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# ***America's Toll Roads Heritage: The Achievements of Private Initiative in the 19th Century***

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By Daniel B. Klein and John Majewski<sup>1</sup>

*Abstract:* Private toll roads shaped and accommodated trade and migration routes, leaving social and political imprints on the communities that debated and supported them. Private road building came and went in waves throughout the 19<sup>th</sup> century and across the country. All told, between 2,500 and 3,200 companies successfully financed, built, and operated their toll road. Although most of these roads operated for only a fraction of the 100+ period, the combined mileage of private toll roads that operated at any point in time would be in range of 30,000 to 52,000 miles. The paper explores the character, methods, and purposes of the private toll roads, and draws lessons for the privatization of highways today.

JEL codes: N71, N91, L92.

*Keywords:* toll roads, turnpikes, plank roads, privatization, free riding, regulation.

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## America's Toll Roads Heritage: The Achievements of Private Initiative in the 19<sup>th</sup> Century

Before Americans built the Erie Canal or hammered the first railroad spike, private toll roads shaped and accommodated trade and migration routes, leaving social and political imprints on the communities that debated and supported them. Private road building came and went in waves throughout the 19<sup>th</sup> century and across the country. All told, between 2,500 and 3,200 companies successfully financed, built, and operated their toll road. Although most of these roads operated for only a fraction of the 100+ period, the combined mileage of private toll roads that operated at any point in time would be in range of 30,000 to 52,000 miles.

America's 100+ year experience with private toll roads offers valuable lessons for policymakers and citizens today. American toll road history is pretty well covered by considering three episodes: the turnpike era of the eastern states 1792 to 1845; the plank road boom 1847 to 1853; and the toll road of the far West 1850 to 1902.

### **The Failure of Local Government Road Service**

Prior to the 1790s Americans had no direct experience with private turnpikes; roads were built, financed and managed mainly by town governments. Typically, townships compelled a road labor tax. The State of New York assessed eligible males (often farmers) a minimum of three days of roadwork under penalty of fine of one dollar. The labor requirement could be avoided if the worker paid a fee of 62.5 cents a day. As with public works of any kind, incentives were weak because the chain of

activity could *not* be traced to a *residual claimant* – that is, private owners who claim the “residuals,” profit or loss. The laborers were brought together in a transitory, disconnected manner, preventing them from developing the appropriate skills and pride in the job. Since overseers and laborers were commonly farmers, too often the crop schedule, rather than road deterioration, dictated the repairs schedule. Except in cases of special appropriations, financing came in dribbles deriving mostly from the fines and commutations of the assessed inhabitants. Commissioners could hardly lay plans for decisive improvements. When a needed connection passed through unsettled lands, it was difficult to mobilize labor because assessments could be worked out only in the district in which the laborer resided. Because work areas were divided into districts, as well as into towns, problems arose because the various pieces were not working together. Thus road conditions remained inadequate, as New York’s governors often acknowledged publicly (Klein and Majewski, 1992: 472-75).

### **The Race Is On!**

To American fortune seekers, the ratification of the Constitution was like the “bang” of a starting gun. The Constitution resolved what Robert Higgs (1997) has called “regime uncertainty,” by building an interstate framework for financial, legal and political affairs (Hurst 1956: 10; North 1966: 50-51). The race was afoot – to capture the trade of the interior, to develop western lands, to expand population, to build the leading entrepot. In 1790, the steamboat was still in its infancy, canal construction was hard to finance and limited in scope, and the first American railroad would not be completed for another 40 years. Better transportation meant, above all, better highways.

Alexis de Tocqueville remarked on the impulse of Americans to push onward. He describes an attitude about the environment very different than today:

The wonders of inanimate nature leave [Americans] cold, and, one may almost say, they do not see the marvelous forests surrounding them until they begin to fall beneath the ax. What they see is something different. The American people see themselves marching through wildernesses, drying up marches, diverting rivers, peopling the wilds, and subduing nature. (Tocqueville, p. 485 of Lawrence/Mayer ed.)

America's very limited and lackluster experience with the publicly operated toll roads of the 1780s hardly portended a future boom in private toll roads, but the success of private toll bridges may have inspired some future turnpike companies. From 1786 to 1798, fifty-nine private toll bridge companies were chartered in the northeast, beginning with Boston's Charles River Bridge, which brought investors an average annual return of 10.5 percent in its first six years (Davis 1917, II: 188). Private toll bridges operated without many of the regulations that would hamper the private toll roads that soon followed, such as mandatory toll exemptions and conflicts over the location of toll gates. Also, toll bridges, by their very nature, faced little toll evasion, which was a serious problem for toll roads.

The more significant predecessor to America's private toll road movement was Britain's success with private toll roads. Beginning in 1663 and peaking from 1750 to 1772, Britain experienced a private turnpike movement large enough to acquire the nickname "turnpike mania" (Pawson 1977,151; Benson this volume). The term "turnpike," in fact, comes from Britain, referring to a long staff (or pike) that acted as

a swinging barrier or tollgate. In 19<sup>th</sup> century America, “turnpike” specifically means a toll road with a surface of gravel and earth, as opposed to “plank roads” which refer to toll roads surfaced by wooden planks. Later in the century, all such roads were typically just “toll roads.”

Although the British movement inspired the future American turnpike movement, the institutional differences between the two were substantial. Most important, perhaps, was the difference in their organizational forms. British turnpikes were incorporated as trusts -- non-profit organizations financed by bonds -- while American turnpikes were stock-financed corporations seemingly organized to pay dividends, though acting within narrow limits determined by the charter. Contrary to modern sensibilities, this difference made the British trusts, which operated under the firm expectation of fulfilling bond obligations, *more* intent and more successful in garnering residuals. In contrast, for the American turnpikes the hope of dividends was merely a hope, usually a faint hope, and never a legal obligation. Odd as it sounds, the stock-financed “business” corporation was better suited to operating the project as a civic enterprise, paying out returns in use and esteem rather than cash.

### **The Turnpike Era, 1792–1845**

“[T]he states admitted that they were unequal to the task and enlisted the aid of private enterprise” (Durrenberger 1931, 37). The first private turnpike in the United States was chartered by Pennsylvania in 1792 and opened two years later. Spanning 62 miles between Philadelphia and Lancaster, it quickly attracted the attention of merchants in other states, who recognized its potential to direct commerce

away from their regions. Soon lawmakers from those states began chartering turnpikes -- and the race was on.

By 1800, 69 turnpike companies had been chartered throughout the country, especially in Connecticut (23) and New York (13). Over the next decade nearly six times as many turnpikes were incorporated (398). Table 1 shows that in the mid-Atlantic and New England states between 1800 and 1830, turnpike companies accounted for 27 percent of all business incorporations.

State	All Incorporations	Turnpike Incorporations	% Turnpikes of All Incorporations
New York	993	339	34
Pennsylvania	428	199	46
New Jersey	190	47	25
Maryland	194	54	28
Connecticut	234	77	33
Rhode Island	127	34	27
Massachusetts & Maine	880	104	12
New Hampshire	304	51	17
Vermont	177	41	23
Total	3,527	946	27

SOURCE: For all states through 1800, Davis 1948:vol. 2, 22-27, 216; for New Hampshire, Vermont, Massachusetts, and Rhode Island, Taylor 1934:339-44, 346; for Connecticut, *ibid.*, pp. 338-39, and Reed 1964:75; for New York, New Jersey, and Maryland, Evans 1948:12-17; for Pennsylvania, Miller 1940:158-59.

**Table 1.** Turnpikes as a Percentage of All Business Incorporations, by Special and General Acts, 1800-1830.

[For Source, we could alternatively just say Klein and Majewski 1992: 470.]

As shown in Table 2, a wider set of states had incorporated 1562 turnpikes by the end of 1845. Somewhere between 50 to 70 percent of these succeeded in building and operating toll roads.

State	1792-1800	1801-10	1811-20	1821-30	1831-40	1841-45	Total
NH	4	45	5	1	4	0	59
VT	9	19	15	7	4	3	57
MA	9	80	8	16	1	1	115
RI	3	13	8	13	3	1	41
CT	23	37	16	24	13	0	113
NY	13	126	133	75	83	27	457
PA	5	39	101	59	101	37	342
NJ	0	22	22	3	3	0	50
VA	0	6	7	8	25	0	46
MD	3	9	33	12	14	7	78
OH	0	2	14	12	114	62	204
<b>Total</b>	<b>69</b>	<b>398</b>	<b>362</b>	<b>230</b>	<b>365</b>	<b>138</b>	<b>1562</b>

**Table 2.** Turnpike Incorporation, 1792-1845

Sources: For all states through 1800, Joseph Stancliffe Davis, *Essays in the Earlier History of American Corporations* (Cambridge, Massachusetts, 1948), II, pp. 22-27, 216; for NH, VT, MA, and RI, 1801-1845, Philip E. Taylor, "The Turnpike Era in New England," (Ph.D. thesis, Yale University, 1934), pp. 339-344, 346; for CT, 1801-1821, Nathaniel Reed, "The Role of the Connecticut State Government in the Development and Operation of the Inland Transportation Facilities from 1784 to 1821," (Ph.D. diss., Yale University, 1964), p. 75; for CT, 1822-1845, Taylor, pp. 338-339; for NY, NJ, MD, and OH, 1801-1845, George Herberton Evans, Jr., *Business Incorporation in the United States, 1800-1943* (New York, 1948), pp. 12-17; for PA, 1801-1845, William Miller, "A Note on the History of Business Incorporation in Pennsylvania, 1800-1860," *Quarterly Journal of Economics* 55 (November, 1940), pp. 158-159; for Virginia, Robert F. Hunter, "The Turnpike Movement in Virginia, 1816-1860," (Ph.D. thesis, Columbia University, 1957), pp. 313-315.

[For Source, we could alternatively just say Klein and Fielding 1992: 325.]

Although the states of Pennsylvania, Virginia and Ohio subsidized privately-operated turnpike companies, most turnpikes were financed solely by private stock subscription and structured to pay dividends. This was a significant achievement, considering the large construction costs (averaging around \$1,500 to \$2,000 per mile) and the typical length (15 to 40 miles). But the achievement was most striking because, as New England historian Edward Kirkland (1948:45) put it, "the turnpikes did not make money. As a whole this was true; as a rule it was clear from the beginning."

Generally speaking, turnpikes eked out enough toll revenue to pay for maintenance, and not more. Organizers and "investors" generally regarded the initial

proceeds from sale of stock as a fund from which to build the facility, which would then earn enough in toll receipts to cover operating expenses. One might hope for dividend payments as well, but “it seems to have been generally known long before the rush of construction subsided that turnpike stock was worthless” (Wood 1919: 63).<sup>2</sup>

Because turnpikes held the promise of facilitating movement and trade, the region’s merchants, farmers, land owners, and ordinary residents would benefit from a turnpike. Gazetteer Thomas F. Gordon aptly summarized the relationship between these “indirect benefits” and investment in turnpikes: “None have yielded profitable returns to the stockholders, but everyone feels that he has been repaid for his expenditures in the improved value of his lands, and the economy of business” (qtd. in Majewski, 2000, 49). Gordon’s statement raises an important question. If one could not be excluded from benefiting from a turnpike, and if dividends were not in the offing, what incentive would anyone have to help finance turnpike construction? The turnpike communities faced a serious free-rider problem.

### **Tocqueville’s America**

Nevertheless, hundreds of communities overcame the free-rider problem. Alexis de Tocqueville observed that, excepting those of the South, Americans were infused with a spirit of public-mindedness. Their strong sense of community spirit resulted in the funding of schools, libraries, hospitals, churches, canals, dredging companies, wharves, and water companies, as well as turnpikes (Goodrich 1948).

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<sup>2</sup> For a discussion of returns and expectations, see Klein 1990: 791-95.

Vibrant community and cooperation sprung, according to Tocqueville, from the fertile ground of liberty:

If it is a question of taking a road past his property, [a man] sees at once that this small public matter has a bearing on his greatest private interests, and there is no need to point out to him the close connection between his private profit and the general interest. . . . Local liberties, then, which induce a great number of citizens to value the affection of their kindred and neighbors, bring men constantly into contact, despite the instincts which separate them, and force them to help one another. . . . The free institutions of the United States and the political rights enjoyed there provide a thousand continual reminders to every citizen that he lives in society. . . . Having no particular reason to hate others, since he is neither their slave nor their master, the American's heart easily inclines toward benevolence. At first it is of necessity that men attend to the public interest, afterward by choice. What had been calculation becomes instinct. By dint of working for the good of his fellow citizens, he in the end acquires a habit and taste for serving them. . . . I maintain that there is only one effective remedy against the evils which equality may cause, and that is political liberty. (Alexis de Tocqueville, pp. 511-13, Lawrence/Mayer edition)

Tocqueville's testimonial is broad and general, but its accuracy is seen in the archival records and local histories of the turnpike communities. Here we find countless episodes, often charming and amusing, in which early Americans employed shrewd social tactics, as well as practiced solidarity and spontaneous generosity.

Tocqueville's America was a web of neighbors, kin, and locally prominent figures interacting voluntarily, often by means of intentional associations. Tocqueville's America spoke in turnpike appeals made in newspapers, local speeches, town meetings, door-to-door solicitations, correspondence, and negotiations in assembling the route.<sup>3</sup> Purchasers of stock were often explicitly moved to think of a turnpike's potential, not for dividends, but for community improvement. Furthermore, many toll road projects involved the effort to build a monument and symbol of the community. Participating in a company by donating cash or giving moral support was a relatively rewarding way of establishing public services; it was pursued at least in part for the sake of community romance and adventure as ends in themselves (Brown 1973:68). Consequently, "investors" tended to be not outside speculators, but locals positioned to enjoy the turnpikes' indirect benefits. "But with a few exceptions, the vast majority of the stockholders in turnpike were farmers, land speculators, merchants or individuals and firms interested in commerce" (Durrenberger 1931, 104).

Champions of government enterprise in the nineteenth-century persistently complained of a "shortage of capital" necessitating government investment, but the turnpike movement showed how local projects could tap into savings of numerous individuals. A large number of ordinary households held turnpike stock. Pennsylvania compiled the most complete set of investment records, which show that more than 24,000 individuals purchased turnpike or toll bridge stock between 1800 and 1821. The average holding was \$250 worth of stock, and the median was less than \$150 (Majewski 2001). Such sums indicate that most turnpike investors were wealthier than the average citizen, but hardly part of the urban elite that dominated larger corporations such as the Bank of the United States. County-level studies

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<sup>3</sup> See Klein 1990: 803-808; Klein and Majewski 1994: 56-61.

indicate that most turnpike investment came from farmers and artisans, as opposed to the merchants and professionals more usually associated with early corporations (Majewski 2000: 49-53). Widespread participation by relatively modest investors underscores the extent to which Americans practiced boosterism and chipping in for the common good.

### **Government Regulations Hampered Turnpikes**

Government regulation made profitability even more remote than it would have been in a more laissez-faire environment. Legislators wrote numerous restrictions into the charters, as conciliation towards objectors to both the specific project and to turnpike companies in general. At this time, in many fields, the corporate form had a public-service *ethos*, aimed not primarily at paying dividends, but at serving the community (Handlin & Handlin 1945: 22; Goodrich 1948: 306; Hurst 1970: 15). This, however, does not mean that such corporations had a governmental flavor, just that they did not have a strongly commercial or market flavor.

Turnpike opposition was of two kinds: ideological and opportunistic. Some opponents claimed that turnpikes were tools of aristocrats, corporate monopolists, and oppressors of the poor. Most opposition, however, came from those who used protest as a means of gaining what they no doubt saw as just concessions (Klein and Majewski 1992: 486-98). A significant portion of turnpikes were built partly over paths, trails or ill-maintained roads that the public had been accustomed to using without charge. Petitions yielded several restrictions on turnpike operators, including “progressive” restrictions on stockholder voting and specification of road quality, toll

rates, toll gate locations, and toll exemptions. Toll gates, for example, often could be spaced no closer than every five or even ten miles. This regulation enabled some users to travel without encountering a toll gate, and eased the practice of steering horses and the high-mounted vehicles of the day off the main road so as to evade the toll gate, a practice known as "shunpiking."

The charters or general laws granted numerous exemptions from toll payment. In New York, the exempt included people traveling on family business, those attending or returning from church services and funerals, town meetings, blacksmith's shops, those on military duty, and those who lived within one mile of a toll gate. In Massachusetts some of the same trips were exempt and also anyone residing in the town where the gate is placed and anyone "on the common and ordinary business of family concerns" (Laws of Mass., 1805, Chap. 79: 649). Needless to say, this last was the subject of some controversy. In the face of exemptions and shunpiking, turnpike operators sometimes petitioned authorities for a toll hike, stiffer penalties against shunpikers, or the relocating of the toll gate. The record indicates that petitioning the legislature for such relief was a costly and uncertain affair (Klein and Majewski 1992: 496-98).

Turnpikes were also encouraged by government, sometimes by the granting of existing trails or public roadbeds to turnpikes, sometimes guarantees against new parallel routes, and typically the granting of eminent domain powers. Were these governmentally granted aids important? After surveying the historical sources and digging into many primary materials, we really cannot say. We suspect that, by and large, landowners, sensible to the prospects of improved transportation and higher land values, sold or even gave land to turnpike routes in the same neighborly spirit

that Tocqueville described<sup>4</sup> – and that they would have readily done so even if companies had not had eminent domain powers. Playing “holdout” games surely would have seemed unneighborly; cooperating would be a genuine and highly visible act of generosity and public spirit. In the 1990s, toll road projects in Virginia and southern California benefited from just such willing participation from large landowners.

A few state governments (in Pennsylvania, Virginia, and Ohio) even encouraged turnpikes by purchasing stock. Yet despite these advantages, all but a few turnpikes lost money. In New York, under state law, tolls could be collected only after turnpikes passed inspections, which were typically conducted after 10 miles of roadway had been built. Only 35 to 40 percent of New York turnpike projects -- or about 165 companies -- reached operational status. In Connecticut, by contrast, where settlement covered the state and turnpikes more often took over existing roadbeds, construction costs were much lower and about 87 percent of the companies reached operation (Taylor 1934: 210). We guess that up to 1845 nationwide at least one-third of the chartered companies never constructed enough roadway to justify a tollgate.

### **Ye Olde Privatization Debate**

Although it was mainly practical ambitions that led Americans to privatize the roads, ideological concerns occasionally appeared in the arguments of both turnpike supporters and opponents. In an article in the Albany (NY) *Register* of June 13, 1796, Elkanah Watson, a leading turnpike advocate, argued for highway user fees by appealing to moral sentiments similar to what we might hear articulated by a

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<sup>4</sup> Illustrative tidbits are found at Klein 1990: 807.

contemporary privatization advocate: "[N]o tax can operate so fair and so easy, as that of paying a turnpike toll, since every person is taxed in proportion to the benefit he derives from a good road, and all strangers and travellers are made equally tributary to its support -- What can be more just?" (qtd. in Klein and Majewski 1992: 481)

Strongly committed to the cause of turnpikes, Watson even kept track of his opponents' arguments in his scrapbook. His chief opponent, "Civis," claimed that turnpiking is "hostile to sound republican maxims," that it "evinces a transition...from freedom toward despotism," that turnpikes "encourage unfair speculation," that they "tend to make the rich richer and the poor poorer [and] divide the community into two orders of opposite interests, payers and receivers." Civis raised the specter of corporate privilege: "it is not turnpike corporations only that excite my apprehension. [W]e are continually incorporating companies of various description, of a combined interest, distinct from the general interest of the people" (Klein and Majewski 1992: 488). Such arguments are, of course, alive and well today.

According to Watson, "[s]trong prejudices have been excited against Turnpikes . . . by a few leatherheads." In America's first era of road privatization, people realized very quickly that turnpikes were not rapacious monopolies but rather locally-initiated improvement projects looking to the legislature mainly for the permission to go forward as a legally recognized undertaking. In 1802, Watson scribbled into his notebook:

this Civis was a member of the Legislature[,] a Doct[or] M[oses] Younglove from Columbia County – a man seeking popularity – he found means to prejudice 2/3's of an ignorant Legislature who were opposing Turnpike

incorporations . . . – at length t’wards the Close of the Session . . . they gave way to Reason & conviction & several turnpikes were incorporated.

### **The Success of Private Initiative**

All told, and in view of the apparent free-rider problem, the success was striking. The movement built new roads at rates previously unheard of in America. Table 3 gives ballpark estimates of the cumulative investment in constructing turnpikes up to 1830 in New England and the Middle Atlantic. Repair and maintenance costs are excluded. These construction investment figures are probably too low—they generally exclude, for example, tolls revenue that might have been used to finish construction—but they nevertheless indicate the ability of private initiatives to raise money in an economy in which capital was in short supply. Turnpike companies in these states raised more than \$24 million by 1830, an amount equaling 6.15 percent of those states’ 1830 GDP. To put this into comparative perspective, between 1956 and 1995 all levels of government spent \$330 billion (in 1996 dollars) in building the interstate highway system, a cumulative total equaling only 4.30 percent of 1996 GDP. Table 3 shows the comparison. This calculation confirms Gerald Gunderson’s claim that the relative investment in early American turnpikes exceeded investment in the post-World War II interstate highway system (Gunderson 1989: 192). In real per capita terms the amount that was raised voluntarily in Tocqueville’s America significantly exceeded the amount raised in post-World War II America for the government’s feted highway system.

State	Cumulative Turnpike Investment, 1800-1830 (\$)	As Percent of the state's 1830 GDP	The Cumulative Investment divided by 1830 total population (\$)
Maine	35,000	0.16	0.09
New Hampshire	575,100	2.11	2.14
Vermont	484,000	3.37	1.72
Massachusetts	4,200,000	7.41	6.88
Rhode Island	140,000	1.54	1.44
Connecticut	1,036,160	4.68	3.48
New York	9,000,000	7.06	4.69
New Jersey	1,100,000	4.79	3.43
Pennsylvania	6,400,000	6.67	4.75
Maryland	1,500,000	3.85	3.36
TOTAL:		6.15 %	
31 years (1800-1830) of private expenditure on construction of turnpikes	24,470,260	of 1830 GDP of those 10 states	\$4.49 per person
40 years (1956-1995) of government expenditure (all levels) on construction of the Interstate Highway System	330 Billion (in 1996 \$s)	4.30 % of 1995 GDP (in 1996 \$s)	

Table 3  
Cumulative Turnpike Investment (1800-1830) as Percentage of 1830 GDP

Sources: Pennsylvania turnpike investment: Durrenberger 1931: 61; New England turnpike investment: Taylor 1934: 210-11; New York, New Jersey, and Maryland turnpike investment: Fishlow 2000, 549. Only private investment is included. State GDP data come from Bodenhorn 2000: 237. Figures for the cost of the Interstate Highway System can be found at [http://www.publicpurpose.com/hwy-is\\$.htm](http://www.publicpurpose.com/hwy-is$.htm), created by Wendell Cox and calculated from Federal Highway Administration data. Please note that our investment figures generally do not include investment to finish roads by loans or the use of toll revenue. The table therefore underestimates investment in turnpikes.

The organizational advantages of turnpike companies relative to government road care did indeed translate into roads of better quality (Taylor 1934: 334; Parks 1967: 23, 27). New York state gazetteer Horatio Spafford (1824: 125) wrote that turnpikes have been “an excellent school, in every road district, and people now work the highways to much better advantage than formerly.” In case law, judges said that turnpikes were “valuable and meritorious enterprises” and that they further “the advancement and prosperity of the commercial, agricultural and social interests of the community” (qtd. in Klein & Majewski 1992: 502).

### **Spontaneous Network Integration**

Transportation researchers, theorists, and engineers exhibit their own versions of the timeless division between central planning and decentralized (or “spontaneous”) order. Speaking for “The Systems Approach to Transport Planning,” David T. Kresge and Paul O. Roberts (1971: 1) wrote in a book published by The Brookings Institution, “any comprehensive, long-run transport plan will need to take into account the interdependency between the transport system and the general economy as well as the systems or interaction effects within the transport network itself.” Only a centralized agency would have the responsibility to survey the whole system, and only such an agency could have the authority to integrate its parts and coordinate its functions. Such integration and coordination could never be achieved by piecemeal or decentralized efforts (Christopher Nash 1988 propounds this view in urban transit research).

Albert Gallatin, Secretary of Treasury under Jefferson, was America’s first national transportation planner. He submitted a plan for an interlocking national

system of roads and canals, to be financed chiefly by the federal government (once the Constitution was suitably amended). One rationale was to bind the Union politically. But also he wrote in the central planning spirit: “The National Legislature alone, embracing every local interest, and superior to every local consideration, is competent to the selection of such national objects” (p. 741). Furthermore, Gallatin argued that private capital was too scarce to undertake large, risky improvement projects. Gallatin’s plan was never enacted, but it did help to win support for federal funding of certain internal improvement projects.

Despite such doubts about private action, the turnpike experience suggests that a company would intelligently develop roadway to achieve connective communication. The corporate form traversed town and county boundaries, so a single company could bring what would otherwise be separate segments together into a single organization. “Merchants and traders in New York sponsored pikes leading across northern New Jersey in order to tap the Delaware Valley trade which would otherwise have gone to Philadelphia” (Lane 1939: 156). Or road organizers would develop new connecting pieces in a system of roads.

Decades before the Erie Canal, private individuals realized the natural opening through the Appalachians and planned a system of turnpikes connecting Albany to Syracuse and beyond. Figure 1 shows the principal routes westward from Albany. The upper route begins with the Albany & Schnectady Turnpike, connects to the Mohawk Turnpike, and then the Seneca Turnpike. The lower route begins with the First Great Western Turnpike and then branches at Cherry Valley into the Second and Third Great Western Turnpikes. Corporate papers of these companies reveal that organizers of different companies talked to each other; they were quite capable of coordinating their intentions and planning mutually beneficial activities by voluntary

means (see inset letter). When the Erie Canal was completed in 1825 it roughly followed the alignment of the upper route and greatly reduced travel on the competing turnpikes (Baer, Klein, and Majewski 1992).

## Central New York Turnpikes, 1845

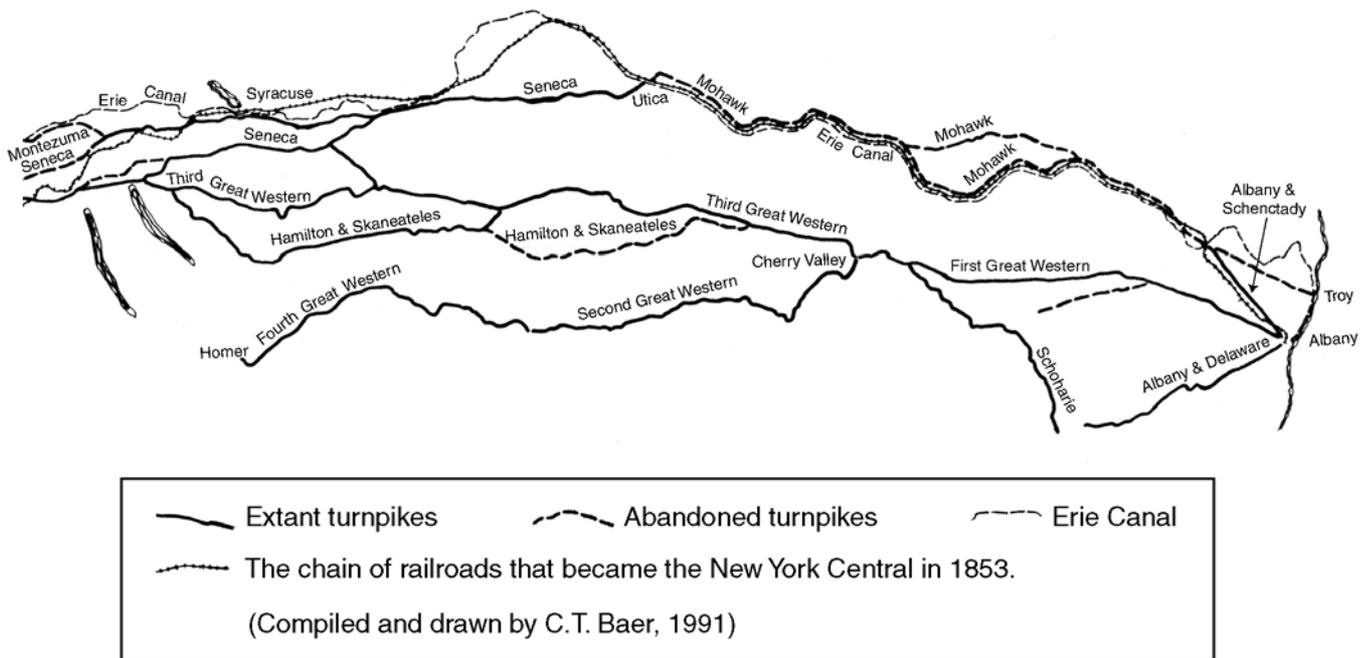


Figure 1: Turnpike Network in Central New York, 1845.

[Note to publisher: Dan Klein ([dklein@scu.edu](mailto:dklein@scu.edu)) has this figure also in two higher quality format, namely .ai and .eps.]

Januray 29, 1803

Dear Sir [Charles R. Webster],

This will be handed to you by Dr. Moore whom I take the liberty of introducing to your acquaintance -- Dr. Moore is sent by a number of inhabitants in this neighborhood as an agent for the purpose of obtaining a grant for a Turnpike road . . . [T]his road is nothing more than a continuation of the [First] Great Western Turnpike of which I observe that you are a Director, and as such I request the favor of you to consult with Dr. Moore upon the subject and to lend him all the assistance in your power, which I am persuaded you will readily grant, not only for my sake, but from a full persuasion that the road which we have in view will be highly beneficial to your Turnpike, as well as to the community at large –

With sincere friendship and regard I remain

Dear Sir your friend and humble servant

J. Lincklaen

[John Lincklaen's project took the name Third Great Western Turnpike and was chartered later that year 1803; Lincklaen was President and a major stockholder. The turnpike operated until 1859. See map here for its place in the network of private roads.]

*Note:* We have corrected spelling and written out abbreviations.

*Source:* Fairchild Collection, New York Public Library, NYC, Box 5.

Another excellent example of network integration achieved by voluntary planning is the Pittsburgh Pike. The Pennsylvania route consisted of a combination of five turnpike companies, each of which built a road segment connecting Pittsburgh and Harrisburg, where travelers could take another series of turnpikes to Philadelphia. Completed in 1820, the Pittsburgh Pike greatly improved freighting over the rugged Allegheny Mountains. Freight rates between Philadelphia and Pittsburgh were cut in half because wagons increased their capacity, speed, and certainty (Reiser 1951, 76-77). Although the state government invested in the companies that formed the Pittsburgh Pike, records of the two companies for which we have complete investment information shows that private interests contributed 62 percent of the capital (calculated from Majewski 2000: 47-51; Reiser 1951: 76). Residents in numerous

communities contributed to individual projects out of their own self interest. Their provincialism nevertheless helped create a coherent and logical system.

In the far West, there were even road systems developed by a single entrepreneur. In southwestern Colorado, Otto Mears built a system which “comprised some 300 or 400 route miles” (Ridgway 1932: 169; Kaplan 1975). In Shasta and Trinity counties, California, William S. Lowden had a large interest in several toll road and bridge companies (Cage 1984).

Many have claimed that we need master planning by government to achieve coordinated, integrated transportation networks. But history would seem to refute that claim.

### **The National Road: America’s First Great and Glorious Federal Boondoggle**

The Pittsburgh Pike fared far better than centrally planned routes such as the National Road. Financed by the federal government, the National Road was built between Cumberland, Maryland, and Wheeling, West Virginia, where it was then extended through the Midwest with the hopes of reaching the Mississippi River. Although it never reached the Mississippi, the Federal Government nevertheless spent \$6.8 million on the project (Goodrich 1960: 54, 65). The trans-Appalachian section of the National Road competed directly against the Pittsburgh Pike. As noted above, the state of Pennsylvania invested in the Pittsburgh Pike, but the state government tended to be a passive investor. The Pittsburgh Pike was thus far more private in character than the National Road. From the records of two of the five companies that formed the Pittsburgh Pike, we estimate it cost \$4,805 per mile to build (Majewski, 2000: 47-51; Reiser 1951: 76). The Federal government, on the other hand, spent

\$13,455 per mile to complete the first 200 miles of the National Road (Fishlow 2000: 549). Besides costing much less, the condition of the privately controlled Pennsylvania route was much better. The toll gates along the Pittsburgh Pike provided a steady stream of revenue for maintenance and repairs. The toll gates also provided a way of regulating road use, such as discouraging the use of narrow-wheeled wagons that could damaged the road's surface.

Lacking private owners, the National Road was often in poor condition. The project relied on intermittent outlays by the federal government for repairs. Even when the money was available the results were poor because supervision of contractors was lax. Since there was no means of regulating road use, travelers often abused the road by dragging heavy logs or locking narrow-wheeled wagons when descending steep slopes. One army engineer in 1832 found "the road in a shocking condition, and every rod of it will require great repair; some of it now is almost impassable" (qtd. in Searight, p. 60). Another traveler sardonically noted that "the ruts are worn so broad and deep by heavy travel, that an army of pigmies might march into the bosom of the country under the cover they could afford" (qtd in Peyton, p. 149). No wonder that historians have found that travelers generally preferred to take the Pittsburgh Pike rather than the National Road. Reuben Gold Thwaites, who edited 32 volumes of travelers' accounts dating from 1746 to 1846, concluded that "Much ado was made over the opening of the Cumberland Road across the Alleghenies [the National Road], but . . . the central Pennsylvania route [the Pittsburgh Pike] seems to have been the popular one from Washington and Philadelphia to Pittsburgh" (Thwaites, vol. 9, 1907: 64-65.)

### **The Plank Road Boom, 1847–1853**

By the 1840s the major turnpikes were increasingly eclipsed by the (often state-subsidized) canals and railroads. Many toll roads reverted to free public use and quickly degenerated into miles of dust, mud and wheel-carved ruts. To link to the new and more powerful modes of communication, well-maintained, short-distance highways were still needed, but because governments became overextended in poor investments in canals, taxpayers were increasingly reluctant to fund internal improvements. Private entrepreneurs found the cost of the technologically most attractive road surfacing material (macadam, a compacted covering of crushed stones) prohibitively expensive at \$3,500 per mile. Thus the ongoing need for new feeder roads spurred the search for innovation, and plank roads -- toll roads surfaced with wooden planks -- seemed to fit the need.

The plank road technique appears to have been introduced into Canada from Russia in 1840. It reached New York a few years later, after the village Salina, near Syracuse, sent civil engineer George Geddes to Toronto to investigate. After two trips Geddes (whose father, James, was an engineer for the Erie and Champlain Canals, and an enthusiastic canal advocate) was convinced of the plank roads' feasibility and became their great booster. Plank roads, he wrote in *Scientific American* (Geddes 1850a), could be built at an average cost of \$1,500 -- although \$1,900 would have been more accurate (Majewski, Baer and Klein 1994, 109, fn15). Geddes also published a pamphlet containing an influential, if overly optimistic, estimate that Toronto's road planks had lasted eight years (Geddes 1850b).

No less important than plank road economics and technology were the public policy changes that accompanied plank roads. Policymakers, perhaps aware that

overly restrictive charters had hamstrung the first turnpike movement, were more permissive in the plank road era. Adjusting for *deflation*, toll rates were higher, toll gates were separated by shorter distances, and fewer local travelers were exempted from payment of tolls.

Although few today have heard of them, for a short time it seemed that plank roads might be one of the great innovations of the day. In just a few years, more than 1,000 companies built more than 10,000 miles of plank roads nationwide, including more than 3,500 miles in New York (Klein and Majewski 1994; Majewski, Baer, Klein 1993). According to one observer, plank roads, along with canals and railroads, were “the three great inscriptions graven on the earth by the hand of modern science, never to be obliterated, but to grow deeper and deeper” (Bogart, 1851).

Except for most of New England, plank roads were chartered throughout the United States, especially in the top lumber-producing states of the Midwest and Mid-Atlantic states, as shown in Table 3.

State	Number
New York	335
Pennsylvania	315
Ohio	205
Wisconsin	130
Michigan	122
Illinois	88
North Carolina	54
Missouri	49
New Jersey	25
Georgia	16
Iowa	14
Vermont	14
Maryland	13
Connecticut	7
Massachusetts	1
Rhode Island, Maine	0
<b>Total</b>	<b>1388</b>

**Table 3.** Plank Road Incorporation by State

Notes: The figure for Ohio is through 1851; Pennsylvania, New Jersey, and Maryland are through 1857. Few plank roads were incorporated after 1857.

In western states, some roads were incorporated and built as plank roads, so the 1388 total is not to be taken as a total for the nation. For a complete description of the sources for this table, see Majewski, Baer, & Klein 1993: 110.

New York, the leading lumber state, had both the greatest number of plank road charters (350) and the largest value of lumber production (\$13,126,000 in 1849 dollars). Plank roads were especially popular in rural dairy counties, where farmers needed quick and dependable transportation to urban markets (Majewski, Baer and Klein 1993).

The plank road and eastern turnpike episodes shared several features in common. As in the early eastern turnpike movement, investment in plank road companies came from local landowners, farmers, merchants, and professionals. Stock purchases were motivated less by the prospect of earning dividends than by the convenience and increased trade and development that the roads would bring. To many communities, plank roads held the hope of revitalization and the reversal (or slowing) of relative decline. But attaining these benefits, again, faced a free-rider problem. Thus, investors in plank roads, like the investors of the earlier turnpikes, also were motivated often by esteem mechanisms -- community allegiance and appreciation, reputational incentives, and their own conscience.

Table 4 shows the residences of plank road stockholders in five New York counties that each had a large city and an agricultural hinterland. Only 26 percent of the funding came from the five big cities, even though the five cities had 36 percent of the population and 50 percent of the assessed real estate in the five counties. If people bought plank road stock primarily for anticipated dividends, wouldn't the big city folk have taken a larger portion of it? Rather, this evidence supports the view that stock was purchased by townspeople seeking to link up with the big cities and the major rail

and canal connections. Use and esteem, not dividends, motivated much of the participation.

Table 4: CAPITAL STOCK OWNED BY BIG CITY INVESTORS  
IN COUNTIES WITH A BIG CITY

County (Big City)	Total Capital Stock (\$)	Investment from Big City (\$)	Percentage from Big City
Albany (Albany)	66,800	37,625	56
Erie (Buffalo)	63,675	10,200	16
Monroe (Rochester)	111,175	26,825	24
Oneida (Utica)	264,275	42,950	16
Onondaga (Syracuse)	100,165	40,325	40
Totals	606,090	157,925	26

*Note:* “Total Capital Stock” refers to the total amount of stock purchased by residents of the county.

*Source:* Articles of association of plank road companies (Majewski, Baer, and Klein 1993: 115).

Although plank roads were smooth and sturdy, faring better in rain and snow than did dirt and gravel roads, they lasted only four or five years – not the eight to twelve years that promoters had claimed. Thus, the rush of construction ended suddenly by 1853, and by 1865 most companies had either switched to dirt and gravel surfaces or abandoned their road altogether.

### **Toll Roads in the Far West, 1850 to 1902**

Unlike the areas served by the earlier turnpikes and plank roads, Colorado, Nevada, and California in the 1850s and 1860s were the frontier. These areas lacked the settled communities and social networks that induce fellows to participate in community enterprise and improvement. Miners and the merchants who served them

knew that the mining boom would not continue indefinitely and therefore seldom planted deep roots in their communities. Nor were the large farms that later populated California ripe for civic engagement in anywhere near the degree of the small farm communities of the east. Society in the early years of the West was not one where town meetings, door-to-door solicitations, and newspaper campaigns were likely to rally broad support for a road project.

The lack of strong communities also meant that there would be few opponents to pressure the government for toll exemptions and otherwise hamper toll road operations. These conditions ensured that toll roads would tend to be more profit-oriented than the eastern turnpikes and plank road companies. Still, it is not clear whether on the whole the toll roads of the Far West were profitable.

The California toll road era began in 1850 after passage of general laws of incorporation. In 1853 new laws were passed reducing stock subscription requirements from \$2,000 per mile to \$300 per mile. The 1853 laws also delegated regulatory authority to the county governments. Counties were allowed “to set tolls at rates not to prevent a return of 20 percent,” but they did not interfere with the location of toll roads and usually looked favorably on the toll road companies. After passage of the 1853 laws, the number of toll road incorporations increased dramatically, peaking to nearly 40 new incorporations in 1866 alone. Companies were also created by special acts of the legislature. And sometimes they seemed to have operated without formal incorporation at all. David and Linda Beito (1998: 75, 84) show that in Nevada many entrepreneurs had built and operated toll roads – or basic social infrastructure – before there was a State of Nevada, and some operated for years without any government authority at all. It wasn’t by the grace of government

“preconditions” that they acted and succeeded. Freedom to act and security from government encroachment is all society needs to move forward.

All told, in the Golden State, approximately 414 toll road companies were initiated,<sup>5</sup> resulting in at least 159 companies that successfully built and operated toll roads. Table 5 provides some rough numbers for toll roads in western states. The numbers presented there are minimums. For California and Nevada, the numbers are probably only slightly under-estimate the true totals; for the other states the figures are quite sketchy and might significantly under-estimate true totals. Again, an abundance of testimony indicates that the private road companies were the serious road builders, in terms of quantity and quality (see the ten quotations at Klein and Yin 1996: 689-90).

	Toll Road Incorporations	Toll Roads actually built
California	414	159
Colorado	350	n.a.
Nevada	n.a.	117
Texas	50	n.a.
Wyoming	11	n.a.
Oregon	10	n.a.

Table 5. Rough Minimums on Toll Roads in the West

*Sources:* For California, Klein and Yin 1996: 681-82; for Nevada, Beito and Beito 1998: 74; for the other states, notes and correspondence in D. Klein’s files.

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<sup>5</sup> The 414 figure consists of 222 companies organized under the general law, 102 chartered by the legislature, and 90 companies that we learned of by county records, local histories, and various other sources.

## A Rough Tally

Table 6 makes an attempt to justify guesses about total number of toll road companies and total toll road miles. The first three numbers in the “Incorporations” column come from Tables 2, 3, and 5. The estimates of success rates and average road length (in the third and fourth columns) are extrapolations from components that have been studied with more care. We have made these estimates conservative, in the sense of avoiding any overstatement of the extent of private road building. The ~ symbol has been used to keep the reader mindful of the fact that many of these numbers are guesstimates. The numbers in the right hand column have been rounded to the nearest 1000, so as to avoid any impression of accuracy. The “Other” row throws in a line to suggest a minimum to cover all the regions, periods, and road types not covered in Tables 2, 3, and 5. For example, the “Other” row would cover turnpikes in the East, South and Midwest after 1845 (Virginia’s turnpike boom came in the late 1840s and 1850s), and all turnpikes and plank roads in Indiana, whose county-based incorporation, it seems, has never been systematically researched. Ideally, not only would the numbers be more definite and complete, but there would be a weighting by years of operation. The “30,000 – 52,000 miles” should be read as a range for the sum of all the miles operated by any company at any time during the 100+ year period.

Toll Road Movements	Incorporations	% Successful in Building Road	Roads Built and Operated	Average Road Length	Toll Road Miles Operated
Turnpikes incorporated from 1792 to 1845	1562	~ 55 %	~ 859	~ 18	~ 15,000
Plank Roads incorporated from 1845 to roughly 1860	1388	~ 65 %	~ 902	~ 10	~ 9,000
Toll Roads in the West incorporated from 1850 to roughly 1902	~ 1127	~ 40 %	~ 450	~ 15	~ 7,000
Other	~ <1000> [a rough guess]	~ 50 %	~ 500	~ 16	~ 8,000
Ranges for TOTALS	5,000 - 5,600 incorporations	48 - 60 percent	2,500 – 3,200 roads	12 - 16 miles	30,000 – 52,000 miles

Table 6: A Rough Tally of the Private Toll Roads

*Source:* Those of Tables 2, 3, and 5, plus the research files of the authors.

### **Governmental Preconditions for Economic Development?**

The success of American toll roads calls into question the prevailing assumptions among many historians and developmental economists regarding the need for government action. In 19<sup>th</sup> century-America historiography, the larger “Commonwealth school,” and to a great extent the mainstream of historians, have sought historical precedence and justification for 20<sup>th</sup>-century levels of government

activism (see Lively 1955). Books such as George Rogers Taylor's *The Transportation Revolution, 1815-1860* (1951) affirmed the centrality of government in establishing order and basic services, the "preconditions" or "framework" of American life. In his *State Government and Economic Development: A History Administrative Policies in California, 1849-1933*, Gerald D. Nash repeatedly suggests that the state government was the precondition of enterprise and the source of progress.

In economics, for ages it has been conventional wisdom that "markets fail" when it comes to certain public utilities and public goods, and that government intervention and tax dollars are required to build roads. In the more specialized field of development economics, many researchers and officials believe that government must provide basic infrastructure to lift a developing society through the early stages of economic growth. These ideas have helped to justify government projects in the developing world, as well as foreign aid. Referring to the early 1960s, a page at the Website of the U.S. Agency for International Development (US AID) says: "The economic development theory of W.W. Rostow, which posited 'stages of economic development,' most notably a 'takeoff into growth' stage, provided the premise for much of the development planning in the newly-formed U.S. Agency for International Development" (US AID 2002). Although the theories of W.W. Rostow may be *passé* in academic circles, the notion that government needs to build (or rebuild) a society's infrastructure remains dominant.

America's vibrant nineteenth-century toll road movement suggests that what is really important is freedom to act and security from government encroachment. It's true that the moral sensibilities of Americans in the 19<sup>th</sup> century were especially favorable to their lifting themselves up by their own bootstraps. And it's true that

throughout the country and the century toll roads companies were typically granted eminent domain powers and often pre-existing paths or roadbeds. But, again, it is by no means clear that these forms of privilege and subsidy were crucial (see Bruce Benson's chapter on eminent domain in this volume). Moreover, these forms are minor in comparison to common practice today, namely, funding by taxpayers and planning and operation by government. The massive toll road experience in America, spilling over 100+ years, ought to lead one to reconsider any presumption about government dominating the field of road provision, as well as any presumption about government dominating or leading the process of economic development.

### **The Toll Road Company versus Progressivism**

In 1880 many toll road companies nationwide continued to operate -- probably in the range of 400 to 600 companies.<sup>6</sup> But by 1920 the private toll road was almost entirely stamped out. From Maine to California, the laws and political attitudes from around 1880 onward moved against the handling of social affairs in ways that seemed informal, inexpert and unsystematic. Although there was never an age of *laissez-faire*, during the late Nineteenth century the social and political mindset was becoming something more directly at odds with spontaneous order. Important social affairs would be administered free of peculiar economic or political interests by professional experts. They would centrally plan and optimize systems for the overall benefit of society. The independent private toll road did not fit the program.

Progressivism was a burgeoning of collectivist ideology and policy reform. Many progressive intellectuals took inspiration from European socialist doctrines.

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<sup>6</sup> Durrenberger (1931: 164) notes that in 1911 there were 108 turnpikes operating in Pennsylvania alone.

Although the politics of restraining corporate evils had a democratic and populist aspect, the bureaucratic spirit was highly managerial and hierarchical, intending to replicate the efficiency of large corporations in the new professional and scientific administration of government (Higgs 1987: 113-116; Ekirch 1967: 171-94).

How this translated into public policy was captured by H. L. Mencken in 1926: “The Progressive is one who is in favor of more taxes instead of less, more bureaus and jobholders, more paternalism and meddling, more regulation of private affairs and less liberty.”<sup>7</sup> Progressivism in the U. S. was the first big wave of a sea change – the onset of the kind of social democracy (big, democratic government that readily taxes, spends, and intervenes in the name of serving “the general welfare”) – that now blankets the so-called free world.

One might point to the rise of the bicycle and later the automobile, which needed a harder and smoother surface. But that is a demand-side change that does not speak to the issues of road ownership and tolling. Automobiles achieved higher speeds, which made stopping to pay a toll more inconvenient, and that may have reinforced the anti-toll-road company movement that was underway prior to the automobile. Such developments figured into the history of road policy, but they really did not provide a good reason for the policy movement against the toll roads. The end of the toll roads, then, did not come principally from developments in road management or technology, or particular failings of the road companies still in operation.

The following words of a county board of supervisors in New York in 1906 indicate the methods and ideas used against the toll road companies:

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<sup>7</sup> From an article by Mencken in the Baltimore *Evening Sun*, January 19, 1926; the passage appears in DuBasky 1990: 385.

[T]he ownership and operation of this road by a private corporation is contrary to public sentiment in this county, and [the] cause of good roads, which has received so much attention in this state in recent years, requires that this antiquated system should be abolished. . . . That public opinion throughout the state is strongly in favor of the abolition of toll roads is indicated by the fact that since the passage of the act of 1899, which permits counties to acquire these roads, the boards of supervisors of most of the counties where such roads have existed have availed themselves of its provisions and practically abolished the toll road.

In other words, county governments are justified in shutting down the companies because governments are shutting down the companies.

Inside the U. S. Department of Agricultural, the new Office of Road Inquiry began in 1893 to gather information, conduct research, and “educate” for better roads. They opposed toll roads and the Federal Highway Act of 1916 barred the use of tolls on highways receiving federal money (Seely 1987: 15, 79). Anti-toll-road sentiment became state and national policy. Since then, highways in the U. S. have been run mainly along socialist lines, although state governments later reintroduced toll financing, and in the 1990s federal resistance to tolling declined and several stretches of highway were built and managed by private companies (see Sullivan this volume, Samuel this volume).

## Lessons for Highway Policy Today

Toll road history offers perspectives on many sweeping subjects such as the potency and forms of voluntary association, the relationship between commerce and community, and the changes that have taken place in America's character and ideology.

But here we confine ourselves to some highway-policy lessons that apply today not only in America but in other countries as well:

- Private toll-roads brought advantages in terms of quantity, quality, and efficiency. These benefits were apparent in comparison to local government road care or the federal government's National Road. The virtues of private ownership – decisive authority over the resources, private ownership that tastes profit and loss, incentives to reduce costs and improve efficiency, dependence on the payments of customers, and lack of access to government largesse – still recommend private enterprise over government as the way of efficiently matching highway supply to demand.
- Private companies spontaneously developed extensive networks and systems of highway. The notion that highway integration must be centrally planned should bear the burden of proof.
- Over-regulation hampered the old toll roads. Regulatory demands for better service and user concessions often resulted in worse road conditions or no

road at all. Policymakers today must understand the deleterious long-run consequences of restricting private road companies.

- The old toll roads faced significant regulations, but until the end of the century they were pretty confident in the rules of the game. In modern times the rules are prone to change harshly and without much warning. To give private investors the confidence to undertake massive projects that will payoff over the course of decades, the government must ensure the integrity of the rules.
- Unlike the olds, the modern highways are often plagued by traffic jams. Today, electronic tolling enables automatic charging without vehicles having to stop and without the provision of large toll plazas and toll collectors. Under conditions of congestion the road officials can increase throughput simply by setting higher charges. It is worth noting that congestion constraints induce the private highway-owner to vary the toll charge roughly in keeping with social-welfare maximization. Furthermore, such charges not only reduce congestion on existing roads; they can help investors identify profitable ways to provide new ones.
- The old toll roads were plagued by toll evasion. The feasibility of private roads today is enhanced by electronic technologies that ease toll collection and prevent toll evasion.
- The old toll roads assembled and cleared their route swiftly and easily. Today the process of environmental clearance involves tremendous delays, outlays, and uncertainties. If new road facilities are going to be built, whether by

private enterprise or by government, the clearance and entitlement process must somehow be simplified.

Looking back, one might say that the American people ran an experiment: 100 years with extensive privately managed toll roads, and then another 100 years primarily of government managed “freeways.” The historical record suggests that road provision is another case where the advantages of private ownership, relative to government ownership, and of user-fees, relative to tax financing, apply. Learning from the mistakes of both epochs, Americans and people in other countries should embark on a new century of road provision.

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