Chapter VIII

SUPERSONIC TRANSPORTATION AND SOCIETY

It is clear that advancements in transportation technology, such as the development of viable supersonic flight, would have an impact that alters the world we live in. It is possible to have a clear sense of the tangible ways in which technology changes the human environment, But at the same time, it can be very difficult to foresee exactly what a projected technological development will demand in the way of specific accommodations in the status quo.

The more specific the technological development we are considering, the more general or speculative attempts at prediction become. The impact of the advent of advanced high-speed aircraft will be felt in the area of long-range, and especially international, travel. Advanced high-speed aircraft would not appear to offer a dramatic change in the character of patterns of international travel, but it would seem to offer the opportunity for an increase in the scale of travel.

However, this potential for enhanced transportation is proceeding at the same time as revolutionary improvements of all sorts in communications capabilities. It is conceivable that progress in the communications area could allow the replacement of some amount of travel by rapid and sophisticated communications; however, as discussed below, it is often noted that increases in the quality and quantity of communications tend to be accompanied by similar increases in transportation. Assessing and projecting the effects of the mutual interactions of improving transportation and improving communications are very difficult tasks, and perhaps impossible.

IMPACT OF INCREASED LONG-DISTANCE TRAVEL

Underlying the assumption that an advanced supersonic aircraft would be economically feasible is the assumption that there would be a ridership for an aircraft that could fly basically international flights at very high speeds (see ch. III). The analysis here has not considered the amount of new travel induced by the higher speed service, especially offered by an advanced supersonic transport (AST) (see ch. IV). However, past experience suggests that most new transportation systems do in fact create a certain amount of new travel. A continuation in the rise of general real incomes and hence of discretionary incomes would tend to reinforce an increase in air travel.

The late anthropologist, Margaret Mead, suggested that mankind is just now on the verge of a new consciousness of air as the ordinary medium for transportation: “We have only begun to think in air terms instead of land and sea terms. The air sets up a new set of possibilities for human development, but also a new set of challenges.” She writes, “It is a framework within which the people of the world who have fought each other for land rights and water rights must now cooperate or perish. ” Indeed, at least four major trends can be conjectured that roughly follow from this recognition.

The first is global cultural and linguistic homogenization, Habits and practices are transmitted across borders by both business and tourist travel. Xenophobia is likely, in general, to recede. This trend is likely to be turbulent and not universal. The portent of change can be the precipitator of resistance—witness the recent events in Iran. But in the longer run, the general direction seems more likely to be toward softening rather than hardening of differences.

The second phenomenon is the slow strengthening of supranational cooperative organizations. Increasing travel brings increasing awareness of common interests and mutual impacts. An example was the impact of nuclear testing in

an atmosphere that the whole world shares. As the awareness of need for supranational organizations grows, so will their likelihood. It is relevant that the strata of society most likely to understand these issues, and most likely to be in a position to take an activist role in their establishment, are also most likely to be the people who do the traveling.

The third is a growing economic interdependence. This is really a subset of the trends addressed above, restricted to the sphere of the private sector and economic organization. Strengthening of the trend toward multinational companies should improve the efficiency of global resource usage.

The fourth is a further strengthening of the position of the large cities in the world's social and economic geographical hierarchy. The links in travel will be large cities. Given an AST, Tokyo and San Francisco will be closer in time than Bakersfield, Calif., and Eugene, Ore. As Margaret Mead has said, "The ports of the future will be air cities, not coastal cities or railroad centers. "

COMMUNICATIONS AND TRANSPORTATION

The communications field is undergoing a revolution with the application of advances in electronics to the transmission of information. It will be easier in the future to transmit more data, more voices, and more picture information and, in addition, it will become easier to set up more versatile combinations of these forms of communication (through holography, for instance) and thus extend telecommunications capabilities into new uses. It is anticipated that these innovations will take place at costs that, sooner or later, will make them quite attractive. Many of the anticipated developments in communications will have an immediate bearing on the continuing practicability of local and short-range transportation, but they also can help establish a framework in which the interactions of communications and long-distance travel can be considered.

The way the issue of the interaction of communications developments and transportation is typically framed is in terms of better communications either substituting for certain kinds of travel or stimulating travel. It is possible to conjure long lists of ways in which communications technology can serve both functions, but lists will not really **analyze** the problem. Developments in data communications and "electronic correspondence" may, in conception, allow the elimination of instances in which material or people are physically transported from office to office, from office to bank, or even from home to office. The development most relevant to long-distance travel is in teleconferencing technology. AT&T's picturephone meeting service is a step in this direction, although it currently still operates only out of a small number of large American cities and requires that conferees travel to a special center for the long-distance audiovisual encounter. One report states that although "there could be some impact on air transport, replacing business trips with audiovisual transmission, " such teleconferencing "may as often stimulate as replace or supplement the need for travel. " It is noted that in most organizations that use teleconferencing no diminution of overall travel budget has taken place: travel money has been reallocated for purposes other than for travel to and from meetings. [1]

Other evidence suggests that, although communications innovations may eliminate the need for certain kinds of trips at least in theory, such innovations will not have the overall effect of reducing time and money spent on travel. For one thing, evidence from past communications developments does not suggest that a communications breakthrough reduces travel. The introduction of neither the telephone nor the telegraph appears to have been followed by a discernible reduction in travel. In a more recent instance, we do not tend to think of satellite communications as having reduced contemporary

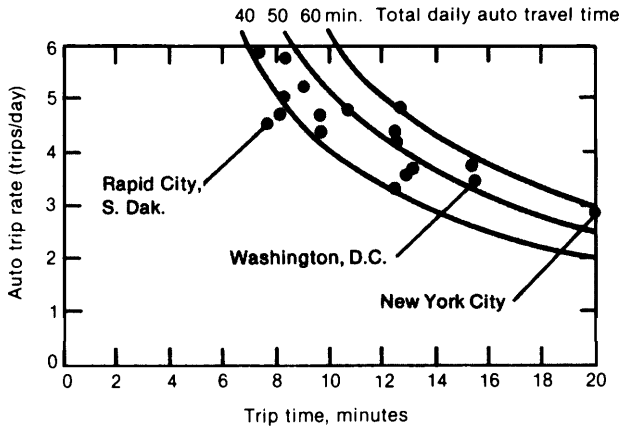
[1] "'National Transportation Policies Through the Year 2000," *National Transportation Policy Study Commission*, Final Report, June 1979.

reasons or opportunities for travel, although no empirical work can be elicited to show this.

In fact, there is a fair amount of evidence that the average time people spend in daily travel has remained essentially constant as far back in history as clues can be obtained. For the past century, more systematic data bears out that average travel time per person per day has remained roughly the same. This is rather remarkable, considering that during this century the telephone was invented and proliferated and the physical character of cities has changed from relatively dense developments where people depended largely on walking to extended areas crisscrossed by highways.

One would think that in small cities, where the average travel time to work is shorter than in large cities, the total travel time per person would be much less than in large cities. However, this does not seem to be the case; people seem to compensate for short commutation with more noncommuting travel. Figure 17 shows some data on auto trips that illustrate this point. Eighteen cities ranging from New York with 16 million area residents to Rapid City, S. Dak., with 73,000 are identified. It would appear that in smaller cities in which shorter distances shrink the average trip, people use the time saved to make more trips. *

Figure 17.—Average Auto Trip Rate v. Trip Time



SOURCE. Vacov Zahavi, *Traveltime Budgets and Mobility in Urban Areas,* May 1974.

*If this effect could be transferred to the market associated with supersonic travel, one would expect that the AST would increase the travel market on account of the timesaving of higher speed travel.

Commuter parking at airports

Photo credits Environmental Protection Agency

Passengers waiting at airport terminals

THE FUTURE ENVIRONMENT

One approach to future projections is to implicitly assume that the world of the next 30 to 50 years will contain no long-term deviations from past trends. In Dr. Herman Kahn's expression, it is the "surprise-free scenario, " at least the "big surprise-free scenario. " Given our cur-

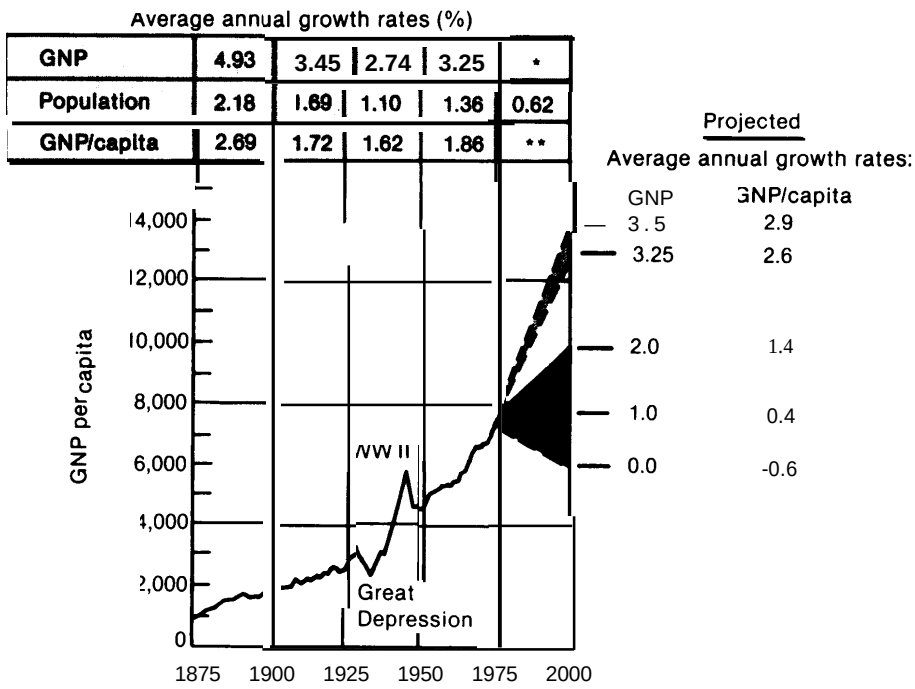
rent concerns over the shortage of petroleum, is it reasonable to assume that we will somehow cope with the energy problem, possibly by providing substitutes, albeit at higher costs, that national economies will continue to expand, albeit slowly, and that world order will remain largely intact? These are necessary assumptions for growth in the air system. If these assumptions fail, the issues addressed in this assessment are moot.

Historical precedent supports the reasonableness of these assumptions. The economic system of the world and the Nation has shown a remarkable ability to weather many other crises that in the context of a quarter-century could be considered short-term. Figure 18 shows a 100-year history of economic and population trends for the United States. Under any economic growth rate that reasonably approximates past trends, we will be a more affluent nation by the end of the century. At the right of figure **18** are five hypothetical annual growth rates that show alternative outcomes in gross national product (GNP) per capita for the next 25 years. The total wealth should increase: at 2-percent annual growth in GNP, the Nation would generate **$48** trillion in GNP (1975 dollars) between the years 1975 and 2000, compared to the $27 trillion between 1950 and 1975. At a 3-percent growth, the figure would be nearly $55 trillion. Whatever the growth in population, it should not be a drag on GNP because the labor force is expected to increase more rapidly than the population as shown.

Whatever happens in this country is likely to approximate generally the economic well-being in other advanced nations of the world as the United States has become intertwined in the world economy.

Obviously, the future is uncertain. In the context of the issues of this technology assessment, it seems that the most useful assumption about the nature of evolving high-speed air transport is not cataclysmic or revolutionary, but is generally a broad continuation of the trends of the last two centuries.

Figure 18.—Long-Term Economic Trends (1975 dollars)



SOURCE: "Toward 2000: Opportunities in Transportation Evolution," report No DOT-TST-77-19, March 1977.