TELECOMMUNICATION AND FUTURE DEMAND FOR AIR TRAVEL

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INTRODUCTION

About 25 years ago, when I was a budding economist looking for a job, I had an interview for a position at the Office of Telecommunication Policy — a part of some government agency, the name of which I have forgotten or perhaps never knew. At one point the interviewer expressed the opinion that telecommunication would lead to the annihilation of transportation. I did not get the job, but that remark set me to thinking. Could it really be true?

Mulling this over, I recalled reading that about the time in the late 19th century when the telephone was beginning to spread around the world, a number of pundits said that the telephone would be the end of cities. People would stay home and conduct all their business and personal affairs by telephone. Reality, of course, proved to be just the opposite. The telephone facilitated and encouraged communication and therefore stimulated travel. Talking to someone by telephone led to going to see them in person.

There is no doubt that communication and transportation go hand in hand and that new forms of technology are constantly evolving and replacing the existing ways of traveling and conveying information. This is the essence of innovation and technological progress.

Professor William Garrison of the University of California at Berkeley has drawn up a remarkable chart that describes the evolution of transportation in general terms. Arrayed along a horizontal axis of time from 1800 to the present is a series of giant S-curves that trace various modes of transportation through a cycle of invention, introduction, rapid growth, maturity, and then decline. Post roads, canals, railroads, steamships, highways, and aviation march across time — each rising to domination and then giving way to a successor. There is a logic to this sequence. As one dies, the next is born; the new replaces the old.

I have some reservation about this cyclical interpretation of history. Modes of transportation do not always die completely. Some do, but most simply sink to some lower and essentially stable level and find a niche where they can survive. Canals and railroads still exist and provide valuable transportation services, albeit substantially less than when they were in their heyday. But setting this aside, Garrison's chart does pose a question about the future of aviation in the face of the meteoric rise of telecommunication technology. Will telecommunication diminish air travel and do harm to the airline industry?

SUBSTITUTION OF TELECOMMUNICATION FOR AIR TRAVEL

The relationship between communication and personal travel is symbiotic. They are linked, and each feeds on the other. Almost everyone here at this conference today came as a result of a telephone call or a fax; and all made use of some form of transportation (auto, rail, or air) to reach this assembly.

Economists look upon this as a matter of substitution and stimulation. With respect to substitution, the question is whether telecommunication leads people to eliminate or defer trips. Stimulation is the inverse effect: whether telecommunication (be it by telephone, teleconferencing, or interaction on the Internet) leads to more face-to-face communication. The discussion that follows focuses on substitution. It is somewhat easier to analyze and quantify, and it bears directly on the matter of greatest concern to this audience. Will telecommunication adversely affect air travel demand?

Substitution can be examined in two ways. What is the nature of the impact, and on whom does it fall? More specifically, what segments of the air travel market could be diminished or supplanted by telecommunication? It is also necessary to specify what kind of telecommunication are we talking about. Telecommunication is not a single amorphous technology. It has several different forms, each affecting aviation in particular ways and to various degrees. Moreover, the telecommunication market is rapidly changing. New products are being introduced, new applications are being found, performance is improving, and the costs of ownership and use are falling at a startling pace. What is true now may be radically different within a few years.

As a personal example, we had a difficult time in our company about seven years ago in deciding whether we should buy a fax machine. Now we have two and are

TABLE 1 AIR TRAVEL MARKETS

Leisure/Pleasure Travel	Business Travel
Vacation Personal	Group • Conventions • Seminar/Training • Other Transient • Sales • Consulting • Repair/Service • Government/Military • Stopover-in-Route • Other Business • Job Change

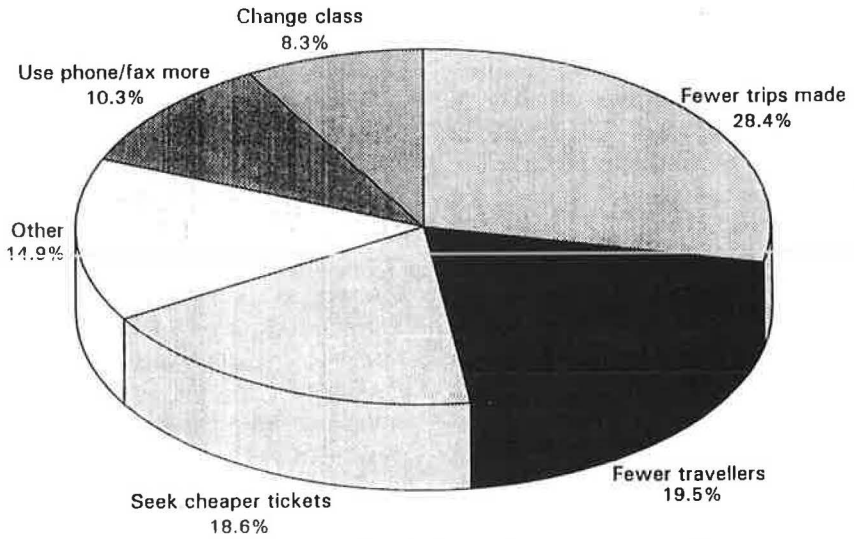

FIGURE 1 Impact of reduced budgets on business air travel.

thinking about a third. In a short time the question has gone from should we spend the money for a fax machine to how can we live without three.

AIR TRAVEL MARKETS

The air travel market is made up of two principal parts — personal and pleasure travel and business travel. At this time it is difficult to see how telecommunication could have much effect on the former, the purpose of which is to visit vacation sites, see family and friends, or carry out other activities that entail going to a location remote from home. (Vacation by virtual reality seems a dim prospect.) The principal effect on commercial aviation, if any, will be in the area of business travel. This market segment, which used to account for the majority of air travel has decreased to about 40 percent over the course of the past several years. Part of this is due to a lingering recession and a general tightening of business travel practices, but it is also due in large measure to a faster rise in travel for pleasure and personal reasons.

Business travelers give many different reason for air travel, but they can be put in two major categories — group travel and transient travel. Group travel involves

TABLE 2 TELECOMMUNICATION INDUSTRY TECHNOLOGICAL TRENDS

Technology	Potential Benefits	Potential Barriers/Disadvantages
Infrastructure		
Electronic Data Interchange	• Enhances responsiveness • Provides cost savings • Improves quality • Links buyer-supplier	• Lack of standards • Proprietary systems • Significant user training
Cordless/Cellular Telephony	• Mobile telephony • Easy expansion of users • Reduced inconvenience	• Higher equipment costs • Varying quality • Out-of-office communications difficult
Wireless and High-Speed Networks	• Faster data transmission • Facilitates real-time desktop videoconferencing	• High investment cost • Still in infancy stage
Information Highway	• High speed, multimedia data network providing universal access	• Requires huge investment • Still in planning stage
Applications		
Videoconferencing	• Interactive collaborations • Improved communications • Cost savings • Increased productivity • Fast response time • Document conferencing	• High cost/price • Poor quality of video • Inadequate compression • Faster connections needed • Few users supported • Lack of applications • Poor industry standards • Cultural hurdles expected
Video Mail	• Improved communications • Fast response time • Uses existing phone lines	• Similar to voice mail • Low productivity gains • Noninteractive
Telecommuting	• Increased flexibility • Cost savings • Increased mobility • Eased traffic congestion • Less pollution	• Uncertain productivity • Possible worker dissatisfaction • Not suited for all workers
Groupware	• Collaborative computing • Document conferencing	• Limited products • Limited achievement of goals

such things as going to a convention, attending a seminar or training session, or taking part in some other such gathering that involves many people. Transient travel involves one person (or perhaps a team of two or three) going somewhere to conduct a specific piece of business — making a sales call, installing or repairing something, providing some professional service, giving a speech, or having a job interview (Table 1). Both these types of business travel are roughly equal in size, and each could be affected by telecommunication.

TABLE 3 POTENTIAL USE OF EMERGING TECHNOLOGIES TO MEET BUSINESS TRAVEL NEEDS

Travel Categories	Technologies			
	Videoconferencing	Video Mail	Collaborative Computing	Telecommuting
GROUP MEETINGS				
Conventions	●	○	●	○
Seminar/Training	●	●	●	○
Others	⊙	⊙	●	⊙
TRANSIENT TRAVEL				
Sales	●	●	○	●
Consulting	●	○	●	●
Repair/Service	●	○	○	●
Government/Military	●	●	●	○
Stopover-In-Route	○	○	○	○
Other Business	⊙	⊙	⊙	⊙
Job Change	●	○	○	○

Key:	●	○	⊙
	Limited	None	Uncertain

CHANGES IN THE BUSINESS TRAVEL MARKET

A number of forces are at work in the business travel market. U.S. firms are adjusting to the demands of competing on a global scale in foreign markets over long distances. Cost is a major concern. Industries, organizations, and government agencies are restructuring and reducing personnel to become more efficient. Executives are becoming more price-sensitive and seeking ways to reduce travel costs, combine trips, and get things done for less money (Figure 1).

Businesses are also becoming more open to advanced technology and new ways of getting things done. Nowhere is this more evident than in the explosive growth of telecommunications. Virtually everyone in this audience depends on fax machines. In two years when we meet again, it seems likely that you will be equally familiar with (and dependent on) e-mail and the Internet. Probably more than half of you are already using these technologies to some extent.

CHANGES IN THE TELECOMMUNICATION INDUSTRY

The telecommunication industry, itself, is an a state of flux. New technologies are being introduced, and new uses of telecommunication devices (and combinations of such devices) are emerging. The interactions within the telecommunications industry and between the industry and its growing numbers of corporate and private users are such that it is difficult to foresee whether the net effect on air travel (especially business air travel) will be positive or negative and of what magnitude. Some sense of future directions and potential impacts can be obtained by looking at technological trends in the telecommunication industry and then by examining more closely those that seem most likely to affect business air travel demand.

Table 2 summarizes eight major areas of telecommunication technology. They can be grouped in two broad categories. One consists of those that facilitate the system and are, in a sense, the infrastructure that makes telecommunication possible — the basic core of things we have to have in order to do other things.

These other things fall in the second category — the applications we make of computers, communication devices, and information networks to conduct our business. It is here that we can find potential substitutions of telecommunication for air travel.

REPLACEMENTS FOR BUSINESS AIR TRAVEL

Table 3 lists four major kinds of telecommunication that could substitute for business air travel. Arrayed along the left of the matrix are various types of group and transient business air travel. Opposite these, in four columns, are estimates of the possible degree of substitution (limited, none, uncertain) within the next 10 years.

Videoconferencing and collaborative computing appear to have the strongest potential to replace air

TABLE 4 DEGREE OF SUBSTITUTION OF BUSINESS AIR TRAVEL WITH NEW TECHNOLOGIES (YEAR 2005)

Business Travel Category	Trip Substitution by New Technologies	
	Low Estimate	High Estimate
Group Meetings		
Conventions	0.2%	2.0%
Seminar/Training	5.0%	20.0%
Other Group Mtg.	1.0%	10.0%
Average	*2.1%*	*10.7%*
Transient Travel		
Sales	1.0%	5.0%
Consulting	1.0%	5.0%
Repair/Service	0.2%	2.0%
Govt./Military	0.5%	5.0%
Stopover-In-Route	0.0%	0.0%
Other Business	1.0%	10.0%
Job Change	10.0%	30.0%
Average	*2.0%*	*8.1%*
Business, Direct Average	**2.0%**	**8.9%**
Business, Weighted Average	**1.7%**	**10.8%**

Source: Apogee Research, Inc.

travel. Video mail and telecommuting are somewhat weaker; but they could have some impact, particularly in the area of transient travel. In no instance, however, are the estimated effects large enough to suggest major inroads into business air travel.

SUMMARY OF IMPACTS

Studies carried out by Apogee and others in the fields of aviation and telecommunication indicate that some substitution will occur over the next decade. Estimates range from 2 to 11 percent penetration of the business air travel market, and virtually none in the pleasure and personal travel market (Table 4). This would amount to replacement of somewhere between 1 and 4 percent of all air travel within the next decade.

To put these figures into perspective, diversion of 1 to 4 percent of business air travel to telecommunications over a period of 10 years is equivalent to about one year of normal secular growth in passenger enplanements. A substitution of this magnitude is scarcely big enough to notice and well within the error of estimate in most aviation forecasts. Certainly, it is no cause for alarm.

Note that only the substitution effect has been quantified. The extent to which telecommunication might stimulate air travel (business or personal) has not been taken into account. At this point any estimate of stimulation is only a guess. We do not know enough about what motivates people to travel and how this might change as telecommunication technology advances and becomes more widespread. It may be that the substitution and stimulation effects will cancel each other out and that the impact on air travel will be nil.