility. *See* Hau, *supra* note 111, at 223 (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”). As Timothy Hau explains, “command and control measures that take aim at altering motorists’ travel behavior all impose a great deal of inconvenience and costs – both explicit and implicit.” *Id.* Moreover, even putting these points to the side, it is unclear how successful behaviorally-motivated command-and-control regulation can be in the congestion context. As explained above, the individual’s attitude that driving is a right is quite robust. While one would expect a mandatory program—backed up by government sanction—to be more successful than a non-coercive program to the same effect, nonetheless one might question just how successful such a program might be. *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).

Yet another response to congestion is to invoke market-based measures to attack the congestion problem *indirectly*—i.e., other than directly through the use of a mechanism like congestion pricing that uses market mechanics directly to affect traffic congestion levels. Indirect market-based measures include annual vehicle license fees, gasoline taxes, and setting economic parking charges and parking taxes. Hau, *supra* note 111, at 224. While indirect market-based approaches will have some effect on congestion, the fact that they are not focused directly on congestion, and do not compel internalization of congestion costs, means that they will not be efficient at attaining congestion goals. Consider first the option of annual vehicle license fees. Such fees are generally quite low, and would have to be raised significantly to have any effect on vehicle ownership and, therefore, roadway usage. Moreover, even if these fees were increased substantially, still they would represent merely a periodic (though hefty) charge; the fee would not be tied to roadway usage. Thus, one would expect that, once someone made the decision to incur the fee, that person would have no disincentive against engaging in inefficient travel. Hau, *supra* note 111, at 224.

Much like annual vehicle fees, gasoline tax rates in the United States are generally too low to have any substantial effect on roadway usage. But, even putting that to the side, “[i]ncreases in gasoline taxes . . . affect only the amount of travel and are ineffective in dealing with congestion whenever and wherever it occurs.” *Id.* *Accord* 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).

Parking fees are more closely tied to roadway usage than either vehicle fees or gasoline taxes. But still the relationship is too tenuous to guarantee an appropriate and full effect on traffic congestion. *See* Hau, *supra* note 111, at 224; Mashaw, *supra*, at 74 n.247. Further, “parking charges based on time can operate to increase congestion by promoting a more rapid turnover of cars.” Mashaw, *supra*, at 74 n.247. Still, the introduction of parking charges should have some ameliorative effect on traffic congestion. *See id.* (“[T]o the extent that parking charges which reflect the real costs of street use in particular areas would deter motorists from driving and encourage transfer to public transport or fringe parking, these charges would be beneficial in allocating resources to higher value users.”). However, because parking charges alone are unlikely to address the congestion problem in its entirety, parking charges ideally “should be used along with other pricing techniques.” *Id.*

Another indirect market-based mechanism is the use of impact fees imposed on land developers to finance road construction and maintenance. Impact fees are imposed, generally by local governments, on developers, with the funds received used to finance public service infrastructure needs, *e.g.*, James C. Nicholas & Julian Conrad Juergensmeyer, *Market Based Approaches to Environmental Preservation: To Environmental Mitigation Fees and Beyond*, 43 NAT. RESOURCES J. 837, 843 (2003), including transportation services, *e.g., id.* at 844 (identifying “[t]ransportation services

story has greater weight at present. I then consider whether the slight movement toward greater acceptance of congestion pricing might signal a weakening in the public choice explanation and a strengthening of the efficiency story. The movement can also be explained on public choice grounds, however. 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 story, that underlies the movement toward greater acceptance of congestion pricing.

Because, at present, the efficiency story predicts an increased reliance on property rights through congestion pricing regimes, while the public choice story does not, the traffic congestion setting provides a natural one in which to measure the predictive accuracy of the stories. As I noted above, the generation of new roadway capacity remains the dominant government response to the problem of traffic congestion. 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 story for the evolution of property rights dominates the efficiency story.

But there are signs that the dominance of new roadway capacity may be fading, at least somewhat. 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.²²⁷

The shift, albeit perhaps comparatively small at this juncture, suggests that the traditional dominance of the public choice story 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. And, indeed, this accords with the understanding that the strength of the efficiency story increases as the size of the externality increases.²²⁸ In addition, the efficiency story predicts an increase in property rights as the cost of delineating property rights drops.²²⁹ 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.

With respect to the decrease in influence of the public choice story, 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. But once the congestion

such as highways and bridges [as] the [second] most common type of impact fee”). See Gregory M. Parkhurst & Jason F. Shogren, *Evaluating Incentive Mechanisms for Conserving Habitat*, 43 NAT. RESOURCES J. 1093, 1139 n.266 (2003) (“Impact fees are already being used in most all communities—for example, development projects are charged an impact fee to pay for the construction of new roads necessary to control congestion.”); see also Louis J. Columbo, *Implementing the Vision: Impact Fees and the Albuquerque Metropolitan Planned Growth Strategy*, 43 NAT. RESOURCES J. 887 (2003) (discussing the design of impact fees in the Albuquerque metropolitan area). The fees can be, and often generally are, set by reference to the marginal increase in demand for services to which the developer’s action ultimately will give rise. Cf. Nick Rosenberg, Comment, *Development Impact Fees: Is Limited Cost Internalization Actually Smart Growth?*, 30 B.C. ENVTL. AFF. L. REV. 641 (2003) (discussing development impact fees as a means of internalizing cost). Impact fees do force internalization of some congestion-related costs, but it is developers, not roadway users, on whom internalization is imposed. See *supra* note 89 (discussing the environmental law’s “polluter pays principle,” and its application in the context of traffic congestion). In this sense, while impact fees should mitigate congestion in the long run, their use will not address congestion problems in the short term, and in general will not address congestion that results from traffic originating in other areas. (Impact fees can be seen as a hybrid between two tools—congestion charges and land use planning. See *infra* note 246.)

²²⁷ See *supra* Part V.D.

²²⁸ See *supra* text accompanying note 11; Rose, *supra* note 10, at 8 (noting that the scope and complexity of environmental regulation will depend upon the extent to which use of the underlying resource is congested).

²²⁹ See *supra* note 12 and accompanying text.

problem becomes “too large,” 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. First, although it was not enacted in that form—the fact that, at this late date and despite the success of pilot congestion pricing programs—a bill was considered in the Senate that would have curtailed pilot congestion pricing programs.²³⁰

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),²³¹ which suggests that one might expect less opposition to congestion pricing on the ground that it imposes a new tax.²³² Nowhere else in the United States, moreover, is reliance upon public transit more possible or more strongly engrained and accepted by the populace.²³³ And the city suffers from tremendous traffic woes.

Even in New York City, however, it has taken Mayor Michael Bloomberg years formally to advance a congestion pricing proposal, the fate of which even now remains uncertain. The mayor initially backed away from a proposal to implement a proposal to charge vehicles that enter Manhattan Island,²³⁴ and this year finally proposed a cordon pricing scheme for traffic entering Manhattan south of 86th Street.²³⁵ The plan was received enthusiastically by New York State Governor Eliot Spitzer (at least initially) and the U.S. Department of Transportation.²³⁶ 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 longer²³⁷—is strong.²³⁸ Further, state

²³⁰ See *supra* notes 182-183 and accompanying text.

²³¹ 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 election”); 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)).

²³² On the other hand, objections to congestion pricing grounded in concerns of fairness might be more prevalent.

²³³ 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”).

²³⁴ See Sewell Chan, *Driving in Manhattan? You Pay, Under One Idea*, N.Y. TIMES, Nov. 11, 2005, at B2.

²³⁵ See Thomas J. Lueck, *Bloomberg Draws a 25-Year Blueprint for a Greener City*, N.Y. TIMES, Apr. 23, 2007, at B1.

²³⁶ See Danny Hakim & Ray Rivera, *City Traffic Pricing Wins U.S. and Spitzer’s Favor*, N.Y. TIMES, June 8, 2007, at A1.

²³⁷ See McGeehan, *supra* note 233, at B1 (“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.”).

²³⁸ E.g., Andy Newman, *Outside Manhattan, Many Oppose Bloomberg’s Traffic Plan*, N.Y. TIMES, June 9, 2007, at B1; 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”). *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 ENV’T. 8 (2006), may also impede the introduction of congestion pricing.

legislators, who had to approve the plan, were tempered²³⁹; State Assembly Speaker Sheldon Silver was critical of the proposal.²⁴⁰ In the end, all that the Mayor has thus far been able to accomplish is the appointment of a commission to examine ways to reduce traffic congestion, including the possibility of congestion pricing.²⁴¹ Thus, political power continues to dog 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, while they remain divided on the question,²⁴² some environmental groups have endorsed the use of congestion charges.²⁴³ It is possible that 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.²⁴⁴ This accords well with President Bush’s decision to appoint a Transportation Secretary who favors expansion of congestion pricing.²⁴⁵

²³⁹ 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 18, 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.)

²⁴⁰ See, e.g., Danny Hakim, *Silver Challenges Health Benefits Promised in Manhattan Toll Plan*, N.Y. TIMES, June 11, 2007, at B1.

²⁴¹ See Nicholas Confessore, *Spitzer Signs Bill to Put Congestion Pricing Plan on Track*, N.Y. TIMES, July 26, 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 Neumann, *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 Neumann, *New York to Get U.S. Traffic Aid, but with Catch*, N.Y. TIMES, Aug. 15, 2007, at B1.

²⁴² See generally Merrill, *supra* note 4, 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 15, at 353-56 (describing the community of environmental organizations as predominantly anti-market-based instrument, with a few “outlier[s],” and discussing reasons for this perhaps somewhat counterintuitive state of affairs).

²⁴³ See, e.g., NATURAL RESOURCES DEFENSE COUNCIL, *DAMAGE REPORT: ENVIRONMENT AND THE 105TH CONGRESS* ch. 4 (1998) (available at <http://www.nrdc.org/legislation/damage/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); Environmental Defense, *Tolling (Congestion Pricing)*, (available at <http://www.environmentaldefense.org/article.cfm?ContentID=4763> (last modified Sept. 15, 2005)).

²⁴⁴ See *supra* note 219 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 David A. King, Michael Manville & Donald Shoup, *The Political Calculus of Congestion Pricing*, 14 TRANSPORT POLICY 111 (2007).

²⁴⁵ See *supra* text accompanying note 2.

The location of the current frontier for congestion pricing lends credence to the continued strength of the public choice story. 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 three 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.²⁴⁶ The fact that congestion pricing has begun to take hold in these contexts conforms to public choice predictions, on several grounds. 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. Thus, public opposition to congestion pricing under such conditions is less intense.²⁴⁷

Second, the fact that new roadway construction will be undertaken means that the support of the transportation and real estate construction industries, their workers, and organized labor should in large measure persist. 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.²⁴⁸

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.²⁴⁹

VII. CONCLUSION

In this Paper, I have considered the responses that the two economic explanations for the emergence of property rights—the efficiency and public choice stories²⁵⁰—predicted in response to scarcity in the resource of roadway access. I demonstrated 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 story for the evolution of property rights, while the other—congestion charges—is currently preferred by the efficiency story. While congestion pricing is an attractive means by which to combat traffic congestion from an economic perspective, implementation of such regimes is today hindered by their general inability to garner political support. In contrast, the provision of new roadway capacity, while likely ineffective—and perhaps even detrimental—from an efficiency perspective, is likely at present to be a successful strategy in the political arena. I also speculated that, while a slight movement toward

²⁴⁶ See *supra* text accompanying notes 193-199.

Cf. Johansson & Mattsson, *supra* note 224, 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 226 (describing impact fees as a hybrid between congestion charges land use planning).

²⁴⁷ See Strahilevitz, *supra* note 58, at 1247 (“Notably, . . . congestion pricing for newly constructed toll roads garners significantly higher public support.”).

²⁴⁸ 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.

²⁴⁹ See *supra* note 243 and accompanying text.

²⁵⁰ See Strahilevitz, *supra* note 58, at 1288 (comparing the San Diego HOT lane regime to tradable pollution permit regimes).

greater acceptance of congestion pricing might signal that the efficiency story has overtaken the public choice story 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 stories in the context of traffic congestion provides insight into the more general question of 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 appears to move toward a more efficient regime. 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.

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