

Paving Over Pigou: Privately Owned Roads and the Case for Private Goods Solving Externalities¹

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Abstract

I develop the case for private firms accounting for externalities with most economic efficiency in the absence of government intervention by examining the theory and empirical evidence in the case of privately owned roads. I add to the current literature critiquing public goods theory, establishing how economizing coordinates costs and activities of road owners, and how these entrepreneurs incorporate externalities such as safety into their profit motive. I then propose a theoretical model in which price discrimination coupled with private rules can eliminate externalities by homogenizing interactions between consumers. Specifically, safety of driving is directly correlated with increasing pricing of tolls and reducing magnitude of speed limits. Consumers pursuing a road with higher toll prices and speed limits have the highest time preferences. The paper later compares discussed theory with an empirical study of private roads from American history.

Keywords: externalities, privately owned roads, public goods theory, price discrimination

¹ This paper's soundness was made possible by the feedback of Dr. Jeffrey Herbener and the six other students of the ECON 420 class.

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I. Introduction: Dispelling the Myths of Publicly Owned Goods

It was the best of times and the worst of times; it was an age of privatization and an age of public-sharing in goods; it was the epoch of unhampered free markets and the epoch of complete government intervention. While America is not by any means living in the “worst of times” as this economic rhetoric-play-on-words of *A Tale of Two Cities* suggests, many citizens fail to see the alternatives to government interference in the free market, specifically in the case of publicly owned goods the state provides to citizens on a nondiscriminatory basis. Park areas, schoolhouses, and even roads existed long before the local, state, and federal governments became the primary providers of these assets as they are today. They did so unconstrained by state monopoly, provided by firms competing within the free market constrained by consumers’ desires. All these goods had “prices” in the unhampered market, so why can the government provide them “free of cost” to citizens today?

While the cost of publicly owned goods may not be directly thrust upon citizens when utilizing units of these goods, it is paid for mainly by the taxes the state coerces and collects from citizens’ income and consumptive behaviors. The main question lies in whether this forced transaction is mutually beneficial. Do American citizens all value the National Parks, public schools, national defense contractors, and the complex road infrastructure, at the amount they are taxed at for funding each respective public good? Chances are no. A definitive answer cannot be given since individual value scales are not realized under forced exchange with government, only mutual exchange with a party that does not behold the coercive power such as those of the state. If citizens are given the option of spending their income in attending a national park versus paying more for a marginally better education for their children, rankings can be analyzed

based on the opportunity costs forgone by consumers in terms of unlimited wants ranked within the distribution of income expenditures.

While many Americans would shake their head at the foreign idea that publicly owned goods today could be better provided by the free market, most the same people would agree to the proposition that private entrepreneurs can economize more efficiently than government. Collecting of taxpayer dollars by government is groveled over by all citizens at some point, yet Americans still seemingly blindly accept the necessity for public goods funded and produced by the state. What can the state provide that private entrepreneurs cannot? In short, the acceptance of the public goods paradigm often comes back to a line of reasoning centered around the topic of externalities.

Roads may be the most prevalent publicly owned goods in American citizens' daily lives. There is no getting around the fact that many Americans utilize automobile transportation on roads essentially all provided by local, state, and national governments. When asking the average person what the road system would look like if the government stepped back from production and regulation of road infrastructure, common answers are always critiques of the free market while pandering to the necessity of government intervention. Safety would be disregarded because private road owners care most about profit, and providing rules and enforcing these on roads are both costly. As a result, there would be no speed limits to prevent reckless driving, no guardrails to protect against severe accidents, no universal signage signaling turns, stops, when to go and where to go, and the quality of roads provided would suffer in the absence of government regulation. The layout of roads not centrally planned would look haphazard, less coordinated, and therefore more traffic ridden and time inefficient. Walter Block in his book, *The*

Privatization of Roads and Highways sums up more common complaints against private roads with humorous rhetoric,

“Why, that’s impossible. You just can’t do it. There would be millions of people killed in traffic accidents; traffic jams the likes of which have never been seen would be an everyday occurrence; motorists would have to stop every twenty-five feet and put one-hundredth of a penny in each little old lady’s toll box. Without eminent domain, there would be all sorts of obstructionists setting up roadblocks in the oddest places. Chaos, anarchy, would reign. Traffic would grind to a screeching halt, as the entire fabric of the economy fell about our ears.”³

All the objections noted, in one way or another, center upon the argument made by public good proponents that government intervention in the free market is the only solution to account for externalities such as safety and standardization of roads. Yet what this argument fails to describe is the unavoidable task of satisfying consumer demand private road owners are subjected to within the free market. Safety and standardization have prices like any other economic good, and since they are valued highly by consumers when driving, private road owners would benefit profit-wise from ensuring their roads rise to the safety and standardization levels that are economically efficient when balancing the costs of those externalities with the costs of other assets consumers look to possess as well. The overarching claim this paper will articulate is that publicly owned goods fail at providing externalities that a privately owned goods system would cause consumers to self-internalize, as evidenced by the case of roads.

This thesis will be justified over the five body sections in this paper. Section Two will discuss the spectrum of definitions used to justify the existence of publicly owned goods such as rivalry and excludability, and how such rigid use of these terms breaks down when considering the complexity of goods and their bundled assets. Section Three will transition into the basic

³ Walter Block, *Privatization of Roads and Highways: Human and Economic Factors, The* (Ludwig von Mises Institute, 2009), 7.

advantages of economizing any private good owner has over the bureaucratic management of public goods by the state. Section Four addresses the externalities of safety and standardization that privately owned roads provide at a more economically efficient level than state ownership. Section Five introduces a simple theoretical model to address the means of consumer discrimination and exclusion private road owners have at their disposal to increase profits while decreasing the externality costs to the average consumer. Section Six will delve into a real-world case of private roads with a few discrepancies from a pure case of private roads, to suggest that a mixed system of government regulation of private ownership of roads is unsustainable at increasing levels of intervention by the state.

II. Not All Just Black and White: The Complexity of Characterizing Publicly Owned Goods and Externalities

Before digesting the specifics of what a private road system may be theorized and empirically evidenced to be, the dichotomy of what constitutes public and private goods must be discussed. Furthermore, stemming from that distinction is the discussion of what externalities are, and how best they are made to be internalized by the consumers of a good, such as a road. What will be made evident is that there is no bright line rule separating out a so-called public and private good. Reality alternatively posits a fluid spectrum of excludability and rivalry in consumption which define public vs. private goods.

Proponents of the Exogenous Provision of Public Goods to the Market

The United States' current structure of production, when simplified down into its overarching components, consists of the private sector endogenous to the market, and local, state, and national governments exogenous to the market. Public good proponents argue that there is an

inherent necessity for the government to provide certain goods that the market fails in efficiently producing through private enterprise. It is upon the foundation of publicly owned goods sponsored by the government that allows the private sector to flourish to its maximum extent.

Examples of publicly owned goods today include maintaining a national defense, police protection of property rights, a legal system to resolve conflict, supplying standards like a national currency, and the case that this paper focuses on: building infrastructure. What all these goods have in common is that they are argued to be both nonrival⁴ and nonexcludable.⁵ While private goods are argued to be divided among individuals in an efficient manner endogenous to the market, public goods, due to the two definitions enumerated above, cannot be divided efficiently among individuals unless exogenously dictated by a central planning authority. Simply put, due to difficulties stemming from charging beneficiaries of a good and excluding non-payers from enjoying the good, the private sector inefficiently provides such goods.⁶ Therefore, proponents of government intervention in production of goods think a collective provision to be essential for these public goods.⁷

Acknowledged by public good theorists is the ability for a good that was once considered as needed to be publicly owned and produced, to become more efficient over time to be produced privately. This is mostly due to changes in technology that allow a good to be more

⁴ Nonrival means that a unit of a good can be consumed by one individual without detracting from the consumption opportunities available to others from that same unit. A common example of this would be the fireworks display, in which the amount of people viewing the spectacle does not seem to have a negative impact on the consumptive experience on others viewing the display.

⁵ Nonexcludable means that benefits are available to all once the goods are provided. An example of this would be our current national defense system. If one wants to defend one's territory that others reside within, the case may happen in which the defense is provided at a cost to the provider, while at the same time benefitting those not paying the cost yet inhabiting the now defended territory. Therefore, it is difficult to exclude those not paying the costs who also end up accruing the benefits of protection.

⁶ Raymond G Batina and Toshihiro Ihori, *Public Goods* (Springer Science & Business Media, 2006), 1.

⁷ William Loehr and Todd Sandler, *Public Goods and Public Policy* (Beverly Hills: Sage Publications, 1978), 3.

easily excludable, and therefore producers can discriminate between payers and nonpayers in providing the benefits of their goods. Television back in the 1950s was nonexcludable since anyone could tune into a television signal broadcast without paying specifically for the channel or signal being broadcast. Yet with the invention of the signal scrambler, producers of television entertainment now had the means of excluding nonpayers from their goods, as a scrambler was the piece of technology required to now view the television channels. Later in the paper, this phenomenon will emerge again, as the case to be made for the privatization of roads has become more sound over time because of advancements in technology in the tolling sector.

The Case for Publicly Owned Goods Reducing Externalities

Externalities are argued to be commodities that the market for a good cannot provide in its pricing structure, and therefore consumers ignore these nonmarketable commodities' benefits and/or detriments because they are exogenous to prices. This theory, if held to be true, is evidence that supports the need for a central planning authority to alter the pricing or the consumptive desirability of a good provided by private firms in the market, in order to realize these exogenous commodities rather than allowing consumers to continuously ignore their ramifications. This is where environmental economics grows its roots, as economic activities that are understood to produce environmental externalities are often being ignored by the generator.⁸ While environmental externalities are usually negative, aka pollution and overconsumption of unrenowable resources, externalities can also be positive such as in the case of nonexcludable commodities. The businesses in a town may benefit from a concert being sponsored by an organization, as it will bring more potential customers in without the shops having to pay for the

⁸ Loehr and Sandler, *Public Goods and Public Policy*, 13.

concert to take place. Hence, a positive externality that the people accruing the costs of the concert do not realize.

Loehr and Sandler argue in *Public Goods and Public Policy* that there are three regimes of resource exploitation that economists focus on when determining the extent of which externalities are accounted for within the consumptive and productive decisions of those utilizing a good.⁹ First illustrated is the open access regime, in which there are no well-defined property rights, and no market prices. This theoretical reality is just present to understand that without any sort of property rights, and therefore costs associated with how one uses one's land, capital, and labor, resources would be overconsumed and devalued and there would be an abundance of externalities not accounted for. This is a deeply flawed system, which is why it rarely if ever persists for long in society. The second position is the market solution. Resources are privatized by allocating the right to their exploitation to an individual or group, so that those users must pay a market price that varies with levels of exploitation. Prices incorporate costs of production, consumer preferences, and other constraints upon the producer of a good, yet proponents of state intervention argue that prices can only account for some, and not all externalities. Hence, the third system of the establishment of a central agency is suggested to solve the issues of open access goods and the externalities they behold.

Celebrated and criticized by economists since its conception is the Pigouvian policy theory consisting of a system of taxes and subsidies meant to alter individuals' choices so that they reflect a more optimal outcome. While taxes and subsidies distort the pricing system, outside prices, government can internalize externalities through the enforcement of quantitative

⁹ Loehr and Sandler, *Public Goods and Public Policy*, 60.

restraints that often come in the form of regulations.¹⁰ The classic example submitted by economists holding to Pigou's state interventionist policy is the tale of the factory owner and the laundry hanger. Pollutants of smoke billow from the factory's chimneys, these costing nothing to the factory owner. Yet the neighboring laundry-hanger accumulates costs in the form of dirty laundry polluted with smut from hanging downwind of the smoke billows. Hence, the pollution of the factory owner is a negative externality. The Pigouvian recommendation to get rid of this negative externality would be for a central authority to step in and either tax or regulate the pollution of the factory owner. This will cause the factory owner to reduce his pollution, benefiting the laundry-hanger as his clothing will be at least less dirty if not free of contaminants.

Yet, when questioning the merit of a system in which the government is responsible for dictating aspects of decision-making by the consumers and producers, one must ask how the government can determine who values their preferences more. Issues also arise in the case of publicly owned goods, in that whether a government may overproduce a certain good in the name of internalizing externalities to the detriment of the citizens they are looking to protect from the unhampered free market.

Critiquing Central Planning

If one is to argue that the free market is inefficient in its allocation and distribution of goods that are nonrival and nonexcludable in production, then one must answer to the questions concerning how a central planning authority exogenous to market constraints and coordination can provide publicly owned goods in a form that better suits the wills of the consumer population. Not only this, but the theory of publicly owned goods seems to oversimplify the division of rival vs.

¹⁰ Loehr and Sandler, *Public Goods and Public Policy*, 68.

nonrival goods, and excludable vs. nonexcludable goods. Rather than two categories, these definitions exist along a continuous spectrum. But before critiquing the theory on which the policy is formed, it is essential to ask how government can answer the following questions: (1) How much of each public good to provide? (2) How to finance the public good?

First off, public goods are often provided by government to an extent beyond those needed by consumers, mainly because the central planners delegating lands to be used for parks and roads, have no way of knowing how much that land is valued for alternative purposes due to being outside of the market. The case for the United States' current road infrastructure being too developed in certain areas, while underdeveloped in others, is merited because of local, state, and national governments operating on a budget not dictated by the value of the roads to the consumer. This allows unprofitable, excessive roads to remain in place on land that has more value in alternative uses. Consumer preference in a private road system acts as the main factor determining the profits a road accumulates, where the amount of use of a certain road dictates the viability of the road. Coordinating aspects of the market such as this will be elaborated on in later sections of the paper.

Transitioning to the related problem of how to finance a public good, one can see that oftentimes taxation aimed at paying for government expenditure is not discriminatory enough in its application. Financing roads today primarily comes from a steep tax on gas consumption. Yet numerous issues stem from this form of financing, such as: determining which aspects of the publicly owned good are profitable as well as determining which consumers value their road usage the most. Besides roads, other publicly owned goods have little to no direct way of raising revenues to finance their production. While roads being developed utilizing gas taxes may seem a connected and reasonable revenue stream, other government sponsored commodities do not

have a resource associated with the free-to-use goods they are providing to tax or accumulate revenues from.

An issue stemming from publicly owned goods failing to properly discriminate costs to those consumers who value the good compared to others is the free rider problem. Individuals have more information about their own tastes and endowments than the government and any other individual, which provides them incentives to withhold that information when it may benefit them. This ushers in another externality, which is what publicly owned goods are meant to diminish, not amplify. A common example is the non-taxpayer in America. Let us assume they value their safety as most rational actors do. Therefore, they would be willing to pay a certain price for their protection from domestic threats and international worries via policing and national defense respectively. Yet, because these goods are publicly provided and owned, the non-taxpayer receives all the benefits of protection without bearing any of the costs, even though in a private system of policing and defense they would be sure to invest somewhat in these safety organizations. Hence, the free rider on the backs of those paying the taxes. Compulsory taxing also distresses those who do not value publicly owned goods to the extent of the common valuation of the rest of the citizenry, as they are paying a higher price than they would have under a private system.

Returning to the Pigouvian theory of taxing, subsidizing, and regulating away externality, what the theory fails to consider is that individuals can bargain with one another and come to a natural solution within the constraints of the market rather than one foisted upon one or numerous other parties under the state. Bargaining rids of the negative externalities when

transaction costs are minimal, as illustrated by the Coase Theorem.¹¹ Going back to the case of the laundry-hanger and the factory owner, let us assume that the laundry-hanger values his laundry being clean, more than it costs the factory owner to reduce the pollutants stemming from his production. The laundry will bargain with the factory, and the resulting agreement would take the form of the laundry paying the factory a certain amount conditional on the factory owner reducing his pollution. Costs from paying the factory will be less than the value gained by the laundry in having clean, non-smut-ridden, clothing. No government intervention, no problem, in the absence of bargaining-prohibitive transaction costs.

Public vs. Private Goods Dichotomy

Not only is much of the interventionist policy unneeded in the face of market coordination and bargaining amongst individuals, but the theories held to by public goods economists also fails to realize that the standards of excludability and rivalry of goods are flexible rather than rigid. Those holding to the rigidity of these two definitions, have utilized them in defining whether a good can be constituted as a private or public good. Yet when coming to an understanding of the flexibility inherent in defining these terms, nearly every good can be classified as either public or private based on the institutional framework surrounding the good and conditions of the good's production.¹² It all ends up being a matter of perspective; public goods economists have exploited the definitions of rivalry and exclusion to support their paradigm, when to a degree, all goods can be rivalrous and excludable, and on the other hand

¹¹ The Coase Theorem mandates that the provision of a good or service will result in an externality and trade in that good or service is possible, then bargaining will lead to a pareto efficient outcome regardless of the initial allocation of property.

¹² Tyler Cowen, "Public Goods Definitions and Their Institutional Context: A Critique of Public Goods Theory," *Review of Social Economy* 43, no. 1 (1985): 53–63, <https://www.jstor.org/stable/29769265?seq=11>, 1.

nonrivalrous and nonexcludable, when considering the different scenarios and individuals interacting with these commodities.

Cowen makes the argument in his paper “Public Goods Definitions and Their Institutional Contexts” that non-rivalrous consumption is present at low enough levels of use of any good, while at extremely high levels of use consumption is always diminishing the consumptive values of others.¹³ Roads are argued to be non-rivalrous in nature, which is why they are often construed as public goods in economic literature. But the extent to which roads are rivalrous varies from highway to highway, based on a plethora of factors such as the number of lanes, the quality of the road, and the number and types of traffic signaling and laws. *Ceteris paribus*,¹⁴ a road with more lanes will be less rivalrous in consumption compared to a road with fewer lanes. This is because if one more car gets on a highway with more lanes compared to one with less, that car will have a lower impact on the quality of consumption of the road by the drivers already on the highway. Having a greater chance of accident, traffic backup, or a scenery blockage, detract from the road’s consumptive experience. Furthermore, perception of rivalry in consumption ultimately relies on the appropriate choice of the marginal unit of a commodity in question.¹⁵ The more limited and narrow the perception of the marginal unit, the closer it seems to fit into the private good paradigm. With roads, when viewing the entire United States infrastructure of roads from the Atlantic to Pacific as the marginal unit, one would assume nonrivalry in consumption; if there is traffic on one road, why not take another? But what if the marginal unit is narrowed down and deemed to be a certain lane at a certain time? Then roads could be considered rivalrous as two cars cannot be in the same lane, at the same place, at the

¹³ Cowen, *A Critique of Public Goods Theory*, 3.

¹⁴ All else being held equal and constant.

¹⁵ Cowen, *A Critique of Public Goods Theory*, 5.

same time. The former perceptions' marginal unit suggests roads should be a public good, the latter posits roads as a private good.

Adding onto Cowen's analysis, Adams makes the relative claim that some goods that have both private and public attributes are cases of joint production of rival and non-rival benefits.¹⁶ This is to say that commodities have various attributes and values to the consumers they benefit, making it difficult to constrain a good to a solely private or public definition. When a highway is built, an example of a rivalrous commodity is road usage. The more cars present on the road, the less someone is able to benefit from consumption of that road than when traffic is calmer. On the other hand, a nonrivalrous externality comes in the form of pollution the new road brings to the town from the added traffic. Yet even with this nonrivalrous externality associated with the road, the road itself as a private good, is still rival as based on car usage of the road. It is not a valid reason to force road ownership to the state to account for the nonrivalrous externality, as that would subvert the rivalrous externalities jointly produced.

Methods and reasons behind excluding and the excludability of a good are overgeneralized by the public goods theorists. If non-excludability merits a good being public, then even goods considered strong cases of private goods should be public as they also suffer from non-excludability.¹⁷ Bread, or any sort of foodstuff, is considered to be a private good when consulting any economic literature. Yet the benefits one derives from consuming a piece of bread are non-excludable to the extent that another may view a friend eating the loaf and derive a psychic benefit by knowing that someone they care about is receiving nutrition and enjoying the fine crust of the bread. While consuming a piece of bread may exclude another from consuming

¹⁶ Roy D. Adams and Ken McCormick, "Private Goods, Club Goods, and Public Goods as a Continuum," *Review of Social Economy* 45, no. 2 (1987): 192–99, <https://www.jstor.org/stable/29769372>, 6.

¹⁷ Cowen, *A Critique of Public Goods Theory*, 9.

that same piece, there is no exclusion available in terms of curtailing the psychic benefit to only the person physically consuming the foodstuff. Besides the nonexclusive nature of any commodity by this logic, exclusion methods are often innovated over time that cause nonexcludable goods to become excludable, and therefore shift them from being provided efficiently publicly to efficiently privately.¹⁸ For the case of roads, this paper will later discuss how the innovations in tolling technology have allowed roads to become more excludable over time, making the case for their privatization even more merited.

Along the lines of exclusion comes the institutional outcome termed the club. A club is a group sharing a particular type of impure public good (such as roads), characterized by congestion and excludable benefits.¹⁹ The club is formed if the costs of exclusion are less than the gains in allocative efficiency derived by the club participants. If the costs or means of exclusion are not feasible, such goods are more efficiently provided by local governments and can be termed as local public goods.²⁰ Exclusion of a good should only happen when it is feasible and cost-efficient. This is the bright line distinction where public goods end and private goods begin. As innovation progresses with time, public goods will enter into the private domain as means of exclusion become less costly to a point where the market can effectively allocate a good by enforcing the rules ascribed by the commodity owner. Due to the coordination of prices and mutually beneficial bargaining within the market, it will always be more allocatively efficient when excludability is feasible. Roads will be argued to best be constructed within the club good framework.

¹⁸ Cowen, *A Critique of Public Goods Theory*, 10.

¹⁹ Loehr and Sandler, *Public Goods and Public Policy*, 4.

²⁰ Adams and McCormick, "Private Goods, Club Goods, and Public Goods," 5.

Externalities Do Not Justify Policies of Overproduction

As is clear now, the distinctions between rivalry and nonrivalry, excludability and non-excludability, are misused by public good theorists to categorize goods more as being efficiently owned publicly than privately. Coupled with the fact that government has no mechanism for coordinating the extent to which externalities should be incorporated into the decisions of producers of and consumers effected by such externalities, private ownership of currently centrally planned commodities must be considered in many scenarios.

The fact that many of the goods and services produced in the public sector may appear to be public goods, is because of consequences of the public choice theory in that governments tend to overproduce goods and services.²¹ In an attempt to internalize externalities, governments force the overall consumer population to pay for goods and services they do not value to the extent government deems it necessary for them to value it.²² Besides that, individual consumers do not see their subjective preferences realized, as they are often forced to pay similar taxes and are subjected to universal regulations that overinvest in certain externalities for some and underinvest in the same externalities for others.

The theory for a private system of roads over the current public system argues the dilemmas of publicly owned goods. Over sections three and four, a theoretical framework will be established positing why privately owned roads account more efficiently for positive and

²¹ Cowen, "A Critique of Public Goods Theory," 5.

²² Phineas Bazandall, "The Facts about Toll Road Privatization and How to Protect the Public," 2009, https://pirg.org/wp-content/uploads/2012/02/Private-Roads-Public-Costs-Updated_1.pdf.

It is worth checking out government funded research into arguments on how privatization fails to provide the externalities government does.

negative externalities government looks to internalize, and for externalities government cannot incorporate currently into consumers' decisions under the "free-to-use" road system.

III. More Gas in the Tank: Economizing with Privately Owned Roads

There is No Such Thing as a Free Lunch

Most roads consumers use would be considered termed as free, besides those nasty tolls that exist on state turnpikes and the sparse privately owned roads populating the current national infrastructure of roadways. Yet everything has a price. The price of road construction and maintenance is mostly entrusted to the state, and they charge accordingly in the form of a gas tax applied per gallon of gas consumed. This tax ranges anywhere from California's 77.9 cents per gallon to Alaska's 8.95 cents per gallon²³, and when multiplied out by the average American driver's consumption of gasoline (656 gallons),²⁴ the average Californian would dedicate over five hundred dollars a year to gas taxes sponsoring infrastructure.

The question is whether this number would be lower, the same, or higher under a privately owned roads system. Not only does economic theory suggest that this number would be lower for the average consumer of roads, but the costs would be better construed across consumers based on how much they value their driving experience. This is because private roads are not funded by a tax, but rather by tolls set up along each individual roadway. The average costs would be cheaper due to entrepreneurs operating under a profit management system rather than the more cost-inefficient bureaucratic system the government uses. No more would one

²³ Adam Hoffer and Jessica Dobrinsky-Harris, "How High Are Gas Taxes in Your State?," Tax Foundation, August 15, 2023, <https://taxfoundation.org/data/all/state/state-gas-tax-rates-2023/>.

²⁴ Matthew DiLallo, "Here's How Much Gasoline the Average American Consumes Annually," The Motley Fool (The Motley Fool, January 14, 2017), <https://www.fool.com/investing/2017/01/14/heres-how-much-gasoline-the-average-american-consu.aspx>.

commonly witness the lackadaisical group of construction workers sitting aside the roadway that has been under construction for six months with only little signs of progress.

Economizing does not just include costs, but the quality and quantity of the product that is to be produced. The quality of the product, or the externalities of safety, similarity, and functionality of roads will be enumerated in section four. This section will key in on the quantity of roads consumers desire best derived from the private goods system. First it is important to establish how private ownership of roads can be a profitable venture theoretically, before moving into dialogue discussing economization of roads in a public vs. private paradigm.

The EZ-Pass Enlightenment: Costs of Private Roads Falling Over Time

Private ownership of roads could consist of any type of business or individual buying a road to maintain to receive revenues from consumers choosing to drive on one's stretch of road. The way revenues are garnered is through establishing tolls along the road that drivers must pay to continue driving on that road. The entrepreneur in charge of the road's operation can dictate the prices of the toll to be set at whatever level, and over time can derive the quantity of tolling, and pricing of tolling that is profit maximizing along their road.

The efficiency of tolling, as mentioned briefly in section two, has expanded greatly over the past couple of decades. Since tolls make up the majority of enforcement costs related to establishing the road as a private good, by excluding non-paying consumers, decreasing costs of tolling have allowed privatization of roads to become a more apparent reality. Tolls throughout the history of the United States road system, up until the last decade or so, have operated with a combination of human labor and capital. A car had to slow down to a complete stop before rolling down their window, conversing with and paying (oftentimes in cumbersome physical

change and monies) the toll operator, and then speeding back up again once exiting the toll booth.

This system created burdens on both the producers and consumers of tolls.²⁵ Producers had to deal with hiring and managing a host of toll operators along the extent of a road, at every exit and interchange along the tolled highway. The costs of human capital were an extensive barrier to tolling being utilized. Also, in the earliest cases of tolling in the 18th and 19th centuries, shirking of tolls were also common occurrences, leaving producers without revenues from consumers utilizing their commodity.²⁶ Consumers had multiple reasons not to appreciate tolling. First off, one had to slow down to a complete halt, wasting time and gas as a result of decelerating and reaccelerating. This often resulted in traffic delays in the case of rush hours along tolled roads. Secondly, the stop itself made it so that roads immediate to toll booths had a high rate of accidents due to the sudden stopping of cars approaching the tolls. Lastly, payment for tolls required one had some form of payment directly on them and finding the payment and handing it over to the operator to be counted and change returned, often added more time to the tolling experience which was already slow to begin with.

Fast forward to today, and almost all of the above problems relating to the costs accumulated by both producers and consumers because of tolling have mostly been nullified. This is thanks to the innovation of EZ-Pass, which allows drivers to maintain high speeds while passing through the toll, which processes a car via a sensor attached to a device within the vehicle provided to vehicle owners by the state government. In the absence of one of these

²⁵ Gordon J. Fielding and Daniel B. Klein, "How to Franchise Highways," *Journal of Transport Economics and Policy* 27, no. 2 (1993): 113–30, <https://www.jstor.org/stable/pdf/20052997.pdf>, 113.

²⁶ See Section XI of paper for empirical cases of shirking and theft of consumers related to tolling across America prior to the 20th century.

devices, a driver's license photo can be snapped by the toll booth, and you will be billed accordingly with an added penalty fee for not having the proper sensor device. In a private system, the sensors used across all roads would be the same, as any private road operator who would look to establish a more inefficient method of tolling would see their consumption of their road suffer as a result. No more increase in accidents around the tolls. No more traffic backups waiting in lines. No more managing cumbersome currencies while trying to drive. No more human labor is needed to maintain and enforce tolling. Both producers and consumers have seen their costs of tolling fall, all to the benefit of proponents of the privately owned roads system as the costs side of tolling becomes more feasible.

The PENN-DOT “Laborer”: The Cost Side of Road Economizing

Now that tolling innovation leading to cheaper tolling costs has been illustrated, one may still be waiting for how the state fails at minimizing costs relative to private firms in terms of road ownership. Governments and private firms both use the same innovative toll systems, right? Yes, but this is not the point. Innovation of toll sensor technology has allowed for market coordination to an extent never realized prior because of the ability of private road owners to establish more tolls and therefore discriminate revenue to a further degree.

Sensor tolling makes it possible for tolls to be included on roads that intersect with other roads regularly, as before the innovation, it would have been cumbersome and costly to have a physical booth set up at every point of entry and exit from one's roadway to another. No one would have wanted to drive around this infrastructure, which is why sensors are crucial in that they enable drivers to maintain their normal traffic habits while maintaining road excludability through monitoring drivers' paths via sensors. Not only is this innovation successful in reducing the costs of tolling upon the consumers, but economies of scale often would occur in which small

segments of road are bought up by the same road owner, to maximize the value of that road or interchange.²⁷ Comparing multiple owners to a single owner, in the latter scenario, costs of tolling are reduced from having fewer tolls to operate along the same stretch of road.

Tolling costs and revenues are allocated on a road-by-road basis in a private ownership of roads system. Private firms know that their road is benefiting consumers when the revenues they receive from tolling exceed the costs they spend maintaining the road via labor, land, and capital goods. Toleration of the classic publicly owned system of roads narrative of lazy construction workers employed by the state mismanaging time and resources would not be present to the extent that it persists today, if at all. Maintenance and management of laborers is much more efficient when constrained by profit management rather than the bureaucratic management of the state. If the costs outweigh the revenues and the road is reaping losses, the road owner(s) are responsible for figuring out how to raise more revenues or cut costs while still constrained by consumer sovereignty. Losses persisting over time may cause the road owner to abandon the road altogether, either selling it to a more effective road entrepreneurial enterprise, or another firm who may abandon the road and utilize the land for a completely different function.

Inefficiencies stem from the publicly owned system where tax revenues are allocated to each town, city, state, or country; there is no way of telling which specific roads are profitable or not. No feedback on any aspect or value of a road is garnered from the consumer; he has to pay the gas tax to the government whether he appreciates the road commodities the government is supplying or not. Minimizing costs is not high on the list of concerns of government construction and maintenance of roads either. Capital and labor are seen sitting around producing nothing of

²⁷ Block, *Privatization of Roads and Highways*, 15.

value every day at a construction site across the country. Management is not rewarded by minimizing costs, especially when revenue streams from taxes are millions and billions of dollars. Wasting a couple thousand dollars will not harm anyone directly associated with the road project. Just indirectly through all the taxpayers who were coerced into funding the shirking of work knowingly or not.

Profit management within the confines of the market in almost every case supersedes the efficiency of bureaucratic management to minimize costs, and this holds true in establishing and maintaining roads. The primary concern regarding current state control of roads is if the activity levels of road maintenance and construction are overall too high or too low, and in specific regions of states, cities, and towns, too concentrated or not concentrated enough. Economizing benefits the private sector over the public sector in determining the efficient level of provision of commodities, as this next subsection will dictate.

Eminent Domain Subverting Mutual Exchange: Evaluating a Firm's Production

One of the significant issues with the publicly owned system of roads is that it is impossible to tell which current roads are beneficial to society, which current ones detract from society, and which land not being utilized for roads should be utilized in such a way. The current infrastructure of roads remains relatively constant. Old roads are maintained even if the land that road occupies has a better use to the public as a building for business, a church, or a park even. Government is exogenous to the market, so there is no competition or coordination that it partakes in with other similar organizations. State monopoly on road construction, maintenance, and lands has left the government without a means of knowing consumer preferences in terms of how valued a road may be.

The United States suffers overall from an infrastructure of roads that is too abundant across the country. Costs that are poured into construction and maintenance exceed the taxes that are meant to fund the Department of Transportation. If forced to build roads within the confines of government and not the free market, tax revenues need to be discriminated in usage between budgets of resources of significant importance to the American public such as education, defense, and welfare. Overproduction of roads must mean one of these other sectors of public goods are not being provided to the extent that taxpayers value. If roads across the country were to be privatized today, the overall amount of land dedicated to road infrastructure would decrease as those lands would be valued more for other uses and would therefore come into possession of firms and entrepreneurs seeking to satisfy those consumer preferences and as a result rid of those excess roads altogether.

Eminent domain constitutes the state's most prominent destructor of economic value, all the while overriding property rights and circumventing fair contracting. The only limits that eminent domain is subjected to is public outcry; if a road were to be constructed over the skeletons of bulldozed high-rise skyscrapers, value would obviously be tarnished, and businesses affected would lobby against such action. There is a veil of mystery shrouding eminent domain in terms of how fair the process is to the property owner who is forced to abdicate the premises. The price agreed with the government is never voluntary. It is coerced, and therefore one party's values are not represented and therefore diminished as a result of the transaction.

How do private owners of roads looking to construct their road across a holdout's land counteract this annoyance without the backing of coercion the state possesses? The value of certain land for uses other than road makes it preventative to construct upon due to profit constraints, like the skyscraper example used previously. If the holdout values the assets or

monies offered by the road constructor in return for their property, they will oblige by engaging in mutually beneficial exchange. If he does not value the offer, the road constructor must pursue an alternative course of action. Transaction costs such as an irrational property owner who does not respond to proper market valuations are costs like any other.²⁸ It is no justification for coercion of the property owner to unwillingly leave the premises, leaving them with immeasurable amounts of psychic harm. Well then it will cost a firm more than the government to get the holdout to sell their property since they lack the instrument of coercion, correct? Not necessarily. Arguments have been made that prices agreed to between holdouts and road owners in the free market are less than what the government grants via eminent domain, because of the profit incentive of road owners to reduce costs that is severely lacking in the state enterprise.²⁹ It is economically efficient when one's productivity dictates one's income that one chooses to reinvest frugally and efficiently. Government's productivity and income are decoupled, leading to less information seeking and cost research resulting in inefficient investments such as eminent domain that spur taxpayer dollars.

Holdouts can often be built around if it is cheaper to do so than pay the holdout the price that they are asking for to trade away their property. Rural lands are cheaper and behold more alternative routes for roads due to more "free" land space.³⁰ In this case the holdout often keeps their property, and the road is shifted to one of the several alternative routes available. Urban lands have little to no alternative routes available but are also of greater value, making it so that the holdout is more likely to agree to trade away their property due to the higher price offered to them. The holdout in this scenario will agree to trade away their lands and the one route available

²⁸ Barry Brownstein, "Pareto Optimality, External Benefits and Public Goods: A Subjectivist Approach*," 1980, https://cdn.mises.org/4_1_6_0.pdf, 97.

²⁹ Block, *Privatization of Roads and Highways*, 19.

³⁰ Block, *Privatization of Roads and Highways*, 18.

for the road is able to be utilized. Ownership of land does not give one property rights to the sky above or depths below. Bridges and tunnels can be used as alternatives if the holdout refuses to leave, and it is still foreseen to be profitable for the road owner to construct such complex infrastructure for the road to be completed. If costs bar all these alternatives from occurring, the road is clearly not of as much value to the public as the road constructor believed, and he can sell off the land he has bought up so far for other uses and therefore still be providing the public with the most efficient and desirable outcome.

IV. The Boogeyman of Road Anarchy: Safety and Standardization Without Government

Rainbow Stop Signs and Infinite Speed Limits

The flawed logic of grasping the free market proceeds as follows. What does it cost more to make a road out of: gravel or asphalt? Gravel. The road owner, in economizing his costs, will construct his road out of gravel. Sure, a couple more cars than on an asphalt road may skid off the side and crash due to lack of traction, but what should he care? Death does not detract from profit, right? The owner of a road's three favorite colors are orange, blue, and pink. He decides to make the stoplights on his road orange for go, blue for caution, and pink for stop. Numerous other road owners all apply their own colors, and suddenly drivers have no clue what any sort of signage or signaling means from road to road as it is all up to the individual road owners, which there are thousands of. Clearly a private road system lacks any sort of safety or standardization. The state needs to step in and require safety measures and normalized signage to be implemented across all roads owned by all private road owners.

This line of reasoning embarked on above may seem like a reasonable validation of the opinion that government internalizes the externalities of consumer safety and comfort on roads more than the average private road owner. Yet it is an oversimplification of the private roads' paradigm, and honestly insulting to the will and brainpower of the private entrepreneurs who are coordinating and competing with one another for the consumption of their product within the free market. Because of the institutional framework that has shaped modern United States citizens' way of life, people often think government oversight and regulation is essential to provide for the safety and simplicity of goods consumers often look to access and use. Information costs are real, and the government circumvents these by ensuring consumers that the products they are consuming are safe and similar in quality and use.

Yet the system of publicly owned roads has not promulgated safety in the slightest. Since 1962, motor vehicle deaths have reached a plateau of around 40,000 per year and have not dropped off since.³¹ The fact that this number is not decreasing means that either by some other factor changing or government ignorance, safety is not being taken seriously in the construction and maintenance of American roads. One would think with the innovations in technology and ideas, over time car accidents would decrease, but with the oversight of government Americans have grown comfortable accepting that the current rate of road fatalities is just the way things are meant to be. Excuses are made blaming other factors, usually related to the consumers of roads, such as drunkenness, speeding, lack of caution, and mechanical failures. The state skirts the blame. Perhaps it is time to give a new player a chance: the private entrepreneur.

³¹ Block, *Privatization of Roads and Highways*, 331.

Death Dealing Bankruptcy: All Lives Matter to Private Road Owners

In a privately owned roads system, each road owner decides upon the rules his customers will follow. There are no better means of doing so than through the competitive process. Gaining customers will mean that the road owner will be rewarded with providing a road that has rules that benefit specific consumers to an extent that it benefits society overall, hence the profit he receives for his efforts. Losing customers will mean that road owners are establishing rules that may be on one end of the spectrum of safety or the far other: too cumbersome or too loose. The rules provided do not capture a large enough portion of the consumer population to make the road profitable. The entrepreneur must innovate and adjust the rules to gain more consumers, as if losses continue to pile up, he will face bankruptcy.³² Either the road will come into the hands of a savvier entrepreneur in dealing with road rules, or the land will be used for another function.

Over time, profits will tend to diminish if an entrepreneur maintains a steady course, as other road owners will notice his success and tend to copy the rules and other specifications of his road. The competitive nature of the free market without significant barriers to entry will make it so that rules will continue to be innovated upon and improved. Desirable rules will be maintained and promoted by the success in profits of one's road, while undesirable rules will be tried, tested, and then discarded if losses are seen as a result. Compared with the stagnant rules of government that rarely ever change because of a disassociation with the coordinating aspects of the free market, private firms' rules will improve over time to meet consumers' adapting needs and concerns. It is a sign of an unhealthy economy when the structure of production, norms, and private law remain unchanged over time. This comes into conflict with the diversity in adaptations humans take when deciding on actions to take every day.

³² Block, *Privatization of Roads and Highways*, 13.

Injury and harm, the maximum extent of these being death, are factors entrepreneurs of private roads are forced to deal with in trying to reap profits from consumptive tolling revenues. If one's road has certain safety features that lead to lower amounts of injury, death, and harm to consumers' psychic and financial well-being, these statistics will be spread through reviews and word of mouth by consumers. This will lead to increased consumption of one's road as safety is viewed as a net good for any rational consumer. Safety is no longer an externality to the private road owner; he looks to provide it to the extent that it maximizes his profits, which means it also is at a level that satisfies the highest number of consumers. In today's publicly provided system, it does not harm the government when an individual or family gets in a brutal accident and passes away along a roadside.³³ The state sees no significant decrease in tax revenue fueling their production and provision of roads, so safety remains an externality in much of their lack of decision making to attempt in preventing these types of death and harm in the future.

How are these ideal levels of safety identified by the private roads' owner? Well safety is something valued highly by consumers, but only to a certain extent. Take the example of a five mile-per-hour speed limit. There will be less accidents due to more reaction time for drivers, and the accidents will be less severe as the velocity upon impact between vehicles will be essentially negligible. Yet it would consume massive amounts of time to drive anywhere. It takes an hour to drive five miles with the five mile-per-hour speed limit, but only 10 minutes driving at thirty miles-per-hour. There is a higher chance of accidents, and higher risk of a severe injury because of a collision, but the point is that most consumers are willing to sacrifice the level of safety under a five-mile-per-hour speed limit for the time saved under the 30-mile limit, *ceteris paribus*.

³³ Block, *Privatization of Roads and Highways*, 332.

Government can never realize the ideal level of safety parameters to be taken, as every road is different in its layout, the amount of traffic it normally receives, the type of drivers usually utilizing it, etc. So instead, the state slaps on arbitrary regulations such as a 55 mile-per-hour speed limit on I-79 that almost every car user speeds fifteen mph over. Private firms through altering different safety features, such as increasing or decreasing a speed limit (while holding all other factors constant), can figure out the point at which the marginal cost of the average road consumers' level of safety intersects with their marginal demand for time, or other competing factors in human decision-making besides safety. This equilibrium will never be constant, so it will remain difficult for private firms to navigate the establishment of safety rules on each unique road, as there are many ways to simultaneously increase/decrease safety levels besides altering speed limits (angle of turns, guardrails, jersey barriers, reflective paint, etc.). But one can be confident in the economic laws of the free market, in that road owners will always be in competition with one another to maximize the safety of the consumer, relative to the other factors the public is concerned with when driving. It is safe to say that consumer safety is an externality better internalized by private firms than governmental oversight.

Standardization Substituting for Market Coordination while Curtailing Innovation

Remember the variously colored stop light example from earlier on in this section? Well not only do proponents of government standardization argue that this would be susceptible to the whims of the private road owner, but stop signs, exit signs, construction signs, and more would all look different for each individual road owner. Who knows if there would even be signs at all for these items?

This argument does not consider the coordinating phenomenon of the market. All the private owners of roads exist within various levels of markets from local to state to national.

Therefore, they all compete with one another for the consumption of each consumer within each market their road is within. Innovation by one road owner that generates the most consumer interest and consumption, gains that provider greater profits relative to the other providers of road services within that same market. Looking to share in those profits, other road providers will copy the actions the profitable road owner pursued, and their roads will become more similar in form to the profitable road's image.

That process is how the uniform signage and traffic coordination comes to be in the free market without any sort of state imposition. Any road owner who would try and go outside the consensus standard, would see consumers avoid their road and result in losses for themselves. In this way the private sector mimics the government in terms of enforcing a near universal system of signage, just without any explicit regulations or rules concerning signage.

Where private ownership excels above a system overseen by the state, is that innovation is possible rather than being forcibly stuck in the stagnation of government regulation. In a hypothetical scenario, a road owner decides to add a fourth light to the traffic light as a flashing yellow turn arrow beneath the green light, to further specify when a driver must look to yield to oncoming traffic before making such a turn. This innovation is appreciated greatly by the consumers of his road, and as a result word spreads, and a few more consumers will drive on his road gaining him greater profits, signaling that this innovation was beneficial to consumers. Other private road owners will catch on, and if they can include the fourth light in their costs while still gaining profit, they will make such an addition. These individual actions made by singular entrepreneurs will set off a ripple effect throughout the market that will result in a new standard of traffic light. The three-light traffic light will just be a sign of the past. Yet none of

these actions have a chance to accumulate if government prevents the initial innovation from being implemented, that being regulated a traffic light to only have three bulbs, not two, nor four.

The externalities of safety and standardization fail to be efficiently provided by government, and this is especially concerning considering that these are the two externalities' proponents of publicly owned roads evidence when disregarding the plausibility of a private road system. Yet when subjecting this critique to basic economic principles and a recognition of the coordination and competition present in an unhampered market, not only do private owners internalize these externalities, but they adjust to the changing nature of externalities as they are valued in the eyes of each individual consumer across time and place. The state has no means of adjusting to the preferences of consumers at the same rate as the market. Yet private roads internalize externalities beyond safety and standardization. In doing so, they are going beyond what the government claims to provide to consumers, venturing into developments the state could never feasibly coordinate or evaluate.

V. Tolls Taking Notice: A Theory of Discriminatory Pricing Repealing Safety and Time Externalities

War of the Grandmas and Teenagers

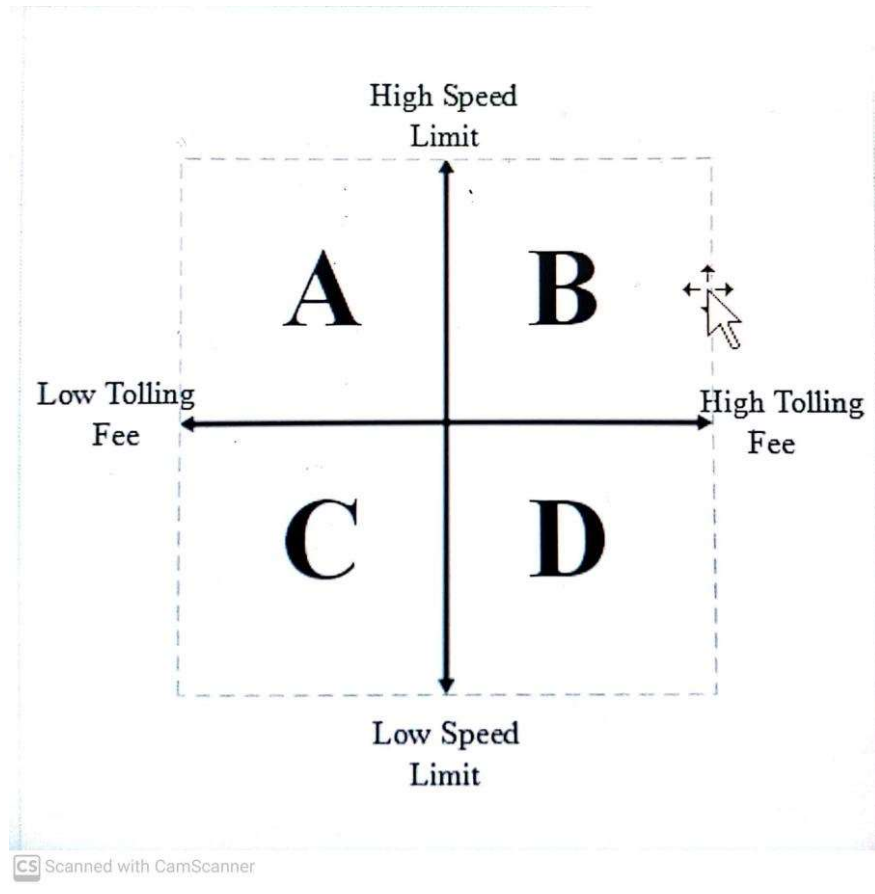
Driving is a precarious discipline. It is a task of controlling one's own actions meanwhile interacting with radically different individuals, with quite different value scales, all attempting to operate in accord with one another. One teenage boy may be rushing to work already knowing he will be five minutes late. Another may be taking their child to daycare, on time, trying to enjoy the relaxing breeze through the window as she cruises along. The first person values their safety

less in comparison to the second, due to their higher time preference in the moment along with a range of other factors. While the mother driving her child to daycare can try her hardest in focusing on the road, taking the proper precautions, and minding other drivers, she cannot account for the reckless teenage driver who T-bones the car, killing her newborn child. Sure, she will receive compensation for her loss in civil court, and the teenage driver will be criminalized, but was there any way that this travesty for both parties could have been avoided?

Usually, rational actors can discriminate themselves from other actors who they find not to share the same values of them. That way, they avoid the negative externalities associated with rash choices by immature, unpredictable, and downright criminal individuals. It is why one does not walk down dark city alleys in crime ridden areas. It is why Christian parents often homeschool their children, or send them to private school, avoiding public schooling. But roads provide no such division in the current publicly owned system.

Discrimination against consumers of a commodity can take place when government intervention in road systems ceases, and private industry is allowed to take shape. This theoretical section will argue that four different types of drivers, all beholding different value scales and exuding a certain level of negative externalities in terms of proneness to accidents and accumulation of traffic. What this theoretical system is meant to demonstrate is just how many different options of road provision can exist under a private road system, and how externalities that the government cannot currently control can be internalized through innovative strategies by the road managing entrepreneur.

The Driving Compass: Breaking Down the Diagram's Framework



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Road owners control a multitude of factors impacting the type of driver that utilizes their road. They can establish rules and regulations over these factors to hold the consumers of their road to a certain standard, or if they feel as though the factor is best left unspecified, then they are free to do so as well. In the end, the road owner is attempting to maximize profits, and one can seek to do so effectively by appealing to a certain type of consumer through a combination of factors.

In this basic scenario illustrated by the “driving compass,” road owners are looking to offer various levels of safety to drivers by discriminating between consumers of roads by setting tolling prices and speed limits to different amounts. Based on toggling these two factors while holding all others *Ceteris paribus*, four different types of driving experiences are established on

these four different roads: Road A having comparatively high speed limits and low toll prices, Road B having comparatively high speed limits and high toll prices, Road C having comparatively low speed limits and low toll prices, and Road D having comparatively low speed limits and high toll prices.

Road A: Drive at Your Own Risk

The combination of lower toll pricing and higher speed limits presents Road A, the least safe of the four road options. There are little barriers to entry for entering this highway; the tolls are relatively cheap, so within a complete private system of roads, this option presents a highway open to any driver who is willing to bare the basic costs of tolling in a private system. The low barriers to entry should yield the following description of the average driver entering the road.

Costs of the vehicle being driven is cheaper than average. The financial repercussions of getting into an accident are lower, as one's vehicle, and any other vehicle involved in an accident, will be cheaper on average to compensate for damages than on average. This is because the less expensive vehicles are more likely to view the marginal cost of paying a higher toll exceeds the marginal benefit that higher toll provides in less probability of damages to the asset. Precaution levels of drivers will be lower due to the financial burden of driving being lower on this road. Overall safety is lower as a result.

Lesser tolling costs will also lead to more traffic on average. Since the price of the commodity has decreased, the demand for the goods should increase in turn. More traffic results in more congested lanes, higher chances of backups, greater amounts of decelerating and reaccelerating; all of these resulting in a less comfortable and safe driving environment. More

likely is there to be more than two cars involved in a single accident, and the likelihood of an accident compounds on itself. Again, safety is lower as a result.

The speed limit relates to the values of the person behind the wheel. A higher speed limit will encourage drivers with a higher time preference to take the private road as they are willing to take the risks associated with fast driving, to save time whether they be driving to work or departing on a cross country adventure. This will invite the type of people who could be considered the most careless class of drivers, as although speeding does not necessitate a poor driver, it does increase the chances of accident especially when combined with the higher rates of traffic present on Road A.

Road B: The Formula One Racetrack

Road B is most likely safer than Road A, as well as arguably sponsoring those with the highest time preferences compared to the other three options. The high-speed limit remains from the case of Road A, emphasizing the high time preferences outweighing the marginal costs of accidents and damages by a greater length than average. But by charging greater toll prices to enter the highway, the types of consumers on the roads change drastically.

Higher toll rates will yield a higher quality of car driving on Road B than Road A, raising the stakes of getting in an accident with another vehicle for drivers. Their precaution levels will be heightened in this respect and therefore levels of safety will be higher. Fewer vehicles will demand an equal quality commodity the road owner provides at a higher price, so traffic will be less on Road B as well, leading to a lower probability of accidents.

What Road B demonstrates is how raising prices can confer benefits on consumers in terms of pricing out other consumers with action patterns and mindsets that confer negative

externalities on other consumers. Road B is just as fast, or even faster than Road A (less traffic), but lower income consumers will be voluntarily excluded from the road. Drivers on Road B are more homogenous as a result of the pricier type of car they are driving, their comfort with high speeds, and their less reckless demeanor. It is unlikely you would encounter an income-poor teenager veneering down a high-priced road like Road B; they would prefer Road A due to the lower toll costs. Economic value is preserved to a greater degree while satisfying consumer preferences all because of the price discrimination between consumers the private sector can initiate.

Road C: Slow Ride....Take it Easy

Road C is a home to the drivers who have the lowest time preferences. Tolling costs are low meaning that more traffic will be allowed onto the road, leading to backups that cause wasted time. Also, the low-speed limit is in place which makes it harder to get from point A to point B in a lower amount of time.

This third option is a way for private entrepreneurs to corner the drivers who value the marginal benefits of safety greater than the marginal costs in time they lose as a result. Since their time preferences are the lowest of everyone, they are willing to sacrifice a faster drive for a safer experience. The low-speed limit also wards off the reckless drivers who have places to be and little time to get there, and do not care as much about whether they are taking the proper precautions to avoid accidents or not. Greater traffic due to cheaper tolls still makes Road C less safe than the final alternative in Road D, but drivers can be assured that they are on a road free from most accident-prone people.

Road D: Stand Aside Time Preference and Toll Costs, Safety Always Comes First

Road D is the safest option amongst the four choices. The high toll rate keeps traffic to a minimum while increasing the quality of cars on average driving on the road, also increasing precaution levels of drivers looking to avoid a costly accident. Lower speed limits sacrifice time in order to ensure the safety of those who have proven they value it the most by choosing this road compared to the three other alternatives. While this is not to say accidents will never happen on this hypothetical highway, the amount and severity of them will be minimal when compared to the rest.

Homogenizing Consumer Pools and Alternative Discriminates of Safety

Consumers, when holding access and quality of the four roads described above constant, will be effectively separated into four different types of consumers who all value safety to different degrees. Yet within each of the four groups, the valuing of safety will be more similar than on the publicly provided road where the full spectrum of values must coexist. Drivers who cause the highest amounts of negative externalities concerning safety will be segregated from the drivers who contribute the least number of negative externalities regarding safety. Because of this, the negative externality of reckless driving only harms those who choose to explicitly bear this burden or convey this externality themselves. Safer drivers are rewarded for their safe driving by having a road on which safety is promoted to satisfy their desire for it.

While the diagram above only had two axes of toll pricing and speed limits, yielding four quadrants of consumers and four types of roads most satisfying each group of consumers, more axes and planes could be added since there are various other ways private road owners could look to increase safety on their roadways. Road owners could also look to prioritize safety less, understanding that there are classes of consumers that value this decision to leave safety lower on the list of road needs. A diagram of the current publicly owned goods scheme only conveys a

single plane devoid of quadrants on which all consumers are forced to coexist with one another. This is inefficient as consumers look to drive with consumers whose actions are based on more similar value scales, and drive on roads whose owners value the same assets their individual consumers prefer. Its implementation relies on whether the costs of creating these distinct roads are covered by the revenues earned by each road owner.

Besides utilizing the price mechanism, qualitative discriminatory measures can be implemented on toll roads to improve safety levels or internalize other negative externalities that may be left unaccounted for on the publicly provided road. Age is characteristic correlated with safe driving. Both young drivers and the elderly are generally unsafe compared to the average driver, so a private road owner could establish an age range of 25-65 on their road and allow no one to be older or younger. If the new rule succeeds in bringing in more consumption than it forces out, then society values its implementation, and the road owner receives profits for his foresight. If the rule forces out more consumers than it brings in, or if enforcement costs of this rule outweigh the added revenues it generates, then the rule is inefficient and can be repealed by the private road owner.

Other factors besides age, such as IQ, type of car, years of driving experience, number of passengers, etc. could be used to discriminate between several types of drivers. The same experimentation process as the age example would have to be gone through for the private firm to realize whether the decision to discriminate was profitable or not. The economically efficient rules will stick, while the unnecessary and cumbersome ones will quickly prove to be inefficient and unprofitable. This plethora of available options, tested by private owners of roads through experimentation, constrained by profits and losses, is impossible under a state-run roads system,

almost guaranteeing that every state produced outcome is economically inefficient to a greater extent than within a private road framework.

Relaxing the Theory's Ceteras Paribus Assumptions

When asking the question of whether the four types of roads made clear by the theory above would come to fruition within the reality of a private goods system, one must be willing to relax the assumptions that were made in order to simplify the model. Essentially, the quality of the road and the accessibility of each type of road to the consumer were held constant, and when left variable, then numerous consequences seem to arise as a result.

Would it be profitable to have four roads on the same route with slight variations in speed and tolling costs? Most likely, no. Only in cases of a road route surrounded by many consumers and land of high value, would such a large project be profitable to the road owner(s) managing and coordinating the four different road types. What the theory is meant to illustrate is that only one of the four types of roads will be present based on the types of individuals the road receives as consumers. If they have a higher time preference road owners should look to construct Road B; if they have a lower time preference, Road C; if they value safety most, Road D; if they value safety least, Road A.

The quality of the four types of roads may differ because of the consumer preferences of those who utilize the road. The cheapest tolls may be for roads of the lowest quality, with minimal safety features affordable to the road owner to provide, further enforcing that added safety correlates with increased toll pricing. Balancing the effects of conflicting changes in factors may provide different equilibrium based on the overall sum of the addition of the changes. A road with a slow speed limit and dirt surface could likely end up being less safe than

a paved road with a fast speed limit. Only through empirical studies and experimentation of private firms in the free market can the magnitude of each factor on an externality such as safety be estimated.

Methods and costs of enforcement are also in question. If age is used as a parameter by road owners to exclude drivers from utilizing their road, how does one track the age of drivers on one's road? Furthermore, if there is a way of tracking such a statistic, at what cost does it come to the road owner? If the costs outweigh the benefits, then it is not an efficient method of exclusion and cannot work until less costly technology becomes available.³⁴ Remember, price discrimination via tolling did not become economically efficient arguably until the invention of the EZ-Pass system. Before then, exclusion could have been unprofitable and therefore it was best that private roads were actually publicly owned.

VI. Actions Speak Louder than Words: Empirical Evidence of Private Road Ownership

Theories are often oversimplified. There is a reason theories relating to microeconomics such as perfect competition, macroeconomics such as unemployment, and economic systems overall such as socialism, work as a concept but fail to hold true when empirical evidence is introduced. Much of this paper has been spent pouring over much of the theory behind the private ownership of roads. Now it comes time to judge these theories by comparing it to one empirical study done by Daniel Klein and John Majewski on the turnpike system of New York from 1797-1845.

While it is merited to compare numerous empirical studies to grasp where theory may be lacking or to explain why a theoretical outcome does not come to fruition, this study has been

³⁴ Brownstein, "Pareto Optimality, External Benefits and Public Goods," 104.

handpicked as it clearly demonstrates a significant hindrance to private roads. That being government intervention in the market. The case has already been made why a purely publicly owned roads system (close to what reality is like today in the United States) is inefficient in minimizing costs or internalizing externalities when compared to a purely privately owned system. This study's outcomes will suggest that a mix of private construction and maintenance of roads within the purview of state oversight and regulation is incompatible due to its unprofitability for the private investor or entrepreneur. It is therefore important to recognize the fragility of economic profitability and if it is stamped out by forces external to the market, society will suffer as a result.

The Rise of the Turnpike Company in Early America

Although Klein and Majewski give a deeper explanation on the conception and construction of turnpike companies as a more efficient replacement for publicly owned roads, it is worth enumerating here briefly as to compare the benefits seen in this empirical study to those described in theory earlier. Even with heavy government intervention in the formation and operation of the turnpike companies, the private firm outcompeted the public authorities in road construction and maintenance.

While the implementation of the uniting Constitution was the initial spark that encouraged a flourishing interstate commerce,³⁵ the more empowered state and federal governments found road construction to be budget constraining and cumbersome. Complaints by state officials were made over idle workers, and fines implemented as disincentives against

³⁵ Daniel Klein and John Majewski, "Economy, Community and Law: The Turnpike Movement in New York, 1797-1845," *Law & Society Review* 26, no. 3 (1992).

shirking work failed to motivate as there was oftentimes no residual claimant to be identified.³⁶

Government administration over roads, usually managed on a town-to-town basis, was extremely inefficient as the hiring process lacked substantial competition as it was localized per town, and the turnpike's numerous subdivisions from town to town meant a plethora of managers all loosely gathered under government oversight that was rarely ever present.

Competition among the states vying for greater expansion of their business corridors was what drove governments to abandon their direct involvement with turnpike construction and maintenance, rather delegating the tasks to private companies who would specialize in such tasks. These companies hired across towns the turnpike was planned to intersect, increasing the productivity and skills of their laborers and managers. Furthermore, the turnpike companies would be in active competition with one another to receive state funding to do a clearly defined job that could be judged accordingly, promoting the more efficient and effective companies, and eliminating the firms that did not achieve state standards.

Having tolls alongside the turnpike due to private firms looking to make a profit off the construction and maintenance of such road, served a beneficial service to both the owners and consumers of the turnpike.³⁷ The tollkeeper responsible for collecting payment from travelers had many other hidden assets not realized until the tolls were installed. He was the security guard that made sure travelers abided by the laws of the road and state in general. He was the custodian who made sure the road was cleared of obstacles and demarcated properly. He was the representative of the turnpike company that owned and operated the tolls and roads and could use this official status to be of trusty help to consumers whether they needed a fix to their

³⁶ Klein and Majewski, "The Turnpike Movement in New York," 7.

³⁷ Klein and Majewski, "The Turnpike Movement in New York," 14.

carriage or a point in the proper direction. So, while tolls were crucial to determining the profitability of a road due to their ability to charge per quantity of road demanded, they served numerous other beneficial purposes only tapped via spontaneous innovation and experimentation that is a trademark of the free market.

Government Intervention Erasing Profitability

As with all change, there is resistance. The public protest that rallied around the implementation of tolls across once free passages elicited the legal restraints that would permanently hamstring turnpikes.³⁸ On a more abstract level, the status quo bias people hold creates a negative outlook where the initial losses loom larger than the gains that appear elsewhere. In this case, the upfront direct tolling of turnpike consumers was seen as a great cost. That led to a widespread ignorance or even misunderstanding about how the road quality, safety, and coverage all generally increased under the privately owned regime at lower costs to consumers than the taxation of the state. The outcry over paying toll costs were also coupled with complaints about private roads being of substandard quality. Klein and Majewski were keen to deem this as an overreaction to there being no guarantees backed by the state of road safety, rather than a reality in which road-user safety was jeopardized by the turnpike company.³⁹

Outcry led to states passing laws that would severely limit the opportunities private firms had to reap profits due to cumbersome regulations that went beyond what the average consumer deemed to be necessary. By attempting to aid the consumer of roads by installing such safety provisions and price ceilings on tolls, the government held turnpike company revenues down while increasing their costs, leading to many turnpikes companies' bankruptcy and exit from the

³⁸ Klein and Majewski, "The Turnpike Movement in New York," 21.

³⁹ Klein and Majewski, "The Turnpike Movement in New York," 25.

infrastructure market. Examples of such laws include an Upkeep Law that dictated, if inspectors deemed repairs were needed on a road, the toll gates were to be lifted and passage on the road was toll-free to the consumers until the repairs were made.⁴⁰ Tolling Exemptions were distributed to road users who were utilizing the road for travel to worship, funerals, town meetings, doctors, or for any user within a mile of a gate.⁴¹ No wonder turnpike companies derived little revenues if oftentimes consumers traveled past tolls either not permitted to be utilized or prevented from tolling specific consumers.

Shunpiking also was a thorn in the side of private turnpike firms. This term pertains to when travelers would take a brief excursion from the turnpike, or the “scenic route,” to circumvent a tolling station. While these trails were illegal, no enforcement by the courts were made against such violations, and by the end of the private turnpike system towns were often creating these “illegal” trails themselves.⁴² When firms would look to solve the shunpiking problem themselves by moving toll gates to different locations and/or adding more toll gates, legislatures enacted laws prohibiting such measures which put the final nails in the coffin of effective tolling and garnering revenue for any private road firm. By the time canals and railroads had entered the transportation industry as robust substitutes for traveling by turnpike, the tolling system was long dead along with any hopes of privatizing road construction and maintenance in the state of New York.

Takeaways: Theory is Sound but Implementation May be Impossible

⁴⁰ Klein and Majewski, “The Turnpike Movement in New York,” 26.

⁴¹ Klein and Majewski, “The Turnpike Movement in New York,” 28.

⁴² Klein and Majewski, “The Turnpike Movement in New York,” 30.

Klein and Majewski's case study of the attempt of privatizing the New York turnpikes in the early 19th century both supports the theoretical claims made earlier in this paper but leaves little hope for privatizing roads in an era of government intervention and shorter consumer time preferences. Costs of construction and maintenance were minimized. Road quality was similar or better than it was under public ownership. The system of roads across New York grew rapidly with the accelerating economic conditions of the time. All these facts from the case lead back to the dynamic equilibrium the free market beholds as well as the greatest satisfaction over consumer preferences, especially when given the counterfactual of state-owned roads.

The privately owned firms failed not due to market forces in which consumers saw no use for the roads that the turnpike producers offered, but due to the presence of a government that did not contemplate the consequences of its actions; legislation that indirectly harmed consumers rather than benefit them as they were intended to. Fast forward to the present day, and the federal government has more power beholden to it in implementing its chosen public policy and provision of public goods than ever before. Due to their high demand, roads are clearly a profitable venture for sound entrepreneurs running an efficient firm. But because of the inability of the members of bureaucracy or even the public to come to grips with a reality in which certain consumer preferences such as safety can be provided without regulation by a free market, privatization of roads will unfortunately never be realized as a comparatively efficient outcome.

VII. Conclusion: Free Market Solutions Triumph Over State Sponsored Systems...Once Again

This paper finds that the theory for the provision of externalities by private goods supersedes the one arguing for the necessity of public goods as a way of reducing such externalities. Nonrivalry and non-excludability can apply to any good when the definitions are carried out to their fullest extent, meaning that they cannot act as parameters for determining whether a good should be produced in the public sphere or private one. The proper boundary is when a good can be excludable at costs that are economically efficient, it should be provided privately. Private firms, by operating within the confines of the free market, economize by reducing their costs and providing a product to the extent that society values its use. Government cannot determine what costs or activity levels are most economically efficient, as they are exogenous to the coordinating aspects of the free market. The externalities of safety and standardization that state owned goods purvey, may be overinvested, or underinvested depending on the preferences of consumers in across various times and places. Private ownership responds more immediately and precisely to the needs of consumers, which includes assets such as safety and standardization of roads to a certain extent. Private road ownership also beholds comparative advantages to government in the fact that price discrimination and other forms of excludability can be embarked upon, and through homogenizing consumer interactions can do away with negative externalities resulting from transaction costs.

The paper is limited in various aspects. Discussion concerning how private roads would work within constraints not optimal to privatization should be further analyzed. When enforcement and exclusion costs are high, do certain private goods become more economically efficiently produced and provided by an authority exogenous to the market? Furthermore, the extent to which a private road system would affect other aspects of the economy rendering economic efficiencies and inefficiencies merits more analysis. While the paper discusses how

private roads can be of benefit to the average road user, it does not go into detail about how places of business, jobs revolving around transportation, and development of complex interactions between road owners would commence. On a side note, it does not elaborate on new situations created by a privately owned system, such as how the courts would account for the greater number of suits to be brought against private road owners by drivers, now that citizens rather than government control road quality and maintenance. More empirical studies could be added to enrich the conversation surrounding if application of a private road system is sustainable in varying degrees of government intervention.

Sweeping implications of the paper include the economic reality that government is inefficient at determining the level at which externalities should be internalized to cultivate the greatest benefit to society. The stagnant nature of road infrastructure today represents the inability of government to adjust to the constant change of the market, and how consumers value distinct aspects of the driving experience over time. There is no better time than the present to consider the privatization of roads, considering excludability costs and enforcement costs have decreased dramatically with the advent of the tolling sensor. Hopefully, this paper can open American citizens' eyes to the plausibility of a private road system, and the repeated failures of publicly owned goods that is evident in today's current road dilemma.

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