Chapter 11
Are Roads Public Goods, Club Goods, Private Goods, or Common Pools?

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Abstract An examination of the history of roads in England demonstrates that roads are never Samuelsonian public goods, and that free access roads are really common pools. In some institutional environments, however, many roads were club goods maintained through reciprocal arrangements. Private toll roads arose where possible but collecting tolls on "public" roads was a government prerogative. Nonetheless, as government action undermined club-good arrangements, local groups petitioned for and received permission to finance maintenance with tolls. Turnpike trusts managed these toll roads, but they were not "private" roads because significant regulations including government-mandated tolls and exemptions were imposed, based on political rather than economic considerations. Profit taking also was not allowed so incentives for trustees to monitor workers were weak, corruption was rampant, and many trusts ultimately failed. In the absence of regulatory constraints there is little doubt that private roads would have been widespread.

11.1 Introduction

An answer to the question posed in the title is offered in the following presentation by differentiating between the four concepts in the question and the institutional conditions that might create them, and then by examining the historical evolution of road provision systems in the United Kingdom. One conclusion is that roads are never public goods in a Samuelson (1954, 1955) sense. This answer may be surprising, since highways and roads are frequently cited as "important examples of production of public goods," (Samuelson and Nordhaus 1985, pp. 48–49). The second conclusion is that specific roads and road systems can be, have been, and are club goods, private goods, or common pools, depending upon the institutional

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environment within which the roads are provided.[1] To support these conclusions, this presentation is divided into six sections including this introduction, beginning in Sect. 11.2 where the concepts of public goods, club goods, private goods, and common pools are described and compared.

An extensive system of voluntarily created and maintained roads existed in medieval Great Britain, but actions taken by various kings undermined the incentives to maintain the system. In order to understand both the voluntary arrangements and their breakdown, Sect. 11.3 begins with a theoretically-based discussion of institutional characteristics that apply for successful voluntary provision of a club good. The analysis is subsequently employed in Sect. 11.4 to describe the early history of voluntary community-level road provision in Great Britain, as well as the coercive institution-changing actions by kings that broke down the incentives for members of some communities to cooperate in road provision. In order to make up for the reduction in voluntary road provision, the state was forced to create new institutions. The first was a mandated-contribution system which attempted to force local parishes to maintain roads. When this failed it was followed by decisions to allow regulated private entities to produce and maintain roads and control access so politically determined tolls could be charged.[2] These institutional arrangements are examined in Sect. 11.5, but in order to better appreciate their weaknesses and ultimate failure, Sect. 11.3 also offers a theory-based analysis of such coercive institutions. Section 11.5 applies this analysis to consider the actual rise and fall of Great Britain's mandated parish system and then its toll road arrangement. Despite initial success and widespread use of toll roads, the political manipulation of institutionalized incentives and tolls led to significant inefficiencies within this system and its ultimate demise. As a consequence, public financing of free access roads evolved, but the result is a common pool, not a Samuelsonian public good. Conclusions in Sect. 11.6 briefly note the substantial mix of club and private roads that still exist around the world alongside publicly provided common pool road systems. This section also contends that similar analysis applies to many other so-called "public goods".

11.2 Public Goods Versus Private Goods, Club Goods, and Common Pools

The seminal analysis of Samuelson (1954, 1955) indicates that the key **characteristics of public goods are: (1) non-excludability, and (2) non-rivalrous consumption, which combine to produce (3) free riding, and therefore, (4) "private**

[1] Minasian (1964) explains, in his criticism of public goods theory, that different institutional arrangements create different incentives for the allocation of resources. He discusses television signals, but consideration of other allegedly public goods has lead to similar criticism (e.g., Coase 1974; Benson 1994, 1998, 2010).

[2] Alternatives may exist (e.g., public roads fully financed by tolls, toll roads provided by private entities that are allowed to set tolls and retain profits), but these two dominated in the United Kingdom.

provision of these public goods will not occur" (Samuelson and Nordhaus 1985, p. 713) because coercive power is required to collect from non-paying free riders (McNutt 2000, pp. 927–928).[3] As a contrast, private goods are often characterized as being completely rivalrous in consumption in that one individual's use of the good means that it is completely gone so no other individual can use it. However, excludability (through force or bargaining) produces the same consequence, as the owner can dictate use and prevent others from using the good. Indeed, "private" generally refers to sole ownership and therefore control of access, so the key characteristic of a private good as the term is used here, is that it is owned by a single economic entity (e.g., an individual, a firm, an organization) with a right to exclude all other potential users. Thus, a private good need not be entirely consumed as the result of a single user's consumption (e.g., a road on a privately owned farm with a locked gate which can handle more traffic than it does; the viewing of a movie in a theater with several seats). In such circumstances, the owner can either use the good repeatedly, perhaps but necessarily ultimately depleting it (e.g., the farm road), or allow access by others if the fully internalized benefits of doing so exceed the fully internalized costs (e.g., the movie), but the good still can only be non-rivalrous to those individuals who are given access permission by the owner (e.g., those who pay to see a movie). Therefore, in comparison to a public good, a **private good's characteristics are: (1) excludability, (2) possibly, but not necessarily, rivalrous consumption (possibly non-rivalrous consumption for those who obtain permission to access), (3) non-owners must get permission (e.g., pay) for use, and (4) private provision occurs if it is allowed and profitable.**

Define a club to be a voluntarily-formed close-knit group of individuals who have a multi-dimensional web of mutually beneficial interactions. Since the club is voluntary, individuals who do not cooperate with others in the club are not likely to be accepted as members (i.e., individuals voluntarily accept membership and are voluntarily accepted for membership).[4] A club good is one that is produced within (or purchased by) a club and then consumed by all the members of the club. That is, access is free to members of a club (e.g., residents of a gated development whose homeowners' association owns the roads in the community), but not for non-

[3] Non-rivalrous consumption means that even though one person consumes the benefits of the good, everyone else can consume the same undiminished benefits. Non-excludability means that, not only unlimited numbers of people consume the benefits, but no one can be prevented from consuming them even if they do not pay their share of the costs. Free access to a non-rivalrous good creates "free-rider" incentives: individuals recognize that they can consume the benefits without paying, so they will not voluntarily pay for the good, and this means that private producers will not produce the good because they cannot collect revenues to cover costs (or at least, that they will not produce enough of the good because, while everyone can free ride, some may not).

[4] Buchanan (1965) contends that the dichotomy between pure private goods and pure public goods suggested by Samuelson and others is inappropriate. Instead, he suggests that all goods should be considered as club goods where the size of the club depends on the good. In theory, clubs can, in this sense, be as small as one person, or as large as infinity. A large theoretical literature on clubs has developed since the seminal work of Buchanan (1965). See McNutt (2000) for a review. Here, the issue is not how many people can consume a good, but rather, it is how many share ownership and the right to exclude others. This is more in line with the analysis of Ostrom (1990, 2005).

members (McNutt 2000, p. 928). Thus, a club good differs from a private good in that it "belongs" to and is used by a limited voluntary association of decision-makers who face collective decision-making costs. If high decision-making costs prevent an agreement, the good may not be produced, since no authority in the club has coercive power to mandate that individuals contribute. Therefore, if the good is produced (or purchased), it is done so voluntarily by the cooperating club members. Furthermore, for individuals outside the club, access requires obtaining permission from the club (members may agree to allow access by at least some non-members, depending on the costs and benefits of doing so in the context of their collective decision-making process). Such a good can be rivalrous or non-rivalrous in consumption for those with access (McNutt 2000, p. 928), **given** the size of and restrictions on access created by the club, so in this sense it can look like a public good.[5] If non-rivalry applies it is **because** access is limited, however. If congestion and overuse arises for club members, they can establish rules that limit use by members too (e.g., quotas). For comparison then, **a club good is: (1) non-excludable for club members but excludable for outsiders, (2) possibly but not necessarily** (McNutt 2000, p. 928) **non-rivalrous for those with access, (3) subject to collective decision-making costs, but within a voluntary close-knit group that can exclude free riders, and (4) voluntarily produced if high decision making costs do not prevent it.**

The common pool terminology usually is applied to a natural resource such as a fishery, but it also can describe many goods and services that are freely provided for some reason, often by the state (see Shoup 1964; Neely 1982; Benson 2010; Benson 2011, pp. 97–101; Rasmussen and Benson 1994, pp. 17–37), but also perhaps by a private entity – e.g., consider a shopping mall parking lot before Christmas or a private charity. A common pool exists when all people (or simply a substantial number of people who face high transactions costs in cooperating either as a club or in recognizing and bargaining over private property rights) have free or "common" access to a scarce good or resource that is subject to rivalry in consumption because one individual's use diminishes the benefits that another user gains. This diminution often involves crowding (congestion/overuse) and a deterioration in quality for all users (e.g., for roads, highway travel time rises, surface damage increases) as the result of over use. In fact, the incentives for individuals with access to the common pool are to consume as many benefits as possible before they are consumed by others. Therefore, an individual has incentives to rush into the commons in order to capture benefits that will dissipate quickly as others with access have the same incentives. This has been called the "tragedy of the commons" (Hardin 1968), of course, and it arises as a negative externality because no user is fully liable for the cost of his or her over use (e.g., congestion costs, excessive consumption).

It is important to recognize that crowding and rapid quality deterioration are not the only consequences of common access to a rivalrous good or resource. The dete-

[5] A club good can be rivalrous, in that use by one individual reduces the value somewhat, but not completely, for other users (e.g., congestion). If such costs are born by club members, and therefore, internal to the collective decision-making process of the club, then the club may still provide the good.

rioration in quality often can be offset with appropriate investments in maintenance, but individuals with common access do not have incentives to make such investments because they cannot charge others who consume the benefits or prevent them from doing so (other drivers will add trips on the highway if quality increases), thus creating a positive externality problem in the form of underproduction of maintenance. Indeed, while it might be contended that "non-excludable public goods" and "free-access common pools" are simply two terms for the same concept because the under-investment implications are the same, this inference is inappropriate.[6] Free riders are not paying for something they consume. Under-investors in maintenance are not paying for something that others will consume. Incentives to pay one's own way may be different that incentives to pay for others' benefit. Furthermore, as Minasian (1964, p. 77) explains, the public goods terminology often is "asserted" to imply that non-excludability is an intrinsic problem that cannot be resolved without coercing free riders into paying for the good. In contrast, the common pool terminology emphasizes that incentives arise because of the legal or customary definition of property rights, and therefore, that another rights assignment can alter incentives. To emphasize the distinction, **a common pool is characterized by: (1) non-excludability, (2) rivalrous consumption as a result of congestion and the resulting negative externalities, (3) under-maintenance due to positive externalities, and (4) either production by nature (a resource) or by someone with incentives to provide it free of charge** (often the state, as discussed below).

With these concepts in mind, let us consider the institutional environment that creates the potential for these different types of goods, and then turn to the actual development of such roads in Great Britain.

11.3 Collective Decision-Making Costs, Clubs, Coercive Mandates, Privatization, Rent-Seeking, and Public Provision of Common Pools

11.3.1 Small Clubs and Bargaining

Assume that two individuals, Dick and Jane are the only members of a club that involves joint consumption of a club good. Let the club good be non-rivalrous in consumption and freely accessible to Dick and Jane, while other potential consumers are excluded (e.g., the club has enforceable property rights). Further assume, for simplicity, that both Dick and Jane own resources (e.g., land and labor hours) dictating their individual capacities to produce both private goods and the club good. To maximize utility each individual decides how to allocate resources between production

[6]They can be related because initially a good or resource can have the characteristics of a public good but given the inevitable congestion that arises with free access, it will become a common pool.

of the club good and private goods, but the amount of the club good each consumes is the sum of the total amount produced by both.

Consider the Cournot–Nash non-cooperative outcome as a benchmark for comparison. This solution arises when Dick and Jane independently adopt a set of strategies which establish the best response that each individual can make to the other individual's allocation decision. As is widely known, the Cournot–Nash solution generally is not welfare maximizing. If Dick and Jane cooperate they can produce a combination of the club good and private goods that generates more utility. The "prisoners' dilemma" (Cournot–Nash) model is often used to demonstrate market failure, including under production of public goods. The Cournot–Nash solution is not likely to arise in a small club, however, as both game theory and experimentation demonstrates that cooperation can be the dominant strategy when repeated interactions occur. Repeated dealing creates both a willingness to cooperate and a potential to punish non-cooperative behavior through strategies like tit-for-tat, and others discussed by Ridley (1996, pp. 53–84). A repeated-game does not guarantee unconditional cooperation, as the dominant strategy still depends on expected payoffs, frequency of interaction, time horizons, and other considerations (Ridley 1996, pp. 74–75), but if a small number of individuals (two in this case) are in a club, they have already cooperated because they expect sufficient payoffs given their expectations about the frequency of interaction over their time horizons. In fact, the club may well form because a non-cooperative solution is recognized as Pareto inferior, so if promises are enforceable at low cost within the club (perhaps through tit-for-tat strategies or other sanctions discussed below) and the cost of bargaining is low, these two individuals should achieve a "trading equilibrium" (negotiate and establish an efficient allocation of resources). The result is a Pareto solution for the club members (Dick and Jane), of course, but not necessarily for society as a whole wherein access to the club good by non-members might be Pareto improving. In order to consider this issue let us explore the potential for expanding the club.

11.3.2 Large Clubs and the Cost of Bargaining

While circumstances under which a few (e.g., two) individuals achieve a Pareto equilibrium involving a club good might be envisioned (e.g., low bargaining and enforcement costs, perhaps due to a repeated game), as the number of individuals increases, the transactions costs of bargaining and enforcement rise. Therefore, the size of a club may be constrained by such costs to the degree that there might be external benefits that the club members do not fully recognize and internalize (McNutt 2000).[7] Perhaps a knowledgeable and benevolent coercive authority could impose a system that would improve on a completely voluntary club arrangement?

[7]Key theoretical conclusions from the two person game can hold for an N person model (Milleron 1972; Bergstrom et al. 1986; Bernheim 1986; Shitovitz and Spiegel 1998, 2001, 2002). Specifically, both a unique Cournot–Nash and a unique trading equilibrium can exist, and furthermore: (1) a trading equilibrium must be a Pareto optimum for the N individuals involved in the game

Key questions then become: (1) are the limits on size sufficiently binding so that a club is likely to be too small relative to the efficient scale of production of its club good(s), and (2) if this is the case, will a coercive authority implement a more efficient arrangement?[8] The first question is considered in Sects. 11.3.3 and 11.3.4, and the second in the remaining subsections of Sect. 11.3.

11.3.3 Community Norms as Substitutes for Bargaining

If there are potential net social benefits from expanding production of a club good beyond its current scope, then their clearly are incentives to do so. Thus, as Demsetz (1967) suggests, when externalities become large enough so that the benefits of internalization exceed the costs of doing so, institutional (e.g., property rights) changes are likely. Direct bargaining is not the only voluntary means for internalizing externalities, including achievement of efficient levels of production of a club good. Two alternative institutional developments are discussed here because they appear to be particularly relevant for the historical evolutions examined below: (1) substitution of norms or customs for bargaining, and (2) development of higher order cooperative clusters that allow limited kinds of inter-group interaction (e.g., produce a specific club good for a relatively narrowly focused club made up of smaller clubs).[9]

Let "rules" refer to behavioral patterns that other individuals expect a person to adopt and follow as all individuals pursue various interdependent activities and actions. The rules one individual is expected to follow influence the choices made by other individuals: like prices, rules coordinate and motivate interdependent behavior.

(Footnote 7 continued)
(the summation of the equilibrium Marginal Rate of Substitution for all N individuals equals 1); (2) the Cournot–Nash solution is not a Pareto Optimum (the Marginal Rate of Substitution = 1 for some individuals, so the sum of Marginal Rates of Substitution over all N consumers cannot equal one); (3) the total amount of the club good produced in the trading equilibrium is greater than the amount produced in the Cournot–Nash equilibrium; (4) each individual contributes more to club good production in the trading equilibrium than in the Cournot–Nash equilibrium; and most importantly, (5) the trading equilibrium **is strongly preferred by all** N **individuals** over the Cournot–Nash equilibrium. Therefore, in theory at least, a non-rivalrous club good can be efficiently produced as a result of the voluntary decisions by the members of a club who then have free access to use the good. This does not mean that the trading equilibrium arises in any institutional setting, however. Institutions that facilitate achieving this are discussed below.

[8]Whether there are net social benefits from expansion depends in part on the consequences of expansion on characteristics of club good itself. At some point, as club membership expands, congestion sets in, so further increases in membership has offsetting marginal effects on members' utility: the quantity of the club good can increase as membership increases, while its "quality" decreases due to congestion costs, and higher maintenance costs. Thus, the optimal membership is likely to be finite, and for at least some club goods, quite small, although optimal membership for other club goods may be very large Buchanan (1965).

[9]These institutional developments clearly do not exhaust the possibilities, however, and others may be equally or even more important for other times (e.g., where technologies differ), places (e.g., where different social, political or economic conditions apply) or club goods.

In this context, note that much of game theory implies that individuals calculate the best strategy in each interaction, but in reality, it is often rational for individuals to adopt rules that guide their behavior under many circumstances, in order to reduce decision-making costs (Hayek 1973). Rules of thumb might be adopted, for instance, by individuals who are not able to use conscious reasoning to evaluate every option in the array of available alternatives because there are significant limits on abilities to reason and absorb knowledge (O'Driscoll et al. 1985, pp. 119–122). Community-wide rules also can be adopted to reduce the need for bargaining or other collective decision making activities. Therefore, while the transactions costs of negotiating an agreement rise as potential club membership increases, members may find it useful to economize on such costs by voluntarily adopting rules and avoiding the need to renegotiate with many changing conditions such as an increasing group population. New members voluntarily adopt the club's existing rules.

While the most obvious rules may be "positive laws" created by legislation, there are many other types of rules that may actually be more important guides to most behavior (Ellickson 1991). In fact, within close-knit groups the rules that dominate tend to arise as "customs" or "norms" which do not require explicit codification or backing by coercive threats. As Nee (1998, p. 87) suggests, "Norms are implicit or explicit rules or expected behavior that embody the interests and preferences of members of a close-knit group or community."[10] A key distinguishing characteristic of community-wide customary norms is that a rule of obligation is initiated voluntarily by an individual's decision to behave in particular ways under particular circumstances. Fuller (1981, pp. 227–228) explains that

> 'Where customary [norms do] ... in fact spread we must not be misled as to the process by which this extension takes place. It has sometimes been thought of as if it involved a kind of inarticulate expression of group will... This kind of explanation abstracts from the interactional process underlying customary law and ignores their ever-present communicative aspect.

Habits or conventions often arise as individuals attempt to economize on time and effort required in calculating tradeoffs in similar circumstances (Hayek 1973), for instance, and many of these habits or conventions are repeatedly observed by others who begin to anticipate the behavioral patterns under similar circumstances, and take these expectations into account in various decisions. Such behavioral patterns also can be emulated by others so the norms and corresponding expectations spread through the community (Mises 1957, p. 192). Rules also can be explicitly and voluntarily created through contracting. The resulting contractual rules only apply for the negotiating parties and for the term of the contract, but others may voluntarily

[10]Buchanan (1994, p. 132) refers to the resulting arrangement as "ordered anarchy" and explains that "Much of human activity takes place in a setting described as 'ordered anarchy,' by which I refer to the simultaneous presence of apparent order and the absence of formal law governing behavior. How is such ordered anarchy possible? ... The answer suggested by my argument here is that interacting parties choose to constrain their separate choices in such fashion as to create non-intersecting and therefore non-conflicting outcomes." Others use the term, "customary law" to characterize such arrangements (e.g., Pospisil 1971; Fuller 1981; Benson 1988, 1989, 1999a, 2011).

emulate the behavior by adopting the same rule, resulting in a community wide norm. In other words, customary norms evolve spontaneously from the bottom up, and they are voluntarily accepted.

Consider a hypothetical example. Vanberg and Congleton (1992, p. 420) note that most forms of interaction are not actually characterized by game-theoretic models which assume that the individuals must play. In reality, people often have an "exit" option, and the exit threat can be more powerful than strategies like tit-for-tat under some circumstances. Specifically, Vanberg and Congleton (1992, p. 420) explain that "In practice, the net benefits of exit depend on the availability of alternatives (or more specifically, on the expected payoffs from those alternatives), whether such alternatives exist in the form of potential interactions with other players or in solitary activity." The exit threat is likely to be credible, for instance, when each individual is involved in several different games with different players, in part because the same benefits of cooperation may be available from alternative (competitive) sources. And of course, even in a very primitive setting, individuals are generally involved in at least one close-knit club "community" as described by Taylor (1982, pp. 26–30), wherein "the relations between members are direct and ... many-sided" (also see Bailey 1992 and Ellickson 1993) – i.e., a club.

Given the availability of competitive alternatives, all members of the club have a refuse-to-play option, so they may cut off all relationships with someone who they know has been untrustworthy in dealings with anyone else in the group. And importantly, to the extent that information, or "truthful negative gossip" (Ellickson 1991, pp. 180–182), can travel from one bilateral game to another, the negative consequences on reputation can limit the non-cooperative player's ability to enter into other games with other individuals. This means that an attractive strategy may be adopt a rule of thumb: **unconditional cooperation whenever an individual chooses to enter into some form of interaction, along with exit and the spread of information about any non-cooperative behavior**. Vanberg and Congleton (1992) refer to this response as "prudent morality," and given that reputation information spreads quickly within a group (club) and everyone spontaneously responds to information, the non-cooperative individual is excluded from all interaction with any member of the community. Such spontaneous ostracism can be a very significant punishment, creating strong incentives for individuals in a club to behave cooperatively in every game with other members, whether that game is one-shot or repeated.[11] The boycott response to information becomes a behavioral norm, as everyone is expected to ostracize a non-cooperative individual.

With regard to roads, Ellickson (1993, p. 1372) notes, in examining the historical development of property rights in land, that "affirmative covenants that impose duties" typically evolve as norms. Imagine an agricultural community for instance, where no system of roads exists. Two neighbors may find it beneficial to interact

[11] Vanberg and Congleton (1992, p. 421) suggest that another strategy is unconditional cooperation until or unless non-cooperative behavior is confronted, and explicit punishment of the non-cooperative player as exit occurs. They label this strategy "retributive morality," but such violence is risky, so with competitive options and the ability to spread information, prudent morality tends to be a superior strategy.

on certain dimensions (socially, religiously, and/or economically), so they begin to travel back and forth between their locations. Neither prevents the other from doing so, and a mutual obligation to respect rights of passage arise (e.g., an easement is recognized). These individuals may develop similar relationships with other neighbors and a network of such "easements" develops. Perhaps a central location becomes attractive as a market, a site for a religious structure, or a meeting place (clubs generally meet, after all), and/or perhaps individuals find it beneficial for some parcel of land to be used by the community as a whole (e.g., a community pasture, a hunting area) and everyone travels to it. In addition, perhaps individuals own dispersed plots of crop land in order to reduce their risks or take advantage of different types of land that have comparative advantages in different crops (Dahlman et al. 1980). In order to travel to the central location and/or the common property from the outlying farms, and/or to travel to dispersed plots, individuals have to cross other individuals' land, but since everyone benefits from the interaction that takes place at the central or common location or as a result of dispersed plots, each land owner has incentives to routinely allow others in the community to pass over their land, although probably only along certain routes (easements). People in the community come to expect such rights and customary obligations to allow passage arise. Indeed, as Ellickson (1993, p. 1381) concludes, "a human group invariably opens a significant portion of its territory to public use," recognizing that "public" denotes access privileges only for community members, not state ownership or free access to people outside the community, unless such access is recognized for some outsiders too. The alternatives, bilateral bargains between every traveler and all land owners whose land is crossed, or a community-wide multilateral bargain, involve very high transactions costs.

11.3.4 Club Hierarchies

No community evolves in complete isolation. Parallel localized communities develop that are geographically proximate, making inter-group competition and cooperation possible. Anthropological and historical evidence suggests that inter-group conflict has been an almost ubiquitous characteristic of human history, of course, but cooperative arrangements and inter-group norms also can and often do evolve between members of different groups (Pospisil 1971; Benson 1988, 1999a). Hardin (1982, p. 184) suggests that "Large-group Prisoner's Dilemmas might be resolved as a byproduct of smaller subgroup interactions. But this could be strictly a spontaneous voluntaristic by-product ..." Importantly, however, communities need not formally "merge" and accept an entirely common set of rules governing all types of interaction. Individuals from different communities only have to expect each other to recognize common rules pertaining to the types of inter-group interactions (e.g., trade, road access) that evolve. Given the importance of frequent interactions and reciprocity, trust relationships, and reputation effects, there clearly is a limit to the size of a single close-knit community, but a much larger web of communities can develop for certain particularly beneficial functions if it is "overlaid by a network of much

smaller subgroups, each concerned with its own conventional behaviors with respect to specific subgroup goals" (Hardin 1982, p. 184).[12] Indeed, Llewellyn and Hoebel (1961, p. 53) point out that the traditional western bias of trying to delineate some all-embracing system of governance for a society as a whole can be very misleading (also see Pospisil 1971; Benson 1988; Benson 1999b; and Benson 2011).[13]

Suppose, for example, each localized group's norms regarding travel across other members' lands can continue to govern its own members, while a different set of rules apply for access to roads for certain members of neighboring communities, and even for people from vary distant communities (e.g., merchants, courting swains, religion officials, individuals on religious pilgrimages, allies engaged in joint defense against a common enemy). Even in primitive societies, entrepreneurs establish extensive trade networks that cross community boundaries, for instance Ridley (1996, pp. 195–211), and trade between some members of different local communities may require linking a portion of each community's road system. Perhaps traveling traders could negotiate access on each trip and pay tolls, but incentives arise to encourage members of each group to recognize rights to access to key linkage roads (although perhaps not to all roads) for those engaged in trade or other value-generating activities. Hoebel (1954, p. 122) provides an interesting example, explaining that if an Ifugao (a primitive tribal society in the Philippines) left his home district he would move through a "neutral zone" into a "feudal zone" where, "Permanent feuding relations with certain families in the area are the thing," and then into a 'war zones" where, "Anybody in the area is killed on sight. Head-taking expeditions make their stealthy raids in such areas whenever heads are wanted for purely prestige or religious reasons." Yet, a "courting swain" had customary immunity from attack when traveling outside his home district, perhaps because one way to end a feud was through intermarriage and the entire Ifugao society recognized the advantages of peace (Hoebel 1954, pp. 122–124).

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[12] Indeed, people often live and interact in many different communities (clubs) with voluntary governance from many different overlapping arrangements (Benson 1999b; Ostrom 2007, 2005).

[13] Various levels of custom can have different content and procedure (Fuller 1981, pp. 241–241):

> That the family cannot easily organize itself by a process of explicit bargaining does not mean there will not grow up within it reciprocal expectancies... Indeed the family could not function without these tacit guidelines to interaction... At the midrange, it should be observed that the most active and conspicuous development of [custom]... in modern times lies precisely in the field of commercial dealings. Finally, while enemies may have difficulty in bargaining with words, they can, and often do, profitably half bargain with deeds... That [customary norms are]... at home across the entire spectrum of social contexts does not mean that [they retain]... the same qualities.... At the terminal point of intimacy [custom]... has to do, not primarily with prescribed acts and performances, but with roles and functions.... In the middle area, [custom] ... abstracts from qualities and disposition of the person and concentrates its attention on ascribing appropriate and clearly defined consequences to outward conduct. Finally, as we enter the area of hostile relations.... the prime desideratum is to achieve - through acts, of course, not words - the clear communication of messages of rather limited and negative import; accordingly there is a heavy concentration on symbolism and ritual.

11.3.5 Implications from Sects. 11.3.1–11.3.4

(1) Voluntary production of club goods is likely for a small group because transactions costs are likely to be low (e.g., due to repeated dealing incentives); (2) larger groups can produce club goods if the group is made up of individuals involved in a multi-dimensional web of mutually beneficial relationships (e.g., due to exit threats and resulting ostracism sanctions); (3) even larger close-knit groups can produce club goods by lowering transactions cost through the substitution of customary rules or norms for repeated bargaining; and (4) if various club goods have different efficient sizes, a hierarchical linking of clubs can evolve, with functionally-focused norms to support production of those club goods which have large efficient scales compared to localized clubs while local clubs develop those goods that are smaller in scale.[14] None of this guarantees that the provision of club/public goods will be universally efficient in a Pareto sense, of course. It simply means that inefficiency is also not inevitable because incentives always exist to internalize externalities by developing a system of interrelated and overlapping clubs. Such voluntary (private) arrangements certainly could take considerable time to evolve, so even if they ultimately will arise, a "market failure" may appear to exist. Institutions might be created more quickly through coercion, so perhaps a political solution can be superior even if the voluntary process might ultimately succeed.

Mises (1949, p. 692) explains that market-failure justifications for coercive government (state) actions "ascribe to the *state* not only the best intentions but also omniscience." He then points out that neither assumption is valid: the state is not purely benevolent since both those who are employed by the state and those who demand state actions have subjective self-interests which may be achieved through the use of coercive power. Furthermore, the state is not all knowing since state decisions are made by individuals, knowledge is widely dispersed across individuals, and the cost of coordination is infinitely high, particularly without market profits and prices as coordinating mechanisms (Hayek 1973). These two assumptions are both relaxed below, in order to get a clearer picture of how and why the United Kingdom's system of road provision evolved as it did.

[14]Transactions costs also imply that there are limits to how extensive an inter-group network of cooperation can be, but there are other reasons to expect that these limits can be broken down if it is desirable. After all, as Mises (1957, p. 257) explains, "Man is not the member of one group only and does not appear on the scene of human affairs solely in the role of a member of one definite group. In speaking of social groups it must be remembered that the members of one group are at the same time members of other groups. The conflict of groups is not a conflict between neatly integrated herds of men. It is a conflict between various concerns in the minds of individuals." For example, a medieval merchant generally was simultaneously a member of the merchant community, a religious organization, and perhaps an urbanized community or neighborhood association, and the geographic dimensions of each varied. Thus, he was in fact familiar with the behavioral rules of several different groups and was in a position to facilitate the development of inter-group ties.

11.3.6 Benevolent Mandates by a Coercive Authority with Incomplete Knowledge

Suppose that an authority has the power to mandate that members of a community contribute to the production of a good that is non-rivalrous in consumption for community members and that all contributors are able to consume the good.[15] Further assume that the authority is benevolent and desires that an efficient level of the good be produced. The task for the authority is to decide how much of the good should be produced and how much each citizen should be required to contribute to its production. Suppose that the authority decides that the "fair" way to pursue production is a Lindahl "public good" allocation process as defined by Samuelson (1954), Foley (1970) and others. The Lindahl equilibrium requires that the total per-unit contribution made (resources contributed to production or prices/taxes paid) by each individual in the community equals the total per unit cost of the non-rivalrous good. These "Lindahl prices" or "Lindahl taxes" mean that every person's consumption decision is based on the share of the cost they must bear in order to obtain the club good. The resulting Lindahl equilibrium is Pareto efficient. A significant problem faces the benevolent authority, however, because in order to set the appropriate Lindahl prices/taxes the authority must know what each individual's demand functions is for all private and public goods. Since the demand determining preference functions are subjective, knowledge of actual demand functions is held exclusively by each individual. Everyone's incentives are to report a lower evaluation of the good than they actually have in order to "free ride." This free-rider problem is the justification often given for government provision, or at least government taxation to fund provision of, goods that are non-rivalrous in consumption, of course, because private producers will be under-paid by free riders, but the problem also undermines efficient public provision since the authority cannot know what individual preferences and valuations are. This preference revelation problem means that the authority cannot determine the efficient level of production or the appropriate Lindahl taxes. It is much more likely that too little of the good (e.g., if the authority accepts what individuals report to be their preferences) or too much of the good (if the authority assumes that individuals are lying, charges higher taxes, and produces more of the good) will be produced than that the Pareto Efficient solution will arise.

Since the actual decision by a benevolent authority cannot be based on the Lindahl process, some sort of approximation is required (e.g., equal taxes, taxes based on wealth which creates incentives to hide wealth). There is an alternative, however, which is much more likely to achieve an efficient equilibrium in which the members of the community reveal their relative preferences. Therefore, a benevolent authority

[15]The good could be rivalrous in the sense that congestion occurs with increased use, thereby reducing the benefits for all consumers, as explained below, but for now, assume that it is non-rivalrous, given the size of the community.

who recognizes the information problem that stands in the way of an efficient solution through coercive taxation should prefer this alternative.[16]

11.3.7 An Alternative for the Benevolent Leader: Privatization

If a benevolent authority really wants to establish a policy that might produce a Pareto superior outcome, one obvious option is to recognize private property rights in the free-access good. Private property rights create the ability to exclude non-payers even for non-rivalrous goods. Movies, concerts, and plays (and numerous other goods and services) are non-rivalrous in consumption, at least up to a point, but they are being provided through the market because people have the right to build theaters and exclude non-payers. In the case of roads, the *existing* roadways could be privatized so that each individual with exclusive ownership rights can charge a toll to any traveler and exclude those who refuse to pay. In this case, rather than relying on customary norms and their associated ostracism sanctions, or on coercively imposed state sanctions, to induce individuals to provide and maintain roads, they could rely on market forces to do so. If private property rights are complete and transactions costs associated with enforcing these rights are not prohibitive, a trading equilibrium should emerge as equilibrium prices are determined and each traveler pays each road supplier.

It should be noted that tolls are not the only way to pay for privately provided roads. A business community (club) may not charge tolls because it builds roads in order to attract customers (e.g., consider Disney World or a mall parking lot) who pay prices for goods or services that cover road costs (i.e., a non-rivalrous good can be bundled with rivalrous goods). Similarly, residential developers may build roads to make their lots more valuable, thereby covering the cost of the roads through the prices charged for those lots. Limits on access also can be achieved by means other than money prices. Thus, for instance, some private residential communities (clubs) discourage through traffic by limiting access to one or a few entrances and/or by installing traffic control devices like speed bumps (Newman 1980). Others place gates at their entrances with either coded locks or security guards. Privatization can lead to the development of club goods if relative net benefits of the market process are less than those of a club arrangement.[17]

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[16]The knowledge problem facing a benevolent authority is actually much broader than suggested here (Hayek 1973; Mises 1949). The authority also does not have the knowledge required for efficient production, for instance, as such knowledge is generally dispersed through large numbers of individuals.

[17]Note the analogy to Coase's theory of the firm (1937) wherein allocations can occur through markets or through firms if the transactions costs of market allocation are higher than the costs of making allocations within a firm hierarchy. This discussion suggests a third choice - cooperation within a club.

One response to this suggestion of privatization as a method for road provision is that if a private-property-rights-based system of roads is efficient then why did it not arise in England (or elsewhere) rather than club or government provision? One answer is that institutional evolution is path dependent (Benson 2005) so the development of cooperative joint production and non-price rationing (e.g., club-goods or government provision) arrangements were less costly, given the institutional environment, than development of a market system. Essentially, the transactions costs of establishing and maintain private rights in roads and relying on a market system (or mixed market and club good system) for creating a network of roads could be very high. With this fragmentation of land holdings, for instance, the transactions cost arising from creating a linked system of toll roads (even to link local club provided local roads) could be quite high. Even if the transactions costs prevent private creation of efficient road networks, however, once the road network exists, privatization could result in a relatively efficient system of allocation and of maintenance. Given true private property rights to existing roads, mergers between road owners should occur to take advantage of any scale economies in their provision and reduce the transactions costs of actual provision (e.g., a highly fragmented system tends to be costly as travelers must constantly stop to pay small tolls, but such costs would fall with mergers). If excess roads were produced prior to privatization, some would fail to attract sufficient revenues and go out of business. If the network has too few roads, once a market is in place, the profit motive is likely to lead existing road owners to expand and/or new road owners to enter. Therefore, a relatively efficient network is likely to arise. This did not occur, however, so the question posed above still remains. The actual answer appears to be that, just as state action is not likely to be able to achieve the Lindahl equilibrium, state action is not likely to produce a property rights arrangement that allows an unhindered market solution (i.e., pure private property rights). Indeed, there are no true free markets once government becomes involved. Regulations limit entry, mergers, pricing options, location choices, and so on. Subsidies, tax breaks, and bailouts are paid to some producers but not others, some markets are declared to be illegal, and so on. The primary reason is that in general government decision makers are not benevolent.

11.3.8 Relaxing the Benevolence Assumption: Pursing Self-interest Objectives Through Manipulation of Property Rights

As Coase (1960) and Demsetz (1967) emphasize, one motivation for creating property rights (or more accurately, rules of obligation to respect property claims) is to eliminate externalities and facilitate voluntary interaction. Coase (1960) also explains that these institutions determine the distribution of bargaining power and therefore the distribution of wealth, however, and while he does not focus on this issue, these distributional consequences also create incentives to assign and reassign property

rights by manipulating rules. Indeed, as Oppenheimer (1914, pp. 24–25) observes, an understanding of the formation and development of the state requires recognition of the fact that

> There are two fundamentally opposed means whereby man ... is impelled to obtain the necessary means for satisfying his desires. These are work and robbery, one's own labor and the forceful appropriation of the labor of others.... [T]he warriors' trade ... is only organized mass robbery... Both because of this, and also on account of the need for having, in the further development of this study, terse, clear, sharply opposing terms for these very important contrasts, I propose ... to call one's own labor and the equivalent exchange of one's own labor for the labor of others, the "economic means" for the satisfaction of needs, while the unrequited appropriation of the labor of others will be called the "political means."

Importantly, when rules arise through coercive power they can facilitate the pursuit of either the economic or the political means of personal wealth enhancement. In fact, positive law (state made law) almost always involves conflicting efforts to achieve both objectives (Benson 1999a). To illustrate this, consider the development of a kingship, such as those in Europe.

An entrepreneurial tribal leader skilled in organizing joint production of raiding often recognizes that an attractive way to gain wealth is through organized aggression against another community (e.g., the Viking raids in Europe). Plunder tends to produce relatively small long-term returns, however, compared to the wealth that might be extorted over time if productive people are subjugated and allowed to continue their productive efforts in exchange for payment of "protection money." Therefore, an entrepreneurial war leader may advocate invasion and occupation of the territory of the other community, rather than repeated plunder. Oppenheimer (1914) contends that the origins of the earliest states trace to precisely this situation, as nomadic hunting and/or herding communities from the relatively unfertile mountains, desserts, or sea coasts, invaded and subjugated those who had settled in fertile valleys.[18] Successful war leaders who conquer other territories often asserted that they are kings, although the result was not necessarily permanent. After all, conquered subjects' promises to honor an invader are credible because of the fear of violence, so the king has to be forever vigilant in policing existing claims, even as he attempts to legitimize his claim and expand his domain. The internal dynamics of such a coercive wealth transfer system appear to be relatively unstable (Levi 1988, p. 44), but there are ways to reduce internal resistance (Levi 1988, p. 11).

[18]Groups relying on hunting tended to develop improvements in technologies for hunting which enhanced their wealth in the short run, but the long-run effect was often quite different. Many migratory animals were hunted into extinction by primitive groups (Ridley 1996, pp. 227–247), for instance, because ownership could not be established until an animal was killed. However, because the members of the group relying on hunting developed new weapons and other inputs to hunting (e.g., domesticated horses, ships), and became skilled in the use of those inputs, they developed a comparative advantage in violence. Carneiro (1970) agrees but adds that successful creation of relatively permanent states of this type occurred where exit by those being subjugated was very difficult due to the surrounding hostile environment (e.g., oceans, desserts, mountains, other hostile communities).

11.3.9 Public Provision Leads to Common Pools

Kings do not simply try to create a monopoly in violence; they also attempt "to act like a discriminating monopolist, separating each group of constituents and devising property rights for each" (North 1981, p. 230).[19] By transferring property rights to those who might be in a position to threaten their control (e.g., reduced taxes; provision of subsidies, franchises, exclusive licensing, privileges such as access to "public" property and services; granting use and even partial ownership of land), kings can buy their support, while taking property rights from those without power (e.g., setting high taxes; regulating the use of so-called private resources by withholding licenses or franchises; limiting or preventing access to public property and services; and/or explicitly taking resources that private entities had owned prior to conquest). Furthermore, in a dynamic setting where relative power can change (e.g., individuals can organize into groups with collective power), the king has incentives to redistribute wealth as changes occur. Given the kings' use of wealth transfers (changes in property rights) as a low cost mechanism of insuring against competition, groups have incentives to compete for favorable treatment from kings. In cases where a coalition of groups could actually threaten the king's power, he actually has incentives to encourage such "rent-seeking" competition (Levi 1988, p. 12), since by keeping sub-groups divided into adversarial political camps the possibility of a strong coalition forming to challenge for control is reduced. By focusing such competition in "advisory councils" or "representative assemblies," the transactions cost of interacting with various powerful groups is lowered (North 1990, pp. 49–51), and powerful groups also see their interests linked to the interests of a "sovereign" as they have a more direct say in the decision-making process (note that roads and communications networks connecting the king's central location with the outlying locations of his potential rivals are also important in this context (Levi 1988, p. 28)). Significantly, however, in such a political environment property rights are never "given": they are permanently in play, because as the relative power of groups change, some property rights are reallocated. Furthermore, one imposed change in property rights inevitably sets off a long chain of reactions (Benson 1984, 2005). For instance, the king may claim large amounts of property (e.g., William claimed ownership of all land in England after his successful invasion in 1066) but then grant "privileges" in the form of various access and use rights to powerful allies or potential enemies. Because of the instability in the relative power structure, more and more groups have incentives to organize and enter the competition (Benson 1984), but reducing existing privileges undermines support from already active and powerful groups. Thus, more individuals and groups obtain access to public property and services which becomes increasingly plagued by common pool problems. When property rights are subject to authoritarian alterations the result is a continually spiraling race for rents (Anderson and Hill 1990; Benson 1984, 2005) which dissipates wealth as resources are used up in the competitive process of trying to influence the coercive power.

[19] Also see Levi (1988, pp. 10–14).

Another closely related reason for the emergence of common pools arises when rights are significantly altered, or when they become sufficiently tenuous due to frequent changes. As Leoni (1961, p. 17) emphasizes, this has "a negative effect on the very efficacy of the rules and on the homogeneity of the feelings and convictions already prevailing in a given society .... [T]he fact that the very possibility of nullifying agreements and conventions through supervening legislation tends in the long run to induce people to fail to rely on any existing conventions." In other words, the fact that property rights are in play creates uncertainty about the stability of existing rules (obligations), including the security of whatever the property rights assignments might be at any point in time.[20] When this happens, individuals may quit performing previously worthwhile functions, such as road maintenance.

If the function is demanded by powerful groups, the king may try to force the previous behavior, and if that fails then the king (through a bureaucracy) is likely to use tax revenues to directly producing the function. Once the king (or a designated bureaucracy) begins to produce such "public services," access becomes something the king can hand out to supporters. Again, as competition for rents expands, many people obtain access to these services. The result is a common pool unless the service is non-rivalrous in consumption (e.g., see Benson 1994, 1998, 2010 regarding public policing, public prosecution, public courts, and public prisons). As those with free access to a publicly provided good or service increase in number, congestion (crowding) and overuse is inevitable. Rationing of the publicly provided service by first-come-first-serve (queuing) and its resulting congestion also typically leads to in rapid deterioration in quality. Other rationing methods can arise (as they do with club goods when overuse occurs), with quotas, limits on use through licensing, merit allocation, and so on, but when these non-price rationing mechanisms arise through coercion rather than voluntary agreement, the rationing process itself consume resources, in part because they must be enforced.

11.3.10 Implications from Sects. 11.3.6–11.3.9

(1) Even if the authority making decisions about the taxes to collect in order to produce a non-rivalrous non-excludable good is benevolent it is not omniscient; it is not possible to set the efficient levels of taxes and production because of the knowledge problem; (2) if the authority truly is benevolent and wants to establish a policy that might produce a Pareto superior outcome, the authority should allow the creation of private property rights in the free-access good(s) so owners can legally exclude non-payers (even for non-rivalrous goods) and market forces can determine prices and quantities of the product, moving the

[20]The resulting incentives for the use of tenuously owned property are similar to those with common pools. The incentives are to consume the property quickly before the government takes it away. Furthermore, incentives to invest in maintenance and improvement are very weak for the same reason - the current owner cannot be confident that he/she will be able to consume the benefits of these investments because the property may be transferred before the benefits are fully realized.

outcome towards a trading equilibrium; (3) authorities with coercive power are not benevolent, however, so the distributional consequences of coercive property rights assignments/reassignments create incentives to assign and reassign property rights in order to increase wealth of the authority and/or his/her supporters; and (4) more and more groups have incentives to organize and compete for privileges and benefits, and as the population with access to publicly provided goods and services increases, common pool problems arise. All of this suggests that government actions to replace private processes is not likely to achieve anything close to a Pareto solution, so the existence of what appears to be a private-sector (club or market) failure does not justify government intervention, at least from an efficiency perspective. Now let us turn to the early system of road provision in Great Britain where such arrangements actually developed, not once, but twice.

11.4 Roads as Club Goods in Medieval Great Britain

The Romans,[21] who arrived in 43 A.D., built "great military highways" in Britain in order to move their legions into the remote regions of the Island (Jackman 1966, p. 1).[22] While there is little doubt that the Roman roads were important transportation arteries for centuries, they were "by no means so good nor so complete" that a much larger system of other roads were not needed (Jackman 1966, p. 4).[23]

11.4.1 Roads in the Hundreds System

Direct knowledge of the process of development and maintenance of roads in Britain before the twelfth or thirteenth century is almost non-existent, but a good deal can be inferred by considering evidence of the kinds of travel that occurred, and by examining the system of roads and customary arrangements for road maintenance that existed shortly thereafter. With the fall of Rome, Europe moved into a period dominated by localized and largely self-sufficient agricultural communities. Nonetheless, the fact that at least some parts of the road networks were in good condition is evidenced by the records of military marches, some averaging as much as fifty miles per day (Gregory 1931, p. 94). Furthermore, Royal income for Anglo-Saxon kings was mostly in the form of the agricultural output of the royal estates, and in order to consume this income a King and his household had to travel from estate to estate throughout the year (Benson 1998, p. 204). Thus, there is substantial evidence that

[21] This section draws from and expand on Benson (2006).

[22] There is evidence of a network of roads in Britain prior to the Roman conquest, although much of it is indirect (Jackman 1966, p. 3; Gregory 1931, pp. 45–55).

[23] Also see Gregory (1931, p. 94). These other roads were not funded or maintained by the state (Roman roads that survived into the Middle Ages were not maintained by the state either).

these kings and their courts "moved incessantly around the kingdom, occasionally with the army" (Hindle 1982, p. 193), requiring passable roads to carry a "very sizable company" (Stenton 1936, p. 6). While such long distant travel occurred, however, indicating that a system of passable roads linked various parts of the Island, the fact is that the vast majority of road use involved local people traveling short distances (Beresford and Joseph 1979, p. 273):

> Journeys to markets, churches and courts are the principal exceptions to the generalization that most medieval roads were entirely local in purpose with an ambition no higher than to serve the villagers' immediate wants. There was need for lanes to provide access to holdings in the fields; to take loaded wagons to the windmill or to the watermill in the meadows; to reach the woodland with its timber, its fruit and its pannage for swine; to take the flock to the common pastures and heaths. The course of the roads with a purpose so narrow would be determined only by local needs.

Thus, almost all of the benefits of roads were internal to the members of local-close knit communities, and local institutions and customs determined how those roads were created and maintained.

By the tenth century, there was a clearly recognized hierarchical institutional arrangement in Anglo-Saxon England. Blair (1956, p. 232) points out that two of the primary purposes of these organizations were to facilitate cooperation in rounding up stray cattle and in pursuing justice.[24] When a theft occurred, for example, the several "tithings" that made up a "hundred" were informed: they had a reciprocal duty to cooperate in pursuit. A tithing was apparently a group of around ten neighboring families, many of whom probably were kin, while a hundred was a group of around ten neighboring tithing. A primary reason for recognizing reciprocal duties was that these organizations produced a number of valuable benefits more efficiently than individuals could, such as the return of stray cattle, deterrence, restitution to victims of law violations, some forms of credit, and so on.[25] These clearly were close-knit communities with multi-dimension webs of mutually advantageous interactions.[26]

Many functions beyond rounding up stray cattle and policing were performed by the tithing and hundred, including dispute resolution *and* road maintenance. Representatives of each tithing traveled to the hundred court, for instance, which met regularly to resolve disputes (Blair 1956, p. 233). When an individual was charged with an offense against someone in a different tithing, his tithing also had a customary obligation to bring him to the site of the meeting of the hundred for the trial

[24] Both can probably be characterized as club goods since cattle were generally held in community pastures to capture scale economies in herding (Dahlman et al. 1980), and policing presumably produced community wide deterrence effects.

[25] See Benson (1998, pp. 198–203) for more detailed discussion of these organizations.

[26] The hundreds were described in some of the king's early codes, so Lyon (1980, pp. 67, 84) argues that as kingdoms grew kings needed a way to organize local government; thus, they presumably established the tithings and hundreds as local judicial administrative units. However, as Blair (1956, p. 235) points out, such an interpretation is erroneous because it "mistake[s] the nature of Anglo-Saxon legal codes which were not so much concerned with promulgation of new law as with codification of established custom. There is little doubt that the hundred [and tithing] was functioning as a unit" before it appeared in any code.

(Stephen 1883, p. 71). Furthermore, higher order jurisdictions apparently existed, as a dispute between individuals who were not in the same hundred went to a shire court.[27] Importantly, in the context of this presentation, under Anglo-Saxon custom, representatives of each tithing were obligated to travel to the various courts, so local road systems clearly were linked and at least some rights to passage over some of the roads of one local community were recognized for members of other local communities (i.e., interconnecting roads were club goods that were extensive in order to produce another large scale club good: peaceful dispute resolution).

While there is no actual documentation of road maintenance and production before records began to be produced in the twelfth and thirteenth centuries (Webb and Webb 1913, p. 5), several inferences can be drawn regarding what was done. First, land over which a road passed actually "belonged" to the owner of the land on either side of the road, in the sense that if a road was abandoned (e.g., because travelers began beating a different path), it would revert to that landowner (Pawson 1977, pp. 65–66). However, under Anglo-Saxon custom, one of the rights to part of the land (i.e., use of the road) was assigned to the extended community (hundred) as an easement: "the right of passage was a communal right" (Pawson 1977, p. 66). Indeed, the concept of the "highway" initially referred to customary rights-of-passage rather than to the roadway or path itself (Jackman 1966, p. 5). Second, road construction and maintenance did not involve anything like modern highway construction. Individuals had customary obligations to other members of a tithing and hundred to remove any impediments to travel such as overhanging trees, hedges, logs, and perhaps water, through a drainage ditch (Webb and Webb 1913, pp. 6–7; Jackman 1966, p. 4), not to build roads. In fact, the word "road" apparently comes from the Anglo-Saxon word "ridan" (to ride) which may derive from the verb "rid," meaning to free or clear away any obstruction. Third, the members of the hundred had a customary obligation to make sure that all members maintained the roadways over their lands (Jackman 1966, p. 33). The actual need for enforcement was rare (Bodey 1971, p. 14), however, due to the multiple dimensions of reciprocities that existed within these close-knit communities.

The road system of the hundreds was in place through the middle of the eleventh century and it proved to be adequate enough to make "possible a centralization of national government to which there was no parallel in western Europe" (Stenton 1936, p. 21) following the Norman Conquest in 1066. After all, the dramatic increase in centralization required a substantial amount of travel by royal officials such as tax collectors and judges, and by armies when rebellions arose, as well as by politically connected citizens (e.g., Barons, representatives of the major church institutions

[27] Above the shire court there was, apparently, a third level of courts "which were, so to speak, hundreds in themselves" (Stephen 1883, p. 67). Note, however, that the higher level courts were not anything like modern courts of appeal. They were simply increasingly inclusive with jurisdictional rules requiring that a dispute be handled by the least inclusive group that encompassed the parties in the dispute. Also note that the rules applied in these courts were customary rather than royal in origin. A panel of jurors with equal numbers of representatives from the separate tithing supervised the trial, which generally involved oath taking (reflecting the important role of reputation in these communities) or ordeal (reflecting the strong religious beliefs of the time).

such as abbeys and monasteries) who had to visit the royal court. At the same time, however, many of the incentives underlying the hundreds were undermined. For instance, William seized virtually all of the land in England, and while he held many large estates for his own use, he also granted use of large tracts to Barons and the Church in exchange for support. Enclosure of some land which had been controlled by local agricultural communities as open fields and common pastures soon followed (Darby 1973, p. 85). In particular, land granted to the aristocracy, called the demesne, could be enclosed (other types of land were controlled by freeholders who paid rent to the lord, and by the villiens who provided labor to the lords). The Statute of Merton (1236) also permitted the lords to enclose large portions of the "waste," the high woodlands and unimproved pastures that lay in clumps around the arable lands, at the expense of the freeholders and villiens who used such areas as pasture, and as noted in Darby (1973, pp. 98–99), grazing was also significantly restricted in the vast royal forests and parks "in the interest of the chase." With increasing enclosure, the potential for straying cattle was diminishing so the value of this cooperative function of the tithing was also declining. Then, in the 1400s, as wool prices rose relative to grain prices, the landed aristocracy evicted large numbers of tenants and enclosed additional large tracts of land, converting it to sheep pasture from crops and stubble fields upon which cattle had grazed. Hundreds of local villages were abandoned (Darby 1973, pp. 210–211). Many of the remaining kinship groups and tithing were broken apart as people were driven from their traditional homes. In addition, the Normans replaced the Anglo-Saxon restitution-based "man-price" system (wer) with a criminal law system involving fines to and confiscations by the king along with corporal and capital punishment (Pollock and Maitland 1959, p. 53; Benson 1998, p. 205). This withdrawal of the right to restitution had significant implications for the tithing and hundred because it substantially reduced incentives to maintain the reciprocal arrangements for protection, pursuit, prosecution, and insurance, and to participate in the local court system. Indeed, the king's expectation that the local communities would continue to provide policing and prosecution in order to collect revenues and property for the crown, without compensation, proved to be unfounded, leading to a long series of institutional changes (Benson 1998, pp. 205–223). Thus, for various interrelated reasons the hundreds became ineffective or disappeared.

While members of local communities that remained probably still had incentives to maintain roads for local use, the breakdown of the voluntary hierarchical tithing-hundred-shire system apparently produced a growing problem of under-maintenance for some long-distance connections. Local freemen were probably less likely to travel between communities, at least voluntarily, so they had weaker incentives to maintain those arteries that were predominantly for long-distant (inter-community) travel, at the same time that the demand for long distance travel was growing from other sources.[28] As noted above, the demand for long-distance travel due to the activities of the king and his court increased dramatically under the Normans. In addition, representatives of the church with its widespread land holdings also traveled

[28]The Normans did mandate that local freemen travel to royal courts, although there was considerable resistance to such requirements (Benson 1998, pp. 210–212).

extensively, as explained in more detail below. Trade also was expanding throughout eleventh and twelfth centuries (Benson 1989). Most commercial retailing activities took place at fairs during this period, and merchants traveled from fair to fair in order to sell their wares and buy others (Benson 1989), thus requiring increasingly intensive use of some roads (Gregory 1931, p. 95; Willan 1976, p. 13).

Kings claimed royal rights to free passage for themselves and their courts to travel anywhere in their kingdom, as well as for anyone traveling to his court on royal business, and expected roads to be provided for these purposes. This claim was reinforced after William's seizure of land, because, even though he granted fiefs of land to his supporters and others that he wanted support from, he retained a claim of absolute authority over the use and disposition of the land granted to these individuals. Landholders controlled land only as long as they performed their required duties and paid their required fees. Successes in putting down rebellions (e.g., against William's successor William Rufus in 1088 and 1095, and against Henry I in 1101) tended to strengthen this property rights arrangement, so the Norman kings' claim of free passage, was simply, in their minds, a right to pass over their own lands. Not surprisingly, then, of the three groups demanding access to roads for long distance travel, it was not the royal government that took up the road-provision task after the breakdown of the hundreds; it was the religious and merchant communities.

11.4.2 Replacing the Hundreds: Merchants, Parishes, and Monasteries

Numerous examples of merchants and merchant organizations contributing to the construction and/or maintenance of roads, and especially bridges, can be found (Jackman 1966, pp. 15–16; Gregory 1931, pp. 97–98).[29] Some guilds were particularly active in this regard, especially when much of the business of the country was conducted at local fairs, and this was the case until the establishment of more permanent markets. However, some guilds and wealthy merchant benefactors continued supporting bridges and roads well into eighteenth century; as Pawson (1977, p. 73) explains:

> Many private improvements were, of course, carried out purely in self-interest. New roads were built to promote the exploitation of mineral wealth within estates, and to enable landowners to divert existing highways ... Sometimes an economic interest led to improvements in the surrounding area, benefiting everyone.... However, when there was little direct return to those involved in private schemes, there efforts were primarily for the social good. It was illegal for a toll to be charged on a public highway without the consent of parliament

[29] Note that the "commercial community" of this period can also be characterized as a club ruled by customary norms, as merchants established their own participatory dispute resolution forums at each market and fair (Benson 1989). The earliest merchant guilds also arose spontaneously, both to provide protection for foreign merchants who were away from their homes, and to protect against unknown foreign merchants who might take advantage of a local merchant and then never return (Milgrom et al. 1990, p. 4).

> so it was not possible to charge those who benefited from such works except by voluntary means.

Nonetheless, there were actually some very important rewards for such local benefactors. After all, roads played a very significant role in determining the success of a market town (Hindle 1982, p. 207) and those trading within it, so other members of both the local community and the merchant community tended to be very grateful to someone who aided the two communities in this way. Thus, building and maintaining roads and bridges was an investment in reputation. And for Christians, even more significant personal benefits were anticipated.

The medieval Church probably had greater demands for long distant travel than the royal court. For one thing, the Church was a major trader (Bewes 1923, p. 9), and in addition, many of the important fairs were held at priories and abbeys. Furthermore, the Church encouraged pilgrimages (e.g., the road from Winchester to the shrine of Thomas Beckett in Canterbury became known as the Pilgrims Way). The Church also maintained frequent tours by peripatetic preachers and friars, but perhaps the most significant source of Church-related travel was the monasteries, whose scattered estates required constant visits (Gregory 1931, p. 95; Jackman 1966, p. 8). Therefore, the Church promulgated the belief that care of the roads was "a work of Christian beneficence, well pleasing to God" (Jackman 1966, p. 8). This created incentives for private citizens within the Christian community to aid in the maintenance of roads and bridges, and the Bishops' registers throughout the United Kingdom provide ample evidence of such activity (Jackman 1966, p. 16). Indeed, such religious beliefs explain the development of the long-lasting customary obligation that members of local parishes accepted for road maintenance (Jackman 1966, p. 30) after the decline of the hundreds.[30] That is, for the purpose of road maintenance (but not for many other functions that had been performed by the hundreds), parishes replaced the hundreds system in the production of this club good, with the aid, encouragement, and where necessary, supervision of the monasteries and bishops of the church. Indeed, and importantly in this context, the monks also accepted a customary obligation to maintain roads, willingly taking on the task because it "was a pious work highly to be commended" (Jackman 1966, pp. 30–31). Thus, the merchants, **and** especially the monks, tended to supplement the parishes where local incentives to maintain roads were relatively weak due to substantial long-distant traffic.

The various local, religious, and merchant communities who established and maintained roads in the United Kingdom prior to 1500 were apparently quite effective, given the technology available. Indeed, the "essence of a modern road pattern existed in the early fourteenth century" and transportation of goods and passengers "could be easily and efficiently undertaken by road" at least throughout southern England and the Midlands (Darby 1973, pp. 174, 287). This system of voluntary road maintenance was also ultimately undermined, however, as a consequence of the almost continuous struggle for power between the English kings and the Church. Henry VIII finally dissolved the monasteries in 1536-39, divided their properties,

[30] See also Pawson (1977, p. 68).

and transferred them to "a class of rapacious landlords who would be slow to recognize any claim upon their rents for the maintenance of roads .... The inevitable result would be a rapid decadence of many highways which had hitherto been in common use" (Jackman 1966, p. 29), also see Gregory (1931, p. 96), and Parkes (1925, p. 7). Local parishes continued to maintain roads in many areas, particularly for local travel (probably 80–85 % of the actual roads in Great Britain), and various merchants and guilds also continued to provide support for some roads and bridges near market towns, but the elimination of the monasteries was apparently quite significant with regard to the roads used for long-distant travel. These roads began to deteriorate (possibly 15–20 % of the roads). Indeed, Jackman (1966, pp. 30–31) contends that the seizure of the monasteries was the primary factor leading to passage of the "Statute for Mending of Highways" in 1555 which mandated that parishes establish a very specific institutional arrangement for maintenance of **all** roads in each parish.

11.5 Evolving Road Policy in the United Kingdom

After seizure of the monasteries, parishes continued to maintain many roads used by parish members but without the help and encouragement of the monks they were often unwilling to maintain the heavily traveled arteries, at least at a level that was satisfactory to many who wanted to use them, including representatives of the state.[31] Therefore the Statute for Mending of Highways (1555) simply ordered the parishes to do, by themselves, what they had been doing with the help and encouragement of the monks.

11.5.1 The Mandated Parish System

Local justices-of-the-peace (JPs) were ordered to appoint two parish surveyors of highways, chosen from a list provided by each parish.[32] The surveyors were ordered to travel the parish at least three times a year to inspect the roads and bridges, see to it that landowners were keeping roads and ditches clear of impediments and announce before the church meeting any violators of the statute. They were also required to collect and account for the fines, compositions and commutations that arose as a result of the failure of individuals to contribute their required inputs (discussed below) to highway maintenance. The JPs were to audit the surveyors' accounts, hear pleas of excuse for non-fulfillment of the statute's input-contribution requirements, levy fines

[31] This section also draws from and expands on Benson (2006).

[32] The JP office was created in 1326 with a mandate "to keep the peace" (Stephen 1883, p. 190). Appointed by royal commission for each county, JPs were to pursue their duties without monetary compensation. Over thirty statutes instituted between the late fourteenth and the middle of the sixteenth centuries establishing additional functions for JPs, including those dealing with the road maintenance.

and order seizures for violations, and when necessary, collect a tax from the parish residents to cover an extraordinary expense. Both the JPs and the surveyors were to perform their tasks without compensation. All of the manual labor, tools, horses and carts needed for repairing the roads were to be provided by the parishioners, also without any compensation. Specifically: "Every person for every plough-land in tillage or pasture" and "every person keeping a draught (of horses) or plough in the Parish" had to provide a cart with oxen or horses, the necessary tools, and two men annually to work four eight-hour days (raised to six days in 1563) in road maintenance on the days chosen by the surveyors. Those households which did not own farm land, horses, or a plough were also required to provide labor, either in person or hired, for the same period.[33] As Parkes (1925, p. 8) notes, however, "Though an elaborate system, it neither sought to introduce any effective method of repair nor took heed of the frailty of human nature."

The mandated obligations of the highway statute of 1555 were largely unnecessary for the roads over which travel remained largely local, and for roads that were heavily used by travelers who did not live in the local community (particularly in the area of London), they were largely unsuccessful.[34] On these heavily traveled roads, traffic by government officials, by freighters using heavy wagons or long pack trains, and by cattle herds being driven to markets "kept the roads in a perpetual slough" (Parkes 1925, pp. 6–7). The burdens placed on the parishioners seemed to them to be very inequitably distributed (Webb and Webb 1913, p. 29).[35] As a result, many did not show up for the mandated work, others sent children or some other substitute instead, and those who did present themselves for work, "often poor men who could ill afford wageless days – would spend most of their time in standing still and prating, or asking for largesse of the passers-by ... so that they became known as The King's Loiterers, in derision of their earlier title, the King's Highwaymen" (Parkes 1925, p. 9). Therefore, JPs were obliged to collect large numbers of fines (Willan 1976, p. 3).

A long series of additional statutes attempted to create sufficient negative incentives to induce the parishioners and surveyors to do their mandated duties. Ultimately none worked and the system of fines evolved into commutations to be collected from individual parishioners that relieved their obligations to perform the statutorily mandated duties and allowed the JPs to hire laborers to work under the supervision of the surveyors (Pawson 1977, p. 71; Webb and Webb 1913, pp. 20–21). These funds also proved inadequate for the heavily traveled arteries, however: "Indeed, what with the lack of any definite valuation roll or fixed assessment, the complications and uncertainty of the law, and the unwillingness of both Surveyors and Justices to be at the trouble of legal proceedings against their neighbors, it is plain that under the commutation system the greatest inequality and laxness prevailed" (Webb and Webb 1913, p. 36). Thus, commutations were supplemented with a general highway tax

[33] See Webb and Webb (1913, pp. 14–26) for more details on this statute and others which followed.

[34] See Albert (1972, p. 8), Darby (1973, pp. 290, 372), and Pawson (1977, pp. 68–69).

[35] Indeed, these cost were often made even higher because the best time of the year for road repairs was also the busiest time of the year for most parishioners since they were engaged in agricultural production (Parkes 1925, p. 9).

from the mid-seventeenth century onward. However, an even more important source of funds was generated through the criminal law with fines levied by the royal courts through presentment or indictment of the parish as a whole for the non-repair of its highways (Webb and Webb 1913, pp. 51–61). Some parishes were perpetually under indictment, and "At varying dates in the different Counties, but eventually ... nearly all over England, it became the regular thing for a parish periodically to find itself indicted at the Sessions for neglecting to keep its highways in repair" and to pay a substantial fine rather than repair the roads (Webb and Webb 1913, pp. 53–54). Despite these sources of revenues, however, the quality of road and bridge construction and repair on the major arteries did not compare to what had been done under the supervision and encouragement of the monks in the previous centuries (Parkes 1925, p. 30).[36] Part of the problem was that surveyors, typically farmers who served for a single year, had no expertise in organizing road repairs and no incentives to see that it was done well (after all, some other farmer would be responsible for taking care of the problems next year if they were not completed), in contrast to the monks who had specialized in such activities and considered them to be long-term obligations to God. In addition, the mandated repair procedure (e.g., periodic large scale efforts rather than ongoing repairs as damage began to appear) was not an efficient way to carry out the task (LaMar 1960, pp. 8–10).

The failure of the mandated parish system to maintain the major long-distance arteries left parliament with relatively few options. One that was tried was a long series of regulations defining "unreasonable" uses of the roads, establishing limits on weight and the number of horses, and so on (Pawson 1977, pp. 74–75). That was an attempt to ration the commons through various restrictions on how it could be used. Surveyors and JPs were expected to enforce these laws, but they were reluctant to do so. A second and more important approach was loosening central government control over and claim to tolls.

11.5.2 Toll Roads and Turnpike Trusts

The right to charge a toll in the United Kingdom had been severely restricted, in part because tolls were an important source of royal revenues (Jackman 1966, p. 11). Kings had long required that tolls be collected from travelers who crossed certain bridges or used some roads. These revenues were not earmarked for road maintenance, however, so they went into the general treasury. Officials who collected tolls also retained a portion for their own purposes, but those purposes rarely included road maintenance. Kings (and later parliament) had the power to grant the right to collect tolls to private individuals or organizations, although they were reluctant to do so for fear of losing this source of revenues. Nonetheless, there is evidence that burgesses (merchants who formed local governments in market towns) in several politically important communities had petitioned for and been granted the right to

[36] Also see Jackman (1966, pp. 48–49).

collect tolls as early as 1154 (Jackman 1966, pp. 9–11). Furthermore, there was one situation under which tolls could be collected by a private citizen without getting government permission: land owners could charge for passage through private land as long as an easement (customary or mandated) had not already been established. Not surprisingly, there is considerable evidence that enterprising land owners began to establish new "private roads" that allowed travelers to avoid the "ill-repaired public highways" (Pawson 1977, pp. 73–74), charging tolls for access. This option was severely limited, however, both by the fragmentation of land and by the fact that easements through many feasible routes already existed. Members of several parishes recognized that these private toll roads suggested an alternative way to finance their required road maintenance activities, however, and the early market-town toll roads provided clear precedent for granting the right to limit access and charge tolls. Thus, politically influential individuals and groups in some parishes began petitioning parliament for the right to collect tolls in order to finance maintenance of certain heavily traveled arteries, and a long series of parliamentary acts were passed beginning in 1663 enabling the establishment of local *ad hoc* bodies known as "Turnpike Trusts." It must be emphasized that these were not parliamentary innovations. The initiative was always at the local level (Albert 1972, p. 12), as parishioners had to petitioned parliament for establishment of a trust for each segment of road on which they wanted to exact tolls.[37]

After about 1700 the turnpike-establishment process became fairly standardized. A group of local landowners and/or merchants would accumulate the money necessary to fund pursuit of a Turnpike Act in parliament and to carry the cost of the trust through its start-up period (Moyes 1978, p. 406). Each Turnpike Acts established a Turnpike Trust and granted it an exclusive right to operate a road (generally for 21 years), fundamentally altering the customary rights-of-passage for most travelers (but see discussion of exemptions below). Trustees did not have complete private rights to the roads they were to operate, however. They were responsible for erecting gates to collect tolls, appointing collectors and a surveyor to supervise repairs and a Clerk and Treasurer to administer the trust, but the trustees were required to be unpaid. The tolls to be charged for various types of traffic were often specified in the legislation, and the funds collected could only be applied to the road named in the Act. No revenues could be diverted to other uses or retained as profit. If start-up costs were significant a Trust could mortgage its future tolls, and many did so, with long-term loans. If the tolls were insufficient to cover costs at particular times (e.g., up front), trusts were allowed to borrow more at a rate of interest fixed by the Act.

Turnpikes were usually existing roadways, although new roads were also built, particularly after 1740, and more importantly, the extent of "usable" roads for heavy traffic expanded significantly through turnpike creation (Webb and Webb 1913, p. 144). The early turnpikes were maintained using the same techniques as the monasteries and parishes had employed before (Darby 1973, p. 374), but much more intensively (Pawson 1977, p. 107). Thus, the quality of the turnpikes tended to be sub-

[37]For detailed discussions of Turnpike Trusts, see Pawson (1977), Webb and Webb (1913), and Albert (1972).

stantially higher than the previously free-access roads they were established on. Furthermore, trusts employed paid surveyors who, thorough specialization, developed expertise in road maintenance, and after about 1750 there is considerable evidence of experimentation and innovation in construction and maintenance by some of these specialists. Webb and Webb (1913, p. 144) note, for instance, that

> Between 1750 and 1770, when the number of Turnpike Trusts was actually trebled, the contemporary self-complacency over the new roads rises to dithyrambic heights, "There never was a more astonishing revolution accomplished in the internal system of any country,' declares an able and quite trustworthy writer in 1767, 'than has been with the compass of a few years in that of England. The carriage of grain, coals, merchandize, etc., is in general conducted with little more than half the number of horses with which it formerly was. Journeys of business are performed, with more than double expedition.... *Everything wears the face of dispatch* ... and the hinge which has guided all these movements and upon which they turn is the reformation which has been made in our public roads [the turnpikes]."

Innovations in surfacing, road widening and banking (Webb and Webb 1913, pp. 133–134), and later, improvements in administration (primarily through the combination of small turnpike trusts into larger administrative units supervises by professional road managers/surveyors, as discussed below) all made travel in the United Kingdom faster and less expensive.

As the preceding quote suggests, Turnpike formation really accelerated during the 1750s (and actually, during the 1740s as well), so by 1770 Trusts controlled almost 16,000 miles of turnpikes (Moyes 1978: 407). In this regard, note that the period of rapid expansion in turnpikes (1740–1830) involved a dramatic increase in heavy long-distance traffic due to the industrial revolution. Indeed, the early period of the industrial revolution was supported by turnpike road (and to a degree, by water) transport, rather than by the railroad system that often seems to get credit for supplying the transportation needs of the revolution (Pawson 1977: 338).[38] As

[38]The correspondence between the timing of the turnpike era and the beginnings of the industrial revolution is more than accidental. As Webb and Webb (1913, pp. 143–144) explain,

> With the coming the Industrial Revolution, with a rapidly increasing population, with manufactures ready to leap from the ground, with unprecedented opportunities for home and foreign trade, improvement of communication between different parts of the kingdom became, from the standpoint of material property, the most urgent requirement. Today, the railway and the tramway, the telegraph and the telephone, have largely superseded roads as the arteries of national circulation. But, barring a few lengths of canal in the making, and a few miles of navigable river estuaries, it was, throughout the eighteenth century, on the King's Highway alone that depended the manufacturer and the wholesale dealer, the hawker and the shopkeeper, the farmer, the postal contractor, the lawyer, the government official, the traveller, the miner, the craftsman and the farm servant, for the transport of themselves, and the distribution of their products and their purchases, their services and their ideas.... And all contemporary evidence indicates that, what with the surface-making and embanking, widening and straightening, leveling and bridging, the mileage of usable roads was, by the eighteenth-century Turnpike trusts, very greatly extended.

Indeed, the tremendous increase in economic activity that began during the mid to late 1700s could not have occurred without the simultaneous improvements in transportation. Furthermore, the development of the British railroad system did not really begin until the 1820s as the turnpike

explained below, the growth of railroads did not begin until the turnpike system peaked. Indeed, aspects of the industrial revolution also helped lead to the demise of the turnpike system as advocates of competing modes of transportation, including the developing railroads, and shippers who wanted reduced their own transport costs (part of which was the tolls they had to pay), manipulated the political process to undermine the ability of turnpike trusts to form, operate efficiently, and/or collect sufficient revenues to maintain their roads. Thus, turnpike activity peaked in about 1830 when there were 1,116 Turnpike Trusts operating 22,000 miles of roads (Roth 1996, 176), and declined thereafter, but the decline was due to political factors rather than purely economic factors.

11.5.3 The Decline of the Turnpike System

The Turnpike era came to an end due to a combination of at least three factors. First, the politically mandated structure and characteristics of the trusts created significant principal-agent problems. The Trustees were not allowed to be paid or earn profits, so other income generating activities (farms, businesses) commanded most of their attention, and they generally were not interested in the day to day operation of the road. Toll gates were farmed out, and while trustees were supposed to monitor the gate-keepers and surveyors, their incentives to do so were very weak. Furthermore, there was no threat of takeover when a trust was operated inefficiently, so the competition for control that regulates managerial behavior in modern for-profit corporations was not at work. With little monitoring and no competitive threat, corruption increased, becoming widespread, "and only a small part of the money collected for the upkeep of the road was in fact used for that purpose" (Hindley 1971, p. 63). Many small trusts had borrowed excessively using long-term mortgages of toll revenues, but then because of inefficient management and increased competition (political and market), they were unable to meet their debt payments.

Second, the political limitations on trusts also led to significant complaints by shippers and travelers. While they probably did not want to pay tolls at all, that may not have been the most significant cost imposed by the turnpike system. A serious complaint was that there were too many toll booths, requiring too many stops, thereby slowing transportation services unnecessarily. Gregory (1931, p. 193) suggests, in fact, that this was the most important complaint against the turnpikes, concluding that: "Road users declared that they would rather pay twice the amount if they could be saved the annoyance of the delay." This problem resulted from the fact that most of the turnpike trusts controlled only short sections of roadway within a parish, so travelers had to pay new tolls each time they left one trust's road and entered another (Webb and Webb 1913, p. 177). While consolidation of small trusts was desirable, the

(Footnote 38 continued)
system was nearing its peak (Pawson 1977, p. 8), and well after the beginnings of the industrial revolution.

trusts operated at the prerogative of parliament, and any formal consolidation required parliamentary approval. Some efforts were made to obtain parliamentary approval to combine small trusts into larger organizations, particularly after the reason for doing so was articulated by John Loudon Macadam, beginning around 1810, but parliament did not respond with necessary enabling legislation that might have led to widespread consolidation, choosing instead to deal with such merger proposals individually and quite slowly (Webb and Webb 1913, pp. 177–180). The cost of influencing parliament combined with political resistance to consolidation (e.g., by local trust employees such as toll collectors who did not want to lose jobs, and by alternatives modes trying to reduce competition from more efficient turnpikes, as explained below) meant that the vast majority of the small trusts remained independent until their bankruptcy and demise.

Third, there was significant political opposition to the trusts themselves. Opposition came from those involved in competitive transportation modes such as the river and canal barges and railroads (see the discussion below), from the trade centers that already had effective transportation connections and feared competition from other centers if their road connections were improved, from some landowners and farmers who feared that better roads would make it easier for their low-wage laborers to be attracted away, from farmers who supplied local markets and feared that improved roads would bring in competition from distant suppliers, from heavy road users who did not want to pay tolls for access even though they wanted the roads to be maintained, and so on. Therefore, in order to gain sufficient support for passage, Turnpike Acts always had to reflect significant political compromise, including long lists of toll exemptions for powerful individuals and groups who opposed each Act (Albert 1972, pp. 12, 14–29). Agricultural interests and in some areas, industrial groups, were particularly effective at obtaining exemptions (Jackman 1966, pp. 260–261). Often those with exemptions were some of the worst abusers of what to them remained a common pool resource. Exemptions also grew over time (individual Trust Acts were annually renewed, with revisions possible), seriously reducing trust revenues (Jackman 1966, p. 261). Politics, rather than economic considerations, also determined the tolls that could be set. Thus, for instance, "There was no invariable relation, and no necessary connection, between the amount that it cost to keep a particular mile of road in repair, and the amount that could be collected in tolls" (Webb and Webb 1913, p. 216). Indeed, just as some road users who did considerable damage to roads were exempted, prohibitively high tolls were established for some types of transportation that did little damage, if that transportation option threatened the market for other politically influential road users or other transport modes such as railroads.

11.5.3.1 Politics and the Inefficiency of Transportation Systems: An Example

The inefficient allocation of transport services resulting from political manipulation of tolls can be seen by examining parliamentary treatment of the steam powered carriages which began to appear on the roads of the United Kingdom in the early

1800s (Fletcher 1891).[39] Indeed, while it is widely believed that the general use of mechanically propelled road vehicles began in the late nineteenth century, the fact is that sophisticated steam powered road vehicles had both commercial and technical success sixty years earlier.[40] These vehicles could maintain high sustained speeds relative to horse drawn carriages (24 miles per hour over four miles, and an average of 12 miles per hour over longer distances) and carry more passengers (up to 14 in 1831). Estimates of relative operating costs suggest that steam carriages could run at about a half to a third of the cost of horse-drawn stage coaches,[41] and in the absence of discriminatory tolls, per passenger fares were apparently about one half those of stage coaches.[42] These vehicles were also much safer as they were much less likely to overturn, and steam engines did not "run away with" passengers the way horses could (Gurney 1831, p. 20). Steam carriages also threatened railroads, which generally were granted monopolies over particular routes (Dalgleish 1980, p. 117), allowing them to charge relatively high prices for passenger services. After all, the steam carriages could compete in terms of speed and they were not limited by the need for rail lines. These competitive threats were not allowed to develop, however, as Parliament responded to political demands from railroad and horse carriage related interests by limiting the potential for competitions from steam carriages.

Where parliament allowed steam carriages they mandated tolls that were at least six times higher than those on horse-drawn stage coaches (Gurney 1831: 22; Dalgleish 1980: 117).[43] Furthermore, parliament imposed outright prohibition of steam carriages in a large number of Turnpike Acts (Dance 1831, p. 48). These very high tolls and prohibitions were imposed despite the fact that "highway engineers were unanimous that injury to the road surface from the action of horses' feet exceeded that caused by the wheels of traffic by a factor of three" (Dalgleish 1980, p. 119). Steam carriages had innovative braking systems that did not lock and drag, as well as one driving wheel with the potential of engaging a second to prevent slippage, both of which did less damage to roads than horse-drawn carriages. Furthermore, the wheels on horse-drawn vehicles were necessarily made narrow to reduce the effort required of the horses, and these narrow wheels caused considerable rutting. Steam carriages, on the other hand, had very wide tires in order to give them greater traction, and these wide tires did virtually no damage to road surfaces, according to engineers such as Thomas Telford (a leading engineer and famous road builder who co-founded the Institute of Civil Engineers and was its first President) who testified before a Parliamentary Select Committee convened in 1831 to consider the exorbitant tolls on steam carriages and to consider the potential future use of mechanical (steam and petroleum powered) vehicles (Dalgleish 1980, pp. 118–119).

[39] Fletcher (1891) provides a very detailed discussion of the development and technological advances in steam powered road vehicles, including information about both the successful and unsuccessful entrepreneurs and inventors involved.

[40] See Gurney (1831, p. 12), Dance (1831, p. 45), and Dalgleish (1980, p. 117).

[41] See Gurney (1831, p. 18) and Dalgleish (1980, p. 122).

[42] Gurney (1831, p. 12) and Dance (1831, p. 45).

[43] See, for example, Gurney (1831, p. 22) and Dalgleish (1980, p. 117).

In light of their safety, cost advantages, speed, capacity, and reduced road damage, the 1831 select committee recommended that the tolls on steam carriage be dramatically reduced (Select Committee on Steam Carriages 1831; Gurney 1831), and if this had occurred, there is "little doubt that a network of good toll roads would have soon been built to take the new vehicles" and that a substantial part of the United Kingdom's railway system would not have been built (Dalgleish 1980, p. 128). However, as Dalgleish (1980, p. 125) notes: "we can well imagine what happened. The many interests – corn merchants, harness makers, horse-copers, railway promoters, iron masters hoping to make rails, and those who were simply against change – would unite against steam carriages. It was only necessary for parliament to do nothing for them to be killed off, and nothing is what it did."[44] As a result, the use of mechanical vehicles on Britain's roads was delayed for some 60 years.[45]

The success of the railroad- and horse-carriage-related interests allied against steam carriages appears to be an important reason for the demise of the turnpike

[44]Dance (1831, p. 46) also notes that coach proprietors, coachmen, and postboys were in the opposition.

[45]The steam carriage industry did not give up. For instance, at least one group including Thomas Telford initiated an effort to run steam-carriage services on their own improved road between London and Birmingham, with intentions of extending the services beyond this route (Dalgleish 1980, pp. 125–128). This group organized the "Steam Company," surveyed the route, and gained support from innkeepers and canal operators (who hoped to compete with railroads by connecting with the steam carriages). The railway serving the route objected strongly, but the group apparently was relying of Telford's prestige to carry them through parliamentary approval. Telford died in September, 1834 however, and the project was abandoned. Yet another initiative by the advocates of steam-powered road travel was the formation of the "Institute of Locomotion for Steam Transport and Agriculture" for the purpose of pursuing the application of steam power to transportation, agriculture and other economic purposes through both economic and political means (Gordon 1833, p. 1). Their political efforts to alleviate the restrictions on steam carriages clearly continued after the 1831 Select Committee report. See for instance, the report of the Select Committee on Mr. Goldsworthy Gurney's Case in 1834; Gurney was an active advocate and promoter of steam carriage transportation (Gurney 1831), but to no avail. There were also numerous additional efforts to develop steam-powered transportation (Fletcher 1891) but politically imposed limitations also continued to be established, even as tolls were eliminated, as discussed below. A significant blow to the development of horseless road transportation in England came with passage of the Locomotive on Highways Act of 1865, for instance, often referred to as the "Red Flag Law". The Act stipulated that all self-propelled vehicles on public highways in country areas be limited to a maximum speed of four mph (two mph in towns) and that they be preceded by a man on foot carrying a red flag or lantern. However, this was just one of the many actions taken to prevent the introduction of steam carriages in England. See Fletcher (1891, pp. 279–288) for details. Indeed, he laments that "All the high-speed engines of recent times have been built for service in foreign countries - our foolish and meddlesome laws prohibiting sensible speeds in this country - hence Russia, Greece, Turkey, India, Ceylon, France, New Zealand and Germany are all ahead of Great Britain in this matter" (Fletcher 1891, p. 257). England was far ahead of the rest of the world in the development and improvement of road vehicles (using steam power) at the beginning of the 18th century and the advantage continued for some time, but the political resistance to horseless transport on roads undermined these advantages, leading to a shift in innovative activity to other countries where the internal combustion engine was favored over steam. The early 1900s saw around 125 different manufacturers producing steam cars in the U.S., however, and one, the Stanley Motor Carriage Company, remained very competitive with internal combustion cars in the U.S. until Henry Ford's development of mass production methods (StanleyMotorCarriage.com 2016, p. 1):

trusts, because it meant that the highways were not allowed to encourage the development of an option that could be competitive with the developing railroads. Indeed, the horse-drawn alternatives proved to be inferior to railroads in head-to-head competition. With the development of the short lines between Stockton and Darlington in 1825 and then between Liverpool and Manchester in 1930, for instance, stage coaches, postchaises and private horse-drawn carriages passenger traffic by turnpike between these points declined dramatically. The turnpikes had come to depend on such passenger traffic for revenues, in part because so many other forms of traffic had more significant toll exemptions or limitations. Ironically, for the horse-drawn passenger service and its supporters who joined the railroads to prevent the development of the steam carriage industry, the advantage going to the railroads quickly led to the decline of their industry as well. Without the steam carriage as a more effective competitor for the railroads, "The transfer of this business was instantaneous and complete. Every coach had to be taken off the road the moment the railway was open to the towns along its route" (Webb and Webb 1913, p. 215). As the railroads spread, road traffic declined. The last stage coach between London and Birmingham went out of business in 1839, for instance, with other routes from London ending their runs over the next few years (to Bristol in 1843, Plymouth in 1847, Bedford in 1848). Thus, turnpike toll revenues fell by one third between 1837 and 1850 as railroads spread through the country while steam carriages were not allowed to offer competition. More and more Trusts were unable to maintain their financial solvency,

(Footnote 45 continued)

> While their car looked similar to most others, their real advantage was simplistic automation. Their early steam engine boasted 13 moving parts with the count for the entire car at 37. It was light, quiet, and perhaps the most powerful vehicle of its time; definitely the fastest. Once lit, the car automatically generated steam to meet demand with little additional attention required except perhaps watching the water level. All that was required of the driver was to set the throttle to a comfortable speed and to move the tiller for steering.
> Steam engines are the only engines (or motors) that generate maximum power from rest. Through the simple movement of a lever the power was precisely controlled. With their finicky ignition systems, balky carburetors, and gear-grinding transmissions the "internal explosion engines" as the Stanley's called them were no match for the simplicity, reliability, and power of steam. The thrashing, banging, clattering, and smell of the internal combustion car was no match for the discernable hiss of a Stanley burner and the sound of tires rolling over stones on the dirt roads of the era. The smell of raw gasoline, partially burned hydrocarbons, along with a mechanical complexity of hundreds of parts for the engine and transmission not to mention the car's audible noise further tarnished the early image of the gasoline-powered automobile. In America the steam car gained popularity, especially with the rich, and Stanleys became the premier steam cars to own.

Stanleys were the most popular car in the U.S. from 1900 to 1904, and they set numerous land-speed records in January 1906, reaching 127.6 miles/hour on January 26. 86 major models were produced with six different body styles. About 11,000 Stanleys were sold over roughly 25 years, with peak production of 750 in 1907. The company consciously chose not to compete with Ford, however, and in 1914 twice as many Model Ts were produced in a day than the annual output of Stanley Steamers. Model Ts also sold at about 25 % of a Steamers price. The company was sold in 1817 and production ended in 1924.

forcing defaults on debt payments (for many, creditors took immediate possession of all revenues to cover interest on bonds, leaving no funds to cover maintenance costs).

11.5.3.2 Public Takeover of Roads

Rather than recognizing the underlying incentive problems and lifting the imposed constraints that created them (e.g., allowing trusts to earn profits and charge market determined tolls for steam carriages as well as other forms of road transportation, allowing competition for ownership to develop and mergers to take place) parliament began to empower the trusts to draw on "statute labor" (i.e., the labor that the parishioners were mandated to provide under the 1555 highway statute). Initially the trusts were required to pay wages fixed by parliament, but later a portion of the labor was required without payment (Hindley 1971, p. 62). Some trusts were even given parliamentary authority to appropriate materials without payment. Furthermore, under the law, the parishes had never been dissolved of their liability for road maintenance, and while they were supposedly able to recover any money they spent from the turnpikes' revenues, the trusts that failed in their road maintenance were generally so far in debt that parishes had little chance of repayment. As chronic insolvency spread, the burden of maintenance for more and more turnpikes was shifted, once again, onto the parishes. The same incentives were at work in the parishes that existed at the beginning of the turnpike era, of course, so this simply led to resistance (shirking, etc.), which actually flared into a "conclusive popular rebellion known as the Rebecca Riots" in South Wales during 1842–1843 (Webb and Webb 1913, p. 217). This resulted in a royal Commission to inquire about the grievances in South Wales, and finally to the dismissal of all Turnpike Trustees throughout the area and the merger of all trusts into "County Road Boards" which took over the roads, their debts, and the tolls of the former trusts. A "General Superintendent of County Roads in South Wales" was appointed by the central government, putting the roads in the area "Under what was virtually Government control" which also loaned 218,000 Pounds to the counties so they could pay off creditors and consolidated debts at low interest rates (Webb and Webb 1913, pp. 219–220). These county organizations were able to substantially reduce the number of toll gates as well as the level of tolls that had led to the revolts. Furthermore, they actually were able to operate efficiently enough to pay off the accumulated debts over the next 30 years, suggesting that if Parliament had responded earlier to the need for consolidation, the riots and subsequent government control might have been avoided. In fact, if consolidation of a similar "sort could have been done with the English Turnpike Trusts in 1844, they might have been spared the long-drawn-out agony of the ensuing half-century. But every attempt at legislation was defeated .... So far as the government was concerned, under the timid and unresourceful advice of the Home Office, and the refusal of successive Cabinets to trouble themselves about the subject, the Turnpike Trusts were allowed to go on just as before, annually getting their expiring terms renewed by Parliament, as a matter of course, falling, most of them, progressively further and further behind

their task, and many of them, deeper and deeper into insolvency" (Webb and Webb 1913, p. 220).

A Select Commission of the House of Commons was formed in 1864 to consider the question of how to end all tolls. The Commission's report concluded that the tolls were "unequal in pressure, costly in collection, inconvenient to the public, injurious as causing a serious impediment to intercourse and traffic," all of which arose because of the politically created constraints on the trusts, of course. However, the Commission concluded that the trusts should be abolished, and that the roads should be turned over to a government authority, as in South Wales (Quoted in Webb and Webb 1913, p. 221). Again, Parliament did not respond to these recommendations by establishing a general policy. Instead, a gradual abolition of more and more tolls began. Most Trusts were renewed each year, although from 1864 onward, 20–30 trusts were dissolved annually, with the roads turned over to a local parish or a highway district. Dissolution accelerated over time, however, as more and more trusts became insolvent, and in 1871 all tolls were ended in the London area. The number of trusts was down to 854 in 1871, 588 in 1875, 184 in 1881, 71 in 1883, 15 in 1887, and 2 in 1890. The last trust ended operations in November of 1895.

The increasing rate of dissolution of the trusts rapidly placed thousands of miles of roads back into the care of the parishes, leading to increased local resistance. In order to mitigate some of the local opposition the central government began giving Grants in Aid in 1876 to help pay for maintenance. Then in 1878 the Highway and Locomotive Act ordered the counties to contribute half of the annual cost of maintaining the former turnpike roads. The Local Government Act of 1888 granted more aid from the central treasury to counties for road maintenance but required the counties to take over full maintenance obligations from the parishes for all of the "main" roads. County governments were becoming the local road authority, and the parishes were finally formally dissolved of their road maintenance liability in 1895. "Thus at length the British road system was placed under control of elected public authorities each representing larger areas" (Gregory 1931, p. 196). Funding shifted from tolls to county (or in places, borough or other local government) taxes along with subsidies from the central government, and government expenditures on roads increased rapidly.[46] The average government expenditure per mile of county roads rose from 43 pounds in 1890 to 69 pounds in 1902, for instance while expenditures on urban roads increased from 49 to 207 pounds over the same period (Gregory 1931, p. 196).

[46]The Local Government Act of 1858 authorized any parish to become an "Urban Sanitary District," and these districts could not be included in any larger Highway District (Gregory 1931, p. 195). Parishes whose local officials wanted to maintain control of their roads used this process to do so, and as a consequence, a number of small districts avoided political consolidation.

11.5.3.3 The Commons Problem

Free access to roads led to new types of road users. By the end of the nineteenth century many highways had more bicycle traffic than horse drawn traffic, for example, and virtually every country home had a bicycle. As Webb and Webb (1913, pp. 204–211) report, "What the bicyclist did for the roads, between 1888 and 1900, was to ... accustom us all to the idea of our highways being used by other than local residents. It was the bicyclist who brought the road ... into popular use for pleasure riding." Pleasure riding is pretty attractive when one does not have to pay for it, of course. In addition, while excessive tolls or outright prohibitions had kept the steam carriage off the roads, the end of tolls and the development of light internal combustion engines in 1885 led to the introduction of the first petroleum driven motor cars in England in about 1894. The commons problem quickly became evident as bicycles and automobiles alarmed horses and pedestrians, and raised dust due to their speed (roads were largely still surfaced with gravel at this time): "the turning loose on our roads of tens of thousands of heavy vehicles, often traveling at speed of an express train, amounted to a real aggression on the safety and comfort of all the other users of the roads" (Webb and Webb 1913, p. 214). Accidents increased dramatically, generally at the cost of those who did not enjoy the benefits of the new transportation methods (pedestrians, users of horses), and road damage significantly increased maintenance costs.[47] Those who wanted to use the roads for traditional horse-drawn traffic protested loudly, but with no turnpike trusts or tolls to manipulate, raising political barriers to road use by bicycles and automobiles proved to be difficult. Efforts to prevent their use were successfully resisted by the growing political influence of motor vehicle owners, although several actions were taken to limit motor traffic access. The Motor Car Act of 1903 required new vehicles to be registered and licenses and to carry "conspicuous identification numbers back and front," for instance, and drivers were also required to be licensed even though other types of road use did not face such costs. The costs of automobiles were also increased due to requirements of lights and alarms that could be sounded, and speed limits were established. These limitations were clearly not sufficient, of course, and the use of motor cars expanded, with their accompanying negative externalities.

The cost of road maintenance and improvement due to these "new users" rose rapidly during the first decade of the twentieth century and the central government was continually pressed to provide relief to local taxpayers. It was felt that the users of motor vehicles should share in the costs of maintenance but the local road authorities (counties, boroughs, etc.) were not able to collect from most of them who traveled through their areas because they could not charge tolls. Finally a national tax on petrol was established in 1909 along with increased licensing fees paid to the central government. These new road revenues were administered by a new Road Board with the power to subsidize local road authorities, not for general maintenance, but for

[47] Pounding of the road surfaces when dry created an unanticipated problem of "waviness" (Gregory 1931, p. 257), the use of "armoured tires" with iron studs on automobiles to prevent side slipping further damaged road services, and ruts were created during rainy weather.

specific types of road improvements and new roads. The new road users demanded a very different type of road than horse-drawn transport required, after all, and as the political power of the owners of motor vehicles increased, more pressure was brought to bear on Parliament to provide roads suitable to such traffic.

The Road Transport Board was created in 1918 to coordinate all work on roads during the First World War, and it continued to function after the war as a Department of the Ministry of Transportation. Its role was one of centralized supervision of road development, but it also was given the power to allocate grants from the central government's Road Fund (Gregory 1931, p. 248). Roads were divided into three classifications based on width (60 feet for first class and 50 for second), and up to 50 % of the cost of maintenance and improvement of first class roads was to come from the national government. Second class roads were to get up to 25 % and third class roads were to receive no aid. At the time, 26,000 miles of Britain's 179,000 total road miles were classified as first class, and 15,800 miles fell into the second class. As Gregory (1931, p. 257) notes, however, "It is a natural desire of local road authorities to transfer roads from the grant-less third class," so local authorities began finding ways to claim that more of their roads were wide enough to warrant subsidization. This did not mean that roads actually had to be widened, however: "Each class must have a minimum carriage way of 20 feet, with one footpath. Therefore a third class road which has a footpath and a grass verge on each side, can be promoted to the second class and made eligible for a grant, by the simple process of absorbing a footpath and part of the verge into the carriage way, to the detriment of the safety of the pedestrian and the appearance of the road" (Gregory 1931, pp. 248–249). Grants could then be obtained to surface formerly graveled third class roads with tar. Thus, more and more of the funding of roads was being shifted to the central government.

11.6 Conclusions

The contention that roads are not public goods, but that they can be club goods, private goods, or common pools, depending on the institutional arrangement that exists, is supported above by an examination of the evolution of road provision in Great Britain. Indeed, recognition of the fact that public roads are really common pools and that other arrangements have existed in the past under different institutional environments reinforces the point by Minasian (1964, p. 79) that the outcomes we observe are a result of the property-rights/institutional arrangements that exist and "alternative exclusion and incentives systems" produce very different results. This opens up a much larger set of policy options beyond government taxation and financing of roads. After all, the analysis presented here is not just supported by the historical evolution of road provision in Great Britain, as similar systems are prevalent in the history of other nations as well.[48] Furthermore, the fact is that both private and club provision of roads

[48]For example, the British experience with toll roads has an American counterpart. The first toll road company in the U.S. was chartered by Pennsylvania in 1792, in order to provide a highway

is evident today. Roth (1996, pp. 180–197) documents several private road projects in developing countries, for instance, where governments have found that the private sector can respond to demands for highways more effectively and more quickly than the state can.[49] Roth also cites examples in developed countries, including two privately built highways in Great Britain (the Dartford River Crossing Ltd.'s toll bridge crossing the Thames, and Midland Expressway Ltd.'s M6-Toll Road, a 27 mile expressway to relieve congestion in one of England's busiest urban areas). Privately-financed highway projects are also appearing in the U.S. (e.g., the Dulles "Greenway" project in Northern Virginia and the State Road 91 project in Orange County, California).[50]

Large proprietary business operations also provide streets and even highways. Consider Disney World, for instance (Foldvary 1994). Smaller scale business operations also provide streets (or substitutes for streets: mall parking lots and corridors are substitutes for public streets that reduce the costs of shopping relative to business districts crisscrossed by public streets, for instance). In addition, many residential developments actually include streets that are private or club goods (Foldvary 1994). The actual number of these arrangements is not known, but estimates of the number of United States residents living in gated communities ranged up to 8,000,000 in 1995 (Benson 1998, p. 93) and this is only a small portion of the communities that do not rely on the government for streets. Many streets are built by developers who factor consideration of the cost of streets in the prices of lots or homes. As residents move in they often form home ownership associations, and at some point these associations generally join with and ultimately replace developers in coordinat-

(Footnote 48 continued)
between Philadelphia and Lancaster. 1,562 turnpike companies established over 10,000 miles of roads in the Eastern United States between 1792 and 1845 (Klein and Fielding 1992). As Gunderson (1989, p. 192) notes, "Relative to the economy at the time, this effort exceeded the post -World War II interstate highway system that present day Americans assume had to be primarily planned and financed by the federal government." Similarly, Klein and Yin (1996) point out that about 150 private toll roads were opened in California between 1850 and 1902. Klein (1990) explains, however, that numerous government mandated toll exemptions for powerful interest groups tended to undermine the incentives to build private toll roads (government regulations often explicitly prevented profit taking, just as in Great Britain).

[49]Many developing countries are franchising roads to private firms which construct the roads and them operate them, charging tolls to earn the costs of construction and operation, **and** to cover franchising fees paid to the government (Pereyra 2002). Indeed, providing such roads are so attractive, in part because of their impact on real estate values, that it is becoming increasingly common for governments to auction franchises (Engel et al. 2002).

[50]The Intermodal Surface Transportation Efficiency Act of 1991 actually attempted to stimulate privately provided toll roads, bridges and tunnels in the U.S. (as long as they are not part of the interstate highway system) by making them eligible for a 50 % grant from the Highway Trust Fund, and in an effort to take advantage of these available funds a number of states have passed their own legislation to allow private provision of roads. However, some of the largest and most important private highway projects have refused federal funds in order to avoid the added complications that accepting such funding entails.

ing street maintenance. Thus, these streets become local club goods. There also are cases where streets were actually owned by a local government that deeded them to local homeowners associations (Newman 1980). This mix of private and club goods clearly demonstrates that roads are not necessarily Samuelsonian public goods, and an examination of the traffic situation on many modern public roads demonstrates that even publicly provide roads are not public goods in a Samuelson sense. This is made quite apparent by a simple examination of the level of traffic congestion in most urban areas of the United States, the United Kingdom, and numerous other parts of the world, but note that negative externalities arise whenever multiple drivers want to travel at different speeds at the same time on the same road.

The focus in this presentation has been on roads, but the same analysis appears to apply to numerous other so-called public goods. Consider education for instance, with its mix of private schools and home schooling, community based (club) schools such as those provided by various religious organizations, and crowded inefficiently run and expensive public schools. Or consider policing. In the United States today there are roughly three times as many private security personnel as there are public police, and there are also large numbers of community level crime control activities, such as crime watch and neighborhood patrols (Benson 1998, 2010, 2014; Benson and Mast 2001). Furthermore, public police find their files crowded with cases that cannot even be investigated due to the excess demand for their services, and victimization surveys suggest that most crimes against persons and property are not even reported as victims are, essentially, crowded out of the system. Indeed, the evolution of the institutions of policing in Great Britain is very similar to the evolution of road provision described above (Benson 1994). Similarly, public court backlogs and delay force many disputes to be dropped while many more disputants choose to go to private or club alternatives: direct negotiation, or mediator/arbitrators service, some of which are offered for a price while others are provided by communities such as trade associations (see Bernstein 1992 and Benson 1995, 1999c for instance). In fact, a claim that roads, education, policing, or courts (or most (all?) other publicly financed goods or services) are public goods, even up to the point where crowding sets in, is of little real relevance for public policy because, as Minasian (1964, pp. 79–80) explains, "the theory [of public goods] generates economic analysis which is not based on the opportunity cost notion." Rationing of scarce goods cannot be avoided by declaring that no one can be excluded; this simply means that first-come-first-serve and its accompanying congestion costs determine who gets what, or that regulations limiting use must be passed. Individuals and close knit-communities look for alternative means to produce the desired services, however, and a mix of club and private goods inevitably exist. And importantly, these alternative sources of the desired goods would provide a lot more of them if property rights were not constrained by the state in order to meet the demands of special interest groups.

References

Albert W (1972) The Turnpike road system in England: 1663–1840. Cambridge University Press, Cambridge
Anderson TL, Hill PJ (1990) The race for property rights. J Law Econ 33(1):177–197
Bailey MJ (1992) Approximate optimality of aboriginal property rights. J Law Econ 35(1):183–198
Benson BL (1984) Rent seeking from a property rights perspective. South Econ J 51(2):388–400
Benson BL (1988) Legal evolution in primitive societies. J Inst Theor Econ 144(5):772–788
Benson BL (1989) The spontaneous evolution of commercial law. South Econ J 55(3):644–661
Benson BL (1994) Are public goods really common pools? Considerations of the evolution of policing and highways in England. Econ Inq 32(2):249–271
Benson BL (1995) An exploration of the impact of modern arbitration statutes on the development of arbitration in the United States. J Law Econ Organ 11(2):479–501
Benson BL (1998) To serve and protect: privatization and community in criminal justice. New York University Press, New York
Benson BL (1999a) An economic theory of the evolution of governance and the emergence of the state. Rev Austrian Econ 12(2):131–160
Benson BL (1999b) Polycentric law versus monopolized law: implications from international trade for the potential success of emerging markets. J Priv Enterp 15(1):36–66
Benson BL (1999c) To arbitrate or to litigate: that is the question. Eur J Law Econ 8(2):91–151
Benson BL (2005) Regulation, more regulation, partial deregulation, and reregulation: the dynamics of a rent-seeking society. Adv Austrian Econ 8(1):107–146
Benson BL (2006) The rise and fall of private roads in England. In: Roth G (ed) Street smart: competition, entrepreneurship and the future of roads. Transaction Publishers, New Brunswick, pp 245–276
Benson BL (2010) The allocation of police. In: Benson BL and Zimmerman PR (eds) Handbook on the economics of crime. Edward Elgar, Northampton, pp 184–217
Benson BL (2011) The enterprise of law: justice without the state, 2nd edn. The Independent Institute, Oakland
Benson BL (2014) Let's focus on victim justice, not criminal justice. Indep Rev 19(2):209–238
Benson BL, Mast BD (2001) Privately produced general deterrence. J Law Econ 44(2):725–746
Beresford MW, Joseph JS (1979) Medieval England: an aerial survey. Cambridge University Press, Cambridge
Bergstrom T, Blume L, Varian H (1986) On the private provision of public goods. J Pub Econ 29(1):25–49
Bernheim BD (1986) On the voluntary and involuntary provision of public goods. Am Econ Rev 76(4):789–793
Bernstein L (1992) Opting out of the legal system: extralegal contractual relations in the diamond industry. J Legal Stud 21(1):115–157
Bewes WA (1923) The romance of the law merchant: being and introduction to the study of international and commercial law with some account of the commerce and fairs of the middle ages. Sweet & Maxwell, London
Blair PH (1956) An introduction to Anglo-Saxon England. Cambridge University Press, Cambridge
Bodey H (1971) Roads. BT Batsford Limited, London
Buchanan JM (1965) An economic theory of clubs. Economica 32(125):1–14
Buchanan JM (1994) Choosing what to choose. J Inst Theor Econ 150(1):123–135
Carneiro RL (1970) A theory of the origin of the state. Science 169(3947):733–738
Coase RH (1960) The problem of social cost. J Law Econ 14(1):1–44
Coase RH (1974) The lighthouse in economics. J Law Econ 17(2):357–376
Dahlman CJ, et al (1980) The open field system and beyond: a property rights analysis of an economic institution. Cambridge Books
Dalgleish A (1980) Telford and steam carriages. In: Penfold A (ed) Thomas Telford: engineer. Thomas Telford Ltd, London

Dance SC (1831) Postscript to steam carriages on common roads. A pamphlet possibly prepared as evidence to the parliamentary select committee on tolls
Darby HC (1973) A new historical geography of England. Cambridge University Press, Cambridge
Demsetz H (1967) Toward a theory of property rights. Am Econ J 57(2):347–359
Ellickson RC (1993) Property in land. Yale Law J 102(6):1315–1400
Ellickson RC (1991) Order without law: How neighbors settle disputes. Harvard University Press, Cambridge
Engel E, Fischer R, Galetovic A (2002) Highway franchising and real estate values. NBER working paper no 8803 57(3):432–448
Fletcher W (1891) History and development of steam locomotion on common roads. E. & FN Spon, London
Foldvary F (1994) Public goods and private communities: the market provision of social services. Edward Elgar Publishing, Chelthenham
Foley DK (1970) Lindahl's solution and the core of an economy with public goods. Econometrica 38(1):66–72
Fuller L (1981) The principles of social order. Duke University Press, Durham
Gordon A (1833) Institute of locomotion for steam transport and agriculture. Report regarding this organization
Gregory JW (1931) The story of the road, from the beginning down to A.D. A. Maclehose, New York
Gunderson G (1989) Privatization and the 19th-century turnpike. Cato J 9(1):191–200
Gurney G (1831) Steam carriages on common roads. A pamphlet possibly prepared as evidence for presentation to a select committee of the house of commons
Hardin G (1968) The tragedy of the commons. Science 162(3859):1243–1248
Hardin R (1982) Collective action. Johns Hopkins University Press, Baltimore
Hayek F (1973) Law, legislation, and liberty, vol 1. University of Chicago Press, Chicago
Hindle P (1982) Roads and tracks. In: Cantor L (ed) The English medieval landscape. Croom Helm, London, pp 191–210
Hindley G (1971) A history of roads. Peter Davies, London
Hoebel EA (1954) The law of primitive man. Harvard University Press, Cambridge
Jackman WT (1966) The development of transport in modern England. Augustus M. Kelley Publishers, New York
Klein DB (1990) The voluntary provision of public goods? The turnpike companies of early America. Econ Inq 28(4):788–812
Klein DB, Fielding GJ (1992) Private toll roads: learning from the 19th century. Transp Q 46(3):321–341
Klein DB, Yin C (1996) Use, esteem, and profit in voluntary provision: toll roads in California, 1850–1902. Econ Inq 34(4):678–692
LaMar VA (1960) Travel and roads in England. The Folger Shakespeare Library, Washington
Leoni B (1961) Freedom and the law. Nash Publishing, Los Angeles
Levi M (1988) Of rule and revenue. University of California Press, Berkeley
Llewellyn KN, Hoebel EA (1961) Cheyenne way. University of Oklahoma Press, Norman
Lyon BD (1980) A constitutional and legal history of medieval England, 2nd edn. WW Norton and Company, New York
McNutt P (2000) Public goods and club goods. In: De Geest G, Bouckaert B (eds) Encyclopedia of law and economics. Edward Elgar, Chelthenham, pp 927–951
Milgrom PR, North DC et al (1990) The role of institutions in the revival of trade: the law merchant, private judges, and the champagne fairs. Econ Polit 2(1):1–23
Milleron JC (1972) Theory of value with public goods: a survey article. J Econ Theory 5(3):419–477
Minasian JR (1964) Television pricing and the theory of public goods. J Law Econ 7(1):71–80
Mises LV (1949) Human action: a treatise on economics, 3rd edn. Contemporary Books, Chicago
Mises LV (1957) Theory and history: an interpretation of social and economic evolution. Yale University Press, New Haven
Moyes A (1978) Transport 1730–1900. In: Dodgshon R, Butlin R (eds) An historical geography of England and Wales. Academic Press, New York, pp 401–429

Nee V (1998) Norms and networks in economic and organizational performance. Am Econ Rev 88(2):85–89
Neely R (1982) Why courts don't work. McGraw-Hill, New York
Newman O (1980) Community of interest. Anchor Press, Garden City
North DC (1981) Structure and change in economic history. Norton, New York
North DC (1990) Institutions, institutional change and economic performance. Cambridge University Press, Cambridge
O'Driscoll GP, Rizzo MJ, Garrison RW (1985) The economics of time and ignorance. Basil Blackwell, Oxford
Oppenheimer F (1914) The state: its history and development viewed sociologically. Bobbs-Merrill Company, Indianapolis
Ostrom E (1990) Governing the commons: the evolution of institutions for collective actions. Cambridge University Press, New York
Ostrom E (2005) Understanding institutional diversity. Princeton University Press, Princeton
Ostrom V (2007) The political theory of a compound republic: designing the American experiment. Lexington Books, Lanham
Parkes J (1925) Travel in England in the seventeenth century. Oxford University Press, London
Pawson E (1977) Transport and economy: the turnpike roads of eighteenth century Britain. Academic Press, London
Pereyra A (2002) Auction theory and road franchising. Universidad de Uruguay-Departamento de Economia-Documento de trabajo en edicion
Pollock F, Maitland FW (1959) The history of English law, vol 1. Lawyers' Literary Club, Washington
Pospisil LJ (1971) Anthropology of law: a comparative theory. Harper and Row, New York
Rasmussen DW, Benson BL (1994) The economic anatomy of a drug war: criminal justice in the commons. Rowman & Littlefield, Lanham
Ridley M (1996) The origins of virtue: human instincts and the evolution of cooperation. Viking Penguin, New York
Roth G (1996) Roads in a market economy. Avebury Techinal, Aldershot
Samuelson P, Nordhaus W (1985) Economics. McGraw-Hill, New York
Samuelson PA (1954) The pure theory of public expenditure. Rev Econ Stat 36(4):387–389
Samuelson PA (1955) Diagrammatic exposition of a theory of public expenditure. Rev Econ Stat 37(4):350–356
Select Committee on Steam Carriages (1831) Report from select committee on steam carriages; with minutes of evidence and appendix
Shitovitz B, Spiegel M (1998) Cournot-Nash and Lindahl equilibria in pure public good economies. J Econ Theory 83:1–18
Shitovitz B, Spiegel M (2001) Stable provision vs. Cournot–Nash equilibria in pure public good economies. J Public Econ Theory 3(2):219–224
Shitovitz B, Spiegel M (2002) Trading equilibrium in the public good economy. University of Haifa working paper presented at the association of private enterprise education meetings
Shoup CS (1964) Standards for distributing a free governmental service: crime prevention. Public Financ 19:383–392
StanleyMotorCarriage.com (2016) The stanley steamer, why the fascination?
Stenton FM (1936) The road system of medieval England. Econ Hist Rev 7:1–21
Stephen JF (1883) A history of the criminal law of England. Burt Franklin, New York
Taylor M (1982) Community, anarchy and liberty. Cambridge University Press, Cambrige
Vanberg VJ, Congleton RD (1992) Rationality, morality, and exit. Am Polit Sci Rev 86(2):418–431
Webb S, Webb B (1913) The story of the king's highway: English local government, vol 5. Archon Books, Hamden
Willan TS (1976) The inland trade: studies in English internal trade in the sixteenth and seventeenth centuries. Manchester University Press, Manchester