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FEDERAL TRANSPORTATION POLICY: THE SST AGAIN

REPORT

OF THE

SUBCOMMITTEE ON PRIORITIES AND ECONOMY IN GOVERNMENT

OF THE

JOINT ECONOMIC COMMITTEE CONGRESS OF THE UNITED STATES

TOGETHER WITH

SEPARATE VIEWS

MARCH 16, 1973

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LETTERS OF TRANSMITTAL

MARCH 10, 1973.

To the Members of the Joint Economic Committee:

Transmitted herewith for your consideration and use and for that of other Members of Congress, Federal Government officials, the business and academic communities, and other interested parties is a report of the Sucbommittee on Priorities and Economy in Government entitled "Federal Transportation Policy: The SST Again."

Sincerely,

WRIGHT PATMAN,
Chairman, Joint Economic Committee.

MARCH 9, 1973.

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 Priorities and Economy in Government entitled "Federal Transportation Policy: The SST Again."

This report is based on hearings held before the subcommittee in December 1972. The hearings and this report are part of the subcommittee's continuing study of Federal transportation policy. Through this study the subcommittee attempts to contribute to the analysis of priorities and possible economies in the transportation field.

I express the appreciation of the subcommittee to the experts, American and foreign, who appeared as witnesses.

Sincerely,

WILLIAM PROXMIRE,
Chairman, Subcommittee on Priorities and Economy in Government.

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I. INTRODUCTION AND CONCLUSIONS

On March 24, 1971, after extensive debate, the Senate voted to discontinue Federal funding for construction of the American supersonic transport (SST). The funding was refused for a variety of reasons. The important ones included (1) the SST's possible deleterious effects on radiation levels and climate on earth through its engine emissions in the stratosphere; (2) its excessive airport noise and sonic boom; (3) its dubious prospects of commercial success; and (4) questions about the propriety of devoting such large sums of public money—even as a loan—to a project that would benefit such a small fraction of the people. At the time of the decision to terminate SST development, about $1 billion had been spent on design and mockup work.

Since the cutoff of the development program, research bearing on the SST has continued at a much reduced but still substantial level of expenditure. This research, for which $42 million are requested in the President's 1974 budget, aims to clarify the effects of stratospheric emissions and to develop improved aeronautic and engine technology. The past 2 years, moreover, have been very important for the Anglo-French Concorde—the SST's main competitor—for which tests and production proceeded after the interruption of the U.S. effort. The Concorde now has demonstrated its technical performance, but firm airline orders have failed to materialize, apparently because of the plane's high acquisition and operating costs, its limited range-payload capability, and doubts that it can meet eventual noise suppression standards. The sales effort now has run into serious difficulty with the cancellation of purchase options by several major airlines. To date, only nine firm orders have been placed for the Concorde. About the Soviet supersonic airliner little more is known that was known 2 years ago, but no orders for it are known to have been placed from outside of Russia.

During the autumn of 1972, several press reports referred to intentions of the President of the United States to revive the proposal for federally funded development and possibly even production of an American SST. In addition, a proposal to establish a Federal loan fund or loan guarantee program to support commercial aircraft manufacturing in general has received increasing notice, most recently in the report of the President's Aviation Advisory Commission, issued on January 1, 1973.[1]

[1] For full citation and further discussion of this proposal, see pp. 9 and 10.

NOTES

Senator John Sparkman states: "Because I was not present at any of the hearings leading to this Report, I do not think that I should join in it."

Senator James B. Pearson states: "Due to the pressure of other responsibilities I was unable to participate in the hearings and deliberations preceding this Report and therefore reserve judgment on its specific recommendations."

Senator Richard S. Schweiker states: "Since I was not a member of the Subcommittee in December 1972, when the Subcommittee SST hearings were held, I reserve judgment on the conclusions and recommendations contained in this Report."

Against this background, the Subcommittee on Priorities and Economy in Government of the Joint Economic Committee conducted hearings on the supersonic transport on December 27 and 28 of last year as part of its continuing examination of Federal transportation policy. These hearings were held to review the conclusions on this subject reached over 2 years ago [2] and to bring Congress and the public up to date on recent developments bearing on these issues. The refusal of the invited officials of the Department of Transportation and the Civil Aeronautics Board to testify or send representatives hampered the subcommittee's inquiry into the results of publicly funded research and into the future plans and priorities of these agencies in civil aviation. Unfortunately, the invited representatives of the airlines and aircraft manufacturers also declined to appear, one of them stating that "there is nothing we could add to the views of the Department of Transportation and NASA." The testimony was limited, therefore, to that of independent specialists on various aspects of supersonic aviation and to public interest spokesmen. Nonetheless, the commercial and environmental issues and Federal budgetary questions were incisively discussed.

The subcommittee's findings, based on these hearings, bear out its previous conclusions. Our present conclusions may be outlined as follows:

1. An American supersonic airliner should not be developed until its commercial prospects—under adequate environmental safeguards—enable it to attract private funding without Government subsidy; technical progress may permit these conditions to be fulfilled in due time.

2. The present Anglo-French Concorde poses no credible threat to American prominence in civil aircraft manufacturing nor to a significant number of American jobs or exports, because in all likelihood only a very limited number of copies will be sold; this is consistent with the subcommittee's conclusion of August 1970.[3] Nor can the Soviet supersonic aircraft be considered a significant factor at this time.

3. The argument for Federal funding for the SST to support domestic employment and the balance of payments in general is without justification. While employment and trade are important public issues, they are to be addressed using broader and more suitable policy measures.

4. Without further delay, the Federal Aviation Administration should prohibit sonic booms by civil aircraft over U.S. territory; supersonic airliners should be required to meet the noise and emission standards now imposed on subsonic planes.[4]

5. Despite the reported view of a White House technical consultant that we may be 95 percent certain that high alti-

[2] See "Federal Transportation Expenditure: Report of the Subcommittee on Economy in Government of the Joint Economic Committee" (Washington, Government Printing Office, 1970), Part IV, "The Supersonic Transport Development Program," pp. 15–23; also the separate views of Representative Clarence J. Brown, pp. 24–28.

[3] *Ibid.*, p. 17.

[4] See note on p. 7 concerning the reservations of Representative Barber B. Conable about this conclusion.

tude flight will have no deleterious effects on the earth's climate, there remains a significant likelihood that a fleet of SST's flying at stratospheric altitudes would subject the earth to dangerously increased radiation through depleting the ozone shield; any judgment on the extent of this danger must await at least the completion of the Climatic Impact Assessment Project in late 1974.[4] The subcommittee notes testimony that a quiet engine virtually free of nitrous oxide emissions may be developed in the future.

6. Any proposal to renew Federal funding for the SST at present is incongruous with the drastic budget cuts now being sought in other high-priority areas such as housing, manpower training and water pollution control. No action to finance civil aircraft development in general through public loans or guarantees should be permitted to become a disguised authorization for the SST. Indeed, the well-known difficulty in controlling costs and assuring quality in military procurement and in other Government-financed and/or Government-managed programs in advanced technology (witness Concorde) should make us exceedingly wary about institutionalizing these procedures in the U.S. civil aircraft industry or any other civil sector. Proposals to do so raise various more general questions to which the subcommittee intends to return in later hearings.

7. The development of supersonic planes with their voracious appetite for fuel (i.e. two to three times as much fuel per seat-mile as for wide-bodied subsonics) seems inconsistent with our need to conserve energy.

In sum, it appears that the weight of argument on all fronts has shifted against rather than for Federal support of the SST since the Senate rejected the program in 1971.

Finally, the subcommittee must deplore the lack of cooperation by the executive branch in conducting its inquiry and reaching valid conclusions on these issues.

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II. COMMERCIAL CONSIDERATIONS

In the commercial sphere, two related developments are taking place that bear directly on any proposal to reenter the SST race. One is the flagging effort to market the Anglo-French Concorde and the Soviet TU–144, which raises the question whether there are any serious competitors in the race. The other is the apparent trend toward markedly lower subsonic fares and more charter and shuttle-type service which increases the cost disadvantage of the supersonic planes.

One main argument by those in favor of building a Government-subsidized American SST, in spite of doubts about its efficacy, is the proposition that a Government subsidized Concorde or TU–144 otherwise would capture a large part of the market for civil aircraft that has long been supplied by American manufacturers, with the concomitant loss of American jobs, exports, and technical prowess and prestige. In its 1970 report the subcommittee concluded that this supposed threat was exaggerated. It now appears that our conclusion was justified.

Far from obtaining many more orders after the cancellation of the American program, the Concorde's sponsors won only five more provisional orders (from China and Iran) while some 18 options were canceled (by United Airlines, Pan-American, and Air Canada). Thus the number of options declined on net, and there is very strong evidence that several, if not most, of the remaining 50 options will be allowed to lapse. Probably no airline will exercise all its options, and many lines will exercise none. Meanwhile, firm orders for only nine planes have been placed, and these were obtained from the national airlines of the manufacturing countries only after lengthy negotiations that apparently resulted in subsidized terms. As a knowledgeable British witness stated before the subcommittee:

> The current hope in the responsible Government department in London—and I am speaking of its optimists—is that 35 Concordes will be sold.

For an aircraft with development costs now approximating $2.5 billion and production costs yet to be revealed, this would be a very disappointing result.

The reasons for buyer skepticism toward the Concorde seem to be manifold—its $45–$50 million price tag is over twice the cost of a 747; its seating capacity of 108 to 120 seats is less than one-third the capacity of a jumbo jet; its range of 3,000 to 3,500 miles is much shorter than that of present jets; its noise level of 115 decibels is much higher than the maximum permitted for new subsonics; its fuel consumption is expected to be two to three times as high per seat-mile as current usage. Various financing and leasing arrangements are being considered to make the acquisition price more manageable for the airlines. The long-run prospect of increasing fuel prices, however, renders its already unfavorable operating economics still less attractive, and apprehension about future noise regulations also helps to deter airline

commitments. Noise suppression equipment aggravates the airplane's already poor range and carrying capacity.

Even if a second-generation Concorde is developed at some future date, it would be limited to the present Mach 2 speed by the aluminum exterior of the aircraft. Thus a boost in the seat-mile productivity through greater speed is ruled out *a priori* barring conversion to a new material, which would involve massive new technical problems. The present engine apparently is not adaptable for a "stretched" Concorde, which would mean that improvement in seat-mile operating economics through enlarging the plane would involve the costly designing of a new engine in addition to a major reworking of the airframe. In short, any second-generation Concorde would involve large new outlays by the two sponsoring Governments which already have watched the development costs of the first-generation plane increase by a full sixfold. In this connection, the witness quoted above stated further:

> I hope nobody is taken in by talk of an improved Mark II Concorde. Not a penny of expenditure has been authorized for such a plane; and after the experience of the Mark I Concorde, no British (or, I think, French) Government is going to sanction the vast sum needed for a major redesign.

Thus the Concorde appears to commercial failure. More than a failure, this plane that was often alleged to end American dominance of civil aircraft manufacturing has debilitated the aerospace industries of our two main overseas competitors by devouring resources that might have been used to develop more viable products and has discredited these industries in the eyes of the suppliers of future financing, including the British and French taxpayers.

This outcome is ironic because, in the words of the witness referred to above:

> If it had been an ordinary commercial venture, it would have been cancelled long ago. But, of course, it is not a commercial venture. It is a political one.

As such, the Concorde testifies to the consequences of political interference in commercial decisions that we ourselves will disregard only at our peril.

The prospects of the Soviet TU–144 still remain in doubt for lack of any concrete data on its performance. The plane is much like the Concorde in size, general design and external materials. No orders from outside the Soviet Union are known to exist, even though the plane is now flying, and it is hard in the absence of such orders to conceive of the TU–144 as a serious commercial factor at this time. Although it may be premature to write off the TU–144 altogether, it certainly provides no basis for relaunching an American SST.

A current development that renders increasingly dubious the commercial prospects of any supersonic airliner—including an American SST—is the continuing decline in the average fares paid by passengers on the heavily traveled North Atlantic sector. It has long been clear that the advent of the "jumbo" jets, if successful, would lower seat-mile costs and bring strong pressures for lower fares through the bargaining power of the airlines serving the high-density routes. The concurrence of economic recession with deliveries of the jumbo planes

in the early 1970's has intensified the pressure for lower fares to the price-elastic tourist market as part of an effort to fill up empty seats. Moreover, the continuing encroachment of charters and the proposal of shuttle-type services now threatens the dominant role of traditional scheduled service on the Atlantic and appears to be driving the airlines toward a new service standard with much higher rates of seat occupancy and markedly lower fares. The subcommittee has noted with interest that the outgoing Chairman of the Civil Aeronautics Board is reported to have suggested future moves to meet public demand by expanding such low-fare, mass travel services even if it means that the amount of scheduled service would be constricted.[1] Presumably what happens on the North Atlantic also may occur in other sectors as the traffic there becomes increasingly heavy.

While the subcommittee tends to support this development of air fares and seat-occupancy rates in the interest of economical transportation and of making the best use of existing aircraft and fuel resources, the percentage surcharge above subsonic fares that would have to be assessed for supersonic service becomes greater with every step in this direction. Whether the response in supersonic service to this development in subsonic fares comes mainly in the form of higher surcharges at traditional load factors or of higher load factors in supersonic planes, the number of Concordes or SST's needed to serve the resulting supersonic traffic would be smaller than previously estimated and their unit production cost would rise. Be that as it may, there is certainly no public-interest justification for any attempt to sustain higher subsonic fares in the interest of the competitive potential of the supersonics.

In conclusion, it appears from all the indications that supersonic service will arrive only to a very limited extent in this decade, and that its onset as an important factor in world aviation and aircraft manufacturing must await solutions not yet foreseen for major economic and technical problems.

[1] Speech by Secor D. Browne to the Royal Aeronautical Society of London on Dec. 7, 1972, reported in the New York Times of the same date, p. 93.

III. ENVIRONMENTAL CONSIDERATIONS

Among the issues playing important roles in past debate on supersonic aviation are those of airport smoke and noise, sonic boom, and the allegedly possible climatic effect of aviation at stratospheric altitudes. The first two questions are technically well understood and now require policy action. The last one still is in the research stage.

Despite the fact that rules governing airport noise have been applied to subsonic planes, there are no present U.S. restrictions applying to supersonic aircraft covering either this nuisance or the sonic boom. The promulgation of FAA rules on these subjects has been pending for several years, and action to legislate such rules, taken by the Senate with a large majority during the 92d Congress, was not sustained in the Noise Control Act of 1972 as finally enacted. It now appears that a ruling against the sonic boom will be issued by the FAA shortly. **It is the view of the subcommittee that future supersonic airliners also should be required in principle to meet the noise and emission standards now imposed on subsonic planes.** The benefits of speed for the few supersonic passengers hardly justifies inflicting substantial discomfort on the public at large.

While the subcommittee does not presume to propose the exact terms of U.S. policy toward the Concorde at this time on the basis of the recent hearings, it recommends that such a policy be based on the following guidelines:

1. Prohibition of sonic booms by civil aircraft over U.S. territory. This rule should be promulgated by FAA without further delay.

2. Understanding at the time of any certification of Concorde that modifications of the plane designed to capture a larger market through improved economics also must include modifications to meet the environmental protection standards now applied to subsonics. The noise rules may require a redesign of the engine.

It must be recognized that any loopholes left open for the Concorde presumably also could be exploited by the Soviet TU–144.

The remaining issue which may override all others in the end is the possibility that SST engine emissions—particularly nitrous oxides—will generate increases in ultraviolet radiation. Nitrous oxides are alleged to take part in a chemical reaction that depletes the stratospheric ozone that filters out such radiation. Research to illuminate this question—the so-called "Climatic Impact Assessment Program" (CIAP)—is currently in progress under sponsorship of the Department of Transportation.

NOTE.—Representative Barber B. Conable, Jr., states: "Although I am in general agreement with the *economic* conclusions regarding the SST contained in this Report, I cannot understand what qualifications the Joint Economic Committee has for reaching the various *environmental* conclusions included in this section."

It is clear from testimony before the subcommittee that a balance exists between the *natural* creation and destruction of ozone in the stratosphere, including destruction by naturally occurring nitrous oxides. It appears that the artificial injection of additional nitrous oxides into the stratosphere indeed depletes the ozone level (contrary to recent erroneous findings [1]) and permits undesirable ultraviolet radiation to reach the earth. Nitric oxide is a much more potent catalyst in destroying ozone than is water vapor which has been the focus of attention heretofore. Considerable uncertainty exists, however, about the *rate* of ozone destruction by nitrous oxides, the rate of emissions of nitrous oxides from supersonic transports, and the severity of any given stratospheric effect on life here on earth.

This last question is the subject of a new report by an *ad hoc* panel of the National Academy of Sciences, which takes a very serious view of the danger of ozone depletion to life on earth.[2] This report concludes in part:

> * * * it has been calculated that a 5-percent decline in ozone would produce at least 8,000 extra cases of skin carcinomas (cancer) and melanomas per year in * * * the United States.
>
> * * * ultraviolet radiation is clearly detrimental to a wide variety of plant species * * *. Agricultural species are among the plants most sensitive to ultraviolet radiation.
>
> Sufficient knowledge is at hand to warrant utmost concern over the possible detrimental effects on our environment by the operation of large numbers of supersonic aircraft.[3]

It is the task of the CIAP project to elucidate the remaining unknowns authoritatively. Some answers may be available by the end of 1974. The subcommittee was informed that it may be possible in the future to design a supersonic aircraft engine that cuts nitrous oxide emissions greatly without major loss of efficiency.

In any event, the possibility of deleterious climatic effects on earth stemming from high altitude flight remains a significant uncertainty that must be satisfactorily resolved before the initiation of any further supersonic transport development.

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[1] See Aviation Week and Space Technology, Nov. 6, 1972, pp. 28–29.

[2] National Academy of Sciences/National Academy of Engineering, "Biological Impacts of Increased Intensities of Solar Ultraviolet Radiation," Washington, 1973.

[3] *Ibid.*, pp. 5–8.

IV. ACCORD WITH NATIONAL PRIORITIES

Any proposal to reinitiate Federal funding for development and/or production of a supersonic transport must be viewed in the context of the severe constraints facing the Federal budget over the next several years. If Congress and the President are to fund the Government's standing obligations without undue tax increases, then spending must be rigorously restrained, and we already see the consequences of the restraint in the form of cuts in existing programs.

The SST question, therefore, must be posed in the form: can we afford Government financing for a luxury commercial airliner when our outlays in such priority areas as housing, health services, education and labor training are being slashed for budgetary reasons? Does it make sense to sponsor this airplane when we are told that we cannot afford the expenditures necessary for adequate urban transportation and clean water? To this subcommittee, the answer to these questions of national priorities seems to be a resounding NO!

The subcommittee also has noted the proposal put forward by the Chairman of the Civil Aeronautics Board, Secor Browne, to legislate much broader authority to guarantee loans to finance production of "new and improved major civil aircraft and aircraft engines essential to the national economy * * *." This sort of plan has gotten its latest boost in the recent report of the President's Aviation Advisory Commission which proposes to "reduce the risk" of aircraft manufacturing through Government supervised design competition leading to selection of a single manufacturer for the production phase of each aircraft type; and furthermore, to "provide some measure of Federal finance" when the elimination of competition from other U.S. manufacturers is not sufficient to induce private funding for production, in order to "transfer the technical and market risks of the aircraft from those unable to bear them to the Government." [1]

Proposals of this nature deserve very critical scrutiny. This is true not only because of their implications for the Federal budget, which might be small at the beginning, but as a major step in the gradual progression that we are witnessing from the confinement of Government participation in commercial fields to basic research toward its extension into ever more advanced levels of development and now to production. These trends are seen not just in civil aviation, but also in electric power generation, ground transport, and other complex engineering fields.

While not wishing to take a position on this major issue at this time, the subcommittee points out that such generalized authority to finance or guarantee loans to the aircraft manufacturers should not be permitted to become a disguised authorization for the SST, unless Congress wishes to reverse its explicit judgment to deny Federal funding for that plane. Moreover, many questions deserve intensive

[1] "The Long Range Needs of Aviation: Report of the Aviation Advisory Commission," Jan. 1, 1973, pp. IV-70 to IV-73.

study before such proposals are considered. Among these questions are the following:

1. It is a foregone conclusion that aircraft development and production costs will continue to rise ahead of general inflation, or may we expect some stabilization or decline of aircraft size and relative costs, at least in the subsonic realm?

2. Is it reasonable to consider the American aircraft industry to be distressed when it supplies over 70 percent of the world's commercial airplanes; is Government financing and regulation of competition necessary to maintain the U.S. manufacturers in this industry, which is serving a world aviation market that doubles every 7 or 8 years in passenger miles served?

3. Should we not be exceedingly circumspect about injecting Government management and risk bearing into aircraft manufacturing in view of the dubious efficacy of these procedures in the SST and Concorde programs, not to mention the difficulties encountered with these procedures in military procurement?

4. How can we justify a Federal lending or guarantee authority that is not open to all qualifying industries, including computers, shipbuilding, and natural resources development, all of which have similarly high setup costs, long lead times, and intensive foreign competition?

Turning to one final aspect of national priorities relating to the SST, authorities seem to agree that supersonic speed using present technique requires a prodigal rate of consumption of fuel, for which we now foresee long-term scarcity and rising prices. It was estimated by one witness that the Concorde would burn over three times the fuel per passenger-mile as the efficient wide-body subsonics only to achieve extra speed. Another witness testified that the American SST would consume it nearly three times as fast to achieve its even greater speed, and that the fleet of 500 Boeing SST's once predicted to be flying by 1990 would burn the equivalent of the maximum output of aviation fuel from a vast oil strike such as the Alaskan Prudhoe Bay field (say, 12 billion barrels of crude) in a mere 3 or 4 years. In view of the apparent need to conserve energy, the question may earnestly be posed whether this rate of use is conscionable in the interest of increasing speed above current levels. In view of the expected radical rise in fuel prices, one may inquire further whether the sales prospects for such a plane need to be fundamentally revised.

SEPARATE VIEWS OF REPRESENTATIVE CLARENCE J. BROWN

Although I have taken the opportunity over the past 2 years to object, almost ad-nauseam, to the practice initiated by the former chairman of the committee, Senator Proxmire, of holding committee hearings at ridiculous times, I cannot let this opportunity pass me by to object one more time. To claim, as this document necessarily does, that the findings espoused in the "majority" report represent anything more than the views of Chairman Proxmire and certain members of the majority staff makes a ridicule of the work-product of the Joint Economic Committee. The fact that the hearings upon which the majority report is based were held on December 27 and 28 speaks adequately to the point.

Approximately 18 months ago the same subcommittee issued a similar report panning the SST. At that time I took the opportunity to file separate views in the hope of shedding some light on what I considered to be an otherwise dimly perceived subject. Having reread those views now, I find for the most part that they still adequately address the subcommittee's rehash of the August 17, 1970, report. It will therefore suffice, with a few preliminary comments, to reprint my earlier expressed views in response to the same old conclusions of the majority report.

Much is made by the majority of the difficulties faced by the Anglo-French Concorde following recent purchase order cancellations. The inference that the majority report would seem to draw from this experience is that similar problems would have faced a domestic SST had we proceeded with production some years ago. The fact that the Concorde and the proposed American SST were quite different in such matters as structural materials, configuration, size, passenger capacity, speed and range is, of course, conveniently forgotten. The fact that the American proposal was far superior to its European counterpart in each of these areas and therefore immensely more attractive in an economic sense to the airline industry is overlooked. Similar logic, if applied to the Ford Mustang because of the Edsel would have ended progress in the automobile business long ago. A majority report would have undoubtedly concluded that because the Edsel as a new design concept was a dismal economic failure, so too would be the Mustang. The many differences in design and the resulting difference in the size of the market to which they appealed would have been counted of little consequence by the bright economists of the Joint Economic Committee. Ford stockholders can be thankful the Joint Economic Committee does not make their company's marketing decisions for them.

NOTE.—Representative Ben B. Blackburn states: "Although I was not a member of the Subcommittee when the hearings upon which this Report is based were held, and therefore am not submitting views at this time, I am in general agreement with the Separate Views submitted by Representative Brown."

Also overlooked by the majority in calculating the costs and/or savings involved in the shooting down of the American SST were the rather significant social and economic costs which befell the city of Seattle. The financial underpinning of an entire area, not to mention the individual and collective spirit of a significant American industry, was damaged with almost cavalier disregard by the Senate action of March 24, 1971. It would be interesting (but totally out of character) if the committee would investigate the cost of this rather significant economic insult with the same fervor with which it induced it.

Lastly, I am compelled to note the slim wisdom involved in our committee's effort to make environmental judgments on the SST without the benefit of full research or a viable prototype. Having had a significant hand in killing the effort to build the test model, the committee's further effort at speculative criticism of possible dangers, never definitively established, strikes me as a cheap shot—and a waste of time, money, and passion.

As noted earlier, a more extended statement of my personal position on the American SST issue is found in my separate views appended to the JEC Subcommittee on Economy in Government report of August 17, 1970, entitled "Federal Transportation Exenditures." For convenience they are printed again below. Nothing which has been developed since on the SST persuades me to change those views.

[Reprinted from "Federal Transportation Expenditures," report of the Subcommittee on Economy in Government, Joint Economic Committee, 91st Congress, second session, Aug. 17, 1970.]

"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 postion 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."

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