

1978

Study of Selected Landside Facilities at Theodore Francis Green State Airport

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STUDY OF
SELECTED LANDSIDE FACILITIES
at
Theodore Francis Green State
Airport

BY
MELIH OZBILGIN
AND
CLIFFORD WESTER

A MASTERS RESEARCH
PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE DEGREE OF
MASTER OF COMMUNITY PLANNING

REVIEWED BY

Dieter Hammerschlag

DIETER HAMMERSCHLAG

PROFESSOR OF COMMUNITY PLANNING

UNIVERSITY OF RHODE ISLAND
DECEMBER 1978



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CHAPTER : 1

Introduction



INTRODUCTION

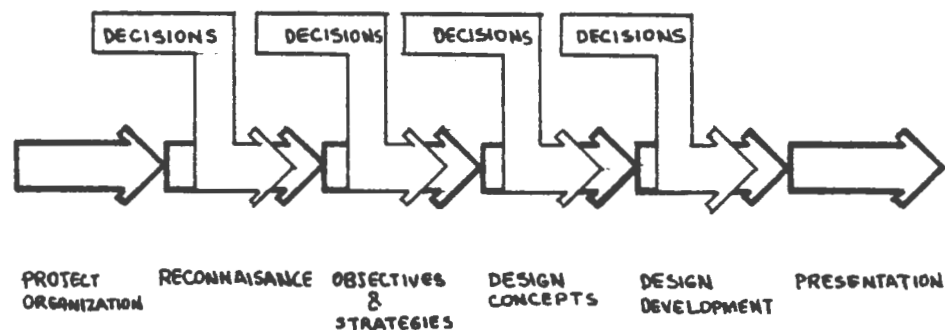
This paper is intended to present to interested groups--both general public and government officials--a proposal to upgrade the terminal building, parking facilities and traffic circulation pattern at T. F. Green State Airport. It was initially conceived to study the possible renovation and expansion of the terminal building alone. However, as the study developed, we felt the need of relating the terminal building to its surrounding elements; such as runway system, traffic circulation pattern, parking facilities, the surrounding community, and the environment. We studied, within the time limit we had, those elements and decided to concentrate on certain elements which we felt were of more importance. We eliminated the less important considerations. We later decided not to study the runway system since it is considered one of the better ones in the country. This study now covers the terminal building, traffic circulation, and parking facilities at T. F. Green State Airport.

During the course of this study, we consulted knowledgeable people at the Airport Division of the Rhode Island Department of Transportation and the Rhode Island Statewide Planning Program. We also feel that Dieter Hammerschlag, Professor of Urban Design at the Graduate Curriculum in Community Planning and Area Development at the University of Rhode Island, with his background in architecture and urban planning and his experience, was most helpful to us in this learning process.



Why did we choose to study T. F. Green State Airport? It is principally because we are interested in the airport. We are part of the public that uses the facility and we feel that we know the extent and type of development needed there. We are interested because we felt we could develop a proposal that is more efficient and useful than what consultant firms have previously proposed. We are also interested because we think this project may be useful to the general public as well as decision makers in government.

The design process out of which this study grew consists of the following six major steps:¹



Project organization: The design team is Clifford Wester and Melih Ozbilgin; we are working jointly in generation of the final product. Mechanics of coordination and decision making were developed in consultation with Prof. Hammerschlag.



Reconnaissance--We assembled existing reports, studies, and data which relate to the subject of T. F. Green State Airport as well as airports in general.

Objectives and strategies--We developed basic alternative objectives, considered priorities, feasibility, options, givens, and constraints.

Design concepts--Based on objectives and strategies selected in the previous step, we developed alternative concepts of development and an inventory of implications.

Design development--We developed the selected design concept in detail.

Presentation--We prepared the final product in the form of a model, built on a scale of 1 in.=16 ft. In addition, the results of the study were presented first to the press and Airport Division officials, and then to the staff of the Rhode Island Statewide Planning Program. Then the final report was prepared.



CHAPTER: 2

History



HISTORY OF T. F. GREEN STATE AIRPORT

Prior to the late 1920's, aviation was viewed by the public as a spectacle--something to spend Sunday afternoons watching for amusement. However, by the late 1920's, several events were taking place. Those events would demonstrate to the public that aviation had many exciting possibilities in service to the public.

One of the most important of those events to Rhode Islanders was the crossing of the Atlantic by Charles Lindbergh, in May of 1927. Lindbergh came to Providence on 21 July, 1927. Landing at the Quonset National Guard Campground, he went by land to the Providence City Hall. More than 300,000 turned out to see him.

The impact upon Rhode Islanders of seeing this great flyer in person was demonstrated in the January session of the Rhode Island General Assembly. There, a West Warwick senator proposed that the Providence River be bridged over from the New Haven Railroad tracks to Crawford Street. The space created would be used for a landing field. This was to be accomplished by a one million dollar bond issue.

The first airport in the state was built in Charlestown by the Atlantic Airport Corporation. Its being near the shore was due to the importance of seaplanes during that period. The first airport to serve the Providence area was established in Seekonk, Massachusetts in May of 1928 by the Providence Aircraft Corporation.



Also in 1923, the Post Office Department began air mail service from Providence. The mail was not flown out of Providence, however. It was carried by train to Boston, where it was flown out to points south and west of New England.

On 16 April, 1929, Rhode Island first officially recognized the importance of aviation to the state. On that date, the General Assembly established a State Airport Commission. This commission would assume the task of choosing, obtaining, and developing a site for a state airport. A \$300,000 bond issue was approved by voters for the purpose of constructing the new airport.

The commission chose a site in the Hillsgrove section of Warwick for the new state airport. This choice was a surprise to many people. A site on Gaspee Point had been discussed on many occasions, because it was away from the threat of obstructions by buildings, and it was convenient for use by seaplanes.

When the members of the commission revealed their reasons for choosing the site in Hillsgrove, a theme emerged that would affect again and again the degree to which the state airport would fulfill its purpose. That theme is money--or lack of it. Everyone, including the members of the State Airport Commission agreed that Gaspee Point would make a much better site for the new state airport.



However, in order to acquire that site, the commission would have had to spend much more than the \$300,000 allotment just for purchase of the site. In order to avoid asking the public for additional money, Gaspee Point was eliminated from consideration.

The site in the Hillsgrove section of Warwick cost only \$100,000. This left \$200,000 for development, reasoned the commissioners. So what if the site was not very suitable for an airport, it was cheap; and that was most important.

By the time work began on the state airport in Warwick, interest in commercial aviation was growing rapidly. On 1 March, 1930, the first regularly scheduled commercial airline service from Providence was begun. This service operated out of the Providence Airport in Seekonk, Massachusetts.

The new state airport in Warwick opened unofficially in July of 1931. Two flying schools began operations there at that time. On 27 September, 1931 more than 150,000 people attended the formal dedication of the first state airport in the United States.

American Airways, Inc. started scheduled passenger and airmail service at the state airport on 6 August, 1932. American Airways was to become American Airlines. This service was discontinued from 1933 to 1936.



In 1935 a major reorganization of the state government of Rhode Island took place. The new chief of the Division of State Airports in the Department of Public Works envisioned a major new program to improve and upgrade the state airports of Rhode Island. However, the conservatism of the public of Rhode Island resulted in the defeat of a mere \$83,000 loan in a special election.

However, in 1935, the state airport in Warwick was closed for most of that year, while certain improvements were made. New lighting and concrete runways were installed at that time. Following those improvements, a Rhode Island Department of Public Works report stated that the Rhode Island State Airport had "been accepted by commercial air companies as an alternative to Newark for all commercial ships coming in from the West."

On 27 December, 1938 the state airport in Warwick was renamed in honor of Senator Theodore Francis Green. Green had done much in government in support of aviation.

By 1940, the state airport was the seventh busiest in the United States. 84,000 take-offs and landings were recorded that year. Its extraordinary growth was demonstrated by the fact that a hangar built to handle ten years of growth became inadequate during its second year of operations.

* * *



Since Rhode Island is on the east coast of the United States, the state was especially affected during World War II. Air bases were badly needed on the east coast. T. F. Green Airport was among the facilities leased to the federal government during the war years. It became known as Hillsgrove Army Air Base. The air base provided a transition situation for those graduating from flying school. Moreover, fliers on overseas duty landed there when sent to Westerly for further instruction.

During the War, the army banned all civilian flying within a coastal band extending from thirty to seventy miles inland and two hundred miles to sea. This prevented civilian flying in the state of Rhode Island. The flying restrictions were lifted in August of 1945. On 26 September, 1945 Green State Airport was returned to state control. Conditions were then restored so that aviation in Rhode Island, through the use of Green State Airport, could again flourish.

In March of 1948 two independent engineering firms released reports to the state, making recommendations for future aviation facilities in Rhode Island. George S. Armstrong and Company recommended that all new facilities to handle future increases in air traffic should be constructed at North Central Airport in Smithfield. In contrast, the firm of Thompson and Lichtner recommended expansion of facilities at Green State Airport.



The Thompson and Lichtner recommendations were, of course, heeded, and in 1948 a \$3,000,000 bond issue was passed to be used for improvements at Green Airport, as well as for facilities at North Central and Block Island Airports.

During the 1950's Green State Airport became well-established as a center of air travel. The number of passengers processed increased dramatically during that period. Between 1953 and 1957 an increase of 100,000 was experienced in the number of travellers using Green State Airport each year. In 1957 alone there was an increase of 46,000 over the previous year.

In 1957, the number of passengers using Green State Airport exceeded the 1960 forecast that had been made by the Civil Aviation Authority in 1953. While ranking fifty-ninth in number of passengers processed, compared with other airports in the United States in 1957, Green State Airport had the ninth highest growth rate in the country.

This greatly increased use of Green State Airport was the reason for increased public support for the facility. In 1956, voters approved a \$1.5 million bond issue for improvements at the airport. With that money, a new terminal building was erected at Green State Airport. It was officially opened on 13 August, 1961.



In 1965, voters in a special election authorized two million dollars to be spent for airport improvement. Of that amount, \$1.4 million went to Green State Airport for extension of runways and some navigational equipment.

On 30 August, 1967 a connecting freeway was opened between Green State Airport and Interstate 95. This provided direct access to the airport from all sections of the metropolitan area, as well as the state. No longer did airport traffic have to travel the crowded city streets of Warwick.

In 1969, a bill which would have greatly affected Green State Airport was introduced in the Rhode Island General Assembly. This bill, H1037, would have "restricted the use of Theodore Francis Green State Airport, except in the case of emergency to aircraft owned by accredited commercial airlines and government aircraft only." The importance of this bill is underscored by the fact that many of the expert studies that have been conducted of Green State Airport in recent years have concluded that all small private planes should be diverted from Green State Airport to other facilities.¹



CHAPTER: 3

Existing plans

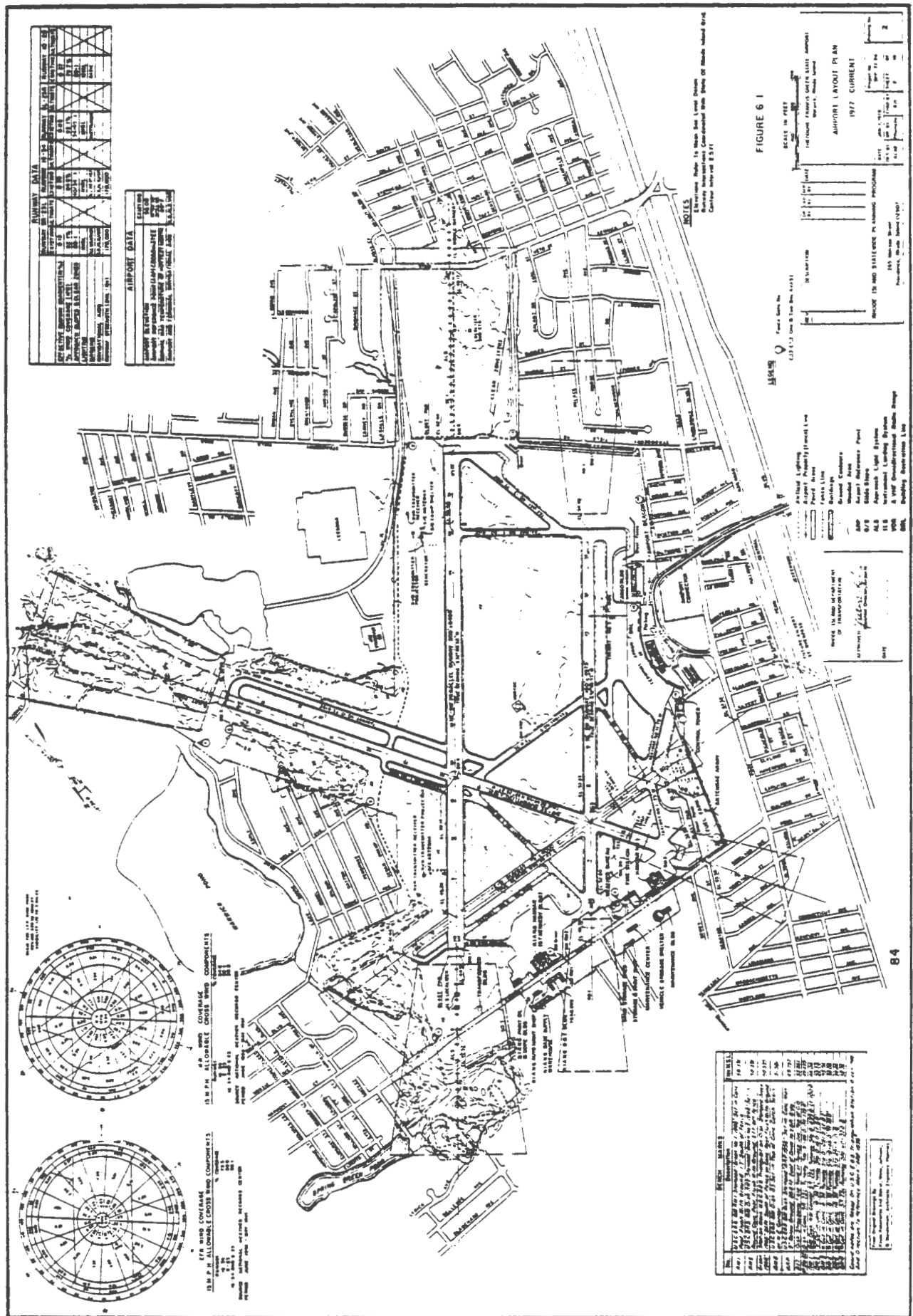


Figure 3.1 Airport Layout Plan-1977



OTHER PLANS--1978 MASTER PLAN (PRELIMINARY DRAFT)

In June of 1978, the State of Rhode Island released the preliminary draft of its latest master plan for T. F. Green State Airport. This is Report Number 32 of the Rhode Island Statewide Planning Program. This draft master plan represents the latest official policy concerning present and future use of Green State Airport.

This section of the report will examine the latest official plans for Green State Airport. After the plans are described, they will be evaluated. The opinions of the writers will be offered as to how well the planned facilities will work, how adequate they are, and how desirable they are.

The recommendations of the 1978 Airport Master Plan are based on certain ideas as to what the goals of the master plan should be. Those goals are as follows:

1. The facility, both in its ultimate and intermediate stages, should achieve the most efficient balance between passenger comfort and convenience, airlines operational requirements, and development costs.
2. The facility should be capable of expansion without impairing its own functioning or that of the other elements of the surrounding community.
3. The design and staging of the facility should be flexible and responsive to continued updating of forecasts and requirements.



4. The facility should be designed and sited with the goal of reducing the impact of the airport activity on areas outside the airport.

The recommendations contained in the Master Plan were considered within the constraints of what those involved in the development of the plan perceived as limitations. Those limitations were specified in the Master Plan as follows:

1. ...current airport access road location and its proposed realignment under the Milvert Street Grade Crossing Elimination Project. This project is currently in the final design state prior to construction.
2. ...the building line restrictions and terminal apron expansion limitations imposed by the parallel runway 5E-23R unless it is eliminated or relocated.
3. ...the area limitations to the north imposed by runway 10-28 and the location of the FAA tower facility and the proposed location of a new FAA TRACON building and its associated automobile parking area.
4. ...the area restriction imposed by the existing and proposed air cargo complex located to the south and southeast.

The official master plan for T. F. Green State Airport puts forth the following recommendations. Those dealing with access to the terminal will be discussed first. Then the terminal building itself will be discussed.



1. Realignment of the airport access road through the present long term parking lot to connect with the Hilvert Street overpass.
2. Enlargement of the present short term parking lot to 109 spaces.
3. Move employees parking to share the present long term lot with the airport connector, providing 113 spaces.
4. Increase the capacity of the rental car parking area at the north end of the terminal building.
5. Construct a new long term parking lot on the opposite side of the airport connector from the terminal building, creating 579 long term spaces.
6. Lengthen the front curbside passenger pick-up and discharge area.

Pedestrian circulation is an important part of access to the terminal. According to the master plan, pedestrians going from the short term parking area to the terminal would exit from the short term parking area on the east side. They would then cross the front driveway of the terminal building, in which the following activities take place: pick-up and discharge of passengers by private automobiles, taxicabs, limousines, and buses; passage of vehicles exiting the medium term parking area for Interstate 95 via the Airport Freeway. Pedestrians from the short term parking area would then enter the terminal building.



Pedestrians going from the medium term parking lot to the terminal building would have direct access to the terminal without the need to cross areas of conflicting activities.

Pedestrian travel from the long term parking area to the terminal building would be dangerous at best. Upon exiting the lot to the east, they would cross the Airport Freeway at grade. This situation is especially dangerous with the threat of injury to pedestrians by automobiles. Consider this: a pedestrian enters the crosswalk on the Airport Freeway. At the same time, several automobiles coming from Interstate 95 on the freeway round a curve and encounter a vehicular intersection, a group of pedestrians, and a signal in the middle of the freeway. The worst can be expected.

If the pedestrian from the long term lot survives this ordeal, he then crosses the short term lot and then encounters more moving automobiles in the front driveway of the terminal. He then passes into the building.

Pedestrians from the passenger pick-up and discharge area have immediate and safe passage into the terminal building, under the master plan.

* * *

The 1978 Master Plan recommends that the terminal building remain about the same size as



it has been in recent years. A relatively small amount of additional space has however been provided at each end of the second floor. This has been given the general designation of office or service space.

On the first floor, the following areas remain about the same in the plan as at present:

1. Rental car service area
2. Passenger service/comfort area
3. Ticket counters
4. Airline office and operational area
(Additional space for this function has been provided behind the present space.)
5. Terminal service area
6. Department of Economic Development
7. Heating-refrigeration-power equipment area
8. Main waiting room and lobby (Additional space has been provided behind the present waiting area.)

The space which is presently occupied by a snack bar is proposed to become a combination restaurant-snack bar area with common kitchen. Additional space behind the present snack bar area and where the present bar is located has been provided.

The baggage retrieval area for deplaning passengers has been moved to the north corner of the first floor. This is where it was located when the terminal building was first opened.



Baggage is given out at a single station, the capacity of which has been increased over that of the present facility.

On the second floor of the terminal building, the following areas remain the same as at present: the conference room and the hanging walk. The present office space for the Division of Airports has been divided by a corridor, and additional space has been provided at the end of the corridor. Some of this space could be assigned to the Division of Airports.

The bar has been moved to the second floor to occupy the space which is presently used by the restaurant. An observation area that would also serve as additional lobby space has been provided on the second floor. This space is connected to other parts of the terminal building by the hanging walk.

The sterile corridors, through which passengers walk to and from the planes, have been moved to the second floor in the master plan. The sterile corridors are not connected to the remainder of the second floor. Access to them is by stair, escalator, and elevator--directly from the first floor waiting area.

Thirteen gates have been provided for boarding planes. Each of these gates has a



boarding lounge. Two of these gates can handle the new wide body planes.



CHAPTER: 4

Criticism of

'78 Master plan



CRITICISM OF 1978 MASTER PLAN

Our evaluation of the various recommendations and proposals contained in the 1978 Master Plan will now be given. As in previous chapters, the functions which take place on the site outside of the terminal building will be discussed first.

There are several aspects of the master plan that are very good and deserve praise. One of those is the medium term parking area. The master plan leaves this where it is at present. Its proximity to the terminal building is quite adequate. An even more important virtue of this area is the safety of pedestrians. Airport users may leave their cars in the medium term lot and walk directly into the terminal building without the need of walking through conflicting corridors of vehicular movement.

It is true that the medium term parking lot exhibits no indications of total architectural integration of the site and terminal building. However, within the context of the master plan, which makes no attempts at architectural integration, the efficient and indeed effective manner in which the medium term lot fulfills its purpose is to be commended.

Another good point of the master plan in relation to the site is the rental car parking area. The master plan provides for an increase in capacity of this area, which is certainly needed.



This is one of the closest functional areas to the terminal building. Moreover, it is located very close to the rent-a-car booths and the baggage retrieval station inside of the terminal building.

* * *

In spite of those good aspects, the 1978 Master Plan falls short in some very important and critical areas. Perhaps the most important is the circulation of automobiles into, within, and out of the airport terminal site.

A general problem is through traffic being allowed to pass right through the center of the airport terminal site, within one hundred feet of the terminal building. From the points of view of efficiency as well as rationality, this is a most undesirable situation. This not only wastes valuable space on a small and confined site, but it creates a "great wall," which any circulation plan for the terminal site must overcome with additional expense and complexity of design.

The developers of the Master Plan believe that they have solved this problem with vehicular intersections, pedestrian crosswalks, and traffic signals. We do not think that their solution is workable. Rather, it will probably worsen the automobile congestion on the airport site, while creating dangerous conditions for both the drivers of vehicles and pedestrians.



The master plan calls for 579 ground level long term parking spaces across the Airport Freeway from the terminal building. Crosswalks and signals would be installed on the freeway in order to stop the cars so that pedestrians could cross the road.

This set-up affects three related activities in an adverse way. First, automobiles travelling eastbound on the Airport Freeway into the airport terminal site round a curve as they approach the airport. What worse situation can be imagined than automobiles rounding a curve on the freeway and encountering pedestrians in the middle of the roadway, a vehicular intersection, and signal lights. Even with warning signs, it would be expecting too much of most drivers coming to the airport to gain a comprehension of such an unexpected situation in the few seconds available--especially since many of the drivers are from other states. The worst is bound to happen all too often.

Second, pedestrian circulation is put in jeopardy. We decided that it was unacceptable to route pedestrians across a freeway on foot to get from the long term parking lot to the terminal building. Some of them are bound to be killed sooner or later by vehicles on the freeway.

Thirdly, the master plan proposal adversely affects vehicle circulation within the airport



terminal site. A circular vehicular circulation pattern--counterclockwise around the short term parking area, as well as through the long term parking lot has been suggested in the master plan. Upon examination, this is an interesting idea.

However, we believe that it will never work as planned. If only airport traffic were allowed on the site of the terminal, a slightly more refined version of this traffic pattern would probably work very well. However, a freeway will dump its traffic--much of it through traffic--into this site. With pedestrians and traffic signals further hindering traffic flow, this plan can only lead to a situation which is worse than what now exists.

Closely related to the vehicular circulation on the site of the terminal building is the problem of an inadequate number of parking spaces at the terminal. It appears that the amount of parking provided in the 1978 Master Plan is not adequate even for the medium term future.

We do not question the projections of future parking demand at the airport. Knowing that those projections were generated by experts and are the most reliable available, we have used them in our analysis. We do however question the advisability of recommending a plan which is known to be inadequate by its makers, as is the case of the Master Plan.



Another part of the master plan for the site, which we consider inadequate for future demand is the provision for passenger pick-up and delivery at the curb in front of the terminal building. Again, we think it unadvisable to recommend the inadequate.

One aspect of the terminal building and its site, which has been given little if any attention by the master plan, is the architectural integration of the various functional areas of the site as well as the building. A driver aiming his automobile into the parking lots in front of the terminal must look twice to be sure he is not driving into the Ann and Hope store down the street. The two buildings and sites are remarkably alike in size and appearance--the terminal being slightly smaller. If the remaining green space in front of the terminal building is paved over, as recommended in the master plan, this resemblance will be strengthened. Imagine the first impression of a couple arriving from Chicago: "Wow, Martha, this state must be poor if they must rent a department store for an air passenger terminal."

After the arriving airport user made sure he was actually at the airport rather than Ann and Hope, he would then park his car and enter the terminal building. He would immediately be confronted with more inconveniences, even if the suggestions of the master plan were to be carried out.



The queuing space in front of the airlines ticket counters doubles as a corridor connecting the main entryway, the men's and women's rest rooms, and the main waiting room. If the space were used only for lines of people at the ticket counters, it would still be inadequate. The present and planned overuse of this space causes inconvenience and confusion. The separate activities of entering the building directly for the waiting room, going to the rest room, and standing in line at the ticket counters should not and cannot be conveniently and efficiently carried on within the same space.

The master plan is to be commended, however, in its effort to clear up the congestion caused by the situation that now exists in which deplaning and emplaning passengers use the same corner of the waiting room, bumping into each other. The present setup is unacceptable. The situation in the main waiting area will be greatly improved if this aspect of the master plan is implemented.

However, we believe that the master plan did not go far enough in separation of emplaning and deplaning passengers. We think that a problem still would exist if the master plan were implemented. Emplaning and deplaning passengers would continue to interfere with one another in the sterile corridor. Since the solution to this problem is not difficult, we recommend that it be solved. The job of separating



deplaning and emplaning passengers where needed should be undertaken in a comprehensive manner and a thorough solution offered.

Another aspect, which we feel needs further study is the main waiting area. It is too small. Even if it is enlarged as the master plan recommends, it will not operate efficiently and provide the most comfort for passengers.

Presently, both enplaning and deplaning passengers and their accompanying parties use one main waiting room. This greatly overcrowds the area. The master plan would slightly enlarge the present waiting space, while adding a second floor observation area.

We believe that the area should be closely tied with the general principal of separation of deplaning and enplaning passengers. This would make the waiting areas more efficient and comfortable for those using them. It would aid also terminal users in finding the correct location at which their party will arrive or leave. Since those with conflicting purposes and resulting travel patterns within the terminal building would be separated, confusion would be greatly reduced. Efficiency of operation and comfort of passengers would be increased to a suitable level.



This leads to the problem of the transfer of passengers from waiting room through sterile corridors and boarding lounges to planes. Many, if not most, airline passengers using the terminal building are brought to the terminal by or are met by a party of friends or relatives. The setup which now exists, as well as that which is proposed in the master plan, requires enplaning passengers to disappear from their loved ones at the gate of the sterile corridor long before the plane boards. This is necessary because seating assignments and other checks are performed in the boarding lounges in the sterile corridors.

This is a discomfort which airport users should not be forced to endure. No parent wants to say good-bye to his son or daughter, who is going off to college or military service, any sooner than necessary. This moment is much harder on both parents and children when one has to leave the other at least thirty minutes before take-off. The proposed master plan, if implemented, would make an already unpleasant condition at the terminal substantially worse.

Not only do enplaning passengers have to enter the sterile corridor too soon, but they must walk much too far to get to their plane after they are in the corridor. The farthest gate in the sterile corridor of the master plan is



375 feet from the entry gate of the corridor. This is an intolerable distance to walk, especially since several designs, including ours, can cut this distance at least 300 percent.

The walk is equally intolerable to deplaning passengers. However, another inconvenient functional area of the terminal must be dealt with by the deplaning passenger. That is the baggage retrieval station. Presently that area is grossly inadequate and in a really bad location.

Although the baggage retrieval station has been moved to a rather out-of-the-way location, it is much better situated there than where it is at present. In addition, the master plan calls for an increase in the length of the conveyor. This too is badly needed.

However, we think that an even greater improvement can be made to the baggage retrieval operation in order to enable it to serve airport users with greater efficiency and comfort. Our specific recommendations in this respect will be discussed in a later section.

Our last observation of the interior of the terminal building deals with rooms and facilities for airline flight crews. The officials with whom we have talked indicate that a need will exist in the near future for such facilities.



Runway facilities are being upgraded and terminal facilities are being enlarged in response to the need to bring larger wide body jets into Green State Airport. This will bring an accompanying need for comfort and preparation areas for flight crews.

Little or no attention was given to this need in the master plan. And, although passengers should of course be given top priority in comfort and service, airline personnel also should have comfortable facilities. It is no secret that economic benefits spill over from the airport into surrounding cities when airline employees are brought in. This will not happen if no facilities or uncomfortable facilities are all that are available.

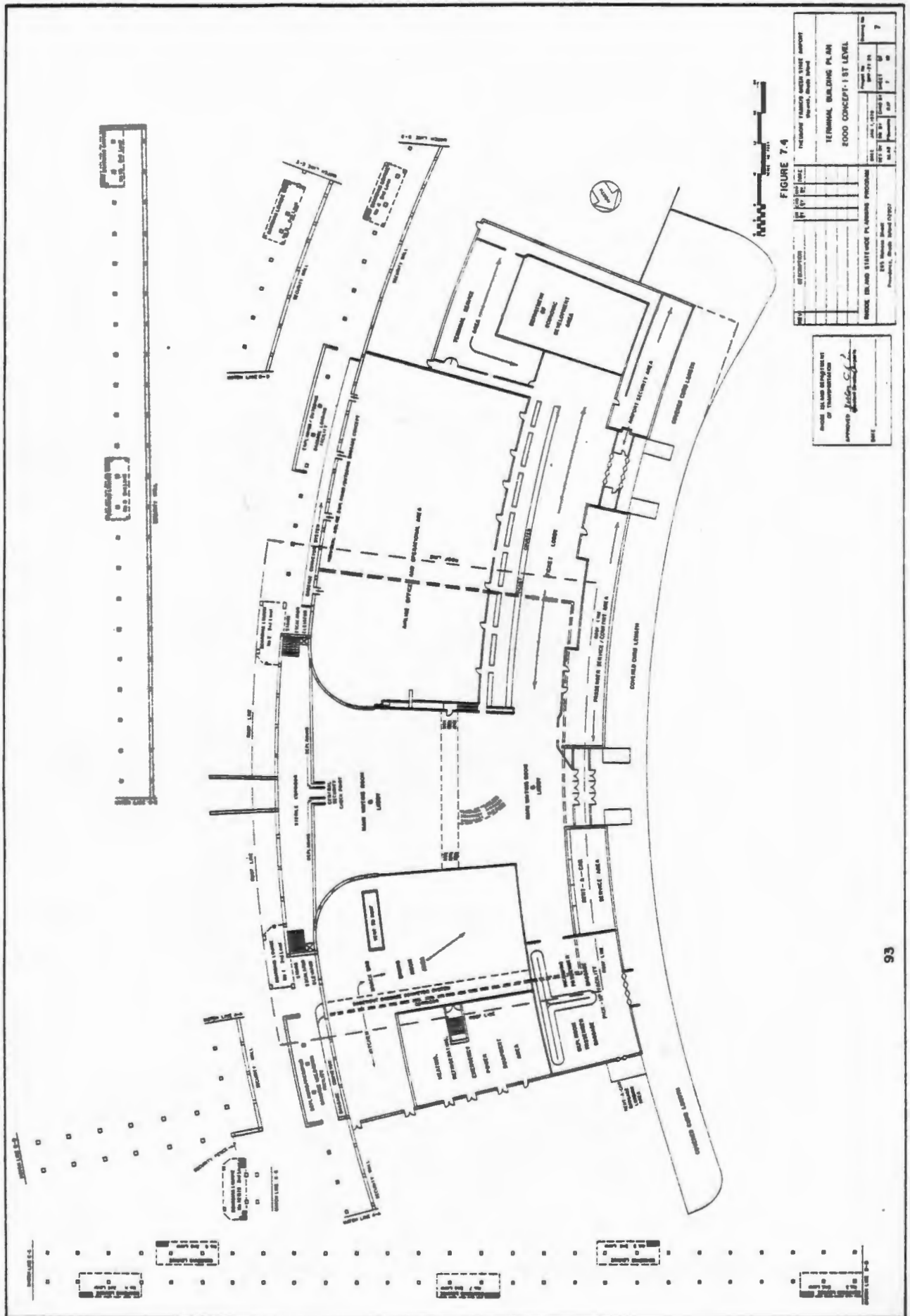


FIGURE 7.4

THE UNIVERSITY OF TEXAS AT AUSTIN
 ARCHITECTURAL ARCHITECTURE
 UNIVERSITY ARCHITECTURE
 UNIVERSITY ARCHITECTURE

TERMINAL BUILDING PLAN
FOOD CONCEPT - 1ST LEVEL

DATE	NOV 1, 2000	SCALE	1" = 20'
BY	ARCHITECTURE	PROJECT NO.	00000000000000000000
CHECKED BY	ARCHITECTURE	DATE	NOV 1, 2000
APPROVED BY	ARCHITECTURE	PROJECT NO.	00000000000000000000

UNIVERSITY ARCHITECTURE
 UNIVERSITY ARCHITECTURE
 UNIVERSITY ARCHITECTURE

Figure 4.1 Terminal Building First Level (Master plan)

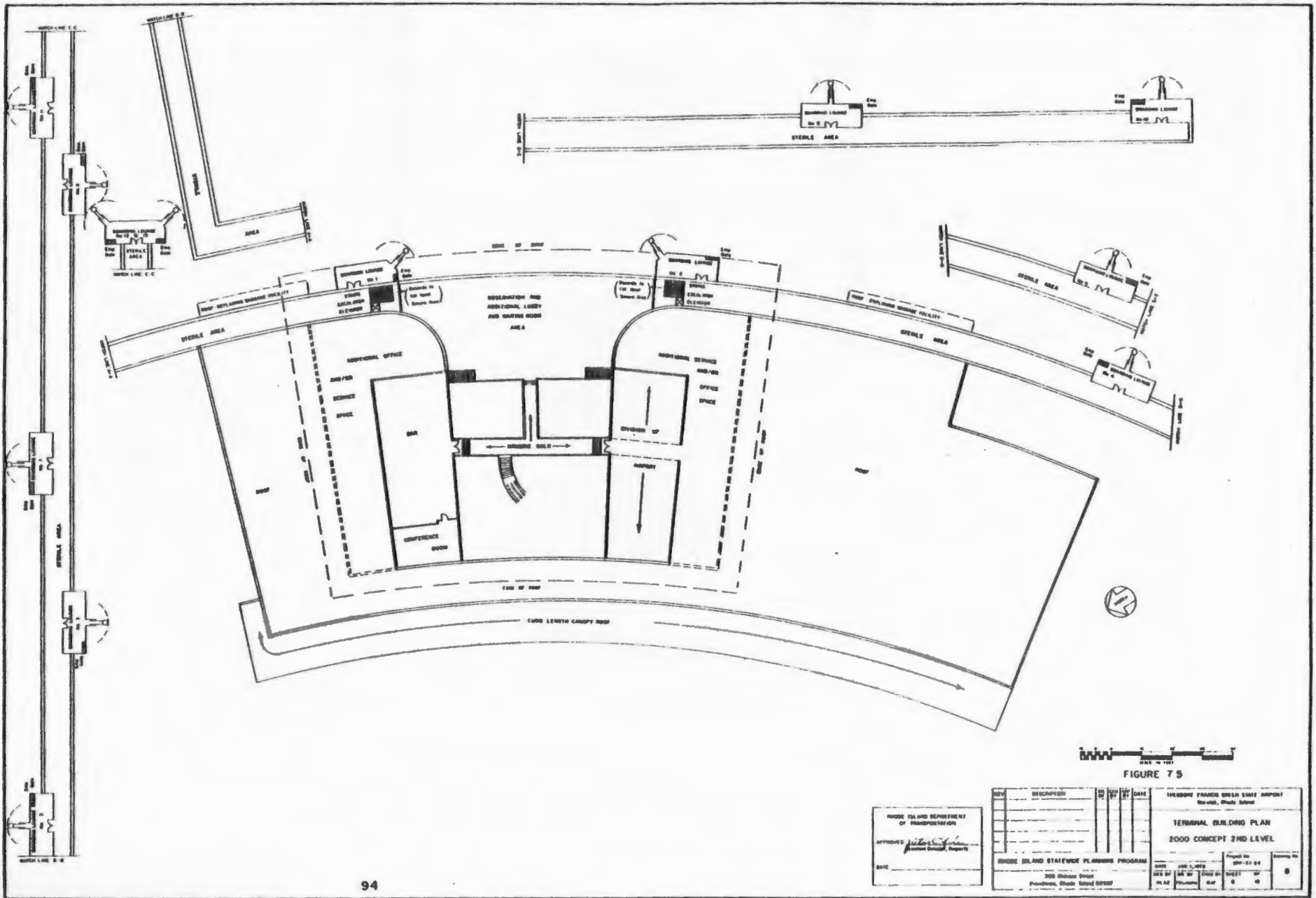
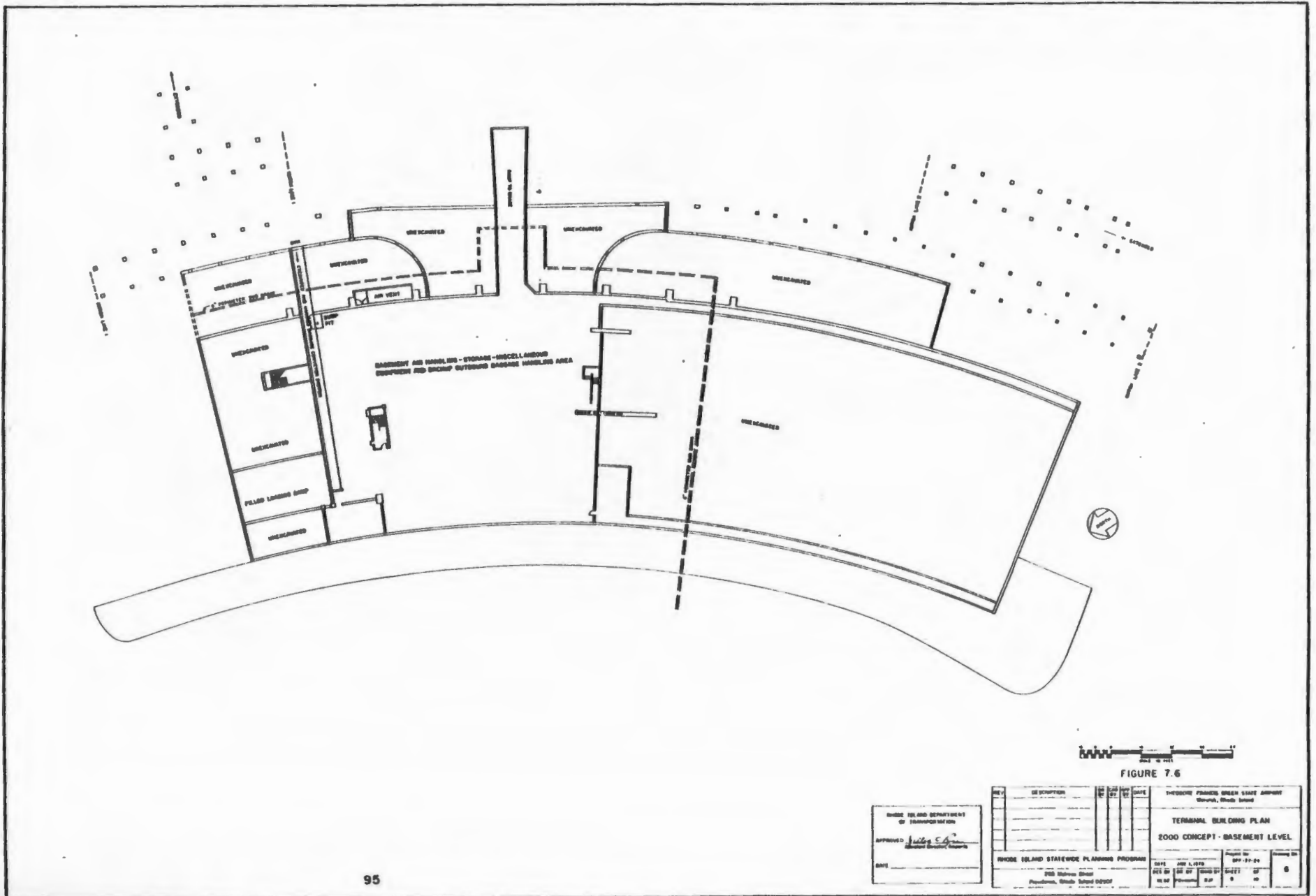


FIGURE 7.5

HONOLULU AIRPORT AUTHORITY APPROVED: <i>[Signature]</i> DATE: _____		THRUHON PACIFIC WHEELS SHANE AIRPORT Terminal Building Plan 2000 CONCEPT 2ND LEVEL
HONOLULU AIRPORT AUTHORITY APPROVED: <i>[Signature]</i> DATE: _____		HONOLULU AIRPORT AUTHORITY APPROVED: <i>[Signature]</i> DATE: _____

Figure 4.2 Terminal Building Second Level (Master plan)



95

Figure 4.3 Terminal Building Basement Level (Master Plan)



CHAPTER : 5

Basic Concepts



BASIC CONCEPTS

The airport must be viewed in terms of the total transportation system. Its primary purpose is to transfer a passenger from the ground transportation system to the air transportation system (and vice versa), or to transfer a passenger from one portion of the air transportation system to another part of that system.

The airport consists of three subsystems:

1. Airspace portion (including runways)
2. Airside portion (runway turnoffs and airline gates)
3. Landside portion (everything from the airplane gate to the airport boundary)

In our study of T. F. Green State Airport, we are only concerned with the landside portion facilities. These may be divided into three types:

1. Ingress--egress
2. Processing
3. Concession--amenity.

The following is a list of typical facilities of each of these types:¹

Ingress--egress facilities:

Airport road system
Rapid transit system
Parking lot and parking spaces
Sidewalks
Corridors--guideways



Baggage and cargo moving equipment
Passenger facilities (lobby and
waiting room)
Cargo storage facilities

Processing facilities:
Ticket counters
Security
Boarding areas
Baggage check-in

Concession--amenity facilities:
Gift shops
Restaurants
Barber shops
Lavatories

Figure 5.1 is a functional flow illustration of overall movements in an airport. Both emplaning and deplaning passenger movements are included in the figure.²

When generating our proposals for the terminal building at T. F. Green State Airport, we basically considered three different types of designs:³

1. Centralized, with either finger piers or satellite subterminals
2. Linear or gate arrival
3. Open apron or transporter

Examples of each of these systems are shown in Figure 5.2 .

It is always considered that renovation and expansion of a building is a more difficult task



Figure 5.1

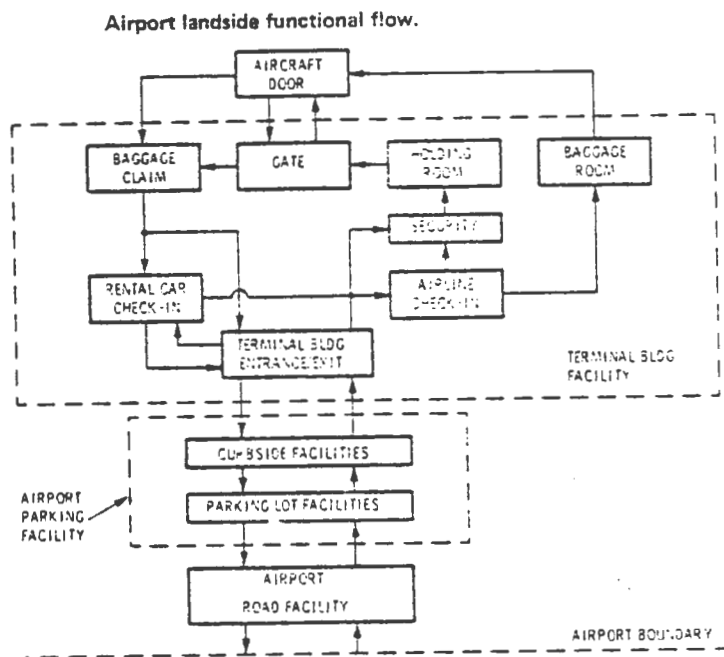
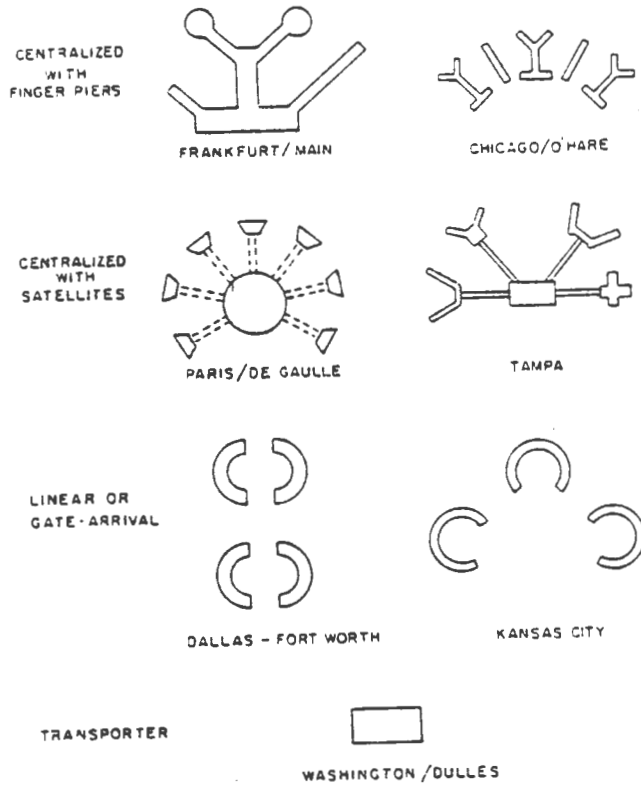


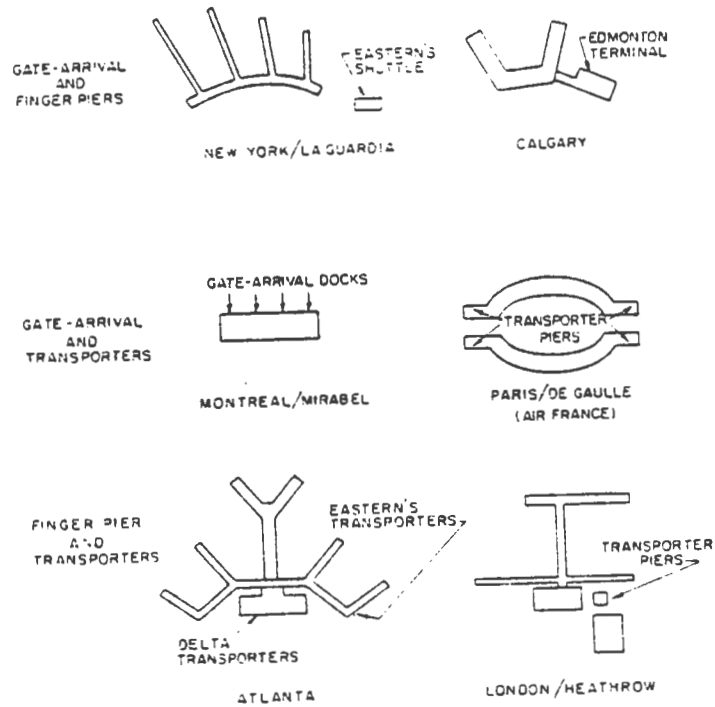


Figure 5.2

Examples of use of pure concepts for terminal design.



Examples of use of hybrid concepts for terminal design.





to accomplish than designing from scratch. Undertaking such a difficult task, we decided to combine two of the three fundamental designs to come up with one design, rather than choosing one of the three concepts and argue whether that or another concept is better for all purposes. We feel that a diversity of needs can be best served by a mixture of three elements that best serve each need, keeping in mind that the users and operators of an airport terminal want it to function smoothly and efficiently. They want a variety of significantly different kinds of services--such as easy access to all aircraft and easy transfers. Combination of centralized and linear design is used in our proposal.



CHAPTER: 6

Design Criteria



DESIGN CRITERIA

In application of "Basic Concepts" to our T. F. Green State Airport terminal building expansion and renovation proposal, we established a series of design criteria in order to come up with an optimum solution to the problem. These criteria can be listed as follows:

1. Investment
2. Demand
3. Cost-effectiveness
 - a. Public convenience
 - b. Aesthetics
 - c. Functionalism
 - d. Human values
4. Future requirements
5. Limitations

Investment--There is little doubt that public policy and politics will play an important part in determining the level and character of investment in Rhode Island's Green State Airport. Capital and labor trade-offs, the extent to which inflation and wage rate expectations are taken into consideration, the quality of service to be provided, and the extent to which the peaks are accommodated are all matters that not only require rigid quantitative analysis but also are ultimately determined in the forums in which public policy is decided. Furthermore, it is our opinion that public policy should be determined primarily by the communities served by the airport.



It is at this level that the community needs, concerns, and objectives must be defined and satisfied. Even though we have discussed such matters with various state and local agencies and politicians, it is not our intension to get deeply into such study here. Although we feel that this is one of the shortcomings of our project, our objective at the beginning was to make use of available data and to come up with the optimum solution to them.

Demand--We feel that the character of the airport demand is an important determinant of the character of the resources that are required to provide the airport system with needed facilities. In other words, it is important to minimize the extent to which mismatches occur between the aircraft and terminal building capabilities. Our calculations of the extent to which the terminal building should be expanded depends almost completely upon the figures taken from the 1978 Master Plan (Preliminary Draft) from the Rhode Island Statewide Planning Program, as well as various other studies.

Importance of cost--effectiveness--
Terminal building design varies from the spartan to the luxurious. Many factors and many parties have been responsible for providing passengers with more than they need in many cases. At the same time, cost-effectiveness plays an important part in terminal building design.



Cost--effectiveness is determined by answering the question, "Is the benefit to be obtained worth the cost involved?" For example, our proposed multi-story parking garage provides more car parking spaces at a lower cost of future expansions through the use of more expensive construction techniques. Since there are no other constraints in this respect, the construction of a multi-level parking garage is suggested.

Applying a cost--effectiveness analysis requires the reduction of each element involved to some quantifiable amount and then the balancing of the pluses and minuses.

Public convenience--This factor is the important part of cost-effectiveness. Installing dual moving walkways on long airport terminal concourses is extremely expensive and certainly not cost effective, and yet public convenience may override the added cost. Public convenience is also involved in meeting the needs of the growing aged and handicapped population by placing walkways, elevators, and ramps in locations where they have not previously been placed. Even the well-established concept of second-level loading of aircraft is one that places the convenience of the public above the cost.

Aesthetics--In past years, public officials sometimes built public structures as monuments to themselves.¹



Some officials still wish to have facilities constructed that not only are workable, but also attest to their public dedication and leadership. Although we are moving away from this particular approach--mostly because of cost implications--there are limits to which local governments should be willing to go in the interest of saving money. Our proposal for the airport terminal building accepts architectural considerations as important as the function of the building: The public wants a structure to look good even if it costs a dollar or two per square foot more.²

Function--"This means that a structure may work better if it costs more."³ The space may be available on a single level to accommodate both inbound and outbound passenger functions, but a two-level facility, which may cost a good deal more, is considerably more functional. Maintaining an operational status is also considered important.

To remodel a certain portion of a building during a phase of the construction may require the eviction of the people using that space and the relocation of them in temporary facilities that are torn down at the end of the remodeling period. This is hardly cost-effective, but it is necessary and functional. We feel that, in the planning, design, and construction of any substantial public facility, considerations in addition to cost-effectiveness of the structure must be included.



Human values--These are expressed in terms of physical and psychological comforts. Elements relating to physical comfort include distances necessary to walk from ground transportation to aircraft, the passengers' baggage load and how far it must be carried, congestion encountered in various facilities the passenger desires or is required to use in reaching the aircraft, building temperatures and humidity, and size of waiting areas.⁴

Psychological comfort elements in our study, such as waiting time, speed and ease of check-in, etc. are not studied in depth unless related directly to physical comfort.

Answers to questions we asked indicate that people seem to complain more about the following problems that they encounter in the terminal building of Green State Airport:

1. Slow baggage reclaim upon arrival
2. Slow check-in upon departure
3. Long walks to the aircraft
4. Inadequate parking facilities
5. Congestion encountered on the airport site as they try to get their vehicles into the parking lots.



CHAPTER: 7

Site Proposal



SITE PROPOSAL

Our proposal for the terminal site at T. F. Green State Airport includes a number of recommendations which are intended to not only improve on those proposals put forth in the 1978 Master Plan, but to address certain problems which either were not viewed as problems by the authors of the Master Plan, or were just not addressed. Among our proposals are the following measures:

1. Scrap the plan to tie in Kilvert Street Overpass Proposal to the relocation of the Airport Freeway.
2. Alter traffic circulation plan in such a way as to remove through traffic from the airport terminal site.
3. Separate conflicting traffic movement patterns--the most important aspect of this measure is the needed complete separation of vehicular and pedestrian traffic.
4. Increase capacity of parking areas--along with this measure go the needs of easier movement of pedestrians between parking areas and terminal building, as well as easier entrance to and egress from parking areas for vehicles.
5. Increase the capacity of passenger pick-up and delivery facilities (area in front of the terminal building curb)
6. Improve both appearance of site and terminal building exterior, as well as architectural integrity between those two areas of consideration.



The authors of the Master Plan state that: "One (restriction of the proposed concept) is the current airport access road location and its proposed realignment under the Kilvert Street Grade Crossing Elimination Project. This project is currently in the final design stage prior to construction." We urge that the relocation of the Airport Freeway in connection with the Kilvert Street Grade Crossing Elimination Project be eliminated. Rather than improving traffic circulation either to the airport terminal, within the airport site, or near the airport site; the proposed relocation of the Airport Freeway would greatly increase problems encountered in using the airport terminal. It is highly undesirable to funnel through traffic from several directions through the center of any airport terminal site. Not only does this practice produce unnecessary congestion on the terminal site, but it is a terrible waste of the scarce space of a confined terminal site.

We recommend that the relocation of the Airport Freeway to connect with Kilvert Street be abandoned. Instead, a design to serve only airport traffic should be adopted as illustrated in Figure 7.1 . This preserves the limited access of the Airport Freeway, removing all conflicting traffic movements from the road. The Airport Freeway is "redirected" in front of the airport terminal building by means of a loop of 35 meters radius (112 ft.).



Around the perimeter of this loop, the following functional areas are provided access: employee parking, air cargo, passenger pick-up and discharge from vehicles, all vehicular parking, and rental car parking. This road would then serve exclusively airport traffic, reducing congestion and increasing efficiency.

Presently, four ground level parking areas provide short-, medium-, and long-term, as well as employee parking. The Master Plan proposes to pave the remainder of the terminal site for the short-range future, as well as erect a parking garage across the Airport Freeway from the terminal building.

We consider this an unacceptable solution for several reasons: architectural integrity, safety of both pedestrians and occupants of vehicles, as well as user convenience. As previously pointed out, paving the remainder of the terminal site for the short-range future (the most remote portion of the terminal site) would indeed increase the resemblance of the terminal to an Ann and Hope store. Even less desirable is the erection of a parking deck on the farthest spot of the terminal site from the terminal building--on the far side of the freeway.

We propose the erection of a parking garage right beside the existing terminal building (see Figure 7.1).



The garage will be of spiral design, which can easily be expanded upward in order to accommodate future increases in demand for parking. The spiral design will also provide for the most efficient use of space, as well as the most user comfort and understanding of traffic movements within the garage. The garage will initially provide 1400 spaces.

By putting the garage next to the terminal building, on the near side of the airport access road, conflict between vehicles and pedestrians is eliminated. In addition, parking is concentrated as close to the terminal building as possible, rather than as far from it as possible.

Since all spaces are near the terminal building, there is no need for segregation of vehicles according to length of stay. Drivers take one of two different colored cards upon entering the garage. One color charges at a short term rate. The other charges at the long term rate. The minimum long term rate is greater than the minimum short term rate; while the short term rate becomes relatively more expensive over time, the long term rate becomes less expensive. This encourages those staying a short time to select the short term parking plan, while long term parkers select the long term plan.

The Master Plan attempts to increase the capacity of the passenger pick-up and discharge



area by slightly lengthening the curb length. It is felt that this does not really solve the problems of congestion and overcrowding.

We adopt a totally different approach to the solution of this problem. We propose to reduce the need to use the passenger pick-up and discharge area, thereby reducing the demand for existing space.

The proposed spiral parking garage design eliminates the need for walking farther than ninety feet from the farthest parking space to the central elevator shaft and subterranean moving walkway leading to the passenger check-in area of the terminal building. No longer will those who have parked their cars to meet their loved ones need to get the car from a far-away parking space and pick up the baggage at the passenger pick-up and discharge area. So, we expect that the parking garage will not only solve present and future parking problems, but it will also solve the overcrowding problem at the passenger pick-up and delivery area.

As previously stated, the proposed design improves the architectural integrity of site and building. Although this aspect will be discussed in detail in the next section, some brief statements can be made here.



The overriding architectural feature of the terminal building is its curved design and sloped roof, accentuating the main entrance. The erection of a rectangular parking structure in front of this building would not only hide the terminal building from view at points external to the terminal site, but it would impose a major structure which should be closely connected to the terminal building, but which would be of a design that is impossible to be connected either visually or physically to the curved terminal building.

The circular parking garage carries out the curved design of the terminal building. The compatible designs provide a close visual connection. By being located close to the terminal building with mechanical conveyance of people the short distance into the terminal building, close physical connection between garage and terminal building is also accomplished.

Figure 7.1 **TERMINAL AREA PLAN**
1977 CURRENT

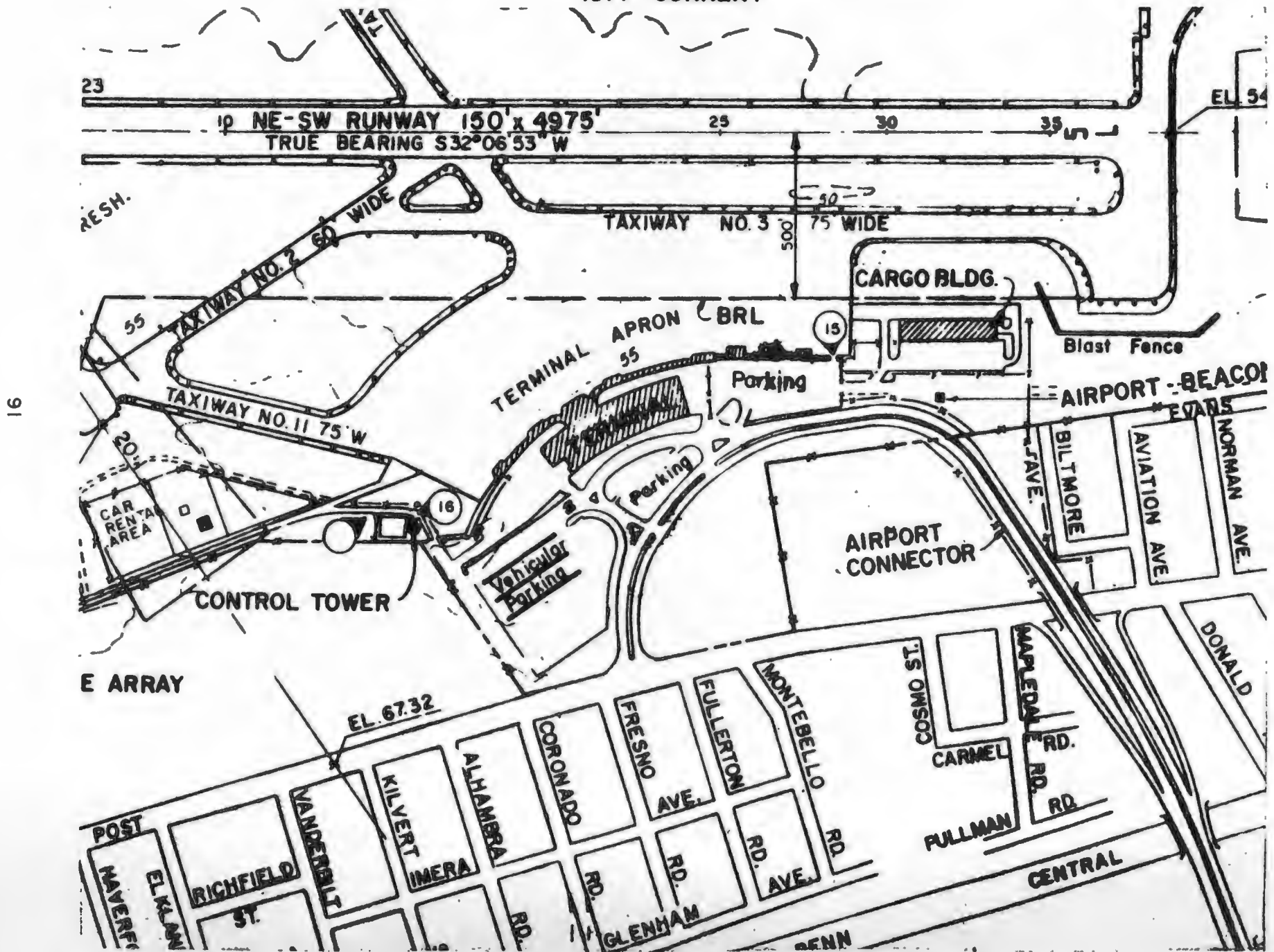
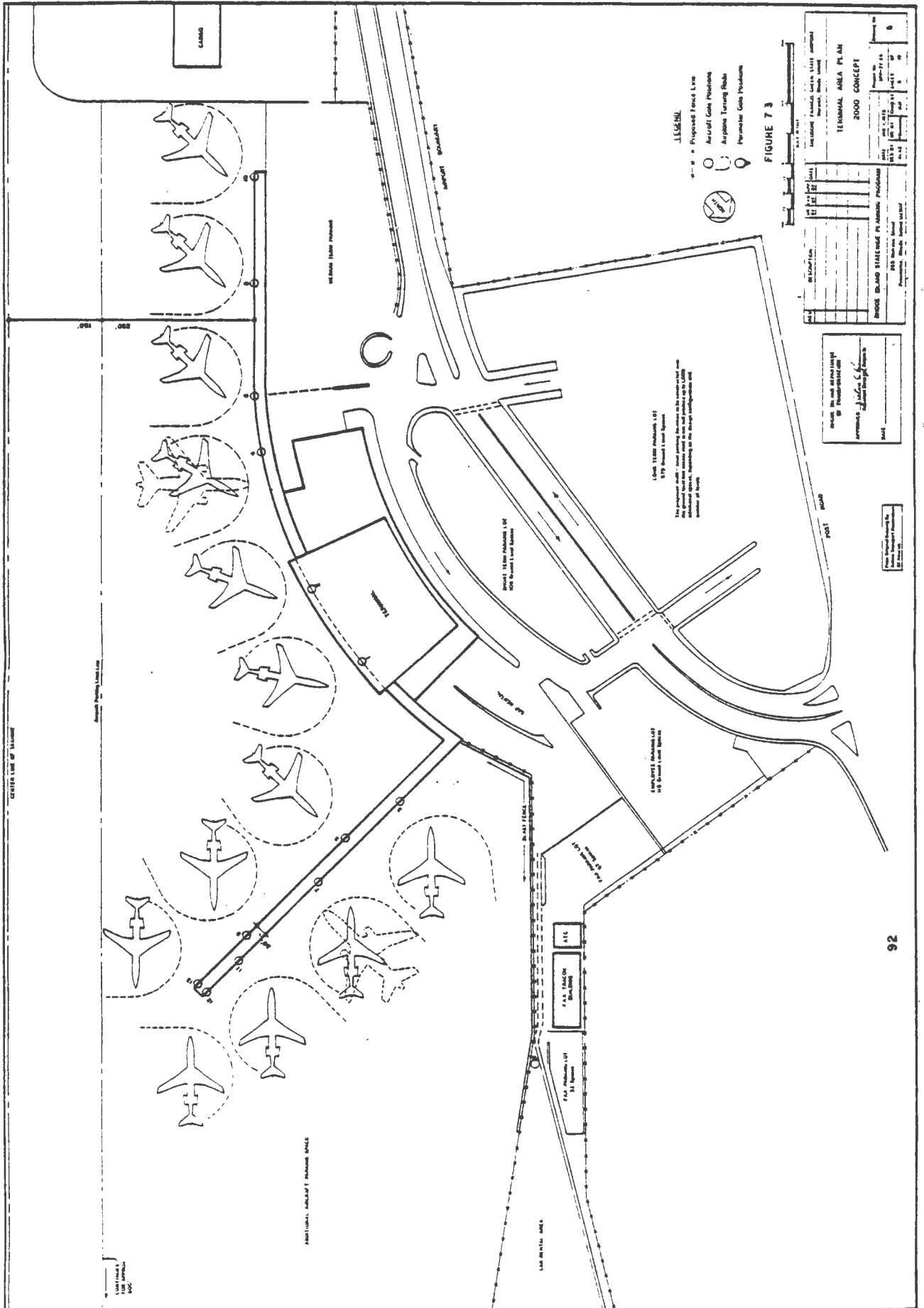


Figure 7.2 Terminal Area Plan (Master plan)



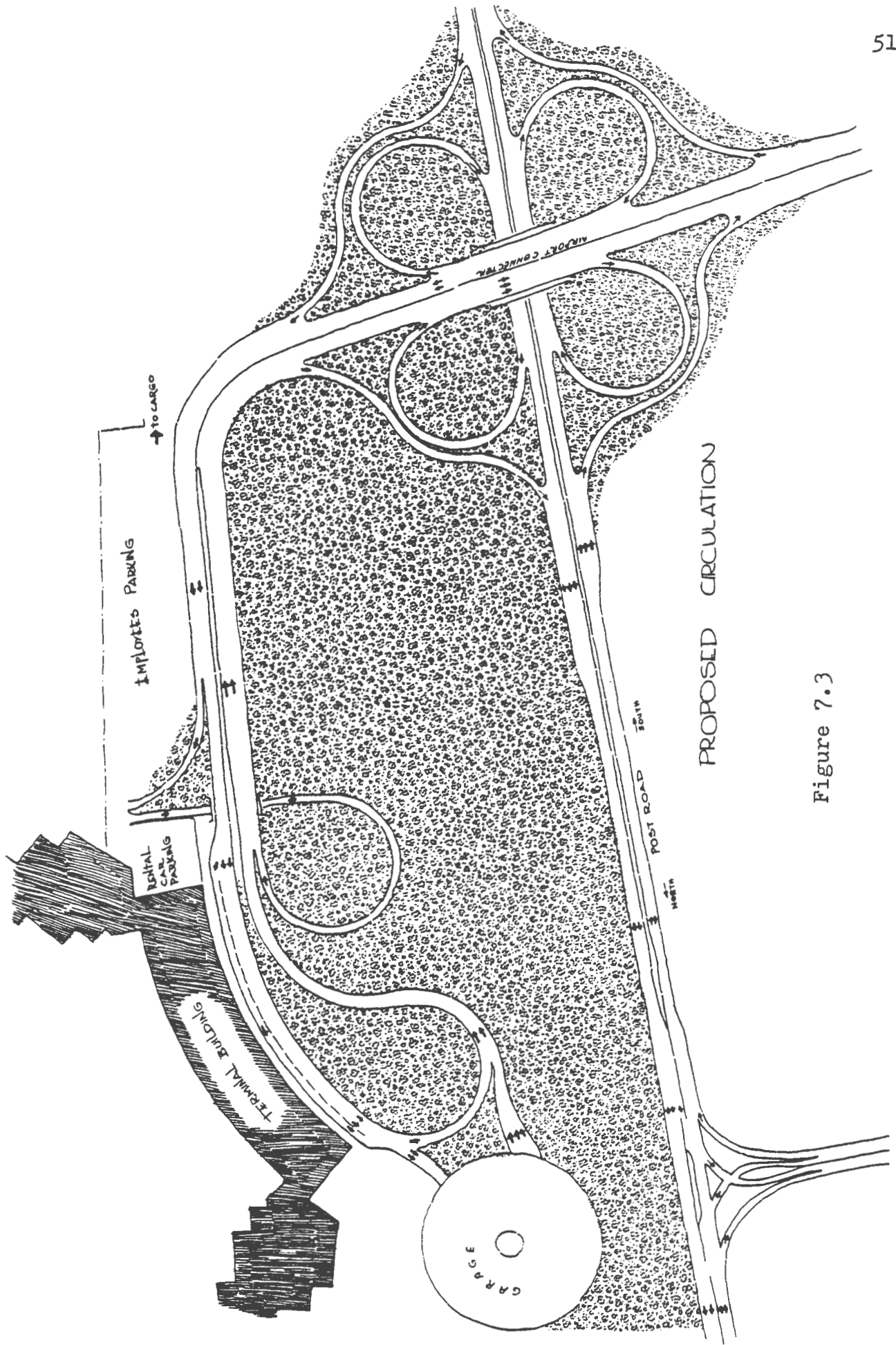


Figure 7.3



CHAPTER: 8

Terminal Proposal



FIGURE 8.1



TERMINAL PROPOSAL

Our terminal building design basically consists of two parts (see figure 8.1):

1. Main building
2. Satellites

The two satellites are designed to be an integral part of the main building. The difference in the functions inside make it easy for us to explain each section more precisely. Satellites are designed to circulate the emplaning and deplaning passengers coming into and out of the aircraft. The main building is the place in which all of the necessary functions of the terminal building will be accommodated.

We feel that it is necessary to list and explain each functional area before explaining the proposed circulation pattern. Our design consists of two floors.

Figure 8.2 shows the functional elements of the first floor:

1. Incoming passenger circulation area
2. Circulation corridor
3. Baggage pick-up area
4. Airline offices
5. Rest rooms
6. Entrance--exit to parking garage
7. Exit to street
8. Rental car offices
9. Exit to rental car parking
10. Entrance--ticket area.



FIGURE 8.2



Incoming Passenger Circulation Area-- This, approximately 3071m^2 (32640ft^2), is devoted to the comfortable deplaning of the passengers. There are a total of six deplaning gates in the first floor of each satellite. The side doors of the aircraft are at the same level as the second floor of the satellites. Passengers leaving the aircraft will be taken down by ramps from the second floor to the gates on the first floor, without conflict with the passengers ready to board the plane on the second floor.

The circulation area (striped in the picture) is designed to eliminate possible congestion by making the area wider as more and more gates empty their passengers to the area. It is approximately meters wide at its widest point where six gates are served. The tip, where only two gates are served is meters wide.

The solid colored area in the picture is the waiting area for the people who are there to meet passengers coming from the plane. Planned seating and interior plantscaping in this area are highly recommended in order to make it attractive to people.

Circulation Corridor--The circulation corridor is basically provided for the deplaning passengers of satellite "I" to reach the baggage claim areas and exits. Public rest rooms for the first



floor will also be reached by this corridor. Even though there will be an exit-entrance door provided for the airline offices in the front of the building, this corridor can be used by airline officials to reach various sections of the terminal building.

Baggage Pick-up--The baggage claim area (approximately 581 m²) is designed to be at the most central area to avoid making it necessary for deplaning passengers to carry their baggage long distances. Arrow "1" in figure 8.3 shows deplaning passengers from satellite "I;" arrow "2" shows deplaning passengers from satellite "II," and arrow "3" shows the exits from the terminal building.

We propose four baggage retrieval conveyers-- each is meters long. Three of them are designed so that people can approach them from both sides.

Baggage taken from aircraft will be brought to the basement and distributed to mechanisms going up to each of the baggage conveyers on the first floor.

Airline Offices--Airline offices, situated at the left end of the first floor of the main building, are designed to provide space for a minimum of nine different airlines, providing space for future expansion.

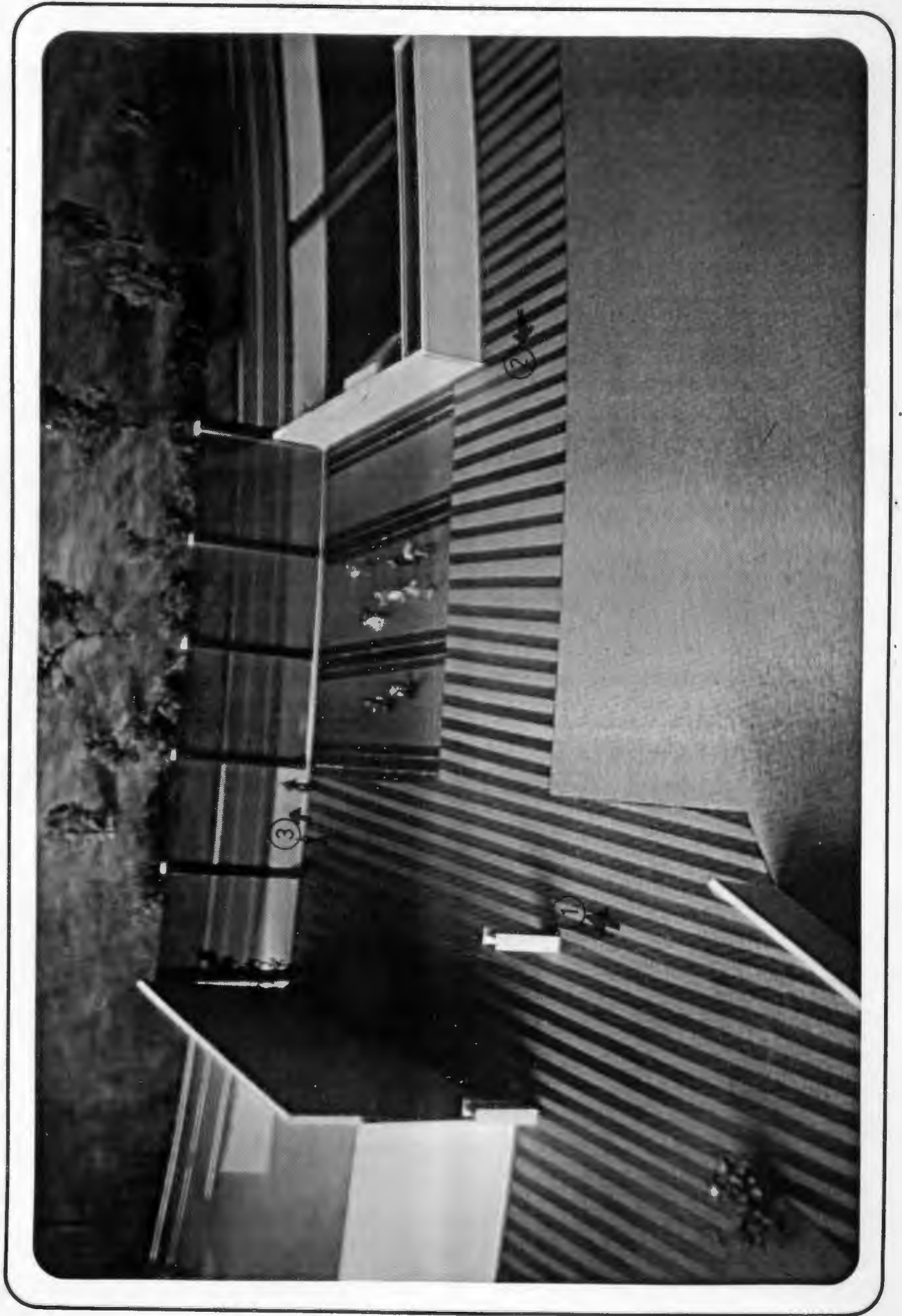


FIGURE 8.3



We suggest that modular wall units be used in this area to make possible different interior configurations and optimum use of space. Airline offices are connected directly to the ticket counters and indirectly to other sections of the terminal building by use of the "circulation corridor."

Rest Rooms--These facilities for the terminal building are provided on both the first and second floors of the main building. Rest room capacities are designed to handle peak loads for emplaning passengers on the second floor and deplaning passengers on the first floor.

Entrance-Exit to Parking Garage--Our plan proposes an underground walkway from the multi-story parking garage to the ticket counters in the terminal building. Considering the fact that there is already a paved basement floor under the terminal building to accommodate two thirds of the distance required for the underground walkway, such a walkway will be useful and simple to install. It will provide advantages such as easy access to the parking garage from the terminal, a smaller area needing security services, etc. To make it more effective and easy for the user, we suggest the use of a moving walkway in this area.

One end of this underground walkway will be located at the multi-story parking garage, with



the other end of it reaching all the way up to the far right corner of the ticket counters. There will be easy access for both incoming and outgoing passengers--handicapped or not--to the second floor via elevators.

Rental car offices--An area will be provided for the rental car companies across from the baggage pick-up area; so that it will be at the central location between satellites and exit to the rental car parking area. This area will contain three small office spaces, with the desk in front of them.

Entrance-Ticket counter--This section of the building is two stories high and located under the existing slanted roof. To make it more related to the surrounding facilities, we prefer to explain this section with the functional elements of the second floor.

Figure 8.4 shows the general plan for the second floor. Like the first floor, the second floor consists of two major sections:

- I. Main building
- II. Satellites

This floor accommodates the people who are going to board the aircraft--enplaning passengers.

- I. Main building--This section of the **building** contains five elements.
 - 1. Entrance area--ticket counters (at the middle right)
 - 2. Circulation area
 - 3. Offices
 - 4. Restaurant
 - 5. Shops
- (Figure 8.5)

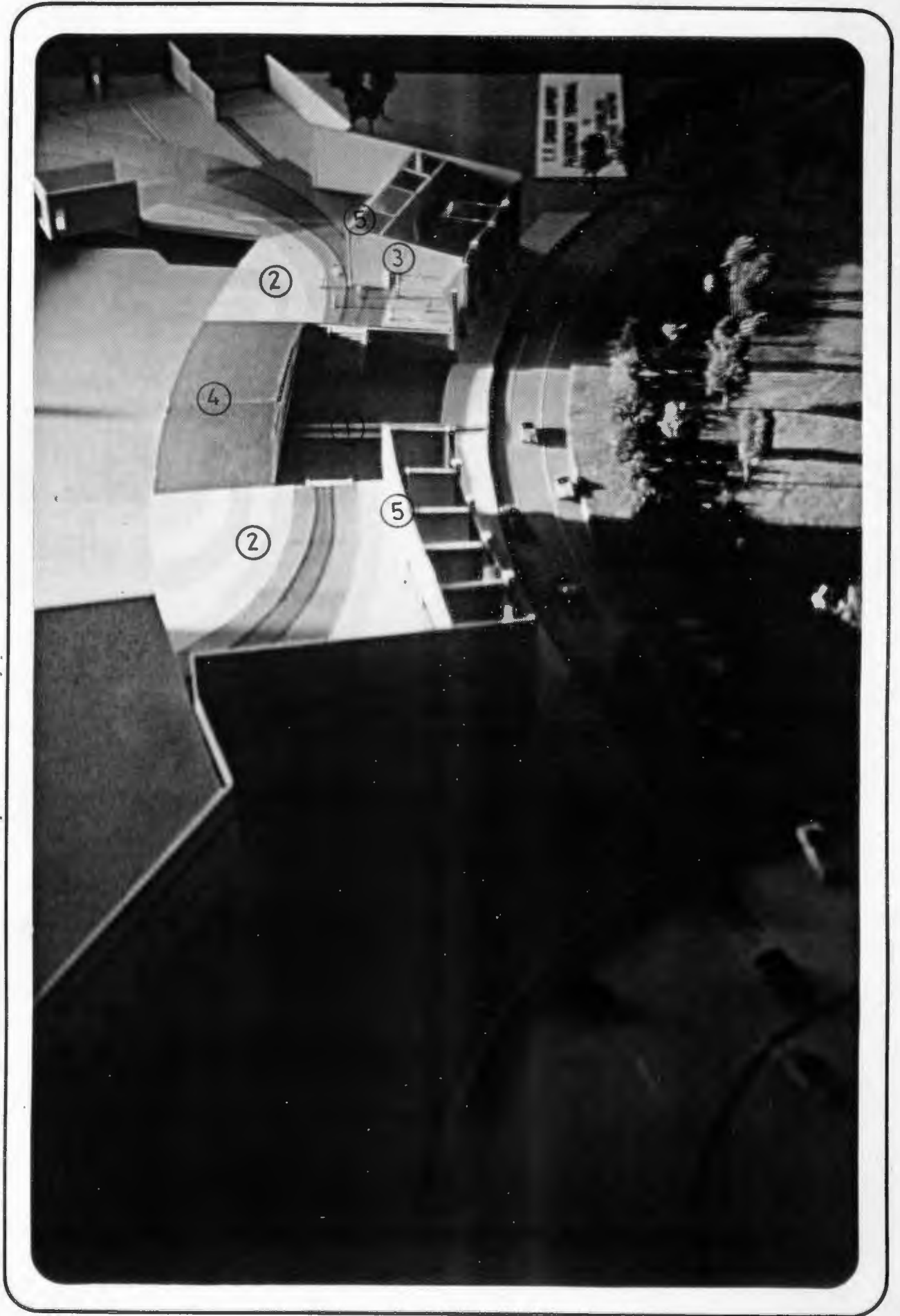


FIGURE 8.5



Entrance area--This area is located at the middle of the front section of the main building, indicated with dark red in figure 3.4 . This area is two stories high and located under the existing slanted roof. One of the reasons we designed this area to be two stories high is because the existing slanted roof does not have enough clearance in the front for two separate floors. Another reason is that we feel a space this big should have enough height so that it will not feel uncomfortable to users.

In figure 3.6, the striped area indicates the path of enplaning passengers as they enter the terminal building at the front of the building. Ticket counters are located directly across from the entrance. They are designed to handle eight different airlines at the same time, with enough circulation area provided in front of them. (area in solid red color on figure 3.6)

Circulation area-restaurant-offices--This area has three sections--"A," "B," and "C." Detailed analysis and design of this area will need further study. Considering the fact that "restaurant design" is a field itself within architecture, we chose not to get into much detail in this section.

Section "A" has two shops, security office, first aid, office space for the Division of Aeronautics and the Department of Economic Development, and a wide circulation area in front of them.



FIGURE 8.6



Section "C" has a bank, post office, souvenir shop, rest rooms, and a circulation area to serve those facilities. It is on the upper level.

II--Satellites--Two satellites on the upper level, over those on the first floor, are designed to serve outgoing passengers. The main purpose of this area is to serve the airport terminal building as its sterile corridors. The dark green area in figure 8.4 indicates the direction of main circulation--with the thin green stripes indicating the direction of each gate. Each satellite on the upper level is designed to handle nine mid-size jets or six mid-size and two wide-body jets, while providing a total of eighteen gates for mid-size jets or twelve gates for mid-size and four gates for wide body jets. The area (124 m²) behind the x-ray machines and security check is designed to accommodate circulation for all of the gates at the same time.

CIRCULATION PATTERN--Basically, there are two main circulation patterns in an airport terminal building--one of which is out-going passenger circulation and the other is incoming passenger circulation.

Outgoing Passenger Circulation--Passengers get into the entrance area of the terminal building by front doors, after disembarking from their cars in the passenger discharge area,



FIGURE 8.4



or by the underground walkway after they park their cars. (Entrance area is indicated in dark red in figure 8.4)

Passengers with their tickets and no luggage are immediately taken to the second floor by two escalators provided on either side of the entrance area. Passengers who are in need of buying their tickets or checking their baggage can do so by simply going to the ticket counters provided in this area. Then they will go to the second floor. The dark green area on the figure indicates the direct passenger circulation pattern from the stairs coming from the entrance area to the gates. After getting to the second floor, passengers are free to use all of the facilities and stay with their families and friends. Only passengers should be allowed to enter the sterile corridors.

Even though we provided counter space for each airline in front of the gates inside of the sterile corridor for seat assignments, we feel that seat assignments should be made at the front ticket counters. This would minimize the time passengers spend behind the security check without being able to use terminal building facilities and being away from their families and friends.

The seat assignment decision is left to the airport management and individual airlines. We designed the building so that in case the seat



assignments are made at the ticket counters, by moving the security check further inside of the satellites, maximum waiting area outside of the sterile corridors will be provided.

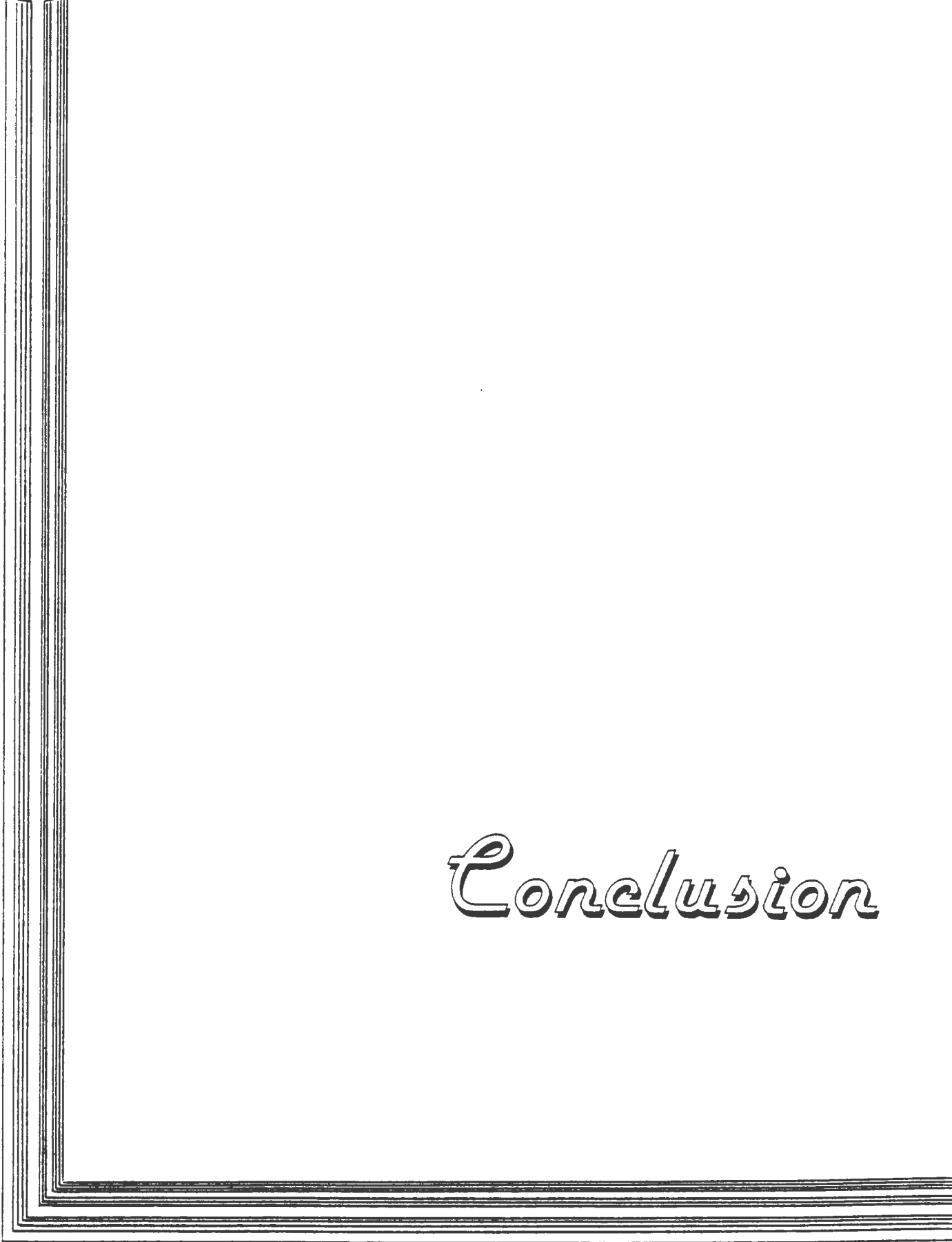
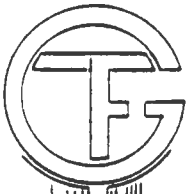
Incoming passenger circulation--Arrows indicated in black in figure 8.2 show the direction of incoming passenger circulation. Passengers will be taken to the first floor by ramps after leaving the aircraft at the second floor level. Then they will be directed to the baggage retrieval area. Passengers, after picking up their baggage, may leave the building either by the exit doors in front of the building or by the underground walkway to the parking garage. Dotted lines in the figure indicate the direction of the underground walkway. Passengers, who are going to rent a car, can do so by picking up their keys from rental car offices and leaving the building from the exit provided on the right side of the building, which leads directly to the rental car parking lot.

We designed the building so that incoming and outgoing passenger contact is minimized. The only area in which these two groups contact is the walkways in front of the building. Even this contact is minimized by dividing the incoming passengers into three groups:

1. Those leaving the building by the front doors



2. Those leaving the building by the underground walkway
3. Those leaving the building by rental car



Conclusion



CONSLUSION

An airport plays an important role in the economic development of a state. Tourism, a rapidly growing industry in Rhode Island, also depends heavily upon a nearby attractive airport. The airport is the first thing that many visitors see when they arrive in Rhode Island. It gives them their first impression of the state. As a result, an airport has a psychological as well as physical impact on its users. We believe, therefore, that T. F. Green State Airport is an important facility to the state of Rhode Island.

In the text of this paper, we presented our proposal for improvement of T. F. Green State Airport. It is up to decision makers as well as the people of this state to implement such improvements.

How should we go about doing this? First, more money should be allocated. But, the burden should not be left completely on the taxpayers of Rhode Island. In Appendix "A" we present some of the possible sources of money for this project.

We believe that this point in time presents a "point of no return." It is the last chance to "do things right" at T. F. Green State Airport. If construction at this time is done in a shortsighted and short-cut manner, scars will be produced that will either remain a hindrance to smooth operation, or will be corrected only at astronomical expense in the future.



This may mean moving the airport to a different location or constructing a new building for the terminal after demolishing the existing one. That, obviously, represents a great deal more cost for the state and its taxpayers than doing the job right, now.

We conclude by saying that the improvement is needed, but it should be done when the money is available to do the job right. Here the theme of lack of funds again emerges. More time should be spent on securing funding of the project, rather than developing an inefficient project at a reduced cost.



FOOTNOTES

Chapter 1

¹Harold L. Adams, "Management Principles," in Current Techniques in Architectural Practice, ed. by Robert A. Class (New York: Architectural Record Books, 1976), p. 34.

Chapter 2

¹Information in this chapter was extensively based on the following:

Rhode Island Statewide Planning Program, Technical Paper #14: State Airport System Inventory, October, 1969.

Chapter 5

¹Lawrence McCabe and Thomas Carberry, "Simulation Methods for Airport Facilities," in Special Report #159-Airport Landside Capacity, ed. by Mildred Clark (Washington: Transportation Research Board of National Research Council, 1975), pp. 112-114.

²Ibid., p. 115.

³Richard de Neufville, "Designing the Airport Terminal," in Special Report #159-Airport Landside Capacity, ed. by Mildred Clark (Washington: Transportation Research Board of National Research Council, 1975), pp. 234-236.

Chapter 6

¹Robert S. Michael, "Airport Landside Capacity: Role of Management," in Special Report #159-Airport Landside Capacity, ed. by Mildred Clark (Washington: Transportation Research Board of National Research Council, 1975), pp. 125-141.



²Ibid.

³Ibid.

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Hotel, parking garage planned for airport; could earn state about \$1 million a year

By DAVE REID

Journal-Bulletin State House Writer

PROVIDENCE — A new hotel and parking garage planned for Green State Airport will earn the state about \$1 million a year once it is finished in 1982, Governor Garrahy said yesterday.

It also will produce at least \$150,000 for the City of Warwick, Garrahy said.

The \$17-million development will be built privately on state land around the Green terminal and then donated to the state.

In return, the developer, Aerial Group Inc., will receive a 30-year lease from the state. The development group also will take over operation of the airport coffee shop and newsstand.

The state will get 10 percent of the hotel's gross profits, and at least \$60,000 from the operation of the coffee shop, newsstand and garage.

Warwick will get payments in lieu of taxes for the 200-room hotel and 1,000-car parking garage.

The parking garage will be built directly in front of the Green terminal,

between the short-term parking lot and Post Road. It may be finished as soon as October.

Once the garage is completed, construction will begin on the six-story hotel on part of the north parking lot. The hotel will be connected to the north end of the terminal building and should be completed in about two years, Garrahy said.

Combined with renovation of the terminal building, which is now under way with state bond money, the hotel-garage complex will make Green "a total-service complex unequalled by any medium-sized airport in the country," Garrahy said.

The new hotel will be smaller than the 350-room Marriott Inn, the 330-room Biltmore Plaza and the 275-room Holiday Inn. But it will be larger than the 125-room Sheraton Airport Inn nearby on Post Road.

Hotel owners in Providence say the hotel business currently is very competitive in the Providence area, with only the Marriott maintaining a high level of

occupancy. Several hotel people believe the Cranston Hilton folded recently and was sold to Johnson & Wales College because it was not drawing enough business.

But Garrahy and Martin G. Olson, the head of Aerial Group, said market studies have indicated a need for hotel rooms at the airport.

Olson said his facility is not intended to compete with downtown hotels, which are oriented toward convention business. He suggested that the presence of an airport hotel might attract more airline flights, and with them, more business for all Rhode Island hotels.

Peter Austin, general manager of the

Sheraton, agreed. "I think it's excellent," he said. "I would enjoy any extra competition coming into the area. It's a good thing. It gives more jobs to the community, as well, and that's important."

The new garage will increase the number of parking spaces at Green from about 800 to 1,541, according to plans unveiled in the governor's State House office.

The four-level garage will have five sets of stairs and three elevators, as well as a 300-foot enclosed walkway to the second floor of the terminal building.

The project is expected to create about 100 construction jobs and provide about 150 positions in the hotel and garage.



—Journal-Bulletin Photo

NEW LOOK: A model of proposed changes at T.F. Green Airport in Warwick.

Student plan to revamp airport too expensive for state's tastes

By DOUG CUMMING
Journal-Bulletin Staff Writer

WARWICK — Two graduate students from the University of Rhode Island have come up with a new version of the T. F. Green State Airport that solves just about every problem anybody has ever encountered there.

Only one hitch: The state isn't about to pay the \$12 million it would cost.

Clifford Wester and Melih Ozbilgin, after designing the make-believe airport improvements for an independent project in community design, presented a detailed model and slide show yesterday to state officials at the airport.

Victor C. Ricci, acting director of the Division of Airports, told the students later that their statement of the problems was accurate. How the state eventually will solve these problems, he added, will differ from their model because the state doesn't want to pick up such a large tab.

THE PROBLEMS at the airport, the

students said, include automobile tieups, inconvenient parking, overcrowding at the baggage pickup and poorly designed waiting areas. The students compared the appearance of the terminal to an Ann & Hope store — showing a slide of just the store they had in mind.

Ricci flinched visibly at the comparison and said that the airport was built for the state's needs in 1960. At that time, the airport served only 300,000 people a year. Last year, it served 941,099, Ricci said.

"In the future, when our consultants go to work, these are the kinds of studies they can go back to," Ricci said of the students' work. The state has \$1.4 million from a bond issue which will be used to improve baggage pickup, traffic, security and interior design of the airport, he said.

ACTUALLY, the state already has contributed to Wester and Ozbilgin's proposal — \$135 came from the Statewide Planning Program to help build their model.

The model includes a spiraled six-level parking garage, two new double-leveled wings to accommodate 10 airplanes each and a second floor on the main terminal. Existing steel beams would be extended to cover the entrance drive and pedestrians no longer would need to cross lanes of traffic.

Dieter Hammerschlag, the community planning professor who is the students' adviser, noted that the beauty of the proposed design was its compactness. Outgoing and incoming passengers, who would remain on separate levels, never would have to walk very far.

Roland J. Frappier, supervisor of transportation for the Statewide Planning Program, said the students' concept was considerably different from the state's concept. "The state's concept is to spend as little as possible and make it work as well as possible, which I personally think is not the best approach, but it is state policy.

But "this concept makes something really attractive out of the airport," he said.