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AIRPORT GROUND TRANSPORTATION

PROBLEMS AND SOLUTIONS

AGTA/Caltrans

Conference Proceedings

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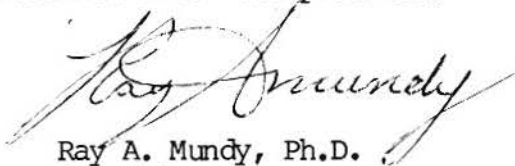
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FORWARD

These proceedings are the product of a joint effort between the Airport Ground Transportation Association and the California Department of Transportation. Contained within are the formal papers and presentation made at a three-day conference on airport ground transportation problems held in San Diego, California, February 23-25, 1981. This document is being disseminated in the hope that others facing similar airport access problems can also benefit from the exchange of information and ideas that transpired during the conference.

Acknowledgement is given to Messrs Fred Stewart and Mark Mispagel of the California Department of Transportation. Without Mr. Stewart's diligent effort in planning, implementing, and follow-through, the conference and these proceedings would not have been possible.

A handwritten signature in cursive script, appearing to read "Ray A. Mundy".

Ray A. Mundy, Ph.D.
Executive Director,
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REGULATORY ASPECTS

Editor's Note

Contrary to many other recently deregulated transportation modes, airport ground transportation is heavily regulated. If the passenger trip exceeds 25 miles in length and is across a state boundary, then the carrier needs a certificate of convenience and necessity from the Interstate Commerce Commission. Airport ground transportation trips within a state's borders are also typically regulated by the state's motor vehicle regulatory agency in the case of vans and buses and by local authorities in the case of taxicabs. In addition, the local airport authority, while not a regulatory agency, generally exercises regulatory-like power in its dealings with private ground transportation providers. In order to provide service at most airports, the transportation provider must either register with the airport officials, pay a fee and contract, or both if they are to be legally able to provide their services.

As will be shown, and also contrary to conventional wisdom, not all regulatory aspects are ill-conceived. Many are well founded and needed if a high level of customer service is to be developed and maintained. Many of our current problems occur when those unauthorized to provide service "break" into the system to steal passengers away from legitimate carriers. Much of the negative image current in airport ground transportation is due to these unauthorized or loosely authorized carriers that have no long-run interest in providing good quality airport ground transportation services.

Contained within this section on Regulatory Aspects are three presentations which further clarify these three levels of regulation a ground transportation provider must hurdle if he or she is to offer their services to the airline travelling public.

Mr. Yellowitz of the Interstate Commerce Commission provides the reader with an up-to-date review of the commission's regulation of both passenger and freight transportation incidental to air traffic. Mr. Well then explains how one state, California, perceives its role in the regulation of airport ground transportation and how he favors an "active" role for the state in developing improved ground transportation services at their airports. Finally, Mr. Bob Davidson of the Los Angeles Department of Airports comments on the pros and cons of exclusive airport ground transportation arrangements.

WELCOME AND PRELIMINARY CHARGE TO CONFERENCE

Mr. Mark Mispagel
Chief, Division of Aeronautics
California Department of Transportation
Sacramento, California

Good morning; welcome to San Diego. On behalf of the California Department of Transportation, I would like to welcome you to the conference and to California. We're pleased that the Airport Ground Transportation Association and Ray Mundy decided to have this conference in San Diego. We are particularly pleased that we were invited to be participants in this conference.

We all know that efficient ground transportation access is the key to realizing the full capacity potential of any airport. Many of the issues on your present agenda for this conference will be directly related to problems that we're experiencing here in California and that I have a feeling many other airports are experiencing. We welcome strong participation by the private operators, airport operators and public agencies in this conference. As I said, a number of California airports are heavily impacted by ground access issues. We look to organizations like the Airport Ground Transportation Association and to conferences such as this to help develop solutions to these problems. I thank you and Ray Mundy again for having us. I trust that your three days here in San Diego will be both profitable and enjoyable.

I did think that I would cover three areas with you. First, of course, is to thank the California Department of Transportation, especially Fred Stewart, which has helped so greatly in designing the programs so that the important issues which are facing state department of transportation, airport authorities and the airport ground operators themselves are discussed. I was involved in these curbside problems, as we call them, from time to time. The issues will be brought to the forefront, and viewpoints will be heard from. I think that, in a conference such as this, a good opportunity would be lost if we didn't speak freely and if we didn't say our own piece of mind.

I also wanted to mention that California is very fortunate; California is a state that is doing an awful lot; it has a tremendous crush of problems at airports. The kind of decisions they make in managing their airports with respect to on-site parking, on-site provisions for high-access vehicles (or I should say for high-occupancy vehicles) and remote terminals impact, and certainly will probably in future years, other major airports across the country.

Thank you once again. I look forward to an exciting exchange of ideas.

Ray A. Mundy, Ph.D.
Executive Director
Airport Ground Transportation Association

Good morning; I too am delighted to be here in San Diego and am looking forward to the coming exchange of ideas and information. First, however, I would like to mention briefly the history of the Airport Ground Transportation Association. The organization will be 35 years old this year; it started in perhaps much different times shortly after World War II in New York. The operators that started the organization really existed in a much different environment than operators find themselves in today. Back then there was a high degree of regulation; there was a high degree of coordination with the airports and with the airport authorities.

Many of the firms in AGTA actually grew up with the aviation industry. They have seen days many years ago where 30 to 40 percent of the traffic was carried by airport ground transportation. This percentage has shrunk substantially today. Automobile use and some of the revenues collected by airports have generally forced the airports to look more upon the automobile as the major source of carrying people to and from their facilities. However, even though the load factor has been decreased in the mode split, the total number of people who use public transportation from the airport has not decreased. The number of people utilizing airports has risen drastically. So while the percentage is not as great, there still is an awful lot of people who are taking public transportation to and from the airport. I choose my words very carefully, because obviously one of the issues that we are discussing as a group of private transportation providers is the role that the private operator and the public operator are going to play in the future in major airports.

I would like to point out some other things about the history of AGTA. It is composed mostly of private operators, but it also has public operators. Kansas City operations and Dallas-Fort Worth operators are both public, but they are run in essence as if they were separate organizations. Hopefully, they are run as if they were profitable organizations.

That leads me to the last thing that I wanted to cover with you which is some of the things that the Association stands for. Obviously, being composed mostly of private operators, it is very private, profit-making oriented. It believes that the airport ground transportation can and should be a profitable market—that it need not be subsidized unless there is a local action or a tremendous desire to do so. But even if service is subsidized, operators would like the opportunity to provide that service under a purchase-of-service framework.

I think the major consideration of private operators (and I'm not an operator myself, but speaking rather freely on their behalf) is that the airport can not be turned into just another origin or destination within an urbanized area and become simply part of the public transportation system, forcing private operators from what used to be a very lucrative market. I think it is this concern which the private operator is watching very carefully as public operators are attempting to move in and provide this service.

On the other hand, the private operators very much welcome the public's desire to improve airport ground transportation, and they very much welcome the assistance given in the areas such as improving signage and improving the road access, especially the considerations being given to exclusive road access for high-occupancy vehicles. The point of this early discussion is primarily to say that we would like to work with the public operators to develop good systems. There may be some very good systems run by public operators; we simply ask them to man them and run them as if they were private operations seeking a profit, perhaps trying to internally subsidize the other not so fortunate parts of the urban mass transportation system.

Hopefully, in my opening comments, I have set the tone for being rather frank and straightforward about some of the issues that are going to be discussed today. We want a spirit of cooperation. Thank you!

REGULATORY ASPECTS OF AIRPORT GROUND TRANSPORTATION**"Federal Deregulation of Airport Ground Transportation"**

Mr. Philip Yellowits
Associate Regional Director
Interstate Commerce Commission
Los Angeles, California

Guess I'm one of those lions that you get involved with in the Federal Government. They asked me to speak or make some comments on Federal deregulation. Deregulation is sort of a catch phrase that has been tossed around for the last few years. We have always felt that we would be talking about reregulation rather than deregulation. But I think in the case of airport ground transportation that deregulation may be the right word.

It is difficult to come up here and make any comments about something that doesn't exist. Generally speaking, in so far as ground transportation of property, there is no federal regulation. Theoretically, or hypothetically, you could take a shipment of property from Miami, Florida, and move it by truck all the way to, say, Las Vegas, Nevada, then put it on an airplane (a domestic carrier) and fly it from Las Vegas to Los Angeles; that entire mode of transportation from Miami, Florida, to Las Vegas is exempt from any Federal regulations. A motor carrier can move a shipment from New York to Seattle, then give it to another motor carrier who will move via motor from Seattle to Fairbanks, Alaska, and then put it on an airplane and fly it from Fairbanks to Nome, Alaska. The entire transportation from Seattle to Fairbanks is exempt from any Federal regulation.

The Motor Carrier Act of 1980, which I think was signed sometime in July, for a change said something simply—the Interstate Commerce Commission does not have jurisdiction over transportation of property, including baggage, by motor vehicle as part of a continuous move which has prior or subsequent air transportation. Basically, the only exemption or problem that we have with it may be political and involves Congress' insistence that this exemption only apply to domestic air carriers. In order for a foreign air carrier to become eligible, let's say, for this, it must secure approval from the Civil Aeronautics Board. That is basically on a case-by-case basis, with the intent being to see that the American air carriers secure the same privileges in the foreign countries.

The new regulation, when it was passed, made reference to baggage, which we have always in the past considered as part of a ride for the passenger; where the passenger went, his baggage went. That's not so in the new Motor Carrier Act. Passengers are treated separately; his baggage goes over to the property side, so when somebody loses his baggage, for the sake of argument, it winds up in New York when it should have wound up in Dallas, Texas, you can really put that thing in a taxicab and take that from New York to Dallas and it requires no authority. Passengers, I think, may be the major concern of this group. There are no changes in respect to the transportation of passengers with a prior or subsequent move by air carrier.

The old exemption, which is 25 air line miles from the boundary of the airport, is still in effect. Basically, to transport passengers in excess of this distance, if there is an interstate move involved, requires operating authority from the Interstate Commerce Commission. There are, of course, many airports in

the country where we have a two-state operation. Most of the airports in California are on the coast side and we don't get involved in this, but certainly back in the eastern and midwestern parts of the country that may be a daily occurrence in the transportation of a passenger.

So again, very simply, on transportation of property, freight and packages, the Federal Government has stepped out of the regulation of that transportation. The regulations and the needs for authority under certain circumstances for passengers still exist.

"The State's Role in Regulation of Airport Ground Transportation"

Mr. William Well
California Public Utilities Commission
San Francisco, California

In keeping with the spirit of the conference, with Mr. Mundy, I'll try and speak my mind. However, I can't speak for the Commission. The Commission and staff are sometimes at odds, and particularly in this period now with deregulation and reregulation. Our historical perspective is sometimes at odds with the Commission's perspective on how we should regulate transportation.

As most of you do know, that state role in the regulation of air transportation has been extensive. Historically, regulation has been the state's role, particularly in a state where the airports serve metropolitan areas entirely within the state where there isn't an interstate problem involved and where most airports are outside the city limits and usually are not intracity units. Therefore, historically, the states are very much involved with passenger service to the airports. This is particularly true in California. California has been regulating passenger service since 1917, so they've been doing it for quite a while. In California, most transportation at airports (with the exception of taxis) is performed by carriers regulated by the California Public Utilities Commission. We have an extensive system of buses, vans, and limousines that serve the airport. Thus, it is important to the Commission and its staff to stay at rest with those factors that affect our private carriers which attempt to serve you.

Let me just explain the role of the Public Utilities Commission in California; I think it is probably similar to those of most states. In most states, the Public Service Commission or the Public Utilities Commission regulates passenger transportation. In California, the Public Utilities Commission consists of five members appointed by the Governor for six-year terms. They regulate everything from power, to light communications, to water, to transportation. The Transportation Division's major emphasis is trucking. The division has three branches—one branch that regulates trucking, one branch that goes with building operations, and one branch that deals with passenger operations. I am the principal of the branch. We are a very small quarter with the Commission. Sometimes that's an advantage; you can do anything without being bothered. Sometimes that's a disadvantage when you want to get the Commission's ear to make some changes.

In the passengers' operation branch, we regulate all service transportation by fleet carriers operating in the State of California. That includes buses, vessels, and railroad operations. At one time we regulated intrastate airlines. We were preempted by the Federal Government for having any regulations over airlines. Presently municipalities are appealing the issue. The staff feels, and the Commission agrees with the staff, that the intrastate air passenger has been the loser in deregulations. As bills move forward to deregulate the bus industry, the Commission has gone on record in favor of the state's rights. If the nation wants to deregulate, fine, but the state should be allowed to determine its own course. . . Essentially what our Commission has said, and this is going to be a battle coming up with Congress this year, is that the states do their thing if the United States deregulates interstate passenger transportation. . . .

In addition to being the principal of passenger operation branch, I am an examiner. I provide orders on matters that are not protested. Right now I have 42, and I will have to get decisions out. These stem from the number of carriers we have.

We have two types of authority in California. I suspect that is similar all over the nation. We have intercity scheduled bus service charging individual fares between fixed terminals or on regular routes. Those are determined by the code on passenger stage corporations. Then we have a charter carrier act for those carriers not chartered, with the individual fares charged to a group of people and taking them anywhere they specify to any destination. We have 675 chartered carriers; 160 of those are authorized to operate large bus equipment. Now these carriers in 1980 are estimated to have generated over 2-1/2 billion passenger miles. Last year we also authorized \$9 million in rail increases.

Prior to the energy crisis, there was a study done by a consultant from out of Chicago for the Commission saying how the Commission is responsible for its actions. At times, back around 1973-74, the consultant said that we are playing a declining role with the Public Utilities Commission in passenger operations. ...This has not proved to be the case. In the last five years, we recruited and increased our city bus carriers by 60 percent. We have increased our charter carriers by 95 percent; so we have got a growing private passenger mainstream in the State of California. Growing that way often isn't recognized. (Of our 223 bus carriers, 51 are airport access carriers, or almost 25 percent of the total, so airport access is a very important function of passenger operation regulated by the Commission.)

To meet this expanding role of passenger service ... we established a bus service development unit in my branch in 1979. This is head up by a Senior Engineer. The goal of this bus service development unit is to encourage and facilitate the development of new and expanded service of transportation. This unit is not a planning unit; ... this unit is a consulting unit which works with individual carriers to help them with their filings with the Commission to give them engineering and economic advice on fare levels, and service levels and to assist them in operation service. There were three things on which this unit was going to operate; the first was airport access.

The unit held meetings with airport operators in Northern California and in Southern California. From those meetings, the main response we got back concerned the lack of enforcement. The Commission was not enforcing its regulations. Second problem with rate increases. Trying to get rate increases through the Commission is difficult and time-consuming. Part of the problem with Commission regulation is inflation. It's very difficult for us to do what we have done in the past yet keep up with costs that are incurred by the carriers. We are working on to alleviate some of this difficulty. We will touch on that later.

The bus service development unit has been rather successful. We're a member of the San Francisco Airport Improvement Task Force which is a joint venture with the Transportation Commission, Caltrans, Santrans, and other agencies in the Bay Area. We also participate in Los Angeles County Transportation Commission and that is airport access. ...

One of the things we are trying to do is to alleviate some of the problems our flight carriers are having with deregulation. As I said, going into total deregulation, we're trying to make it simpler for the carriers to come to the Commission. We're trying to establish applications that are like filling in the

blanks. We haven't standardized them completely, and we have several hurdles to go over. We have the Legal Division which we have to go through; this is always a challenge.

We have been successful in the home-to-work operations where applications to the Commission are docked. We can expedite a procedure where you can file for a home-to-work operation authority and have that authority within 30 days. There is a certain procedure we can go through that has been agreed upon by several administrative levels and Legal Division. We would like to extend this procedure to other carriers.

Also being considered is a fare window, which right now is written on our general order, that will grant a fare window to transportation companies. As it stands right now, we're allowing transportation companies to raise their rates twice a year for a certain percentage without having to make a complete showing of necessity for a decision in the slow way of the Commission.

Another thing we're trying to do is include making more use of the computer. Our insurance programs are now on the computer, and we hope to expand to some other things for our computer. We hope to get a unit which was recently installed to handle word processing, and hopefully my branch will get a unit. However, that computer will push buttons and out will come the decision. Put in certain facts pertaining to a certain application, push a button and out comes the decision—at least they told me that would happen.

As far as deregulation, some of the problems carrier in California have is with the Commission's attitude towards regulation. The Commission would like to free up the market. We would like to authorize more carriers. There are some conditions in the codes standing in the way. The Commission can't authorize additional carriers unless the existing carriers are providing inadequate service. We would like to have that removed. Carriers have a proposal on that, so the Commission hasn't been successful.

In the area of enforcement, the Commission would like to have the Highway Patrol act as its enforcement arm. We discussed this with the Highway Patrol, and they were not receptive at all unless, of course, they get additional funding. But we have had a task force that met with Motor Vehicles and the Highway Patrol to discuss where our computers could talk to their computers and it would end up with the patrolmen out of the freeway knowing exactly which buses by license number did not have insurance up to date or did not have the proper authority. Or if they see a bus, they could check and be assured if it had authority on file or not. The Highway Patrol is not going to be receptive to this idea at all at this stage. There's a lot of work to do in this regard. We do have in the compliance enforcement branch a new transportation unit with officers throughout the state's extensive highway network. However, their efforts go to trucking. ... They are paid out of a trucking rate fund. We've been meeting with bus operators and bus associations to try to convince them that they should get into this fund. To get into this fund, you have to pay a quarter of one percent of your gross receipts which goes to this fund. If they could be a part of that rate fund, then we could use this expensive compliance and enforcement fashion to enforce bus regulations as well as trucking. ...

Another idea is to allow the Commission to grant exemptions to certain classes of carriers. This would speed up some of the certification process. For some carriers, the Commission has the authority to grant an exemption so they wouldn't have to comply with all the rules and regulations and formal proceedings.

Another area the Commission would like to deregulate, as far as our state goes, is limousine service. ... We would like to be out of the regulations aspects. ... In California, I don't know if this is true in the rest of the country, there is a conflict between taxi operators and limousine operators. Sometimes our limousine operators get state permits and will tend to operate as taxis.

Thereby, we have problems. It is difficult for us to deal with this, with respect to having the local agencies to report their home taxi regulations and the limousine operators violating those taxi regulations. We'd be violating the city ordinance; they should be prosecuted by the city, not by the state. ...

One of the things the Commission staff has done with the blessing of the Commission is apply to UMTA for a grant to have a public/private mix study. We felt some time ago that the private system needs greater recognition and greater utilization. Maybe there are some regulation changes that could be made, or legislative changes; but we really need to study this to see what the problems are, what the carriers are, and what the service can be. The Commission and staff feel that there is a significant potential for a new passenger service to be operated by a private sector at little or no cost to the taxpayer. This stems from the fact that we have an energy crisis, also from Proposition 13. We need more transportation without increased taxation. Therefore, we go for this public/private mix theory. ... We hope to fully explore this public/private interrelationship so that they can all be seen as components of the same transportation system.

In the issuing of new certificates, are they in the new markets or are they parallel with present certificate holders? Do you feel that the idea of the proof of the certificate is right?

Most of the new certificates have been new markets. There have been some in parallel markets where the Commission has ruled that the service is different—maybe a luxury service in a van authorized on top of a regular bus route. That has occurred in a couple of instances, much to the consternation of the certificated bus carrier. Whether this is a wave of the future, I really can't say. We just had two new Commissioners appointed by Governor Brown. I don't know what their feelings are. I know one Commissioner who is very interested in transportation and does want to see more carriers. In a recent decision, in fact, the last Commission conference, they signed up a decision where a limousine operator in Los Angeles had asked for service from certain hotels in the Hollywood area to Los Angeles Airport. The operator also asked for authority from the Biltmore Hotel to Los Angeles. Well, Airport Service protested the application for it and pointed out that Airport Service provided 40 some trips a day from the Biltmore Hotel to Los Angeles International Airport—almost half-hour service 24 hours a day. At the hearing, the losing operator withdrew its request to serve the Biltmore in face of this opposition. Now, the obvious difficulty is getting around the Section 1032 Airport and Facilities Code regarding adequacy of service. And yet, when that decision came out, one Commissioner who signed the statement to the decision said, "I would have granted it if only to serve the Biltmore Hotel". That's one Commissioner. And, of course, you have to have three votes to have the decision. It's very difficult for the staff to know what direction they really are going.

There are some areas in the state where we cannot authorize carriers. Airport access is owned by the airport and it's not officially a public highway; therefore, we can only certify carriers up to where a public highway ends. We had a case recently. We had authorized an airport operator in Monterey who had to let his passengers out on a public highway. The airport wouldn't let the operators' vehicles into the airport grounds. It was only a half a block away. We need to work with the airports. The next part of the matter is what I handle now to make certain that carriers have some kind of approval from the airport before they go through with requesting authority. This matter is handled by administrative decision. Of course, a protest could go to a hearing. Sometimes the airport participates. Sometimes it does not.

The Highway Patrol performs the safety inspection for us. There is a motor carrier safety section in the Highway Patrol for passenger stage corporations; it is a continuous monitoring. I'm not sure what their schedule is. They may get each carrier; but I don't think they get each carrier once a year—I'm not sure how that works. If they find a carrier that is unsafe, they notify us in writing and we revoke their authority.

But the charter carrier is a different story. Charter carriers are renewed annually. In order to get their authority renewed, they have to have a clearance from the Highway Patrol, and the equipment has to be inspected by the Highway Patrol. So we have control over the authority, but the Highway Patrol has the inspection and tells us whether they are safe or not.

"Airport Authority Franchise—Exclusive Vs. Non-Exclusive Aspects"

Mr. Bob Davidson
Los Angeles Department of Airports
Los Angeles, California

I think we at Los Angeles Airport have long since learned that most people's ideas of adequate ground transportation are measures designed to take other people off the streets and freeways so that they can drive their private cars under the structures. We've had some limited success in getting people into alternate modes of transportation, but Southern California, Los Angeles in particular, is on an economy that is dedicated to the preservation of automobiles.

I can just regress for a moment. I notice the chairman is wearing plaid pants. I have had a long association with some of the executives from that unnamed midwest airport like Bill Downs and Pat Dunne. It seems like whenever they attended a meeting here in Los Angeles or Southern California, they always wear plaid pants. I've never been quite able to understand that, but I'd like you, Tom, to take the message back that plaid pants are out and jeans and cowboy boots are in. L.A. is certainly not a typical airport as most of you know. Chicago or Atlanta are generally hub airports in which the majority of the passengers transfer from one airline to another. However, airports like L.A. and New York tend to be terminal airports where people either originate or are destined. As the result of this, the kinds of problems that we are experiencing in L.A. are largely related to ground site, land side congestion. Compare this to the problems of airspace and taxiway management which some of the hub airports have to deal with.

Just to give you some flavor of the ground transportation aspect, our annual budget is now in the neighborhood of \$150 million a year (most paid for by the users of the airport) of which about \$85 million is our operating budget. Only about \$790,000 comes from fees paid by ground transportation is not in itself a significant contributor to the revenue stream of the airport. Yet, in comparing that with the year 1979, there was almost a 50 percent increase in the amount of money realized. There obviously is a trend of getting people out of private automobiles and into alternate forms of transportation.

We have rental car industry at L.A. airport, for instance, which is the largest rental car market in the world. It probably has 20,000 automobiles rented at any time. Rental car agency payments to the L.A. Department of Airports average over \$19 million a year in just concession payments. It's a very significant source. These agencies are relatively trouble free. We have been able to confine their activities to centralized pickup and dropoff areas and run buses from those various terminals. This is becoming an increasingly common practice throughout airports around the country.

Taxis handled perhaps 4 percent of the total traffic at the airport. L.A. is not much of a taxi town. Taxis are a considerable problem, however, because they constantly face complaints for service refusal, complaints of overcharging and many other complaints which anyone dealing with taxis would know.

I think Tom's statement about the blurring distinction between exclusive and nonexclusive activity at airports is becoming increasingly clear. In L.A., prior to 1972, taxicabs had a single franchise from the community of L.A. which included the airport by Yellow Cab Company. Of course, at that time it was fairly easy to control, manage and operate taxicabs. For example, because they in turn would have a single operator, nobody could plead that it wasn't their taxicab, and it was generally easy to establish rules and insist upon adequate performance. I think that from a public policy standpoint, most political institutions now tend to view many of these ground transportation aspects as being something that should be open to competition. In 1972, L.A. opened up the taxicab market. Just as down here in San Diego there are no regulations whatsoever—a kind of open taxicab market which is becoming a model for many taxicab operations throughout the country.

The airport buses and vans that provide semi on-call service, as well as the scheduled airport limousines have always been an important part of our operations at the airport.

Philosophically, we have always felt that we are the public utilities commission (or any other agency) having the legal authority to decide on public convenience and necessity. If that group or organization is granted such a right, it's generally been our feeling that they should be accommodated somehow at our airport. We feel that the widest range of choices which can be available to the public to serve their travel needs should be available. This is really a pretty good idea.

Unfortunately, of course, we are faced with increasing competition for curb space and waiting areas, and control of traffic as such as becoming more and more of a problem. I don't see that this trend can be abated in the future. For instance, the Justice Department, as many of you know, is taking a much sterner and more careful look at all types of exclusive agreements of airports. At the present time, for instance, we're under an investigation by the Justice Department for antitrust violations because of exclusive duty-free concessions at the airport. And certainly I think this kind of thing is a camel's nose under the tent. There has been a long standing Federal Trade Commission investigation into rental car activities at major airports. I think most airport proprietor's, on the advice of their counsel, are steering further and further away from any kind of agreement which would smack of exclusive ticketing or be anticompetitive in its fare nature.

Also, in L.A., because of the tremendous magnetic growth of the airport, we have developed a substantial hotel-motel industry around the periphery of the airport. Literally thousands of rooms are available. And while they enjoy high occupancy, most operate hotel-motel pickup buses which run between the airport and hotels either on-call or on a circulating basis, if it's a large enough hotel.

These are generally the forms of ground transportation that serve the airport. You can see that in L.A. none of these are exclusive in nature. I can't really see how they might be.

In looking to the future, we're embarking on nearly a \$400 million improvement program at L.A. airport which includes the building of the circulatory roadway system around the terminals and construction of a new domestic terminal and a very large international facility. For the next four years, these construction projects are going to have a substantial impact upon the ability of people to use the airport. We feel that we are going either to have to use more

innovative methods in trying to deal with the problems of getting private automobiles away from the curbs in front of the ticketing buildings and baggage claim areas or to try to deliver these people in larger packages through the increased use of buses or other forms of ground transportation.

I think from our standpoint, we also have to realize that you cannot force the choice upon your public. We have had this demonstrated time and time again, particularly in California where we tried to do with our regulation what the public just would not accept. We recognize that people insist upon having access to the attributes of the private automobile, but we believe that it is possible to offer perhaps a superlative kind of service or range of services which may provide an attractive alternative to the automobile. I think, from our prospective looking into the future, that rather than dealing with exclusivity or nonexclusivity, we're dealing with the opportunity to provide a more attractive, efficient form of alternate transportation for those people to use.

I think we were one of the first major airports who pioneered the use of perimeter parking lots to reduce congestion. This was done at a time in the late 1960's when it was really uncertain that anybody would be willing to use them. Yet we found that most of our parking lot growth has taken place in this kind of activity because we've been able to offer fast, efficient and free bus service from these perimeter parking areas. We also used the weapons of discriminatory pricing as it were to raise the charges for long-term parking within central parking areas to force long-term parking into perimeter areas in an effort to free central parking areas for short-term use for pickup and dropoff; this has had a substantial impact. In 1979, for instance, we had average daily vehicle count of about 50,600 vehicles; in 1980 it was reduced by 11.6 percent to 44,600, so there is a long-term impact in erosion on the private automobile competing for very precious curb space. We think that over the next four years when faced with the kind of construction management problems that we might have, we're going to have to do more in promoting this.

I'm just sure you're all familiar with these statistics, but for instance, when we took a survey to indicate how much of our parking area capacities were being used by long-term parkers, we found that fewer than 5 percent of the cars parking were using over 25 percent of the total capacity of the lots by staying longer than 24 hours. The average space turned over approximately four times a day and is left free for the use of the pickup and dropoff travelers. So it becomes apparent that there are a number of tools that are available to use as airport proprietors to try and correct this imbalance between the private automobile and more efficient forms of ground transportation.

Now I think one of the problems that we must deal with as airport proprietors is the problems of where our responsibility begins or ends with respect to providing ground transportation services off the airport. We will hear later about the Van Nuys Fly-Away project which has been in operation for several years with a good deal of success. I think that the philosophical clash between the private operator and that of the well-meaning proprietor of a public facility who offers the kind of ground transportation services for patrons which may initially be uneconomical for a private operator to buy is certainly one for which I have no answers. I'm sure that these problems will ultimately be sorted out in the courts over the years to come.

I think my observation in terms of other airports and certainly the other airport representatives here is that this trend towards the elimination of exclusive arrangements for almost any purposes except those which are absolutely necessary is becoming the standard for the industry for a variety of reasons, so it does not seem to be that large an issue looming up in the future ahead of us. I think what does concern us, as a proprietor of a busy airport (and certainly I think you share this concern), is the proliferation of buses and high-capacity vehicles within our already congested terminal spaces. On one hand, under the freedom and anticompetitive aspects of transportation, we try to involve the largest number of ground transportation operators. On the other hand, we are faced with trying to regulate for ourselves with little statutory authority the masses of buses, vans, and all other types and sizes of vehicles, whether they be rental cars, hotel-motel pickups, passenger stage carrier limousines or whatever.

One problem with which you are all familiar and which is particularly acute in L.A. is that involving limousines. A limousine in California is a charter party carrier, that is, allegedly the arrangement for that service is made at some other point than on the airport which would theoretically bring it within our control. Under the law, we can only regulate, control or issue permits to those businesses which actually conduct the given business at the airport. If the contract is arranged off the airport, then it is not within our authority to regulate.

The problem, of course, is that a person hiring a limousine is generally rather wealthy—typically a wealthy executive, sporting or entertaining figure who is really paying for a kind of service which a limousine operator is really hard pressed to deliver in today's environment. Obviously, people who are going to pay several hundred dollars for their airport transportation do not believe they can be treated like the rest of the world and have to walk across the street or to the parking lots or do anything except be greeted by their chauffeurs and walked out of the baggage claim area immediately with the doors open to their waiting limousines. Our security forces spend a good deal of their time trying to dissuade the limousine operators of this, but with a limited amount of success. The result is almost a constant regulatory problem of towing and citing limousine vehicles, which are, in fact, operating in service with people who they really can't deliver. I think that this is the most frustrating aspect of it because what has really blown up is a kind of counter-culture inasmuch as an operator of limousines very often prices his services so he can afford the \$10 ticket or the occasional \$30 impound fee. The same thing is true for rental cars.

The bus operators have gone to larger units which create more and more congestion within the confines of the terminal space. Many of them, I suspect, use their buses for purposes of other than transporting people but maintain a constant roving caravan as large buses with Hertz, Avis, National or whatever painted on the side are a major advertising device as well.

I think that probably one of the great challenges in the future will be the problem of trying to regulate the users of ground transportation equipment in the sizes numbers and frequencies of vehicles within the airport areas. I think that became apparent from Mr. Well's discussion and I'm sure from others. Simply no one wants to get into the business of trying to regulate activity. Everybody conveniently feels that it's outside of their province and that they don't have the funds, the personnel or the statutory authority to do it; they feel since the problem impacts the airport, the airport authority should deal with them.

I think all of you know that the airport authority in itself is somewhat of a loss. Our experience in trying to control many kinds of legal activities at the airport, especially in terms of ground transportation, have really gotten us rather disastrous fates. In viewing that some poor innocent person who is just trying to make a living selling transportation in front of an airport terminal has been arrested and booked, it is very difficult for many of the judges in our judicial system to summon up any kind of sympathy for our case, especially when they feel that so many other criminal activities are going on that the efforts of the prosecution and the police activity should be directed more to more serious crimes. As a result, these people are increasingly being left off with summary probation and sometimes are not even prosecuted at all.

In California, we have an incredible judiciary system. (For those of you who don't live in this State, it's very difficult to appreciate the full scope of that.) One court decision in effect threw out the impounding of vehicles, and we were required to refund over the last eight years the amount of impound fees charged to people who left their vehicles unattended in front of the ticketing buildings and after 15 or 20 minutes or longer had it towed away. The reason of the court of California was that those people should have been granted a hearing before their vehicles were towed. We now have a procedure. We do tow the vehicles away, but if somebody picks up the car and demands a hearing, they are relieved of paying the impound fee. If they so insist, they are entitled to a hearing on why they parked there illegally. If the hearing officer agrees with them, they go free.

I think these are the kinds of issues which make us yearn for the return to the days of exclusivity where you are dealing with a single operator who is readily identifiable and available to deal with rather than deal on a mass market basis with all kinds of suppliers of all types of activities and financial conditions. Nonetheless, I think that we and many other airports around the country are starting to make some inroads into this problem. I think that in L.A. more than perhaps at any other airport, we've always had the ability to get people in and out of the airport. I think more of our attention over this last 20 years has been dedicated to the problems of breaking ground barriers than probably any other transportation issue that we've had. I think that we have made some firm but steady progress. Without any question, we are going to have to make a good deal more. I suggest that an organization such as yourself and the airport authorities have much to gain by continued close cooperation in achieving these mutual objectives.

When we talk about these problems of going back to the exclusive type of service, with or without exclusivity, I should think that the ground transportation will end up going to smaller and smaller vehicles. Where you get five or six operators trying to serve downtown regions, they are going to have to go to smaller vehicles to stay efficient and to get better use of the vehicle. I would think the government in the area of more efficient use of vehicles and energy should realize that exclusivity makes sense.

I'm afraid the Energy Department does not make the Justice Department policy. There is not actually a decent reliable vehicle, small vehicle, available for competitive service in an airport environment. Most of the rental car agencies have gone to very large vehicles of the GMC type which is a very large coach of which seldom fills to capacity. This is the kind of problem that we're running into, and it tends to have a serious impact upon our traffic conditions. I notice that Dulles Airport, in its new rental car agreement, interjected a clause whereby rental car agencies on six month notice, can be required to enter into a common bus service operation at the airport. That to my mind may be a very sensible approach for some of the more congested airports to take. The airports can either

perform the service under contract for the rental car companies or can have the rental car companies designate a third party to operate a common bus service for all. I think that's really our only hope.

INSURANCE

Editor's Note

Insurance problems plague both the airport and the airport ground transportation provider. In the following article, Mr. Paul Goldman of Pual Arnold Associates, Inc., gives the reader not only some practical advice on how to lower insurance premium costs, but also some broader philosophical concepts to deal with. Within, he asks the reader to consider the historical relationship that lawyers, legislatures, and the courts have had in dealing with increasingly higher court awards in motor vehicle liability cases. Truly a thought provoking article that deserves greater attention.

INSURANCE

"Liability, Insurance, and Safety Problems Facing Airport Authorities and Ground Transportation Providers Alike"

Mr. Paul Goldman
President
Paul Arnold Associates, Inc.

The announced topic in your program is insurance as the problem relates to you. This is an area that I will dwell on briefly, but then I would really like to get to the heart of something that troubles me, and I hope it troubles you. When I'm finished, you may want to do something about it. The world of public transportation insurance or the public transportation insurance buyer has become very very sophisticated. There was a period of heavy market decline which dramatically escalated insurance costs. Limited ability to obtain higher limits, tightening underwrite restrictions, and many more changes that I know have troubled each one of you, particularly during the period that began in 1975 as the market became almost nonexistent.

The end result, I think, was good for most of you. What has happened is that there has been a greater sensitivity created on your part as to your own responsibilities. You probably pay more attention now to driver selection, to rigid discipline, to proper accident reporting methods, to more strictly enforced preventative maintenance programs, to better housekeeping, and to improved public relations in the area of your employees responding to passenger needs, comments, and complaints. Further, you make whatever efforts are possible, within the framework of very tight operating structures, to improve your financial position—an area looked in very carefully by insurance companies interested in writing your class of business. To many of you it might reflect as the reason behind why we probe so carefully with respect to financial conditions. It's really quite simple: a soundly run financial operation reflects on the ability to hire or maintain qualified operators and to provide for adequate maintenance. So it's not solely your financial ability to pay premiums (something generally guaranteed from the insurance company by your agent or broker) which concerns an insurance company, it's your ability to take care of what you're operating, to try and help avoid an accident before it actually happens.

The market has improved dramatically over the past couple of years. There have been new entries in the field of underwriting your operations. These are available in group or association programs nationally, and there are companies writing on a local and regional basis as well. The latter concept relates to local exposure and density of population, vehicular traffic, local work conditions, and the claims orientation attitude of the writing public in your area. The softening of the market, I'm happy to tell you, will probably continue for another year, maybe a year and a half. However, this depends on the stock market, and a lot depends on the interest rate as it relates to an insurance company's approach to underwriting. You will contribute much though, towards the attitude of your underwriters in the period that is to come beyond that. You must continue to be concerned with those areas of safety involvement to which I made reference—personnel and maintenance.

Let me sum up this brief first part of my talk. I have highlighted the responsibilities that you and top management have. You have to make certain that whoever is handling your risk—your manager, your controller, yourself, your safety personnel director—understands the capability of your agent in assisting you in controlling losses. You have to make certain that all those associated with your insurance safety program know the individuals handling risk in your office. It makes you more visible. You want to make certain that you get to know the members of your broker agent backup team—the safety people, the claims people, those who handle the certificates of insurance or statutory filings, and certainly the accounting people. Make certain that you get a report from time to time from your agent or broker on how you are seen from their perspective. Make certain that you or your risk manager establish a good working relationship. It's a two-way street. Make certain that you have viable and working contacts with key insurance company people in the area that you serve, particularly loss prevention claims people. Make certain that your agent is aware that you as top management have a continuous interest in your insurance program. This serves you in many different directions. Your people feel it, and their sensitivity to it creates even more attention to your account.

Now, let's get to what I think is our major festering and totally neglected problem. . . . It seems to me that we have gone from the concept of award to reward, or perhaps to what was referred to some while back by George Will of the Washington Post as the "I am entitled atmosphere." Let's not forget that the basic purpose of our tort system is to restore a person who is at a loss to the position he or she was in before that loss occurred. This should be only at the expense of those who own the duty of care and whose fault caused the loss.

Somehow or other, over the last decade or so, our legal system has drifted very dramatically from the touch stones, especially in the requirement of fault. The jury awards are frequently in excess of the amount necessary to restore the injured party to a position held before the loss. Often the awards are made without fixing the responsibility for the loss with the party most directly responsible. Too often our courts seem to become gambling places where people who have suffered a loss go to spin some wheel of fortune expecting and very often receiving a windfall profit. Those who win serve only to inflate the expectations of the law.

Steps must be taken by people like yourselves to convey the message to those legislators who control the potential windfall. Many of the legislators regrettably practice negligence of court law, though not in the legislature. Due principally to our system of part-time legislatures in many states, cities, and government, the need for pressure on them has to be great. The economic potential loss to them would be so substantial that they would deny the privilege of practicing them. . . . Steps have been taken along the road of the first corrective actions. The doctrine of punitive damage seems to have been somewhat restricted in many states by recent rulings of the Insurance Services Office, particularly by those insurance companies who do subscribe to ISO. Many, whether subscribing or not, do follow. This doctrine allows jury awards above and beyond the amount actually needed to compensate an injured party for the loss. The levy is solely as a means of punishment to the person causing the injury. They really are more in the nature of criminal fines or assessment of compensation, but these fines are not paid to the state. Instead they are wind-fall payments directed to the injured party, another clear inequity. Punitive damages are essentially a matter of confiscation of property without due process.

Since the civil court levies the punitive damage, not the criminal court where constitutional rights can be properly protected, the contingency system thrives where attorneys can thwart this sort of problem. I wouldn't for a moment suggest that there is no room for the reparation system that the contingency process provides. That is the only way that an injured party can afford to seek recourse. But there are sound arguments for limiting the amount that lawyers can collect on the contingency fee arrangements. We have such a law back in New Jersey. It has proven moderately effective.

The collateral source rule also results in windfall property and payments to injured parties. This rule makes it impossible to point out to a jury that thousands of dollars in medical expenses may have already been received by an injured party. Insurance with the employer may have already paid most of it. The rule makes it impossible to point out to a jury that an injured party may not have lost any income as a result of the accident, his salary having been continued during the period of disability. I might say that there is a footnote in three of our States back east—Connecticut, New York, and New Jersey. The same situation would apply to temporary disability which is provided under statute for the individual to receive under the collateral source rule. If you as an employer decide to make up the difference so there is no economic loss, that is not permitted as evidence.

The cost of legal action is extraordinary. Establishing fault under our system as you know is a long and expensive process. It would be even worse under civil administrative cases as you heard Tom say this morning. We should look long and hard at the idea of handling by arbitration many of the matters now being resolved in lengthy and expensive trials, in Discovery hearings, and in the unavoidable cancellation, postponement, and running back and forth process of getting people together. Arbitration is a simple streamlined method of bringing together the interested parties in an objective manner, with all having agreed beforehand to a factual no-appeal presentation.

Achieving any kind of reform is always difficult, most difficult. Reform usually follows access. We might, perhaps, have even passed that point now. We live in a time and atmosphere of law suit explosion as you all know. The sue syndrome seems to be spreading constantly. The law suit fever results in your premium skyrocketing. Insurance companies take the blame when too frequently they really are innocent witnesses or bystanders.

There are some occasional glimmers of hope, a light at the end of a dark tunnel. Recently we had a New Jersey Supreme Court decision where they refused to expand the scope of uninsured motorist coverage that we have in all of our New Jersey automobile policies. The ruling occurred simply in the case of four accident victims seeking to collect money on the uninsured motorist clause of their own insurance policies. They claim that the individual who caused the accident had only the minimum personal injury coverage, which at the time was \$20,000. The contention was that the sum was insufficient to compensate them properly for their injuries and damages. Therefore, they sought to collect additional compensation from their own insurers, arguing that the uninsured motorist coverage should have been used for that purpose. Fortunately, the court disagreed, ruling that state legislature required the uninsured motorist coverage simply to protect the public from uninsured financially responsible motorists, not one who is sufficiently or insufficiently insured. The court went on to say further, and I quote, "The law did not undertake to guarantee an irreducible minimum sum available to every injured person under every set of circumstances."

We have come to the point where people expect that. To give you some instances to show exactly what we are talking about, Frank Trippett, a regular writer at Time magazine, some while back noted that a man struck by lightning sued the National Park Service for negligently failing to warn him not to stay where lightning might strike him. These are the facts. Park Service only won on appeal against a judgement in a case where a man was bitten by a bear, where it can't be illegal, in Yellowstone, where there was abundant publicity warning against bears. And yet he had received an award in the lower court. A woman collected \$50,000 from the City of San Francisco claiming that a fall in a runaway cable car had turned her into a nymphomaniac. Another woman whose jaw was broken when she was blown against a railing in Chicago Sears Tower Place is demanding a quarter of a million dollars from the architect whose building she alleges increases wind velocity. Here is a marvelous story. Three convicts who escaped from the County Jail outside of Columbus were caught within 48 hours, were brought back as fugitives and had an additional six months tacked onto their sentences. The three of them brought suit against the County Sheriff and his deputies for being negligent in their making of security at the jail and their possible cause for being able to escape. An attorney took the case. . . .

Many of these law suits are frivolous and malicious, and their real intent is to make social policy by litigation rather than by legislation. This particular evasion of our democratic due process diminishes society's already attenuated belief in individual responsibility.

What can you do about all this? Fortunately there are a few things, although unfortunately success cannot be guaranteed. . . . If you hit someone hard enough, often enough, where it hurts, at the ballot box, you get results. You have to get through to the legislatures. There must be reforms in the contingency system. Constraints must be put on attorneys who inflate the value of a case to simply assure themselves a higher share of dollars based upon their proportionate participation in what a judge would award in a settlement. . . . Arbitration must be brought to use more heavily so that contributory negligence may become a greater part of determining actual fault. There must be constraints imposed with respect to ultimate disposition of just and proper awards of settlements, so that generations of legitees' yet unborn heirs are not permitted to gain financially from the unfortunate tragedy that may have beset their predecessors. . . .

We seek constantly the extension of liability in myriad forms. We now have a complete disruption of the sacred relationship of the parent and child in several northeastern states, and most of our unusual laws come from right here in California. We have extraordinary situations that involve the testing of sovereign immunity which has begun to destroy the road to basic municipality relations with the communities they serve. Professional liability of all fields has been extended, with cases being brought against all except attorneys. They haven't had their fare share yet.

There is no free ride in the expense of the insurance company. It is the policy holders, the public, all of you and me who pay the high insurance premiums that are unavoidable as payment and expenses go up. Even when suits are thrown out of court, the judgements are reversed on appeal or awards are later reduced, litigation adds to the burden of cost, and you are paying those costs. Situations are becoming desparate, not just from insurance companies, although they are in the front line. The trend has to be reversed. There has to be a change by the courts. The courts must recognize that damages are actually paid by ordinary citizens, you and me, and that insurance premiums reflect the cost covered by the premiums. It is not simply the burden of an impersonal enemy, an insurance company, where supposedly unlimited funds might be available. There must be legislation to correct the irrationalities of the law. . .

In summation, there must be a turn by all towards a better way of settling things than the wasteful, too costly and ultimately unfair social devisive system of sue, sue, sue.

"Automated Information Systems at
Stapleton International Airport—A First Step"

Editor's Note

The need for more and better ground transportation information is apparent at almost every U.S. airport. Passengers are simply under-informed of the public transportation alternatives.

Recognizing this need both the California Department of Transportation and the U.S. Department of Transportation have initiated major research and implementation programs of improved information systems at airports. In this sector, the reader is exposed to both of these efforts.

In the initial paper, Mr. Gary Anderson of Forum Communication Corporation details his firm's installation of an automated information display system at the Denver Stapleton International Airport and the developmental plans for a demonstration at a California airport.

Following Mr. Anderson is a brief presentation by Mr. Fred Stewart of the California Department of Transportation on a marketing demonstration project aimed at implementing an Automated Ground Passenger Information System in a Southern California airport complex.

Concluding this section is a paper presentation by Mr. Kenneth Bray of the Transportation Systems Center in Cambridge, Mass. Mr. Bray outlines the Federal D.O.T.'s research efforts in developing a prototype automated ground passenger information system for major airports and the government's plan to implement it at Boston's Logan Airport and later at Dullas' International Airport. (Editor's note: The implementation phase of this project has not yet been funded.)

"Automated Information Systems at
Stapleton International Airport—A First Step"

Gary Anderson
President
Forum Communications Corporation
Portland, Oregon

We are in design and information systems. That sounds like a big word, I suppose, to those of you who look upon information primarily as signage. I think its important to give you a little bit of background as to why we're at this point in the development of information systems. Since 1972, Illiam Associates has been involved in a variety of public transit type projects. One related to improving productivity for operations that were pretty much oriented toward Government sector operation as opposed to the consumer himself. So our job was to find ways where the agencies could begin to get more ridership for the existing kinds of revenue being spent. As part of that effort, we did a lot of research in the area of consumer attitude. We tried to find out what would stimulate the use of public transportation in a variety of cities throughout the country.

In the course of that research, we were measuring the various variables which the public transit industry has and attempted to manipulate those which could stimulate the use of public transportation. So to look at what we're doing is to look at time as a factor. Many yesterday mentioned what we're doing is to look at time as a factor. Many yesterday mentioned time as being a major deterrant in the use of your services to the airport if, in fact, you are stopping along the way as opposed to taking a direct route. We measured also the function of distance which is a function of how long do I have to (or how far do I have to) walk from my home to my public transit conveyance or how far will I have to walk once I get off the public transit conveyance as opposed to the alternative of which would be a private automobile of some sort.

We also measured information; we measured amenities such as shelters or people out in the fields to help to provide information or to sell passes or fare cards or whatever. We also measured the equipment itself. How important were the cleanliness, the attractiveness, and the comfort of the equipment? We also figured marketing and advertising costs. We were around the country doing research projects from Seattle and Portland to Little Rock, Arkansas, and even to Memphis, Tennessee. We also looked at places like Cleveland.

We kept looking for the information component, in other words, how do I use the bus system? This component was No. 3 in rank or importance as compared to the other variables we were researching in the public transit area. It ranked roughly behind distance and time. In other words, there was a very strong latent demand in the use of public transportation, but a lot of folks did not know how to use public transit.

Now, as a frequent air traveler, one of the problems you suffer from in airport facilities around the country is that its very difficult to understand how you use public transit conveyances, and I'm including the airport ground transportation that you represent here. So as a result, our company, in a course of years, looked for alternative ways to develop more efficient systems. I will begin to show you some of the work we're doing in public transit and what we're

doing for the airport industry. . .

The first project for an airport interfacing with public transit conveyances involved the electronic information at Denver airport. I'd like to give some background to what had happened and to talk about other kinds of automated information for the airport and airline industry. Consider it a basic area of increased productivity that can happen from information systems at airports. First of all, we're talking about airport management areas where there can be some more efficient information in the form of design and order of information about goods and services provided within the airport facility, especially about trying to get to public transit conveyances. There also can be better information on flight departure and arrival instructions. More can be done in information areas to speed up the functions of reservations, seat availability, seat assignments, and other kinds of information for the would-be airline traveler. And finally, there is a need for better information about ground transportation, especially near an airport. Management people realize that there is a need to provide more necessary carrier access information. So, obviously, we'll provide more directional instructional information on how to use those carriers.

One thing we've learned in our research around the country is that people are not used to using a public transit conveyance—that includes carriers of all kinds providing ground transportation. The folks don't know what's going to happen to them. There is a great reluctance on their part to use that carrier, be it public transit conveyance, a limousine at drop off point or whatever. There's a fear of what's going to happen, especially if there's not anybody to greet you, if there's not a lighted street corner, if there's not a telephone or if there's a too long a walk to carry your bags

Let me look at areas of processing of people at an airport. We find this common type of processing problem where there's peak and off-peak circulation of the people. We're dealing with Eastern Airlines in helping to provide more information for management of people in airport facilities.

We've talked with many agencies around the country trying to find ways to improve information and to improve flows around the facilities. There are several basic areas of information we can provide to the public here. First, there is the airport "you are here" type information. People need to know how to get to the next point, whether it's to a public transit carrier, to a gate or to a concession. We need to provide that kind of information to the public. Characteristic of the airports we studied are the maps that are put up. Maps are not satisfactory for a number of reasons, one being that they don't change very well. Secondly, the public is not oriented that well with that kind of mapping feature, especially in those complex airports where there are more than one terminal.

Another area of information deals with ground transportation. Where is it? How do you get there, and by what means of travel? The questions which those people who use a public transit conveyance or ground transportation are concerned about the time function, cost function, points of departure and arrival and rules and regulations.

Also, the questions that are being asked depend on activities—where are hotels? What's in town this week?—different kinds of things that people are needing to know. One information system executive established these seven basic points. First of all, it's going to give necessary information to the public in a very consistent manner which is rather obvious. Next is optimized patron flow through the terminals. We've looked at airports, and I suspect you have too. You find there's a great deal of confusion in some airports at certain times of the

day. The people don't know where they're supposed to be going.

In Portland, Oregon, there are what we call trip planning kiosks. There are eight of them that have a map like this for one side and on the other side have a t.v. monitor where you can access your destination and look for it while you wait for the bus. Now, according to this system in Portland, would the public accept this idea of electronics as opposed to something they have in their hand? The answer is yes.

Consider the typical forms of information dissemination that have been used by the transit industry—first of all, telephone information, secondly, public time scheduling information. In 1978, the telephone was used by 59% of the riding population. Public time schedules were used by 74%. In the first year after the installation of the electronics, there was some pretty significant up-front acceptance. There was a considerable drop off in the use of traditional forms and an increase in electronic information. Now that's the acceptance aspect.

Another aspect was cost. On cost questions, here is what's happening now. Tri-Met annually spends \$700,000 to provide telephone information to the public. Cost per thousand inquiries is \$510 or 50 cents per call. That's about an average for the public transit industry. There are larger places like L.A. where the cost per call is 65 to 70 cents. Cost of public time schedules is running about \$105 per thousand; electronic information costs about \$20.50 per thousand inquiries.

Now I don't mean to say that this kind of a case history would begin to provide you with exact cost figures, but I would like you to think about electronics for your systems. We're trying to encourage airport facilities to provide this kind of information to do a variety of things which we believe will help people and will stimulate the use of ground transportation. By being able to enter your information independently into the system with a small monitor into their basic hardware component system, you will be able to give people instructions on using your service, to tell them the cost, to give them the times and to take them to their destination from one part of the airport to where you actually operate.

What about vandalism? (Participant Question)

In Portland, Oregon, there have been three t.v. sets broken in three years, and there are 40 of them on the premises. In Long Beach, we are putting the units behind polarized pieces of plastic. So it will take a bullet to go through it. This plastic has to be replaced every year, but it costs only about \$50. We don't consider vandalism to be a problem here so far. I expect that in certain parts of the country this will be different. However, I think in most cases that vandalism in airport facilities will not be a problem because there are policemen around, because it's not that easy to get out, and because monitors can be designed to be vandalism resistant.

"A Transit Marketing Demonstration by Caltrans"

Fred Stewart
Division of Aeronautics
California Department of Transportation
Sacramento, California

I promised myself last night that we were going to speed through this session, and one way to speed through is to eliminate the long presentation. I'm just going to spend a couple of minutes talking about what Caltrans Division of Aeronautics is doing. I had a boss a year or so ago who, after spending 15 years in planning, told me that he is taking this new job because one thing he wanted to do was to get away from planning and to do something.

We developed a program to try a few demonstration projects as in R and D projects. One of them involves information about ground transportation, like Gary is talking about, trying it in an airport. We felt, after doing some brief study on ground access, that there was a lack of information. We knew that there wasn't a good alternative to the automobile, and we were looking for an airport that had good transit service but where the patronage was not significant so that we could discover if the information really had an impact in getting more patronage.

In keeping with that, we applied for a state R and D grant, and we were awarded something in the neighborhood of \$300,000 out of the sales tax on gasoline from California SP620 funds that the Legislature appropriated to improve transit. We were favorable in this, and we have selected an airport where we want to try this. The Transit service is about 15 minute service, but ridership is very low. We hope to evaluate this. We hope to have an installation very similar to what Gary mentioned at Denver, but this will be in the terminal area. So we don't have the design considerations as he did by having an outdoor unit. We hope to have this system installed a year from now and to go through about a six-month to a year evaluation to see if transit ridership increases and, if so, by how much. I don't have anything to report on that project now, but we want to evaluate our thesis that ground transportation information is a must in order to get an increase in patronage.

"Automating the Delivery of Ground Transportation Information"

Transportation Systems Center
Cambridge Massachusetts
Presented by Ken Bray

Introduction

This paper introduces the concept of an automated ground transportation information system (AGTIS) for use at major intermodal transportation terminals. The AGTIS uses a touch-sensitive cathode ray tube terminal to facilitate input to a computer-based information retrieval system. The patron uses the touch-screen terminal to indicate an ultimate destination and then receives visual information on the travel time, cost and availability of transportation services to that destination. After selecting the most appropriate service, the patron then receives detailed printed instructions for its use. A prototype system has been set up in the U.S. Transportation Systems Center in Cambridge, Massachusetts. The development of the AGTIS has been sponsored by the Federal Aviation Administration (FAA) and the Urban Mass Transportation Administration (UMTA). An AGTIS system will be installed at Logan International Airport, Boston, Massachusetts, for demonstration, test, and evaluation in 1981-1982. (Editor's Note: the system was not funded in 1982 further.)

The Need for Automated Information

The traveler arriving by plane, train, or bus at a major transportation terminal is often faced with an immediate problem: how to get to one's final destination. This problem becomes particularly complex at a large hub airport where a wide variety of taxicab, bus, limousine, and sometimes rail services are provided. Because air travelers are usually in a hurry, information they receive on the availability and current status of such services must be delivered quickly. Otherwise, most will be inclined to use low-occupancy vehicles, such as taxis, rental cars, or private autos, thereby increasing traffic congestion and energy consumption.

A similar problem is presented to the airport operator. The operator wants to dispense ground transportation information efficiently and accurately to the airport user. However, the increasing number of air passengers combined with rapidly escalating personnel costs make it more and more difficult to provide the level of information that passengers need to select the ground transportation service best suited to their time schedule and budget.

Traditionally, airports have used three basic methods for delivering ground transportation information: (1) brochures, (2) personnel (at booths or via phone), and (3) signs. A brief survey of twelve large hub U.S. airports evaluated the effectiveness of these three methods against the criteria listed below:

1. Is the information comprehensive?
2. Is it easy-to-understand?

3. Can it be easily updated?
4. Does it provide quick access to the air traveler?
5. Is it location specific (i.e., can information for a particular destination be isolated)?
6. Does it permit intelligent decision-making?
7. Can it be set up, operated, and maintained at low cost?

Analysis indicated that none of the current methods rated very highly when evaluated by the criteria. The brochure can be made comprehensive, but it then becomes difficult for the passenger to extract information quickly. Updating brochures to account for frequent schedule, route and fare changes can be very expensive and confusing to the air passenger.

Trained personnel are usually able to respond to a variety of questions. However, the cost of maintaining sufficient personnel to respond to ground transportation questions during peak periods is prohibitive.

Space constraints limit the comprehensiveness of signs. A well-designed sign can provide quick information on where to, who to call, and perhaps provide more detailed information for downtown trips. However, signs are difficult to update and rarely contain enough information to permit intelligent decision-making.

Automating the Delivery of Information

Problems with current information systems point up the need to improve three areas of information deliver--(1) speed of access, (2) ease of updating, (3) comprehensiveness of information.

These shortcomings could be overcome by taking advantage of the speed and comprehensiveness possible through computer-based automated information systems which are being instituted with increasing frequency in virtually all areas of modern society.

Automated systems are starting to appear at airport terminals. In December 1977, London's Heathrow Airport installed a "Route-Finder" System which provides subway routing information in three languages for passengers who press a button to indicate their desired destination. Denver's Stapleton Airport has a transit information display board which indicates routes and departure times for all buses which serve the airport. These systems provide fast, easily updated and accurate information for passengers who have already chosen to use transit as a means of getting to their ultimate destination. They do not provide information which would enable a patron to select from a variety of transportation services.

To examine the effectiveness of a more comprehensive system, the Operations Analysis Branch of the U.S. Transportation Systems Center currently is planning an automated ground transportation information system (AGTIS) at Boston's Logan Airport. The work at Boston Logan is sponsored jointly by the Federal Aviation Administration (FAA) and the Urban Mass Transportation Administration (UMTA).

The Boston Logan AGTIS

Boston is a logical location for a demonstration of the AGTIS because it

contains a wide variety of ground transportation services including bus, limousine, rapid transit and "share-a-cab" (the latter, a system where reduced taxi fares are charged to patrons willing to share a taxi with persons going in the same general direction). Boston also experiences frequent heavy traffic congestion in the Sumner and Callahan tunnels which connect the airport with most of the metropolitan area and would really benefit from any program which could divert air passengers from low-occupancy to high-occupancy vehicles and rapid transit. Reducing vehicular traffic to the airport has been given high priority by the airport operator, the Massachusetts Port Authority (Massport).

The heart of the propose Boston Logan system are touch-sensitive cathode ray tube (CRT) terminals located throughout the airport terminals (Figure 1). A touch-sensitive CRT is recommended because it is easier for an untrained patron to use than the traditional keyboard. The passenger would touch the screen of the terminal and be guided through a sequential series of screen displays to determine the user's local destination and specify the various transportation options which can be used to get to the destination. The sequence is indicated in Figure 2.

The user is asked to select a type of destination, either (1) an area municipality, (2) a landmark (hotel, university, etc.,) or (3) another airline terminal at the airport. In the option, the screen asks a series of questions which the user answers to provide a precise specification of the user's destination zone. When this zone is reached, a service choice display is produced on the screen. If the user specifies a landmark, a service choice display can be referenced directly. Patrons requesting "another airline" are given information on Massport's shuttle bus.

The service choice display indicates a variety of potential means of getting to the destination including taxicab, "share-a-cab", limousine, bus, and rail transit. The information provided for each service is type of service, travel time, service frequency, and cost.

After reading the service choice display, the user can then touch the screen to receive a detailed service information display for any selected service to include:

1. Directions for getting to the point from which the vehicle departs;
2. Name and phone number of the company providing the service;
3. Fare information;
4. Schedules;
5. Location of stops at destination points;
6. Services available at destination points; and
7. Instructions for use of service.

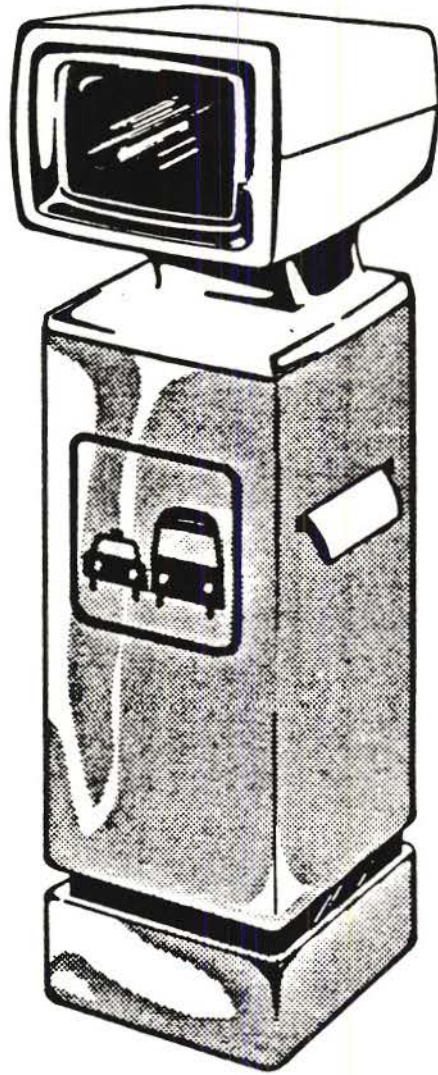


FIGURE 1. CONCEPTUAL DRAWING OF AN AGTIS TERMINAL

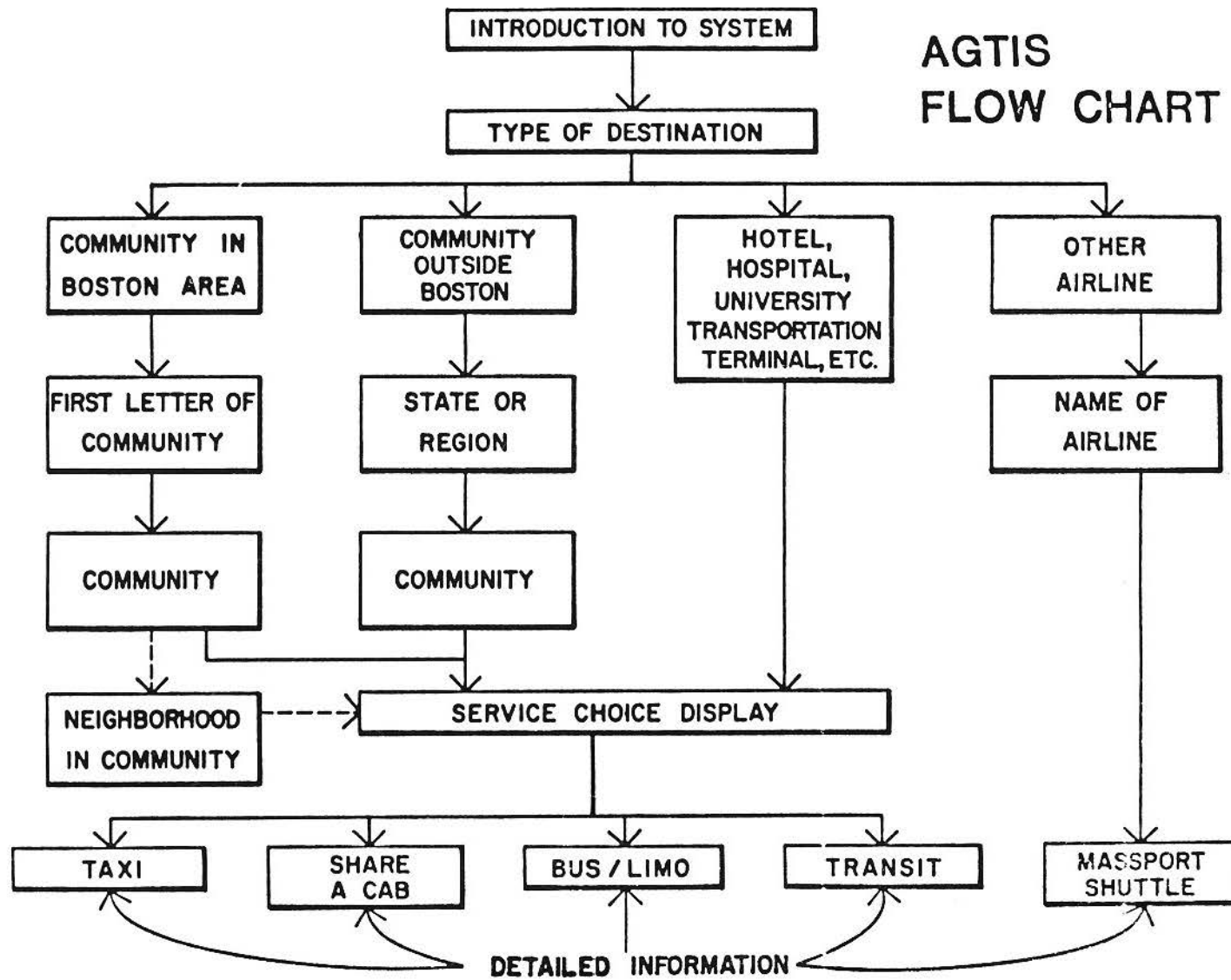


FIGURE 2. AGTIS FLOW CHART

The air passenger would receive, if desired, a printed copy of the detailed information to provide a reference during the trip from the airport. The sequence of displays a passenger would go through in selecting transit service to Cambridge, Massachusetts, is shown in Figure 3.

It is also intended that the system should provide information on short-term transportation changes and events such as major traffic congestion problems or transit system problems, for example:

1. "Accident in Sumner Tunnel - delays of up to one hour;" or
2. "Power failure on Blue Line - do not take MBTA Transit;" or
3. "Hudson Bus Lines reports that its 7:30 a.m. limousine to Concord, New Hampshire, will not depart until 8:10 a.m."

A functional diagram of the Boston AGTIS is shown in Figure 4. A prototype system consisting of a touch-screen terminal, printer, and micro-computer with floppy disc storage has been set up for demonstration at the Transportation Systems Center's (TSC) Cambridge offices. TSC will issue a Request for Proposal for the design, development, documentation, and installation of the Boston Logan AGTIS in February 1981.

Evaluating the Effectiveness of AGTIS

As a demonstration project, the performance and impact on travel habits of the AGTIS project will be comprehensively examined. Four general aspects of the AGTIS will be evaluated:

1. System Reliability and Performance. An appraisal will be made of the system's hardware and software components in meeting system specifications and in providing comprehensive and relevant information.
2. System Use. Information relating to the extent of the system usage and to its usefulness in providing relevant and comprehensive information in an understandable format will be gathered.
3. System Costs. Capital, operating, and maintenance costs will be tabulated so that the system's cost-effectiveness can be assessed.
4. System Effectiveness. The impact of AGTIS on transit services and on ground travel habits of air passengers will be evaluated.

A program for collecting data at Logan Airport to evaluate all four aspects of the AGTIS is currently being developed. The program (which is only preliminary at this stage) consists of ten elements:

1. Air Passenger Survey. A questionnaire would be handed out either before or during a sample of departing flights. This survey component is needed primarily to measure change in passenger mode choice and to determine the characteristics of passengers who are not using AGTIS.
2. AGTIS User Questionnaire. Prepaid, mail-back questionnaire survey forms would be distributed at the AGTIS terminals. The questionnaire would provide a profile of the AGTIS user, including non-air passenger users of the system and user perceptions of the AGTIS.
3. Transit Carrier Questionnaire. A questionnaire would be mailed to all private bus and limousine operators providing service at

HOW TO GO TO BY TRANSIT

(Available from 6 AM to 11 PM)

TAKE AIR-PORT SHUTTLE BUS TO THE MBTA STATION
TAKE THE INBOUND TRAIN TO GOVERNMENT-CENTER
CHANGE TO THE GREEN LINE TO PARKSTREET CHANGE TO RED LINE TO ALL POINTS.

FOR MIT EXIT at CENTRAL SQUARE and walk back 1/2 MILE ALONG MASS AVE.

FOR HARVARD U EXIT at HARVARD SQUARE

FOR DOT-TSC EXIT at KENDALL-SQUARE

FOR POLAROID EXIT at KENDALL SQUARE walk about 1/4 mile along MAIN-STREET

NOTE: Have exact change , \$.25 ready for shuttle and for. MBTA) !

BACK
UP

START
OVER

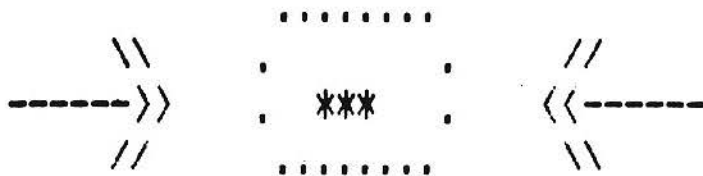
PRINT
PAGE

(g) Detailed Information

FIGURE 3. (Continued)

WELCOME TO BOSTON

FOR INFORMATION ON TRANSPORTATION
PLEASE TOUCH THE ASTERISKS
BELOW



BEM VINDO A BOSTON

PARA INFORMACOES DE TRANSPORTE
MECHA NAS ESTRELAS
EM BAIIXO



(a) Introduction

FIGURE 3. SAMPLE SEQUENCE OF DISPLAYS FOR BOSTON LOGAN AGTIS

SELECT A DESTINATION OR SERVICE

*** HOW TO GET TO OTHER AIRLINE TERMINALS (AIR-PORT-SHUTTLE) ***

*** BOSTON AREA AND MASSACHUSETTS DESTINATIONS ***

*** SELECTED LOCATIONS IN NEARBY STATES ***

*** DOWNTOWN RAIL AND BUS TERMINALS ***

*** LIMOUSINE AND BUS SERVICES ***

*** MILITARY INSTALLATIONS ***

*** UNIVERSITIES ***

*** HOSPITALS ***

*** HOTELS ***

(b) Selection of Destination or Service Type

FIGURE 3. (Continued)

TOUCH THE GROUP OF LETTERS CONTAINING THE BEGINNING LETTER OF YOUR DESTINATION

A	***	M	***
B	***	N	***
C	***	O,P	***
D,E	***	Q,R	***
F	***	S	***
G,H	***	T,U,V,W	***
I,J,K,L	***	X,Y,Z	

BACK UP *** START OVER ***

(c) Destination Group

FIGURE 3. (Continued)

SELECT A DESTINATION

CAMBRIDGE	***	CENTRAL AVENUE(MILTON)	***
CAMPELLO		CENTRAL SQUARE(CAMBRIDGE)	***
CANTON		CENTRAL SQUARE(E. BOSTON)	
CANTON JCT.		CHARLES ST. CIRCLE	***
CAPEN ST.	***	CHARLESTOWN	***
CARLISLE		CHELMSFORD	***
CARVER		CHELSEA	
CEDAR GROVE	***	CHESTNUT HILL	***

! *** CONTINUE HERE FOR MORE "C"S *** !

BACK UP *** START OVER ***

(d) Destination City or Town

FIGURE 3. (Continued)

COMMUNITIES IN CAMBRIDGE

CENTRAL SQUARE *** PORTER SQUARE
HARVARD SQUARE ***
INMAN SQUARE
KENDALL SQUARE ***

! FOR OTHER ADDRESSES AND TRANSIT-STOPS IN CAMBRIDGE !
! CONTINUE HERE !

BACK START
UP *** OVER ***

(e) Neighborhood in City

FIGURE 3. (Continued)

CHOICE OF TRANSPORTATION

<u>MODE</u>	<u>TRAVEL TIME</u>	<u>COST</u>	<u>AVAILABILITY</u>	<u>MORE INFO</u>
TRANSIT	30 to 40	\$.75	6.00 AM to 11.30 PM	***
CAB	15	\$ 8.00	on demand	***
LIMOUSINE	20 to 46	\$ 3.50	6.30 AM to 11.05 PM	***

BACK UP ***
START OVER ***
PRINT PAGE ***

(f) Service Choice

FIGURE 3. (Continued)

TOUCH THE GROUP OF LETTERS CONTAINING THE BEGINNING LETTER OF YOUR DESTINATION

A	***	M	***
B	***	N	***
C	***	O,P	***
D,E	***	Q,R	***
F	***	S	***
G,H	***	T,U,V,W	***
I,J,K,L	***	X,Y,Z	

BACK		START
UP	***	OVER

(c) Destination Group

FIGURE 3. (Continued)

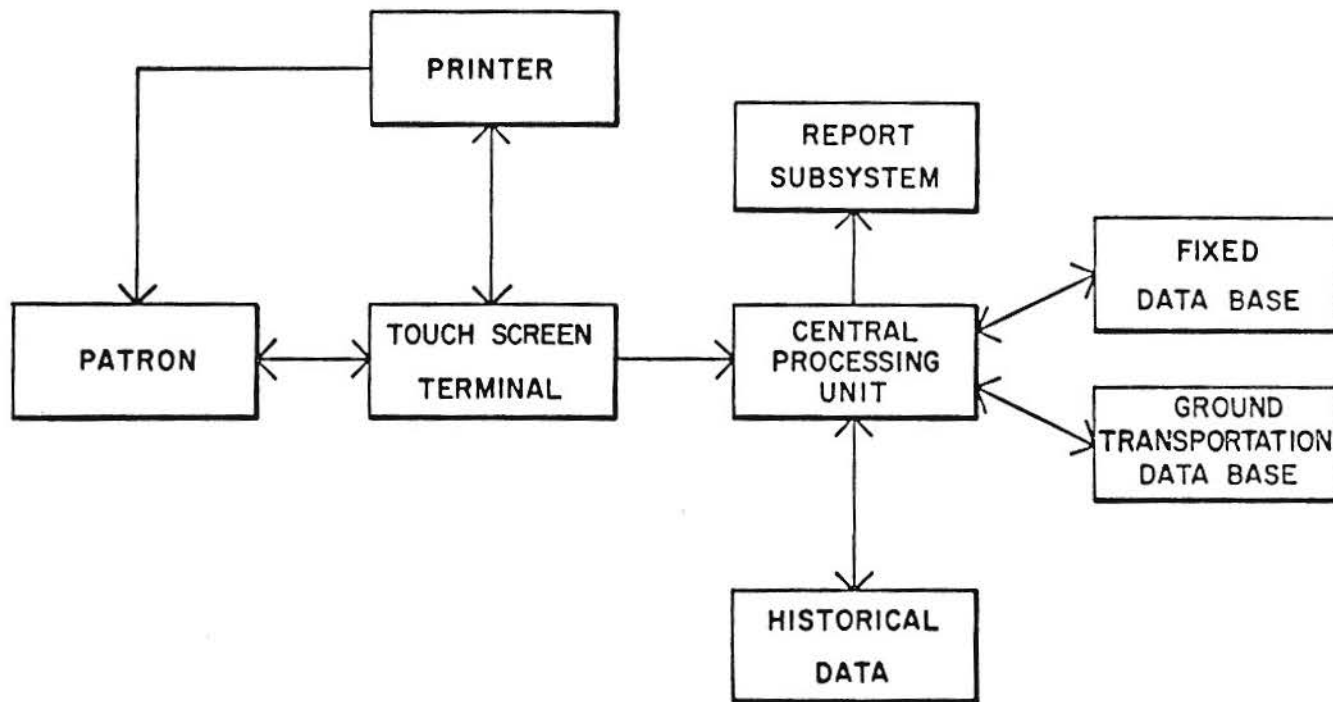


FIGURE 4. BOSTON LOGAN FUNCTIONAL SYSTEM

- Logan Airport to assess the AGTIS' impact on carrier operations and on the availability and further need for other transportation mechanisms employed by the carriers.
4. Massport Interview. An interview would be conducted to determine Massport's perspective on the feasibility and effectiveness of the AGTIS demonstration at Logan Airport. The interview would focus in on system reliability, user acceptance, impact on Massport's operations and costs, and suggestions for other airports.
 5. Rapid Transit Rider Count. To assess AGTIS impact on rapid transit, riders entering and leaving the Massachusetts Bay Transportation Authority Airport Station would be counted for one day both before and after AGTIS implementation.
 6. Internal Roadway Count. To measure AGTIS impact on vehicular traffic, traffic counts would be conducted at selected roadway locations. The counts would be taken during the duration of both air passenger survey periods (seven days each).
 7. System Observations. Observations of persons using AGTIS would provide information on system comprehensibility and human factors problems. Data received from these observations would be used to correct the AGTIS data base and procedures as well as to evaluate the system.
 8. AGTIS Maintenance Records/Operator Logs. System records would be used to provide an objective record of system performance throughout the life of the project. Maintenance records would be prepared for every preventive maintenance or failure/malfunction observed.
 9. AGTIS Data Files. AGTIS user tabulations would be compiled using an AGTIS Report Generator subsystem which would summarize data stored in the historical data files on patron usage. These data would be used to provide general information concerning system usage and to provide base data for comparison with the air passenger and AGTIS user surveys.
 10. Ridership data currently collected by Massport, for limousine, private bus, taxi, and share-a-cab services on a monthly basis, would be summarized by the contractor for a period of time before and after AGTIS implementation. These data would identify long-term trends in public transportation utilization and verify results obtained from the air passenger surveys.

Conclusions and Future Applications

The proposed Boston AGTIS consists of a single touch sensitive computer terminal with a limited data base. Considerable development, operation and testing will have to be done before the worth of the AGTIS can be evaluated. Still, it does appear to be a concept whose time has come.

Computer systems are becoming less expensive and more powerful, while costs are rising in virtually all areas. An automated information system may be one of the least costly means of increasing transit ridership (although this assumption has not yet been tested) and, therefore, decreasing traffic congestion and energy costs. If the system proves successful, it could be applied to major rail and bus transportation terminals as well as airports.

"Airport Planning"

Editor's Notes

Airport planning plays a key role in the type of problems that later appear, or do not appear, at curbside. Sometimes referred to as the "curbside mess" these problems are often the result of poor initial design as is pointed out by several authors in this section.

An excellent review of the major design characteristics necessary for adequate airport ground transportation planning is provided through a paper developed for the conference by individuals of Wilbur Smith and Associates and delivered by Mr. Terry Brothers of the same firm.

The operator's viewpoint of the curbside problem is presented by Mr. Bruce Roberts of Airport Service, Inc., of Anaheim, California. Through this discussion, the reader is able to grasp the everyday operational problems faced by a large bus-type airport ground transportation provider.

Finally, the reader is treated to the regional government's view of airport planning through the frank presentation of Ms. Margorie Kaplan of the Southern California Association of Governments. This candid assessment of the local area's propensity to improve its existing ground transportation system to the airport is to the point and indicative of the economic problems many other areas are currently experiencing.

"Airport Design Characteristics Affecting
Ground Transportation Systems"

Mr. Terry Brothers
Wilbur Smith and Associates
New Haven, Connecticut

Over the past three decades, we've witnessed a dramatic growth in airport traffic in this country, and it's become the backbone of the intercity transportation system both for travel in the country, and, of course, for international travel. However, the continued growth in airport traffic has certainly magnified the many deficiencies in both planning and designing ground site transportation facilities at our airports. As Bob previously indicated, most airports consider ground site access to be their largest problem. The future trends indicate that the airside capacity of our aviation system will continue to expand largely as a result of the wide body aircraft becoming more prevalent and also because of the new navigation and planning systems. They're going to be coming on the line in the next few years. To balance the future growth in the airside capacity, there is going to have to be a comparable increase in the groundside capacity. Economic, environmental, and other constraints largely preclude the construction of new airports in this country and largely curtail the major reconstruction of the existing airports. Thus, the increased capacity must come from small-scale improvements to existing airports and from more efficient use of these airports.

As sort of an introduction, I would first like to discuss the magnitude and composition of airport groundside traffic. I think we're all aware that, at every airport in the country, the highway oriented traffic mode is the mode serving the air passenger, although some cities have rail connections either existing or being planned. The airports that we've looked at, which include Miami, Denver, LaGuardia, the American Airlines terminal at J.F.K. and L.A. International, have approximately between 0.9 and 1.3 vehicles entering or exiting the airport for each passenger originating or terminating at that airport. What this means is that, for an airport such as L.A. with about 33 million passengers, we have about 100,000 to 150,000 vehicles each day either entering or exiting the airport. For a smaller airport, such as San Diego, that figure would run more in line with 30,000 to 35,000 vehicles per day. The figure of 100,000 to 150,000 is the equivalent to a six-lane freeway; 30,000 would be equivalent to a six-lane arterial or six-lane expressway. The low-occupancy travel modes, private autos, and the taxis, have a minimum of about 75 percent of the air passenger traffic. High capacity vehicles tend to carry only 10 to 15 percent of the total air passengers at most of our major airports; the maximum we found is about 25 percent.

Next, consider the components of the groundside transportation system. We first have the regional highway system. Next is the access roads and ramps leading into the airport. Then there are the circulation roads at the airport itself and the all-important critical curb loading and unloading area. There also are car rental facilities, close-in parking, remote parking and short-term parking. As I mentioned, quite a few of the airports also will have rail connections into the terminals themselves.

I would like just briefly to talk first about the regional highway system. This system tends to be shared with the travel needs of the community at large, so in most instances the access to the airport is largely impacted by the general community travel, particularly since airport peak movements correspond to work-to-home and home-to-work commute peaks.

I'd like to say a little on the curbside activities. This is a critical aspect of the terminal. It is the interface between the transportation system and the terminal itself. Generally, we find that a minimum of half of the air passengers at an airport are going to unload or load at the curb from the terminal. The remainder will be using remote parking or other parking in the terminal area. Factors which influence the curbside capacity are the composition of vehicles that are using that curb (private automobiles, buses, limousines, etc.) and the average time in which those vehicles occupy that curb. In the studies we've done around the country involving some two dozen or so airports, we've found that generally actual loading and unloading time at airports are fairly constant for each mode, and there is not that much difference in loading time between the modes.

To give you an example, the range of loading time for automobiles is about 0.6 to 1.3 minutes; for buses loading time is about 0.8 to 1.5 minutes. This is the actual loading time. Now how long that vehicle sits at the curb is a different matter. At a departure curb, you find that autos tend to average 1.2 to 3 minutes at the curb, buses about 1.7 to 2.9 minutes. At the arrival curb there is a more dramatic difference, the auto being about 2.4 to 4.3 minutes at the curb while buses occupy the curb 1.6 to 3.5 minutes. Two things are evident from this. First, the broad variations in dwell times is generally a result of level of enforcement at the curb at the airport. An airport like LaGuardia that has a very strict curbside enforcement has a very low dwell time at the curb. The second factor is that, depending on modes, the private automobile tends to be the least efficient use of the curb, the buses are most efficient users of the curb, along with taxis.

The other proponent to parking again is the three categories of parking—remote parking serving long-term parkers, close-in parking serving one- or two-day parkers and short-term parking usually serving well-wishers or people there to drop off or pick up passengers. In studying the airports, we've found that there are four principal contributors to the groundside constraints. The first is that most of the airports have inadequate highway access; most are served by one or two major facilities and they tend to share them with the community traffic at large. Next is the dispersed nature of the trip origins and destinations within the community. Essentially, this makes it very difficult to organize trips to take advantage of more efficient modes and, in particular, makes it difficult to justify taking a rapid transit line or other capital intensive facility into the airport itself. Third, in most airports, the central terminal areas have too much parking which tends to exceed the capacity of the airport roadway systems which provide access to that parking. The last factor is that too much of the airport's vehicular activity is concentrated at or near the enplaning or deplaning curbside in the terminal area and in the limited curbside space.

As an airport changes in its character or increases in its passengers, there are a number of factors which can influence the various components of the groundside access. Different factors influencing different components. . . For example, the introduction of international air service or major increases in air service have dramatic impact. . . . The international traffic has a very dramatic negative effect, increasing the requirements for on-site roadways, long-term parking, short-term parking and curbside facilities. This is largely attributed to the fact that international air travelers have a tremendous amount of baggage and are very desirous of using the curbside facilities. They also require much short-term

parking because they tend to be picked up or dropped off by other people or else are met by well wishers.

Airlines increasingly are going to a hub and spoke type system. This creates heavy concentration commuter travel. What generally happens is that an increase in commuter travel at an airport generates an increase in close-in parking requirements, decreases the curb area required in the airport and decreases the long-term parking required. . . . With one exception, we have commuter terminal arrangements which requires the transfer passenger to travel between terminals outside of the terminals. He has to use the same curb frontage and the same roadway system generally on the shuttle buses that are being used by originating or terminating air passengers. Exceptions to this are airports such as Dallas-Fort Worth or Atlanta that take care of this movement with internal systems.

Off-site processing is something that the airlines have found quite unpopular at this point because of liability in security and operating costs. However, it has been used at a number of airports such as Zurich, Victoria Station in London, and Eastside Terminal in New York. Essentially, off-site processing will decrease the requirements on each one of the components within the airport terminal area itself. You can get largely the same effect by increasing the amount of remote parking outside the airport terminal area.

Of the remaining factors, one is the enforcement of curb frontage. This is probably the least costly thing to do to increase the efficiency of airports. A number of airports like LaGuardia or Dallas-Fort Worth have towaway type of rules and enforce these. As Bob just mentioned, L.A. has run into problems with that. Other airports also have had jurisdictional problems in towing cars away from the curb that are parked over a length of time such as 5 or 10 minutes.

Of the remaining three factors, one is the increase in aircraft capacity as larger, wide body jets become more prevalent. That increases the peak loading of the groundside system which increases the demand for the airport roadways themselves, for short-term parking, and for curb frontage since you have a larger number of people alighting or loading from the curb in a shorter amount of time. The last two factors are in increase in airport employment and the increase in service and air cargo at the airport. Both of those primarily increase the demand on the regional roadway and on the airport roadway system.

What I'd like to do in the next few minutes is do a little crystal balling about what we see happening with airports and how it's going to affect the groundside element. The first of these factors are the energy limitations and the increasing cost of energy. In surveys that we did last year, about 75 percent of the people say they have changed their patterns in using the airport, have changed modes, have changed the number of trips or have made some other change since the price of gasoline has doubled and since air fares have gone up. Then you have the next question. If gasoline prices go up to \$3.00, what do you see changing in the patterns? The answer comes back universally—they don't foresee making any other changes. They're reacting one way in the past saying they won't act differently in the future. Again this is probably going to lead to an increase in the amount of flights and in the number of passengers impacting on the airport during the peak hours.

Increase in peak hour airside capacity is going to make groundside loading more heavy during the peak period. . . .

Budgetary limitations are something that the whole country has been living with for the past four or five weeks. In California, we have been living with it

for about five or six years as far as transportation facilities. We are becoming increasingly aware of these constraints. There are going to be few, if any, new airports built in the next several years. Next, it is going to be very difficult to find monies to build increased regional access into our airports. Very few airports such as L.A. have large amounts of funds available for these purposes.

The last factor that I have listed is the glamorization of air travel. Twenty years ago most Americans hadn't flown in their lives. Today, most Americans have flown, so it's no longer a novel travel mode; it's now regarded as a utilitarian mode of travel from Point A to Point B. In most cases, intercity travel by plane is the only realistic form of travel. Additionally, the increased competition between the airlines has led to decreasing amounts of service on these flights, and this has largely been accepted by the passenger as evidenced by the no service shelter systems that are now operating and by the reception of the low-budget, low-service flight such as Skytrain.

We're not really certain how this is going to affect ground transportation, but we suspect one change will indicate a growing instance of using high-capacity, high-occupancy travel modes to travel into the airport and from the airport itself. They're going to trade off the freedom of the automobile for the most convenient cost of the use of some high-capacity form of transportation. Next, how this will affect the groundside activities. First is the increase in transfer passengers. This is going to change the amount of groundside traffic given a certain number of passengers who are using these hub airports. Secondly, it's going to tend to group the flights together at these airports, so you are going to have more intensive loading of the system. Next thing we see will be decreasing percentage of automobiles in the air passenger trips. The automobile, we feel, is still going to be the prevalent, predominant mode of access to the airport; but it's going to decrease in proportion of the total number of trips.

With the increasing use of high-occupancy modes, there will be more traffic at commuter terminals. This is going to be a problem that has to be solved because most of our commuter terminals at major airports have been stuck away at some corner since they have been very low generators in the past. Now, with the increasing hub-and-spoke systems, there is much greater use of these airlines. This is going to be causing capacity problems because the passing in front of commuter terminals is inadequate to accommodate the increasing traffic that they are experiencing. So these commuter terminals either will have to be relocated within the terminal areas where there is available capacity or they will have to be reconstructed within the areas of these commuter terminals to provide additional curb areas and additional parking areas close in to serve commuter passengers.

Again, as more and more peak period traffic develops at the airports because the airlines desire to use hub and spoke arrangements, the increasing proportion of personal automobile travel will be balanced out by much greater increases in the high-occupancy modes—limousines, airport buses.

A large increase in the number of passengers being served by public transit and by private operators of the airport bus service is going to occur in conjunction to other things we feel are going to be increasingly used, on being the remote community park-and-ride facilities. One of these will be discussed tomorrow—the Van Nuys fly-away. You will see more of those occurring serving the major airports. In conjunction with this, we will see increasing pressure to reinstitute off-site processing of fare passengers at some of the remote terminals that are serving high density intensive air travel areas.

Your belief that high occupancy modes will increase is totally opposite to

present decreases of maybe 13 to 20 percent in most airports. Did you come up with any sort of theory as to when these increases are going to inflict themselves on us?

The increases in passenger capacity of the aircraft have been happening for the last several years and are going to become more pronounced starting in the next year or so as the 757's or the 767's are being put into service by the small airlines. Again, this is a trade-off of a level of service. Things become more and more congested, and it's going to become less desirable to drive an automobile to an airport, to fight the traffic, and to find a parking space which is going to become more difficult to find.

When do you expect this to happen? That's the opposite of what has been happening. Plenty of room at the parking lot, plenty of room at the air place, plenty of room in limousines.

It's going to be very long term. It isn't anything that's going to be happening in the next two or three years. We're looking more at a long-term type of thing that is going to be happening over the next 10 to 20 years.

"Airport Design Characteristics Impacting Ground Transportation Systems"

(Paper)

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Air transportation forms the backbone of the international and national transportation system, in terms of intercity travel. Future trends indicate that airside capacity will continue to expand as wide body aircraft become more prevalent and advanced airside navigation and landing systems are introduced. To balance the future growth in airside capacity, there must be a comparable increase in groundside capacity at major airports. Economic, environmental, and other constraints may result in the construction of few new major airports in the near future. Thus, the increased capacity must be the result of improving and rehabilitating existing groundside systems and using these facilities as efficiently as possible.

Background

Continued growth in the movements of persons and goods by air throughout the world, and especially within the United States, has magnified many of the design deficiencies in the ground facilities available to serve aircraft. This trend points out the necessity to study implications of terminal design, airport design, and airport passenger characteristics upon airport ground transportation systems to complement the technical improvements and innovations which have increased airside capacity.

Although there have been some recent movements by middle-income households back to the city, it is unlikely in the near term that there will be a change from the suburban orientation of most greater metropolitan areas. The low-density, dispersed trip origins associated with these communities have impacted many segments of life, including the airport ground transportation system. Dependency upon the automobile for almost all work, social, and shopping trips in the suburbs has also resulted in auto-oriented trips to the airport.

For a trip between 100 and 150 miles in length, modal choice is almost academic in that trip times between origin and destination with automobile, bus, conventional rail, or air are comparable, depending on the trip. As travel distances increase beyond 150 miles, the air trip gains in popularity because of the time savings and the convenience experienced in selecting this mode.

Using this premise as a basis for further study of air travelers, one recognizes the important contributions innovations have made in the treatment of passengers and visitors to airport terminals today. Among those innovations

which have been inaugurated in the recent past are computerized reservation and seat assignment systems, preticketing concepts, provision of boarding passes

prior to day of the flight, and scheduled-sustained shuttle service between major metropolitan areas.

TABLE 1
TOTAL PASSENGER MILES BY MODE
1968-1979

Year	Number of Passenger Miles (Billions)		
	Rail	Highways ^a	Domestic Air
1968	13.1	1,797.0	93.7
1969	12.2	1,894.1	111.1
1970	10.8	1,985.2	109.5
1971	8.9	2,091.5	110.7
1972	8.4	2,195.5	123.1
1973	9.1	2,263.5	132.2
1974	10.0	2,207.3	135.4
1975	9.7	2,287.3	137.0
1976	10.0	2,391.8	152.2
1977	10.1	2,486.7	164.2
1978	10.2	2,601.8	189.1
Percent Change (1968-1978)	-22	+45	+102

^a Includes passenger cars, taxis, and intercity buses.

SOURCE: National Transportation Statistics, September 1980, Annual Report prepared by United States Department of Transportation.

A summary of the annual nationwide passenger miles provided by mode of travel is presented in Table 1. Between 1968 and 1978 total air passenger miles have more than doubled, as compared to a 45 percent increase in highway vehicle miles (passenger cars, taxis, and intracity buses) and a decline of 22 percent in rail passenger miles. This accelerated growth in air passenger activity has aggravated both airside and groundside capacity problems at most major airports.

The Groundside Transportation System

The groundside system, depicted in Figure 5 and 6, encompasses all travel links from the airport's access roads to the aircraft gates inside the terminal building. These links include the long-term and short-term parking areas; car rental pickup and return facilities; arrival and departure curbs; curbside baggage check-in and access and recirculation roadways. This presentation focuses on those components outside the terminal building.

Access System. All airports in the United States are accessible principally by highways. At the larger airports, limited access facilities, including freeways and expressways, have been provided for rapid transfer of people and goods between the air terminal and the urban area. The availability of limited-access roadways is necessary to serve large traffic volumes generated by a major airports. A major airport generates 0.9 to 1.3 vehicles (entering plus exiting the airport) for every passenger (originating plus terminating) as shown in Table 2. Recent surveys at Dallas/Ft. Worth Airport indicated 77 percent of the originating passengers arrived at the Airport in rental or private cars. Data gathered at Miami International, Denver-Stapleton, LaGuardia, and Kennedy International's American and United Terminals, presented in Table 3 confirm that over three-fourths of air passengers arrive in automobiles or taxis. The major variation occurs at LaGuardia, where about half of all passengers arrive in taxis. These facilities also serve urban travel requirements for the surrounding communities, and many are now operating beyond practical capacity. Peak-hour airport traffic characteristically overlaps with other peak-hour urban traffic, compounding congestion and delay on roads that serve the airports.

As the anticipated growth in passenger and goods movement by air is realized, however, it may become necessary to plan several highway systems to keep employee and goods vehicles segregated from air passenger vehicles. This has been accomplished as Dallas/Ft. Worth and New Jeddah International Airports, among others.

In a few cases, rail services also provide direct access to major airports. Some airport planners are now incorporating transit systems into existing and proposed airports to help solve some of the passenger transportation requirements.

Curb Frontage. The transfer of passengers from vehicles to the terminal (the basic purpose of an airport groundside system) occurs primarily at the curb. Within the airport proper, authorities at larger airports have encouraged separation of arriving and departing passengers and dual or triple curbs to improve capacity. In some instances, such as LaGuardia, buses, taxis, and other transit vehicles are segregated from private vehicles. These measures tend to simplify vehicular movements, optimize capacity at the terminal areas, and provide preferential treatment for high-occupancy vehicles.

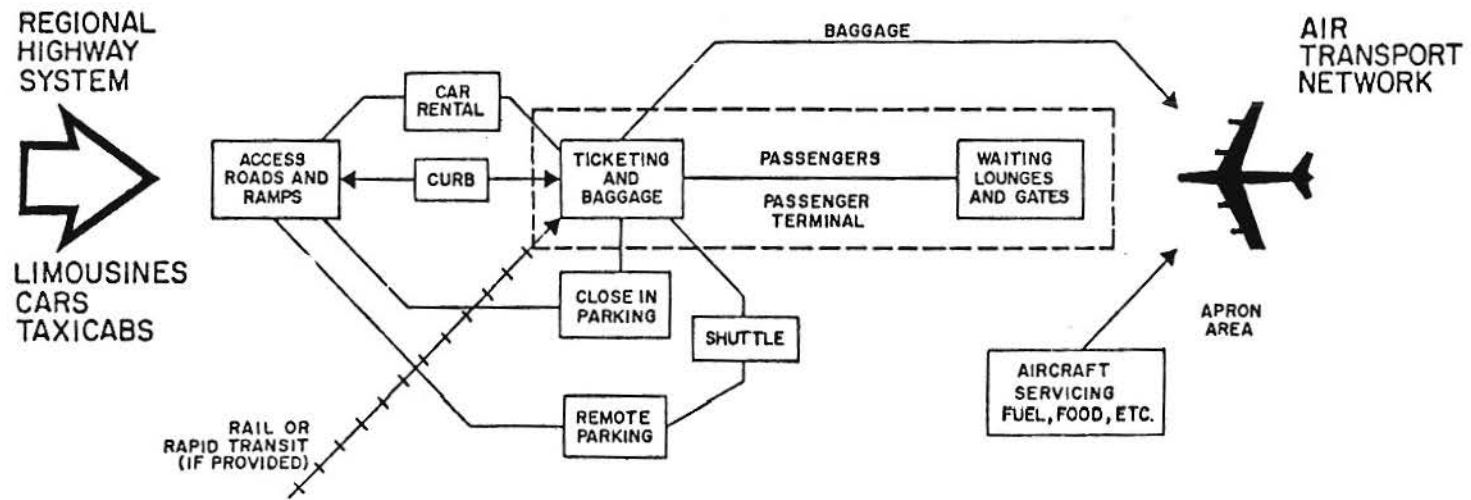


FIGURE 5. LANDSIDE BOUNDARY ELEMENTS

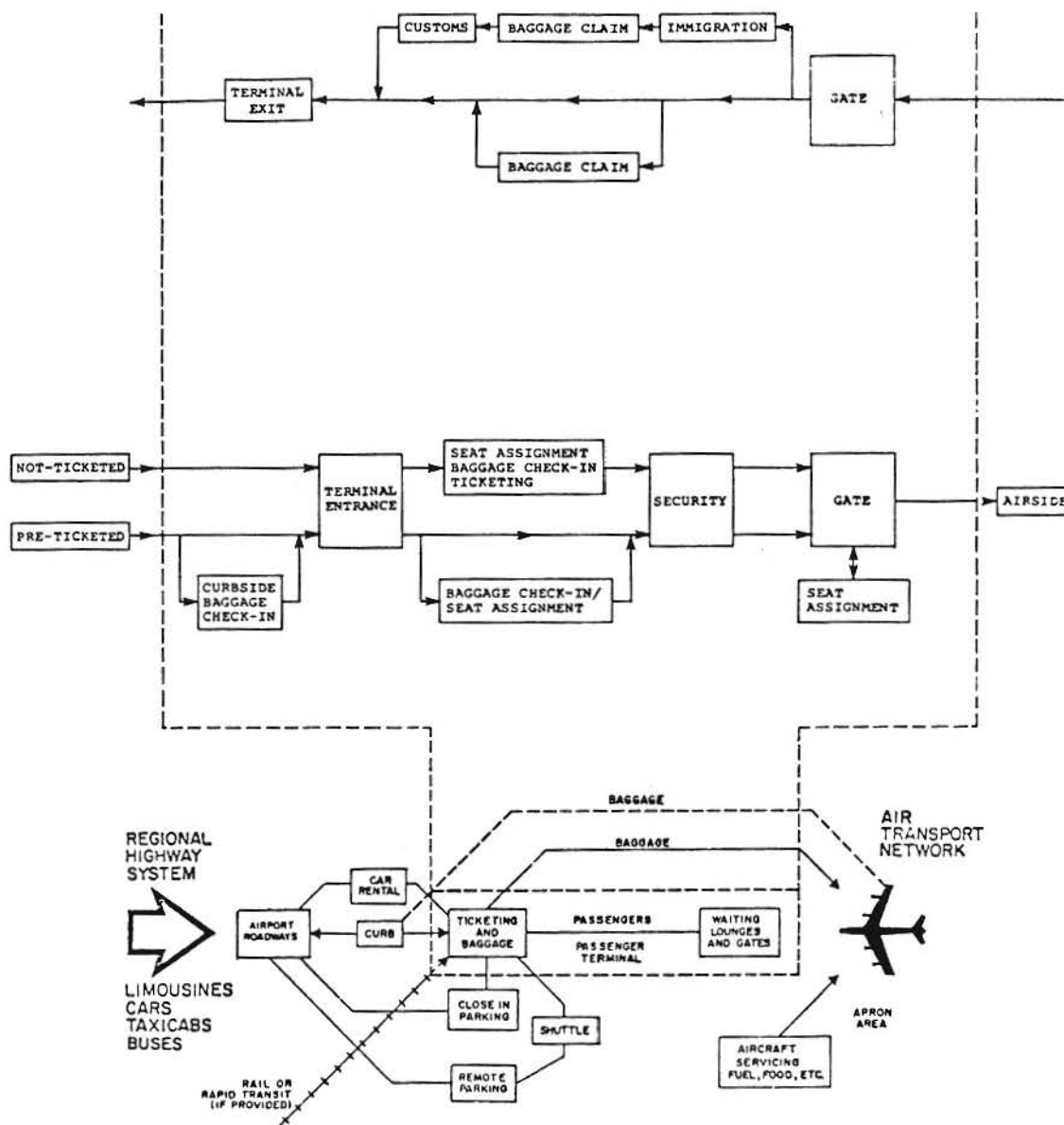


FIGURE 6. PASSENGER FLOW CHART

TABLE 2
OBSERVED AIRPORT TRAFFIC GENERATION RELATIONSHIPS
(Miami, Denver, LaGuardia, JFK Airports)

Planning Ratios	Passenger Type	Ratio of Passengers Versus Total Vehicles at Entrance and Exit		
		MIA ^a	DEN ^a	LGA ^a
Ratio of Total Vehicles Entering Airport Versus:	Originating Passengers ^b	0.87	1.34	1.02
	Total Passengers ^b	0.43	0.69	0.56
Ratio of Total Vehicles Exiting Airport Versus:	Deplaning Passengers ^b	0.93	1.26	0.99
	Total Passengers ^b	0.48	0.61	0.45
Ratio of Total Vehicles Entering and Exiting Airport Versus:	Originating Passengers ^b	1.84	2.54	1.83
	Deplaning Passengers ^b	1.75	2.70	2.18
	Combined Total ^b	0.90	1.30	1.00

^aBased upon six-hour surveys conducted by Wilbur Smith and Associates at MIA, March 17 and 18, 1978; DEN, April 20 and 21, 1978; LGA, May 24 and 25, 1978; and AA/JFK, January 27, 1978.

^bExcludes transfer passengers.

TABLE 3
 AVERAGE OBSERVED MODAL CHOICE PATTERNS
 (Miami, Danver, LaGuardia, JFK Airports)

Emplaning Passengers ^a	Mode of Arrival			
	Percent			
	MIA ^b	DEN ^b	IGA ^b	AA/JFK ^b
Private Auto	42	56	25	46
Car Rental/Bus	11	14	9	3
Taxi	22	13	46	35
Airport Limousine	10	5	13	7
Bus	15	3	5	9
Other	—	9	2	—
Total	100	100	100	100

Deplaning Passengers ^a	Mode of Departure			
	Percent			
	MIA ^b	DEN ^b	IGA ^b	AA/JFK ^b
Private Auto	47	70	31	47
Car Rental/Bus	20	8	4	2
Taxi	18	10	35	37
Airport Limousine	10	5	20	5
Bus	5	5	5	9
Other	—	2	5	—
Total	100	100	100	100

^a Excludes transfer passengers.

^b Based upon six-hour surveys conducted by Wilbur Smith and Associates at MIA, March 17 and 18, 1978; DEN, April 20 and 21, 1978; IGA, May 25, 1978; and AA/JFK, January 27, 1978.

The factors which influence curb frontage area capacities are the distribution of modes (automobile, taxi, rental car, bus and airport bus/limousine) and the time each vehicle spends at the curb. Obviously, reduced dwell times will result in more vehicles using a space in a given time period (turnover), and increase the productivity of the curb. As shown in Table 4, unloading/loading times at a curb are fairly constant for any mode (0.6-1.3 minutes for autos, for example), while the total dwell time varies considerable (1.2-3.0 minutes). This variation is the result of the level of enforcement of parking/loading regulations at the curb. Proper enforcement results in more productive curb usage. As over half of all passengers use the curb, this increase productivity is needed.

Parking. All airports have off-street parking for passengers, visitors, and airport employees, the latter group usually accommodated in more remote parking lots. Parking meter and ticket-cashier operations are prevalent, with the larger number of spaces being allocated to long-term parkers. The airport passenger who drives his car desires to find a space and to leave the vehicle parked as quickly and conveniently as possible in order to meet arriving or departing aircraft schedules. This generates the need for a maximum number of spaces convenient to the terminal buildings. Fast access between the passenger's car and airplane loading areas has been propounded to reduce travel time between parking spaces and terminal buildings. Passengers perceive the level of service as the time required to find an empty stall, to park, and to travel to the terminal. Remote lots provide a lower service level due to the extra time required.

Three types of airport parking are required. Long-term or remote parking serves passengers leaving their cars for 24 hours or more. At many airports, shuttle buses or, in some instances, people-movers are needed to travel from these parking lots to the terminal building. Close-in parking located near the central terminal area is designed to serve persons returning the same day. Vehicles are normally parked from 2 to 24 hours at these premium priced facilities. Short-term parking, of two hours or less, serves meters, well-wishers, or persons picking up or dropping off air passengers. Short-term lots are those closest to the terminal and should be priced to discourage close-in parkers from using these spaces. The proportion of parking allocated to each facility is dependent upon the type of passenger served by the airport. Business-oriented airports need more close-in and less remote parking, for example.

What are the Problems?

Previous studies have indicated there are four prime issues in landside planning for airports (see Figure 7):

1. Origins of trips from home or work to the airport are too dispersed in urban areas to justify either rapid transit corridors or other main-line investments to facilitate trips between home or work and the airport. This makes it necessary to use private, semi-public, or public vehicles on the road system to effect the linkage, which further adds to demands for more and better highways.

TABLE 4
COMPARISON OF MEAN VEHICLE UNLOADING/LOADING AND DWELL TIMES
(Miami, Denver, LaGuardia and JFK Airports)

Departure Curb	Miami		Denver		LeGuardia		Am. Airlines Term/JFK	
	Unloading/ Loading Time (Minutes)	Dwell ^a Time	Unloading/ Loading Time (Minutes)	Dwell Time	Unloading/ Loading Time (Minutes)	Dwell Time	Unloading/ Loading Time (Minutes)	Dwell Time
Auto	1.3	3.0	1.0	2.3	0.6	1.2	1.2	2.5
Taxi	1.0	3.0	0.7	1.2	0.5	1.1	0.8	1.3
Bus	1.3	2.9	0.8	1.8	0.7	2.2	1.3	1.7
Limousine	1.0	1.7	0.6	1.3	0.5	1.3	1.7	2.6
Other	0.9	1.5	0.6	0.7	0.4	1.2	0.7	1.0
Total Average	1.2	2.6	0.9	1.9	0.5	1.4	1.1	2.0
<u>Arrival Curb</u>								
Auto	2.8	4.3	2.9	4.2	1.2	2.4	1.6	3.3
Taxi	0.9	NA ^b	1.0	NA	0.3	NA	0.0	NA
Bus	2.9	3.5	2.6	3.2	1.2	1.6	1.2	1.7
Limousine	--	--	--	--	3.8	4.5	2.5	4.4
Other	0.5	1.5	--	--	--	--	1.0	1.5
Total Average	2.0	3.9	2.7	3.9	1.9	2.4	1.5	3.0

^aDwell time is equal to the difference between the time the vehicle stops at the curb and the time the vehicle departs from the curb.

^bNA = Not applicable.

SOURCE: Based upon six-hour surveys conducted by Wilbur Smith and Associates at MIA, March 17 and 18, 1978; DEN, April 20 and 21, 1978; LGA, May 24 and 25, 1978; and AA/JFK, January 27, 1978.

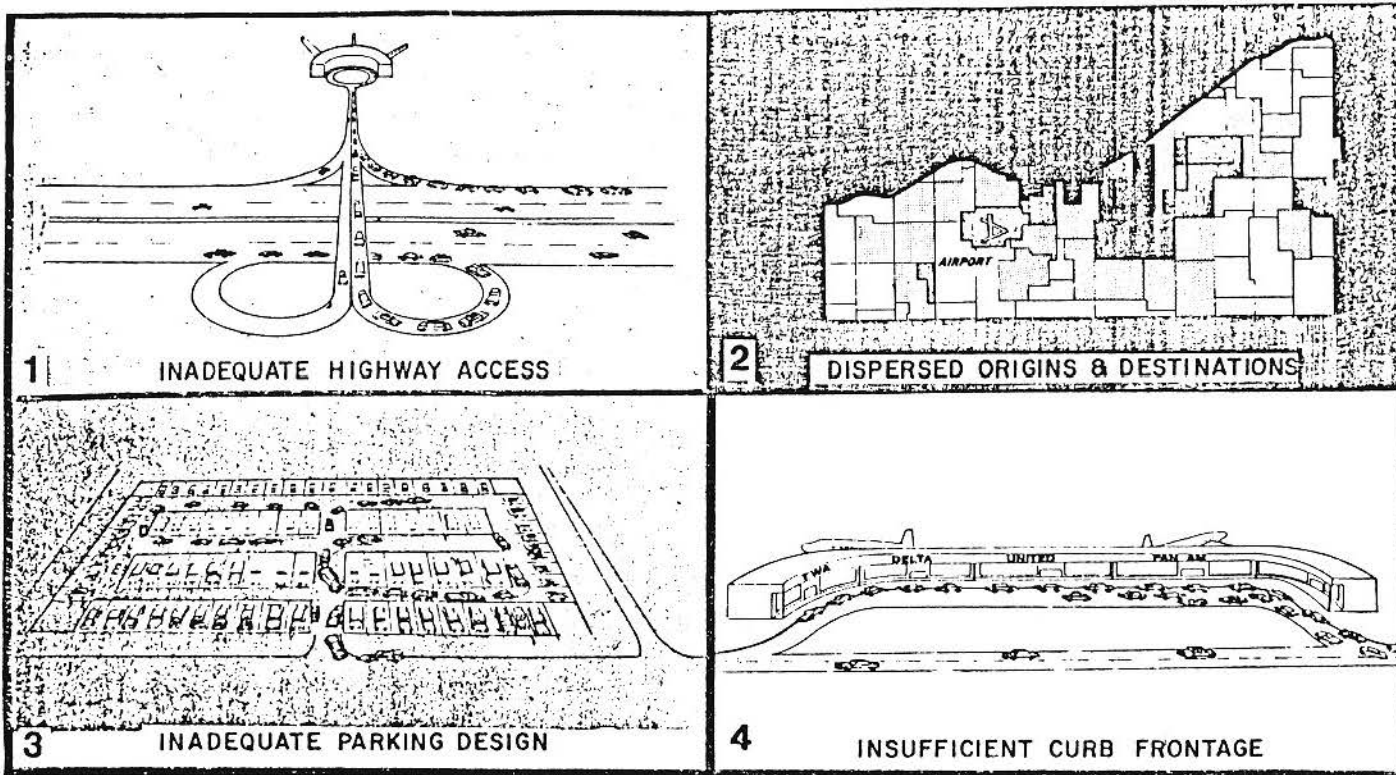


FIGURE 7. MAJOR REASONS FOR AIRPORT GROUND DELAYS

2. Limited availability or intensive use of primary or secondary access routes to most airports placed substantial demand on a single road system. This adds to the congestion and delay problems during periods of peak airport use and when airport peaks coincide with journey-to-work trips. These problems are exacerbated as the air passenger expects a higher level of service than the normal weekday commuter.
3. Too much parking has been placed in the central terminal area in relation to the airport roadway capacity to adequately serve these demands. This further increases congestion and confusion in the central terminal area.
4. Too much vehicular activity is concentrated on or near enplaning and deplaning curbs in the terminal area. Curb frontage is perhaps the most precious real estate at any airport terminal facility because of this great need.

Additionally, an ad hoc working group, working with the U.S. Department of Transportation, identified seven further concerns which contribute to the access problems at airports. These are:

1. Physical elements of airport layout, including roadway design, signing, location of parking, and curb space. All contribute to airport congestion.
2. Lack of intermodal coordination. In many instances, off-airport transportation officials, airport managers, and airline officials do not consult each other about changes and plans.
3. Peaking of airline activity. Air passengers usually want to start and end their trips during peak travel periods. This contributes to the off-airport congestion.
4. Visitors waiting to pick up passengers. Visitors represent about one-third of airport traffic. The airplanes are delayed, waiting vehicles begin to accumulate.
5. Large non-passenger population. Two-thirds of the airport traffic comes from visitors and airport-related employees.
6. Baggage handling. Moving baggage from automobile to check-in points causes delay to automobiles. Lack of curbside baggage handlers or inadequate curb space contributes to congestion.

7. Proximity to major urban arterials. Most airports are near heavily traveled roads used mostly for non-airport related travel. When these roads congest, trips to the airport are slowed down as well.

Factors Influencing Ground Transportation Systems

The operation and capacity of the components of the ground transportation system are related to several factors. The basic components of the groundside transportation systems include the regional/local roadways (including the primary and secondary roadways serving the airport) and the on-site roadways at the airport (including the terminal, circulation, and parking access roadways). Other components include the curb frontage areas, including both the arrival and departure curbs, and the parking areas. Parking areas have been divided into long-term or remote parking, (Primarily serving vehicles parked for 24 hours or longer); close-in parking (serving vehicles parked for between 2 to 24 hours); and, short-term parking (primarily serving visitors with parking durations of less than 2 hours). As shown in Figure 8, altering any of the factors which influence the system components may increase or decrease the service level, capacity, or demand of the ground transportation system.

The basic factors influencing the ground transportation system include the type of the air travel (domestic, international, or commuter), the type of air passenger (business, vacation, transfer passenger), the availability of off-site processing, the productivity of the curb frontage area, the airside capacity, the number of airport employees, and the amount of goods, cargo and service trips generated by the airport. For example, curb frontage requirements at airports serving a proportionally larger segment of international air travel, such as Kennedy International, or Miami International, are increased compared to a "typical" airport, while the need for short-term parking may be reduced. This is because, as international passengers typically have more baggage per passenger, they require more time to unload/load at the curb frontage areas. However, international air travel durations are generally of one day or longer, reducing the demand for close-in parking.

As scheduled airlines develop more routes feeding a central hub airport ("hub" and "spoke" route arrangements), the role of commuter airlines is expected to increase. At airports which serve a significant segment of commuter travel, such as Philadelphia International, requirements for long-term remote parking are reduced proportionally. This is because of the higher proportion of business travel and shorter parking durations associated with commuter air travel.

Airports serving higher proportions of business travelers, such as LaGuardia Airport, need more close-in parking than airports serving significant volumes of recreation and vacation passengers, such as Miami International. Recreation passengers generate more long-term parking and require more curb frontage capacity than business travelers. Although they are less likely to use a high-cost, close in parking area, they will, however, also generate more well-wishers and meeters who will use short-term parking. These differences are reflected in the range of planning criteria presented in Table 5. The larger curb frontage traffic and pedestrian volumes are due to international and recreational passengers.

INFLUENCING FACTORS	COMPONENTS OF THE GROUNDSIDE TRANSPORTATION SYSTEM					
	REGIONAL ROADWAY	ON-SITE AIRPORT ROADWAYS	PARKING REQUIREMENTS			CURB FRONTAGE
			LONG-TERM	SHORT-TERM (0-2 HOURS)	CLOSE-IN	
TYPE OF ORIGINATING AIR TRAVEL						
Domestic	○	○	○	○	●	○
International	○	●	●	●	⊗	●
Commuter	○	○	⊗	○	●	⊗
TYPE OF PASSENGER						
Business Traveler	●	○	⊗	○	●	⊗
Recreation/Social	○	●	●	●	○	●
Transfer	⊗	⊗	⊗	⊗	⊗	⊗
OFF-SITE PROCESSING						
Remote/Community Park-and-Ride Satellite Terminals	⊗	⊗	⊗	⊗	⊗	⊗
ENFORCEMENT OF CURB FRONTAGE						
INCREASE AIRCRAFT CAPACITY	○	○	○	●	●	⊗
EMPLOYEES	●	●	○	○	○	○
SERVICE AND GOALS/AIR CARGO	●	●	○	○	○	○

- Increases Requirement.
- ⊗ Decreases Requirement.
- No Appreciable Change.

FIGURE 8. FACTORS INFLUENCING AIRPORT GROUNDSIDE TRANSPORTATION SYSTEMS

TABLE 5
SUGGESTED PLANNING CRITERIA FOR TRAFFIC AND PEDESTRIANS

Item	Ratio per Passenger ^a		Total
	Originating	Deplaning	
Airport Traffic:			
Entering Vehicles	0.90-1.35	—	0.45-0.70
Exiting Vehicles	—	0.95-1.25	0.45-0.65
Total Vehicles	1.85-2.55	1.75-2.70	0.90-1.25^b
Curb Frontage Roadways Traffic:			
Enplaning	0.50-0.55^c	—	—
Deplaning	—	0.50-0.55^c	—
Pedestrian Volume:			
Entering Terminal	1.50-2.00	—	—
Exiting Terminal	—	1.50-2.20	—
Total Pedestrians	—	—	1.50-2.10^d

^aExcludes transfer passengers.

^bMaximum values reflect the predominance of courtesy-type vehicles.

^cCommuter-type airports 1.50, International airports 2.10.

^dAt individual terminals within a major airport increase value to 0.65-0.70.

Boldface = Recommended values.

Measures which have been applied at airports to reduce groundside transportation needs include off-site processing (such as has been introduced at St. Gallens in Zurich, at the Victoria Station in London, and at the East Side Airline Terminal in New York City), the provision of park-and-ride lots at remote locations, and peripheral parking lots (such as those provided at Los Angeles International Airport). Several cities have proposed connecting the central business district with the airport by way of a rapid transit link, including Philadelphia, JFK, and others. Rapid rail service is already in operation at Cleveland-Hopkins and London-Heathrow. Kennedy International has the JFK Express, a combination subway-bus operation from Manhattan to the terminal building. At Washington National, the Washington Metro service connects to the terminal via a shuttle bus. A Flyaway Express bus was initiated at Los Angeles in July 1975, serving over 300,000 passengers annually from a parking lot located 20 miles away. These rapid transit systems and express bus systems attract airport employees as well as air passengers and, thus, reduce the total airport traffic demands.

The most critical area of the airport ground transportation system is typically the curbside arrival and departure roadways. An efficient method of improving the capacity of these facilities is strict enforcement of the time vehicles spend at the curbs. Several airports (i.e., Dallas/Ft. Worth) have a strict tow policy for vehicles parked longer than a prescribed time period (5 minutes or longer). However, jurisdictional problems at other airports reduce the effectiveness of the curb dwell-time enforcement policies. Other measures of improving curb frontage capacity which have been tried include remote curbs, such as those provided within the central terminal area parking garage at LaGuardia Airport. However, at LaGuardia, this curb has not been well-accepted by the public, possibly because of the lack of airline check-in or baggage handling accommodations within the garage.

It appears that certain airports (Atlanta, Dallas/Ft. Worth, Memphis, Kansas City, and St. Louis) will attract a greater proportion of transfer passengers. This will result in substantial airside passenger growth without corresponding growth in groundside demand at these hub airports.

Future Airport Planning Considerations

We have taken this opportunity to do some crystal-ball forecasts of possible changes in airport activities. Based upon these changes, we have estimated the possible impact these future activities may have upon airport ground transportation systems, as presented in Figure 9. The proportion of transfer passengers should increase at major hub airports but, due to increased connecting passengers, the volume of groundside traffic will not increase as rapidly as the volume of air passengers served at a few of the major airports. At airports with unit terminals, transfer passenger volumes may also have an impact on airport roadways systems, since movements from one terminal building to another may require passengers to use the same roadways as arriving and departing passengers.

CHANGES IN AIRPORT ACTIVITY

- Increase In Transfer Passengers
- Automobiles Will Constitute A Small Proportion of Airport Traffic
- More Traffic At Commuter Terminals
- More Peak-Period Traffic (Due to Spoke-Hub Schedules)
- More Remote/Community Park-and-Ride Lots
- More Limousine-Transit, High-Occupancy Vehicle Service
- More Potential for Off-Site Processing/Grouping of Passengers

CAUSES

- Increased Costs
- Deregulation (More Common)
- Few New Airports - Limited Expansion
- Increase Aircraft Capacity
- Regional Access Limitations to Airports
- Energy Limitations-Cost
- Limited Peak-Hour Airside Capacity
- Environmental Constraints

FIGURE 9. FUTURE AIRPORT PLANNING CONSIDERATIONS

Commuter Operations. This trend toward "hub and spoke" routes will provide continued opportunities for commuter airlines. At many airports, these airlines (especially those using aircraft seating 30 passengers or less) are served at remote or smaller terminals or separate sections of existing terminal buildings. As passenger volumes accommodated by these carriers increase, the major carriers may possibly share their gates and terminal areas with the commuter airlines to attract the commuter passengers to their systems. This will add traffic links already near or over capacity.

Improving Existing System. In terms of airport access, first, it is likely automobiles will still form a major proportion of airport traffic; however, we believe that the private vehicle will constitute a smaller share of the total traffic. Second, due to financial, environmental, and other constraints, it is likely few new major airports will be constructed within the forthcoming years. As the airlines introduce more wide-body aircraft, such as the Boeing 757 and 767, and as further advances are made in improving airside capacity, the imbalance between the airport's airside and groundside capacities will increase in favor of the airside segments. It is likely future groundside expansions will tend toward rehabilitation and improvements of existing facilities rather than construction of new airports. This is what has occurred at Atlanta-Hartsfield and is occurring presently at Miami International and Los Angeles.

High-Occupancy Vehicles. As airside traffic continues to grow to accommodate the passengers, airports may have to encourage the arrival of passengers in high-occupancy vehicles, rather than single passenger automobiles, in order to make better use of existing roadway capacities. Consequently, we believe in the long range that airports will encourage more limousine, transit, and high-occupancy vehicle service. Airports and airlines may also promote off-site processing of air passengers, which appears to be workable in certain high-density corridors. This may consist of grouping passengers destined for the same flight or airlines in vehicles at an off-site processing location or at a remote park-and-ride lot.

Another factor which appears likely is the "deglamorization" of airline travel. Twenty years ago, flying was still a fairly novel experience for many. Today, however, it is an accepted form of travel or, in some instances, the only realistic form of travel between certain origins and destinations. A greater proportion of the American population is familiar with planes, and with flying. It is increasingly rare to find adults who have never flown. Additionally, the increased competition between airlines has forced the curtailment of services once provided aboard air carriers. This reduction in service, compounded with the increased familiarity of air travel, suggests that in the future, air travel and airports may be considered less glamorous than previously. In the future, air travel may be considered a basic form of transportation, perhaps more utilitarian than previously. Examples of this are the no-service shuttle service operations, the acceptance of Skytrain and other budget, low-service operations.

It is not certain at this point how this factor will affect the ground transportation systems. One possibility is for a greater acceptance of transit service at airports as passengers become more accustomed to not being coddled, but who still require convenient, comfortable, and reliable transportation to and from the airport. Another impact may be that passengers will reduce the time they spend in the terminals; in and out as quickly as possible may become the order of the day.

These changes are compounded by the uncertainty associated with the future cost and availability of gas and other energy sources. What impact will these energy sources have upon airline operations or groundside travel patterns? Surveys we have conducted recently all tend to confirm that over 70 percent of employees, businessmen, and travelers have made changes from the time gasoline cost \$.75 a gallon, and most indicate they plan no further changes, even if gas should cost \$3.00 per gallon.

Conclusion

As airline passenger traffic grows and the groundside transportation system facilities remain relatively constrained, there will be greater requirement to improve existing ground access systems to accommodate passengers arriving and departing from the major airports. Facilitating this traffic will require not only effective use of existing facilities and effective management of existing groundside facilities, but also imaginative use of future facilities.

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"Common Curbside Problems at U.S. Airports"

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I had better take the opportunity while I have the podium to make some remarks that are in response to some of the things mentioned this morning. First of which is that when I was packing yesterday, I thought I had packed enough for three days attire. However, one of those included some plaid pants, so I guess I'm one day short.

The other thing is one's past comes back to haunt him apparently. Some remarks were made this morning about the establishment of the mass transit service and the train-to-plane facility. You are looking at one of several planners who was developing that concept in New York City about a dozen years ago. Before I become tarred and feathered by this group, let me assure you that for those of us who planned and envisioned it, it turned out to be two particularly unique things—separate unique things—so we'll let that one ride.

There was another comment made this morning by Bill Well about the situation at the Biltmore Hotel. I know that many of us here are concerned about what we consider unnecessary competition. Basically, in the long run, if there is too much competition in our industry in certain areas, it's the general public that is going to suffer. If you have certain fixed number of people who are going to be served and you have one provider, that's one thing; if you have 20 providers, your cost of operation isn't going to decrease. Competition in the sense in effect is going to make a number of companies go out of business. And the loser in the long run is the general public. Anyway, so much for my editorial comments on that.

I would like to speak about design considerations for airports—not in a general sense that was discussed this morning by Terry, but some way more specifically about how it effects the operator and what perception the operator has in this matter. I'm trying to think of what is really needed in terms of planning for airports. My conclusion is what the airports need is a good family doctor. I know this sounds a little bit absurd, but think about it. This is a person who is a general practitioner, and whether it was taking out your tonsils, delivering a baby, or treating a bad cold, the family doctor knew enough to take care of it all. He or she practiced comprehensive medicine. Today, however, we live in a world of specialists. For example, if you go to your doctor and you want to lose weight, all of a sudden you're sent to a nutritionist. It goes on and on like that. Certainly there is nothing wrong with specialization as long as the basics are not forgotten.

I feel that medicine doesn't have a monopoly on over specialization. This is particularly true of airport planning. For example, so much attention is given to design criteria of roadways and control towers that the original purpose of an airport—to facilitate the movement of people and goods—is often an afterthought. To correct this situation, we need a general practitioner, one who practices comprehensive transportation planning.

Let's examine some key areas to be addressed by such a person. When so much attention of airport planning is directed to air travel itself, planners frequently forget how to get passengers into and out of airports. When they do remember, they make a major assumption, that is that 90 percent of the people will use their private automobiles. It's my contention, as I think it is to most of you here in this room, that this is a self-fulfilling prophesy. If you design airports to be accessible only by car, the only practical way of getting there is by car. Ironically, many airports are constrained in the number of passengers they can accommodate, not by size, available air space, or numbers of runways, but by inadequate or badly designed roadways. Two possible solutions to this problem are to restrict automobile parking at the terminal areas and to provide traffic lanes nearest the terminal buildings for exclusive use of high-occupancy vehicles.

I'm happy to say that in L.A. this is going to come to fruition in the next few years. Right now there are some considerable problems in ground access. A second local roadway is being constructed, and it is being designed with high-occupancy vehicle exclusive lanes near the passenger terminals. Even here, however, a problem exists in that legitimate mass transit providers themselves must compete for limited curb space.

Several steps can be taken to dissolve these issues, from both design and procedural approaches. First, vehicle curbspace must be separated into functions. Areas must be designated for intercity and transit buses, taxis, hotel and car rental vans, and limousines. Another point that was made this morning is that you do have problems with limousines. I don't know whether any of us really have an answer to it, but it's a problem that should be addressed by airport planning, because there is a legitimate function to them. The way it's handled right now is obviously posing all sorts of problems.

Second, adequate holding areas either immediately adjacent to or actually in central terminal areas must be established. At L.A. International Airport, Century Boulevard becomes World Way and World Way is a horseshoe shaped roadway going through the airport. The holding areas for buses and taxis are at the designated points. The problem is, however, that when a 747 lands and discharges all of its passengers, all of a sudden you have to dispatch 20 to 30 taxis at one time, or you have to dispatch 2 or 3 buses for one particular trip as Airport Service does. We have, as part of our certificate, a person who is prepared and ready to board at the scheduled departure time to accommodate the passengers. That means that if there are 60 passengers, and we have a 53-passenger bus, we are sending out a second bus for those extra people. And in order to do this, you have to have something close by. Right now it takes us about five minutes to get from that holding area, and we're going to be moving from that holding area when the second level roadway begins constructions, which means between four and five more minutes. . . . From a practical point of view, in terms of the most good for the most number of people, it will be a lot more easy to have these holding areas in the central terminal area itself. In this manner, a large number of cabs, vans, and buses can be dispatched quickly. Unneeded vehicles wait at the holding areas right now rather than laying over at precious curb space waiting for patrons while other vehicles are unable to stop. The dispatch office the airport has at this holding area sends out those buses.

Third, multi-purpose ticket booths at convenient locations throughout an airport provide numerous advantages to transportation users and providers alike. At L.A. you have the JAGTA. It's a joint airline ground transportation association ticket booth which serves not only Airport Services but also four other transit providers. A lot of advantages can be gotten by the utilization of these booths. For example, announcements of departing buses of many companies assist passengers in making their connections and the sale of their tickets

reduces potential problems in cash fare handling and speeds the loading of buses. The less time required at the curb, the more vehicles can be accommodated in the same place.

Fourth, airport regulations can encourage maximum utilization from resources—another point that Bob Davidson made before. At most airports, even at L.A., you can observe about five or six passengers being accommodated on a 40-foot advance design bus operated by one rental car agency. But if one large 40-foot bus is operated by the airport itself, it can pick up and drop off patrons of all car rental agencies. This is better than having five separate 10-passenger vans with five separate drivers serving five separate car rental companies which in turn have to establish five separate fleet maintenance facilities. We would have the net result of reduction in cost, fuel consumption, traffic congestion and potential safety liabilities, and we would have savings of curb space, all of which would far outweigh the limited publicity advantages to the individual operators.

As a further step, consideration may be given to establishing centralized car rental sites from which many competing agencies can operate as opposed to scattered locations within and near the airport itself. This concept is just a logical extension of existing placement of car rental reservation desks which are often immediately next to one another in baggage claim areas. Keep in mind that when a person makes his or her reservation, that person has a ready-made commitment to which car rental company they are going to be taking. So it doesn't really make any difference whether they are taking individual vans or one bus to their car rental site.

Fifth, pedestrian amenities must be considered. Wide unobstructed and weather-protected sidewalks permit faster and more convenient movement of passengers, particularly those who have to carry luggage. Proper signage is essential; confusing visual clutter can be reduced by the utilization of internationally understood symbols. These signs should be repeated frequently so that passengers can maintain their orientation. Signing is a real shortcoming which many of the ground transportation operators feel exists at L.A.

Moreover, an airport that is designed to be barrier-free does not simply help the very limited number of handicapped people. It actually aids all travellers. A luggage cart also has an advantage at a drop curb designed for the handicapped. Studies have shown that, when designing and creating a facility, the various amenities for the handicapped will only increase your construction cost by about one percent. The wide sidewalks are also a help to the non-handicapped. Things like that are not really burdens, they actually help.

Two other less visible areas also should be addressed. First, airports must be concerned with the movement of goods as well as passengers. The small package express industry is growing rapidly. Unlike traditional air cargo which is boxed in crates, small packages are not readily handled at air freight terminals. But present loading and unloading of such items at terminals intended for passengers take precious curb space needed by others. The establishment of separate small package facilities could assist not only with passenger ground carriers but also airline and express package industries. Finally, there is a matter of transportation for airline personnel. Many carriers operate or contract for buses or vans to shuttle their flight crews quickly from one airport to the other. If the shuttle vehicles use passenger terminal curb space, traffic congestion may result. If the same vehicles are directed behind the terminals, however, they frequently compete with fuel or luggage trucks, jet ways or even taxing airplanes. Separate facilities for such vehicles or special corridors for flight crews to reach these shuttle vans are two possible solutions to these growing problems.

These are some of the factors that the general practitioner of airport planning must consider. If these problems are not addressed in a comprehensive rather than piecemeal fashion, it makes little sense to spend five hours flying across the continent only to spend another five getting out of the airport. . .

I would like to direct you to two things if you are interested in additional information on the signing. First, there's a study done by the U.S. Department of Transportation on symbol signs that are passenger/pedestrian oriented for use in transportation and related facilities. It's a long title, but you can pick this up for relatively small cost. They make some recommendations on the types of symbols that can be used. Airport Service, for example, has utilized this symbol on its own bus stop signs. The other publication that I'm going to direct you to is a book that was written several years ago by Dr. John Fruin, Pedestrian Planning and Design, which takes into account a lot of things we often forget about.

A second afterthought concerns barrier-free and clutter-free sidewalks. Now if we could move the pedestrians faster, we could also move the buses in and out of the airport a lot faster. This would make our jobs a lot easier to all of us.

Participant Questions:

Question: Davidson, this morning, eluded to a figure of 12-1/2 percent gross of your growth. Is that passengers both in and out of the airport?

Answer: No, it's passengers leaving the airport. Most of our passengers don't pay a cash fare leaving the airport because the ticket booths are there. However, if the ticket booth is closed, the driver can collect a cash fare. We also accept vouchers from travel agencies, literally all over the world, as I'm sure many of you do. However, in our case, there is a graduated rate which will go from 12-1/2 percent to 15 percent to 17-1/2 percent. Airport Service is such a major operator that it pays 15 percent, not 12-1/2. The figure that Mr. Davidson quoted you today was several hundred thousand dollars, close to a million dollars. I suppose many of you might have taken this implying that this is just a drop in the bucket. Believe me, it's not just a drop in the bucket. Airport Service pays about, I would say, 85 percent of that total money, but that's our cost of doing business and we accept that.

However, what we do object to are problems which I'm sure are multiplying in your areas, and they are with what we call the air bandit or hustler cabs, and it really gives a bad taste in the travellers mouth in any area where these people are taken literally for a ride. To get from the airport to downtown L.A. on an Airport Service bus costs \$3.10. If you want to take a cab, it'll cost you about \$20. These hustlers are soliciting—illegally soliciting—patrons just as soon as they step out of the baggage claim area, usually unsuspecting patrons such as foreign travellers who have a hard time using the language. We have had reports of people being charged anywhere from \$60 to \$400 to get from the airport to downtown. Even putting aside the business that they may siphon off from operators like Airport Service or your own, it has this negative impact in terms of whether that person is ever going to want to come to your area again. It's siphoning off many from legitimate cab operators who are waiting there in line in rotation order to get their fares, and their fares are also being robbed. It's a big problem; it's an enforcement problem, and one which we have been working very closely with the FUC, the Department of Airports and the L.A. Police Department to resolve with some success. In that particular consideration, it's more than a design consideration; it's a planning consideration. It's an important problem, and I don't know exactly how to solve it.

In a typical baggage claim area at L.A. airport, right above the baggage claim, is a sign that shows the symbols of all authorized taxis operating, and there is a sign warning people not to take any other taxi except the ones displayed on the sign. I don't know if any more than one percent of the people who go into and out of the airport ever see that sign. I have a company that operates 320 trips into and out of the airport every day, and even I didn't see these signs until they were pointed out to me. It's one of these things that could be of great assistance in avoiding a problem like this. And something that could be remedied easily is to get those type of signs posted right by the exit doors rather than in some small obscure area.

Question: Do you favor Public Address Announcements for ground transportation?

Answer: In terms of PA announcements, I think that there is enough. I think the airlines think that there may be enough noise clutter as it is in announcing the flight departures or the arrivals and in calling for people to pick up courtesy vehicles. I think they may be a little reluctant to do that. In the bulk of airports, once you get outside of the buildings, recorded announcements are repeated on the PA systems to advise people of the fact that parking is limited to loading and unloading of passengers only at curbside. This, however, doesn't help direct people to legitimate operators and to using more efficient transportation. We have tried to take several steps. For example, Airport Service tries to have as many of its fares as possible on a ticket rather than cash fare basis. We operate out of two counties, Los Angeles and Orange, which, for those of you who are from back East, may take up as much space as several eastern states. We operate out of these two counties. We have our sales staff. We actually have a sales staff that goes to travel agencies to try to sell these tickets and to have out schedules there. We also try to have a ticket outlet with our schedules where we stop.

In addition, our sales staff has been responsible for making distribution of brochures that were printed up by the Southern California Association of Governments which show all major ground carriers in the metropolitan Los Angeles region. And these were called envelope stuffers! Perhaps tomorrow you can ask Irv Jones about that. We have tried to distribute them to airlines and to travel agencies so that people will be aware before they even get to the airport so that they have alternatives to renting of cars to having someone pick them up by car. Now I believe there were something like 15 or 20 ground carriers listed in those brochures. I don't know how much of an impact it has had, and obviously one company would not really be in a position to do that alone. But perhaps the Metropolitan Planning Organization, which is SCAG in the Southern California region, can help ground carriers like ourselves.

The Department of Airports, by the way, puts together a very nice color brochure which is labeled "All About LAX". Not only does it have a listing of the various ground carriers, but it also has photographs so that passengers can identify which color buses to look for. The problem is, however, that this is quite an expensive project, and it costs quite a bit of money to print up. Actually, any kind of joint promotional type of material like that can be of great assistance. If a passenger knows before hand that there are alternatives, you've got half the battle won.

Additional Reading

For additional information on topics covered in this presentation, the speaker recommends the following publications:

1. Pedestrian Planning and Design John J. Fruin, Metropolitan Association of Urban Designers and Environmental Planners, Inc. New York, New York, 1971.
2. Transportation and Traffic Engineering Handbook, The Institute of Traffic Engineers, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1976.
3. Symbol Signs—The Development of Passenger/Pedestrian Oriented Symbols for Use in Transportation-Related Facilities, prepared by The American Institute of Graphic Arts for the U.S. Department of Transportation, distributed by the National Technical Information Service of the U.S. Department of Commerce, 1974.
4. New York City Transit Authority Graphics Standards Manual, Unimark International Consultant Designers, New York, New York, 1970.

"Planning for Airport Access in Southern California"

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I've divided this into four parts, and I'll give a brief summary of what they are. I'd like to cover a few myths and realities regarding access planning. I'd then like to discuss some supply and demand statistics. I'll then get into a little description of the system's studies we're doing in the Southern California region. Finally, I'll give a real brief prognosis for what I think the future development will be in ground access to airports.

To start out with, one of the myths I think that airport planners and ground access planners have assumed in the past was that the speed of a flight had to be matched by speedy ground access. Another myth was that travelers leave for the airport from central business districts. The third myth was that air travelers really deserve better ground access and other services than other people traveling to other destinations. I think that, in my personal view, time—for instance, speed considerations—is important to travelers no doubt, but often not as important as cost. And my feeling about this is that, typically, the traveler expects to spend an hour on the ground or even longer to make that hour trip to San Francisco or, that two-hour trip to Denver because he is saving a really major amount of money by making the longer flight. The time that was spent going to the airport is not that valuable to him when he's going far away; he's also saving a lot of money in overnight accommodations and meals and other related costs. So the traveler on the ground has a very low monetary value in my kingdom. This is even more exaggerated for the vacationers or recreation travelers because their access to travel time has almost no value at all. It's not work time that they're spending; they wouldn't get paid for it anyway. And you can see that in terms of charter flights where people take very long waits at airports and very inconvenient conditions just to save some money on a vacation.

The second myth I talked about was travelers leaving from the central business district. The statistical information surveys we've done with Fly Away and LAX (Los Angeles International Airport) show that travelers mainly leave from place of residence, or their hotel, or place where they are staying overnight. They're not leaving from their office. And as we have seen on the bus system, a good portion of the travelers are employees. So that is something to consider also. Many passengers at the airport, certainly major hub airports, are connecting (about 27% at LAX) and they are not taking any ground access. There are some meeters and greeters going to the airport, and there are a lot of commercial vehicles.

For the third thing we mentioned, do air travelers deserve better service? I really think this is an equitable issue, and I don't really think that an air passenger does have the right to better accommodations on the ground or anywhere else. A person going anywhere in the region has just as good justifications for having good service as anybody going on an airplane. No special compensations are deserved. That's my own personal opinion.

The motivational issues here are really that the airport and airlines want people to get there, and the passengers and employees want to save time and money, but that isn't anything that is unique from the planner's perspective. So from our perspective, its very dangerous to predicate your decisions as to why your going to set up a certain systems with the main consideration being only time or only convenience or only cost. The object is to get the people to the airport on a cost-effective basis, and any planning effort must include the entire journey, and that is from the door of your home or hotel or office to the entrance to the airplane. It is not just, as I would say, from a certain part of the city to the airport. For example, a collective transport facility such as a satellite terminal at a remote location is only really cost-effective if you have a substantial traffic concentration in an area and where the airport is far away and/or difficult to reach.

At the airport, the shortages of parking or shortages of curb space may determine how a person will use the airport, that is, how they will strategize the trip to the airplane. It may be that the trip getting there is really determined by what they think is going to happen in that last half-mile between arrival and the airplane itself. And that is something that we should consider also.

Now into some of the supply and demand relationships. In the SCAG (Southern California Association of Governments) region, which includes counties of Los Angeles, Orange, Ventura, San Bernardino, Riverside and Imperial, we have approximately 11 million persons. It is a very large geographic region. And if you substracted Imperial County from that, the remainder comprises the standard metropolitan consolidated area which the Federal Government uses. You have the L.A. hub which serves all the persons in that region, and its roughly the same 11 million because Imperial County is a very sparsely populated county.

In our region, demand is very high, but the access facilities are rather static. They haven't been changing. The airport access facilities (by this I mean the central terminals area, the parking, etc.) are limited, and funds have been very limited. Access acts as a major constraint to this service.

We have six major existing airports—LAX, Ontario, Palmdale, Long Beach, Hollywood-Burbank (which is now called Burbank), Glendale-Pasadena and John Wayne (which is also known as Orange County Airport). On face value, this region looks fairly balanced. It looks like there should be enough airports there for everybody to get where they want to go. But due to constraints, primarily environmental constraints, John Wayne is limited to about 3.5 million annual passengers; Long Beach is serving less than 500,000; and Hollywood-Burbank is very limited, I think its just a couple of million. There is an imbalance between where the population is concentrated and where the supply airport seats are. What you have is LAX really soaking up most of the passengers in the region. There are 33 million passengers for LAX, and that's about it because the region only carried about 40 million altogether in 1980.

If you look at LAX, you see the imbalance in its system. Orange County, which does have an airport, is contributing over 23 percent of LAX's passenger traffic. There are 14 percent from the valley and 15 percent from downtown Glendale-Pasadena area. There again you do have Hollywood-Burbank, but it doesn't seem to do it. And LAX even gets passengers from San Bernardina, Covina, Long Beach, and Palos Verdes contributing another 22 percent. Right along the airport you're getting about 22 percent also. From a systems point of view, this is a major inefficiency in the system. You cannot go to the closest airport and get the flight you want.

The future is even more threatening in this area. On December 17, 1980, SCAG had an aviation forecast review session. We had representatives from major airlines, aircraft manufacturers, the FAA, Caltrans, ITS Berkeley, consultants, and airports. There was even a representative of one of the major three counter metric forecasting firms. We sat down and talked about what was the prognosis for aviation demand in the next 15 to 20 years. Their consensus of the 1995 time from (what we have been looking at specifically) was that there was about a 4.5 to 5 percent annual average growth expected for the U.S. as a whole. This is slightly higher than the historical average. There was a higher projected annual average growth for California which I figured could probably be 5 to 5.5 percent average growth due to the fact that California is growing faster than the nation and has always had higher economic activity and recreational traffic.

We were basically interested in Southern California. Our basic assumptions that were presented at this review are as follows: real growth in fares would be about one percent over that time period; fuel prices will go up about one to two percent annually over the Consumer Price Index. If you are going to tamper with the forecast, you have to tamper with those assumptions. (We do have a two or three-page summary of that session if anyone wants a copy.) This means that you have a doubling of passengers in about 15 years, or more than double for our region than for the U.S. in general, but, of course that would partially depend on what's going on in each particular region.

Much of the problem in providing capacity is access really. We have a 40 million annual passenger limit at LAX; Ontario is planned for 12 million passengers; Palmdale is planned for 12 million passengers annually. With these three and John Wayne, Long Beach and Hollywood-Burbank, we have a capacity of 73 million and over passengers. In 1995, we are going to have about 85 to 90 million passengers give or take. And even if that's not true, in the next few years, if you go with the compounding effect, you easily get beyond that capacity.

It's true that most of the constraints are based on noise. The second one I would say is ground access. At LAX, the ground access constraint is congestion primarily. On the ground only, we assume that noise comes first. At Ontario the problem is pollution. It is in a very heavily polluted basin. It's got a major problem in that the surrounding cities are very leary of any further growth because improved ground access brings more cars, and that is where they're getting their emissions.

So much of the ground access problem is on the supply side also. It's even more exciting if you look at the total. Total access capacities are not that terrific in terms of what we're talking about happening. We're getting into regional airport circulation parking and curb loading capacities and what I was talking about before when you get that last half mile to the airport; that's where this comes in to play. You might spend a half hour getting that last half mile. At most of our airports, almost 92 to 96 percent of our ground access is on wheels, creating congestion and air pollution. The one winner in here is LAX. The reason it can command a better ratio is because it is getting so many business travelers who are using other modes of access to the airport. You almost need that large of an airport to get major mass transit. Even at LAX, the percentage of passengers arriving by auto is 80 (64 percent private auto; 16 percent rental auto) percent.

We're doing the best we can with this problem, SCAG is studying this on a regional basis. We're studying ground access for a regional airport system, especially those three major airports I talked about, because they have the best potential for serving large volumes of passengers—that's LAX, Ontario, and Palmdale. They add up to 64 million annual passenger capacity. These three all

happen to be operated by the L.A. Department of Airports, so it makes it a little easier to do something when you have one single operator to work with.

I'll talk about some individual cases at point. As originally planned, LAX had a loop around it. The original plans called for some connecting underground tunnels that were supposed to go under the runways and feed into a terminal at the west end. As actually built, Century comes into LAX and makes a little circle. The terminals are located around the loop and the parking is in the middle. When the airport was planned, five freeways were planned nearby; these freeways were considered in the original plans. What happened was that the freeways were slowly dropped. None were built, and it looks very doubtful that there will ever be any one of them built. The best we can hope for now is for one of the five freeways, and in view of some recent announcements by the recent administration, we're just kind of clinging to that.

So what you have is that the system as it exists has just one access point on Century. (You can get in from another street that goes north-south by small access roads). So here you have another problem with constraint in that capacity system. Now LAX is working on this problem. They have a second level roadway under construction now in the central terminal area that will solve some of their ground access problems along the airport property.

However, the problem beyond the airport is going to be just as bad as ever, so they are working on remote lots and express buses. They have a formula—the MTAO formula (Maximum Terminal Airport Operation). The thing that is exciting to me is that it's completely founded in ground access problems. It limits its airport operations because of ground access. The fact that they think the ground access is so important is rather interesting.

The second airport we're talking about is Ontario. SCAG is doing a study on Ontario which is required by the state to show how the airport can handle traffic generated annual growth from 2 million annual passengers to the 12 million that are planned by 1995. This is a very interesting problem because the area is somewhat remote, it's quickly developing and it gives us a chance to look at some of the problems before they occur. What we have here is a lot of little two-lane roads and inadequate intersections. Three railroads surround this airport—Union Pacific, Southern Pacific and Santa Fe. Road crossings for all three are at-grade. One of them happens to lie directly across the entrance to the airport; so in terms of the future, this is one of the major access constraints.

The Department of Airports is working with us. We made a major study on this problem to plan before development occurs around the airport and before the passengers start arriving. Primarily, what we've discovered is that there is going to be such high growth in the area in terms of population and employment that there will be more of an access problem due to that than there will be due to airport. The impact of this growth is going to be rather severe. Any additional impact which the airport might generate is becoming a sore point to the people from the area. Yet, many also want to see the airport because it brings a lot of economic activity. We're looking at the entire system in terms of all these problems.

The other airport is Palmdale. Palmdale airport was acquired. It's a very large acquisition, over 17,000 acres, but it's very far from the market area. A very small population is served locally. It's about 65 miles north of the central business district by ground access (it's 40 miles directly) because there's a large mountain range blocking direct access.

As an exercise, we at SCAG looked at transit-type access to his airport by bus coach, passenger trains, advanced trains and even a maglev system that's just been introduced in Germany. (We haven't done anything very official about this, but just kind of informally). All of the rail types were very expensive to us in terms of cost-effectiveness because the airport is planned for 12 million annual passengers. To run a rail system for 12 million annual passengers just doesn't make a lot of sense, especially when you don't see tremendous population growth coming in at the same time. What we found was that the bus access still came out looking more feasible and more economical in terms of the airport. These are the tactics to improve ground access that we usually consider when we're doing our studies. We run them all through and every now and then, we spread them this way and that, depending on what the system is.

Let's wind up here with my prognosis from what's going to happen in the Los Angeles area in general. In Los Angeles, we have several major problems—a couple anyway. It's not a high density area. We do have some dense corridors, and we will have some more dense corridors in the future. Basically the region kind of sprawls.

I've a feeling that the increases in air travel will be, as I said, 5 to 5.5 percent for Los Angeles and about 4.5 to 5 percent for the U.S. in general. That means there will be considerable growth. There might be peaks and troughs, just as we're having right now with the business cycles, economic conditions and other factors, but on an annual average basis, we are looking at that kind of growth. That means we'll be seeing about 60 percent more passengers in 10 years than we have right now.

Another factor is that very few new airports will be constructed and looks less and less promising all the time. We are more likely to lose some of the smaller ones than we are to get new ones. Also, I see very little improvement to ground access in airports as far as I can see in our region by roads, highways, rail and other publicly financed mass transportation facilities. The money just isn't there. The costs have gone up dramatically; the public is reluctant to pay the tab. I'm not saying that nothing will happen, but it won't happen, I think, in the next 15 years.

We've been hearing that FAA and UMTA have really cut back on their funds. This makes the public funding default to the state and local levels where it's competing for funding with education, medical programs, housing, urban renewal and all the programs that are supposed to go into that pot. The result of all this is that we're going to need increasing ingenuity in these things, in utilizing the existing systems—TSM, remote terminals, one thing or another. Much more must be done with airport processing of air travel activities, ticketing, parking, taking buses and trams, and making more and more ground access consolidations.

In the SCAG region, by 1995, we'll be moving over 40 million more passengers than we have now on an existing system that is fast approaching the capacity in some places and is considerably overtaxed in others, which gets me to a prognosis of the future.

In general, I think automotive transport (and by this I mean things that go on rubber tires and go on roads and freeways) will remain the most economical forms of transport to airports, especially if you have collective transport such as Fly Away bus systems and satellite terminals. Patronage will determine popular levels of service that we could give at our full service terminals. The most promising, I think, are express buses and remote terminals.

I really think that providers in this area need supply-side involvement, that they should be working lobbying for preferential bus and high-occupancy vehicle lanes all the way through the system from the freeways and on the ramp, in the central terminal areas, to the airports, anything that it takes to assure the passengers that they are not going to get locked up in the traffic with the automobiles that the bus is competing with. And this is probably going to happen; but if operators really got more involved, it probably would happen faster. I also think that operators need to push for more supply-side remote facilities such as parking lots, remote parking lots and pickup locations and should constantly be looking for safety and pleasant conditions to encourage patronage in the systems. And the other thing I think that they kind of expect or at least in the long term should lobby for now is marketing support to publicize their systems and to demonstrate that they really are acceptable to airports, airlines, and the communities that they serve. Most operators don't have the resources to go out and do these kinds of things. Some of these things are things that the community and the airport can sort of fold into their existing public relations activities.

SATELLITE AIRPORT TERMINALS

Editor's Note

The concluding session of the conference dealt with a most promising improvement in airport ground transportation - satellite terminals.

The initial speaker in this session, Professor Geoffrey Gosling of the University of California, Berkeley, gives a most comprehensive and informative history of satellite airport terminals and their development here and abroad. He meticulously categorizes them and provides illuminating data on why some city-centered ones survived, others died off, and why newer, suburban terminals are becoming most popular and profitable.

Next the reader is treated to two rare articles from operators that detail their business strategy, success, and failures in dealings with airport authorities and their attempts to develop remote airport ground transportation terminals.

Ms. Pat Neri of Northside Airport Express, Atlanta, Georgia, gives the reader an inside view of the start-up frustrations, costs, and procedures of what was to become one of the few "full service" remote suburban airport ground transportation facility. Ms. Neri explains how the firm determined the type of services desired by their customers and how they built there services into their system.

Mr. Ed Kuryluk, of Connecticut Limousine Service, then explains in detail his company's efforts to develop a remote terminal for their airport ground transportation service. Readers should pay particular attention to the business strategy and philosophy exposed by Mr. Kuryluk. He indicates the concepts of marketing research to determine not only services desired by the customer, but also willingness to pay. Price is not the major consideration - service, quality, and consistency is. This paper presents an excellent example of the risk-taking nature of airport ground transportation and the need to be innovative and aggressive, but along the general lines of a business strategy that is proving highly successful.

The final paper of this session was an interesting in-depth case study of the Van Nuys Flyaway bus terminal serving LAX airport. Through the presentation of Mr. Irv Jones, readers are exposed to a well-developed presentation of how the publicly sponsored, remote airport access terminal was conceived, built, and developed from 1976 to present. Excellent data on the cost, revenue, market penetration, etc. are present in this well-written article. Somewhat ironically, however, the authors conclude that the service has been so successful it may not need public subsidy in the future. To the private transportation provider, this has always been a given - painfully not so at times, but properly developed and marketed, high quality airport ground transportation needs little public subsidy in densely populated areas.

SATELLITE AIRPORT TERMINALS

"The Variety of Concepts In Airport Ground Transportation Terminals"

Dr. Geoffrey Gosling
The University of California
Berkeley, California

Let me start in briefly by outlining what I hope we can cover this morning. I think it will be useful if we start off and think a little bit about the historical perspective. Airport terminals have been with us for a long time, and we can learn something from the experience that we observe in some of these cities where they have existed in the past. As Ray mentioned, the term of airport terminal or remote terminal or satellite terminal means different things to different people, depending upon their interest and experience. And so that it might be useful to just look at the classification system of remote terminals so that so that we are aware of what we mean and, when I use terms, that we all understand what I imply by those terms, and similarly as we go down and look at the different sorts of terminals we can have some standard of terminology.

The two sorts of terminology that I think I would like to use this morning are what we call access terminals (where there is no passenger processing or airline processing involved) and what we might call remote service terminals (where some processings of the sort that is normally done by the airlines at the airport is instead done remotely at the terminal).

When we try to think about these remote service terminals, we find a number of technical issues that we have to deal with, so let's talk a bit about those. If we're going to operate a terminal in a remote location, we're going to have to deal with some institutional issues having to do with who is going to do the various things, how they are going to meet your act, and what problems we are going to deal with in finding these different difficult operations. Finally, we could think a little bit about what planning requirements we might have if we want to go out and do an analysis of the potential terminal market to decide its worth in improving service at an existing terminal, or indeed introducing a brand new service.

Later on this morning, Irv from the Southern California Association of Governments is going to be talking about the FlyAway service at Van Nuys, and Pat Neri will be talking about her experience in Atlanta. So I think there's a session connected. We're going to get an opportunity to see what actually happens in different parts of the country. So let's start then with a brief story about what happened over the last 50 years with airport terminals.

The very first terminal which we have been able to identify was in London in 1934, when what was later to become British Overseas Airways Corporation, decided to start providing check in and ticketing services in their city center headquarters near Victoria Station in London. But from 1934 until the sudden expansion of air travel of the second World War, not much else happened on the remote terminal.

However, when air travel started to become big business in the 1950's, what happened in many cities was that the airlines were traditionally providing some sort of limousine service from their downtown ticket offices and the limousines would park on the streets outside the ticket office. People would come to and buy their ticket, and they would get taken by limousine to the airport. The motivation behind this was largely because, first of all, air travel was still a relatively innovative form of transport. People weren't aware of where the airports were. The rapid growth in traffic was swamping the facilities at the airport so to speak, so airlines would do much of the processing some where else. It was possible to relieve some of the pressure on the airports; parking facilities at the airports weren't all that adequate. Finally, airlines were still competing very much with the traditional forms of transportation such as the railroad, and there was a feeling that, if they were going to compete with the railroads in providing city center-to-city center service, then the airlines would have to provide this service too. So for all these reasons, we had the limousines operating in the city centers.

In many cities—New York, San Francisco, and some others—the city planning people eventually started giving the airlines a hard time because all these limousines parked in the street were congesting traffic. It was suggested to the airlines that they should get together and build city center terminals where the vehicles could be taken off the street and where they would be integrated into the public transport system of the city. So in New York, San Francisco, Washington and a number of other cities, one finds a city center airport terminal being developed.

Figure 10 looks at the history of this development. This shows more or less what happened apart from the London scene. The East Side Airlines terminal started in the late 1950's and continued on. In fact, there is still service from there. Shortly after that, with the rise of New York airport, another terminal was started on the west side of Manhattan. At that time, these terminals provided full airline passenger service. The airlines maintained their own staffs at the terminals where you could check your bags, buy tickets, etc. And we see there was also a terminal in San Francisco and Washington. Briefly there was an experiment in Honolulu with a terminal. It didn't last very long for various reasons.

By the early 1970's the airlines were beginning to lose interest in the idea of providing service at the city center terminals, partly because of the fact that by this stage, better airports had been developed. There was a lot more spare capacity at the airports, and airlines were becoming very concerned about the costs of providing duplicated services in the city center and at the airports. Another issue that was becoming important at that stage was the change in the patterns of the origins of the trips to the city. No longer were most of the travelers going from city center to city center, but rather they were traveling from suburban location to suburban location.

Now, one of the things which we find in the study for the USDOT on this is that, although there was a general sense that there was a large number of these terminals, the experience was that traffic just didn't happen and that the airlines discontinued the service because there simply wasn't the market. In fact, when you look at the situation, you'll find out what actually did happen was that there weren't that many terminals which really met definition of the city center full-service terminal. And for terminals offering full service, there were often very strong local circumstances which overriding that gave rise to their discontinuation. For example, consider the West Side Airlines Terminal.

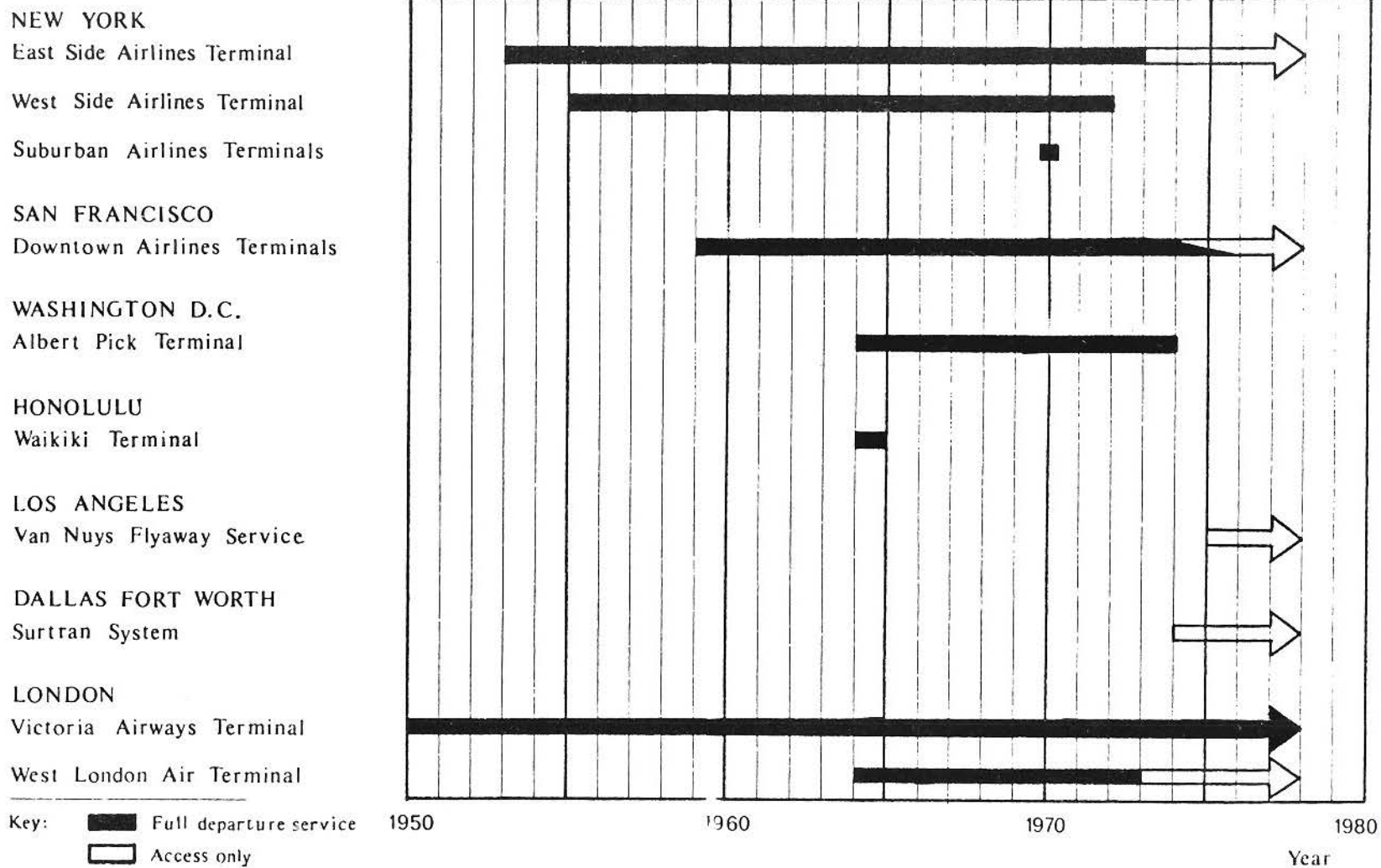


FIGURE 10. CHRONOLOGY OF CITY CENTER TERMINALS

Most of you are familiar with Manhattan and know that, by the early 1970's, the west side of the Manhattan was just simply a dangerous place to be. The area was in advance urban decay; you literally took your life into your own hands walking the streets after 11:00 p.m. at night. Therefore, it was not surprising that in 1972 the airlines decided that they just weren't getting enough traffic at the terminal. People wouldn't go there. The staff didn't like to work there—felt insecure working there. So the airlines closed down the West Side Airlines Terminal and transferred that traffic to East Side Airlines Terminal.

Those of you who have been to Manhattan and have used the East Side terminal will know that the public transport connections from the East Side Airlines Terminal are not good. It's several long blocks from the Grand Central Station (near a subway station). There's, I think, one bus line going past it on something like a 20-minute headway. The main bus routes move up and down the avenues, the nearest again two long city blocks from the terminal. For somebody arriving in Manhattan not knowing how the transit system works and with heavy baggage, international travelers perhaps, it's a bit discouraging to use the terminal if you either have to get a taxi just to go about two blocks to go to a subway station or else have to hump your bags down the street. On the other hand, when you get a taxi to go to the terminal, the taxi driver says, "Hey, why go there? I can take you to the airport for another xx dollars." A lot of traffic got lost simply because of the difficulty of getting from the hotel or whatever to the terminal.

Recognizing that problem, the ground transport operator in New York provides bus service to some of the major hotels, so that in a sense there was a service competing with itself. There already was direct service from the hotels being provided by the same operator who was also servicing the East Side Airlines Terminal, so straightaway there was some dilution of the traffic going through the East Side Airlines Terminal. Faced with these situations, the airlines eventually decided to discontinue checking.

At San Francisco, the problem was one of the contractual arrangement. The terminal was built by a private developer on a 20-year contract with the airlines. As the contract came up for renewal, the airlines were asked, "Do you want in or out in 20 years?" They looked at the situation and looked at the market and decided they didn't. The Washington, D.C. terminal was in a hotel and survived for approximately 10 years. For reasons which we weren't really able to find out, apparently either the hotel lost interest in having the terminal or the airlines lost interest in servicing it. The interest just dissolved, and the space in the hotel that was used the space in the hotel was taken over with something else.

Now that incidentally happened in West London Air Terminal. In fact, what happened there was the British Airlines decided they needed the space in the terminal that was being used for passenger check in a reservation center. So over quite strong protests of the community groups, air travelers and representative groups about the valuable service, they discontinued the service and used the space in the building that had been the terminal reservation center.

That's the story on the city center terminals. In addition to that there were also a number of suburban terminals experiments. There was a brief attempt in New York by Pan Am to provide a number of terminals. They tried to follow the pattern of the city center terminals—the building with the airline staff where you did the ticketing and checking in. It didn't really work. The volume of traffic through the terminals was such that they lost a lot of money. After six months they discontinued the service.

In Dallas, however, with the new Dallas-Fort Worth airport, a corporation was set up to provide ground transport. They provide access service from a number of locations, some of which have structures which you might consider as terminals. There is no passenger processing provided, simply an access service.

More recently, in Los Angeles at Van Nuys, there is a service that is again initially a primary access service, although recently TWA and I believe some other airlines have expressed an interest in providing ticketing service at this terminal. So we see the Van Nuys experiment moving more in the direction of some sort of remote processing.

And finally, there is the Atlanta situation with the North Side Airport Express terminal. I won't say too much about that, since we're going to hear more of that service later this morning. But there again ticketing is being provided. Suburban terminals appear to be starting with purely access services and moving in the direction of providing more passenger services in contrast to the situation in the city center terminals where the reverse happened, where they went in going with all the services at the beginning and then gradually started pulling the services out.

Finally, before leaving the historical story, there's one particular experiment that I want to mention. Some of you who read the New York Times recently may have picked up some ads by Swiss Air. They're carrying out an interesting experiment in Switzerland whereby they have come to an arrangement with Swiss Rail whereby you can go to any railroad in Switzerland and, if you already have bought a ticket from a travel agent, you can check your bags at the railroad station for, I think five Swiss francs. The railroad will get your bags to the airport, and Swiss Air will undertake to collect your bags from the railroad station at the airport in Zurich and get them on the plane. I think you need to allow another hour in addition to the train travel time, so if your train takes three hours to get to Zurich, then you need to check in four hours before departure. This has started fairly recently. They plan to run it for a year to see how successful it is and then decide to continue it or extend it thereafter. So it will be interesting to see, first of all, whether the travelers find this to be a convenient service and, second of all, whether the railroad considers it worth their while doing this additional work in return for the revenue they could get.

Let's just look briefly at what some of these terminals look like so that we will get some idea of the scale of these facilities. By far the biggest is the terminal at East Side Airlines Terminal in New York. Figure 11 is the East Side Airlines Terminal. It's about three stories high with extensive parking on the river. This photograph is not a very good picture, but it gives you an idea of the scale of the facilities and where it is located in Manhattan relative to some of the office buildings. One also gets something of a sense of the immediate ambience of the area around the back which I would characterize as very hostile. The sides of the building are extremely plain, surrounded by primary warehouse areas. As you walk under the terminal onto the street, it's not the bustling bright 5th Avenue scene, it's pretty much in a seedy part of Manhattan. The reason for the location of the terminal was primarily convenient access to the

East Side Airlines Terminal

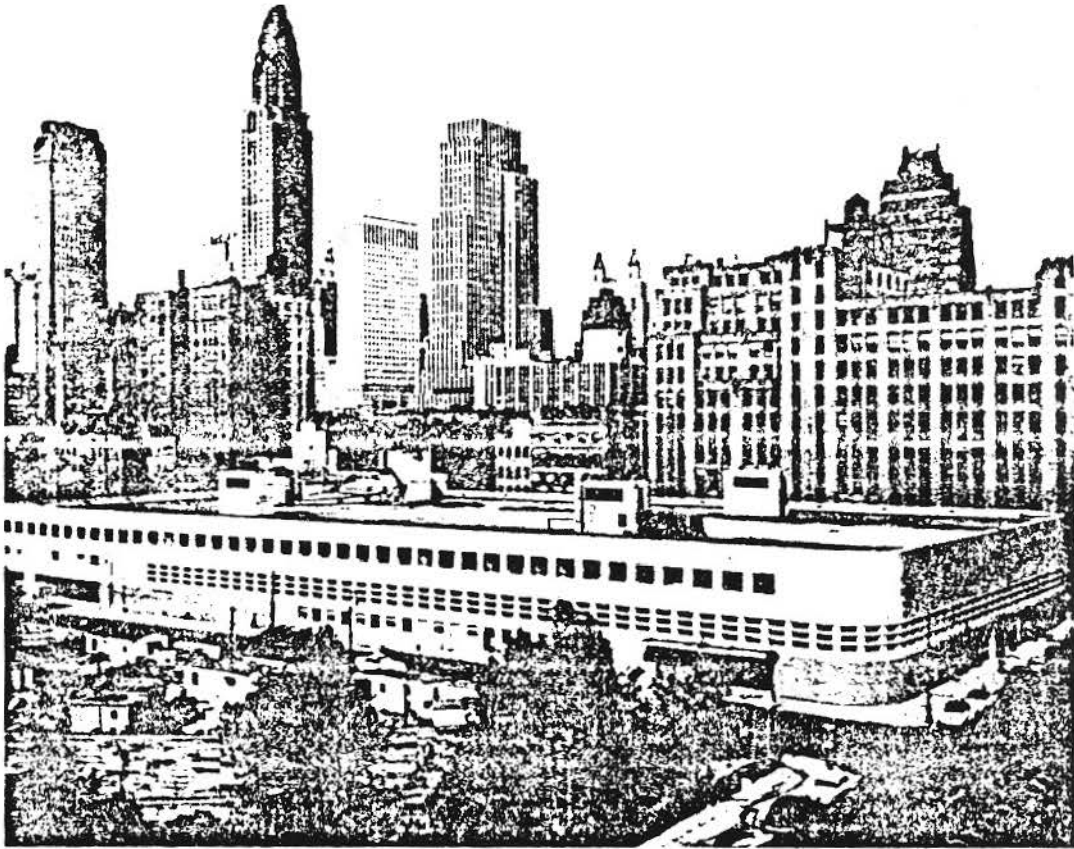


FIGURE 11. EASTSIDE AIRLINES TERMINAL

Queens-Midtown Tunnel. They were concerned about getting the buses from the terminal onto the freeway system, and so they located it relatively close to the tunnel. In consequence, the access from the other side of the system wasn't so good.

The interior of the terminal was essentially a large hole on one level. Airlines desks surrounded a central open area. Outside were the bus bays where the buses came in to park. So, when the airlines would check your bags, they would put them on a belt and take them through a hole in the wall to where the buses were parked. The bus drivers would get the bags on the bus.

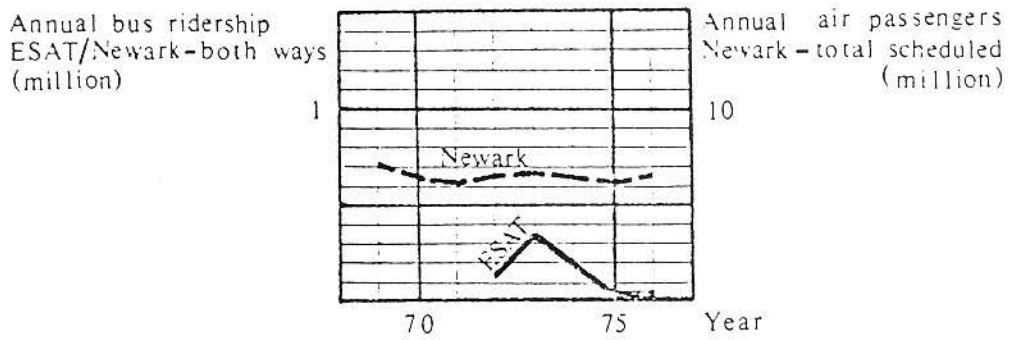
Initially the plan was that the buses would be designated for particular flights, so you would have all the buses lined up with flight numbers on them. Passengers would check in to the flight, say United 53, would get on the bus and would be driven to the United terminal. This turned out to be very inefficient because you would only get a half a dozen to a dozen passengers going to a given flight. After a while they discontinued that and went to a time departure where the buses went every 15 minutes. The airlines then had to sort the baggage in a baggage area behind the wall so that, once you got to the airport, the baggage was presorted by airline.

Figure 12 shows you how the traffic varied, I think, at the East Side Airlines Terminal. The interesting things here are two things. First of all, if we were told when the check in was discontinued, you would see that there is really a sharp drop in traffic from about 1973 through 1975 that coincided with the time that check in was discontinued at the terminal. We also notice the phenomena of the rapid growth in total traffic at the airports with a relatively steady small growth at the terminal. What's happening here is that most of the traffic growth is occurring in the suburban locations; it's not occurring in Manhattan, so the Manhattan terminals are just holding their own as it were. However, it is certainly very hard looking at this data to make the case their failing; they're still managing to pull in a significant fraction of the traffic.

If you look at the scales of the two curves (and the scales are different by a factor of 10), you see that about 1965 10 percent of the total traffic through the airports was being handled by the central terminal. As a rough rule of thumb, we figure about a third of the total trips are coming out of Manhattan. That's saying there was about a 30 percent capture rate for Manhattan, and that 30 percent capture rate in fact holds fairly constant through to the early 1970's. Because of the loss of the check in service at the terminals, we started seeing this progressive decline from 1972 through 1975 in traffic at the terminal.

But it's also worth noting the total traffic through the East Side Airlines Terminal in 1975, which is so generally considered to be the disaster year at which everyone said, "Oh, the whole thing's failing, we better close it down." It was still attracting the same number in terms of millions of passengers per year that it had attracted back in 1953 when everyone was building terminals like crazy and saying it was a really good idea. Although the percentage of traffic being handled by the city central terminals has changed considerably, the total volume in terms of millions of passengers has not changed.

East Side Airlines Terminal - Newark traffic



East Side Airlines Terminal - Total traffic

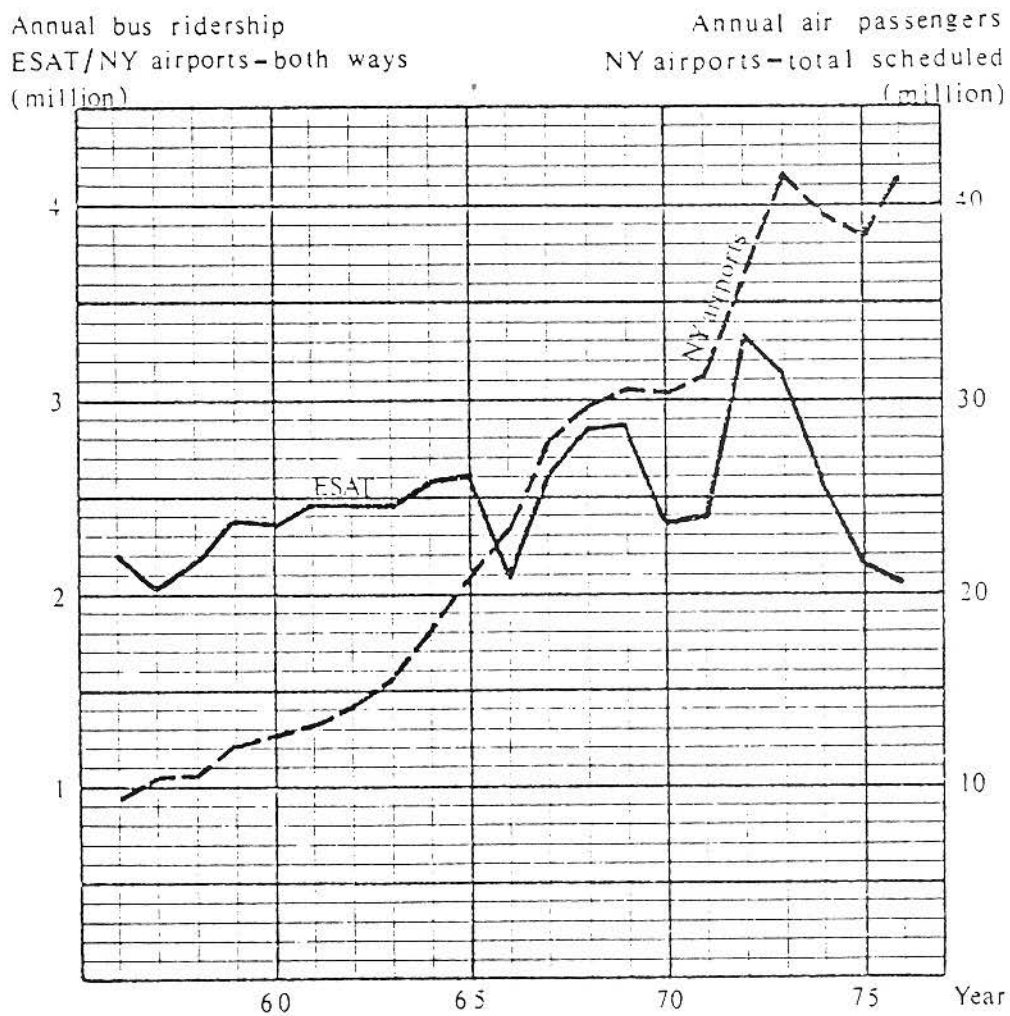
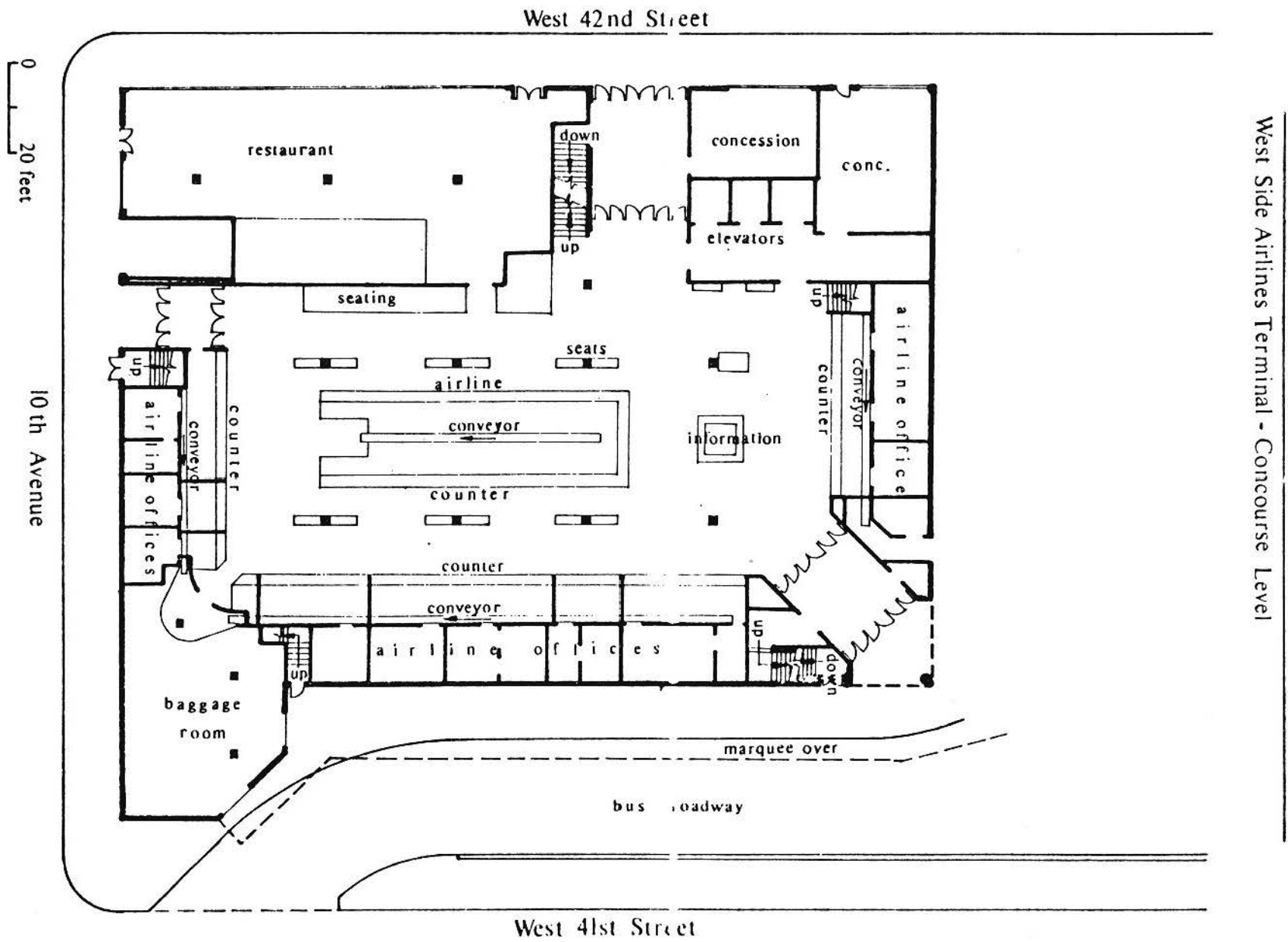


FIGURE 12. EAST SIDE AIRLINES TERMINAL PASSENGER VOLUME



West Side Airlines Terminal - Concourse Level

FIGURE 13. WESTSIDE AIRLINES TERMINAL FLOOR PLAN

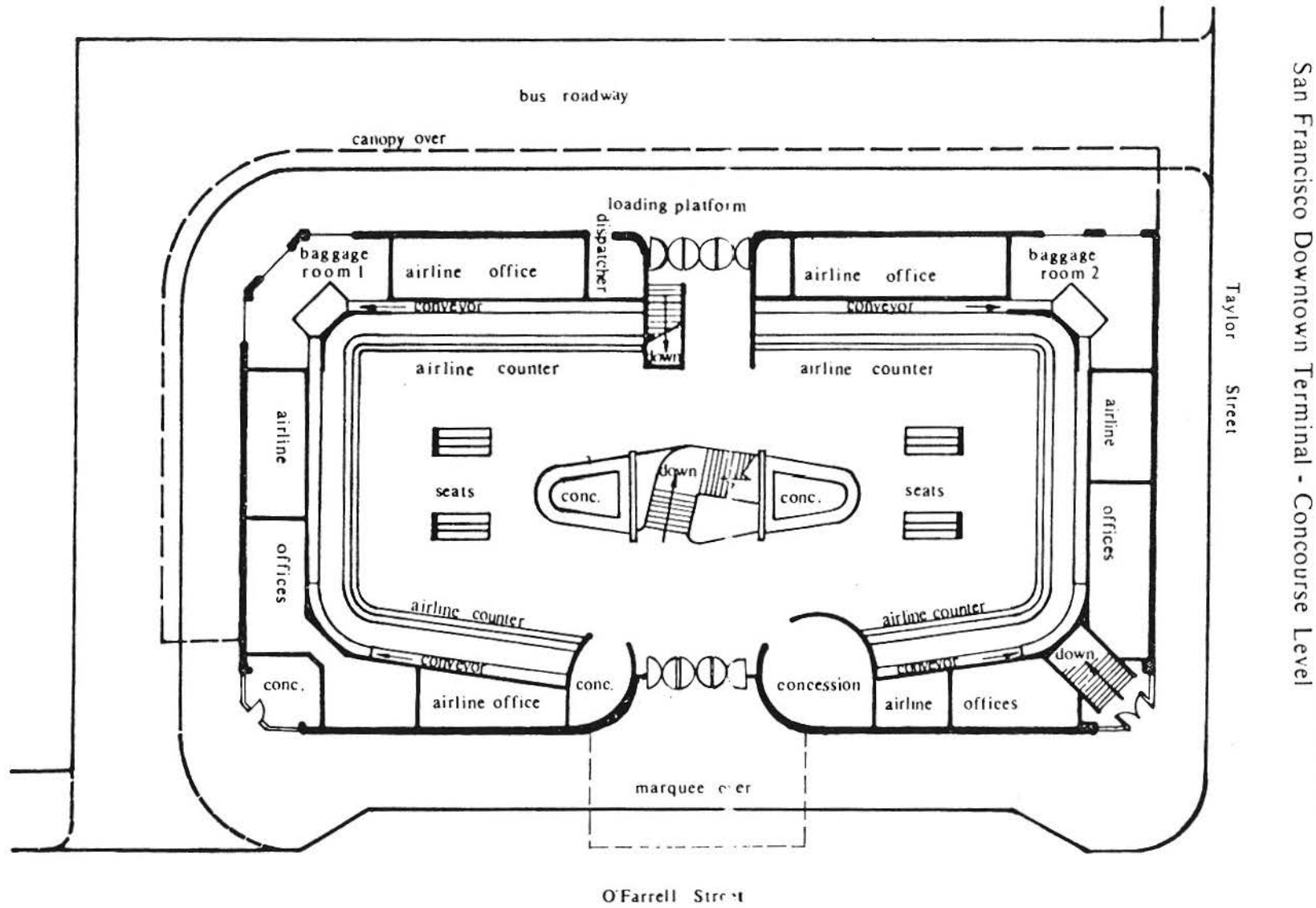


FIGURE 14. UPPER LEVEL FLOOR PLAN OF THE SAN FRANCISCO DOWNTOWN TERMINAL

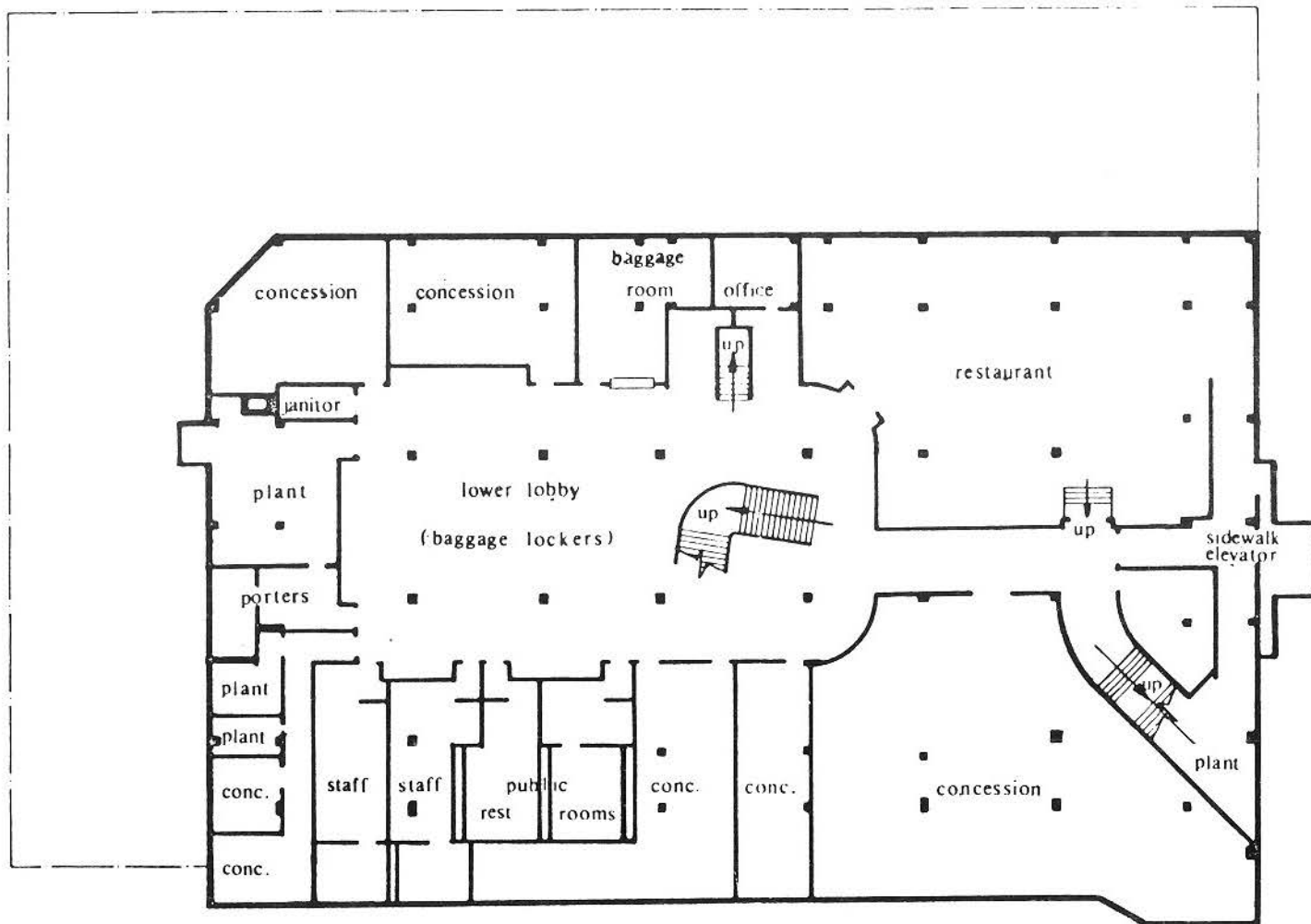


FIGURE 15. LOWER LEVEL FLOOR PLAN OF THE SAN FRANCISCO DOWNTOWN TERMINAL

In terms of how the terminals were organized, I have interior plans for the West Side Terminal (see Figure 13). This is a slightly different arrangement, a little bit more interesting than the East Side Airlines Terminal. Although the terminal was very poorly located and failed because of its location on the west side of Manhattan, this sort of represents what we might look to in a large suburban or city center terminal. It was built on a much smaller scale than the mammoth East Side Airlines Terminal.

Essentially, you see the airlines check in desk area in the middle of the hole. There's a conveyer belt in the middle of that that carries the baggage to the bus area that's on the floor below. The airlines have a number of offices around the edge of the building, again with counter space in front of them, and conveyer belts to handle the baggage. There's a baggage hold room in the lower left-hand corner where baggage from the various airline offices gets carried to be sorted by bus. The bus roadway, as you can see, is just on the bottom. The buses come and park there. The baggage is carted from the baggage room and placed into the bus holds, and the passengers who are waiting would come out to load the buses. On the top you see other passenger convenience services—a restaurant, some concessions, etc. It is a fairly simple functional design, obviously deriving very much from the way an airport terminal functions.

If we contrast that with the situation in San Francisco, we see similar sort of arrangement (see Figure 14). The San Francisco terminal has a bus roadway at the rear of the terminal and airline ticket counters around the periphery of the main hall. That area in the middle shows a flight of stairs that leads down to a lower level where the various services are—the restaurant, restrooms, baggage lockers and so forth (see Figure 15). The airline offices are around the peripheral of the building behind the ticket counters.

Figure 16 is a view of the front of the terminal. The location is much superior to that of the New York locations. It's close to the hotel; in fact, that building behind is San Francisco's Hilton Hotel. So you can see that it's straight out the door and a walk down the block and there you are. Figure 17 shows the various airline ticket counters around the peripheral of the building. .

. . . To get the feel of the contrast between the large investment that was required in the city center terminals when compared to much more modest facilities that are economically feasible in a suburban location, consider the Van Nuys terminal. It was a preexisting building that was taken over by the Los Angeles Department of Airports and used as a terminal. (Note: Pictures of this facility may be found in the paper, "Airport Access: Case Study of a Remote Terminal Operation.") Parked passengers just come and buy their tickets in the building and walk out to the bus. The idea is that, as you drive into the car park, you drop off your baggage. Then you can park your car. The baggage which was been dropped off at that point is loaded into the bus hold on the other side of the bus from where the passengers board. The passenger flow and the baggage flow is kept relatively separate.

Switching to Atlanta, Figure 18 is one of the terminals at Atlanta. Again, it's a preexisting building that was converted for use as a terminal. You can see some of the parking behind the building. This stretches on for quite a ways. There's a fair amount of parking provided at both Van Nuys and the Atlanta terminals. The Atlanta terminal is somewhat different from the Van Nuys terminal in that it does not have ticket agent or travel agent facilities within the terminal. Figure 19



FIGURE 16. FRONT VIEWS OF THE SAN FRANCISCO DOWNTOWN TERMINAL

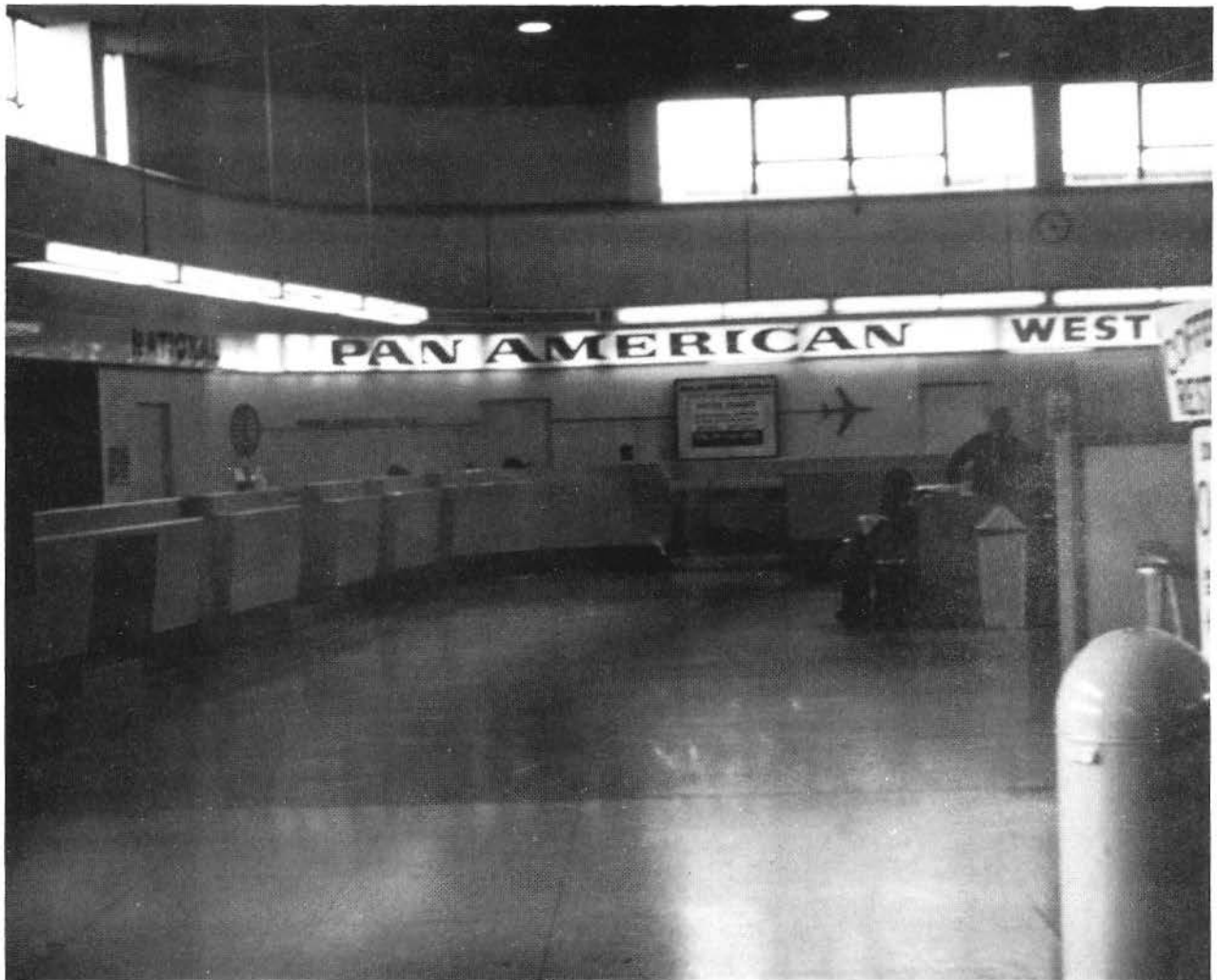


FIGURE 17. AIRLINE TICKET COUNTERS AT SAN FRANCISCO DOWNTOWN TERMINAL



FIGURE 18. NORTHSIDE AIRPORT EXPRESS TERMINAL IN ATLANTA



FIGURE 19. INTERIOR VIEW OF NORTHSIDE AIRPORT EXPRESS TERMINAL.

isn't a particularly good photo, but it shows the interior of that terminal with the ticket agent stations to the right. There are some waiting room facilities in the rear of the building where the passengers wait for the bus.

Let's just go back to the graphs to finish the story on this traffic pattern that we were experiencing at these various terminals. Figure 20 shows the San Francisco traffic using the bus service (which is the same thing as the traffic using the terminal). In the case of San Francisco, the bus operation between the terminal and the airport was a private operation run by Westgate, whereas the terminal was run by the airlines. You see again that 10 percent of total traffic through the airport was handled by the city's central terminal. Again, it's a rough rule of thumb that 30 percent of total trips were for the region served through San Francisco so that again about 30 percent of the market was being tapped by the service—again, the ratios which I think by general standards of transit access to airports are considered to be fairly high ratios, particularly in the case of San Francisco where, in fact, the distance from the city to the airport is not very great and that the taxi fare from San Francisco to the airport is not particularly expensive. Again you notice that in 1975, when the checking was discontinued, the rapid growth in 1974-1975 started to level off, although the effect in San Francisco, interestingly enough, is not as great as New York. You don't actually get a significant drop in traffic after 1975 when checking was discontinued. The little drop in 1974 is due to a strike that lasted two months that's not adjusted in the data. There's about 10 months of data there, so the apparent drop in 1974 does not represent decline in use.

In any event, the East Side Airlines Terminal is certainly holding its own in the terms of the number of passengers using the terminal, although in the case of San Francisco, in fact, the percentage of the total traffic using the airport is holding its own. So much of the historical background of what's going on.

Let's talk briefly about another classification. I mentioned the two basic classes of terminals—access terminals (those which essentially are simply facilities where one can get a bus service or some transit service to the airport) and remote service terminals. Remote service terminals can provide a number of different options for the traveler. The first and simplest form is just to provide air passenger ticketing—buy your airline ticket, make a reservation. In addition, you may be able to check baggage; however, whether or not you can check in baggage, you may or may not also be able to check in the passengers.

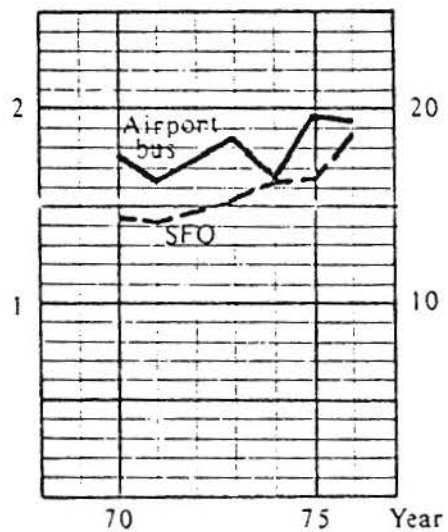
The most important distinction, which we will come to in a moment, is between baggage check and passenger check. Passenger checking is your getting your seat assigned on the airplane and get issued a boarding pass. Baggage checking is getting the baggage tagged with its destination and sorting it in some way. Normally, in a regular airport, all these things are done together at the curb, although not necessarily. If you have your bag checked by a skycap at the curb, you may have these two functions done separately.

The final option that could be provided, which has never been provided anywhere (not even in the London terminals, which are perhaps the most centralized with the various services) is to provide through baggage service where one can go into an airport, in Miami, shall we say, and check baggage through to the East Side Airlines Terminal. You don't see you bag again

San Francisco Downtown Terminal - Traffic

Airport bus ridership
Downtown Terminal—both ways
(million)

Annual air passengers
San Francisco International
(million)



SOURCE: Reference 2

FIGURE 20. PASSENGER VOLUME AT SAN FRANCISCO DOWNTOWN TERMINAL

until you arrive at East Side Airline Terminal where, lo and behold, hopefully you find your baggage. There are some obvious technical problems with this, and we'll talk a little about them. In fact, in the past, those technical problems were deemed to be insurmountable, and this service has never been provided. But we're talking about whether in the future maybe there will be ways of doing this and why one might be interested in providing that kind of service.

Let's talk briefly then about access terminals. These are by far the most common situation, certainly at the moment. The access terminal provides a number of functions and most of these are self-explanatory. It provides some sort of amenities, maybe a coffee shop or restrooms. Some have places where you can buy magazines or newspapers. It provides some identity. You can, of course, pick up passengers off the curb, but it's sometimes convenient for somebody who may not be making an air trip very often and asks, "Where do I get this bus?" to say, "Well, you catch it at the terminal at such and such." This sounds more like there's a high level of service being provided than saying, "Well, you can stand on the corner of Main Street and Third Avenue and the bus comes along." We may need to provide parking. Certainly one of the functions of terminals is to have somewhere for information services, not just information on the bus service being provided, but also for inbound passengers on things like where can they get a motel or how the transit system works if they want to go by transit from where they're getting dropped off by the airport service. In some areas, terminals can provide security, either physical security, such as having security personnel on duty, or more just the sense of security, the sense that you're in a place where there are people, where you aren't going to get mugged if you're waiting a length of time for a bus. Finally, from the point of view of the operation of the service, you may want to have buses lay over. You may want facilities where drivers can wait, and you may want to have some sort of dispatch facility. Again, the terminal provides a place where this can take place.

Among the various potential locations, motels or hotels may have certain advantages because a lot of the functions are already being provided. Hotels and motels have restrooms; they have coffee shops; there is space where you can wait out of the rain. In some areas, the metro subway, BART, will have you at the railroad station at suitable locations. In fact, in Europe, it's common for the national airlines to run bus service to the airport from the central railway stations in the city. This is not so common in the U.S., mostly because we don't have too many cities where there are railroad stations. Bus terminals, by this I mean like transit terminals or regional transportation centers, might provide suitable locations. Increasingly, we're finding some of the cities building park-and-ride lots to suburban locations. These are primarily intended for commuter service, but they can also be used as pickup points for an airport access service. They, in general, will certainly provide parking, but they may or may not have some shelter or something like that. They won't necessarily have a security, although just the mere fact that they're busy activity areas with lots of people going and coming will give a sense of security. And finally, of course, there are activity centers such as shopping centers, recreation centers, Disneyland and so forth where many of the functions needed for an access service are already provided.

Let's think little about service terminals and what we might go into providing in the way some sort of passenger processing. The first question to ask is a very valid question. At the airport, you can buy your ticket, check your bags, etc. Why go through all the additional hassle of doing these things in a remote location? Well the first reason is perhaps their convenience. Many passengers may well want to get rid of their baggage and be certain that they've got a boarding pass in their pocket and their seats assigned. They want to do all that at the front end of their access rather than when they get to the airport. Many people have a lot of anxiety when they make air trips. They don't do it that often. They are not familiar with the procedures. Therefore, the earlier in their trip they can get squared away, the happier they are going to be.

As we move to a more deregulated environment there are a couple of other phenomenon that we are going to find, and that these are worth thinking about in the context of their convenience. The first is that we may find a lot more of standby type service. The problem with standby is that you have to go to the airport and wait around. If you can do your waiting around at home, off location, of course, and it turns out that the 9:00 flight is booked and there isn't any thing until 4:00, why you can go off and do something else—go shopping, go to work or whatever.

The second function that might arise is that under deregulation, and particularly with higher fuel costs, the airlines will tend to try and increase their load factors. We've seen this already. One of the consequences of increasing load factors is the higher probability of overbooking. If you are going to have situations where flights are overbooked, then the passengers who check in earlier are going to have better chances of getting on the flight than the passengers who checked in later. Now, if you can do your checking in at the start of your access journey, and a typical access journey lasts about an hour, then you are checked in an hour before flight departure. The guy who drives up to the airport 20 minutes before the flight departure is going to be the guy who doesn't get on the flight. So for these reasons, we may find that the users may prefer to do their checking in and getting their seats at an earlier stage in their trip.

The second reason you might be interested in providing remote passenger processing, particularly when I'm speaking from the point of view of the ground access provider, is that there is a revenue potential here. The airlines pay a commission on the tickets that are sold, so it may mean that, in fact, the revenue which you derive selling airline tickets at a remote location may exceed the cost of providing that service.

Thirdly, there are considerations of operation efficiency. Many of our major airports already are experiencing some landside congestion problems. Instead of trying to provide additional processing capacity at already congested airports, it may be a lot more efficient to do some of that processing at remote locations.

Somewhat tied in with that question of airport traffic peaks. Increasingly we're finding more emphasis is having to be placed on providing public transport access to airports, both in terms of getting the sheer volume of people through the airports and in terms of other considerations, such as highway congestion, pollution, and energy. The problem with doing that is that, instead of getting passengers arriving in a steady stream—cars with two or three people per car—you are going to get buses arriving on schedule. In general, if you have people driving themselves to the airport, they tend to sort of spread their arrival times out to maybe the hour before flight departure. It would seem likely that what could happen when you start writing a schedule is that passengers will look at the schedule and ask "When is the bus that will get to the airport before my flight leaves?" Let's suppose you are running buses on a half hour schedule. Most

likely all the passengers who have flights in the half hour between arrival of the bus and the next bus will arrive on that bus. From the airline's point of view, instead of getting the passengers coming in a steady flow over say an hour before flight departure, what's going to happen is that all of a sudden a large number of people are going to arrive on the bus together. Without going into the mechanics of the queueing theory of how the airlines determine how many staff they need to process passengers and how many minutes they need to get everybody checked in before the flight leaves, the fact is that this will have a profound impact on the number of staff needed at the counters that would come from using high-occupancy vehicles, there is a good case to be said for having the passengers already checked in so that those passengers won't have to go through the ticket counter at the airport. If congestion problems are occurring at the airport, then the passenger who has already checked in can just walk past the line, go straight to the gate, get on the plane and be in much better shape.

Let's back up and listen to what are the elements of passenger processing that you might want to provide at those terminals. We've mentioned them already. We may want to provide some sort of reservation. In general, people will already have those reservations; not too many people show up at the airport these days without knowing what flight they're going to take. However there will be some people who need to make a reservation, either because they just show up not knowing what flight they'll take or else because maybe they missed the flight that they were going to take and need to rebook the trip. Having done that, we may need to ticket them. We will certainly need to check in the baggage if baggage handling is to be provided. Finally, the passenger checking process involves seat assignment and issuing a boarding pass. In order to do this, we have to take account of a number of operational considerations.

The first consideration we have to deal with is efficiency. The flows which can be dealt with in a remote location are relatively small. Therefore, it's clearly not going to be efficient to have every single airline with its own staff behind the counter. We've got to find some way in which one or two people can handle the traffic for all the different airlines.

The second consideration deals with hours of service that are going to be provided. It's expensive to put people on duty at a remote location. It's quite clear that the volume of traffic at 2:00 in the morning is not really going to justify having check in agents on duty. So there's a real trade-off to be made on the one hand wanting to provide essentially 24-hour service, on the other hand, the economics of having staff on duty at times when traffic flow really doesn't justify it. I don't think there is a hard and fast answer to that, and that is a decision which just has to be made on a case-by-case basis. The trade-off is between marketing advantages of being able to say "Yes, you can come along to the terminal any time you like, get to the airport and check in," on the one hand and the operational process of doing that.

During the periods of light traffic, such as late at night, all you may want to provide from the remote service terminal is just an access service. There isn't a problem of checking in at the airport; there are no lines at the ticket counter at 2:00 in the morning. Therefore, the passenger who arrives at the remote terminal, say, for midnight flight can be easily taken to the airport and can get the processing done there without problem.

One consideration in that context which is worth making is that many passengers are not sure when they are returning. Therefore, if you provide a service, shall we say, only between 7:00 a.m. and 10:00 p.m., you lose a lot of traffic. Those people will say, "Yes, I'm scheduled to come back on the 8:00 flight and I can get back from the airport. On the other hand, what if my meeting

runs late and I end up taking the late flight and don't get in until midnight. The service will have stopped operating, and my car will be at the remote location at the end of the city. I will be stuck at the airport with no way of getting to my car." There may be a very strong case for providing at least a skeleton service though the night, say maybe on a half hour or hour headway with 10- to 12-passenger vans. They are a very low cost operation, purely access, just to get the late passengers back from the airport to their cars.

Of course, one of the other things we're going to be finding increasingly, at least in those airports that aren't covered by curfews, is that the airlines are going to be pushing night discount flights (night coach flights) very heavily in order to keep the utilization up on their equipment. Perhaps we are going to find growth in the number of night marginal trips (the visiting friends and relatives type of trip where the person is paying for the trip out of his own pocket). More and more of these people will be prepared to travel at night in order to save themselves some money. So perhaps the problem of handling passengers late at night is, in fact, going to become an important consideration.

These people are also, incidentally, people who are perhaps more likely to want to pay for public transport service to the airport rather than jump in a cab or take their cars and park them.

Finally, one other consideration has to be made. What is the most appropriate ground transport mode to get people from the remote location to the airport? In general, for most services we use a bus. There's a question to be asked about what the appropriate sized vehicle is, whether you want to have a 40-passenger bus or a 12-passenger van. There's a trade-off to be made between the size of the vehicle and the frequency of service. In some cases, it may be more practical to use an existing rail system. In some areas, maybe a ferry system might be used. There are no ferry services presently, but certainly they can be considered in many cities where the airport is located adjacent to a body of water, such as in the bay area, or in the New York area. It's not inconceivable that you could run a high-speed ferry service from say one of the ferry piers in downtown Manhattan to LeGuarda. And, finally, of course, is one of the considerations that has been looked at in the past—the use of helicopters. We won't go into detail about these various other modes. I think in the foreseeable future we will see most of the services being provided for with buses for regular patrons.

Let's just move very quickly on and talk briefly about some of the technical issues that are involved with doing remote processing. On the reservation and ticketing side is the problem that we have got pretty much to solve. One can go out as a travel agent now and rent one of the airline reservation systems. American Airlines has a system they call Saber; United has a system they call Apollo. There are various others around—although these two carry perhaps the biggest share of the market. These systems allow one to type in a destination and the system responds with all the flights that are available. Then one selects a place on the flight and is then coupled in with the ticket printer, and the airlines ticket is printed there. The systems have intersystem communication capabilities so that, even though you are on the American Airlines' system, you can make a reservation on United you can find out what the seating availability is on PSA or Western or whomever. So there's really no problem. Most travel agents are doing this already.

Baggage checking is a slightly more complex situation. There are some fairly complicated procedural requirements that have to do with the fact that the baggage requirements of different airlines tend to vary in terms of how many bags you can check, weight limitations, and whether you do interlining of baggage from one

carrier to another. In addition to knowing the various rules of the different airlines, you have to have the appropriate bag tag stamping in order to do this. For most of the direct flights where you are simply flying from Los Angeles to San Diego, say you're getting on at one place, riding the plane, and getting off at the other, there's no problem. You just have the bag tag preprinted with the destination, put it on the bag, take the bag down to the airlines, and get the bag on the appropriate flight. The real problem comes when the passenger is transferring. There are two sorts of transfers that the airlines have to deal with. One is interline transfer and the other is the on-line transfer. With the on-line transfers you are flying on one airlines but transferring on the same airline to another flight.

One of the things that we're finding is that the airlines are increasingly building things like co-connecting complexes. If we think of, perhaps, United Airlines flights to the east and west coasts, many of these flights tend to go through Chicago. United sets up their schedules in such a way that all the flights from the west coast come to Chicago, say, 15 minutes before the hour. Then all the flights to an east coast destination leave around 15 minutes after the hour. So during that half-hour interval there is tremendous resorting of passengers and baggage. In that way, with a limited number of flights, you can serve a much larger number of origin-to-destination pairs.

In order to facilitate this system, the airlines have a number of special tags which they can put on, frequently called alter tags (say bright red tags that go on the bag), so that when that bag gets to Chicago, the baggage handling crew in Chicago is alerted to the fact that this bag from the flight that has come into the flight that is going out. In addition to being alerted to the fact that they need to give the bag some priority treatment, they need to know where it's going.

Figure 21 represents a couple of tags for American. The tag on the left is an on-line transfer; the tag on the right is an interline transfer. You can see that basically they're the same. What happens is that you fill in the sequence of flight segments which the passenger is taking, starting at the bottom and moving up on the tag. As the bag proceeds through the system, it is transferred to a different airport. These tags are perforated in sections, and the bottom piece is torn off. This then provides a record for the passenger which is stapled to the ticket and which has the number. You can see the number there. As the bag proceeds on its way various pieces are torn off, and they are kept at the stations where the transfer took place. Should the airline need to track the baggage to find out where it is if it doesn't get to its destination, they at least have some way of doing that.

Now, increasingly, airlines are bringing in computerized baggage tracking systems so that they don't have to call all possible destinations to see who has got tags for the bag. As these systems come up, we might see some changes in the ways the bag tagging is done. An interesting idea which has come along, but which has not been implemented by any carrier to my knowledge is to design tags that can be read magnetically. The problem with this of course, is that you are going to stick a tag on the bag and you can't just sort of feed it under a reader in the normal way of, say, a credit card or something like that. It has to be read from a device where maybe the reader is several feet away from the bag. But work has been done on this. Apparently, it is technically possible to develop a tag that can be read by a magnetic reader. This then would allow you to code the bag with some sort of serial number, and the computer system would keep track of where the bag is on the system, and route it to its appropriate destination. However, this is something down the road.

AA Form OK13-1D
Printed in U.S.A.

AA

American Airlines

final destination **A**

pcs. / flight

total wt.

Baggage Checked Subject to Tariffs, Including Limitations of Liability Therein Contained.

to flight

On Line

44-83-05

to flight

This is Not the Luggage Ticket (Baggage Check) Described by Article 4, of The Warsaw Convention.

OK12-1 Printed in U.S.A.
INTERLINE BAGGAGE TAG

American Airlines

FINAL DESTINATION **A**

PCS. AIRLINE FLIGHT

TOTAL WT.

AA22-09-25

TO

AIRLINE FLIGHT

THIS IS NOT THE LUGGAGE TICKET (BAGGAGE CHECK) DESCRIBED BY ARTICLE 4 OF THE WARSAW CONVENTION

TO

AIRLINE FLIGHT

AA

INTERLINE BAGGAGE CLAIM TAG

BAGGAGE CHECKED SUBJECT TO TARIFFS, INCLUDING LIMITATIONS OF LIABILITY THEREIN CONTAINED.

FIGURE 21. SAMPLE AIRLINE BAGGAGE TAGS

In the meantime, it's still the manual process of writing in the route on the bag tag. Therefore, if you are going to do baggage checks in a remote location, the staff who are doing this must understand the routing system. They must be able to read the information contained on the airline ticket sufficiently to be able to look at the ticket, see where the passenger is going, pick off the relevant information from the ticket in terms of the flight and destination and the transfer points, transfer all that information correctly to one of these tags, selecting the appropriate bag tag whether it's an on-line transfer tag or an interline tag, and put on any alert tags which are needed to ensure that the bag gets transferred. This is not particularly difficult stuff to do; you can probably train somebody to do it in a day or two. But the fact is that there is a definite training requirement before someone starts checking in baggage.

Now the other possibility of baggage check in is, in fact, not to do that, but just to tag the bag with the airline and use that to get the bag off the bus at the airport and into the hands of the appropriate airline people and let the airline people at the airport handle it. However, at that point, you get into another issue which is that, if you're going to do that, somehow the passenger has to be at least present at the airport while this process is taking place so that the airlines' staff can be sure that they get the right information. Where this is done, then some sort of sorting will be needed at the remote terminal. For example, at say Van Nuys, the bus comes in from Van Nuys terminal and makes a pass around the various terminals at L.A. International dropping bags off. In order to be able to be sure that the bags will get dropped off at the appropriate terminal, even though you are not checking baggage anywhere, you still need to be able to identify the bag as to the airline or the terminal so that it gets off loaded at the right place. Even where no baggage checking is provided, there may still be some need to identify the airline if the traveller can tag the bag in some way.

A number of particular problems may arise in the baggage check in. How do you deal with excess baggage, if someone shows up with more baggage than you are entitled to ticket? A fee has to be collected for the excess baggage, some mechanism has to be provided to get money that's being collected back to the airline. There are problems with restricted articles. Again, it has to be handled in a special way. . . . There is a fairly complicated set of rules governing all that, and it probably isn't worth the proverbial canary in a cage, then you say, "Sorry, we can't check that at this remote terminal, but you can ride the bus to the airport and deal with it there."

There are questions of security. Currently, the FAA requires that all baggage be x-rayed. Airlines have a profile of suspicious baggage. If a bag meets that profile, then the passenger is often asked to open the bag and allow it to be searched. It may be necessary to do that at a remote terminal or, again, it probably would be better to tag the baggage in some way, on an alert basis, so that the suspicious baggage could be inspected when it gets to the airport. That's what I think would satisfy the concern over how suspicious baggage might get introduced into the flow between the remote terminal and the airport. In any event, arrangements will have to be made with the FAA regional office and the airport authorities concerning how the whole question of baggage security would be handled at the remote terminal. The discussions which we've had with the FAA in the Bay area suggest that this is not the big problem that some people have thought it to be in the past and that suitable arrangements could very easily be worked out.

Finally, one of the toughest questions, how do you handle the baggage once you get to the airport? Here comes the bus that arrives at the airport that has a lot of baggage on it. Somehow you've got to get the baggage which is sitting there all pretagged from the bus to the baggage makeup rooms of different

airlines. There are a number of options dealing with that. One method is simply to have staff available who can take the baggage and transfer it to an airline counter, where it will get put on the belt and sent down to the baggage makeup room and on its way. These staffs could be provided by the ground transport operator; they could be provided by the airline; or they could be provided by the airport authority. Regardless of who provides them, somebody has to pay them, because there are going to be some costs associated with doing that.

Another alternative is to have a curbside area where the bus stops and where a belt is available to transfer the bags down to the baggage makeup room at the airline. The only trouble is that, at a major airport where you've got maybe 20 or 30 carriers, you're going to have to have 20 or 30 belts, and that is quite a complex problem. Recently, at a number of airports, we've seen something that is destination coded vehicle technology whereby you have a plastic cart into which the baggage gets put. Then you punch in the destination, the flight number of the airline onto a console along side the station at which the cart gets loaded. This information gets recorded into a computer, and the computer has a way of identifying the cart and where it is in the system. You only need one belt, and there are switching arrangements to allow the little plastic cart to get routed through the system to its appropriate destination. From the airline's point of view, this has a number of advantages. If someone checks in, say, three hours before flight departure, you can shoot the cart with their bag off into a holding site and keep it there for 2-1/2 hours. The computer will remember 2-1/2 hours later to pull that cart out and send it to the makeup room. You don't have the problem of baggage being put on the side because it's early and then forgotten.

The final option is that at a number of airports people are starting to think about ways to handle these large flows of people and baggage that are going to be coming in on buses and on ground transport systems. We need something that might be called a ground transport facility. The arrangement of having a curb is fine for people coming in by car or taxi or small vans; but when you start getting large numbers of people arriving on subway trains or in buses you need a special purpose facility at the airport that can be used to load and unload these vehicles and to transfer the baggage to the makeup rooms. If that happens, then the airlines might well be providing their own baggage check facilities and transport facilities.

Airlines have a problem already at airports in transferring bags from one airline to another when passengers transfer. In the design of airport terminals, one of the things that people are starting to introduce is some kind of interline belt system where the belt system connects all the baggage rooms of all the different airlines. When a bag comes in on United and they want to transfer it to Western, they just mark it Western and stick it on the belt. It moves along the belt system until it gets to the Western makeup room where somebody sees it coming along and pulls it off. You can be a little more sophisticated than that, however, if a computer does it. If you're going to do that, it's fairly easy to include the ground transportation provider on the interline belt system. The ground transportation provider would be treated as if it were a baggage makeup room of an airline, and the system would handle baggage moving between the ground transportation facility and the various airline makeup rooms.

In terms of designing new airports, there are a lot of options available to make this whole process relatively painless. However, in terms of incorporating these facilities into existing airports, we don't have that sort of technology, we don't have interline belts, we don't have a destination-coded vehicle. These are really serious problems. For the short run, anyway, the only way out of these problems is probably to have people with carts moving the bags around by hand and that's going to get very expensive.

Going on to talk about passenger check in, the procedure requirements for check in are relatively simple. You look at the ticket; you see where the passengers are going; you make sure the tickets are valid; you ask the passengers what seats they would like. Most computerized systems allow one to identify the ticket or seats and which seats are already taken. With the older method, you had a chart; you would put a sticker on the chart indicating the seat as it is taken.

Now the problem is that many of the airlines do this on a separate computer system from their reservation system. These computer systems are generally run as departure control systems, and the departure control system does more than just recognize that the passenger has shown up. The departure control system feeds that information back into such things as calculating the weight of the aircraft, its passengers and baggage in order to calculate fuel consumption and providing the various information that the FAA and the aircraft dispatcher needs to compile for the use of the flight crew. These systems are very much tailored to the needs of the individual airlines. They don't talk to each other; they can't communicate with each other, because there is no reason why they would have to under the present situation. So one can have a real problem at a remote location in trying to serve several different airlines if you have many different departure control systems, none of which can talk to others in the way that the traditional reservation system can.

There are a number of strategies open to us. We could have dedicated desks where essentially each of the different systems has a location and you put a sign up in the passenger seats just as you do at a regular airport. This could work for the major carriers. You might have three or four major carriers at a given airport, but then you wouldn't really be able to handle the other carriers. So one alternative would be to have some sort of telephone communications either to the ticket counter or to the gate location at the airport. When the passenger arrives to check in, the agent at the remote terminal calls up the airline at the airport in question and says, "I've got a passenger here who wants to check in on Flight 23." The person at the airline at the airport can do the stuff on the departure control system and they say, "Okay, fine, issue the boarding for seat 7F." Then the boarding pass could be issued. Now obviously a communication interface is needed, but I think, in principal, that this could be very easily taken care of.

The other possibility is to develop some sort of microcomputer interface where you could emulate the individual departure control systems so that, as the agent of a remote terminal types the information into the remote terminal computer, the terminal computer in turn could communicate to the individual departure control systems of the separate carriers. Now implementing such a thing as that is obviously going to be very difficult and would only happen if the airlines themselves agreed that this was a suitable idea before they would put in the sort of technical resources needed to make it happen. I don't see right now the airlines getting terribly excited about the idea of remote processing, so I think the prospects in the near future of that sort of option are rather limited.

However, that might change as airlines start finding it more and more important to cut the costs of maintaining their competitive posture. There are many airports where a given airline may operate only once or twice a day. In consequence, they may not wish to keep their own staffs there for just a few flights a day and may come to handling arrangements with other carriers. When that starts to happen, then they're going to run into the same problem that people run into at every remote terminal. Their arrangements may be handled by, say, Western, but Western's departure control system can't communicate with the departure control system of whichever the airline is. The need for some sort of

intersystem communication may well exist independently of the remote terminal location problem, so that it's not impossible that we'll see that problem solved in the near future.

Finally, the remote terminal must deal with flight close out. Obviously, you can't have someone show up at a remote terminal five minutes before flight departure expecting to be gotten to the airport and onto their plane. Somehow, someone has got to set a time ahead of the departure where you say, "Well, if you arrive after that, too bad. You can ride the bus to the airport, but we can not guarantee that you'll get on the plane." In calculating that close out time, one needs to find how long it's going to take to handle the baggage at the airport and how long it will take the passenger to walk from wherever they are going to be dropped by the bus. If a bus comes in and travels around to say, three or four different terminals, then it may well be that the flight closeout time for different airlines will be different, because travel time to the airline in the terminal at the far side of the loop is going to be longer than travel time to the nearest terminal.

One also needs to make some reasonable estimate of likely ground transport delay. There will be some delays, I think. Experiences with the FlyAway Service of Los Angeles indicate that these delays are, in general, not very long, so certainly the sort of margin we need to allow for delays is not to be so great as to discourage people from using the service.

Institutional issues are going to have to be dealt with. First of all, who's going to run the terminal? There are various options open. The airport authority, an airline, or group of airlines may be interested in doing it. The ground transport operator may want to do it. Or, finally, you may want to create a special purpose agency which has access to public funding in order to do that. Whoever runs the terminal operation, there's a question as to who actually is going to provide the passenger staff. The obvious candidates are the airlines, either on their own or perhaps by entering into a service contract with one of the private companies which presently do a lot of passenger processing for individual airlines at particular airports. Another option would be a travel agent. Travel agents have the know-how to do the ticketing and can retrain fairly easily to do the baggage checking. We may enter into a service contract with a specialized contractor who could provide the necessary staff. And finally, the staff may be trained by airlines through some sort of training contract, or one could simply employ staff who have been laid off by the airlines (which happens all the time) and who already have the skills and knowledge to operate the system.

Finally, someone has to pay for all this. One of the questions that should be considered is whether the particular agency operating the terminal is eligible for operating subsidies. Many states, for example, require that, to receive public operating subsidies, the operator has to be a non-profit agency. There are questions of eligibility for capital grants. Of course, it is not clear, given the change of administration, what's going to happen to some of these UMTA programs, but nevertheless, presumably there will be some sort of capital grants and operating subsidies for public transport. Many of these access services will certainly qualify.

Finally, as I mentioned earlier, the airline ticket commissions are paid for selling tickets, and the fact is that this may turn out to be one of the reasons why airlines may want to get back in this sort of business. They may consider it cheaper for them to provide their own staff for the remote terminal and do all the passenger processing than to be paying the commission through a travel agent who will be doing the same thing. In fact, in recent discussions in L.A., it was suggested that this may have become the case; the airlines would actually prefer

to run the terminal themselves in central L.A. than to have a travel agent doing it for them. What are the planning requirements for going ahead if, after going through all this process, one decides that its worth looking further into feasibility of this particular project? The thing we need to do is to make some sort of market assessment, looking at what alternative services exist, looking at the socioeconomic patterns in the areas served (where the high income areas are) looking for any major employers that generate a lot of air travel and, finally, looking at existing traffic problems, particularly with respect to congestion on the road system and whether any freeways have high-occupancy vehicle lanes or would give slight advantage to a public transport service versus people driving themselves to the airport.

Secondly, one needs to make some sort of an assessment of the economic feasibility of this whole thing. One needs to look at the supply and demand interaction of the terminal to see whether the revenue that you are going to get from passengers, the airline ticket commission and so forth is going to meet the operating costs of the service.

Next it is necessary to go out and see if there is actually anywhere that you could provide such a service, whether there are sites available to do it. In considering the various sites, one would like, as far as possible, for the site to be convenient to where the people want to go. One needs to deal with how the people are going to get from their true origin to the terminal. Many people, of course, will drive and park at the terminal, but some will want to use public transport modes. Whether or not they use public transit or whether or not they drive, there's going to have to be some consideration of traffic flow on the road system or around the terminal. There are questions to do with familiarity. You would like a site where passengers who don't use the service very often are going to find the terminal easily. If the terminal is tucked away in the back streets where you need a map and two years experience to find it, then we aren't going to get to many people using it. One would like to have enough space available for parking. One should certainly consider what land use interactions will take place. We don't want to go putting the terminal in the middle of a residential area and have the neighbors complaining all the time.

"Atlanta's Northside Airport Express Service"

Pat Neri
Manager
Northside Airport Express
Atlanta, Georgia

My presentation is kind of informal and not statistical. The concept of the Northside Airport Express was originally a remote access terminal. There was no service provisions originally outside of the bus when we were involved. That was in 1974. The idea started in 1973.

Without having maps, you will have to use your imagination. The airport is located 10 miles south of the downtown city district. The major growth in the Atlanta region is to the north, particularly in the suburban bedroom communities and in the light industrial/office development all among the Interstate 85 Corridor. We have three interstates, so to speak, in Atlanta. When I moved there in 1972, they were all four lane highways. (I didn't think that was interstate, having grown up in California. They thought it was a big deal in Atlanta.) There is a beltway system which completely circles the area. The airport sits just inside that circle on the southside. Our terminal sits along that circle on the northside. You have the two major through interstates, Interstate 75 and 85, which very cleverly merge just north of downtown and become one road all through town. This creates a bottleneck or congestion point, so we use the circular highway, which takes us completely around the outside. But back to marketing.

The idea was to have an eastside terminal, I believe like we heard about this morning—to have a full complete airline ticketing, restaurant, bars; just name it, you could do it. Check your bag and go to the airport. The airlines laughed at anyone who talked about it, and in fact they were laughing in October 1974 when we started the Northside Airport Express to the airport. We opened one terminal at I-85 and I-285 on the northside, that was the heaviest used road area in 1974. We opened the terminal in January of 1975. The following terminal was on the westside of the city. Then in September of that year, we started the third terminal location. We started it on one-stop basis, meaning that we would make a pickup at what is now our central terminal. We would go into our east terminal, make that 10 minute stop and go to the airport. We ran it that way for approximately three months and we generated no passenger traffic from central, so what we did was drop the stop. We now run direct nonstop into the airport, and we have a terminal there.

We learned in selling the Northside Airport Express that the business traveler who makes up the major portion of our service market wants to get there quickly. He doesn't want to stop on the way. He wants a place to park his car. These are the things that we feel have made Northside Airport Express a profitable remote operation. We give them an express, nonstop service that they can depend on, and we give them free parking.

Our terminals are two free-standing buildings—one that we built, one that we remodeled. One terminal is located in a hotel, the other terminal is located in a little shopping center, sort of taking advantage of various kinds of areas that you drive in.

Each time we started a terminal, being a private operator, we were looking at a lot of capital outlay. We usually started out renting the facility, putting in the shortest term we could get, because we could not always be sure we were going to make it work. Success has proven to be a very difficult thing because the problem you run into is partly that, if your renting a facility, you don't have the ability to expand right where you rent it. You end up having to move your facility if it is operating for a period of time. You've lost perhaps a year's worth of advertising in educating people how to find you and what to do when they get there. We've been lucky in that the two situations where we had to relocate after the initial start up, one is directly across the street and the other is two blocks down the street. We didn't have to leave the area that we started out in.

In 1975, we decided to add an additional service. In setting up our operation, we went to the intercity coach. We do not use vans; we do not use limos; we use over-the-road coaches. We started out with an older GM Model 1364B which we still use. We do not allow our drivers to handle any money. We have our own ticket agent. Our first action was to try to get a local travel agency to sell our tickets for us. That would save us the expense of having to pay those people to sell our tickets. They didn't want to do it; they didn't think it would work. So, in turn, we decided we would learn how to be a travel agent. As Ray said, we were not experienced bus transportation people. We were not experienced airport people. We did have some transportation knowledge in the rental car industry. But we found out what the rules were as a travel agent, and we established our first agency in August of 1975. By February 1979 we had four full-service agencies.

As our customers came in, the travel agent will sell bus tickets. That travel agent, in turn, can sell airline tickets, so we offer that additional service. We automated our agencies in February 1980. We went with an airline reservation system so that we have immediate access to seat availability and to all the airline schedules. We can give you your airline tickets and, at the same time, handle your hotel, rental car or anything that you want. This is how Northside has developed.

The first two years were not profitable. The capital investment and the operating cash requirements are tremendous. Presently, we have a fleet of 31 coaches. It takes 20 coaches to operate our present schedule. We do operate a scheduled service. On Monday through Friday we operate between the hours of approximately 4:00 a.m. to 1:00 a.m. At night we are closed for about three hours. We run an alternating schedule; our most frequent service is every 30 minutes; our most infrequent service is every 45 minutes. We're on a simple turnaround system; this keeps our coach requirements to a minimum. We're just getting into charter service (we use it for airport transfer work), and we're looking to get in some sightseeing.

In Atlanta there are two major carriers. We run a suburban service. I think this probably makes us unique in that for the first five years of our business we did nothing but suburban airport service. We do nothing but remote terminals to and from the airport. The other carrier provides exclusive downtown airport ground service. They stop at various hotels to deliver and pick up passengers.

Some of the problems that we've encountered in Georgia in trying to deal with our airport are, I think, interesting. It is a totally different attitude than the one I heard expressed yesterday. I don't know how other people who are affected, but I'll mention our side. We have a very good working relationship with our public service commission. When we file an application, we won't necessarily have it approved, but at least we'll be at a hearing within 45 days of the filing. We don't have 10- or 11-month waits like other people mentioned. We

have a five-member commission which is elected which is kind of interesting. We've for the most part had good working relationships with them. Bus transportation is a minor incidental in their realm. Transportation is not very important to them either. Its predominantly the trucking industry; that's what they look at; that's what they worry about. Naturally, their big deal on life is electricity, gasoline, the telephone and utilities. We really have a good situation. The staff people are super; they work well with us. We do get our hearing quickly; we get our decisions relatively quickly. If you have a really opposed situation, they might stall around for a while before they come out with it, but the longest we've ever seen was when we personally had to wait two months for a decision. That relationship is not bad.

Our airport situation is something else. Our airport is actually a City of Atlanta Property. There is a Department of Aviation which answers to the City of Atlanta. Your contracts and your permits to operate at the airport come from the City of Atlanta. These go through a transportation committee.

Our new airport was designed in the early 1960's. It was designed by a committee within the Department of Aviation. All the airlines and the City of Atlanta were involved. They started working on it in the late 1950's, and they finally got it under construction in the late 1970's. The planning never included input for ground operators. They did talk to the rental car people. But they never talked to the bus operators. They didn't talk to the taxi operators in Atlanta, because there are thousands. They never really talked to the hotel courtesy car operators, and there are a lot of close-to-airport properties running their own courtesy vehicles. They didn't talk to the downtown people.

The airport itself is very nice. Atlanta is a hub airport, second in traffic figures only to O'Hare. Seventy-five to eighty percent of the traffic going through Hartsfield is transfer traffic, so the airport itself is really designed for that person. It's a big terminal building with four separated concourse connected by a tram. Now if you are an arriving passenger from Atlanta or if you want to go out to the City of Atlanta, you have relatively decent access. You come in on a single road. They've got two roads that will take you into the airport. You have a doubledeck loading situation where the lower level is supposed to take care of commercial vehicles. The upper level is supposed to take care of private automobiles. The lower level is two drive lanes wide, and the upper level is six or seven drive lanes wide.

In the old days we had a simple circle where we drove right in and we dropped you off in the middle and you had easy access to where you wanted to get to. In this new situation, two major carriers are split—one is on the southside, one is on the northside—but it's all one single building; you can walk through it. But, if you want to curb check luggage or if you want to get to the ticket counter for some reason, you have to go either to the South Terminal or North Terminal. In designing it, designers all sat around and said "We're going to have the private automobile on the upper level deck, and we'll have all commercial vehicles come in on the lower level," which is very nice. It looks good on the drawing, but it didn't work.

They also built the airport with no easy way to get from the North Terminal back to the South Terminal. So as a ground operator, they came to me and they said, "You will bring your bus in, and I want a single stop with you." So I went to ~~one~~ point, unloaded my passengers who walked across the roadway to ticketing. They came back out to the same point, got on the bus and I left. Then they came to me and said, "you will go down to the lower level at the North Terminal" (which is Eastern Airlines which has the minor share of my market that is predominantly Delta which carries probably 65% of the boarding passengers). It was taking 10

minutes to run from the North Terminal to the South Terminal because they added a mile and a half loop so that I had to take to get from the North Terminal to the South Terminal. So I was putting the majority of my passengers in a situation where they had to run 10 minutes from one terminal to the other. They did not like it.

We found out about this situation two weeks before the airport opened. That was the kind of cooperation which the airlines, the airports managers and the city transportation people gave ground operation, and it was not for lack of trying. I went to the airlines a year before and pointed out to them that they needed to get ground transportation involved in the operation of Hartsfield, that we would be bringing a lot of people in and out of there. Northside carries approximately 75,000 people a month in and out of Hartsfield International Airport (and we do not carry any of the downtown convention traffic) and yet they would not talk to us. It's costing us approximately \$75,000 a year extra to just run the extra distance at the airport, whether I get another passenger ever. As a private operation, that's a great concern of ours.

We came to terms with airlines. We did end up serving on the lower level on one side, because we told them that we would go in on the south. There is a way to get from the south to the north that's not too bad. I still had to make that loop, but I made it when I went to reload, so I had no passengers delayed on the bus.

They then had us all going in to the south terminal on the lower level. But when I came in with 47 people (two bus loads of people) at peak period, they couldn't handle it. They had one point where you could check bags. Most of my passengers are business travelers again who are in a hurry to get to an airplane. They don't often have to stop at an airline counter. The most they have to do is check their baggage early. Two weeks later the airlines came back and said, "Yeah, your right, go to the upper level."

This situation did not affect just Northside; it affected the downtown carrier, rental car agencies and everybody else. They had everyone--hotel courtesy cars, rental car buses, Northside Atlanta Express, Airport Shuttle (which is our downtown carrier), courier dispatch, air dispatch, small package services and small freight services coming in to one door, and if three of us were coming in there with full loads of people it was just nearly hysterical. We had to get out there and direct traffic and just do all kinds of things. They couldn't handle us. But they wouldn't listen to us.

Our airport people and our city people will not face the fact that they've got to deal with ground transportation. They've got us all in a west curve area which is sort of our baggage claim area, but there are times during the day when taxis back up and that means I can't get my buses in, or when they get too many hotel courtesy cars in and the rental car buses can't get in. It's just a terrible thing. They created a more congested ground area than we had in the old airport, which itself was a disaster because of space. The old airport was so terribly over crowded that it was difficult to handle us. Well, what they ended up doing was far worse for ground services and far worse for the passengers. There is no inside area for passengers waiting for the bus. The overhang that we are under is so little that, if it rains, it's like it's not even there. They had no consideration whatsoever for the passengers who want to utilize ground transportation.

Our airport is built for the private automobile. It was designed back in the period of time when the private automobile was not costing quite so much to operate. They almost tripled their parking capabilities in this new airport, and they can't fill the parking lots up. They've had to reduce their rates because people don't want to drive. But they did not take time to work with ground operators and find out how to deal with the 75,000 people I carry or the 100,000 the downtown carrier carries or passengers carried by those who run hotel courtesy cars; we're all out there in the rain together. There was absolutely no consideration for the ground transportation operation in this airport, and it's the world's largest airport and the second busiest.

The building is a long run. When you first circle onto the deck, you are in the ticketing area or the ticketing end of the terminal building. Delta is on one side, Eastern is on the other. They have curb check. You come on down that building and you hit baggage claim. So if you just come to Atlanta and you are being picked up by private auto, they just go all the way to the end of the building. We have a rapid rail line being built in Atlanta, so the west end of that terminal building is envisioned as a future station when it gets there. They were projecting 1985, but not they aren't sure. It will be a modern rail system. You go down a very long hall of empty area which will some day be the rail line. You come out to what we call the west end. The first thing you hit there is a little sidewalk area which is designed for taxicabs. As you come across the raised crosswalk, two drive lanes wide, the first curb that you hit is where the Hertz rental car buses park. The hotel courtesy cars park in the center of that, and more buses park on the other end from the rental car buses. Come across the side walk, and you hit the coach docks. I'm designated to use three spaces, and I share one. The downtown carrier uses four spaces and he shares one. The end of it is for chartered coaches and exempt operators, like school buses or church buses.

This is not a major problem for Northside because of what we do. Most of our people are residents in the area. They use us. They are going home to a car, or they are coming in for a meeting at one of our hotels; they have already been told that the best way, the only way, to get there is Northside as cab rates don't compete with us at all. The person who is really hurting is the downtown carrier. Everybody who owns car can be a cab in Atlanta. They're there in the bull pen; there are 500 cars in it, and they pay a quarter to go through there in Atlanta. So he is really in trouble because that means a lot of people are getting picked up on cabs without ever seeing the ground operator.

"Connecticut Limousine's Remote Airport Ground Transportation Terminal"

Ed Kuryluk
President
Connecticut Limousine Service
New Haven, Connecticut

I've really enjoyed southern California, and I've enjoyed the opportunity to speak in public to some of you people from the various airports. Certainly your attitudes are very progressive in comparison to those in the Northeast. I think our relationship with the airport is similar to Pat's, maybe worse inasmuch as they like to take fees from us. To give you an idea, last year we paid a million dollars in fees to Port Authority of New York, and I'd like to relate that I received nothing from it with the exception of the given time to complain to the various agencies involved with it.

One of the things you didn't tell me, Kay, is that I had to follow a couple of gentlemen like Dr. Gosling. At one time I thought I was an authority on this remote terminal situation, but I only learned this morning that I don't have a remote terminal but that I have an access terminal. Certainly if I was in Southern California, Dr. Gosling, I would enjoy being in some of your classes.

I think our approach to the subject is quite different from some of the public operators or public commission. First of all, we are a company that's in business, I guess, for one reason—to generate a return on its assets. In that situation, certainly, my criteria are very strict. By the same token, my philosophy for the 16 years I've been with Connecticut Limousine has been such that I could accomplish that by doing whatever is possible to provide the best possible service for the customer. Fortunately, for the most part, we have the kind of philosophy that, if you get people in the car, you surely can take them for a ride—sometimes not necessarily to the airport.

I think that the concept of the access terminal really developed in a different way with Connecticut Limousine. It developed as a result of a number of problems, which seemed to have a common solution. I'll give you a little history of some of these problems.

First, for the most part, we have picked up our customers at various terminals, and most of these terminals have been hotels. Obviously, in the past, the mutual benefits of these hotels were relevant for both parties. We provided customers to them; they provided 24-hour security, sheltered waiting area, lavatories and other assorted amenities. Unfortunately, as our volume increased, the problems also increased. Most of the problems came about because of increased congestion in the lobby areas and congestion in the loading area. The hotels had problems due to the increased costs of maintenance as a result of our customers. Slowly but surely, we could see the situation deteriorating. As we looked towards the future, we were obviously concerned as to where we go if we had to leave the hotels and motels.

One of the unique situations that we serve is that due to the strict zoning laws and due to the increase development of corporate headquarters, the availability of space and the availability of hotels and motels for our usage was extremely limited, and if you were not in the right place, you could find yourself in a situation where you might be serving a town but no location. You'd have to

do it going from corner or going to the downtown area, which for the most part you could not consider suitable for our type of service.

The other problems was that we had very little control over our volume, and for the most part our volume was dependent upon airline growth. We then looked for ways to increase ridership, primarily through market penetration. I think one of the considerations in looking at this problem is what would it take to keep the family car at home? Well, some people may think that the thing you should probably do is to go to church on Sunday and pray that the gas prices will continue to escalate. We considered that there had to be solutions other than that.

Before I get into the solutions, I would like to describe a little bit about our service so that, when you look at the solutions, you'll see why they make sense. First of all, we serve two counties in Southwestern Connecticut on a line operation. Like our name, it is a limousine service, and we operate 11-passenger vehicles, a few passenger vans and a number of MCI 5C's. We serve nine stops every hour from 4:30 in the morning until 9:30 in the evening. We serve six stops on our second route which tends to be a low density area, and only serve six times a day, but it's also an area for future growth and an area that we are presently expanding. From the airport we service all those towns essentially on the same frequency from 6:30 a.m. in the morning until 2:00 a.m. the next morning. For the most part, our service has had prime frequency from communities on a local basis.

I felt that, in order to obtain greater market penetration, we had to satisfy the service oriented needs of those who use private cars or car rentals. The thing that we found here was an evolutionary process that didn't happen in two or three months but evolved over a period of two or three years. We found that a lot of people had very difficult problems getting to our terminal locations. Cab services in these communities were very poor. Some people didn't want to bother family members or relatives driving them to our terminals. They found it easier to drive to and from the airport. Others found that it was very difficult to park in the areas of our terminals, or that the motel's parking was prohibited or limited. The customer need in this area was very obvious—long-term parking lots. As you will see later, the concept in regards to our long-term parking lot has changed. Originally my concept was essential that they would be free and would generate no revenue problem.

The next problem we faced was that businessmen coming from out of town have no way of getting around town once they arrived in Connecticut again due to the poor taxicab service. So most rented cars at the airport and drove them to Connecticut. We discovered that, in most situations, businessmen and their companies could save in excess of \$50 after paying our fare by taking our service and renting a car at our terminal. The obvious need here again would be to have a convenient car rental service available at our motel or hotel situations. For the most part, due to our relationship with these hotels, this was not feasible.

We also found that many businessmen look for a total transportation and travel service which only could be combined by a travel agent. So we now found there was a need to get into the travel service business.

The fourth problem was that, due to the type of service that we provided, we serviced two airports (La Guardia and Kennedy). Our furthest stop from the airport was approximately 95 miles, and we serviced 19 towns. As you can see, we are covering a lot of towns—lot of stops—especially when you are doing these virtually around the clock. One of the things which we found was that some of our limousines would be going to the airport non-stop, depending upon the volume, while others would make up to four stops. We found that this was a deterrent. The

unpredictability of the numbers of stops kept many people in their cars away from our service. The solution obviously was non-stop service from key terminals. But how to do this economically was a major problem, since non-stop service would reduce load factors significantly. The possibility existed that the institution of non-stop service might inflate enough growth to make it economically feasible. We felt that this could be accomplished, but obviously there was a risk factor. Again you have to come up with a lot of capital up front, then advertise and market it. Hopefully, we would generate the volume.

We also found that we could not attract people in low density areas to come to our terminal locations. And we couldn't afford to go after them.

I never mention the price of our service as a way of trapping new customers. We have been very fortunate in that income for our average passenger was \$49,000, and 75% of them were on business expense accounts. For the most part, people we serve are not only concerned about money, but they want service. Most of our competitors in the past have gone in with the idea that cheap is good, but unfortunately in this situation, cheap is very bad because it is reflected in the type of service you provide.

Some 4-1/2 years ago we made a commitment to evaluate the feasibility of a remote terminal or, as I now learn, an access passenger terminal which, on the surface, appeared to solve the previously mentioned problems. In 1977, we began to make a serious effort to fill this need. We began to search for a suitable site. I guess it was this point in time that my job at Connecticut Limousine changed. I found that I was spending more and more time with real estate and development business than the limousine business. And this is one of the pitfalls you get involved with. Unfortunately, or fortunately, whichever way you look at it, we've also discovered that there is opportunity in this area, and along these same lines we continue to get into other areas; we tend to dominate the whole travel service field. More and more opportunities in this area in real estate and travel-related services seem to make sense, especially from an economic standpoint. A suitable site was finally located. The criteria that we were looking for in the beginning were that this site had to have at least three acres, it had to be located within close proximity to Interstate exit and entrance ramps and it had to be affordable. Due to the scarcity of prime development acreage near the Interstate system, the task seemed impossible and, for the same reason, very expensive. Our first attempt to purchase the site resulted in failure due to the rejection of a variance required in a commercial zone by a local zoning board.

At this point I found out the problem of cost was not the only problem; now I had to fight with the community about the zoning law. We were dealing with property in commercial zones, but in our situation, they didn't specify mass transit in those particular proper useages. Then I found that I had to go before zoning laws review boards. Immediately the township would come out. They love our service. We're fantastic; but we're going to pollute the air in the downtown area; we're going to add congestion—all the typical problems. In the future, zoning problems will continue to haunt us. Even to this very day we're involved in another situation where the zoning is a very critical problem.

Finally, in the fall of 1979, we located a suitable site and began negotiating for the property. Figure 22 is an aerial view of what we finally got involved in. At the bottom you can see the Interstate Highway, and in the center is the grey building which happened to be a cinder block 8,000 square foot building in the ghetto area of deteriorated buildings. For the most part, it would seem very undesirable. We got a very good price here. It was a site which for the most part seemed unattractive, but as it turned out it was a gold mine.

I thought my problem, was solved but found again that my problems were only beginning. I recognized the importance of and the needs to pursue the project, but how were we to fund and maintain the project?

The property purchase would eventually cost million dollars, and an additional \$500,000 was needed to make the site suitable for our service. Believe it or not, again, the price for the land, when you consider the area we were involved in, was cheap. That's understandable. Fortunately, my relationship with my Board of Directors was greatly enhanced when, six months after we purchased the property, without it being on the market for sale, we were offered a price that exceeded our cost by some 20%.

I immediately began to look for federal and state assistance, but of course nothing was available. . . . The Connecticut Development Authority, through a state's statute, could authorize tax exempt bonds for various building projects in the state to increase employment. The state statute that gave this authority for tax exempt bonds did not include mass transportation terminals or further related projects. As I've also found out for the most part, various types of statutes and zoning laws totally ignored mass transit. In most situations, I had to spend the time, energy and money in trying to educate these people in changing the laws. Finally, with the help of a lobbyist, we changed the state's statute to include mass transportation projects as acceptable building projects for tax exempt bonds, but unfortunately, not until the project was underway, which made it inelligible for the funding. The funding could only be applied for if you had not begun construction. Unfortunetly, most state agencies don't realize that, when you're sitting in a piece of property, you've got to do something with it quickly, otherwise your losing thousands of dollars every day that you sit on it.

The owners of the property finally agreed to a long-term note on the property for 10%. It was a 15-year note and, as things turned out, I was a hero on that one. Parking revenue was another interesting thing inasmuch as I originally intended to do it for nothing, but obviously with that kind of a cost figure, we had to charge to generate revenue to pay for the site. We also took into consideration car rental agencies, coffee shops and other facilities which we could have in the building. We also planned to use the area where space was available in the building as a driver terminal and as a location to store limousines. This would result in various savings related to elimination of deadhead mileage and various labor management costs. We also put bulk gas purchases on this site. We also included profits from anticipated growth. This was very speculative, and as I look back now, at the time I was very optimistic. As things turned out, I underestimated the potential that we had here. We also included profits from the travel agency that we would develop on our own. After considering all the potential revenue interests and operating costs, we came up to a bottom line of \$80,000 lost annually.

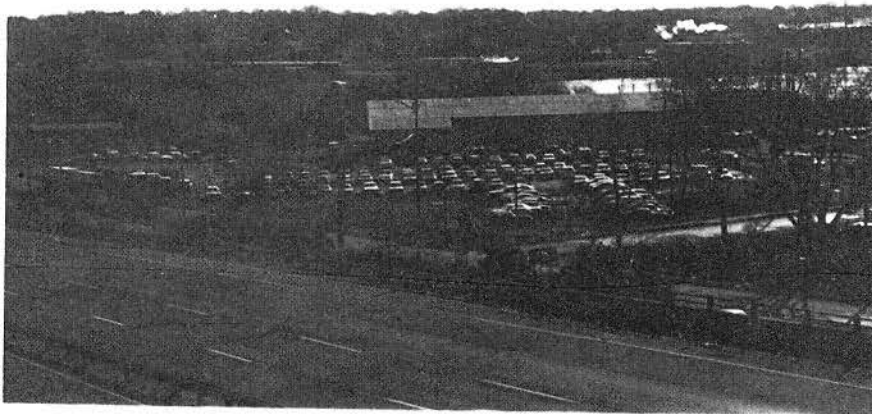


FIGURE 22. CONNECTICUT LIMOSINE NORWALK TERMINAL

Obviously, going to a Board of Directors with a scheme like this might have just ended the thing in a couple of minutes, but I had a firm belief in the project and, if anything, what's occurred during the last year would reinforce these beliefs. Before I went to my Board of Directors, I had to improve my position. By investigating and talking to various people in the real estate development business, I found that the area which we were involved in, despite the appearance, is a very isoated ghetto area that is surrounded by railroad tracks, the Interstate highway and a main artery. If we could control the environment in the area, we could potentially build a hotel and office building on the site and eventually turn the property into a profit-making enterprise while meeting the needs of Connecticut Limousine and its customers. I felt strongly enough about this concept and the need to go into this direction to ensure our position in the marketplace in the future that I recommended a purchase to the Board of Directors that would appear to be a substantial risk.

You have to understand one thing, I have been committed to the idea that we have to continually upgrade our service and continually provide more amenities to the customer. By doing so, we are guaranteeing our postion in the marketplace in the future. My long range planning is all based on this one element.

After a week of meetings at various times with my Board of Directors, they finally agreed. To be quite frank with you, I was very surprized.

Before we closed on the main site, before we let it be known what we were doing, we attempted to take out options on additional sites. As you can see in Figure 23 there are a lot of older homes here. We tried to grab as many of those as possible so that potentially we could control most of the area for future development. Unfortunately, after taking out five options for five sites, the word got out and every thing went wild. Eventually we would end up paying \$1.2 million dollars for 4-1/2 acres of land which includes a number of those buildings which you see there. The building was renovated, the acreage was paved and we opened the facility in December 1979 on a very limited basis since our car parking was not completed. For the most part, we only had a rental car agency.

Figure 24 is a view from ground level that shows you part of the parking lot and part of the building. At the cost we were involved in, I couldn't do a hell of a lot with the building but try to dress it up. A good portion of the \$500,000 for renovation was allocated to site preparation, paving, draining and lights which, as I found out, are very expensive. You can see the highway system that is adjacent to the parking lot.

Figure 25 is part of the area where we gas up our limosines. By putting in a driver terminal at this point, we save lot of deadhead milage and some 16 cents a gallon on gasoline that we purchase in bulk. In March 1980, we opened our custmer parking lot (see Figure 26). We charge \$3 per day for the first four days and \$1 a day thereafter.

In the beginning, during the first six months, we did just a minimal amount of advertising; most of the advertising that we did tended to be in our normal publications, but nothing through the mass media.



FIGURE 23. NORWALK TERMINAL AND ITS SURROUNDING NEIGHBORHOOD



FIGURE 24. GROUND-LEVEL VIEW OF NORWALK TERMINAL



FIGURE 25. SERVICING AREA AT NORWALK TERMINAL



FIGURE 26. CUSTOMER PARKING AT NORWALK TERMINAL

Figure 27 shows you the terminal from the front of the building. On the right hand side, you see the canopy going over the road. All passenger traffic which comes in here is directed under the canopy area. Essentially, what we did was to correct some of the problems that we experienced at the motels, that being segregation of our services from the customer cars.

Figure 28 is the interior of the waiting lounge. One of the things that we try to do is to make people feel as comfortable as possible in that building. We want them to feel secure; we want them to feel it's the best place to go and something they could feel very comfortable with. For the most part we have avoided typical railroad, bus station or airline type of lounge area. We have comfortable seating and are trying to make the customer feel much more comfortable. Again, we are dealing with an individual, as I said before, who has an average income of \$49,000 annually, so we feel that he deserves more, and for the most part he is willing to pay for more.

In October 1980, we began what we call our corporate shuttle service in low density area. Now we started to address the spoke and hub effect by trying to bring in some people from the surrounding low density area into the terminal here at Norwalk rather than going to their homes. We addressed some of the major corporations in the area who had high-volume traffic to the airport and were not using our service. We offered corporate shuttle service from their corporate headquarters to our facilities and then service which eventually went to the airport. In the beginning, we spoke with probably a dozen corporations and received some very good input from about a half a dozen of them.

Initially in October only one started with us. The main problem again was that they were looking for non-stop service. Finally, in December 1980, we began non-stop service and, in conjunction with that non-stop service, we brought on board another corporate entity who never used us before but was using car rentals. We pick them up at their headquarters and bring them into the terminal here. At the present time, we have a third corporation that's coming aboard. From these three applications alone we will have generated some 800 new one-way fares a month that we never had before.

I think it's interesting to look at what the effect of this terminal operation has been. First of all, from the standpoint of customer success, volume has exceeded all my original expectations in performance. Our volume at this terminal in 12 months has doubled. I think it's interesting to know where the people have come from. In some of our surveys we found that a certain percentage of people are coming from our other stops, primarily because of the parking, non-stop service and other amenities. We also know that there's a good percentage of people who have never traveled with us before. I think it's also interesting to note that the time when we noticed the greatest increase in use if the terminal was in December and January when we initiated the non-stop service and spent a lot of money for advertisement. I think, in conjunction with the snow, it really was a success for the situation here. From the financial standpoint, it also is interesting to note that, if you consider the losses that were involved here, it's probably a total failure. But I think, from the standpoint of our future in the industry and the future impact that we will have on the industry in Connecticut, this investment is critical. At the rate we're going right now, our losses are on target, and we expect to be close to a marginal basis within about two years. And this is without the development of a motel or a hotel. We are proceeding in that direction but, unfortunately, it tends to be much slower than what we were able to do with limousines here.

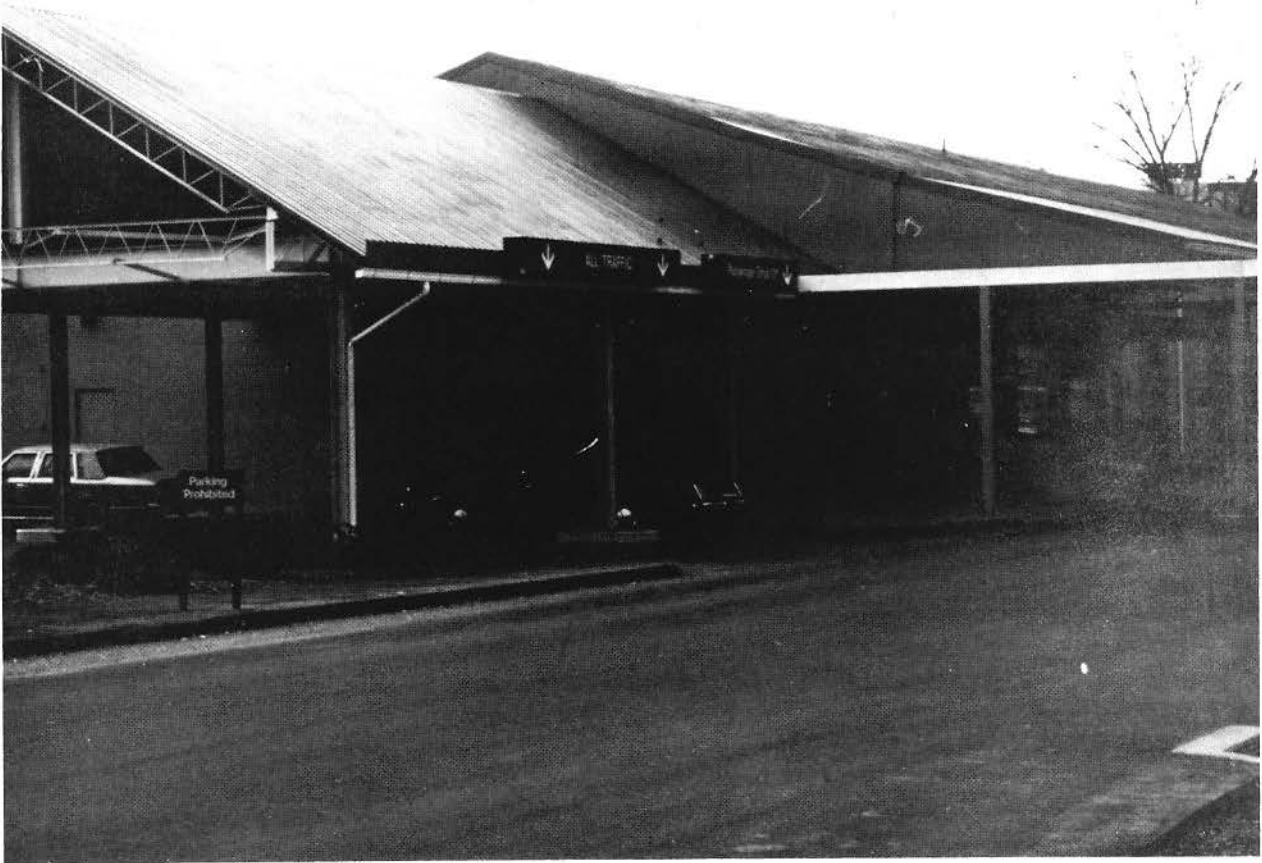


FIGURE 27. NORWALK TERMINAL BUILDING AND CANOPY



FIGURE 28. WAITING LOUNGE AT NORWALK TERMINAL

As a result of this success, we then can start looking for other sites. We're not looking to turn all of our 19 stops into company-owned terminals, but I think what we're trying to accomplish is to centralize these terminals and concentrate volume.

We began looking at a number of areas, and some time ago we purchased 12 acres of land in New Haven which is the furthest stop on our mainline run which happens to be 80 miles from the airport. Fortunately, in this situation, we came across a very unique situation with Amtrak, whereby they had some excess land which happened to be by a rail yard. We were able to make acquisition there which really was bone cheap compared to this acquisition in Norwalk, inasmuch as we paid \$330,000 for 12 acres of land. I don't know if I am lucky or not, but as it turned out I'm a hero on this one also. We're looking to do the same project in New Haven with the idea that we can also develop it into a hotel or office building site and still meet our requirement. In April of this year we will begin construction in New Haven. We expect to be operating by August, with the anticipation that we will be on a marginal basis at that facility within 18 months.

In closing I would like to give you some of my opinions on the remote terminal concept. I think, as I explained to you, that we got where we are for different reasons than maybe some public entities, but I think that, in reality, we are talking about the same thing—we're talking about serving the customer. We found that, with a strong marketing program, we can impact volume. I firmly believe that this is the wave of the future. A strong marketing program obviously has to be done in conjunction with new and improved concepts. You have to be innovative; you have to do new and different things. I think the other thing too is that the park-and-ride concept at the terminal is a very important concept and can, in fact, attract many new customers. Unfortunately, I think the biggest thing most of us face is how to do it with the high cost of property. If you can overcome the cost of property, you've come a long way in accomplishing what you want in this area. And certainly without public input in regards to that it is almost impossible.

"Airport Access: Case Study of a Remote Terminal Operation"

(Paper)

Margorie Kaplan
Southern California Association of Governments
Los Angeles, California
Presented by Irv Jones

Abstract

Considerable interest has developed in recent years in remote airport terminals as a means of reducing landside congestion at metropolitan airports. A prime consideration in assessing the suitability of the remote terminal concept for a particular airport lies in its economic feasibility, i.e., can it attract sufficient patronage and be operated efficiently enough to be cost effective?

This paper analyzes the cost of operating the FlyAway Bus system, an express bus service linking Los Angeles International Airport with a suburban area contributing about 15% of the airport's passengers; though it does not offer baggage check in, other services such as ticketing are offered on a limited basis and expansion to a full service remote terminal is a distinct possibility in the near future. The objective is to identify actual costs relative to all aspects of the operation to assist planners in costing out such systems for other airports. Included are overviews of physical characteristics, operational problems, passenger market segment, airport and bus patronage growth rates, cost/revenue relationships of bus operation and terminal maintenance, bus fuel price impacts, foregone bus terminal site rental income, break-even patronage, facility replacement costs, and prognosis for future activity.

After five years of operations, many of them beset with problems, the FlyAway appears to be thriving. A recent passenger survey revealed that much of the system's attractiveness lies in its economical fare, frequent headways, low cost parking and dependable service. As passenger volumes rise and roadway capacity continues to be stretched beyond design standards, remote terminals offer the best hope of alleviating airport ground side congestion. The FlyAway demonstrates that not only do they work, but they work well and cost-effectively.

Introduction

There has been a great deal of discussion in recent years on the topic of express ground transportation services to airports. With enthusiasm for new rail systems dampened by tales of mechanical malfunctions and design inadequacies, as well as the high capital expenditure associated with the building and operating such systems, many airport operators have turned to express bus services as an alternative to expensive and land-hungry roadway/parking lot expansion.

Express buses have a number decided advantages over other forms of transit: buses are relatively affordable, generally costing about \$120,000 for standard metropolitan models; they are dependable and durable, the art of bus design and construction being rather advanced; they require minimal start up time for initiating service since buses generally require no special roadway adaptation, nor elaborate driver training; they may be disposed of readily if a system is unsuccessful in attracting patrons since there is a large market for used buses in

the United States; and buses have adaptability in route selection since they are free moving and are not bound to fixed guide ways.

Given all these positive characteristics, and knowing that the ground access network at Los Angeles International Airport (LAX) would soon be inadequate vis-a-vis forecasts of passenger demand, on July 10, 1975, the Los Angeles Department of Airports (DOA) inaugurated the FlyAway Bus Service. The FlyAway was a pilot express bus service designed to provide residents of the San Fernando Valley—large sprawling bedroom community located 20 miles north of the airport—with a direct bus to LAX. There were a number of motives for creating this service including:

1. Establish a pilot program to study the effectiveness of the remote terminal concept;
2. Alleviate curbside and parking lot congestion at LAX;
3. Alleviate airport/roadway/freeway vehicular congestion;
4. Conserve energy; and
5. Reduce air pollution.

Most importantly, given the prevailing ground access modal split of 90%-10% for private automobile versus bus/limo transport, the airport's central terminal area roadway had a passenger capacity (approximately 28 million annual passengers) well below that of the runways and terminal buildings. Consequently, the primary physical constraint to growth at LAX was ground access capacity.

This problem was not due to faulty design but rather optimistic planning; the airport had been built under the assumption that a complete freeway network would encircle it, bringing traffic in from all directions. It had also been planned that a set of underground tunnels would eventually be constructed to channel traffic from airport environs directly into roadways and parking lots at the western end of the terminal area loop. These improvements were supposed to eliminate bottleneaking at the airports entrance, reduce queueing at curbsides, and relieve congestion on the interior roadway.

Unfortunately, as the extreme high passenger volumes predicted for the late 1960's failed to materialize on schedule and the flat growth period of the 1970's set in, the previously described highway/roadway/tunnel support was downscoped in concept. Ultimately, as slow growth continued and the 1974-75 recession followed it was tabled indefinitely.

Today, the ground access system that serves LAX remains virtually the same as when the airport was developed in 1961. It consists of one major freeway that runs north-south—the I-405—plus several primary surface streets including one that feeds from the I-405 directly into the airport's central terminal loop. The loop is a U-shaped one-way circulation system with the terminal buildings ringing the outer edge and the parking lots and structures contained in the middle. The roadway is now capable of handling about 30 million annual passengers (MAP) at service level D. In 1979 LAX served nearly 35 MAP. The FlyAway bus was an experiment to address this type of imbalance in supply/demand of ground access capacity.

A relative pioneer in the remote terminal arena, the FlyAway has attracted much attention as landside constraints at metropolitan airports point to remote terminals as a tactic for relieving congestion. Though originally conceived as a full service remote terminal, airline baggage check-in has not yet been implemented and airline ticketing is provided on a limited basis only. Both services may be provided, pending airline support, in the future. This paper describes and discusses the costing of the FlyAway bus service. The purpose of this discussion is to provide background to help airport planners evaluate the economic feasibility of remote terminals. The paper covers five major aspects of the system:

1. A description of the system's operational problems, physical characteristics, and market served;
2. Detailed description of system costs/revenue including bus operations, terminal maintenance, bus fuel price impacts, foregone rental income and break-even patronage;
3. A brief summary of a passenger survey with analysis of passenger travel habits, and demographic data;
4. A comparison of air passenger growth rates with bus passenger patronage; and
5. A description of planned improvements at LAX and discussion of where the FlyAway fits in.

The New System: Growing Pains

The San Fernando Valley was a prime location for such an airport express bus service (see Figure 29). It was located a reasonable distance away (about 20 miles) via a mountain pass that had only two primary access routes to the airport (Sepulveda Boulevard and the I-405 Freeway), it housed a large sprawling bedroom community that contributed about 15% to LAX's total passenger market, and the DOA owned a large piece of real estate at a central Valley location. This real estate, better known as Van Nuys Airport (a large general aviation facility), meant that the DOA could initiate its program without buying, leasing, or paying taxes on land. In addition, an existing building was available at Van Nuys that could be adapted for use as a bus terminal (see Figure 30), and it was adjacent to a large parcel that was suitable for 1,400 space parking lot. The site totaled 12.2 acres.

Acting on recommendations contained in a feasibility study completed in 1973 by Wilbur Smith and Associates, the FlyAway Bus service was inaugurated in mid-1975. It operated via six DOA-owned Neoplan buses making a circuit of 44 scheduled round trips per day, with 30 minute headways in the daytime, and 75 minute headways between 12:30 a.m. and 5:30 a.m. The adult fare was \$5/round trip or \$3 one way, a child's fare was \$1.50 each way, and employee passbooks were available to all persons working in any capacity at or near the airport. Parking was available at the Van Nuys terminal for 50 cents per lot entry with no limit to parking duration.

Although the feasibility study had addressed the possibility of FlyAway being a full service remote terminal including airline ticketing and baggage check-in, the additional expense of such a service, plus airline opposition to remote baggage check-in, made it unsuitable for the pilot program.

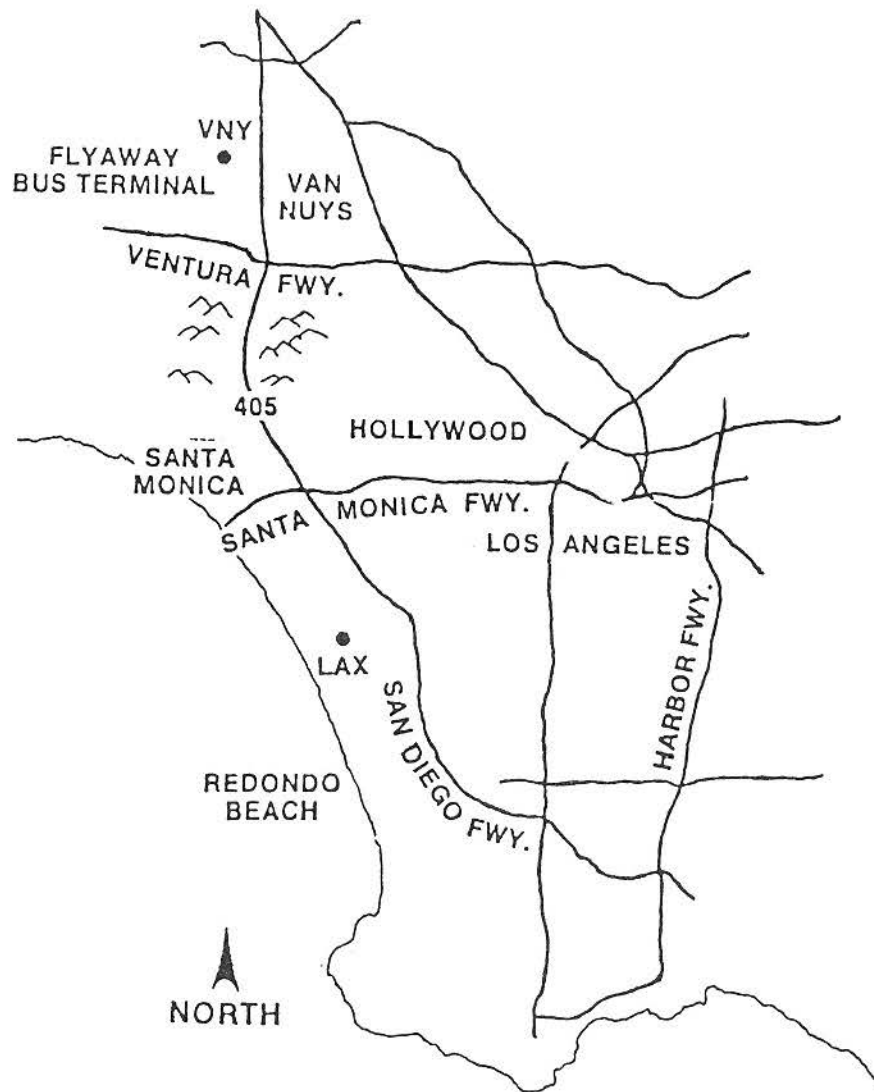


FIGURE 29. FLYAWAY BUS TERMINAL LOCATION

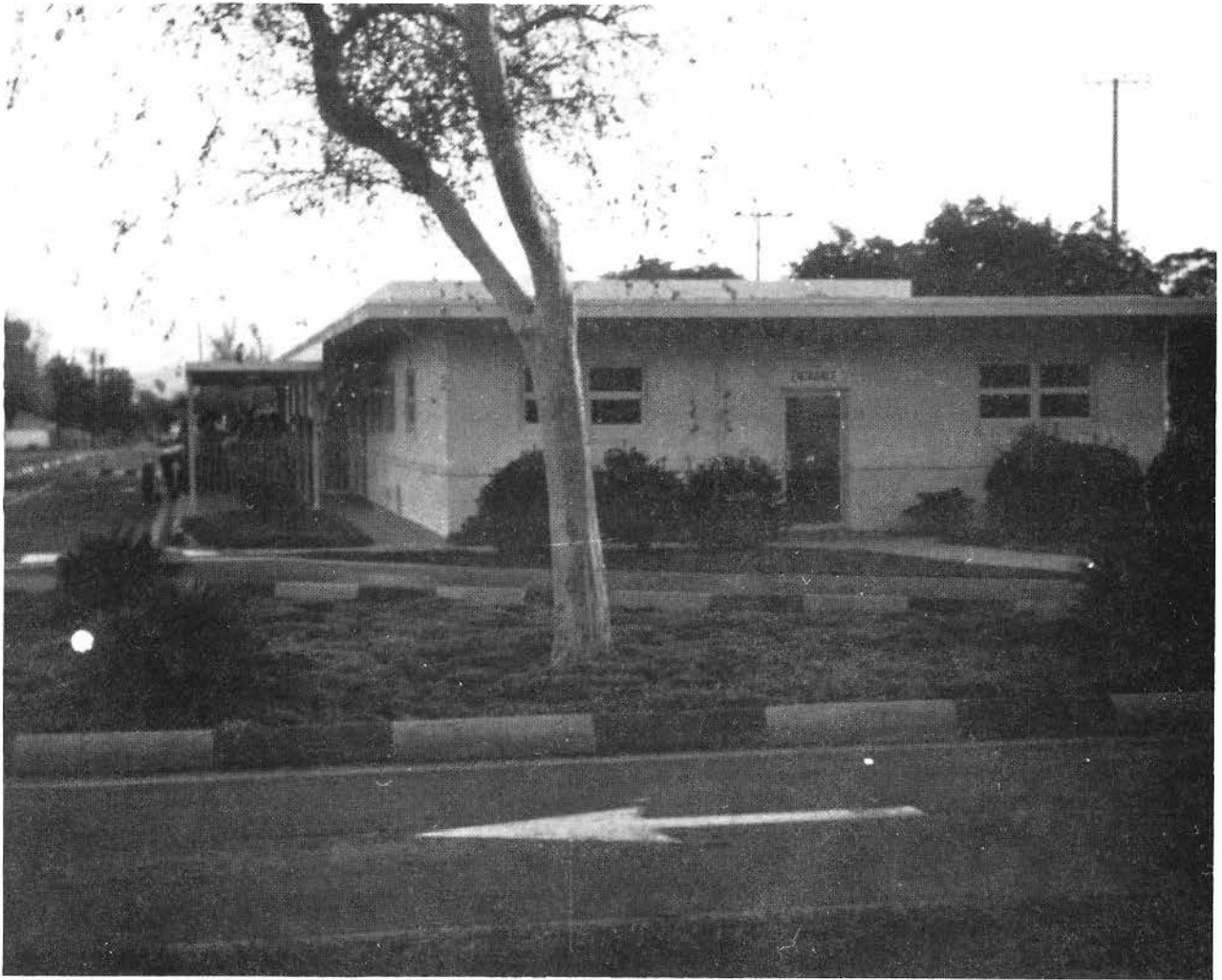


FIGURE 30. FLYAWAY BUS TERMINAL AT VAN NUYS

By the end of December 1975, the system had carried nearly 90,000 passengers and collected \$225,843 in passenger fares plus \$7,239 in parking fees (total = \$233,982). Bus operation costs were \$464,510 leaving an operating deficit of \$231,428. Since the service was new, an initial deficit had been anticipated.

It was hoped, however, that the service would be in the black within two years.

Such expectations did not seem unrealistic. From the onset, patronage was much stronger than had been projected in the FlyAway feasibility study, and it continued to steadily grow. In August 1976, the entry fee to the parking lot was raised to \$1, which caused no apparent change in the parking lot patronage. A break in the growth pattern came late in 1976 when Airport Transit, the company under contract with DOA to maintain and operate the buses, folded, an action that abruptly cut off service and tied up the DOA's buses in a legal tangle. The Neoplan buses were put into storage pending a decision as to their status and bus service was suspended for three days until a new company could be hired to resume service utilizing its own buses. At this point, the FlyAway began operating under a series of very short-term agreements while legal matters were settled and a new comprehensive contract could be negotiated. The Associated Charter Bus Company took over the service on December 23, 1976 and ran it until July 5, 1977, at which time FlyAway was taken over by Grayline Tour. Grayline ran the service until November 7, 1977 when it reverted back to Associated Charter Bus Company via award of a one-year contract for bus operation and maintenance issued through DOA's standard bid procedure. Associated's contract ran until November 7, 1977 when it revealed plans to phase out bus service operations and did not rebid for the service when its contract expired. Through the bid process and negotiations, the service was then contracted to Grayline for a three-year term plus a two-year option, with a stipulation that seven new busses be purchased. This contract is still current. It will remain in effect until November 8, 1981, and may be extended to 1983 if the options are exercised.

The Cost/Revenue Relationship

The terms of the contract specify one inclusive hourly cost which includes bus operation and purchase, maintenance, and all overhead. These items had previously been billed separately. The hourly costs are \$22.25 for the first year of the contract, \$23 for the second year, and \$24.50 for the third year. The contract stipulates that hourly cost covers the period beginning when bus arrives at Van Nuys terminal and ending when the last passenger is dropped off, including any layover (deadhead) time.

The contract also has an escalation clause to cover possible fuel price increases. The clause stipulates that for every 3 cent increase in bus fuel prices, the hourly operations cost will increase by 15 cents. This clause has been an active factor in the bus operation's costs since the price of fuel has fluctuated greatly (see Table 6).

At an average of 34,000 bus service hours per year, the increase in fuel prices added approximately \$55,000 to the cost of the service between November 1978 and June 1980 (\$15,000 for the first year of the current contract period, and \$40,000 for the first eight months of the second year).

At the end of the three-year contract period, Grayline has the option to continue operating the service for an additional two years. Applying the Los Angeles-Long Beach Consumer Price Index to the hourly base of the previous year to compute each new yearly rate.

TABLE 6
 HOURLY RATE ADJUSTMENTS AS A
 FACTOR OF FUEL PRICE INCREASES

	Fuel Price	Hourly Rate
	\$	\$
12/78	.48	22.25
3/79	.48	22.25
6/79	.57	22.70
9/79	.754	23.60
SECOND YEAR OF CONTRACT: NEW RATE		
12/79	.79	24.50
3/80	.86	24.80
6/80	.952	25.25
9/80	.952	25.25
12/80	.963	25.40

Despite periodic and, at times, severe fluctuations in level of service until the end of 1978 when the current contract was enacted, patronage of the FlyAway remained high on an annual basis and reached a peak in 1979.

A summary of FlyAway economic activity and passenger subsidy is itemized in figure 31. These figures are difficult to compare as a cohesive series since the various bus operators that run the service charged different hourly fees. For example, for bus operation (excluding bus maintenance and terminal operation) the rates in Table 7 were applied.

The apparently large difference in hourly rates is due to differences in hourly pay scales for bus drivers as well as administrative costs. Hourly bus driver wages have varied between about \$5.50 to \$8.50 per hour (nonunion versus union, respectively) for private operators in the Southern California area. The cheaper service had a lower service level, with frequent personnel problems and breakdowns. There was a noticeable relationship between level of service and patronage during 1976 and 1977 when the service was changing management frequently. Patronage would fall off when service became irregular, unreliable, or unfriendly, and then would slowly revive when such problems were corrected. In addition, monthly payments of \$15,862.12 to United California Bank for lease/payment of the Neoplan buses were suspended when the buses went into storage in December 1976; these payments were resumed at \$17,137.45 in July 1977 and were paid until November 1978 when the Neoplan buses were retired from FlyAway usage. The suspension of payments reduced the system's cost by about \$100,000 in 1977. A more detailed breakdown of the system's costs is provided in Table 8. When deflated by Consumer Price Index for public transportation in the Los Angeles-Long Beach SMSA, the yearly costs convert to \$795,981, \$656,708, \$723,823, and \$728,106 for the years 1976 through 1979.

Additional personnel and a restructuring of the accounting system account for the large differences in cost for certain items between 1977 and 1979. Terminal staffing as of 1979 included six clerk positions, five security personnel (some were part-time), and one supervisor. The high publicity (1976) cost were generated by an intense campaign to popularize the system. An annual average pay adjustment of +5.6% is also reflected in these costs.

As shown in the figures, most items are fixed cost items, the largest and most essential being bus operation and maintenance. There is every reason to assume that these items will remain relatively stable over the next few years, with adjustments for inflation and fuel prices. A simplified breakeven analysis of the bus system for the year 1979, the first year it was in the black, produced the relationship shown in Figure 32. Break-even analysis is a method of relating fixed costs, variable costs, and total revenues to show the level of sales that must be attained if the system is to be self-supporting or operate at a profit. The variable costs in the FlyAway analysis include Advertising, General Administration, and Miscellaneous; also, it was assumed that the proportions of types of tickets sold, and ratio of tickets sold to parking lot usage, would remain constant.

As is the case with operations having high overhead, the FlyAway's break-even point requires high income; but also has potential for substantial rise in revenue as passenger volumes do increase, due to the high degree of operating leverage. This characteristic is even more pronounced in the case of a

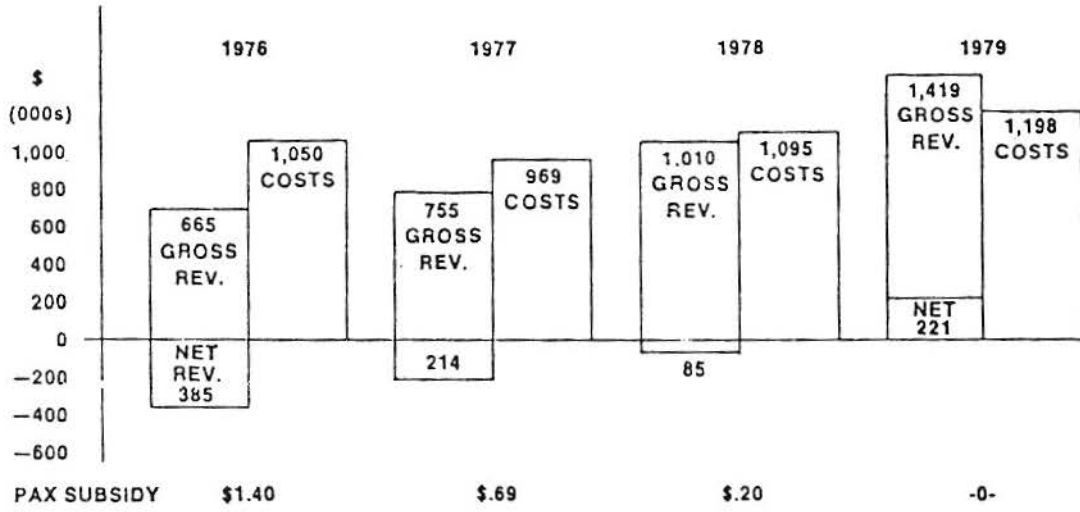


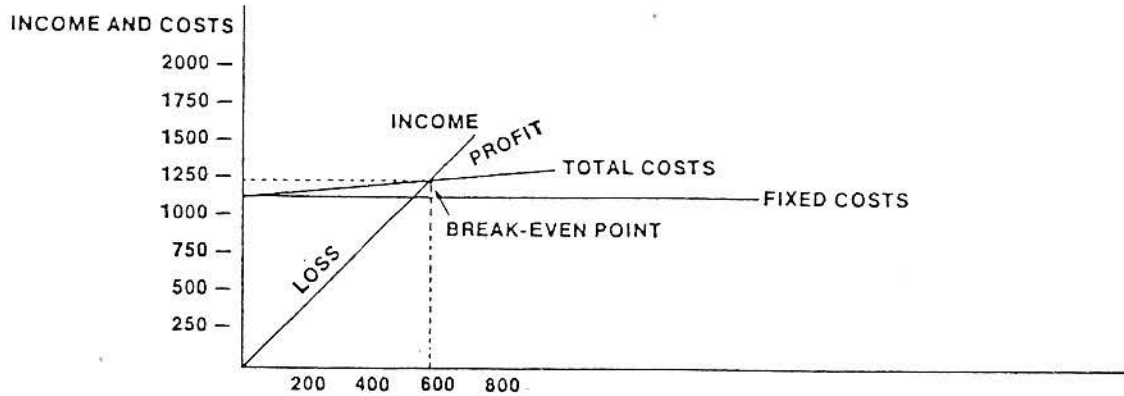
FIGURE 31. SUMMARY OF FLYAWAY BUS SYSTEM ACTIVITY

TABLE 7
OPERATIONAL RATES PER COMPANY

Year	Company	Service Period	Hourly Rate
1976	Airport Transit	1/01--11/30	\$14.58
	No Service	12/01--12/02	
	Grayline	12/03--12/22	\$21.75
	Associated	12/23--12/31	\$14.15
1977	Associated	1/01-- 7/06	\$14.15
	Grayline	7/07--11/07	\$21.75
	Associated	11/08--12/31	\$14.15

TABLE 8
FLYAWAY BUS OPERATIONAL COSTS IN NOMINAL DOLLARS

	1976	1977	1978	1979
Security	49,300	53,500	64,500	63,300
Grounds and Parking lot	21,400	20,300	30,000	28,300
Terminal Maintenance and Administration	22,200	48,600	85,100	113,400
Wages and Fringes	57,800	65,100	86,000	81,200
Bus Operations and Maintenance	564,800	550,900	611,700	869,200
Neoplan Payments	174,500	137,200	154,300	-0-
Advertising	157,400	89,100	52,700	36,100
Miscellaneous	2,300	4,500	10,800	9,200
TOTAL	1,049,700	969,200	1,095,100	1,197,700



Q = TOTAL PASSENGERS (ONE WAY)

Q	VARIABLE COSTS	FIXED COSTS	TOTAL COSTS	SALES	NET PROFIT
678,000	125,000	1,080,000	1,205,000	1,420,000	215,000
800,000	147,500	1,080,000	1,227,500	1,672,000	444,500

$$\text{Break-even} = \frac{\text{Fixed costs}}{1 - \frac{\text{variable costs}}{\text{sales volume}}} = \frac{\text{FC}}{\frac{1 - \text{VC}}{\text{P} \cdot \text{Q}}}$$

variable cost = .1842 Q
average price = \$2.09

$$\text{BE} = \frac{1,080,000}{.911786} = \$1,184,488 \text{ in sales} = 566,740 \text{ pax}$$

FIGURE 32. BREAK-EVEN ANALYSIS UNDER 1979 RATE STRUCTURE

hypothetical fare increase as shown in Figure 33. In this instance, a 30% price increase was applied, resulting in a much lower break-even point vis a vis passenger volume, and an even higher revenue potential. Since the FlyAway fare prices have remained stable in nominal terms since the service began in 1975, a 30% increase is not unreasonable. If deflated by the Consumer Price Index for Transportation in the Los Angeles-Long Beach-Anaheim area over the four-year period, the real bus ticket price is over 30% less than the nominal price.

The prices applicable to the two analyses are:

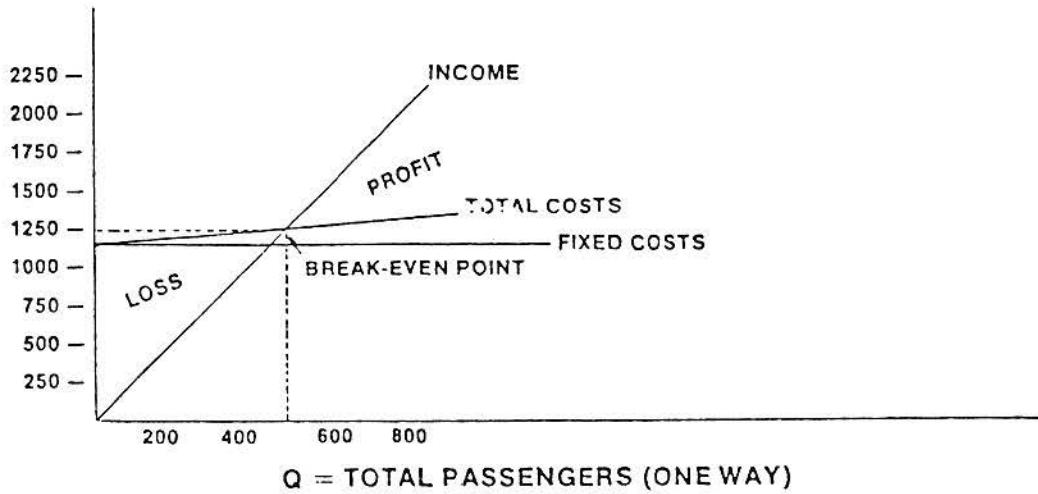
	Figure 32	Figure 33
Adult round trip	\$5.00	\$6.50
Adult one way	\$3.00	\$4.00
Child	\$1.50	\$2.00
Employee passbook	\$35/20 round trips	\$45/20 round trips

Parking was held constant at \$1.00 per entry with a 15-day limit.

Given the fact that parking in the LAX central terminal area is \$10/day and \$1.50-\$2.00 per day in the LAX's peripheral parking lots, and applying a moderate \$.25 per mile cost to driving a car, the 40-mile trip ride to LAX from Valley would cost a minimum of \$10 for driving expense, plus an additional amount for parking. At an average parking duration of five days for the FlyAway lot, the least expensive travel plus parking expense for a private automobile from Valley is \$17.50 (\$10 to drive plus \$7.50 to park at \$1.50 per day). Clearly, even at the 30% higher rate, the FlyAway would still be a bargain.

An additional element in this cost analysis is a review of facility construction costs and foregone ground rental income for at Van Nuys site for the FlyAway was reviewed, and a proposal to relocate the bus terminal was elevated. At that time only 3,340 square feet of the 6,530 square foot terminal building were being utilized, and 1,400 parking spaces were in use on the 12.2 acre site. It was estimated that construction of a new 3,340 square foot terminal with a 1,400 space parking lot would cost about \$1 million in 1979 dollars. This included cost estimates of about \$485 per parking space, plus \$100 per square foot for the building. Replacement with a 6,530 square foot for the building and a 1,800 space lot added up to over \$1.5 million.

These costs, when compared to the potential ground rental income of \$7,7225/acre/year on the industrially zoned site (\$88,145) did not justify relocating the terminal. Shortly thereafter, the lot was expanded to approximately 1,800 spaces as an additional 3.3 acres were added to the parking lot. Even when the lost rental income became \$111,988/year for the 15.5 acre site, it was still lower than the amortized cost over a 30-year period of building a replacement facility (estimated at nearly \$150,000 per year).



Q	VARIABLE COSTS	FIXED COSTS	TOTAL COSTS	SALES	NET PROFIT
678,000	125,000	1,080,000	1,205,000	1,820,565	615,565
800,000	147,500	1,080,000	1,227,500	2,152,000	924,500

variable cost = .1843 Q
 average price = \$2.69

$$\text{B.E.} = \frac{1,080,000}{.931} = \$1,159,467 \text{ in sales} = 431,029 \text{ pax}$$

FIGURE 33. BREAK-EVEN ANALYSIS USING 1979 RATE STRUCTURE ADJUSTED FOR INFLATION

Patronage

A review of bus passenger ticket activity reveals the breakdown in Table 9. This breakdown shows a rather constant distribution of bus user-types over time, with a substantial portion of patronage coming from the airport/airline employee sector.

A closer look at the FlyAway market was taken by the DOA in 1979 via a survey questionnaire handed out and collected on the buses. Questionnaires were collected over a one-week period in April and another week in August, the peak travel month. The April survey, capturing 1,983 valid responses, was completed just before the gas shortage of that year, and the August survey, with 666 responses, was intended to hit the peak vacation travel period. Not surprisingly, the responses to the surveys were differentiated by a slightly higher proportion of recreational travelers in the August run. Consequently, the following shifts in passenger market were expressed:

	1979	
	<u>April</u>	<u>August</u>
Pax travelling alone	54.6%	45.0%
Pax travelling with spouse	24.0%	32.8%
Female head of household		
Working outside the home full-time	34.2%	42.9%
Working not at all	38.3%	30.4%
Males	62.2%	59.9%
Females	37.8%	40.1%
Business trip	46.1%	39.9%
Vacation or personal trip	47.2%	55.6%

The remaining market characteristics remained constant. The most relevant ones to this discussion are cross-tabulated in Tables 10-14 and are drawn from the April survey. These include characteristics of modal choice, income, business versus nonbusiness travel, number of trips per year, access travel time and bus terminal parking characteristics. This data reveals that the FlyAway's passengers come from a high income pool (85% earn over \$30,000/yr.), are frequent travelers (40% take over five business trips per year), are well educated (47% are college graduates or post-graduates), are predominantly over 30 years old (67% are in the 30-59 year old group), started out to the bus terminal from their residence or the home of a friend (92%), and often drive a considerable time to get to the bus terminal (42% drove 6-15 minutes, 37% drove 16-30 minutes, and 10% drove 31-45 minutes). The FlyAway's travel time to LAX from the Valley terminal ranges from 30 minutes under free flow conditions to over an hour during peak periods.

TABLE 9
FLYAWAY BUS RIDERSHIP (ONE-WAY)

	1976	1977	1978	1979
Full Fare Pax	215,398 (78%)	240,736 (78%)	326,371 (79%)	508,166 (75%)
Half Fare Pax	11,927 (4%)	13,064 (4%)	17,419 (4%)	27,106 (4%)
Employees (Passbooks)	45,880 (17%)	54,246 (17%)	62,364 (15%)	128,735 (19%)
Others	1,899 (1%)	2,669 (1%)	9,505 (2%)	13,551 (2%)
TOTAL	275,104 (100%)	310,715 (100%)	415,759 (100%)	677,554 (100%)

TABLE 10
TRAVEL TIME TO FLYAWAY TERMINAL (MINUTES)

Air Trips in Past Year	Up to 5 %	6-15 %	16-30 %	31-45 %	45+ %	Total %
First Ever	.1	1.1	.8	0	.1	2.1
First this Year	1.3	5.6	5.9	2.3	1.1	16.2
2-4	2.5	17.6	15.9	3.7	1.9	41.6
5-9	1.0	7.8	5.9	2.2	.6	17.5
10-19	.6	3.4	4.1	.9	.2	9.2
20+	1.3	5.1	5.4	1.2	.3	13.3
TOTAL	6.8	40.6	38.0	10.3	4.2	99.9

TABLE 11
FLYAWAY TERMINAL ACCESS MODE

Family Income	Bus/Taxi/Rental Car/Van/Limo %	Car/Parked %	Car/Not Parked %	Total %
\$0-\$10,333	.6	1.4	4.2	6.2
\$10,000-\$14,999	.6	3.5	4.5	8.6
\$15,000-\$19,999	.5	3.9	4.1	8.5
\$20,000-\$24,999	.5	6.9	4.6	12.0
\$25,000-\$29,999	.5	6.8	5.4	12.7
\$30,000-\$34,999	.7	7.1	7.2	15.0
\$35,000-\$49,999	.8	10.4	7.2	18.4
\$50,000+	5.2	9.3	7.6	17.9
TOTAL	5.2%	49.3%	44.8%	99.3%

TABLE 12
TRIP REASON

Access Mode	Business \$	Vacation/Personal \$	Other \$	Total \$
Bus/Taxi/Rental Car Van/Limo	2.5	2.8	0	5.3
Car/Parked	23.9	18.7	3.2	45.8
Car/Not Parked	19.8	25.5	3.4	48.7
TOTAL	46.2%	47.0%	6.6%	99.9%

TABLE 13
TRIP REASON

Access Travel Time (Minutes)	Business \$	Vacation/Personal \$	Other \$	Total \$
0-5	3.5	3.1	.3	6.9
6-15	18.2	19.6	2.9	40.7
16-30	17.9	17.2	2.8	37.9
31-45	5.4	4.3	.5	10.2
45+	1.2	2.8	.3	4.3
TOTAL	46.2%	47.0%	6.8%	100.0%

TABLE 14
TRIP REASON

Family Income	Business \$	Vacation/Personal \$	Other \$	Total \$
\$0-\$10,000	.6	5.3	.3	6.2
\$10,000-\$14,999	1.7	6.2	.9	8.8
\$15,000-\$19,999	2.4	4.3	1.4	8.1
\$20,000-\$24,999	4.1	5.9	.6	10.6
\$25,000-\$29,999	6.0	5.6	.9	12.5
\$30,000-\$34,999	8.5	5.7	.8	15.0
\$35,000-\$49,999	12.4	6.4	.4	19.2
\$50,000+	11.6	6.5	1.3	19.4
TOTALS	47.3	45.9	6.6	99.8

TABLE 15
COMPARISON OF FLYAWAY PAX VOLUME TO LAX VOLUME

	1976	1977	1978	1979
FlyAway Pax	275,104	310,751	415,759	677,554
Growth Rate (Ann.)	-	12.9%	33.8%	63.0%
Market Share	10.1%	10.4%	12.0%	18.5%
Lax Pax	25,983,079	28,361,863	32,901,361	34,923,205
Growth Rate (Ann.)	-	9.2%	16.0%	6.0%

Growth Rates of Passenger Volumes

When viewed in terms of LAX passenger volumes the FlyAway has managed to capture a considerable portion of market share. This is illustrated in Table 15. The market share is calculated by subtracting the 25% of LAX passenger volume that is connecting traffic and then assuming that, of the remainder, 14% is currently based in San Fernando Valley. (The Valley's market share has declined from 15% in 1975 due to rapid growth in the passenger market located in Orange County).

Planned Improvements at LAX

The DOA currently has a goal of building two major new terminals, three parking structures, and at least one phase of a double deck for the central terminal roadway, before the 1984 Olympics. These improvements promise to create serious access problems during the several years of construction. Systems such as FlyAway offer the only hope for serving growing passenger volumes while curtailing roadway capacity. In addition, when the second level roadway is completed, it is planned to have special lanes for busses on the lower level, thereby offering more specialized service for bus passengers. In conjunction with this plan, the Regional Transportation Plan specifies that special lanes for high occupancy vehicles be provided whenever feasible. Such lanes are currently being planned for the freeways accessing LAX. If this system can be coordinated and implemented, remote terminals clearly become increasingly attractive to passengers, employees, and airport operators.

If the FlyAway experience is at all typical of what a metropolitan remote terminal can do, the good news is that not only can such a system be useful and attract considerable patronage, it may also operate without subsidy.

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