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SOME ISSUES IN TRANSPORTATION POLICY: PROBLEMS IN PREFERENCE ARTICULATION

By

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In this paper I deal mostly with questions, not answers. The questions have implications for policy analysis. I am concerned with political economic problems of improving the performance of the U.S. transportation system. Attention is focused on problems of instituting market and political mechanisms for articulating preferences for transportation. Because of public goods characteristics and pervasive externalities of transportation, the blending of market and political processes is especially difficult and important. By preference articulation I mean the processes by which participants in the political economy get their preferences taken into account.

Preference articulation has two aspects: the mechanism for identifying preferences, and the responsiveness of the system to preferences.

I have organized discussion of issues under five general headings--pricing and regulations, jurisdictional boundaries, energy, settlement patterns, ownership and a section dealing with some observations on difficulties encountered in implementing a public program in rail service continuation. The issues are, of course, all interrelated.

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The discussion of issues suggests the need for comprehensive long run planning while the observations of political practice illustrate the difficulty of political decision-making even for a small program.

The Transportation Meta Plan

Consider the attempt to develop transportation meta plans at the national, state and local levels. By a meta plan I mean a plan for making plans and policy decisions. The objective would be to provide a process for systematic evaluation of our long-run transportation "needs" and alternative approaches to transportation policy given the probable constraints of the future. We cannot know with certainty either the future demands for transportation or the constraints, but current decisions must be made based upon the best estimates available. The process of debating a meta plan should provide a framework for more informed political preference articulation with respect to desired performance and major alternative developments in the transportation system. The meta plan should provide useful guidelines as a framework for making specific planning, funding and regulatory decisions affecting transportation. The current Rural Transportation Task Force may provide elements of such a plan.

We are spending more than 20 percent of the GNP for transportation. Performance of transportation affects all aspects of the economy and disruption would threaten the social order. We face critical issues in transportation which should be identified and debated, not only in Congress but also in the political parties, state legislatures, within and among interest groups, and among economists and other policy analysts.

Pricing and Regulations

The concept of an unregulated market is a meaningless construct. Markets always reflect both preferences for specific products and political preferences reflected in regulations, rights, taxes, and subsidies. Thus, all prices are political and a particular equilibrium price has no unique economic significance as an indication of preferences or value. Broadly conceived, price is an instrument of regulation. It is an inexpensive means of rationing. It is also an effective instrument for reflecting preferences of large numbers of people once the pattern of political constraints is established.

Decisions in regard to regulation and government participation in transportation must be pragmatic. The market price system, where buyers have strong incentives to weigh alternatives before purchasing and sellers have incentives to identify consumer demand and search the opportunity set for low cost means of responding to demand, is a marvelous mechanism for preference articulation where the appropriate benefits and costs are taken into consideration. The political process produces regulations, taxes, subsidies and government provision of services in an effort to achieve performance which is preferred to what would have resulted without the government action. The problem is that the political process is not a very effective mechanism for citizen preference articulation. It is difficult to efficiently express preferences in the political process and there are problems in designing bureaucracies to be responsive to preferences.

The problem of pricing transportation is particularly difficult because of the nature of the economies of density--the marginal cost of a unit of production is usually very low relative to average total

costs--and physical characteristics which limit competition. Thus, rate regulation, government provided service, and politically determined user charges are critical issues.

User Charges

User charges reflecting full costs would test users preferences and could create an incentive to use the least cost method. But how should costs be allocated among types of users? This is a critical issue for trucks and cars in determining highway user charges. Full cost pricing would not necessarily result in the lowest system cost in supplying transportation.

A current issue is the failure to maintain and modernize rural roads and bridges. It is a serious problem but I have not seen good benefit/cost analysis dealing with the investment. Baumel suggests part of the problem arises because of the use of much larger farm equipment and trucks. Would it be more efficient to use smaller equipment than to build larger bridges? If users of large equipment had to pay the extra cost of the roads and bridges they might choose different equipment. Transportation must be analyzed as a factor of production in a complex system.

Cross Subsidies

If regulation requires a firm to provide some customers service at a price below costs, resulting in higher prices to others, this is the same as a tax and subsidy. Would the political process weigh costs and benefits more accurately if direct subsidies were used and the cost appeared explicitly in a budget?

Transportation pricing involves extensive cross-subsidies with or without rate regulation. Rates vary from commodity to commodity and from place to place and are not closely related to costs. This raises significant questions of equity. A special problem involves the granting of low rates to large shippers because of the potential effect this has on industrial structure. Has (or will) the substantial differential in rates on unit train shipments of grain lead to concentration in the grain trade? What is the appropriate theory of allocation of overhead costs for multi-product firms to provide effective guidance for establishing rates leading to desired performance?

Captive Shipper

The problem of the captive rail shipper is especially critical. Where there is not effective competition some control must be placed on rates. But what are the appropriate decision rules for establishing and enforcing rates? There does not appear to me to be any basis for the belief that two-firm competition among railroads would reduce the need for rate regulation.

Rail Car Shortage

Perhaps the most common complaint about rail transportation by shippers is the shortage of rail cars. To an economist it appears to be a problem of peak load pricing. It simply is not profitable to supply cars to meet peak demands given current price practices. Here the market should work to allocate cars to shippers with greatest demand. J.O. Gerald suggests separate pricing of the car and the hauling service to get a more effective articulation of demand for

cars. With appropriate pricing mechanisms investors would have an incentive to supply more cars if needed. The cost of leaving cars idle or using them for storage would be increased, thus increasing supply of cars, and more efficient decisions between shipping and storage would be made. At least there would be no car shortage. What would be the consequences and problems I do not anticipate?

These are only a few of the complex problems involved in pricing and regulation of transportation.

Jurisdictional Boundaries

A general issue in transportation policy involves determining appropriate jurisdictional boundaries.

Geographic Boundaries

Every unit of government from the township and village to the Federal government is involved with transportation. As a general rule better resource allocation would be expected where costs and benefits were closely associated within the same unit. The costs and benefits of a decision by one unit which accrue to other units often are not taken into account by the decision-making unit. The problem of devising appropriate boundaries and related funding and regulation decision rules is complicated by the pervasive effects of transportation and the problems of collecting revenue in relationship to benefits. The classification of roadways and related formula funding by the Federal and state governments is a response to this problem.

The Railroad Reorganization Acts provided Federal subsidies for rail service continuation on light density lines. At least one state

tended to make decisions on the basis of the state's share of the cost, not the total costs. A different evaluation would be made if local governments and users were required to contribute to the funds for rail service continuation.

A benefit frequently included in analyses of rail service continuation projects is its effect on employment and income. These estimates are clearly related to the boundary of the area under consideration. Discontinuation of rail service may affect employment and income in the immediate area, but would have little if any effect for the total U.S.

The federal government as an advantage as a tax collector. For example, state and local taxes on gasoline result in purchases in lower tax areas. State taxes may affect location decisions and tax competition among states is common. Economies may exist for both collecting and paying taxes. Thus, Federal taxation and funding of transportation is appropriate, but what decision rules for distribution would contribute to desired performance?

The recent truckers' disruption of service was due in part to inconstant regulations among states. The variations in regulations would be justified if they reflected real differences in circumstances or preferences. In this case, the Federal government has a role in establishing regulatory standards. Perhaps federal regulation should prevail on highways built with a specified percent of federal funds.

Agency Boundaries

The jurisdictional boundaries among agencies is another important issue. The problem is to design agency responsibilities in such a way that benefits and costs are compared among alternative actions. Are multimodal departments of transportation more likely to take into

consideration the extensive interdependence among transportation modes than the single mode agencies? Interdependencies of transportation policy with other areas of policy are pervasive. Rural areas and farming interests, for example, are likely to be better served if the USDA and state departments of agriculture participate in government transportation decisions. The same is true of most other agencies.

Adjusting to the Energy Situation

Energy and transportation policy are closely linked. Estimates are that more than 40 percent of the energy marketed in the U.S. is used for transportation. The current transportation system is designed to use oil based fuels. Oil reserves are being depleted at a rapid rate. My colleague, Herman Koenig, has calculated that oil production has doubled about every 10 years since 1890 and if this rate were to continue, the most optimistic assessments of remaining world recoverable crude oil (169×10^9 barrels) and oil from shale (760×10^9 barrels) would be depleted in only 34 years. The real cost of oil will increase substantially and we will run out of oil which is economically available for transportation in a relatively short period of time unless conserved. Other sources adaptable to transportation needs are uncertain and will probably be expensive.

Market Problem

The price system alone is not an adequate means of articulating preferences in this situation. The market does not provide a mechanism to adequately express the demand for the option to buy in the future. Nor does the market adequately reflect preferences for conservation because of the free rider problem--that is, if I conserve and others do

not, my conservation will not result in more fuel for me in the future. The use of oil by one person imposes costs upon others. Dependence on foreign oil has substantial and critical implications for defense, international relations and monetary stability which cannot be reflected in the market. What is the appropriate policy to deal with the allocation of a critical nonrenewable resource over time?

What policies are appropriate to make transportation more efficient in the use of energy resources and to effectively reflect preferences for conservation? Modes of transportation differ greatly in energy use related to lengths of haul and size of load. Water and rail are much more efficient for long hauls and large loads than trucks. Trucks are more fuel efficient for short trips and small loads. Thus, an energy efficient transport system will be one with efficient intermodal connections. What role should the government take in facilitating development of cost effective multimodal systems? Individual carriers cannot make effective systems changes.

Railroads

An energy efficient, integrated multimodal transport system requires efficient railroads. Many diagnoses of the rail system have been made and the conclusions are that many factors have contributed to their poor performance. Because of economies of density the loss of one shipper reduces the ability of the railroad to serve others and a process of sequential quality deterioration sets in. Large volumes of commodities are shipped by truck for long distances, which could be shipped by rail at considerable saving of fuel. Shippers chose trucks for long shipments because of differences in quality of service relative to direct transportation costs. Some rail subsidy may be necessary to obtain the

benefits to be derived from energy savings. An alternative to the subsidy would be to require certain classes of shipment to go by rail. This would create private costs, equivalent to a tax, but would be largely beyond observation by those ultimately paying.

Conservation Practices

There are mahy public and private practices in transportation which waste energy. Examples include: The scheduling of aircraft take-off and landings results in large energy losses while planes circle and wait in line; The subsidy or non-pricing of parking by employers and cities which reduces the incentive to car pool and use of public transit; The organization and revenue splits of railroads, which results in longer than necessary routing; and Extra miles traveled due to competition on delivery and assembly routes which could be served by a common carrier. There must be hundreds of examples. Higher fuel prices will modify some of these practices but others will not be altered by prices--political action will be required. Responding to the truckers' demands for lower diesel fuel prices would, of course, have a perverse effect on efficient use of energy.

Regulating Use of Oil

A major issue of significance in oil conservation is the type of energy used for different purposes. In the production of electric power close substitutes to oil exist. Space heating and rail transport could be converted from oil to processed pelletized coal or coal based electric. Large scale changes in energy sources would require complex systems changes and huge investments. Also, coal involves major environmental problems. Again, prices have a significant role to play in

selecting uses consistent with preferences but political decisions must also be made. The trade-off decision between oil savings, current trucking services, personal mobility, and environmental quality are extremely difficult. My judgement is that adjustments to the evolving energy situation involves the most critical and difficult policy issues in transportation.

Settlement Patterns

Settlement patterns, transportation and energy are intimately linked. Individual decisions in regard to location of activity are not likely to result in aggregate settlement patterns consistent with the preferences of those making the individual decisions because important benefits and costs are external to the individual decisions. For example, efficient public transportation requires a certain density of population. We generally have a dispersed population which makes public transportation uneconomical and thus the great bulk of the population is dependent upon the automobile. We have a dispersed population because roadways respond to demand generated by individual location decisions. Can policies be developed to achieve patterns of settlement which would reduce costs of assembly and distribution, costs of heating and enhance the quality of the environment and life?

Early in our history public investment in railroads, waterways and roads were made to stimulate economic development of the country. The public investment in rural farm-to-market roads influenced the location of agricultural enterprise. The interstate highway system was a huge investment which has had a great impact on location of economic activity. The reduced cost and improved service available by truck attracted business from rail and, because of density economies on rail lines, made

some lines unprofitable. This left some businesses and communities without rail service. Lower cost truck service reduced assembly and distribution costs and made larger sized food processing plants more economical, thus eliminating many firms, which in turn reduced the viability of some small communities. Few of these consequences seemed to be taken into account in the planning of the interstate system.

High quality agricultural land is lost every year to alternative uses. Should transportation decisions consider the benefits of preserving this land, not just in terms of the land used for roadways, but for the settlement patterns which result because of the roadways?

Rail and truck regulations include a settlement pattern objective in the public service obligation. Analysts cannot put a value on service to rural areas which preserves small towns, but can provide information about costs and cost effectiveness.

People who are old, handicapped, or poor and who have no access to public transportation are at a serious disadvantage in participating in our automobile-oriented society. Access to many welfare services requires mobility. People in rural areas are generally without public transportation. Should the existing economic incentives be allowed to force this group to live in cities? My observation is that government actions have, on balance, contributed more to the problem than to the solution. For example, where Amtrak provides highly subsidized passenger service in competition with intercity buses, the bus services suffer. Similarly, publically provided dial-a-ride services may destroy the economic viability of a taxi service. Regulations restricting entry to the passenger transportation business is probably the most important barrier to effective service. Could the market work with "private" vehicles providing the

needed service inexpensively, as has been proven in many areas of the world?

My main points are that transportation policy should be in the context of explicit settlement pattern objectives and that the market is important as a mechanism for articulating some preferences related to settlement patterns and not others.

Ownership

Railroads

There are many issues of ownership and property rights related to transportation. The most critical issue currently involves the railroads. Much of the rail system is bankrupt or on the verge of bankruptcy. ConRail does not appear to have improved on the performance of the bankrupt railroads it replaced, even with large treasury costs. Prior to establishing ConRail a proposal was made for government ownership of the railway, with private companies operating on the government owned and maintained rails. The concept was known as ConFac. What would be the expected performance compared with ConRail-type solutions or long term subsidies? By separating ownership of functions and reducing entry barriers would competition responsive to shippers' needs be stimulated? Could rate regulation then be eliminated or greatly modified? Restrictions on companies operating both rail and truck services could be eliminated; would multi-modal firms develop improved systems?

If budget decisions for development and maintaining ways, whether road, water, or rail, were in the same governmental units, would this encourage better consideration of benefits and costs for expenditures in all modes as a system? System interfaces involving signalling and overpasses could be dealt with more rationally than in the current practice

where railroads are generally responsible for maintenance of grade crossings and signals. User charges could be established to foster national objectives, including, first of all, effective performance at low cost, but also those relating to settlement patterns, energy conservation, and equity.

There would be many practical problems in changing to a ConFac rail system. Many institutional design decisions would determine the outcome. Traffic control would be a problem. Railroads, however, have operated with joint trackage rights for years; this would be an extension of that concept. The organization of labor would be a difficult problem, also. The political process would probably overinvest in the provision of ways; eliminating lines would be politically difficult.

Pipelines

The proposed construction of coal slurry pipelines is another significant issue involving the role of government and markets in preference articulation. Peterson has provided an interesting discussion of the pros and cons. The immediate issue is, should the government use the power of eminent domain to require the granting of easements for the right of way of coal slurry pipelines? This involves the taking of private property for use by a private firm. The market test for the decision for building such pipelines is expected profitability. There are, however, many benefits and costs external to the firm. Water would have to be obtained in the area of origination and dirty water disposed of at the other end. Both have environmental effects. Elimination of coal revenue to railroads could seriously affect the availability of rail service for shipment of grain and farm inputs, or would require

rail subsidies. Greatly increased coal shipments by rail creates inconvenience and environmental deterioration in communities through which the trains pass. The pipelines could conserve oil both in shipping coal and in reducing costs of coal, thus facilitating substitution of coal for oil in generating electricity. The issue involves a complex system and a sophisticated benefit cost analysis.

An Observation of Political Practice

The following are a few cryptic observations on the political process in practice relating to the rail service continuation decisions in the State of Michigan from the vantage point of a member of an advisory council. The observations illustrate issues and problems in preference articulation. The problem of representation of the tax payer interests, a dispersed interest group, in contrast to the concentrated interests is highlighted.

Michigan has about 900 miles of track under railroad service continuation subsidies. In addition, nearly 1,000 miles of line and 300 miles of car ferry service are either under abandonment petition or believed to be subject to abandonment. Estimated operating subsidies for 1978-79 were $16.7 million and an additional $6.1 million was spent for rehabilitation projects on the subsudized lines.

My major observation is that a rail service continuation program is needed; that the discontinuation of rail service on all bankrupt and unprofitable lines which solvent lines wish to abandon would disadvantage large numbers of people, would be inequitable, and would generally fail to reflect preferences of Michigan voters. However, the political process as instituted in this case was not very effective in discriminating among projects, in making cost effective decisions, or in planning the

design of a long run viable rail system.

The settlement pattern issue is best illustrated by the case of a 14 county area served by 3 railroads. Two of these railroads were bankrupt and are currently operated by independent companies under a rail service continuation subsidy. The third is a solvent carrier with all lines in this area under petition for abandonment. Without subsidy or a declaration of public necessity requiring the solvent railroad to continue service, this area would presumably lose all rail service. The subsidized railroad which serves the major portion of the area has 245 miles of track, will receive an estimated subsidy of $3.5 million for 1978-79, and originate or receive 1,752 cars (about $1,997 per car load). The subsidy exceeded revenues by almost $2 million.

The solvent railroad has about 140 miles of track in this 14 county area under abandonment proceedings. Based upon the hearing evidence, costs exceeded revenues by about $1.5 million and about 2,400 cars originated or terminated on the line. The state's formal position is opposition to the abandonment. If the solvent carrier is forced to continue service the costs will not show up in the government budgets.

Analysis by Patrick and the technical staff of the Michigan Department of Transportation indicates that approximately 95 percent of the volume of originations and terminations in the area could be served by combining segments now operated by the three railroads, eliminating half the track mileage and costs.

Major barriers to such a proposal are that 4R Act funds cannot be used to subsidize a solvent carrier. The solvent carrier wants to abandon and does not want to operate under subsidy. A state proposal would weaken the case in opposition to the abandonment, Perhaps

most important, transaction costs are high and the availability of federal funds relieves the pressure for effective action.

A 104 mile segment of track is operated by a small solvent carrier at a subsidy cost of about $1.3 million with 388 carloadings ($3,415 per carloading). The area served is obviously not developed but does have a future potential, but this level of subsidy is difficult to justify. Loss of rail service has been a threat for years, thus discouraging development. The solvent carrier has offered to guarantee service on the line without subsidy if the state would purchase and rehabilitate the line and grant the company a non-exclusive, permanent easement over the right-of-way--that is, for all practical purpose give the line to the company. The cost would be a one time investment of about $8 million. Thus, in the long run the government would save money, service would be improved, and uncertainty would be reduced. But such a project would set precedence and transfer property to a private firm. (The situation, as usual, is more complex than I have described.)

A much less expensive solution to serve those shippers currently using this line and several others would be to subsidize truck-to-rail service. But acceptable decision rules for such a program have not been devised. It is, in fact, difficult to devise decision rules which would provide substitute service without subjecting the treasury to extensive claims by a large group seeking equal treatment.

Individual line benefit/cost analysis used by the DOT staff estimated the impact of abandonment on local employment, income and users costs. The boundary question was not confronted. Energy budgets usually indicated abandonment and shift to truck for quantities now shipped would reduce energy consumption. Consequences for road and

highway costs were usually negligible. Johnson, in a detailed rail disinvestment study of two Michigan lines, found that rationalization could reduce cost of service with negligible social impact. Benefit/cost analysis on rail segments will, I believe, influence decisions eventually, but are not easily introduced into the political decision process. The uncertainty of potential future shipments and developments cloud the issue in political debate.

Public hearings may produce some useful specific information about the problems of people immediately affected by a transportation project but reveal very little about trade-off preferences for the majority of citizens. Over several years of hearings I never heard a presentation representing the interests of the general taxpayer. Similarly, legislators argue for economy in government and vote to restrict budgets in general, but almost always support a local group seeking rail service in their districts. The news media will do editorials supporting economy in government but will dramatize the problems of firms and areas threatened with the loss of rail service.

The decisions on rail service continuation which counted the most--the design and awarding of contracts--was usually done under time pressure. Funding was usually uncertain, making effective planning difficult. Rail planning and rail operations were in separate units. The planning unit complained that the plans and analysis they produced were not used and operations complained that planning was always too late and inappropriate. Plans were never in the context of total transportation or even the total rail system, but concentrated on line by line evaluations. No state group systematically considered the issue of settlement

patterns. An annual plan satisfied the Federal requirement to have a plan as a condition of funding.

An effort to establish a meta plan failed. It was not possible to adopt a time schedule for making critical decisions in a logical sequence. This was due in part to real uncertainty in regard to budgets and Federal policy. Some argued that the 3R and 4R Act concept of limited Federal subsidy designed only to facilitate adjustment and which would be phased out over a prescribed period should be taken seriously. Others believed this to be poor strategy.

Conclusion

My assignment was to identify issues and problems in articulation of preferences for transportation, not to provide solutions. The solutions lie in the political process itself, not with any one specialist. There is no unique optimum transportation system. I conclude that neither the market nor the political process is very effective as mechanisms for preference articulation for such complex products as the national transportation system. While good applied political economic analysis will not produce a perfect system, it can make a very useful contribution. To be useful, economic analysis must be tuned into the reality of the political system.

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