Many of the first manmade improvements to those tracks were made by the military because the deployment of armies depended heavily on reliable supplies. There’s a saying among military logisticians that soldiers fight on their stomachs, so in order to keep those stomachs filled, armies needed wheeled carts to bring in the supplies of grain, meat, and other provisions to sustain the bodily energy and the morale of the soldiers. Military engineers were among the first road and bridge builders. Because the state depended on the military for its survival, it has always been interested in roads.

At the same time, roads have always been a vital part of peaceful trade and commerce, and have served the movement of people in search of new opportunities. So a tension has always existed over the role of the state in assuring good roads. They have always served state and private purposes.

Roads have varied from the apparently haphazard and irrational in organization to the almost mindlessly regular. George Washington complained in his diary that New England’s roads were “amazingly crooked,” but noted quickly that this was designed “to suit the convenience of everyman’s fields.” People built local roads to suit their own purposes, making things difficult for distant travelers. Washington, a great traveler in his first profession as a surveyor and then as an officer in the war against the French, wrote acerbically that the circuitousness of local roads made finding one’s way difficult because “the directions you receive from people are blind and ignorant.”[1]

In Washington's time it was regarded as an act of enlightenment to have the military engineers lay out a new town according to a rectangular grid—thus the layout of central Philadelphia, old town Alexandria, Washington, D.C. (with diagonals added), and Manhattan north of the Dutch Wall Street area. Among the quite mindless applications of the grid, consider hilly San Francisco!

Such “grid” road networks were laid down by rulers going back to ancient Egypt and Assyria, though the design is normally attributed to Hippodamus, the Greek follower of mathematician Pythagoras, for its application in the building of the town of Miletus following its sacking by the Persians in 440 BC. The grid Hippodamus laid down in Miletus was extolled as a triumph of “reason” over the “wanton riot of nature,”[2] and “Milesian” road plans became widely applied in the classical world, especially by the Romans in their new towns, but also as far away as China.

Washington was not the only early American founder to take an enormous personal interest in roads. At Thomas Jefferson's initiative, the 1785 Land Ordinance Act specified that on land in the territories beyond...
the original 13 states, farmers were required to deed 33-foot strips on either side of all the boundaries to provide 66-foot rights of way for roads, this being the estimated width needed for a horse and wagon team to execute what we now call a U-turn. The road geometry mandated by the act, which was reinforced in the Homestead Act of 1862, was an instrument of social and economic engineering in that it set a pattern for farm size and land subdivision over vast tracts of the west. It is easily visible today to passengers looking down on states like Iowa and Kansas from an airplane window.

Roads for Safety and Sanitation

Besides serving the ruler’s military needs, roads were also seen as lines of demarcation for property and as safety and sanitation devices. They provided safety, it was hoped, by being wide enough to confine fire to a single city block. Sanitation was advanced by the roads’ functioning as gutters for the drainage of waste water. That was perhaps the first “utility” associated with streets, followed by water, gas, electricity, and now telecommunications. The state was involved to adjudicate rights and responsibilities with respect to vehicular safety, trash disposal, and common rights of passage. Many roads were indeed commons in the sense that they were wide enough for livestock to graze and feed a bit while resting on a journey.

It was another kind of utility, the postal service, that enshrined in the Constitution the interest of the U.S. government in roads. Article I, Section 8, Clause 7, gives the Congress the power “To establish Post Offices and post Roads.” Post roads were not defined, but in support of the postal service the Founding Fathers apparently gave the federal government broad powers over almost any roads in theory.

It is one thing to be granted a power, another to raise the funds to exercise it. From the earliest days of the republic there have been arguments about the fairest and best method to finance roads. Before the introduction of the spark-ignition engine early in this century, there was no feasible way of collecting a fuel tax. A fuel tax is feasible when the fuel used is manufactured at a small number of major refineries or distributed from major points. The taxman can track the fuel under those circumstances. But before petroleum, road vehicles depended on horse and ox power, and their “fuel” consisted of hay, oats, and other feed that was so highly dispersed, no tax system could possibly track them.

Involuntary Servitude

The most common early method of getting roads built was the corvée—a decree of the local court ordering all able-bodied men in an area to report with pick and shovel for a couple of days of local roadwork. The well-heeled were able to pay for substitutes to fill in for them. As trade developed further west, the attitude toward corvée changed because local people didn’t see why they should engage in forced road labor on behalf of distant interests. It was one thing to band together with immediate friends and neighbors for mutual benefit. But it was quite another matter to labor for the benefit of through traffic—commercial carriers or travelers from far away. Whenever the corvée was stretched to road improvements that benefited outsiders, it broke down.

Three alternatives were available to corvée-maintained roads, alternatives that remain today: state-funded roads, nationally planned and funded roads, and private turnpikes. With this last alternative, investor-financed corporations would build and maintain a road based on user tolls. (The turnpike was literally the lightpike, or spear-like barrier, that was turned by the toll collector to let traffic pass.)

At the center of American transportation politics has been debate over how far each of these three models should be used. There have always been those favoring national planning and finance of roads. In 1808, at the request of the U.S. Senate, Treasury Secretary Albert Gallatin produced a national plan for highways and canals. He proposed federal construction of roads from the Atlantic-coast cities to Detroit, St. Louis, and New Orleans. In one passage of the report he asserted that public subsidies of this kind would
increase national income by the full amount of any expenditure. A road, like any other investment, can only be assessed on its likely revenues and costs, not on its general nature. But then public officials and bureaucrats, risking the money of others, have always been cavalier in such pronouncements. Gallatin’s economic nonsense is repeated by enthusiasts for transportation subsidies to this day.

But if his rationale was faulty, there was a case for improved roads, and Gallatin’s plans caught the imagination of congressmen. The Congress passed a bill to charter a special bank to raise $13 million over 20 years for Gallatin’s national roads. The bill was vetoed in 1817 by President James Madison, who argued it infringed states rights. In so doing he averted national planning of highways for a while. A federally subsidized National Road between Cumberland, Maryland, and Wheeling, West Virginia (now US-40), had been built in the 1810s but the federal government did not have the money for its maintenance. Again there was contention. The Congress in 1822 passed a bill to impose tolls for maintenance of this Cumberland-Wheeling road. Again a president, this time James Monroe, intervened, vetoing the bill as unconstitutional. The issue of responsibility for roads was so big that it became an early test of the whole structure of the U.S. Constitution and produced some of the first presidential vetoes.

In a pattern that survives to this day, the Cumberland-Wheeling National Road was maintained by the states, with the amount of federal support varying from year to year, depending on the vagaries of political machinations in Washington, D.C. In general, government funding for roads was so poor in the age of horse power that turnpike corporations were the major mechanism for improving and maintaining roads. Some of them were what would now be called “public-private partnerships.” The government provided charters and some subsidies or capital contributions. There was plenty of innovative financing; for instance, landowners subscribed to stock on condition that the toll road serviced their property.

**Turnpikes as Investment Opportunities**

Straight investor money was garnered too. In the early days of the republic, such turnpikes provided the main basis of intercity transportation. This was a major business. By some estimates, half the corporations formed in the first half of the last century were tollway companies. At least 10,000 miles of private toll roads were built in the first 60 years of the republic.[3]

The toll road was often the subject of controversy, political pressure, and changing rules. But it was a central economic institution and a major public utility in late eighteenth- and early nineteenth-century America. Local merchants, landowners, and farmers financed several thousand turnpikes in the northeast, and smaller numbers elsewhere—evidence of which remains in the name “pike” found on many now “free” roads. Investors knew that political interventions to cap toll rates, exempt classes of people from tolls by law, or improve competitive free roads could ruin a turnpike. So subscription to the stock was often made on other than strictly investment grounds. Some invested because they saw it as a civic duty or were subject to peer pressure. Some stock buyers wanted to influence the route of the turnpike to their own benefit. For example, the records of the Brandonville Turnpike Company in Virginia show that on June 6, 1847, one E. Brooke pledged $75 for stock “if it [the proposed turnpike] goes within ten yards in front of my house.”[4]

A small minority of the turnpikes gave their investors a good return on their capital. Other pikes were badly managed or simply ill-conceived, and failed. And competing technology—the steam railroad—came along to supplant the gravel-and-dirt pikes at least for long-haul transportation from about 1850 onward. With respect to animal-drawn vehicles, the turnpikes’ grand era was 1780 to 1840. Some lasted to late in the new century; others went into decline or were taken over by local authorities. In most cases, the localities inherited from the turnpikes much improved roadways and bridges that would never have been built otherwise.
The Automobile Era

In the early years of the automobile, the gasoline tax was seen as a sensible user fee for roads. The federal Department of Agriculture gained support for “lifting farmers out of the mud” with a program of tax-financed rural roads. In the 1920s a Federal Bureau of Public Roads was established. It successfully pushed the notion that a nationally planned network of roads was needed and that only government funding would ensure that this could be developed.[5] The modern motorway, or freeway, especially suited to tolling because of its limited access and egress points, was not implemented until the 1930s. That coincided with the Great Depression’s (erroneous) discrediting of capitalism and its celebration of the state, as seen in the New Deal’s government activism.

Government dominated highway building. In New York City, Robert Moses, the great city-government activist, pressed tax money into a system of expressways to supplement the early parkways (essentially low-speed freeways in a park-like setting). The parkways drew on the inspired park designs of Frederick Law Olmsted. Lake Shore Drive in downtown Chicago, which opened to traffic in 1933, is described as the first “superhighway” that discarded the pastoral setting of the parkway for the unapologetic utilitarianism of a mass automobile movement system. The year 1937 brought the first proposal for a metropolitan-wide network of freeways (though described then with the British term “motorway”) in Los Angeles, an idea promoted by a city engineer and the Automobile Club of Southern California. The first freeways in Los Angeles were built from 1938 to 1940—the Arroyo Seco (later renamed the Pasadena Freeway) and a one-mile piece of the Hollywood freeway. Their funding was a patchwork of government money, including cash from the federal Works Progress Administration, city funds, and the first gas taxes, which were imposed by local governments. The next L.A. freeways were funded by the feds under the National Strategic System of Roads umbrella, ensuring priority in allocations of administered supplies of steel and cement.

The first auto-era roads to be tolled—by the state highway department—were Connecticut’s Merritt and Wilbur Cross Parkways in 1937. Various state turnpike authorities were being formed in the war years, following the example of the Pennsylvania Turnpike, which opened its first toll motorway in 1940, using the right of way and works of “Vanderbilt’s Folly”—an uncompleted set of tunnels and embankments from the abandoned New York Central’s south Pennsylvania railroad. The idea for the Pennsylvania Turnpike, the first of the big cross-state turnpikes, was credited to a lobbyist, William Sutherland of the Pennsylvania Motor Truck Association and Victor Lequoc, an employee of the State Planning Agency, whose role was to garner the maximum anti-depression money by coming up with projects that would impress the federal government.[6] These government-owned corporations pioneered the earliest sections of the interstate highway system and financed some 2,100 miles of tolled freeways between 1940 and 1956, when the Federal-Aid Highway Act introduced a gasoline tax to finance a highway trust fund out of which the U.S. government would fund 90 percent of the cost of new interstate freeways. That act grandfathered the existing toll roads into the interstate system, meaning that they got convenient connections with the new untolled freeways plus nice federal interstate shield signs.

The act, however, banned any new tolls on interstates. In one of the most spectacular misuses of economic modeling, the U.S. Bureau of Public Roads purported to analyze the feasibility of toll financing and estimated that only 172 miles out of an initial 14,336-mile interstate system could be supported by tolls! Defense and economic arguments were advanced for the gas-tax–financed system, which built about 36,000 miles of freeway in the next 20 years. Some 2,500 miles of new toll roads were built by state turnpike authorities during this period, either extensions of pre-existing toll roads or, as in Florida, Oklahoma, and Kentucky, freeways that local politicians could not get put on the interstate map and funded by the feds. The tolled mileage peaked in 1975 at 4,400 miles. From the late 1960s de-tolling became common. Toll plazas were nuisances, the site of stops and queuing that seemed an anomaly on an
otherwise high-speed highway. So it was generally popular for politicians to promise to get rid of the tolls. Moreover, the states could get federal grants for reconstruction and improvement of the grandfathered toll roads only by de-tolling them.

By 1990 there were 42,000 miles of non-toll interstate freeways, 9,500 miles of state-financed non-toll freeways, and 4,100 miles of turnpike.[7] This decade has seen few new interstate freeways and about 300 miles more of state and local government-built turnpike, including the first major toll roads in California. And since 1995 two investor-financed highway projects have been built, totaling 24 miles—the Dulles Greenway in Loudoun County, Virginia, and 91-Express in Orange County, California.

The Market Alternative

Given our history of state dominance of highways this century, we have huge vested interests in its continuance: state highway bureaucracies, an industry of contractors and consultants with connections to those bureaucracies, and legislators for whom highway pork projects are part of the political medium of exchange. Two arguments are deployed that buttress the statist status quo for tax-financed highways—that taxes are the most practical and most fair way to pay for roads. Both are widely believed, but dubious. On fairness, it is said to be more burdensome for the worker earning $30,000 or the welfare mom on $15,000 to pay a $2 toll than it is for a rich person making over $100,000. That is true, of course. Any expense is less burdensome to the rich than to the poor, which is a major reason that people work. The inexorable logic of the tolls-are-unfair argument is that prices for goods and services generally are unfair, which leads to a case for socializing everything and distributing goods through the state according to some godly judgment of “need.” But in the real world, where capitalism and markets have been found a rather practical way of getting people to work on behalf of one another via exchanges of goods and services, prices are central.

Indeed, the lack of pricing and markets for highway services is at the root of many of our highway problems. There is a constant moan from people about the lack of money for roads, a complaint you never hear in respect of building new electric generating plants, telephone lines, computer factories, car plants, or pig farms. Because those products sell for a price, their producers are able to raise money by going out into the capital markets with estimates of the profits they may be able to generate through their proposed investment. So if highways were priced with tolls, the highway service providers could raise capital for good toll highway projects based on the prospective stream of future revenues.

Such bottom-line-oriented managers are likely to run their highways much better than civil servants working in state agencies. The civil servant, whose funding comes from the legislature, will be helped by the poor condition of the roads. Roads in disrepair will draw attention to the supposedly dire need of the state agency for more money in the next budget. The worse the condition, and the more aggravating the traffic jams, the more likely state managers are to gain political support for generous funding. No reason to schedule repaving at night, or to quickly move the overturned tractor trailer, or do life-cycle cost analysis of more robust initial construction versus maintenance or rebuild. No one ever calculates returns on capital at a state highway administration or sees the adverse results on their income of causing traffic jams.

The second argument against tolls is that they are costly and cumbersome to collect. But compared to what? Taxes are also costly to collect. The tax agencies employ vast staffs and impose large costs on taxpayers. The various “highway user” taxes imposed on fuels are a huge object of evasion. Gasoline used on farms or boats, for example, is tax-exempt. So is diesel fuel used in construction or shipping or as heating fuel. Thus, from organized crime down to small struggling gas stations and tanker drivers, people heavily exploit the profit to be gained from classifying fuels as tax-exempt, then quietly selling them for transportation use as tax-paid.
Moreover, the politicians for so long have diverted money from the so-called highway trust fund to nontransport purposes that most citizens understandably resist proposals for higher gas taxes. They doubt that they get highway value for the gas tax. Tolls are often the politically practical only way to get needed new highways financed and built.

Toll collection via the traditional toll plaza is, of course, usually cumbersome and costly. But advances in radio and imaging allow new roads to levy tolls on the fly. Most existing toll roads are being retrofitted so that motorists with transponders (a battery-powered radio device the size of a cigarette pack) can drive through toll plazas and pay by mail or credit card without stopping. The first toll roads are now operating without any plaza at all—the investor-built 91 Express in California and 407 Express Toll Route in Toronto. Motorists using 407-ETR acquire a toll transponder, allowing the system to identify their accounts on entry and again on exit, compute their mileage, apply the appropriate time-of-day toll, and debit their accounts. If a motorist doesn’t have a transponder, the license plate is photographed, and a toll bill arrives each month in the mail.

With these technologies, the cost of toll collection can be cheaper than tax collection, and the hassle of paying on the road is ended. Some raise “Big Brother” concerns, but they apply equally to requirements for Social Security numbers, vehicle license plates, and drivers licenses. Concerns can be mitigated by anonymous transponder accounts, independently verified and routine purging of toll data, and the argument, “If you really are concerned that information about your movements are in a toll computer, then don’t use the toll road.”

**Market Practices**

The new automated toll roads are bringing market practices into highway service, for example by charging higher tolls at peak than at off-peak times. They do that because they make more revenue that way. The time savings from using a free-flowing toll road are much greater in rush hours than nonrush hours, so motorists are prepared to pay more then. Variable pricing makes business sense, too. Highways can operate much more efficiently if they can persuade some motorists to defer their trips to times when there is spare capacity, or to use mass transit or car pools. Variable tolls are thus a powerful tool for increasing transport productivity. They can be used to prevent backups and all the resultant frustration, pollution, energy use, wasted time, and accidents that accompany unpriced or fixed-price roads.

Asked recently to devise a method to manage smooth efficient traffic flows on high occupancy vehicle lanes under construction on State Route 91 in the western portion of Orange County, California, consultants said, “variable tolls.” It is the way commodity markets work, the way we get our food, our housing, and most other things. The idea is old and tried and proven. New technology allows it to be implemented on highways, lifting the heavy hand of statism from motorists at last. If a case ever existed for state provision of roads, it exists no longer.

A variety of methods are available to reduce the role of the state in the provision of roads:

- The various state and local government-owned turnpikes, toll bridges, and tunnels can simply be sold off to the highest bidders. There are about 100 of these, and they collect about $5 billion annually in tolls and are probably worth $20 billion to $30 billion.
- The maintenance of highways is increasingly being privatized, just as construction of highways has always been based on competitive contract. But government can get out of the road business by reducing gas taxes and calling for proposals from business for funding roads. Eight states already have mechanisms in place for investor-financed companies to build new roads as toll projects, and a number of projects are under way. The advantages of this are that investors rather than taxpayers take the risks.
Existing nontoll highways can be either sold off by the states or franchised to business in return for the rights to levy tolls, sell off utility rights-of-way, and run service and refreshment concessions. Users of the toll roads should be exempted from gas taxes and other state charges that would otherwise have gone to the upkeep of the roads. With commercial ownership and management, highway service will be more responsive to motorist needs than state “pork” roads.

It is possible to bring some of the benefits of the marketplace by introducing tolls while maintaining state ownership. That is what the Germans plan for their autobahn system, and it seems to be the major British approach. But full privatization would transfer ownership to investors and allow the assets to be traded, introducing the additional market discipline of competition in both consumer and capital markets. By allowing takeovers, consolidations, and spin-offs of highway assets, the markets would ensure that highways are managed for the best return on capital—the dynamic that gives us our food, our fuels, our housing, our electric power, and all the rest of what goes into our standard of living.

2. Ibid., p. 13.

**Other Sources**