Evolution of Ground Transportation Management as a Major Airport Function

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Airport organization is discussed, special attention being given to the structure of landside management. The past structures of airport management are surveyed, the origin of the structures of these organizations is explained, and ways the structures have evolved from 1940 to the present are discussed. With this background the results of a recent U.S. survey on current airport organizational structures are presented as they pertain to ground transportation management. Organizational literature and theory are discussed as they pertain to the potential development of airport organizational structure; specifically, four evolutionary stages of ground transportation management are proposed. It is suggested that airport ground transportation officials are represented inadequately in the management of U.S. airports as depicted by their representation in the organizational charts. However, this is changing as the management of landside activities receives more attention and resource prominence within the overall management of modern airport complexes.

Airport management of the 1940s did not involve the scope of operations that airport managers of today control. The management ranks were lean. Often only two or three key managers controlled most decisions of even larger airports. This was partly due to the size of operations, the lack of amenities, and the substantial influence of airline committees on the management of the airports.

In the 1940s there were two main trunks in the typical airport organizational chart: airport operations and administration, and airport engineering. This basic decentralized structure has been sustained in some airports, with few variations, into the 1980s as shown by this textbook organizational chart of the 1940s (*1*).

Several studies on airport management and organization surfaced in the 1940s. They emphasized ways in which the top of the chart interacted with the municipal government. Three such interactions were studied: (a) delegate authority to an existing department of the city government, (b) establish a new department, and (c) vest authority in an independent airport commission (*1*). However, Frederick and other authors of the period do not address the functionality of the lower-level management structure. Lower-level structure apparently was not deemed important at this time, only the structure of the policy makers was.

Frederick states in his text that there are two types of activities in an airport: (a) aviation activities and (b) nonaviation activities and facilities for the general public. "It is important to maintain functional separation of these types for throughput planning. Mixing of the two has led to congestion, confusion, and inefficiency" (*1*). That is a strong statement. Unfortunately, the author confuses this issue by his organizational chart (Figure 1), which mixes aviation and nonaviation activities.

Other airport management writers of the period include Froesch and Prokosch. In their book *Airport Planning* they state that "the two types of traffic, air and ground, must be in balance: otherwise the airport will not function at maximum efficiency" (*2*). Unfortunately, in the same book of 250 pages, less than 1 page is devoted to ground transportation.

Further inadequate representation of ground transportation is evident in early airport master plans. The typical master plan of the 1940s did not include ground traffic patterns or forecasts of future ground transportation needs. Authors of this period did recognize the need for separation of the airport functions to increase throughput and efficiency, but that recognition was not realized on the organizational charts.

The 1960s saw an expansion of staff operations at airports in general and in landside functions in particular. The use of terminal concessions and other concessionaire agreements began to grow as more traveling amenities were made available.

Airline committees were heavily involved in the financial development and management of some major airports, thereby influencing the organizational structures of many. These airline committees participated in large capital expansion projects. Officials of the airlines and the airports worked together to find the best possible solution to each community's airground problems. The airport management took charge of the day-to-day operations of the airport, but the financing of long-run improvements and major functional additions was often decided with approval of the only airline committee.

In the 1960s, just as in the 1940s, recognition of the landside operations did not result in actual status on the organizational chart. Reese, in his text *The Passenger-Aircraft Interface at the Airport Terminal*, gives an "ideal" airport organizational chart (*3*) (see Figure 2). This chart gives very good departmental representation of ground transportation. Not only are there appropriate departments, but each is given importance, as evidenced by its higher level on the hierarchy. However, the authors were unable to find any airports that followed this ideal structure in the 1960s. There is also no mention of landside management structure in Reese's text, only this representation of a possible terminal organization.

Airport textbooks of the 1980s can be divided into three broad categories: airport engineering, airport planning and design, and airport operations and management. The last two categories should give attention to the management structure of the airports. Some texts in these categories give due attention, and some don't. Even those texts that include a chap-

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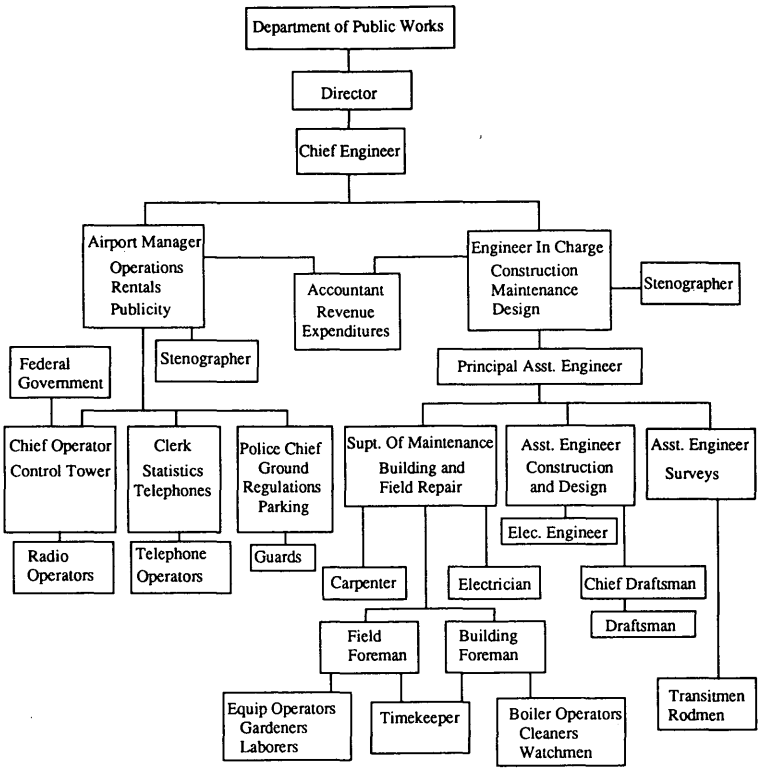

FIGURE 1 Airport management (*1*).

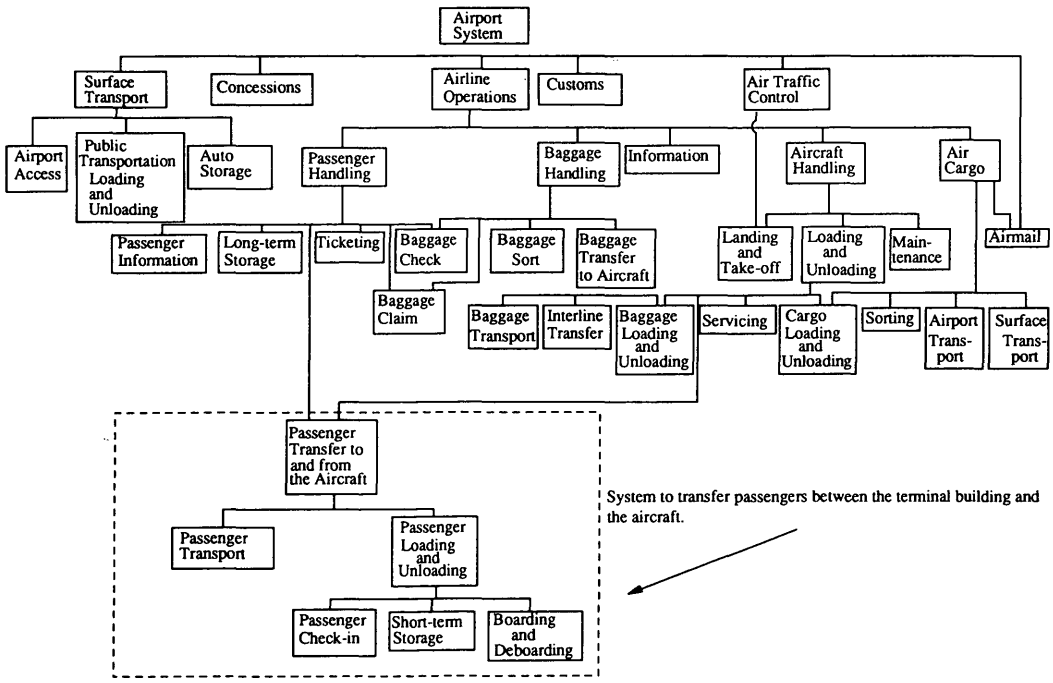

FIGURE 2 Ideal airport management organization chart (*3*).

ter on airport management and organization do so from the view of the top of the management hierarchy—that is, they give attention to how the airport is organized within the city government or as a free-standing legal entity created by state legislature. These texts usually are not concerned with the way that the airport managers further down the organizational chart interact. They do not address issues such as

- Which departments should operate which activities?
- Which managers should operate which departments?
- Which managers should report to whom?
- Which manager characteristics are needed to operate each department?

The authors argue that although top-level organization is important, the intraorganizational structure handles the everyday operation of the airport system. The entire management structure of airports should be researched in order to better understand how to increase the efficiency and effectiveness of our airports.

INDUSTRY SURVEY

Seeking to learn more about current airport management of ground transportation and its related activities, the University of Tennessee, the Airport Operators Council International (AOCI), and the Airport Ground Transportation Association compiled a survey of U.S. airports in 1989. The survey asked questions that sought to identify the level of attention that each airport gave to ground transportation issues. The airports were also asked to submit current organizational charts.

The purpose of the study was to

- Document the present organizational structures of U.S. airports;
- Attempt to relate the functions performed by the ground transportation department to the airport size;
- Understand the relationship of airport structure and the type of airport control (i.e., independent authority versus municipality);
- Understand how airline deregulation has affected airport organization; and
- Determine underlying trends.

The major findings of this study are reported in the following.

The survey achieved 66 returns. Seventeen large airports responded, as did 24 medium-sized and 25 small airports. Thus, there was a good representative sample of large, medium-sized, and small airports as defined by AOCI. Three-fourths of the large airports surveyed had a separated ground transportation department. One-third of the medium-sized airports have evolved to include a separate ground transportation department. None of the small U.S. airports has yet evolved to this point.

Some of the returns revealed subjective answers. Dallas–Fort Worth Airport (DFW), for instance, reported no formal landside department. However, it has quite an expanded list of activities and a fairly well developed landside program, though it has no specific department.

The questionnaire compiled a self-reported "snapshot" of the current duties of the landside departments. This is summarized in Figures 3 and 4.

As shown, the title used most often for U.S. airport ground transportation managers is director, manager, or supervisor of ground transportation. At midsized airports the title of manager of transportation services was used also; at major airports the title of landside operations manager was used frequently.

The most common duties of these ground transportation departments are also reported in Figures 3 and 4. Day-to-day operations, rules enforcement, and information are performed by the vast majority of these departments. Parking responsibility, contracts administration, access planning, and roadway management are performed by only two-thirds of these departments. However, if one looks at size, most ground transportation departments of major airports perform all these activities. Finally, activities such as access fee collection, security, and lost and found are found in half of the respondents'

- Surveys Returned = 66
  - 17 Large
  - 24 Medium
  - 25 Small
- Separate & Distinct Department?

Large	13	76.5%
Medium	8	33.3%
Small	0	00.0%

- Titles

  50% = Dir./Mgr./Supv./of Ground Transportation
  18% = Manager of Transportation Services
  18% = Landside Operators Manager
  14% = Operators Manager/Director/Coordinator

  Answered "No" to separate department but have:

  Transportation Manager-Dallas/Ft. Worth
  Ground Transportation Coordinator-Port Columbus

- Duties:

Operators-Day-to-Day	83%
Rules Enforcement	83%
Information	80%
Parking Responsibilities	57%
Contracts	66%
Access Planning	63%
Roadway Management	63%
Access Fee Collection	49%
Security	46%
Lost & Found	40%

- Staff Size: (?)

  Range - 1 to 108

- Salaries of Department Head or Equivalent

Small Airports	$ 30,000
Medium Airports	Range: $22,888 to $45, 000 Average = $32,555
Large Airports	Range: $20,000 to $77,000 Average = $40,625

FIGURE 3 Airport commercial ground transportation management study.

	OPERATORS-DAY-TO-DAY	PARKING RESPONSIBILITIES	RULES ENFORCEMENT	INFORMATION	CONTRACTS	ACCESS PLANNING	ROADWAY MANAGEMENT	LOST & FOUND	SECURITY	ACCESS FEE COLLECTION	OTHER SIGNIFICANT DUTIES	
Burbank-Glendale-Pasadena A.A.	Y	Y	Y	Y	N	N	Y	Y	Y	N		
Cleveland-Hopkins Int'l Airport	Y	Y	N	N	Y	N	N	N	N	N		
DFW Airport	N	Y	N	N	N	N	N	N	N	N	Y	
Dallas Love Field	N	N	Y	Y	Y	Y	Y	Y	Y	Y		
Dane Co. Regional A. (Wise)	Y	Y	Y	Y	Y	Y	Y	Y	Y	N/A		
Daytona Beach Reg. Airport	Y	N	Y	Y	N	N	N	Y	Y	Y	N	
Fairbanks Int'l Airport	N	N	N	N	N	N	N	N	N	N	N	
Jacksonville Int'l Airport	Y	N	N	Y	N	N	Y	N	N	Y	Y	
Kansas City Int'l Airport	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Metro Knoxville Airport A.	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Lincoln Municipal Airport	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Boston Logan Int'l Airport	Y	Y	Y	N	Y	N	N	N	N	N	Y	
Memphis-Shelby Co. Airport	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	
Rock Island IL Metro A.A.	Y	Y	Y	Y	N	Y	Y	Y	Y	N		
Metro Nashville Airport A.	Y	Y	Y	Y	Y	Y	N	N	N	N		
Ft. Lauderdale/Hollywood Int'l A.	Y	Y	Y	Y	Y	Y	Y	N	Y	Y		
Gen. Mitchel Int'l Airport	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	
Greater Cincinnati Int'l Airport	Y	N	Y	N	Y	Y	N	N	N	Y		
City of Palm Springs A.A.	Y	N	Y	Y	Y	Y	Y	N	N	N	Y	
Port of Columbus Int'l	Y	Y	Y	Y	N	N	N	Y	N	Y		
Port of Portland	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
RDV Airport	Y	Y	N	Y	N	N	N	N	N	N		
Richmond Int'l Airport	N	N	Y	Y	Y	N	Y	Y	Y	Y	Y	
Robert Mueller Mun. (Austin, TX)	Y	N	Y	Y	N	Y	Y	Y	Y	Y		
Sacramento Co. Airport	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	
S.W. Florida Reg. Airport (Lee Co.)	Y	N	Y	Y	Y	Y	N	N	N	Y		
San Antonio Int'l Airport	Y	N	Y	Y	Y	Y	N	N	N	N		
Port of San Diego (Lindberg Field)	Y	Y	Y	Y	Y	N	Y	N	N	Y	N	
San Jose Int'l Airport	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	
Santa Barbara Municipal	Y	Y	Y	Y	Y	Y	Y	Y	Y	N		
Springfield Reg. Airport	N	N	N	N	N	N	N	N	N	N		
Stapleton Int'l Airport	Y	N	Y	Y	Y	Y	Y	N	N	N	Y	
Tri-City Reg. A. (Blountville, TN)	Y	N	Y	Y	Y	N	Y	Y	Y	Y		
Metro Washington Airport A.	Y	N	Y	Y	Y	Y	Y	N	N	N		
Will Rodgers World Airport	N	N	Y	N	Y	Y	N	N	N	Y		

Y = Yes
N = No

FIGURE 4 Airport commercial ground transportation management study, individual airport report.

departments. Figure 4 breaks this information down by individual airport.

Staffing for these departments varies greatly in size depending primarily on whether parking is a part of a department's responsibilities. An individual and a single staff person may manage an entire ground transportation department for a small or medium-sized airport, but larger airport complexes, which manage their own parking and shuttle operations, may have a staff of 100 or more people.

As expected, salaries of ground transportation department heads vary greatly depending on airport size. At small airports the average salary is $30,000 (1989 data). At medium-sized

airports the average is $32,555, with a range from $22,888 to $45,000. Finally, major airports have an average salary of $40,625 for ground transportation managers, with a high of $77,000 (1989 data).

Although no formal comparison of these salaries with those of other managers within airport administration was made, it is suspected that they are somewhat lower than salaries of either airside or terminal operations managers. This would be indicative of the relative newness of the position or its lack of organizational status within the managerial hierarchy of many U.S. airports.

The relationship of airport structure and type of control (i.e., independent authority versus municipality) proved very difficult to quantify; thus no firm conclusions were reached. It did appear that several of the major airports that were municipally controlled have not developed comprehensive airport ground transportation departments. However, further research into this observation would be needed to ascertain any definitive rationale for this occurrence.

Airline deregulation appears to have affected U.S. airport ground transportation management structure in several ways. Initially, it has focused the attention of airport management to be more self-sufficient and less dependent on airline operating agreements to finance the facility. Thus, more emphasis is being placed on all sources of revenue—especially commercial users of the airport roadway system who historically have paid nothing or very little to use the facility.

This recent attention to ground transportation is more than financial. Airport managers realize that airline deregulation also deregulated airports in that airlines and passengers are free to choose or not choose to use a certain facility. Thus, top managers are paying more attention to the planning, execution, and support of good access and ground transportation systems at their facilities. This often translates into higher salaries and greater status as well as responsibilities for the ground transportation manager.

EVOLUTIONARY TRENDS OF AIRPORT GROUND TRANSPORTATION

As evidenced by trends noted in the survey, airport ground transportation departments are in a period of evolution. Airport boards and general managers are realizing the importance of the landside department to airport revenue and to the operating efficiency of the management structure. We can foresee an elevation of the ground transportation function within the organization. From this review of current U.S. airport organizational charts and ground transportation duties, four distinct evolutionary stages of airport ground transportation management are evident. They are as follows:

1. Subfunction,
2. Beginning structure,
3. Departmentalization, and
4. Full integration.

Stage 1: Subfunction

Ground transportation is still considered to be a subfunction. Landside or groundside reports to the assistant director of operations and employs few, if any, workers. The landside function simply administers contracts and has no input into their drafting. Parking lot and shuttle services are usually operated by concessionaire agreements, and they report to someone in security, administration or operations.

Stage 2: Beginning Structure

Ground transportation begins to gain some structure. Landside has contract agreement responsibility and oversees it on a day-to-day basis. There is typically someone who is vested with the responsibility to "manage the curb."

Stage 3: Departmentalization

Ground transportation now gains departmental representation. Parking and ground transportation are frequently merged. Contract authority has shifted from administration to the groundside department personnel. In this stage we observe that ground transportation is growing in stature, in personnel, and in relation to the other departments in the airport. In Stage 3, planning develops a formal relationship with the landside department. Some of planning time is devoted to solving ground transportation problems, and the groundside department is allowed input into how these problems are solved. Finally, there is usually a formal liaison with the airport police force to enhance the operation of airport roadways for maximum efficiency.

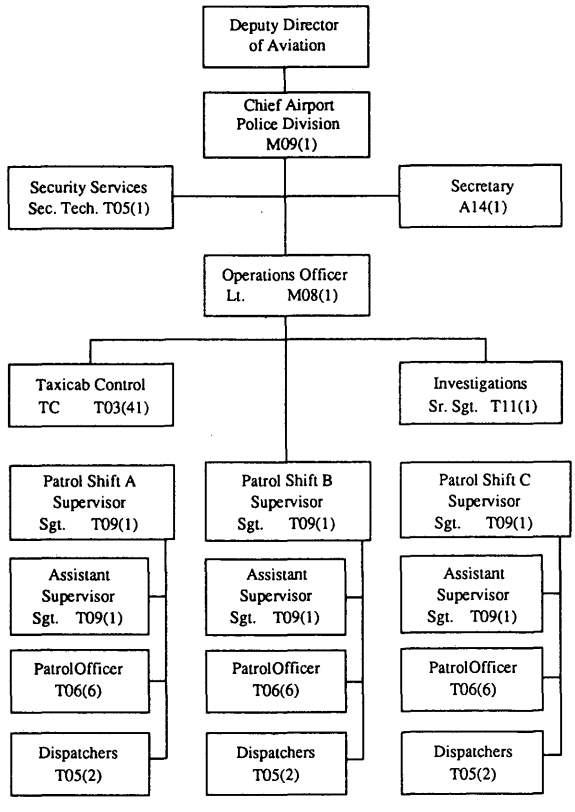

FIGURE 5 Ground transportation management study, Robert Mueller Municipal Airport, Austin, Tex.

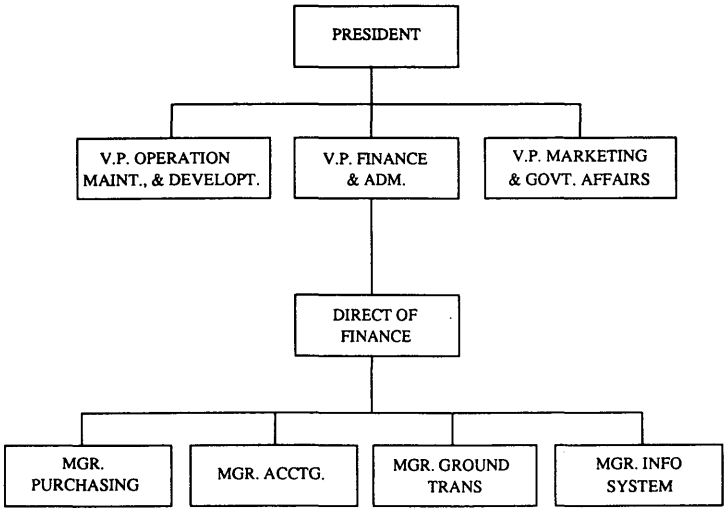

FIGURE 6 Ground transportation management study, Memphis (Tenn.) International Airport.

Stage 4: Full Integration

In Stage 4, groundside, or "landside," gains equal status with airside and terminal operations, at least on the organizational chart. These departments have full budgetary responsibility. They are responsible for their own planning and may even have planners on their staff. Roadway management security will probably employ their own personnel in addition to the airport's own police force.

Austin Municipal (Figure 5) is an example of a Stage 1 airport. Landside reports to the operations manager and is not identified as a separate department.

Memphis International (Figure 6) is evolving from Stage 1 to Stage 2. The manager of ground transportation has no staff reporting to the position, but he handles responsibility for administering contracts.

Minneapolis–St. Paul (Figure 7) is an example of a Stage 2 airport. The ground transportation manager oversees other personnel. The assistant director is at the same level as the fire chief and police chief and reports directly to the airport director.

Charlotte, Seattle-Tacoma, San Antonio, and the Southwest Florida Regional airports are examples of Stage 3 airports (Figures 8–11). Charlotte's organizational chart repre-

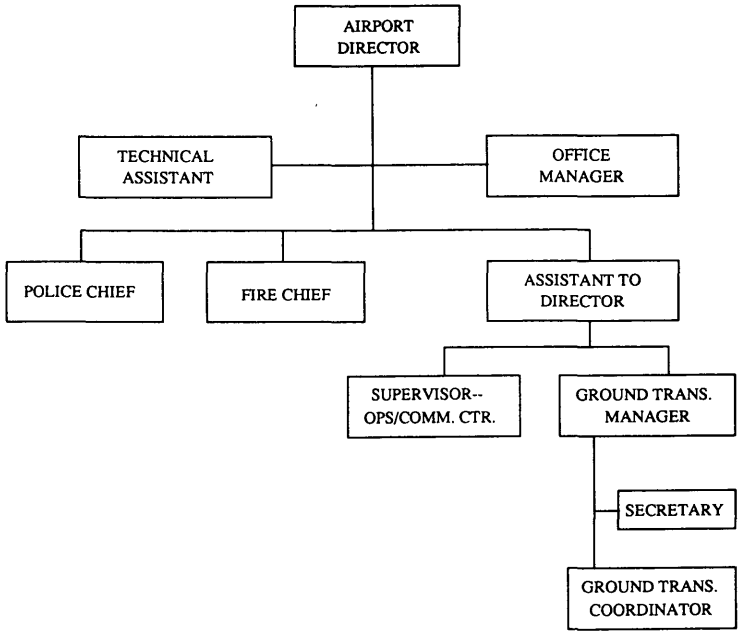

FIGURE 7 Ground transportation management study, Minneapolis–Saint Paul (Minn.) Airport.

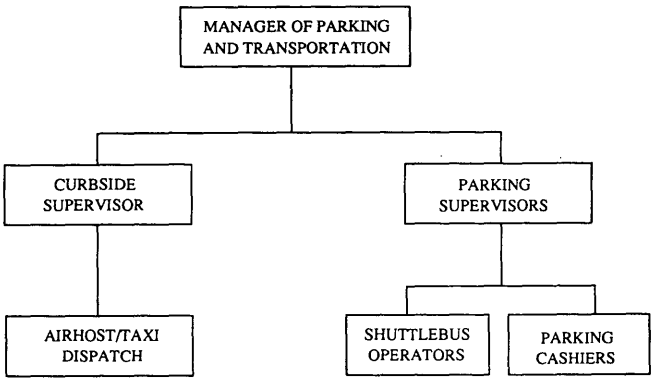

FIGURE 8 Ground transportation management study, Charlotte (N.C.)-Douglas International Airport.

sents a clear picture of a Stage 3 airport. Parking and ground transportation functions have been merged into one easily controlled department.

San Antonio and the Southwest Florida Regional airports demonstrate that the evolution of ground transportation isn't necessarily a function of the airport's size. Instead, it can often be a function of the board of directors' recognition of the growing importance of landside operations. In San Antonio, the landside director is given the same level as the directors of operations, airport policy, and fire and rescue. Southwest Florida Regional is a new airport and has had the unique opportunity to review other airport structures and the importance of landside operations. Currently its function is combined into a single manager of terminal and landside on an equal status with other departments.

DFW and San Francisco (Figures 12 and 13) have fully integrated landside developments and are good examples of Stage 4 airports. At San Francisco the landside department encompasses parking, ground transportation, planning, and engineering; it contracts subfunctional responsibilities. At DFW, the department of transportation is divided into four subfunctions: operations, parking, transportation, and support (which includes engineering and planning).

ORGANIZATIONAL ENVIRONMENT AND NEED FOR CHANGE

Throughout most organizational textbooks there are theories relating to change and dynamic environments and to how organizations must change with their environments in order to operate effectively and efficiently.

Garratt uses an analogy of ecology. In order for an organization to survive in the wake of change, its capacity for learning must be equal to or greater than the change ($L \geq C$). If organizations do not monitor their environment and adjust accordingly, they risk extinction (*4*).

Livingston uses an analogy to chemistry: chemistry procedures break down certain products to determine their chemical makeup; this breakdown allows analytical research on how the product is structured. Organizational patterns can be similarly analyzed (*5*). The purpose is to

1. Design and construct the best arrangement of units;
2. Design intergroup relationships and the system of communication; and
3. Train personnel to operate in the new environment.

The U.S. airport industry is similarly in a dynamic environment. It must adjust if it is to remain effective. Since the 1940s, there have been few revolutionary changes in airport management structure. However, throughout much of this period, the airline industry was controlled largely by regu-

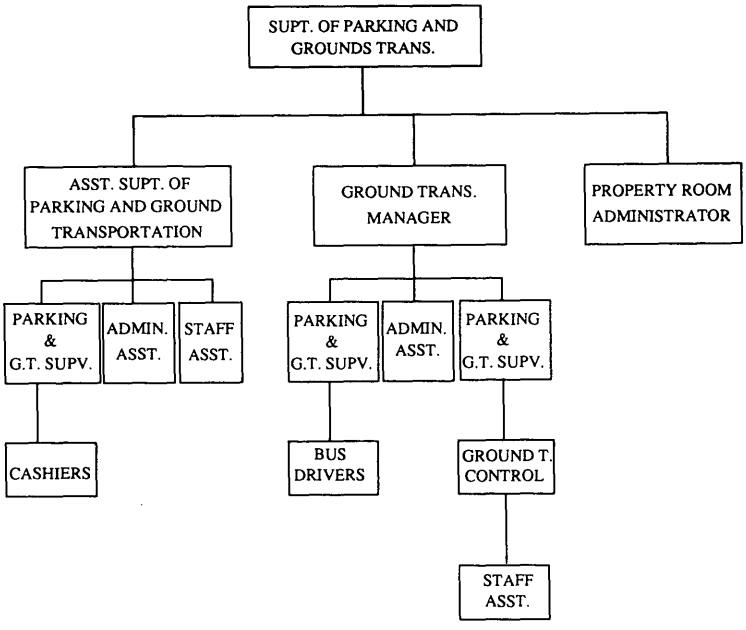

FIGURE 9 Ground transportation management study, Seattle-Tacoma (Wash.) International Airport.

FIGURE 10 Ground transportation management study, San Antonio (Tex.) International Airport.

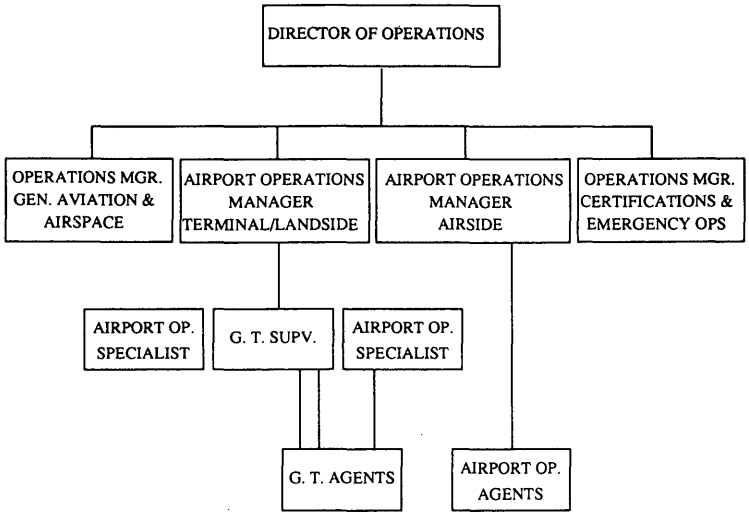

FIGURE 11 Ground transportation management study, Southwest Florida Regional Airport, Fort Myers.

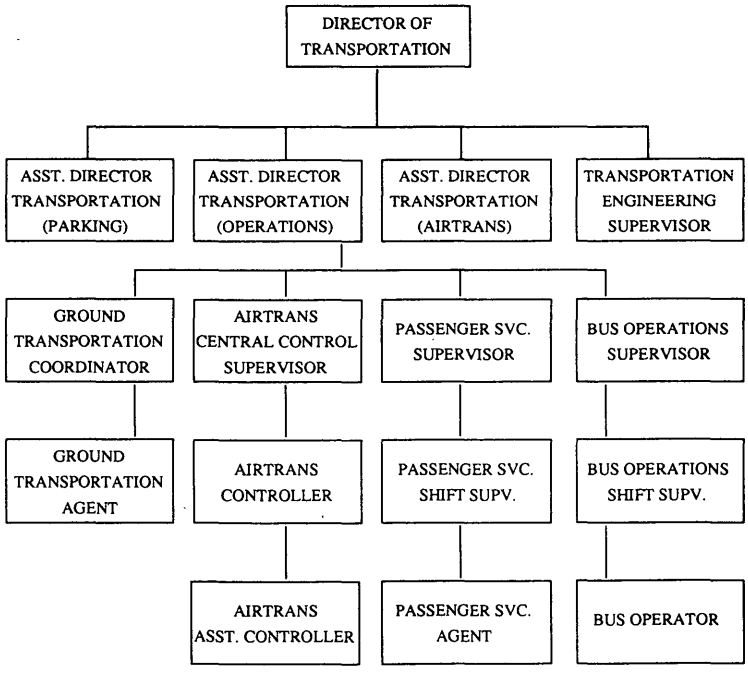

FIGURE 12 Ground transportation management study, Dallas–Fort Worth (Tex.) International Airport.

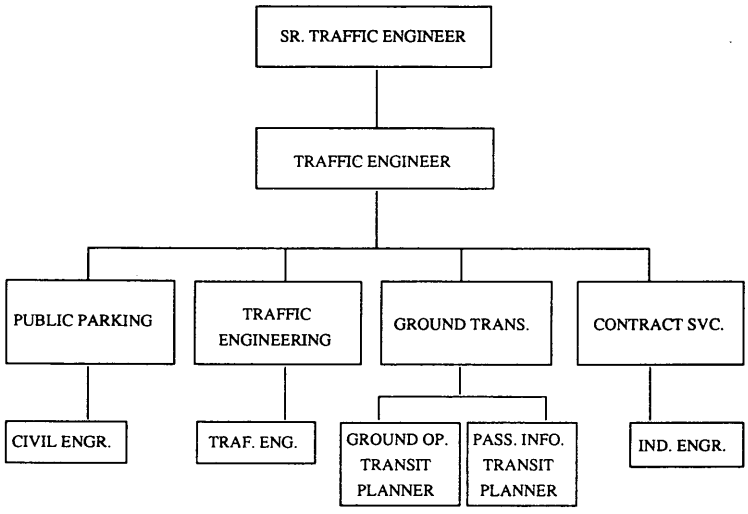

FIGURE 13 Ground transportation management study, San Francisco (Calif.) International Airport.

lation and thus not allowed to change freely. Since the early 1980s the air industry has not been so constrained; thus, airport organizational structures must be flexible and able to change as their environment changes in order to respond to these changes and to take advantage of the opportunities present in these changes.

CONCLUSIONS

The dynamics of the airport industry today call for more effective organizational structures that allow flexibility and more efficient use of resources. A necessary change is the departmental representation of airports' ground transportation divisions. Such representation will increase airport use and effectiveness in many ways, including

- Increasing throughput to the airside,
- Securing appropriate fees for use of airport facilities and business opportunities,
- Providing better management for growing landside activities,
- Facilitating changes and growth,
- Giving more attention to landside safety issues, and
- Giving due representation in the master plan development.

Changes will not just happen as a function of growth or expansion. Private industry is more adaptive to change and evolution because its survival depends on it. Airports are public entities and as such are not typically risk takers. It is more difficult for public entities to evolve before reaching a consensus on what they should do.

Most airports will postpone organizational changes until a function is already being performed. They will then adjust their organizational form to coincide with the function. Thus, airport boards of directors should look at organizational structure and periodically decide whether to accelerate this change through early, formal changes.

In these dynamic times, however, one might ask if airports can really wait for their form to catch up with their functions. This author suggests that they cannot with our current growth predictions. Our airport structures must evolve to fully integrated landside-airside-terminal operations. They must delegate landside responsibility, budgeting, and planning to the appropriate department.

The shift toward Stage 4 management structures is growing. Increased revenues are more likely to come from landside operations than from airside or terminal operations in the future. Therefore, the support for Stage 4 airport structures will not only solve the problem but generate income as well.

The progressive evolution of the ground transportation function is exciting. As this evolution continues, airports will appropriate increased funds and personnel to support this expanding landside activity.

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