

“How to Plan and Pay for the Safe and Adequate Highways We Need”*

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I. The Proposal: A Shift to the Private Enterprise Point of View

The building and maintenance of our highways is today almost exclusively a governmental operation. We have become so used to this that whenever the question arises how to solve our highway problems, we take it for granted that we are simply asking how we can improve government planning of roads and government financing of them. The proposals in the present essay are based on an attempt to re-think the problem from the outset and to refresh our imagination on this problem by putting the question in another way. Suppose we ask not how the government can do a better job for us, but how our highways might be provided by free private enterprise.

Like automobiles, shoes and cigarettes, highway service is a product offered to a number of individual consumers. How can this product be most economically provided? How can the type of service be provided for which there is the greatest consumer demand? How can this service best be paid for? For the production and financing of automobiles, shoes, and cigarettes we do not make any collective ‘plans’ or make collective estimates of ‘needs’. Instead we rely on each individual deciding for himself how much he ‘needs’ and how much he is willing to pay. We rely on the prospect of profit to lead other individuals to meet this “need” by producing the products and selling them on the free market. Producers who satisfy the needs of customers at least cost prosper; those who do not, fail. We test whether a thing is worth producing by whether consumers are freely willing to pay a price at which other individuals are freely willing to produce it. The ‘planning’ is decentralized, the paying is voluntary, and the ‘need’ is evaluated by each individual according to his own lights. The problem of ‘planning’ and that of ‘financing’ are both solved at the same time. These are the fundamental principles of our free enterprise system; these are the principles that have produced our material prosperity and at the same time enabled us to preserve political freedom—to avoid having politics engulf the whole life as it has come so close to doing not only in Communist countries but in most other parts of the world.

Why should planning and paying for our highways needs be treated differently than planning and paying for other services or commodities? Highway services do have some peculiarities which make it unwise or impossible to leave their provision entirely to free private enterprise. But these peculiarities are not so great as they are generally assumed to be; and they have become less important as a result of the growth of our economy and modern developments in technology. In any event, we should not take it for granted that these peculiarities require that highways be and remain a government monopoly, or that the principles of private enterprise cannot be applied to solve this problem as they have so brilliantly solved others. The accepted approach to this problem is an illustration of the way in which the proponents of our free enterprise system accept the role which is given them by their opponents—a role as fighters of a rear-guard action against socialism. While they devote their energies to preventing further encroachment by government, they take for granted that those areas in which government is at any moment operating must be so operated. Those of us who believe in free enterprise should show as much imagination,

intellectual daring, and willingness to experiment in extending the scope of free enterprise as the opponents of free enterprise have shown in seeking to extend the power of the state. If we do, we shall find that much now being done by the state could better be done by free enterprise. We shall discover that the trend of opinion toward collectivism of the past few decades has led us all to accept many kinds of state action as inevitable and desirable that will turn out not to be so if we examine them from a fresh point of view.

Highways are a touchstone of the whole problem. There are exciting prospects of introducing the many benefits of free enterprise into the provision of highway services, and avoiding many of the evils of government operation. The measures proposed in this essay are of three types:

- a) Those clearly feasible, desirable, and capable of being introduced promptly; here particular practical proposals are made;
- b) Those more speculative, requiring more knowledge and experiment before they can be adequately evaluated; in this class the present essay attempts at least to suggest areas of investigation and experimentation which might be productive of practical proposals in the long run;
- c) Other possibilities which must still be regarded as visionary.

We have deliberately included the visionary possibilities along with certain practical proposals in the hope that these may stimulate others. While we recognize that it is not possible to go all the way, that government will have to continue to play an important role in the provision of highway services, our main purpose has led us to walk as little as possible along this well-trodden path and to give our attention primarily to opening or exploring some new paths.

Two important facts should be noted at the outset which may put this suggested change to a private enterprise point of view in its proper perspective.

1. *The introduction of private enterprise would be likely to lead to a substantial increase in actual expenditure on highways.*

The public now expresses its demand for highway services by paying for them in the form of license fees, gasoline taxes, and tolls on the toll roads that have been mushrooming in recent years. But, strictly speaking, the highway-consumers who have been paying these fees have not been getting their money's worth. This appears from the simple fact that the amount paid in state and federal motor-vehicle fees, motor fuel and motor carrier taxes has year after year been decidedly greater than total current expenditures on roads (for maintenance and administration of state, county, and local roads and city and village streets, debt retirement, and interest on debt). In 1950, for example, receipts were in excess of 3 billion dollars, while expenditures were only about 2.25 billion dollars. In addition, toll roads have in general been extremely profitable, which is of course a major reason why they have been tending to increase in number. By the criteria of private enterprise, therefore, the provision of highway services is already a highly profitable business. The introduction of the profit incentive would thus confer a double benefit on the users of highway services: it would not only lead to greater efficiency in the expenditures now being made; but also to a substantial expansion in the highway system.

2. The provision of highways is neither too expensive nor too large-scale an activity to be conducted by private enterprises.

By comparison with other activities carried on by private enterprise, the provision of highway services is a small industry. As noted above, in 1950, about 2.25 billion dollars were spent in the maintenance and operation of all state, county and local roads, and city and village streets, debt retirement, and interest on debt. The railroads spent more than three times as much on current operations (including interest, rents, and dividends); the automobile, perhaps six times as much. Consumers spent more than this sum on cigarettes, other tobacco products, and smoking supplies, even after subtracting the part of their expenditure on these items that went to taxes; they spent more than this sum on hiring domestic servants; they spent more than twice this sum on alcoholic beverages, again after subtracting taxes; they spent between twenty and twenty-five times this sum on food.

Highways bulk larger in capital outlay than in current expenses, but even here they are by no means exceptional. Total capital outlay on roads in 1950 was about the same as current expenditures, about 2.25 billion dollars. Gross public expenditures by all private enterprises were more than twenty times this amount, net capital expenditures (after deducting depreciation charges and the like) more than ten times as large. More than five times as much was spent by private enterprises on building new houses and dwellings as was spent by governmental units on building roads and streets.

Clearly, sheer size and expense are no justification for government operation of our highways system. If this conclusion and the preceding comparisons seem surprising, it is, we believe, because highways have been provided by governmental activity, therefore requiring collective action for financing and becoming footballs of political discussion, whereas the other activities have been carried on by myriads of separate enterprises through an impersonal market mechanism that attracts little attention. What seems large and difficult for government gets done almost without attention by private enterprise.¹

II. Economic Peculiarities of Highways

The correct explanation of why the provision of highways has been so exclusively a governmental function is, we believe, to be found in three real peculiarities of highways that raise obstacles to their operation by private enterprises. Some grasp of these peculiarities is essential if we are to get the benefits of private enterprise in the provision of highway services, and at the same time avoid doing serious damage in the process. These peculiarities are:

1. The technical difficulty of charging for the use of roads

In fairness, the people who drive on a road should be charged for the service received, and in proportion to their use of the service. But from the very nature of the road it is difficult to charge each traveler on the road this kind of price directly. Automobile license fees and the gasoline tax are attempts to charge people for the use of roads indirectly. They are, however, very crude means. The charge does not depend on the particular road used, so the taxes involve the same charge for the use of a super-highway and a dirt road, or for the use of a crowded road on which it would be desirable to discourage traffic, and a little-used road. The tax varies from one kind of

vehicle to another in a way that may bear only a rough relation to the difference in the amount of highway service used or cost imposed by use.

The inability to identify the particular highway use for which a particular dollar in tax is paid also makes it almost inevitable that this kind of charge be collected by government. This simple fact has played an important part in keeping the provision of highway service a governmental function. A consequence has been that it is now difficult or impossible to tell which roads are paying their own way and which are not.

A really thoroughgoing and satisfactory solution to the problem, of improving our roads will, therefore, require improvement and refinement in the method of charging for their use. Yet it must be emphasized that, however crude may be the present method of charging people by means of gasoline taxes and license fees, it is vastly better than paying for roads and highways out of general tax revenue. For at least it establishes some relation between use and payment, and thereby imposes the cost of highways at least roughly on those who benefit from them. In so doing it creates some incentive for the economical use of highways.²

At first glance, it seems hardly possible that this apparently trivial problem of how to charge people for the highway services they use is a key to the whole problem of how to plan and pay for better highways; yet it is just that. This fact cannot be too strongly emphasized. It is a key not only for a system that would involve operation of roads by private enterprise but equally for the present system of public operation. Should a particular road be built? How should it be built? How should it be financed? Should an existing road be maintained, improved, or allowed to deteriorate? If we could charge directly for the service of the road, we could answer those questions—whether under private or public ownership—in the same way that we now decide how many automobiles should be manufactured, what kind of automobiles should be manufactured, how their production should be financed, whether a particular model should be discontinued, and so on.

If there is a price for road services at which traffic on a new road would pay for the cost of constructing it, it should be built; if the extra traffic on a better road or the higher price people would be willing to pay would yield enough revenue to pay for making it better, then it should be made better. If the receipts on an existing road do not cover costs of maintaining it, it should be allowed to deteriorate. This is the test we apply to the bulk of our economic activity. We have never been able to discover a better or more effective test; and every attempt to dispense with this test—such as has occurred in times of governmental price controls or in socialistic experiments—has raised staggering difficulties to which no satisfactory solution has yet been found.

2. A road is in some measure a natural monopoly

Given one road between two places, there is seldom any justification in precisely duplicating the road—even if it were possible; if there is more traffic to be carried, common sense suggests that the desirable thing is to enlarge the road, not build a duplicate road. In this sense a road is a ‘natural monopoly’.

With respect to most items, say automobiles, or furniture, if one producer were to try to charge consumers a price considerably higher than the cost of producing automobiles or furniture, consumers have the alternative of buying from another producer—or if there is only one producer at the moment, there is a strong incentive for someone else to go into the business. And there is no technological barrier to prevent other people from going into the business or to prevent the simultaneous existence of a number of firms all producing essentially the same product. In such cases, the consumer is (or can be, provided government avoids the creation of an ‘artificial’ monopoly) protected against exploitation by the actual or potential competition of other enterprises capable of producing the same product. The maintenance of vigorous and active competition has in this way been a major source of our high standard of living.

With a natural monopoly like a road between ‘A’ and ‘B’, such protection cannot be present to the same degree. If a private owner of a road charges a toll, say, that is considerably higher than the cost of providing the highway service, there is little possibility of someone else building a precisely duplicating road. The absence of the competitive check tends to lead to a check via government control. This is how the existence of ‘natural monopoly’ helps explain the socialization of highways.

But while it is clear that there is an element of natural monopoly in roads, the extent of monopoly power is always limited, and much more sharply limited in some cases than in others. While it may not be feasible to duplicate the precise road between ‘A’ and ‘B’, there are almost always other ways of getting from ‘A’ to ‘B’; by roundabout routes, by railroad, by plane. Even more indirectly, it is possible to avoid going from ‘A’ to ‘B’ by doing business elsewhere, or by transacting business by writing, wiring, or telephoning. This indirect competition sets limits, and in many cases very narrow limits indeed, on the monopoly power inherent in the ownership, say, of the road between ‘A’ and ‘B’. One drastic and almost unnoticed effect of recent technological change, and of the growth and development of our economy, has been progressively to lessen the element of natural monopoly in roads. That monopoly element today is much smaller than it was, say, one hundred years ago; and every year with the development of our means of transportation and communication it becomes less and less. These changes make it far more feasible today to introduce elements of private enterprise and competition into our highways system without danger of undue exploitation of the consumer, than it would have been at an earlier stage in our economic development.

3. The ‘neighborhood effect’ of roads

The benefit a person receives from the existence of a road, or from its being in good repair, may not be proportionate to the amount he himself travels on the road. A person living on a road, for example, who traverses it say only twice a day, may be willing to pay much more for the privilege of having a road there than a non-resident who also traverses it twice a day. The resident will want the road to make it easier for his friends to visit him; to improve the appearance of his house; to avoid noise, dirt and congestion, and perhaps for still other reasons. As a result, it is not fair that the cost of road-maintenance should be borne exclusively by the people who travel on it. More important, the amount people are willing to pay directly for the privilege of travelling on a street or road may not be an adequate indication of the amount it is appropriate to spend on that street or road. If one could charge not only for such direct benefits but also ferret out all the indirect benefits and charge each person the amount he would be

willing to pay for them, the sum thus obtained would be a better measure of the amount it would be worth spending on the street or road.

Wherever such indirect benefits can be identified and charged for, it is highly desirable that they should be. We should try more than we have in the past to find ways of measuring the economic advantage which private individuals (other than travelers) receive from particular roads, to make them pay fairly for these advantages, and hence to enlist their initiative and concern in the improvement and maintenance of our roads. But we cannot hope for more than modest success in this endeavor. In consequence, the existence of ‘neighborhood effects’, where they are important, imposes a major obstacle to the introduction of private enterprise in the provision of highways. They are likely to be particularly important in cities, which is why our proposals are least adequate for city roads and streets.

But here again, the importance of ‘neighborhood effects’ should not be overestimated. In one sense, every economic activity has ‘neighborhood effects’: the suburban supermarket benefits from people in general having cars, because this enables it to draw on a larger circle of customers. It does not therefore follow that the supermarket should be assessed directly for some part of the costs of the customers’ cars, or that too few people will have cars unless this is done. Insofar as the supermarket benefits, it can—and competition will force it to—reduce the price at which it sells its product, and this price reduction gives potential customers just the right additional incentive to buy cars, so that in effect the supermarket is contributing to the cost of the cars. In the same way, the suburban supermarket benefits from good roads, but this does not create any ‘neighborhood effects’ that justify building more roads than consumers are willing to pay for in the form of a fee for travelling on the roads. The ‘neighborhood effects’ that are important are those that do not get effectively expressed in some such way in the form of an increase in the direct demand for highway services.

Benefits from highway service may also accrue to the nation as a whole rather than to individuals separately. Perhaps the most important example is the value of roads for national defense. Where such benefits are important they may justify building roads at government cost that would not otherwise be needed.

These are the three main peculiarities of highways from an economic point of view. How can we overcome them or at least reduce them so as to put the building and maintenance of highways more and more on a common footing with other economic activities in a free-enterprise economy, thereby bringing to our highways the initiative, competition, efficiency and freedom from political manipulation that only free enterprise can provide?

III. Practical Proposals

We shall consider separately three classes of highways:

1. turnpikes (express roadways covering extensive distances);
2. ordinary inter-city roads; and
3. intra-city roads (roads within cities).

The problems and the solutions are different in each case.

1. Turnpikes (express roadways covering extensive distances)

In this case, the three peculiarities listed above, while present, are all at a minimum. It is not particularly difficult to charge a toll for an express highway, or to vary the toll appropriately for different kinds of vehicles; the 'natural monopoly' is at its minimum (the greater the distance traversed by a road, the more likely that there are alternative roads or other means of transportation) and the 'neighborhood effect' is of negligible importance (express highways are mainly ways of getting through the countryside as quickly as possible, not means of access to businesses or dwellings along the way). But beginning with this case we therefore start with the simplest of the problems, the one where it should be easiest to assimilate highway construction and maintenance to other private enterprises.

Our plan for the construction, maintenance and operation of superhighways is simply the following: turn them over to private enterprise. There is nothing impossible about this suggestion: toll roads have frequently been privately owned. Indeed, it is no more impossible than that many other demands of the community should be adequately supplied by individual enterprises, when they are allowed to make a profit on the venture. It involves no new administrative trick, no new government commission or public corporation; all it requires is that we allow to operate in this field the normal incentives of private business which have built our factories, our railroads, and our department stores.

Whenever an individual or firm wishes to construct a new turnpike he will offer to the state highway commission (or that of several states if it is interstate) a detailed proposal. This proposal would include: the points between which the turnpike is to be constructed; the route to be taken; the method of construction. Approval of the state highway commission is required for two reasons:

1. to assure that the highway meets minimum safety standards—just as a building license is frequently required for a new factory building for the same reason;
2. because the building of a road may require governmental assistance in condemning some of the land required—just as is now the case in the construction of a pipe line or railroad.

If the state highway commission finds that the plans meet legally enacted minimum standards, and that the offer is a bona fide offer (and not a device say for acquiring a particular piece of land) it shall approve the proposal, authorize the firm to proceed to build the road, and give the firm the cooperation (but not the financial assistance) of the state in the legal process of condemning any land required which cannot be obtained through direct purchase. When construction is completed, the owning firm may charge any toll it thinks proper for the use of the road.

If all roads were toll roads, this would be all there would be to the plan. But if there are other roads, and if these other roads are being financed by a charge that does not depend on the particular road travelled—as at present by gasoline taxes and license fees—an additional problem arises. For the toll road would then be operating under an undesirable handicap: the traveler would be paying in two ways for travelling on the toll road—in the form of the toll, and

in the form of gasoline taxes—but the owners of the road would be receiving only the toll; in consequence, they might not have an incentive to build a road even though people were willing to pay enough (in both ways) to justify its construction. The proper solution to this problem is for the state which collects the gasoline taxes to pay the owners of the toll road a sum equal to the tax on the gasoline consumed on the road.** In this way, the toll charged will equal the actual price consumers are willing to pay for the *additional* convenience of a turnpike.³

Current practice on toll highways suggests another possible, but in our view undesirable, source of income to the owners of toll highways—namely, the sale of franchises for commercial enterprises (restaurants, filling stations, motels, gift-shops, etc.) bordering the highways. It is not likely that this would in fact be a source of income even if the owners had the power to sell such franchises. The owners of the road could charge for a franchise only by limiting the number of concerns and thus enabling them to charge higher prices than they could get elsewhere; but this would make the road less attractive to travelers than otherwise and so diminish the toll receipts from any given toll. In general, gains from the franchises would be more than balanced by losses in tolls. While self-interest alone would therefore generally prevent the use of the power to sell franchises even if the toll-owner had such power, it seems undesirable to give him any exclusive privileges that are not absolutely essential to the construction of the road, in line with the general aim of strengthening competitive forces and eliminating monopoly power.

Though described in terms of new toll roads, there is no reason why this plan could not equally be applied to existing toll roads. These are now generally operated either directly by states, or by public corporations. They could readily be sold to private concerns, by open competitive bidding.

Getting the government out of the business of providing service on toll highways in this way, and opening this area of economic activity to private enterprise, is the quickest and most efficient means of meeting the current demand for such highways. Individuals risking their own funds in the search for profits will have a far stronger incentive than government officials spending public funds to build highways that will most effectively serve the public's need and to build them at minimum cost. Political pressures that now tend to play so important a role in determining what roads are built, and who builds them—pressures that even the most public-spirited highway officials cannot fully resist—will be minimized if not entirely eliminated. The incentive to secure the maximum total return will operate to keep the toll on such highways down and will assure that highways are built whenever the price that the community is willing to pay for the service of a toll road will cover its cost.

The only defect of private ownership and operation arises from the natural monopoly element that will necessarily be present. This is a real defect that there seems no way of fully eliminating. However, given the significant indirect competition from alternative routes and alternative means of transport over long distances it seems clearly a tolerable defect, and much less serious than the basic and fundamental defects of alternative solutions to the problem.

2. A policy for ordinary inter-city roads

For the great bulk of inter-city or country roads, the 'neighborhood effect' is little, if at all, more important than for long-distance toll roads. The natural monopoly element, on the other hand, is considerably more important: the available alternatives are frequently fewer because these roads

are used to traverse shorter distances, and in some cases a particular road may be the only way of getting to a particular place or city without incurring inordinate expense. This feature alone would require somewhat more governmental intervention than in toll roads. But the most important difference from toll roads, and the most serious obstacle to full-fledged operation of these roads by private enterprise is the greater technical difficulty of charging directly for the use of the roads. A long-distance toll road is very much like a railroad line, with a limited number of 'stops' along the way. On such a road a 'conductor' can collect your ticket and require a ticket for a particular station you want to go to. But on an ordinary inter-city highway with its great number of entrances and exits, any such direct method of selling tickets for particular trips is obviously not feasible.

We have already emphasized that this technical problem of how to charge for the use of roads and how much to charge is a key to planning and paying for better roads. It arises equally under public or private operation of the roads. If it has not been recognized as a key problem, it is not because the problem has been 'solved' under our present system. It is rather because it has generally been ignored. When the state goes into business, nobody worries much whether people are getting what they are willing to pay for; or whether the people who are doing the paying are those who are receiving the service.

We have not been able to devise any simple and satisfactory solution to this problem; and in consequence we see no way to turn the provision of inter-city highway services over to private enterprise in the same thorough-going fashion that we have suggested for toll roads. So far as we can see, the collection of fees for the use of roads will have to continue to be performed by government in some such indirect way as is now used—though it should be possible to improve on the present method in detail. But this does not mean that government must continue to take direct responsibility for constructing, maintaining and operating these roads. The operation of the roads can be separated from the collection of revenues. Accordingly, our proposals for inter-city roads fall under two headings:

- a) suggestions for improving present techniques of charging, together with some highly tentative ideas for novel methods of charging;
- b) a plan for turning the construction, operation and maintenance of these roads over to private enterprise.

a) How to charge and how much to charge

i) What is an 'ideal' system of prices

We have already indicated some of the crudities of our present system of charging for highway services by license fees and gasoline taxes. An ideal system of prices would have the property that the price paid for a unit of highway service would be just equal to the extra cost of providing that unit of service. Of course, there is generally more than one way of providing an additional unit of service: improving the road, new construction, reducing congestion, and so on. If one method costs less than another, more highway service should be provided that way and less in other ways. As this is done, the cost of providing additional service the first way will rise, the cost of providing additional service the other ways will fall. The efficient combination of ways of

providing highway service has been reached only when this process has been carried to the point at which the extra cost of providing one additional unit of service is the same no matter how it is provided—which is why we could speak of ‘the’ extra cost in describing an ideal system of prices.

These principles require that the price, say, of a mile’s travel on a highway would vary from vehicle to vehicle—the cost of providing a mile’s travel for a passenger car is clearly much less than for a heavy truck; that the price vary from road to road—the cost of providing an extra mile’s travel on a dirt road may be different than on a concrete road, on a road through built-up areas than on a road in the open country, on a road through mountains than on a road in flat country; and even that the price vary from one time of the day to another—the cost of providing an extra mile’s travel at peak hours of travel and congestion is clearly different from providing this same service at slack times. It would also mean that the price would depend on how much demand there is for highway service at various prices, for the cost of providing an extra mile’s travel may depend on how much road service in total of various kinds is being provided.

This is the kind of price system free competition and private enterprise tend to produce where they can operate. Individual enterprises in their ceaseless search for profit try now one price now another, and in the process tend to approximate to the structure of prices described, for, if attained, there would be no further opportunities to profit by departing from it. Of course, in a dynamic world, the ideal structure of prices is itself always changing, which is why experimentation is always going on and why the relations among prices in the competitive sector of our economy are in continuous flux.

ii) How to improve the present system

Without the actual test of the market a close approximation to the ideal system of prices cannot be expected. The difficulties in the way of achieving the proper system are multiplied manyfold for highways by the necessity of using a simple system like the gasoline tax in which payment is for highway services in general rather than for a particular use of the highways. Nonetheless, it should be possible to do a good deal better than we are now doing.

In order to improve on present methods of charging for the use of highways, the basic need is for detailed, thorough, and continuous study of the costs of providing additional highway services on each type of road to each type of vehicle. Such studies have, of course, been made, and are doubtless now under way. Their goal should be some simple formula for charging for highway service that, on the one hand, permits collection of the charge without excessive administrative cost, and, on the other, imposes charges that are in proportion to the extra cost of rendering each type of service. For example, if it were a fact that the extra cost of providing services to different types of vehicles is in proportion to the amount of gasoline consumed, and that the extra costs are roughly the same for different types of roads, then the present gasoline tax would be a highly satisfactory formula. Presumably, however, this is not the case: the extra cost for heavy vehicles is apparently much greater than their extra gasoline consumption per mile of travel, which is the justification for the higher annual license fees to which they are subject. In this same class would be taxes on tires or oil or some other expense of automobile operation that varies with the amount of travel; conceivably one of these might vary more nearly than gasoline consumption in proportion with costs of providing highway service.

Somewhat further afield would be a charge per ton-mile of traffic. It seems not at all unlikely that costs of providing highway service vary more nearly with ton-miles than with gasoline, oil or tire consumption. Such a tax would be more difficult to collect than present gasoline taxes, but it does not seem clearly impracticable. Perhaps each vehicle could be required to carry a sealed speedometer that would accumulate the number of miles travelled and on the basis of which a tax would be paid once every three or six months. Or perhaps, the gasoline tax could be relied on for passenger car travel but supplemented by such a ton-mile tax for trucks, buses and the like.⁴

For both such ton-mile taxes, the present gasoline tax, and the other taxes mentioned, a real problem arises, and now exists, of allocating receipts among states. The receipts should go to the state in which the travel occurs, but now it goes to the state in which the tax is paid. This is a problem that requires interstate agreements. In principle, it would not seem impossible to solve it—at least if states charge the same taxes. Sampling studies of traffic should at moderate cost permit estimates of the amount of traffic in each state on the basis of which states could reimburse one another.

All these methods of charging have the defect that they do not permit variation from one type of road to another, or from one time of day to another. Here we have no experience to guide us except for toll roads. Yet the gains of having such a system are potentially so great that it would be worth devoting a good deal of technical effort to devising some means of making differential charges on different roads possible. For, if this could be achieved, it would not only contribute to more rational planning and development of roads by public authorities, but would also make it far easier to turn the task over to private enterprise.

iii) Atomic age suggestions

One possibility that has occurred to us may be worth outlining, even though it may be completely visionary. Suppose it were possible to incorporate minute traces of radioactive material in the paint used to mark center lines of roads, and that cars could carry sealed geiger counters that would accumulate the impulses received. A charge could be levied of so many cents per so many impulses to be paid periodically. The amount of radioactive material could then be varied from road to road and each road could be posted with signs showing the class in which it fell. On this scheme, the cost would depend on time taken to traverse a road, not on miles, so the prices would be expressed as, say, one cent per ten minutes. And the price charged could vary from vehicle to vehicle, so this system would permit differentiation of charges both from vehicle to vehicle and road to road.

This scheme may well be completely impractical at present or at any foreseeable time in the future, yet it may be worth expanding a bit on its operation for illustrative purposes. One obvious disadvantage is that by making the charge on a per time basis it might stimulate speeding. Offsetting this disadvantage is the incentive it would give to avoid peak hours of travel, since it would take a longer time to travel any given distance at such hours than at times when traffic is light. The effect here would be similar to that of lower charges for electricity consumed during off-peak hours, a practice now fairly common.

Such a scheme would also greatly facilitate experimentation with different rates to see how sensitive traffic is to changes in the rate. Such experimentation is almost ruled out if it has to be

done simultaneously for all roads, whereas under such a scheme it could be done on a much smaller basis. The scheme would permit a wider variety of types of roads, since expensive roads for which there is a demand could be financed by high charges on such roads, whereas now, if constructed at all, people who drive over them are in effect paying less than their economic cost and are being subsidized by other travelers. And the reverse of this is, of course, that it would permit low rates for inexpensive roads or poor highway service. Finally, under the plan of private operation to be described below, it might make possible competition among enterprises in price as well as in other ways: each enterprise could establish its own price for its own section of the roads—though this would require not only that the charges be recorded in the vehicles that traveled on the road but also, reciprocally, that there be some method of estimating the charges accumulated in all vehicles that have used the piece of road in question.

b) How to operate the roads, given a method of charging

Let us assume that, at least for the time being, the only feasible method of charging for highway services is similar to existing methods in the sense that the charge is independent of the particular road traveled. For definiteness, we shall assume that the gasoline tax is the only method of charging. The necessity of using this tax means that the state must undertake to fix the price for highway services and to collect the tax. It does not, however, follow that the state must also decide where to build new roads, and take responsibility for constructing them, or for operating, and maintaining, existing roads.

An alternative, and in our view much superior plan is the following. Let the state highway commission divide the roads of a state into convenient sections. Let it then call for bids from private enterprise for the maintenance and operation of these sections. The call for bids will specify that the contractor will receive from the state a sum equal to the taxes collected on gasoline consumed on the highway section in question. The bids will take the form either of an offer to pay a specified sum per year for the franchise of maintaining the section in question, or of the additional sum per year demanded by the contractor from the state. In general, no bids requiring that the state pay an additional sum would be accepted—in these cases the general presumption would be that the road in question should be allowed to deteriorate; but there might be some cases (for example, roads important for national defense) in which an exception to this general rule would be justified. For the rest, the highest positive bid would be accepted. In addition to receiving bids on existing roads, the highway commission would also be ready to entertain bids for permission to construct new highways under similar terms.⁵ Again, in general only bids requiring no payment by the state over and above the gasoline taxes would be accepted. In view of the large capital investment required for new highways, contracts for such highways would be for a relatively long period, whereas contracts for maintaining existing roads could be for shorter periods.

The only technical problem this plan would raise would be estimating the amount of gasoline consumed on each section of the road. This might be a troublesome problem in practice but it does not seem impossible to solve it at moderate cost through carefully planned sample studies of volume and kind of traffic.

What advantages would such a plan have over existing practices? On old roads, the plan would mean considerably greater economy in their operation and maintenance. The contractors would

have a strong incentive to keep costs to a minimum—an incentive difficult to match when the care and maintenance of roads is the responsibility of a public body subject to political pressure and without any clear-cut test of efficiency. In addition, the contractor would have an incentive to perform the maintenance in a way involving the least interference with traffic, and to make improvements that would make the road most attractive to travelers. For the income of the contractor would depend directly on how much traffic he could attract to his road.

For new roads, the plan would provide a means of making the tastes and preferences of travelers fully effective. It would establish precisely that direct and strong link between the needs of the public and the building of highways, the absence of which is the chief defect of our present system. Highway enterprises would be continually on the lookout for possibilities of building roads that could attract traffic, i.e., for which there is a great need. Of course private enterprises, no less than public ones, would make mistakes. But the costs of the mistakes would be borne by the contractors, not the public, just as gains from good judgement would be received by them. And the contractors would be guided by the right aim, the aim of satisfying the demands and needs of the public for highway services, unmixed by the many irrelevant considerations that are bound to enter public decisions. It need hardly be repeated that this is the technique for meeting the needs of the public that is responsible for our high standard of living.

Even assuming that no more refined method of charging than the present one can be devised, here is a plan that puts the provision of highway services in important respects on the same footing as the provision of most other services in our economy. Competition would take the form of competition in the quality of services offered. The absence of price competition is a serious defect, but it is a defect that is present equally under public operation. Under either public or private operation, if the price per mile of travel (or its equivalent) is set very high, traffic will be reduced, the amount of roads it pays to maintain will be relatively small but it will pay to make them high-quality roads with a light density of traffic—just as when cities fix taxi-cab fares and fix them very high, cabs tend to be relatively few but extremely luxurious and available with a minimum of waiting time. If the price per mile of travel is set very low, traffic will be encouraged but it will not pay to maintain good roads. There will be a very high density of traffic on inferior roads—just as when cities fix taxi-cab fares very low, cabs tend to be small or ancient or battered, and it is difficult to get a cab much of the time. The right fare is somewhere between, with enough roads of high enough quality so that congestion is relatively infrequent and with few enough roads so that only few are very lightly travelled.

The discovery of some scheme for charging different prices on different roads—such as our fanciful idea of radio-active center lines and geiger counters—would solve this problem in the most satisfactory way. It would then be possible to let individual contractors fix their own prices and to have competition in price as well as in quality. The one problem that would then remain would derive from the natural monopoly element on roads. To avoid exploitation of consumers in cases where this element is important, it might be necessary to give some public authority the power to establish maximum rates.

3. Suggestions for intra-city roads

We come, finally, to roads within cities. These raise by all odds the most difficult problems: the technical difficulty of charging for the use of roads is at a maximum; the natural monopoly may

be important; and neighborhood effects for the first time are extremely significant. In addition, the parking problem is added to that of transport. For these and other reasons, the plan suggested above for inter-city roads does not seem feasible.

In the light of these difficulties, we have not been able to devise any acceptable general plan fundamentally different in its broad outline from the present system of planning, constructing and operating city streets. Unfortunately, this does not mean that the present system—judged by its fruits—is anywhere near ideal. Indeed, casual observation suggests that city streets and highways are currently the segment of the nation's highway system most in need of improvement. Even without thoroughgoing reform of existing methods, a number of specific changes might produce significant improvement.

a) Give cities their full share of motor-vehicle taxes

Cities now receive much less than they are entitled to. In line with the general principles outlined above, taxes collected on gasoline consumed on city streets, and that part of other motor-vehicle fees attributable to such traffic, should be made available for maintaining and improving such streets. This should be done city by city, each city receiving its share of total receipts on the basis of appropriate sample studies of traffic. This method of distributing revenues would be a radical departure from current practice. It is estimated that roughly half of the total miles of travel by all vehicles in the United States occurs on city streets, which probably means that not far from half of all gasoline consumed is on city streets (less truck than passenger travel is on city streets which would reduce the percentage of gasoline consumed, but this may well be more than offset by the greater amount of gasoline consumed per mile of city than of country driving).⁶ Yet cities apparently receive only about five percent of state receipts from gasoline taxes and motor-vehicle license fees. Cities themselves impose some motor-vehicle taxes. Nonetheless, it seems clear that cities are receiving not much more than one tenth of the amount to which their traffic entitles them—which is a major reason why they are spending too little on roads.

The greater deficiency of city than of other roads—if our casual observation is right—is a striking illustration of the importance of the general principles for which we have been pleading. The preferences of consumers of highway services as expressed in the sums they have paid for such service have not been appropriately translated into expenditures on highway service. A proper allocation of gasoline and motor-vehicle taxes would permit more than a tripling of the annual expenditures currently being made for the maintenance and administration of city and village streets, even if cities devoted to other purposes all of the general revenues they now spend on roads and streets. This in turn would justify vastly higher capital expenditures than are currently being made.

b) Reducing the size of administrative units

In large cities, in particular, administrative units are so large as to make effective participation by the community difficult. Smaller units would enable public spirit and constructive assistance to be mobilized much more effectively. It would also facilitate a more intimate and informed performance of the officials in charge of streets.

c) Privately operated throughways

There may be some possibilities for private throughways or turnpikes to solve the problem of through traffic. The general principles discussed above in connection with turnpikes apply equally to such throughways.⁷

d) Parking should be charged for

Parking meters furnish another striking illustration of the gains from the application of private enterprise principles. Almost uniformly, the results from their introduction have exceeded the expectations even of their supporters. Making people pay *directly* for the space they use has resulted in a vastly more efficient and satisfactory use of space. They are otherwise getting something for nothing, so have no incentive to economize space. The use of parking meters should be extended wherever feasible. In addition, experimentation is highly desirable in methods of charging for parking on city streets under conditions where existing types of parking meters are not justified—in side streets and residential neighborhoods. Perhaps some method of charging by the week or month can be devised and thus give an incentive to greater provision of off-street parking. It goes without saying that expansion of privately constructed and operating parking garages, parking lots, and the like should be encouraged—and certainly should not be inhibited as they now sometimes are by legal limitations on prices they are permitted to charge.

IV. Conclusion

The major theme of this essay is that the deficiencies in our present system of planning and paying for highways are a particular example of the general inferiority of socialistic governmental enterprise to free private enterprise. The provision of highway service is a socialized industry removed from the test of the market. The result has been that total expenditures on highways have been too small, that these expenditures have been improperly distributed among different kinds of roads, and that we have too little highway service per dollar spent.

Unfortunately, special peculiarities attached to the provision of highway services make it impossible to provide such services completely through competitive private enterprise: the industry cannot well be completely desocialized. Yet much can be done in this direction. Substantial improvement in highway services requires that we desocialize as much of the industry as we can, and that we seek to bring private enterprise tests to bear as fully as possible on the rest of the industry.

Long-distance turnpikes can be fully desocialized; and the maintenance and operation of inter-city roads can be largely desocialized, though at present there seems no way of doing so fully because of the technical difficulty of charging directly for highway services. City streets and roads probably will have to continue to be almost entirely provided by governmental bodies, but private enterprise tests suggest that a much larger fraction of total receipts from gasoline and motor-vehicle taxes should be made available for their maintenance and construction. A move in this direction would radically alter the sums available and permit rapid and striking progress in removing some of the worst defects in our highway system.

If our suggestions seem strange, it is at least partly because we have become so accustomed to regarding the provision of highway service as a government function; what seems strange when

suggested for highways seems natural when suggested for railroads. But in this and in other areas we must be ready to think about problems afresh, to reexamine our ingrained notions, if we are to succeed in maintaining the vitality of our free enterprise society, protect it from the encroachment of government, and maintain it as a bulwark of personal freedom.

Notes

* This paper was written in 1951 or 1952 when we were both teaching at the University of Chicago. It was entered, without success, in a contest offering a prize for the best essay on its topic, and was forgotten until discovered by one of the authors (Friedman) in 1988. It is published here as originally written, as a contribution to the on-going discussion on the role of private enterprise in the provision of highway services. The title of the essay was not of our choosing. The footnote ** is our own. The endnotes were added by Gabriel Roth.

1. As was noted in Section 7.3, the magnitude of private investment in US roads in the early nineteenth century exceeded in comparative magnitude the twentieth century investment in the Interstate Highway System.
2. This was written before the establishment of the federal Highway Trust Fund, which weakens these incentives.
3. This recommendation for ‘shadow tolls’ predates by many years the discussion in Sections 4.2.5 and 8.1.1.
4. As mentioned in Section 4.2.3, both New Zealand and Oregon impose such charges, the ‘ton’ being measured as the axle load.
5. As mentioned in Section 7.6.2, California invited bids on this basis, with the significant difference that the bids had to cover all the costs of the new roads, not just the excess required in addition to the revenues collected from the taxes on gasoline consumed on them.
6. Fuel consumption in ‘stop-go’ traffic conditions is significantly higher than when traffic flows freely.
7. Recent technological advances in electronic road pricing open many opportunities for the provision of new road links in congested urban areas.
 - * This would, of course, raise a variety of detailed administrative problems—estimation of the amount of taxes due, division of payments between states, and the like. While in practice these problems would doubtless be important and troublesome, none that we have been able to think of seems sufficiently serious to render the proposal impracticable.

4/5/13