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FEDERAL TRANSPORTATION EXPENDITURE

REPORT

OF THE

SUBCOMMITTEE ON ECONOMY IN GOVERNMENT

OF THE

JOINT ECONOMIC COMMITTEE
CONGRESS OF THE UNITED STATES

TOGETHER WITH

SEPARATE VIEWS



AUGUST 17, 1970

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LETTERS OF TRANSMITTAL

AUGUST 15, 1970.

To the Members of the Joint Committee:

Transmitted herewith for your consideration and use and for the use of other Members of Congress, Federal Government agencies, the business and academic communities, and other interested parties is a report concerning economic analysis and the efficiency of government entitled "Federal Transportation Expenditure" by the Subcommittee on Economy in Government.

Sincerely,

WRIGHT PATMAN,
Chairman, Joint Economic Committee.

AUGUST 14, 1970.

HON. WRIGHT PATMAN,
*Chairman, Joint Economic Committee,
U.S. Congress, Washington, D.C.*

DEAR MR. CHAIRMAN: Transmitted herewith is a report by the Subcommittee on Economy in Government entitled "Federal Transportation Expenditure."

This report is based on hearings which the subcommittee held in May 1970. These hearings and this report are a part of the subcommittee's continuing study of economic analysis and the efficiency of government. Through this ongoing study, the subcommittee is attempting to focus attention on the potential contributions of improved budgetary procedures and policy analysis in attaining efficiency in government.

I express the appreciation of the subcommittee to the administration officials and private experts who appeared as witnesses.

Sincerely,

WILLIAM PROXMIRE,
Chairman, Subcommittee on Economy in Government.

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FEDERAL TRANSPORTATION EXPENDITURE

I. Introduction and Summary

In May of this year, the Subcommittee on Economy in Government of the Joint Economic Committee held hearings on Federal transportation expenditure policy. This examination was part of the subcommittee's continuing study of Economic Analysis and the Efficiency of Government. The subcommittee does not yet regard this study as complete and hopes to continue its examination of Federal transportation policy as well as of other major Federal activities which lend themselves to economic analysis. We have as yet given little attention to such important areas of Federal transportation expenditure as airport and airways development or rail transit. Nor have we fully examined the regulatory aspects of Federal transportation policy. However, the hearings which we have already held have revealed some serious deficiencies in the economic analysis available to Congress. Thus we feel it is important to report at this time, in order that the Congress may have available the results of our study as it proceeds with major transportation expenditure decisions during the current session.

Our report is concerned both with the general capability of Congress and the executive branch to conduct and to evaluate economic analyses of transportation programs and with the application of general principles of economic analysis to the Federal-aid highway program and to the supersonic transport development program. Our principal conclusions are as follows:

- A more unified approach to transportation expenditure decisions is needed, in Congress as well as in the executive branch.
- The provisions of the Department of Transportation Act relating to the Department's authority to conduct investment analysis should be re-examined. If it is found that these provisions restrict the Department's authority to perform investment analysis essential to Government program efficiency, the law should be amended.
- The executive branch should provide the Congress with more comprehensive analysis of the social costs and benefits of Federal transportation programs, and Congress should improve its capability for evaluating such information. Since existing authorizations for the Interstate Highway System extend into fiscal 1974 Congress would be well advised to postpone action on further authorizations until more adequate analysis of the social costs and benefits of further Interstate Highway expenditures can be made available.

NOTES

Senator John Sparkman states: "The responsibilities of my position as Chairman of the Senate Banking and Currency Committee, together with my other committee assignments, made it impossible for me to participate to any great extent in the hearings leading up to this report. Accordingly, I do not feel that I should join in it."

Senator Symington states: "Because of unusually heavy commitments in connection with other committee responsibilities, I was unable to participate in all the hearings on which this report is based; therefore I do not wish to endorse it."

- Transportation expenditures should be subjected to all the usual procedures of budgetary review. Congress should take such legislative action as is required to provide for the orderly but expeditious phasing out of the highway trust fund and the return to the financing of transportation expenditures out of general revenues.¹

- Federal programs of highway aid should contain incentives for the development of efficient road pricing. Existing Federal restrictions on the use of tolls should be reexamined.

- The diversity of Federal financing formulas which distorts choices among alternative types of transportation investment should be corrected, and restrictions on the uses to which States can apply revenue from State gasoline and motor vehicle taxes should be removed.

- The Federal aid highway program, the supersonic transport development program, and most other transportation investment programs clearly fall within the scope of section 102 of the National Environmental Policy Act of 1969, which requires full reporting of the environmental consequences of proposed Federal programs. Authorization and appropriation requests for these programs should not be approved until the required information has been supplied.

- Few significant public benefits appear likely to result from the supersonic transport (SST) development program. On the other hand, very significant social costs are associated with this program. More productive uses of Government resources are clearly available. No further Federal financial support of the supersonic transport development program is justified at this time.

- If the SST program is continued, the total cost to the Government is likely to reach \$3 billion or more. There is little prospect that the Government will earn a reasonable rate of return on its investment. It is entirely possible that the Government will recover none of this investment.

- Unless new technology for reducing engine noise can be developed, adherence to the administration's commitment to avoid degradation of the noise environment in the vicinity of airports—a commitment which we strongly support—will make it difficult or impossible for the SST to operate from existing U.S. airports.

- The British-French Concorde does not pose a competitive threat of sufficient magnitude to justify continued Federal Government support of the U.S. SST.

- Further work on the SST prototype is premature at this time. Research efforts should be concentrated on investigating the effects on weather and climate of introducing additional moisture into the stratosphere; on new technology to reduce engine noise; and on efforts to eliminate the sonic boom. When more progress has been made in overcoming these serious environmental effects, the SST may look like a much more attractive commercial proposition. When the SST does become an attractive commercial proposition, we believe that private financing will be available, and there will be no need for direct Government investment in SST development.

¹ See comments of Representative Patman, Representative Conable, and Senator Percy on p. 9.

II. Economic Analysis of Federal Transportation Expenditure

The establishment of the Department of Transportation in 1967 was envisaged as a major step toward coordinated transportation policy decisions; decisions based on analysis of investments in different modes of transportation as alternative means of meeting the Nation's need for mobility; decisions designed to produce fast, safe, and convenient transportation in an efficient manner. The opening sections of the Department of Transportation Act state:

Sec. 2. (a) The Congress hereby declares that the general welfare, the economic growth and stability of the Nation and its security require the development of national transportation policies and programs conducive to the provision of fast, safe, efficient, and convenient transportation at the lowest cost consistent therewith and with other national objectives, including the efficient utilization and conservation of the Nation's resources.

(b)(1) The Congress therefore finds that the establishment of a Department of Transportation is necessary in the public interest and to assure the coordinated, effective administration of the transportation programs of the Federal Government; to facilitate the development and improvement of coordinated transportation service. * * *

As yet these goals remain far from realization. The Department of Transportation is handicapped by legislative restrictions which discourage the needed analysis of alternatives. The way in which Congress handles transportation legislation—with urban mass transit considered by the Banking and Currency Committees, highways by the Public Works Committees, other forms of transportation by the Commerce Committees, and trust fund legislation by the Ways and Means and Senate Finance Committees—places further obstacles in the way of a coordinated approach to transportation policy.

A more unified approach to transportation expenditure decisions is needed in Congress as well as in the executive branch. The decisionmaking process should be organized so as to permit and require full review both of the relative costs of alternative ways of meeting a given transportation need and of the priority which a proposed transportation investment should be accorded relative to alternative uses of public resources.

LEGISLATIVE RESTRICTIONS WHICH DISCOURAGE ADEQUATE INVESTMENT ANALYSIS SHOULD BE REMOVED

Section 4(b)(2) of the Department of Transportation Act states:

Nothing in this Act shall be construed to authorize, without appropriate action by Congress, the adoption, revision, or implementation of—

- (a) any transportation policy, or
- (b) any investment standards or criteria.

Section 7(a) reads in part:

The Secretary, subject to the provisions of Section 4 of this Act, shall develop and * * * revise standards and criteria consistent with national transportation

policies, for the formulation and economic evaluation of all proposals for the investment of Federal funds in transportation facilities or equipment, except such proposals as are concerned with * * * (5) water resource projects; or (6) grant-in-aid programs authorized by law.

Both the general prohibition of section 4(b) and the major specific exceptions to section 7(a) would appear to seriously restrict the authority of the Department of Transportation to conduct investment analysis. In 1968 Dr. M. Cecil Mackey, who was at that time Assistant Secretary of Transportation for Policy Development, supplied the following statement in response to questions raised by this subcommittee concerning the possible need to amend these sections of the Department of Transportation Act:

There would not appear to be special reasons for imposing particular restrictions such as those in sections 7(a) and 4(b)(2) on DOT's authority to manage its programs * * * .

The amendment of section 7(a) of the Department of Transportation Act would facilitate implementation of effective economic analysis. There does not appear to be any important administrative or noneconomic reason why the act should remain as it is.¹

Another witness, testifying before the subcommittee in September 1969, interpreted these two sections of the Department of Transportation Act as "explicit caveats" against engaging in "economic analysis of costs, benefits, and appropriate discount rates."² While the present Assistant Secretary of Transportation indicated in our most recent hearings on this subject that he did not feel these provisions were "unduly restrictive," and were designed "to insure that rigid cost-benefit criteria are not * * * made a benchmark against which projects wind up on a go-no-go basis," the subcommittee feels that, at the very least, these provisions of the law should be reexamined with respect to their effect on the authority of the Department to perform needed economic analysis.

Legislative restrictions which discourage or prohibit adequate investment analysis should be removed. The relevant provisions of the Department of Transportation Act should be reexamined. If it is found that they restrict the authority of the Department of Transportation to perform investment analysis essential to Government program efficiency, the law should be amended.

SOCIAL COSTS AND BENEFITS MUST BE FULLY INCLUDED IN INVESTMENT ANALYSIS

While cost and benefit estimation is a valuable tool in the decision-making process, it is subject to abuse if the concepts are applied too narrowly. Since Congress is concerned with the public value of Federal investments, the social, or external, costs as well as the direct monetary costs must be fully considered. A similarly broad concept must be applied to the estimation of benefits.

¹ "Economic Analysis of Public Investment Decisions: Interest Rate Policy, and Discounting Analysis." Hearings before Subcommittee on Economy in Government, pp. 171-172.

² James Nelson, "Economic Analysis and the Efficiency of Government, Pt 2." Hearings before the Subcommittee on Economy in Government, p. 488.

In the case of highways, for example, the social costs include such things as noise, air pollution, dislocation of homes and businesses, neighborhood disruption, creation of barriers between neighborhoods, loss of recreational land, and the like. Some of these, such as housing dislocation, are at least partially reflected in the actual dollar costs to the Government of highway construction. Others such as noise and air pollution are not (except to the limited extent that damages may have been awarded to individuals who have brought court actions). Some of the social costs, such as neighborhood disruption, are extremely difficult, and in some cases impossible, to quantify. Additional efforts to measure such costs should be undertaken. Where such costs cannot be quantified, they can and must be explicitly recognized as qualitative factors which should be fully considered in making program judgments.

In the case of benefits, such relatively simple techniques as the estimation of traffic volume obviously are not a sufficient measure of social benefit. A rural highway may have a relatively low traffic volume, but it may provide residents of the area with their only means of mobility, and hence their only access to jobs, schools, and community services. It may open up to industry and tourism areas which were previously inaccessible. By contrast, a new urban highway may bring more cars onto already congested city streets, while at the same time discouraging use of alternative means of transportation. In this latter case, the volume of traffic using the road may on balance be a cost to urban residents and commuters rather than a benefit.

It is also necessary to know how the social costs and benefits of a transportation investment will be distributed among different groups in the population. In the case of highways, for example, the benefits accrue largely to users of the highway (although many of these might prefer alternative means of transportation if adequate alternatives were available) and to owners of strategically placed commercial property. Under our present financing system, the dollar costs of highway construction are paid by purchasers of gasoline, tires, and diesel fuel, regardless of the extent to which they will benefit from the construction of a particular highway. The costs of highway maintenance and repair, as well as the cost of feeder roads, are not, however, financed from Federal gasoline taxes.

Many of the social, or external, costs of highways are paid either by those who must move out to make way for the highway or by those who must continue to live in close proximity to it. Another, more generalized type of social cost is borne by the substantial fraction of the population who are nondrivers—the young, the aged, the poor. These groups are at a growing relative disadvantage as society becomes increasingly dependent on the private automobile. Is it good public policy to assess costs against some groups in order that other groups may benefit? This is a judgmental question relating to the real distribution of income in our society. Fuller information as to the probable distribution of costs and benefits would improve the ability of the Congress to make wise judgments.

The highway "need" estimates contained in the national highway needs reports, which are required to be submitted to Congress every 2 years, are not based on these broad considerations of social cost and benefit. "Need" as used in these reports refers to "capacity adequate to accommodate the highway travel forecast for a given target year."³

³ 1970 National Highway Needs Report, p. 11.

Since funds are apportioned to the States in accordance with their estimated "needs," the financing system contains a considerable incentive to produce inflated travel forecasts. Furthermore, there is persuasive evidence that the "demand" for highways, as measured by traffic volume, is partly a function of highway availability. Increasing the highway mileage may merely stimulate more automobile travel.

Based on the misleading concept of equating need with travel forecast, the most recent highway needs report estimates that there is a "need" to devote \$320 billion worth of our national resources to road construction over the next 15 years. We do not believe that anything like this enormous sum can or will be spared for road construction. The crucial question, however, is: Which parts of this total highway "need" offer a social rate of return sufficient to justify the expenditure of public funds? A more specific and pressing question which the Congress must decide is the extent to which the social value of the remaining segments of the Interstate Highway System justifies the authorization of additional funds. It is now estimated that completion of the presently designated 42,500 mile system will require approximately \$12 billion in Federal funds, beyond currently authorized amounts, and this estimate contains no allowance for any future cost increases.

At our recent hearings, Assistant Secretary of Transportation Baker described to the subcommittee analytic efforts currently being undertaken by his Department which are designed to yield conclusions about the comparative value of investment in different modes of transportation. The target date for completion of this analysis is not until 1972. In the meantime, the background information needed to make a major new decision on Federal-aid highway authorizations is simply not available.

In making transportation expenditure decisions, Congress needs access to more comprehensive analysis of social costs and benefits than is currently available. The appropriate agencies of the executive branch should make such information available at the time authorization requests are introduced, and Congress should improve its capability for evaluating such information. Specifically, such analysis should include:

- (1) Estimates of the full costs and benefits of proposed transportation investments. External costs and benefits should be included, and an adequate discount rate should be applied to the estimation of future benefits;
- (2) estimates of the distribution of the costs and benefits of the proposed project among different groups in society, together with an analysis of the extent to which fully adequate compensation of those who are adversely affected by such investment is feasible.

Adequate information of this type is not presently available with respect to uncompleted portions of the Interstate Highway System. Since existing authorizations for the Interstate System extend into fiscal 1974, we believe Congress would be well advised to postpone action on further authori-

zations until more adequate analysis of the social value of further Interstate Highway expenditures can be made available.

If there are proposed sections of the Interstate System which cannot demonstrate a high social value, Congress should have this information when further authorizations are considered.

FEDERAL TRANSPORTATION EXPENDITURES SHOULD BE SUBJECTED TO REGULAR BUDGETARY REVIEW

The previous two sections of this report have stressed our belief that more complete economic analysis of proposed transportation investments is essential. Such analysis will really be of value, however, only if our financing system is sufficiently flexible to permit rational use of the analytic evidence. Evidence that a particular transportation need can be met most efficiently by improving the public transportation system, for example, is apt to be ignored if funds are available only for highway construction. Similarly, evidence that urban transportation problems could best be eased by enabling people to live closer to their jobs may be primarily of academic interest if funds are available for transportation systems but not for housing and urban reconstruction.

From its initiation in 1916 until 1956, the Federal aid highway program was financed out of general revenues, so that highway appropriations were subjected to all the usual procedures of budgetary review. In the mid-1950's, it was decided to give a very high budgetary priority to the construction of a comprehensive national highway system. A special financing arrangement, the highway trust fund, was created. Revenues from the Federal gasoline tax and certain other motor vehicle-related taxes were placed in this fund, and the use of these revenues was restricted to the financing of federally aided highway construction.

The receipts of the highway trust fund now exceed \$5 billion per year. Total receipts from 1956 through its scheduled expiration date in September 1972 will approach \$60 billion. For 15 years now this important source of revenue has been insulated from any real consideration of the relative value of highway and nonhighway uses. We believe the time has arrived when provision should be made for Congress to again have the opportunity to review annually the uses of this revenue.

It is sometimes argued that it is somehow unfair to use revenues from the gasoline tax and other road-user charges for anything except highway construction. There are several reasons why we do not accept this argument. First, since the average family finds it very difficult to get along in today's world without an automobile, this family has little choice except to pay gasoline taxes. There is no logical basis for regarding payment of these taxes as a "vote" for more highways. Second, we do not view our other excise taxes this way. Alcoholic beverage taxes, for example, are not used to build distilleries, nor are they dedicated to use in constructing facilities for the treatment of alcoholics. Third, even if we were to accept the view that the proceeds of the gasoline tax should be expended only for the benefit

of road users, new highways are clearly not the only investment from which road users might benefit. A witness at our recent hearings told of a study he had made indicating that 35 percent of the benefit of a proposed new subway line would accrue to road users, rather than subway users.⁴ Yet we do not finance rapid transit from the gasoline tax. Many road users would benefit from making our central cities livable again, so that urban streets would be less clogged with commuters from the suburbs. Yet we do not finance urban reconstruction through the gasoline tax.

There have recently been a number of proposals put forward for broadening the uses to which highway trust fund revenues can be put. These range from the relatively modest proposals put forward by the administration this year to finance forest and public land highways and the highway safety and beautification programs out of the trust fund to sweeping proposals to finance Federal investment in all modes of transportation out of a general trust fund made up of receipts from all the existing Federal transportation user charges, perhaps supplemented by transfers from general revenues.

The Assistant Secretary of Transportation indicated in his testimony before our subcommittee that the Department has various proposals for a general transportation trust fund under active consideration. Several other witnesses at our recent hearings advocated this general trust fund approach. Many of their arguments are quite persuasive. A general trust fund offers one major advantage over the proliferation of separate trust funds for the various modes of transportation, a proliferation evidenced by the establishment this year of an airport-airways trust fund. With a general trust fund it would become possible to allocate funds rationally among transportation modes choosing in each individual situation the mode which will most efficiently and effectively serve our need for mobility.

The disadvantage of the general transportation trust fund approach arises when we come to the question of a rational allocation of budget resources between transportation and nontransportation uses. How can we be sure that we would not lock ourselves into a situation in which we would overinvest in transportation while underinvesting in other aspects of economic development and public well-being? There is clearly, for example, a tradeoff between patterns of residential location and our need for urban transportation. But the establishment of a general transportation trust fund would provide no incentives to analyze housing investment and transportation investment as alternative solutions to the problem of urban mobility, nor would it provide the opportunity to allocate expenditures in accordance with the results of any such analysis.

Thus, while some broader concept of a transportation trust fund would contribute to a more rational allocation of Federal expenditure than at present, this objective would be more completely realized by a return to the financing of transportation investment out of general revenues. There is, of course, need for some assurance of financing continuity where investment projects take several years to complete, but this problem is not unique to transportation investment, and we believe it can be satisfactorily handled without the segregation of revenues into special funds.

⁴ Christopher Foster, testimony before the Subcommittee on Economy in Government, May 6, 1970.

Transportation expenditures should be subjected to all the usual procedures of budgetary review. In keeping with the previous recommendation of this subcommittee, subsequently endorsed by the full Joint Economic Committee, that "the trust fund should be abolished as an instrument for financing Federal programs involving investment, construction, or the provision of facilities or services," Congress should take such legislative action as is required to provide for the orderly but expeditious phasing out of the highway trust fund and the return to the financing of transportation expenditures out of general revenues.^{5 6 7}

ECONOMICALLY EFFICIENT PRICING OF PUBLICLY PROVIDED TRANSPORTATION FACILITIES IS LACKING

One aspect of transportation policy on which we found widespread agreement among our witnesses was that in the United States we have largely failed to employ user charges as a method of insuring efficient use of publicly provided transportation facilities. User charges for services and facilities provided by government are the equivalent of the prices which are charged for goods and services in the private marketplace. These prices perform the important function of efficiently allocating resources among competing uses. If the price (user charge) is below the cost of the service, demand for the service will be greater than if the user had to pay the full cost, and resources will be diverted to this use which would be more productive in other uses. Users of the service will be being subsidized by someone. Where there is some public purpose to be served by encouraging use of a particular service, an argument can, of course, be made for public subsidization of that service. In such cases, however, the extent of the subsidy should be explicitly recognized and weighed against alternative uses of public resources.

The purpose of user charges for those parts of our national transportation system provided through the private market is well understood. Travelers by train or commercial airline buy a ticket, the price of which is at least roughly related to the cost of operating the service. The role of user charges for those parts of the transportation system provided by the public sector is much less well understood. Introduction into general usage in this country of the British term "road pricing," or more generally, "transportation pricing," would aid in gaining wider public understanding of the pricing function served by user charges.

There are many aspects of our present transportation pricing system which violate principles of both equity and economic efficiency. Public subsidization of general aviation is one glaring example.

⁵ Representative Patman states: "I approve the report with the exception of the recommendation to abolish the highway trust fund. In my opinion, it would be more practical to expand the existing trust fund to cover the extremely urgent needs of mass transit. I believe this would be a more effective way of meeting immediate mass transit needs and also serve the purpose of reordering priorities in the field of transportation."

⁶ Senator Percy agrees there is a great need for better budgetary control over transportation spending, but feels that the best way to meet the transportation needs of this Nation—especially for urban transit—would be through the use of a general transportation trust fund.

⁷ Representative Conable believes that since the Federal highway trust fund was created to finance the construction of the interstate highway system, it would be premature to advocate abolishment of the fund before the system, as presently envisaged, is complete. Therefore, he does not endorse this recommendation at the present time.

Another, which we discuss later in this report, is the potential subsidization of supersonic flight by passengers on subsonic flights. Road pricing is another major area where public policy has failed to follow sound economic principles.

Road pricing, in the form of tolls, was at one time quite common in this country, but with the development of the Federal aid highway program this approach was largely abandoned. Federal law now provides that, with certain exceptions related to the retirement of bonded indebtedness, all highways built with Federal aid "shall be free from tolls of all kinds." Highways today are financed by the gasoline tax and other related charges, but these Federal funds can be used only for the construction or major reconstruction of highways, not to cover the maintenance costs of the use of existing roads, nor to compensate for the congestion, noise, air pollution, and similar social costs associated with the use of existing roads.

A further major limitation of the gasoline tax as a road pricing device is that it bears little, if any, relation to the cost of using a particular road at a particular time. The amount of gasoline tax paid is essentially the same whether the driving is done on an uncongested rural highway or in the middle of the city at rush hour. Efficient pricing of our road system would require that the cost of operating a motor vehicle be higher under conditions which impose a higher social cost. By providing free use of urban highways at congested times of day, while requiring users of public transportation to pay their own way (or a large part of it), we encourage the use of the private automobile relative to the use of public transportation. Society at large is in essence subsidizing the rush hour driver.

We found widespread agreement among the witnesses at our recent hearings that several approaches to the differential pricing of road use—including tolls, special licenses for rush-hour driving, parking charges, and perhaps special metering devices—are technically feasible, but they have been largely neglected in the United States. Much more extensive investigation of the practical possibilities for road pricing has been undertaken in Great Britain, and the subcommittee was fortunate in having some of the results of these studies described by Dr. Christopher Foster, formerly Director General of Planning for the British Ministry of Transport. Dr. Foster explained that urban roadspace should be regarded as a scarce commodity, and then explained:

Where there is scarcity private enterprise—and Government—usually uses the price mechanism to ration the commodity, rather than allowing people to form lines and jostle it out. On urban roads we let people form lines. It would be a much more efficient solution if an economic price * * * were set on highways. * * * In my own country there has been great interest in new methods of urban road pricing since the report of the Smeed Committee in 1964.⁸

This may be compared with the description by another witness of his experience in discussing road pricing with officials at different levels of government in this country:

⁸ Christopher Foster, testimony before the Subcommittee on Economy in Government, May 6, 1970. The title of "Smeed Committee Report" referred to is: "Road Pricing: The Economic and Technical Possibilities," London, HMSO, 1964.

No one had really considered the possibility of using peak-hour tolls as a device to manage the use of the road system. * * * No assessment has been made, or even contemplated, of the costs and benefits of peak-hour tolls under any circumstances. * * * Development of rational parking policies * * * is another unexploited possibility for increasing the efficiency of urban transportation systems at virtually zero cost. * * * Parking policy in most cities is unbelievably bad.⁹

The potential for road pricing devices as a means of reducing urban road congestion and of obtaining an efficient allocation of resources into urban road construction and maintenance should receive much more attention at all levels of government. Federal programs of highway aid should contain incentives for the development of efficient road pricing. Existing Federal restrictions on the use of tolls should be reexamined.

FEDERAL FINANCING FORMULAS SHOULD NOT DISTORT THE ALLOCATION OF STATE AND LOCAL RESOURCES

The Interstate Highway System was initially conceived as a national highway system, designed to provide an efficient means of traveling between cities and, therefore, designed to yield significant national benefits. It was thus thought appropriate for the Federal Government to assume 90 percent of the cost of building the Interstate System.

In fact, however, many urban portions of the Interstate have come to be used primarily, not to connect cities, but to move local residents around within a given metropolitan area. Since other federally aided urban highways receive no more than 50 percent Federal aid and since Federal aid for urban mass transit has been almost nonexistent, a substantial incentive was created for local governments to attempt to meet their local transportation needs through the Interstate System. In many instances these local transportation needs could have been met at lower total cost and in a manner more consistent with clear local preferences through improvement of existing roads, development of express bus service or, in larger cities, construction of rail rapid transit. However, the disparities in the level of Federal support for different types of transportation have distorted local choices and discouraged selection of the economically most efficient alternatives.

If the purpose of Federal support of urban transportation investment is to assist metropolitan areas in meeting their local needs, then surely alternative ways of meeting these needs should be examined on the basis of comparative cost and compatibility with local preferences.

Under the present method of allocation of interstate highway funds, if a proposed section of the Interstate is not built, the funds for it revert into the highway trust fund. The choice facing State and local governments is thus one of going ahead with a proposed highway section or of losing the Federal money entirely. The alternative of using the Federal funds to meet the transportation need by some other means is not available.

⁹John Kain, testimony before the Subcommittee on Economy in Government, May 6, 1970.

The Department of Transportation has recently identified a number of segments of the Interstate System which will be particularly difficult to complete either because of local opposition to the highway or because the cost seems excessive. It is estimated that the proposed "Chicago Crosstown" route, for example, will cost approximately \$1 billion, or \$50 million per mile, to construct. Although the number of miles involved in these segments is a very small percentage of the total Interstate System and none of the segments is regarded by the Department of Transportation as essential to an integrated national system, the combined cost of these segments is estimated to be \$4 billion. Consideration should certainly be given to deleting segments such as these from the Interstate System. Consideration should also be given to making available to the States and localities involved some portion of the funds they would otherwise have received for these interstate projects for use in meeting their transportation needs by alternative means, provided that such alternatives were approved by the appropriate Federal officials.

Diversity of financing formulas has a tremendous impact on local decisions, but it is not the only provision of Federal transportation law which influences State and local expenditure decisions. Another which we feel should be reexamined is the restriction placed in the Federal law 36 years ago requiring the States, as a condition of Federal aid, to earmark their own revenues from gasoline and motor vehicle taxes to highway construction. Today the States continue to be obligated to devote at least that portion of these taxes which was in effect in 1934 exclusively to highway use. Just as we favor making the Federal revenues which now go into the highway trust fund available for general use, we feel States should also be free to allocate their revenues to the uses they determine to be of highest priority.

States and localities should be encouraged to use their Federal assistance, as well as their own funds, in the most efficient way. The diversity of Federal financing formulas which distorts choices among alternative types of transportation investment should be corrected and a full evaluation of the way in which Federal transportation law restricts or influences State and local decisions should be undertaken. Restrictions on the uses to which States can apply revenue from State gasoline and motor vehicle taxes should be removed.¹⁰

¹⁰ Senator Percy believes a general transportation trust fund would allow for such flexibility and permit State and local governmental units the freedom to allocate funds among different modes of transportation in the most efficient manner to meet the particular needs of each State and locality.

III. Measuring the Environmental Effects of Transportation Investment

Section 102(c) of the National Environmental Policy Act of 1969 requires that all agencies of the Federal Government shall:

Include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—

- (i) The environmental impact of the proposed action;
- (ii) Any adverse environmental effects which cannot be avoided should the proposal be implemented;
- (iii) Alternatives to the proposed action;
- (iv) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and
- (v) Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Prior to making any detailed statement, the responsible Federal official shall consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved. Copies of such statement and the comments and views of the appropriate Federal, State, and local agencies, which are authorized to develop and enforce environmental standards, shall be made available to the President, the Council on Environmental Quality and to the public. * * *

It is obvious that any major transportation investment will "significantly affect the quality of the human environment." In his testimony before our subcommittee, Russell Train, Chairman of the Council on Environmental Quality, indicated that in his judgment proposals for legislation relative to the two programs in which the subcommittee was especially interested, the Federal-aid highway program and the supersonic transport development program, should be accompanied by the information specified in section 102 of the National Environmental Policy Act. As yet no such reports have been prepared with respect to the SST, and the Department of Transportation, was unable to assure the subcommittee that this information would be submitted before the ending of this session of Congress. The subcommittee is pleased to note, however, that the report required under the act is expected to be issued shortly with respect to the administration's request for extension of the highway trust fund.

As we have stated earlier in this report, environmental effects of transportation systems are an important part of the social costs and benefits which must be taken into account in measuring the public value of an investment. The environmental consequences of the transportation programs with which we are concerned are very great and should be a major element in decisions on whether to proceed

with funding. It is essential that full information on environmental effects be made available before expenditure decisions are made.

Section 102 of the National Environmental Policy Act of 1969, which requires full reporting of the environmental consequences of proposed Federal programs having a significant environmental impact, must be complied with. The Federal aid highway program, the supersonic transport development program, and most other transportation investment programs clearly fall within the scope of this act. The Department of Transportation should make the required information available to Congress as promptly as possible. Authorization and appropriation requests for these programs should not be approved until such information has been supplied.

IV. The Supersonic Transport Development Program

Federal participation in the development of a commercial supersonic transport has aroused a great deal of controversy. Numerous attempts to analyze the public value of this program have failed to produce a clear justification for Federal participation. Arguments have been advanced by responsible public officials that the development of a commercial SST would advance scientific knowledge, strengthen the U.S. balance of payments, contribute to the health of our aerospace industry, provide employment and enhance our national prestige. Other equally responsible public officials have concluded that the SST would more likely hurt than help the balance of payments, would have a negligible impact on employment, would contribute seriously to noise pollution at airports, might potentially have serious effects on weather and climate, would be utilized by only a small fraction of our population, and is unlikely to be a commercial success. For example, the Under Secretary of the Treasury for Monetary Affairs concluded in March 1969 that "the balance of public benefits or losses may well be negative," and the Director of the Office of Science and Technology concluded that "the Government should not be subsidizing a device which has neither commercial attractiveness or public acceptance."

In view of the many pressing demands on the Federal budget and in view of the recommendation of the Joint Economic Committee in its 1970 Annual Report that Congress take prompt action to meet "the need to reduce or eliminate expenditures for space, the supersonic transport, and highways," the Subcommittee on Economy in Government in its May hearings undertook an extensive review of the social costs and benefits of the SST program. We heard testimony from Federal officials responsible for the program and from private experts. Representatives of the Boeing Co., which is building the SST prototype, declined our invitation to appear before the subcommittee, but made extensive written information available to us. The chairman of the subcommittee also requested and received written comments from the members of the ad hoc committee of Government officials which reviewed the SST program at the President's request early in 1969. The subcommittee thus feels that its review of this program has been quite thorough and that efforts have been made to obtain all points of view.

It is our conclusion that few significant public benefits appear likely to result from the supersonic transport development program. On the other hand, very significant social costs are associated with this program. More productive uses of Government resources are clearly available. No further Federal financial support of the supersonic transport development program is justified at this time.

THE SST OFFERS FEW PUBLIC BENEFITS

Employment Benefits of the SST.—The country is suffering from excessive and rising unemployment at the present time, and much of this unemployment is in the aerospace sector of the economy. We strongly advocate effective action to restore full employment. However, the employment impact of SST prototype development is extremely modest. The Boeing Co. estimates that the *production* phase of the SST program will provide employment for 50,000 persons. This figure has been widely publicized, but it has seldom been pointed out in conjunction with this estimate that the production phase of the program will not, at the earliest, be reached until the mid-1970's. The Under Secretary of Transportation stated during our hearings that "the employment peaks in this program would not occur until the latter half of the 1970's."

The current phase of the program, the *prototype* phase, is estimated by Boeing to employ 20,000 persons. This is only 0.02 percent of the civilian labor force, and only 0.5 percent of total employment in the electrical and transportation equipment industries. It is only 0.5 percent of the 4 million unemployed in May 1970. The unemployment problems of this country can only be solved by promoting an economy which provides job opportunities on a much more massive scale, and this means productive jobs providing goods and services which society regards as useful and desirable. The SST does not qualify on these grounds.

Our conclusion with respect to the minimal employment impact of the SST is confirmed by the Assistant Secretary of Labor for Manpower, who wrote to the chairman of the subcommittee on April 30, 1970, that "although the overall employment situation in the country has certainly shifted since last year, we would still conclude that the net employment increase from the SST would be negligible."

Balance of Payments.—The difficulty of estimating the balance-of-payments impact of the SST is evidenced by the widely different estimates made by competent and responsible Government officials. In testifying before us in May, the Under Secretary of Transportation estimated that SST sales could have a total favorable impact on the U.S. trade balance through 1990 of as much as \$16 billion. This estimate is based on assumed sales of at least 500 U.S. SST's and on the further assumption that in the absence of a U.S. SST, the U.S. airlines will import some 300 British-French Concorde. For reasons we discuss below, both of these sales assumptions are very hard to accept. Furthermore, this balance-of-payments estimate ignores the potential impact of the SST in generating increased foreign travel by U.S. citizens. A more complete estimate of the balance-of-payments impact would consider the foreign travel impact as well as the direct impact of aircraft sales.

Using this broader method of estimation, both the Treasury and the State Department have concluded that the SST is at least as likely to hurt as to help the U.S. balance of payments. In a letter to the chairman of this subcommittee on May 1, 1970, the Under Secretary of the Treasury for Monetary Affairs confirmed his earlier judgment that "the potentially adverse impact on our travel account from development of a U.S. SST could equal or outweigh the positive impact on the aircraft sales account." The Department of State also confirmed, in a

letter to the chairman of the subcommittee on May 7, 1970, that they continue to share this view that the balance-of-payments impact of the SST could well be adverse.

Competitive Threat Posed by the Concorde.—Many of the arguments advanced in support of the SST, especially those relating to the balance of payments, and the preeminence of the U.S. aerospace industry, are based on the assumption that if a commercial U.S. SST is not developed, a large and lucrative market will be lost to the British-French Concorde. Consequently, the subcommittee endeavored to obtain as much information as possible concerning the Concorde. We found no convincing evidence that a commercially viable Concorde will be developed and sold on the world market in quantities sufficient to damage either our balance of payments or the health of our aerospace industry.

Although the Concorde prototype is now undergoing test flights, serious technical problems remain. It has not yet been demonstrated that the Concorde can carry passengers across the Atlantic without refueling. The weight of the plane has increased substantially over original estimates, meaning that it must carry more fuel in order to give it trans-Atlantic range. It is quite possible that there will be no room left in the plane for any significant "payload" (passenger and freight-carrying capacity). In such an event, substantial redesign of the plane would be required. It is not at all certain that the British and French governments would continue with Concorde development in the face of another major cost increase.

Even if a commercial Concorde is developed and put on the market, purchase is not likely to be a commercially attractive proposition for the airlines. The British and French airlines, which are government-owned, can and probably will be required to buy the Concorde, and can be subsidized for operation of an uneconomic plane. In this event, other major airlines might feel obliged to purchase a few Concorde for competitive purposes even though they would be operated at a loss. However, the likely sales of the Concorde to U.S. airlines are far below the 300 assumption on which some estimates of the impact on the U.S. balance of payments have been based. World airlines currently have options for 74 Concorde, but these options represent a minimal financial investment and imply no obligation to actually buy these planes.

The Concorde does not pose a competitive threat of sufficient magnitude to justify continued Federal Government support of the U.S. SST.

Scientific Advance.—The advance in scientific knowledge, the so-called "technological fallout," is undoubtedly useful, but this knowledge could be obtained in other ways, at lower cost. The Government officials who reviewed this question at the President's request last year concluded that "the value of this benefit appears to be limited. * * * In the SST program, fallout or technological advance should be considered as a bonus or additional benefit from a program which must depend upon other reasons for its continuation." This panel, which included a representative of the Department of Defense, further concluded that "The SST program cannot be considered as providing unique technological inputs to military programs." This

conclusion was confirmed by the statement in a letter from the Department of Defense to the chairman of this subcommittee on May 8, 1970, that "there are other avenues of research which could develop the technology which would accrue from the SST."

National Prestige.—As to the contribution of the SST to the health of the aerospace industry and the prestige of the United States, we find it hard to believe that either will be enhanced by spending billions of dollars to produce an airplane which will have a seriously adverse environmental impact and for which the prospects of commercial success do not appear sufficiently bright to attract private financing. If our aerospace industry is to maintain its preeminent position it must do so by continuing to show the initiative to privately develop and finance products which can find a successful commercial market. When and if commercial supersonic flight becomes an attractive commercial proposition, private financing will be forthcoming. The appropriate Federal role is one of protection of the public interest by requiring that aircraft meet standards of safety and environmental quality. We can best enhance our national prestige and that of our aerospace industry by protecting the public interest.

THE SOCIAL COSTS OF THE SST ARE GREATER THAN IS GENERALLY RECOGNIZED

Actual Dollar Cost to the Federal Government.—The monetary cost to the Government of SST prototype development is now estimated to be about \$1.3 billion, including the recently revealed cost growth of \$76 million. Some idea of the increase in cost of this program since the initial decision to proceed with the program can be obtained by comparing this \$1.3 billion with the statement made by President Kennedy in 1963 that in no event would the cost to the Government be permitted to exceed \$750 million.

Numerous technical problems remain to be resolved during the prototype phase—the basic structural material has recently been changed from titanium "Stresskin" to aluminum brazed titanium honeycomb; a satisfactory fuel sealant has not yet been developed; and the engines still require substantial modifications to reduce takeoff noise. With serious technical difficulties still to be overcome, experience with the development of other U.S. aircraft, both military and commercial, and British-French experience with development of the Concorde all suggest that further substantial cost increases during the prototype phase must be expected. Cost estimates on the Concorde have now approximately quadrupled since the original estimate in 1962. Dr. Richard Garwin, who recently headed a group of technical experts who reviewed the SST program for the Office of Science and Technology, expressed the opinion during our hearings that a cost increase of 30 to 40 percent over present estimates could be expected during the prototype phase of the U.S. SST. Such an increase would bring the cost through the prototype phase to \$1.7 or \$1.8 billion.

Between \$600 and \$700 million has been spent on the SST through the end of fiscal 1970. This is substantially less than one-half of what we regard as a realistic estimate of the costs through the prototype phase. Two hundred and ninety million dollars has been requested for fiscal year 1971. If the program is terminated now, the cost to the Government, while large, would be only a fraction of the eventual total costs of prototype development.

Even more disturbing than the probable cost increase during the *prototype* phase is the likely need for Government support for the actual *production* of the aircraft. Financing requirements for the production phase were estimated by the Under Secretary of Transportation to be about twice those for the 747 jet, or about \$1 billion. Although officials responsible for the program have repeatedly expressed a belief that the production phase will be privately financed, they have been unable to produce evidence in support of this belief and unwilling to give a commitment that Federal support for SST production would not be sought. Indeed, the Under Secretary of Transportation expressed to us his intention to recommend Federal support of SST production, should that prove necessary, when he stated, "I am on record * * * with the statement that while I was of the opinion that private financing would be available, if it were not at that time, and if we felt that we had a successful SST program * * * and it required some Government-guaranteed loans, then I would think that we would so recommend."

Other witnesses expressed the belief that the total cost of SST development and production would be on the order of \$5 to \$7 billion. They expressed great skepticism about the availability of private financing, in the absence of Government guarantees. They felt that the Government's share of the cost of the SST program might well reach \$3 to \$4 billion. This skepticism concerning private financing is due to the very shaky prospects of the SST for commercial success and to the readily available opportunities for private capital to find alternative uses which appear both safer and more profitable.

Our witnesses felt that the estimates being used by the advocates of the program that 500 or more SST's can be sold were entirely unrealistic. The airlines have heavy financial commitments over the next several years for the purchase of 747's (jumbo jets). Operating costs for the 747 will be far below those for the SST. The number of travelers willing to pay the premium necessary to cover the higher cost of operation of the SST will be very small. In a tight financial situation and with more than adequate capacity already available, the airlines are unlikely to purchase many SST's. For those SST's which are put into commercial operation, fares are likely to be set below full cost of operation. This loss will probably be covered by keeping fares higher than otherwise necessary on subsonic flights. Thus, all air travelers will help subsidize the SST. Asked about the views of airline executives regarding the SST, Gen. Elwood Quesada, who is a director of American Airlines, told us, "There are a lot of people that say that the airlines wish the [SST] airplane would go away. And I am one of them."

Adding to our skepticism about the commercial success of the SST and its ability to attract private financing is the apparent inability of the Boeing Co. to come up with a financial plan as required under its contract with the Government. The contract as amended in July 1969 required Boeing to submit by December 31, 1969, a plan for financing of the production phase, but the subcommittee was informed that this requirement had been waived by mutual agreement until June 30, 1972. Thus the Congress is being asked to appropriate \$290 million this year for a program for which no assurance can be given that there is any upper limit on the eventual total cost to the Government.

The SST has sometimes been defended as an appropriate use of government money on the grounds that the Government will recover

its investment. Even if it were correct that the Government investment will be fully recovered, this argument obviously does not justify Government participation in a program. On the basis of this argument, the Government should feel free to invest in any commercial enterprise, just so long as the prospects for recovery of the investment were good. However, we have concluded that, in any case, the prospects of the Government fully recovering its investment are remote. The contract is designed to produce recovery of the Government dollars invested upon sale of the 300th SST. Subsequent royalties cease when the Government has earned 6 percent on its investment. Thus, the maximum potential return to the Government under its contract with Boeing is recovery of its investment plus 6 percent.¹ Six percent is obviously not a full rate of return to capital in today's market. The average cost of Treasury borrowing has been consistently above 6 percent since early 1969.

Should sales total less than 300 planes there is no assurance that the Government would get any money back at all. The contract already allows deferment of royalties, by mutual agreement, until after 100 airframes have been sold. One can easily imagine further royalty deferment if poor sales are causing losses to the private investors. Another weakness of the contract is that it defines "airframe" as one designed to fly at speeds between Mach 2.2 and Mach 3.1. Should Boeing redesign the aircraft to fly at Mach 2.1, its financial obligation to the Government would apparently be terminated.

Our private witnesses did not feel the prospects for selling 300 SST's were very bright. When we asked General Quesada how much the Government might lose if, for example, only 279 aircraft were sold, he replied, "I think the Government in all probability would lose all of its investment."

No satisfactory evidence has been presented that the production phase of the SST program can be financed entirely from private sources. If the SST program is continued, the total cost to the Government is likely to reach \$3 billion or more. There is little prospect that the Government will earn a reasonable rate of return on its investment. It is entirely possible that the Government will recover none of this investment.

Environmental Costs of the SST: Sonic Boom.—There are at least three major types of environmental cost associated with the SST. These are sonic boom, airport noise, and possible damaging effects on the upper atmosphere through the introduction of additional moisture and the destruction of ozone. In an effort to meet the sonic boom problem, the FAA has issued notice of a proposed rule prohibiting supersonic flight over populated areas. We regard strict adherence to such a rule as essential. This rule, however, will greatly reduce the prospects for commercial success of the SST since operation will be restricted to overseas routes. There is thus reason to expect that great pressure will be brought to bear to relax this rule, particularly if the SST does not prove commercially successful when restricted to

¹ In a Summary of Current Economic Studies of the U.S. Supersonic Transport prepared by the Federal Aviation Administration in September 1969, it was estimated that the Government's rate of return assuming the sale of 500 planes would be only 4.3 percent, while the after tax rate of return for Boeing would be 15 percent and for General Electric, the engine manufacturer, 11.2 percent.

overseas operation. The language of the proposed rule is such as to raise doubts that the rule would be adhered to in the face of such pressures. The notice of proposed rulemaking reads in part:

Sonic boom producing flights over populated areas within the United States are believed to be economically and technologically "unnecessary" as that word is used in section 611 of the Federal Aviation Act of 1958. Traffic demand studies have concluded that from 500 to 800 supersonic transport airplanes will be in operation by the year 1990. Available studies conclude that these expected traffic demands are sufficient to insure an economically viable supersonic transport, even assuming a sonic boom restriction of the kind proposed in this notice.

A restriction on sonic boom producing flights over populated areas is supported at this time by the inconclusive results of research concerning the effects of sonic boom on the surface environment.

Will this rule be adhered to if the belief that boom-producing flights over populated areas are "economically unnecessary" does not prove to be correct?

Airport Noise.—While the problem of airport noise created by the SST has not received nearly as much public attention as the sonic boom, the dimensions of this problem appear to us to be equally as serious. The high level of sideline noise on takeoff may very well preclude use of many of our existing major airports for SST flights. The costs of airport modification and of construction of new airports designed to accommodate the SST will be enormous. These costs have not been taken into account in estimating the cost of the SST. Furthermore, new airports will have to be constructed at a considerable distance from major centers of population. The time spent traveling to the airport could largely negate the flight time savings achieved by flying at supersonic speeds.

The FAA has recently set a limit on sideline noise at takeoff for new subsonic planes of 108 perceived noise decibels. In terms of the noise measures used by the FAA, the SST will be three to four times louder than this standard, and it will be four to five times louder than the 747. In terms of the noise measure cited by Dr. Garwin in his testimony the SST will produce as much noise as the simultaneous takeoff of 50 jumbo jets satisfying the 108 perceived noise decibel requirement.

In testifying before us, Russell Train, Chairman of the Council on Environmental Quality, announced a commitment by the Administration that:

The guidelines with respect to noise certification of the supersonic civilian transport should assure that the noise environment in the vicinity of airports at the time of the introduction of supersonics will not be degraded in any way.

In the course of questioning, Mr. Train revealed that in order to fulfill this commitment to avoid degradation of the noise environment, it will in all probability be necessary to prohibit the SST from landing at most of our existing major airports:

I believe that if we set our standard for the supersonic aircraft in a way which insured that the noise environment

in and around our airports will not be degraded, that it will be exceedingly difficult if not impossible for the SST as presently designed and the Concorde as we now know it to operate from U.S. airports.

Eventually the technology necessary to overcome this noise problem will undoubtedly be developed. But such technology is not presently available, nor is an adequate effort to develop such technology apparently being undertaken. Mr. Train told us:

The present level of research in sideline noise, as well as the other environmental problems and uncertainties to which I have referred, is not at a level that we think it should be.

Dr. Gordon McDonald, a member of the Council on Environmental Quality, added:

Using current technology, the chances of obtaining an economically viable airplane and meeting what we propose as the noise criterion are slim. However, there are alternatives ahead that might very well lead to a quieter engine.

We strongly support the commitment made by the Administration that the supersonic transport will not be allowed to degrade the noise environment in the vicinity of airports. This commitment should be incorporated into regulations setting airport noise standards for supersonic planes; standards equally as stringent as those already established for new subsonic planes. The Congress should, however, be aware that unless new technology for reducing engine noise can be developed, adherence to this commitment will make it difficult or impossible for the SST to operate from existing U.S. airports.

Atmospheric Effects.—The third major environmental problem associated with the SST, the possible damage to the upper atmosphere, has also received inadequate public attention. When the Chairman of the Council on Environmental Quality called this area of concern to the attention of our subcommittee, he made it clear that the possible effects on weather and climate are not well understood at this time. It is known that SST operation will introduce substantial additional moisture into the stratosphere. This moisture may destroy some fraction of the ozone in the atmosphere, leading to an increase in the ultraviolet radiation which reaches the earth. This moisture may also increase our cloud cover.

Mr. Train told us:

The increased water content coupled with the natural increase could lead in a few years to a sun shielding cloud cover with serious consequences on climate. * * * The effects should be thoroughly understood before any country proceeds with a massive introduction of supersonic transports.

With respect to the destruction of ozone and the consequent increase in ultraviolet radiation, little is known at this time about what the harmful effects might be. The ultraviolet radiation which presently reaches the earth causes such familiar effects as sunburn. Life could not exist on the surface of the earth if the earth were not shielded by ozone from the full effects of ultraviolet radiation. It is not presently known just what adverse effects small increases in ultraviolet radiation might have on leafy plants and other sensitive life forms. Dr. McDonald of the Council on Environmental Quality stated at our hearings:

This is potentially such a significant problem that we really must understand it before proceeding in any way to alter the water vapor content of this part of the atmosphere.

It seems clear to us that further work on the SST prototype is premature at this time. Research efforts should be concentrated on investigating the effects on weather and climate of introducing additional moisture into the stratosphere; on new technology to reduce engine noise; and on efforts to eliminate the sonic boom. When more progress has been made in overcoming these serious environmental effects, the SST may look like a much more attractive commercial proposition. When the SST does become an attractive commercial proposition, we believe that private financing will be available, and there will be no need for direct Government investment in SST development.

Separate Views of Representative Clarence J. Brown

If the Joint Economic Committee had been advising Queen Isabella, we would still be in Barcelona waiting to prove the world round before daring the Atlantic. The same kind of thinking displayed in this report would have kept the American Government of the last century from developing transcontinental railroads—or President Kennedy 10 years ago from undertaking a program to reach the moon.

While suggesting that there may, indeed, be two sides to the story, the committee does not present in this report the very persuasive arguments or authorities in favor of developing the supersonic transport. The report is a collection of unsubstantiated "concerns" from "experts" who are given equal weight in spite of widely varying degrees of competence. Reasonable men can differ on whether an American SST should be developed at this time. But this report would have been much more helpful in reaching a sound conclusion on this question and the broader issues of transportation policy had it presented the arguments pro and con, made some differentiation between facts and opinions, and indicated the degree to which the latter are or are not substantiated.

Disregarding its conclusions, this report has blurred facts with suspicions and used tortured (frequently contradictory) logic to come to conclusions about future U.S. transportation policy which will not bear the test of close examination.

There is a natural tendency to over-emphasize our own importance akin to the tendency in human nature which resists change. From time to time in various ways, all of us wish we could slow down technological progress and freeze things as they are.

Opponents of developing an American SST argue as if the United States alone were deciding whether there will be a supersonic aircraft. Neither the Joint Economic Committee nor the U.S. Government will determine whether a supersonic carrier is developed. The British-French Concorde has been flying regularly for over a year and has accumulated hundreds of test hours successfully. Supersonic transport aircraft are currently a reality.

Further, ever increasing numbers of passengers travel by air to more and more places for one primary reason—shorter trip times. Time is money and the airline industry sells time-savings. An industry that is in the business of conserving time will take advantage of any technological change that enables it to perform more productively. Everyone may not like today's emphasis on speed, but like it or not, it is a fact which must be accepted.

If the SST is technically and economically feasible, the airline industry will buy supersonic aircraft (which they have indicated they intend to). The issue then becomes whose aircraft will they buy. The U.S. aircraft industry presently supplies over 85 percent of all commercial planes and parts in use throughout the free world. If the United States does not maintain our technological momentum and our leadership in commercial aviation, our position will disintegrate, and

such a disintegration would mean a significant change in our balance of payments (an estimated loss of \$22 billion through 1990) and an equally enormous loss in domestic employment which may be even more important.

Some opponents to the SST say that the development of a supersonic aircraft is fine, but that it should be done entirely with private financing and that Government assistance weakens our successful free-enterprise tradition.

This argument is unsound and should not be the basis for failure to support the SST. Development of the SST is estimated to cost \$1.5 billion. No private financial arrangement in the present economic circumstance can produce that kind of financing, particularly since the SST program will have stretched over 18 years from the time the Congress started appropriating funds to the time of the first delivery to airlines. No industry could afford an investment of this magnitude for such a long period before getting a return on its money. The \$1.5 billion figure approaches the entire net worth of our major commercial transport producers. Thus it should be obvious that the SST business is in fact competition between countries.

While I sympathize with the support of free enterprise given by the SST opponents, their argument overlooks the sizable participation of the Federal Government in the historic development of our railroad system in the 19th century, construction of the Federal Highway System, support of navigable waterways, and the development of atomic energy in the 20th century.

Rather than being an abandonment of the free enterprise system, Government participation in a development the size of supersonic transport is an enormous assist to the continued growth and prosperity of one of our largest private industries which has been of great benefit to our Nation and the world.

The report attempts to make its points against the SST by arguing first that the SST will be economically and technically infeasible. Then it turns around and argues that the SST will be so successful that its development by the United States will worsen our balance-of-payments situation by encouraging Americans to travel abroad and spend U.S. dollars there. Can both things really be true?

Ignoring for the moment which of these contradictory assumptions about the feasibility of the SST is true, one must question the logic that says SST planes will be taking Americans abroad so American companies should not build them. If Americans will be adversely affecting our balance of payments by traveling in foreign countries, that presumed economic disadvantage might be ameliorated at least by retaining the present leadership the American aviation industry holds in making and selling a U.S. product in world markets. If American technical and economic leadership could produce a commercially successful SST before foreign competitors market their plane (and parts and collateral services and activities), it might even benefit U.S. airlines by enhancing the success of their service to both American and foreign travelers in the United States and abroad and further offset any adverse balance of payments impact from added foreign travel by Americans.

And that gives no consideration to the positive impact on trade balances which would accrue to the world's leading manufacturer and marketer of products from being able to open up new parts of

the world to swift trade. It will not be interstate travel in the United States that benefits from the development and use of the SST. Nor will the greatest benefit be in cutting the flight time to Europe from 8 hours to half a working day. The real benefit will come (as it did a few years ago in European travel) when almost anyplace in the world is available on an overnight flight. The movement of civilization and cultural development throughout world history has depended upon such shortening of trade routes.

No one can say with certainty whether the supersonic transport will be a commercial success. If such answers could be prophesied with accuracy, there would be no need for this report. Without such assurance, however, how does the evidence argue? The French and the British apparently feel it lies on the side of developing an SST in the hope of seizing a bigger chunk of aircraft markets in the world. And orders (which must necessarily be optional until a working version flies) have clearly demonstrated the airline industry's confidence in the commercial feasibility of the SST if actual costs of the plane come within estimated limits. In spite of the one distinguished spokesman from the industry who opposes the SST, the general business judgment of the aircraft and airline industry would seem superior to that evidenced in the majority report. The entire history of the aerospace industry, from the Wright brothers through the 747, is full of scenarios similar to the one in which we find ourselves. Doomsayers had similar negative views of the 707. History records the same problem for Robert Fulton and his steamboat, but the reaction to the concept of the wheel has been lost in the past.

The entire history of the airlines is based on the productivity of the aircraft available. To the airlines, productivity is the number of available seat-miles-per-hour that an airplane will produce. The SST will be a significant improvement, being nearly twice as productive as the 747. Without the periodic improvements in productivity and the continuing research and development in American aviation technology, we would still be flying DC-3's, fare levels would unquestionably be higher and the problems of airport and airway congestion would make air travel as we know it today impossible.

Suffice it to say, the committee makes no case that the SST will not fly and do so to economic advantage. The market is there to get to Europe faster and vast new markets will be opened further away even as recent aircraft developments took European travel from ships. Today 43 percent of the American public has flown and the curve is sharply upward. That percentage will hit 60 percent by 1985, according to present estimates.

The report properly indicates difference of opinion about the cost to develop a supersonic plane to serve a growing portion of this growing market. It is axiomatic, because of recent rates of inflation, that SST development is costing more now than it was originally predicted to cost. So does everything else. This trend makes for legitimate differences of opinion on what final costs may be. But two facts stand out clearly. To stop development now means that resumption of development at some future date will be much more costly than to finish the job now. And to suspend development now—even temporarily—will result in a loss of some significant portion of the \$700 million the Federal Government has already invested since President Kennedy first recommended the program be undertaken.

Based on optimistic estimates of prospective sales of an American SST, the Federal investment would be fully returned with a modest rate of interest before we take into account any social and technological benefits which might derive from having an American version of the plane. And, of course, this does not include the debatable economic benefits to our balance of payments. At this rate, the SST becomes a better investment than the transcontinental railroads, the one-time canal system and many past public works projects. Even at the committee's most pessimistic market estimates, it seems possible that technological and other benefits might offset some of the lack of direct cash return to Federal coffers. But what benefits will accrue from abandonment of the \$700 million invested thus far? The committee suggests none.

With no thought of downgrading economic questions involved with the decision on whether or not the Federal Government should invest funds in the SST development, it is difficult to avoid the feeling that the real core of the committee antagonism to the project involves environmental concerns—an area in which there is legitimate widespread interest, but in which this committee is not necessarily expert. Given the political climate of any question relating to the environment, one doesn't have to be an expert to raise a bogeyman that would appear to be sufficient to create Government action—or inaction, as in this case. Obviously, we must be cautious about any program which would damage our environment, particularly if such injury might be permanent. But if all Federal or private programs are to proceed only on a “guilty until proven innocent” basis, progress will indeed come slowly in a wide variety of areas. Under such a case, any question raised can be determining.

Claims of a new ice age, fundamental alterations in weather patterns or deterioration of marine life if SST's take to the air fall more in the area of conjecture not unlike the arguments against the use of aluminum pans in cooking. While they have not been disproven, they have certainly not been proven to any impressive extent. If all technological change must await proof of its safety, then technological change will be slow indeed. In the past, technological change has been successfully undertaken with a view that it would benefit mankind and any harmful effects could be corrected—by technology. This approach brought man out of the cave. Some confidence might come from that. But the fact that Government, which presumably speaks for all of us, is involved in the development should give the committee some further confidence that nothing would be finally approved that would be detrimental. (One is inclined to ask how the United States would prevent use of the Concorde outside American airspace should it be proven detrimental. Perhaps we ought to undertake the development to assure the world a safe SST.)

The President has already announced that the Government will not permit supersonic flights over land, if there are resulting sonic booms. At this time there is no evidence that sonic booms over the ocean or ice cap will injure anything. The military has been conducting such flights for many years with no apparent damage.

Much has also been made of the airport noise factor. At the present time the industry and the Government are in the midst of a concerted research effort to reduce the airport noise of the SST. Competent testimony indicated SST noise would be only slightly higher than the

707 at the present state of development. The problem of airport sideline noise is but one of many which experts argued would succumb to our superior technological ability. In the related, and more important area of community noise, the SST will be quieter than subsonic jets because of its faster climb capability and quieter operation during approach to landing.

While it is difficult to disagree with the rest of the committee's report, since it contains many beautiful thoughts and is basically harmless, I do not think that the report offers much in the way of sensible, practical, specific recommendations for proceeding. No one can reasonably argue that someone ought not to examine the efficiency of our transportation programs, but I hope that in the future it is done less superficially.

Governing is hard. The decisions are not easy. I question that this report helps anyone much. I favor, as I assume everyone does, considering all of the factors in locating highways. I strongly support a more unified approach to transportation policy, and hope the committee continues to hold hearings in this area. But it is one thing to observe that we ought to consider "social costs" and another to quantify them.

Conversely, the report insists that we quantify social costs for highways, particularly urban ones, but does not mention that the social costs of public transportation, such as inconvenience, lost time, and so forth, be considered. The social costs—and perhaps more important, the practicality—of all proposals ought to be considered.

I worry about the inconsistency of the committee's report. It finds fault with the rural highway user having to pay a gasoline tax dedicated to the building of an Interstate Highway System he will not use (and which the committee feels has social disadvantages not present in a rural lane); but then it later suggests that interstate highway users (and presumably anyone else paying a gasoline tax) ought to happily pay the bill for the construction of urban mass transit systems which they might never use.

I agree with the committee, and hope that the proposal is thoughtfully reviewed, that our current highway trust fund undoubtedly has distorted some decisions because of the financing available, but I am confused as to whether the committee favors financing all transportation out of general revenues, which seems to be what is advocated on page 5 and pages 7-8, or a specific user charge, which seems to be advocated in the remarks about road pricing on page 10.

I strongly support, as I trust the committee does, an approach to our transportation which considers all modes, their interrelationships, and a careful consideration of all costs and benefits. I hope that we move toward viewing our actions involving one mode as unquestionably influencing another mode. Indeed, I have continuously advocated that this policy be applied to transportation regulation also.

However, I cannot help but feel that the report sheds little light on the subject; it is long on superficial, nice-sounding, ideas and short on practical analysis and applications of the views expressed. The report sounds good, but adds little in the way of hard facts or logic by which to measure transportation policy. It is a vehicle for flaying the supersonic transport program, but not a very convincing one because of its lack of logical conclusions drawn from any hard facts.