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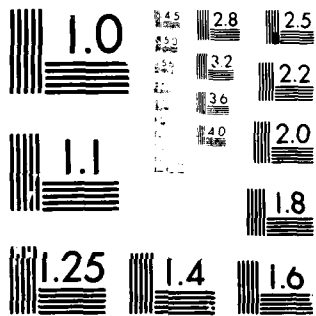
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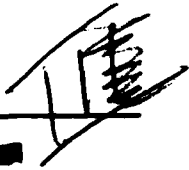
Volume II

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The Allocation of Runway Slots by Auction

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Office of Aviation Policy
Washington, D.C. 20590

The Airline Management Game and Slot Auction Testing

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April 1980
Final Report

M.L. Balinski
F.M. Sand

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16. Abstract The allocation of runway slots at the high-density airports by means of an auction is studied. Previous approaches to slot auctions have not allowed for the interdependency of slot values to the air carriers--a single slot for a landing of an aircraft is likely to be of little value without a corresponding slot for a subsequent take-off of that aircraft. A Slot Exchange Auction is designed, its theoretical properties and practical implementation discussed. It is shown to allow the slot market to reach an efficient equilibrium under competitive conditions. The Airline Management Game is used to create a simulation test of the Slot Exchange Auction and its associated continuous market, the slot exchange.			
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1. INTRODUCTION

In order to evaluate the viability of the Slot Exchange Auction* and subsequent continuous slot exchange, an interactive computer simulation of actual slot auctions was conducted using the Airline Management Game; participants from the airlines acted as airline executives engaged in bidding and scheduling activities. This Evaluation Exercise held at FAA headquarters in Washington, D.C., February 11-15, 1980 also included a test of the FAA's Administrative Allocation procedure. An earlier version of the same simulation was conducted at M.I.T. in December 1979 by the staff of Flight Transportation Associates (FTA). The scenario included five competing airlines and 17 airports with three of them being capacity-limited. These three airports carried about 66 percent of all the traffic in the initial schedules (base case), and there was a total of 480 flights per day in these schedules. Hourly quotas for the three capacity-limited airports were established by the game administrator based on the airport activity profiles obtained in the base case. They were 13, 12 and 11 for the three airports designated AAA, BBB and CCC respectively in the Evaluation Exercise scenario.

The five teams were assigned FTA staff members and airline participants. They were instructed to maximize short-run airline profits using a fixed fleet of aircraft and fixed fares, but free choice of routes and schedules. The schedules were assumed to operate for six months at a time.

This second volume of the Final Report on runway slot allocation by auction presents an outline of the Airline Management Game, the experimental design, the bidding rules and the results and analysis of the Evaluation Exercise. After the

* The terms "Slot Exchange Auction" and "slot exchange," as used in this report refer to the same objects as the earlier names "Trading Post Auction" and "aftermarket."

exercise the airline participants were invited to submit written comments and responses to FAA questions about the two methods of slot allocation and the testing procedure used for evaluating them. Their replies are included in facsimile as Section 5 of this volume.

The airline participants were given a rather large amount of scenario data--operating statistics, cost parameters, initial schedules, system route maps, etc.--and a set of instructions for bidding in each of the two allocation methods. We have not included all of this material here since most of it is covered in the report in a slightly different form, and furthermore this report deals with one of the two methods. We have tried to include all data relevant to the task of interpreting the results of the Evaluation Exercise concerning the Slot Exchange method. The results of the earlier (December) exercise are summarized in Appendix B.

2. TESTING CONCEPTS AND PROBLEMS

This approach is new. There is no mathematical guarantee that the tatonnement process will converge. The circumstantial evidence is very positive, but not completely convincing. The 42 interdependent trading posts of today may well become 142 trading posts tomorrow. Can the airlines cope with this complexity? What are the effects of this complex dependency on the convergence behavior of the repeated Trading Post auction?

These are difficult questions which demand careful study and thorough experimentation.

When should the auctioning process be stopped? It seems highly unlikely that the procedure will of itself reach a point where no party wishes to change a bid--the sheer dimension of the number of trading posts would seem to admit the wish of at least one airline to change its bid at at least one trading post. A sine qua non is that the conditional outcome of any round of auction be a potential final outcome: this to ensure that each airline reveal its true demands to the extent it knows them. The threat must exist that, at any time, the hammer may fall.

The dynamics of the conditional outcomes are complex. After several rounds one may expect that many prices and allocations begin to repeat, with the "action" occurring at the margin. "Chases" may occur, with prices at one or several trading posts driving upwards as participants compete for the marginal slots at those posts. These followed by some, perhaps "too many," airlines dropping out, the demands at the corresponding posts dropping below supply. Because of the indivisible nature of the commodity it may well be necessary to impose, in such cases, a positive trading post price even in the presence of excess supply. This "threshold" price or "entrance fee" would be introduced to prevent cyclic phenomena at trading posts

(caused entirely by the indivisibility of slots): a trading post price might slowly climb in successive rounds, then suddenly drop to \$0 with several bidders dropping at once, then begin climbing again with \$0 being an attractive price to those who had dropped out, etc.

So a stopping rule must be defined. There are several candidates.

1. By convergence of price. If, in two successive rounds of bidding, the 42-dimensional trading post prices are sufficiently close to one another, stop. For example, if $p = (p_1, \dots, p_{42})$ is one set of prices and $p' = (p'_1, \dots, p'_{42})$ the next set and $\max_i |p_i - p'_i| \leq \epsilon$, for ϵ some positive number defined at the beginning of the auctioning process, then stop.

2. By convergence of allocations. If, in two successive rounds of bidding, the trading post allocations to airlines are sufficiently close to one another, stop. For example, suppose airline i receives a_{ij} slots at trading post j in one round, receives a'_{ij} in the next round, and $\max_{ij} |a_{ij} - a'_{ij}| \leq \delta$, for δ some small positive integer defined at the beginning of the auctioning process, stop.

3. By vote. If, at any round, $m\%$ ($m \geq 50$) of the bidders are satisfied with the conditional allocations, then stop.

4. By payment. If, after weak "convergence" by 1, 2 or 3, an airline wishes to change its bid, then it pays a fixed sum for the privilege of so doing.

5. By price-averaging. If, after several rounds of bidding have taken place, the administrator observes cyclicities in the successive trading-price vector, then the rules of price formation are changed and the conditional trading-price becomes a weighted average of past prices. For example, let $\underline{p}^1, \underline{p}^2, \dots, \underline{p}^{k-1}$ be the trading post prices of the first $k-1$ rounds as usually determined, and \underline{p}^k that of the k^{th} round as usually determined. Then the commissioner announces instead $\underline{p}^k = \sum_{j=1}^k \lambda_j \underline{p}^j$, with $\sum_j \lambda_j = 1$ and $0 \leq \lambda_1 \leq \lambda_2 \leq \dots \leq \lambda_k$.

6. By successive shares. Instead of seeking convergence over the entire process, one could seek it by "successive shares." Each round of bidding results in a final but partial allocation. The first round is conducted as usual: conditional trading post prices are found. The top q_1 , with $q_1 < q$, e.g., $q_1 \leq q/10$ of the bidders in a market with quota q are actually awarded the slots at the trading post price. The second round is conducted as usual, but with the quotas reduced to $q - q_1$: conditional trading prices are found and the top q_2 (where $q_1 + q_2 < q$) of the bidders in each market are again awarded the slots at the trading post price. And the procedure iterates, with the number of winners per round q_1, q_2, \dots, q_k defined in advance with $\sum q_i = q$ and perhaps decreasing as the rounds proceed. Convergence is assured by construction. The airlines know "where" they are at any point and react accordingly. Uniform trading post prices are lost, but the ultimate allocation should be close to an economic equilibrium.

3. TESTING THE SLOT EXCHANGE AUCTION

3.1 Background

The experimental testing of the Slot Exchange Auction poses a number of difficult problems as pointed out in the previous pages. Foremost among these is the need to have bidding which is related to airline network scheduling in a meaningful way. If the structure of slot interdependence, which we have repeatedly emphasized in this report, is not present in the experiment, the prices attached to slots will have no relationship to the airlines' valuation of slots. Since the real airline scheduling problem is immense and complex, there is a need for a simplified structure in the experiment. The Airline Management Game (AMG), developed and tested by Antonio Elias¹ of M.I.T. and Flight Transportation Associates, is a vehicle for providing a simplified structure of the air transportation network. It is a combination "game" and computer simulation in which the "players" make realistic airline management decisions. These decisions are fed into a computer along with CAB air traffic data, airline operations cost parameters, and air transportation block times and distances. The computer simulation allocates the passenger demand among the competing air carrier services offered by the competing "players," which in practice are teams rather than individuals. It also prints profit and loss, balance sheets, OAG-type schedules, and network and operating statistics for the game. The "players" have a chance to read the computer output, evaluate their performance in the competitive transportation scenario and revise their decisions. After some number of iterations, the results can be regarded as final.

The initial idea for an experiment to evaluate the effects of allocating slots by auction was as follows:

1. An air transportation scenario for five competing airlines would be created by Dr. Elias.
2. The "players" would be told the hourly quotas at three congested airports and required to bid in a Slot Exchange Auction for runway access slots at those airports. However, many rounds of bidding would be needed (held). A computer program would process the bids to determine slot prices and allocations at the three congested airports.
3. The AMG would be played with the slots restrictions imposed on the airlines by the auction results.
4. The Slot Exchange Auction and the AMG would be repeated at least once.

In December 1979 a trial exercise of this sort was held at the Flight Transportation Laboratory at M.I.T. It was observed by Harvey Safeer and John Rodgers of the FAA, participants were drawn from the staff of ECON and the FTA, and it was conducted over approximately five days. As a result of this trial exercise it was decided to invite airline participation in early 1980 for a slot allocation evaluation exercise using the AMG and the Slot Exchange Auction. The purposes of this were to expose some representatives of the airline industry to the allocation methodology and obtain their reactions and to evaluate the approach to slot allocation, together with an alternative administrative approach. The December trial exercise involved considerable fine tuning of the AMG and Slot Exchange Auction, and as such can be regarded as a necessary developmental step in creating the procedures, forms, computer software and rules of the game for the evaluation exercise. Neither exercise permitted convergence of the Slot Exchange Auction within the resource constraints available. There was a clearly demonstrated need to have more rounds of bidding to bring the slot market into equilibrium. Results of the trial exercise are presented in summary as Appendix B.

3.2 Organization

In order to evaluate two alternative methods of allocating runway access slots to air carriers at congested airports, the FAA sponsored a week-long evaluation exercise in Washington, D.C. on February 11-15, 1980. A daily schedule for this exercise was provided in advance to participants (Figure 3.1). The heart of the exercise was the Airline Management Game (AMG)--a realistic computer model which permits competing airline teams to schedule their air transportation networks, and learn the performance and financial results through simulation of the resulting traffic flows, costs, revenues, load factors, etc. There were five airline teams: Blue, Gold, Green, Red and White.

With the assistance of the Air Transport Association (ATA), management and professional staff from the airlines were invited to participate in the exercise. Those who accepted the invitation were assigned to the five teams as follows:

<u>AMG Team</u>	<u>Airline</u>	<u>Participant</u>
Blue	Delta Piedmont	W. Jeffrey Rowe Bob McAlpin
Gold	Eastern USAir	Bill Pacelli Jerry Frissora
Green	United Braniff	Ian Bamber Jim Bowers
Red	American American	Brad Jensen Don Roach
White	TWA	R. J. Zablocki

In addition each airline team was assigned a professional staff member of Flight Transportation Associates who served as an experienced user of the AMG software and provided data processing capabilities to his team. Antonio Elias of M.I.T. and the FTA was the Game Administrator.

The major purposes of the evaluation exercise were:

DAY	AM/PM	ACTIVITY
MONDAY FEBRUARY 11	0830-1000	BRIEFING--THE AIRLINE MANAGEMENT GAME
	1000-1015	BREAK
	1015-1130	BRIEFING, THE TRADING POST AUCTION
	1130-1230	LUNCH
	1230-1630	PREPARE DESIRED PERIOD 1 FLIGHT SCHEDULES
	1230-1330	OBSERVERS ONLY--BRIEFING--ADMINISTRATIVE ALLOCATION
	1630-1700	BRIEFING ACTIVITIES--FEBRUARY 12-15
TUESDAY FEBRUARY 12	0830-1200	TRADING POST AUCTION NO. 1
	1200-1300	LUNCH
	1300-1500	PREPARE FINAL PERIOD 1 FLIGHT SCHEDULES
	1500-1700	PERIOD 1 SIMULATION
WEDNESDAY FEBRUARY 13	0830-1030	PREPARE DESIRED PERIOD 2 FLIGHT SCHEDULES
	1030-1230	TRADING POST AUCTION NO. 2
	1230-1330	LUNCH
	1330-1530	PREPARE FINAL PERIOD 2 FLIGHT SCHEDULES
	1530-1700	BRIEFING--ADMINISTRATIVE ALLOCATION (SIMULTANEOUS PERIOD 2 SIMULATION)
THURSDAY FEBRUARY 14	0830-1200	ADMINISTRATIVE ALLOCATION NO. 1
	1200-1300	LUNCH
	1300-1500	PREPARE FINAL PERIOD 1 FLIGHT SCHEDULES
	1500-1700	PERIOD 1 SIMULATION
FRIDAY FEBRUARY 15	0830-1030	PREPARE DESIRED PERIOD 2 FLIGHT SCHEDULES
	1030-1230	ADMINISTRATIVE ALLOCATION NO. 2
	1230-1330	LUNCH
	1330-1430	ADMINISTRATIVE ALLOCATION NO. 2
	1430-1530	PREPARE FINAL PERIOD 2 SCHEDULES
	1530-1700	CLOSING FORUM (SIMULTANEOUS PERIOD 2 SIMULATION)

FIGURE 3.1 EVALUATION OF RUNWAY QUOTA ALLOCATION MECHANISMS--
DAILY SCHEDULE (AS REVISED FEBRUARY 7, 1980).

1. To test the feasibility of two slot allocation mechanisms in a fairly realistic airline scheduling environment:
 - A. The Slot Exchange Auction
 - B. The FAA Administrative Allocation
2. To obtain comments from the airlines on their reactions to the two allocation methods
3. To obtain rough estimates of the economic and air service effects of slot rationing.

The two different allocation methods were evaluated by using them to allocate slots within the context of the Airline Management Game. The first on the timetable was the Slot Exchange Auction; slots were auctioned off to the competing airline teams as described in Volume I. Two days were allowed for this part of the evaluation exercise. The second method on the evaluation timetable was the Administrative Allocation, a nonprice method developed by Ken Geisinger at the FAA. It will not be described in this report. The Slot Exchange Auction was administered in the evaluation exercise by Francis Sand. Before the application of the slot allocation method, the airline teams developed their preferred schedules without consideration of slot restrictions (quotas). After examining airport activity profiles for this base case, the game and auction administrators set hourly quotas for three of the 17 airports in the scenario. The Slot Exchange Auction followed; airline teams had to bid for their slots. They were allowed to reschedule their airlines following the auction to maximize profits in the restricted game. Only those slots which they had acquired at the auction could be utilized. A similar approach was followed in relation to the Administrative Allocation. The same starting schedules and quotas were used as for the auction; accordingly it was not necessary to repeat the initial step of unrestricted scheduling.

3.3 The Airline Management Game

The Airline Management Game placed a team of players in the role of airline management responsible for airline scheduling and market, fleet and financial planning. The Game Administrator created a scenario for one or more competitive airlines by providing historical and forecast information on schedules, traffic, revenue, costs and airline finances, and a set of rules and objectives for the players. Each airline team developed period schedules, having determined appropriate route development, marketing strategies and fleet plans. The results of team decisions were then simulated in a computerized model which estimated the traffic and revenues and consequently the financial results for each airline.

During this exercise the objective of each airline team was to schedule its flights so as to maximize its short-run profits with a fixed fleet of aircraft. Market strategies open to individual airlines consisted of changes in schedules and routes. Schedules had to be feasible in terms of fleet size and slot allocations. No route authority was required because complete deregulation was assumed.

The heart of the game is a computerized traffic allocation process which determines the through and connecting passenger traffic on each segment of each flight. It is based on the complete services offered in all markets and is sensitive to:

- Differences in fares^{*}
- Differences in departure time
- Differences in flight times, including the added inconvenience of connections
- Effects of high load factors on certain flight segments.

^{*} Not used in the evaluation exercise. Fares differed by trip length, but not by discretion of the airline team.

The scenario for the evaluation exercise comprised 17 airports grouped in four major classes according to the market and traffic characteristics:

1. There were four major hubs: Alpha (AAA), Bravo (BBB), Charlie (CCC) and Delta (DDD). About half of the total network activity was made up of the traffic between these four major airports. Of these, the first three (AAA, BBB and CCC) were capacity restricted and the participants had to compete for slots at these airports.
2. There were six intermediate airports: Echo (EEE), Foxtrot (FFF), Golf (GGG), Hotel (HHH), India (III) and Juliet (JJJ). There was considerable activity between the four major airports and these six, as well as between these six airports.
3. The third group was comprised of six minor airports. There was significant traffic between these airports and the previous ten, but no traffic among these minor airports.
4. The fourth group was a single airport: X-ray (XXX). This was a special long-haul case, and there was traffic only between XXX and AAA, and XXX and BBB. There was no traffic between XXX and any other airport.

A system route map (Figure 3.2) was provided to the players.

Individual airline teams did not know exactly what the demand was in any of these markets; however, they had the existing traffic data. The game model allowed some stimulation or contraction of demand due to improvement or decrease in the level of service offered (including the case where the market is not served at all).

There were five airlines competing in this network: Blue (BL), Gold (GL), Green (GR), Red (RD) and White (WT). Each of these airlines had, during the past, a traditional pattern of service, which is reflected in the given initial schedule. Under deregulation they were free to serve any market, subject to the limitations of their available equipment. For purposes of this exercise, fares for all airlines were limited to a simple tariff of \$23.40 plus 10 cents per nautical mile (8.68 cents per statute mile).

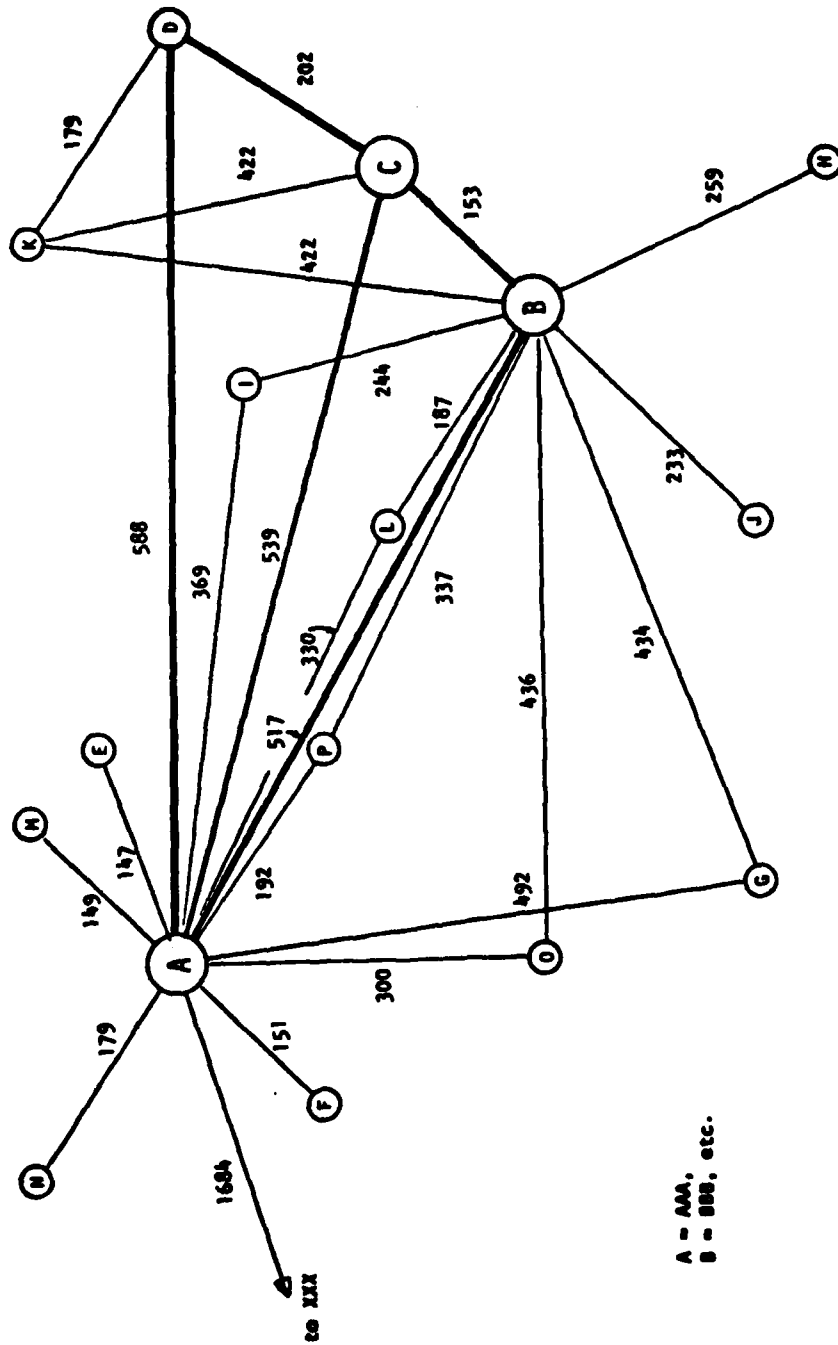


FIGURE 3.2 SYSTEM ROUTE MAP (DISTANCES IN NAUTICAL MILES)

The participants' fleets included three types of aircraft: DC9, 727 and 707. The technical and economic characteristics of each of these aircraft are summarized in Table 3.1.* The composition of each participant's fleet was fixed as follows:

1. Blue: ten 727s and six 707s
2. Gold: eight 727s and six DC9s
3. Green: nine 727s and six DC9s
4. Red: four 727s and three DC9s
5. White: six DC9s.

It was not necessary for a team to use all of its aircraft; however, airlines incurred some daily ownership costs for all the aircraft owned, whether they flew them or not. Table 3.2 shows the distance in nautical miles between each possible pair of airports in the system, as well as the block time required to fly that particular link. This block time includes the flight time, and the average air and ground maneuvering times, including average ATC delays. The minimum gate time for a flight's intermediate stop was 20 minutes. The minimum gate time to turn around an aircraft at the end of a flight and make it ready to start a new flight was 45 minutes.

Teams could declare on-line connections. Note that the simulated passengers only took advantage of published connections (i.e., they did not generate their own connections). Table 3.3 shows the data on each airport, including the minimum connect time (the same for all airlines) at each airport.

Interline connections were not allowed.

* Tables 3.1 through 3.5 are presented in the Data Appendix because they are too voluminous to include in the body of the report.

Each simulation iteration simulated a six-month period of operations. Therefore, the participants were required to maximize their short-term objectives, e.g., before-tax profit.

Tables 3.4 and 3.5 contain initial schedules for each airline and associated base period traffic data and economic performance of each airline. Separate material was provided to individual airline teams on the profitability of individual flights during the base period.

3.4 Reference Material on Slot Auction Provided to Participants

The following pages contain the instructions on bidding in the Slot Exchange Auction. They are reproduced here exactly as given to the five airline teams prior to commencement of the exercise.

Slot Auction Description and Instructions

1. Introduction

You are taking part in an experiment to determine the effects of runway slot auctions on airline scheduling and profitability. The FAA imposes hourly quotas on landings and takeoffs at the high density airports. At certain peak hours of the day, the airlines wish to schedule more flights at these airports than there are slots available under the FAA rules. In the experiment, we will simulate the slot restrictions, and an allocation of restricted slots will be made by means of an auction. A slot price will have to be paid for slots at peak hours at congested airports. The purpose of charging a price for such slots is to resolve, in an economically efficient way, the question of which airlines obtain slots when there is an insufficient supply of slots.

You will be asked to prepare bids for slots after you have completed a first cut at desired schedules without slot restrictions. The method of bidding and the determination of slot prices and allocations will be explained in detail below. After you have submitted bids for all the slots (at all quota-airports) that "interest" you, a computer program will determine an allocation and a single price for slots at each peak hour at each congested airport. The price may be nominal--this happens if the number of slots requested in all the bids for one airport at one peak hour is less than the FAA quota. The auction results are not necessarily final. You may study them and prepare new bids if you wish,

providing the auctioneer has not closed the auction market. On the first round of bidding you can be assured of another chance to bid; therefore, you will get a chance on the second round to correct "mistakes" in bidding which may arise due to unfamiliarity with this type of auction.

2. The Auction Procedure (Trading Post Method)

To introduce the concept of the auction we ask you to imagine that there are a number of trading posts at which slots are offered for sale--one for each peak hour at each congested airport. All these trading posts will be open simultaneously. Airlines wishing to buy one or more slots at particular trading posts prepare bids (offers to pay a specified amount of money) for these slots as follows:

<u>Airline A</u>	<u>Trading Post "i"</u>	Bid (\$/opr)	Slot Number				
			1	2	3	4	5
			150	100	100	70	0

This means that airline A is offering to pay \$150 for one slot,* \$100 for each of the second and third slots and \$70 for a fourth slot at trading post "i," at a specific hour at a specific airport. If awarded one to four slots, it will pay the announced price which will not exceed the bids. Suppose a slot price of \$95 is announced. Then airline A will be awarded 3 slots at \$95--the fourth slot, for which only \$70 was bid, is not awarded to A.

* A slot is defined as a right to conduct one runway operation within a 60-minute period at a designated airport every day for six months. Pricing is expressed in dollars per operation. The actual payment for slots awarded will be price times 182.

The bidding rules are as follows:

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1. Airlines prepare their bids privately.
2. Airlines bid for as many slots as they wish at all trading post simultaneously.
3. When the auctioneer closes the auction at any time after the first round of bidding, the airlines must accept and pay for the slots awarded them. Slot prices will never exceed bids for slots actually awarded, and frequently will be substantially lower. The payment schedule for slots awarded may be spread out, interest-free, over the six months of slot utilization.
4. If more than one bid is made at the slot price, but the quota is such that not all bids at that price or higher can be awarded, then a random allocation is used to determine which among the airlines bidding the slot price are awarded slots.
5. At the end of each round of bidding, the slot prices and allocations are computed and all airlines are informed of the results. If this is not the last round, they may study the computer results and make any changes they wish in their bids, subject to the rules.
6. There is no need to resubmit unchanged bids as these are stored in computer memory. Only those bids which are to be

changed in any way need be submitted, and these must be submitted in full. Thus, if the bid was originally:

<u>Airline A, Round 1</u> <u>Trading Post "i"</u>	Bid (\$/opr.)	Slot Number				
		1	2	3	4	5
		150	100	100	70	0

and the \$ amount for the second slot is to be increased to \$125 and this is the only change, the resubmission should be:

<u>Airline A, Round 2</u> <u>Trading Post "i"</u>	Bid (\$/opr.)	Slot Number				
		1	2	3	4	5
		150	125	100	70	0

7. After completion of two or more rounds of bidding, the auctioneer may determine when to close the auction. Once the auction has been closed, no further bidding for slots will be accepted. The auction will be closed if the players vote unanimously to discontinue bidding, or if the auctioneer determines that the slot allocation has "settled down" sufficiently.

3. Explanation of Price Determination

The bids prepared by airlines (See Figure 1) for slots at each trading post represent, in effect, the individual demand schedules of the airlines. When all the airlines have bid, the bids are aggregated into market demand curves for slots at each trading post (See Figure 2). The FAA hourly quota causes the supply of slots to be restricted, so that a supply curve for slots is generated with zero price for slots under the quota, and a very high price* for

*effectively infinite

slots above the quota. Supply and demand are in balance if the 20
price is set at the intersection of the supply and demand curves
(See Figure 3). The solution technique is displayed in Figure 3 for
the same example presented in Figure 1 and we see that the slot
price in this example is \$65. Because these curves are step
functions, and the quantity of slots must be an integer, there is a
slight ambiguity about the intersection which is resolved by taking
the midpoint of the range of slot prices around the balance point of
supply and demand. In other cases, the ambiguity may result in two
or more marginal slots for which the same amount was bid having to
be allocated randomly to airlines. For example, if A and D, had
both bid \$80 for their third and fourth slots respectively, only one
of these slots could have been awarded; which one would be decided
by the "toss of a coin".

Ordinarily, when supply is in excess, the absence of demand
pressure will allow the slot price to be zero. However, a minimum
price will be announced and charged for all allocated slots.
Whenever there is excess demand, however, a positive price is
necessary in order to eliminate some of the demand. The price is
chosen so that all airlines which bid above that price are awarded
slots, all who bid below are not. In a subsequent round of bidding,
the disappointed airlines have a chance to bid higher, so as to try
to capture desired slots. This causes the slot price to go up so
that there will be a new allocation of slots at the next round.
Some airlines may find they have lost slots which were previously

FIGURE 1. SUMMARY OF ALL AIRLINE BIDS
FOR ONE TRADING POST
(UNITS = \$ PER OPERATION)

AIRLINE	SLOTS (QUOTA = 11 PER HOUR)						ALLOCATION
	1	2	3	4	5	6	
A	100*	90*	50	0			2
B	150*	150*	150*	100*	50	0	4
C	100*	0					1
D	110*	100*	90*	80*	0		4
E	49	49					0

*INDICATES SUCCESSFUL BID

FIGURE 2. FORMATION OF PRICE, SLOT ALLOCATION AT A TRADING POST

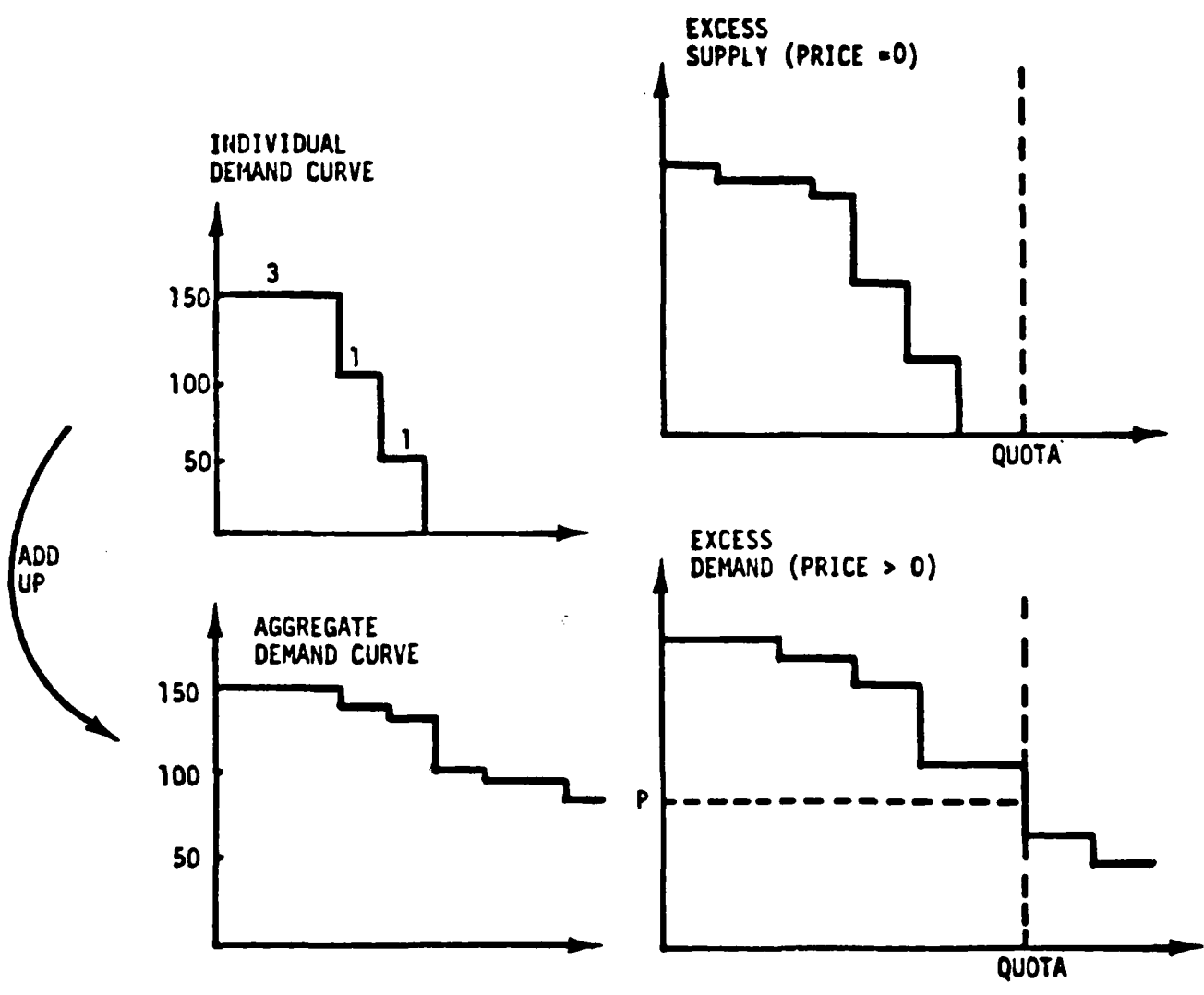
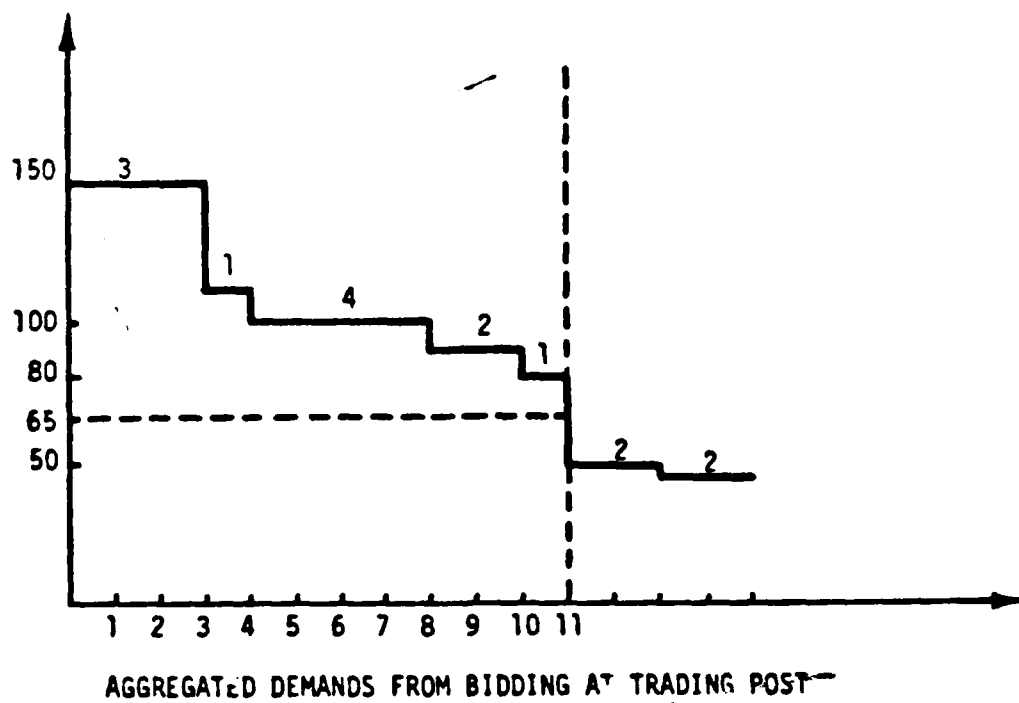


FIGURE 3. AGGREGATED DEMANDS FROM ALL AIRLINE BIDDING AT ONE TRADING POST



won. In addition to bidding higher amounts to recapture these lost²⁴ slots, the airlines should consider "sliding" to an adjacent market. Eventually the process converges to a competitive equilibrium. In practice the auctioneer must determine when the bidding has "settled down" sufficiently and announce a cut-off, as described in the Rule No. 7 above. If the available auction time runs out with the allocation still fluctuating, then it will be necessary to halt the simulated auction. In reality, it will be desirable to resume bidding the next day in any future implementation of the slot auction.

4. Scheduling Flights After Slot Allocations To Airlines.

Following the slot auction, each airline will have received a printout containing detailed information on the slots awarded to itself, and payments required over 6 months operations for those slots. It will be the responsibility of each airline to make sure that flights scheduled subsequently are compatible with the slot allocation at capacity restricted airports. An airline awarded five slots at 9:00 a.m. at airport AAA is therefore expected to schedule no more than 5 runway operations at that airport from 9:00 a.m. to 9:59 a.m. The game administrator will also check the schedules for slot feasibility and inform airlines of any violation.

4. RESULTS AND ANALYSIS

The exercise was conducted in five offices, one for each airline team, and a control center for the game administrators on the ninth floor of the FAA building at 800 Independence Avenue. The airline schedulers, the game administrators and the members of the FAA's Office of Aviation Policy who were involved all put in long hours. A large amount of learning of game procedures and sifting through scenario airline data was required of the airline schedulers. Considering this and the time pressures, the evaluation exercise was conducted reasonably close to the daily schedule and with a number of useful results.

First, the exercise showed that it was possible to operate profitably in the simulated slot-restricted environment, allowing for the new cost element when the slots were priced. Secondly, the results indicated that the airline teams were able to prepare bids and acquire a usable set of slots through the Slot Exchange Auction. Thirdly, the results showed that some of the teams were able to make even better profits within the restricted environment than they did in the base case; other teams gave up some profits to slot payments. The improvement of airline profitability in the face of increased costs due to slot pricing shows a learning effect.

Procedurally, the Slot Exchange Auction was found to work satisfactorily within the time constraints of the exercise. Due to these constraints, there was only a partial test of the equilibrium concept, and indeed many more rounds of bidding would seem to be required. The slot awards demonstrated remarkable convergence, but price convergence remains to be shown. In the previous section some alternative methods of guaranteeing termination were discussed.

4.1 The Slot Exchange Auction Results

Because of the large amount of data generated by the slot allocation evaluation, this section will necessarily be selective in presenting the results. The complete body of the airline management game output and auction evaluation output will be made available on request. Table 4.1 presents the "bottom line" for each phase of the evaluation: the net earnings (after tax) of the five airline teams. In the case of the second and third lines of Table 4.1 these figures are also net of slot payments resulting from the auctions. The "industry" as a whole proved able to generate as much profit after suitable learning with an auction for slots (line 3) as it did without the auction (line 1); indeed, without any restrictions as to slot utilization. Individual teams either improved their profitability (Blue and Red) or managed to avoid serious losses (Gold, Green and White), again after suitable learning. The large loss generated by the Blue team in Period 1 is anomalous and was corrected in Period 2; it was caused by an excessively simplistic market strategy on the part of the Blue team, leading to severe drop in load factors.

The quotas were set by the game administrator and auctioneer as being:

Airport	A	B	C
Quota	13	12	11

at the end of the base period. Tables 4.2 through 4.11 summarize the financial and performance results of the evaluation exercise. Starting with Tables 4.2 through 4.4 we find that slot prices within the first period Slot Exchange auction tend strongly upwards at the most favored peak hours, particularly at airport C which had the smallest quota. The exceptionally high slot prices at 0800 and 1600 hours at airport A (implying slot payments of respectively \$141,232 and \$128,674 per season by each airline scheduling arrivals or departures at those hours) are indicative of overbidding in the first period auction. This was corrected in the

TABLE 4.1 NET EARNINGS* BEFORE AND AFTER SLOT ALLOCATIONS (IN MILLIONS OF DOLLARS PER SIX-MONTH PERIOD)						
CASE	AIRLINE					
	BLUE	GOLD	GREEN	RED	WHITE	ALL
1. BASE	-0.220	3.817	3.845	1.109	4.018	12.569
2. PERIOD 1--AUCTION**	-7.967	3.098	1.634	0.485	3.183	0.433
3. PERIOD 2--AUCTION**	1.349	3.254	3.445	1.426	3.691	13.165
4. PERIOD 1--ADMINISTRATIVE	2.020	4.282	3.849	1.656	3.892	15.699

*AFTER TAX
**AFTER SLOT PAYMENTS AND INCOME TAXES

TABLE 4.2 SLOT PRICES AT END OF ITERATION 1.1 (DOLLARS PER OPERATION)			
HOUR	AIRPORT		
	A	B	C
0600	0	0	0
0700	100	7	7
0800	200	0	8
0900	8	0	50
1000	8	7	100
1100	54	8	38
1200	79	125	4
1300	200	8	8
1400	29	0	100
1500	29	38	100
1600	200	1	4
1700	104	4	54
1800	129	25	58
1900	4	125	8
2000	1	0	7
2100	0	0	0
2200	0	0	0

TABLE 4.3 SLOT PRICES AT END OF ITERATION 1.2 (DOLLARS PER OPERATION)			
HOUR	AIRPORT		
	A	B	C
0600	0	0	0
0700	202	4	8
0800	860	0	8
0900	101	0	101
1000	30	12	151
1100	78	13	0
1200	251	201	0
1300	311	51	51
1400	101	0	251
1500	0	76	201
1600	432	1	0
1700	180	0	403
1800	201	51	210
1900	8	201	18
2000	0	0	51
2100	0	0	0
2200	0	0	0

TABLE 4.4 SLOT PRICES AT END OF ITERATION 1.3 (DOLLARS PER OPERATION)			
HOUR	AIRPORT		
	A	B	C
0600	0	0	0
0700	276	4	0
0800	776	1	58
0900	209	1	209
1000	51	0	485
1100	0	0	0
1200	301	301	0
1300	351	204	209
1400	197	0	429
1500	0	201	501
1600	707	5	0
1700	201	0	510
1800	0	351	458
1900	0	155	51
2000	0	0	0
2100	0	0	0
2200	0	0	0

TABLE 4.5 POTENTIAL SLOT REVENUES (MILLIONS OF DOLLARS PER HALF-YEAR SEASON)				
ITERATION AND ROUND	AIRPORT			
	A	B	C	ALL
1.1	2.709	0.760	1.093	4.562
1.2	5.809	1.332	2.909	10.050
1.3	7.261	2.671	5.826	15.758
2.1	1.051	0.646	1.269	2.966
2.2	0.582	0.535	1.922	3.039
2.3	2.432	0.937	3.934	7.303

**TABLE 4.6 NET EARNINGS BEFORE TAXES OR SLOT PAYMENTS
(IN MILLIONS OF DOLLARS PER HALF-YEAR
SEASON)**

AIRLINE	BASE*	PERIOD	
		1	2
BLUE	-0.22	-2.11	3.00
GOLD	3.82	10.14	7.23
GREEN	3.84	7.25	7.66
RED	1.11	2.48	3.17
WHITE	4.02	9.07	8.20
ALL	12.57	26.84	29.26

* THERE WERE NO SLOT RESTRICTIONS IN THIS INITIAL ITERATION.

**TABLE 4.7 POTENTIAL SLOT PAYMENTS AFTER EACH BIDDING ROUND
(MILLIONS OF DOLLARS PER HALF-YEAR)**

AIRLINE	PERIOD AND ROUND					
	1.1	1.2	1.3	2.1	2.2	2.3
BLUE	1.843	3.574	5.971	0.921	0.641	1.778
GOLD	0.158	2.079	3.047	0.843	0.959	2.410
GREEN	1.823	2.135	3.617	0.395	0.725	2.034
RED	0.034	0.889	1.019	0.371	0.318	0.185
WHITE	0.703	1.372	2.104	0.436	0.397	0.886
ALL	4.561	10.049	15.758	2.966	3.040	7.303

**TABLE 4.8 NET EARNINGS AFTER SLOT PAYMENTS, AFTER TAXES
(MILLIONS OF DOLLARS PER HALF-YEAR)**

AIRLINE	BASE	PERIOD	
		1	2
BLUE	-0.220	-7.967	1.349
GOLD	3.817	3.098	3.254
GREEN	3.845	1.634	3.445
RED	1.109	0.485	1.426
WHITE	4.018	3.182	3.691
ALL	12.569	0.432	13.165

second period auction as can be seen by referring to Table 4.5. Total slot payments at the end of Round 3 of the bidding in the first period amounted to nearly \$16 million per season, which exceeded net earnings (\$12.5 million) of all five airline teams in the base period (Table 4.6). The airline teams were nevertheless able to increase net earnings in Period 1 so that, even with the high cost of slots, they managed to break even (Table 4.8).*

There were significant reductions in slot prices and improvement in profitability during Period 2. The aggregate level of slot payments was less than half the Period 1 level after three rounds of bidding. Net earnings before taxes were up sharply and the final Period 2 profitability was actually better with slot pricing than it had been without slot pricing in the base period (Table 4.8). A learning effect on the part of the team players is clearly in evidence and explains this strange result. It is therefore very important to allow for airline learning in planning to implement a slot auction. The Slot Exchange auction is specifically designed to allow learning about slot market effects to take place without imposing real costs on the airline industry. More than three rounds of bidding would probably be required in implementation of the Slot Exchange auction to complete the information exchange between airlines that occurs through observing slot prices and slot allocation sequentially.

4.2 Levels of Service

In reviewing the results of the evaluation exercise, it is necessary to recall that the five teams had complete freedom to determine which markets they would

* As previously mentioned, the Blue team suffered severe losses in Period 1.

serve subject to the constraints of their given equipment. Due to time pressures, not all of the participants were able to take full advantage of this freedom. Nevertheless, we do see considerable improvement over the initial schedules which were prepared by Flight Transportation Associates in Period 1. Further progress is in evidence in the Period 2 results. Undoubtedly, the fact that the airline participants were professional schedulers contributed to the improved airline schedules. That this improvement occurred in the face of slot restrictions which were not applied in the initial scheduling makes the result more striking.

4.2.1 The System Responses

The operating statistics for the base period and Period 1 and Period 2 are presented in Tables 4.9 through 4.11. The OAG schedules, as printed on the computer by the Airline Management software, are presented in Table 4.12* (Period 1) and Table 4.13 (Period 2). Traffic data are also generated by the AMG software; these are shown in Table 4.14 (Period 1) and Table 4.15 (Period 2).

The operating statistics (Tables 4.9 through 4.11) show considerable stability. While average load factors actually improved in Period 2 for three of the airline teams and were hardly changed for the other two, there is an overall appearance of very little change in airline operating statistics if one compares Period 2 (Table 4.11) with the base period (Table 4.9). The difficulties encountered in Period 1, such as Blue's 10.8 percent drop in load factor, can all be attributed to learning. The main conclusion which we draw from the evaluation exercise is that the airlines can perform "business as usual" in the face of slot pricing and can maintain their profitability. Caution is required in extending this conclusion to the real air transportation system; in allowing the players complete freedom of choice

* On account of their large bulk, Tables 4.12 through 4.15 are presented in the Data Appendix.

TABLE 4.9 OPERATING STATISTICS--BASE CASE

	BLUE	GOLD	GREEN	RED	WHITE	ALL
SEAT-MILES ($\times 10^6$)	1,407.7	887.0	1,090.1	378.8	309.7	4,073.2
RPM ($\times 10^6$)	781.6	558.0	651.7	180.0	215.5	2,386.8
ENPLANEMENTS ($\times 10^6$)	1.665	1.200	1.278	0.500	0.493	5.137
AVG. EQUIPMENT UTILIZATION (HRS/DAY)	10:08	9:07	10:08	8:08	9:41	9:36
AVG. STAGE LENGTH (MILES)	453	401	454	355	370	420
AVG. LOAD FACTOR	0.555	0.629	0.598	0.475	0.696	0.586

TABLE 4.10 OPERATING STATISTICS--PERIOD 1

	BLUE	GOLD	GREEN	RED	WHITE	ALL
SEAT-MILES ($\times 10^6$)	1,521.8	900.2	963.1	412.4	309.7	4,107.1
RPM ($\times 10^6$)	752.5	582.5	561.9	183.8	215.0	2,295.8
ENPLANEMENTS ($\times 10^6$)	1.383	1.202	1.172	0.490	0.510	4.757
AVG. EQUIPMENT UTILIZATION (HRS/DAY)	10:19	9:09	8:51	8:17	9:41	9:21
AVG. STAGE LENGTH (MILES)	572	426	477	369	370	461
AVG. LOAD FACTOR	0.495	0.647	0.583	0.446	0.694	0.559

TABLE 4.11 OPERATING STATISTICS--PERIOD 2

	BLUE	GOLD	GREEN	RED	WHITE	ALL
SEAT-MILES ($\times 10^6$)	1,309.1	913.7	1,000.1	393.8	314.6	3,931.3
RPM ($\times 10^6$)	722.9	590.4	610.8	190.4	219.7	2,334.3
ENPLANEMENTS ($\times 10^6$)	1.348	1.236	1.313	0.482	0.520	4.899
AVG. EQUIPMENT UTILIZATION (HRS/DAY)	9:11	9:21	9:19	8:08	9:52	9:12
AVG. STAGE LENGTH (MILES)	529	416	459	383	361	443
AVG. LOAD FACTOR	0.552	0.646	0.611	0.484	0.699	0.594

with regard to routes and market strategies we have undoubtedly exaggerated the extent to which airlines would change their network in response to slot pricing and allocation.

One advantage of the real situation is that over several six-month periods the equilibrium of slot supply and demand may be easier to obtain due to the inherent stability of the air transport system over time. The existence of previous prices and slot allocations will speed up the convergence of the Slot Exchange auction. In the exercises there was no such history of prices to guide the players and the equilibrium was accordingly harder to obtain.

4.2.2 Service to Small Communities

The six minor airports in the evaluation exercise were KKK, LLL, MMM, NNN, OOO and PPP. Together, they had only 5.75 percent of all traffic (passengers enplaned per day) in the base case and each individual market involving a small community had less than 1 percent of all traffic. In contrast, the AAA-CCC market claimed 8.59 percent of passenger traffic. It should be noted that the simulated demand for air service did not allow for any traffic among these six airports. After the Period 1 auction, the rescheduled network showed an overall drop of 49 percent in these small markets (Table 4.16). Service to and from airports OOO and PPP was dropped entirely. Only KKK, of the six minor airports, did not lose significantly. Following the Period 2 auction, some of the small community service was restored--mostly for MMM and NNN. Two airports, OOO and PPP, still had no service. This remained true after the Administrative Allocation even though overall traffic from the six small airports was slightly up (Table 4.16) relative to the Period 2 auction.

TABLE 4.16 SMALL COMMUNITIES AVERAGE ENPLANEMENTS/DAY				
AIRPORT	BASE	PERIOD		
		1	2	AA
KKK	500.2	469.6	470.2	536.2
LLL	255.2	78.8	96.8	98.2
MMM	231.8	69.8	219.9	219.8
NNN	273.8	156.7	279.8	278.4
OOO	94.5	--	--	--
PPP	172.6	--	--	--
TOTAL	1,528.1	774.9	1,066.7	1,132.6
REL. CHANGE COMPARED WITH BASE		-49.3%	-30.2%	-25.9%

4.3 The Slot Exchange (Aftermarket)

The aftermarket was organized as an openbook exchange. The players could bring written offers to buy or sell specific (time-of-day) slots at specific capacity-restricted airports (AAA, BBB or CCC) to the exchange. These offers were posted immediately on a blackboard. The forms for making such offers (to sell) or bids (to buy) are shown in Figures 4.1 and 4.2. The aftermarket administrator attempted to match sells with buys at each airport and time of day. Those slots which had not been purchased in the Slot Exchange Auction (unclaimed slots) were offered on a first come-first served basis at a nominal price of one dollar. Buyers of unclaimed slots were limited to four slots per team each 15 minutes so long as the exchange remained open and the desired slots were still available.

The activity on the exchange was not extensive. Far more offers to sell slots occurred than bids to buy slots, and the number of transactions, other than

AIRLINE:

THIS IS A FORM FOR AN AIRLINE TO SUBMIT BIDS TO BUY SLOTS ON THE AFTERMARKET.

		SLOTS REQUIRED					
AIRPORT	HOUR	1	2	3	4	5	6

FIGURE 4.1 AFTERMARKET FORM A--BUY

AIRLINE:

THIS IS A FORM FOR AN AIRLINE TO OFFER TO SELL SLOTS WHICH IT HOLDS ON THE AFTERMARKET.

SLOTS OFFERED

AIRPORT	HOUR	1	2	3	4	5	6

FIGURE 4.2 AFTERMARKET FORM B--SELL

TABLE 4.17 AFTERMARKET ACTION--PERIOD 1

TRANSACTION	AIRPORT	TIME	BUYER*	SELLER*	PRICE** (\$/OPR.)
1	CCC	21	BL		1
2	CCC	21	BL		1
3	CCC	21	BL		1
4	CCC	21	BL		1
5	AAA	15	GL		1
6	BBB	17	GL		1
7	CCC	12	GL		1
8	AAA	11	WT		1
9	BBB	10	WT		1
10	CCC	7	WT		1
11	AAA	18	WT		1
12	AAA	6	GR		1
13	AAA	11	GR		1
14	BBB	17	GR		1
15	CCC	12	GL		1
16	AAA	6	GR		1
17	CCC	11	RD		1
18	CCC	11	RD		1
19	CCC	16	RD		1
20	CCC	16	RD		1
21	CCC	8	GL	BL	116
22	CCC	13	GL	BL	418
23	AAA	14	GL	WT	394
24	BBB	14	GL		1
25	AAA	20	GL		1
26	AAA	15	GL		1
27	AAA	22	BL		1
28	BBB	21	BL		1
29	BBB	21	BL		1
30	CCC	19	RD	WT	102
31	CCC	20	GL		1
32	AAA	10	GL	BL	158
33	AAA	19	RD	WT	50
34	BBB	20	GL		1
35	BBB	11	GL		1
36	CCC	21	RD		1
37	BBB	22	RD		1
38	AAA	6	RD		1
39	BBB	10	RD	WT	50

* TEAMS IDENTIFIED BY TWO-LETTER CODE ARE: BL=BLUE, GL=GOLD, GR=GREEN, RD=RED, WT=WHITE.

** A ONE-DOLLAR PRICE WITH NO SELLER IDENTIFICATION DENOTES A PURCHASE OF AN UNCLAIMED SLOT FROM THE SLOT AUTHORITY.

TABLE 4.18 AFTERMARKET ACTION--PERIOD 2					
TRANSACTION	AIRPORT	TIME	BUYER*	SELLER*	PRICE** (\$/OPR.)
1	CCC	17	RD		1
2	CCC	15	RD		1
3	CCC	7	GL		1
4	AAA	14	GL		1
5	AAA	15	GR		1
6	BBB	10	WT		1
7	AAA	12	WT		1
8	CCC	14	WT	BL	300
9	CCC	12	GR	GL	150
10	AAA	12	GL		1
11	AAA	8	GL		1
12	AAA	8	GL		1
13	AAA	8	GL		1
14	CCC	12	RD	WT	75
15	AAA	12	GR	GL	50
16	CCC	11	RD	GL	150
17	CCC	12	RD	BL	50
18	CCC	10	RD	WT	250
19	BBB	22	GL		1

* TEAMS IDENTIFIED BY TWO-LETTER CODE ARE: BL=BLUE, GL=GOLD, GR=GREEN, RD=RED, WT=WHITE.

** A ONE-DOLLAR PRICE WITH NO SELLER IDENTIFICATION DENOTES A PURCHASE OF AN UNCLAIMED SLOT FROM THE SLOT AUTHORITY.

TABLE 4.19 SLOT PAYMENTS IN AUCTION AND AFTERMARKET (\$ PER DAY)						
AIRLINE	PERIOD 1			PERIOD 2		
	AUCTION TOTAL	PURCHASES	SALES	AUCTION TOTAL	PURCHASES	SALES
BL	32,806	7	692	9,823	0	350
GL	16,742	1,096	0	13,241	7	350
GR	19,875	4	0	11,177	201	0
RD	5,601	209	0	1,020	527	0
WT	11,559	4	596	4,866	302	325

the \$1.00 purchases, fell short of the number of offers by an order of magnitude (Tables 4.17 and 4.18). The total slot payments by all teams for exchange activities are shown in Table 4.19, also indicating the small volume of activity when compared with the total auction slot payments.

The airlines apparently did not behave speculatively in the slot auction and exchange, but many auction acquisitions were in excess of slot requirements as evidenced by the pressure to sell in the exchange. Some airline players informed us that they were attempting to buy "insurance" slots for important flights--slots at adjacent hours in the same airport. This may account for the excess supply in the exchange.

In a real exchange there undoubtedly would be more activity because of the six months duration of each period in real time compared with approximately two hours in simulated time. Furthermore the changing environment in the real air transportation system might necessitate slot exchanges and the pricing of such slots might not be an important consideration to the airlines. Naturally, this would change if any tendency towards speculation in slots developed.

5. COMMENTS BY THE AIRLINES

Those airlines which sent participants to the Evaluation Exercise in Washington, February 11-15, 1980, were invited to comment in writing. During March 1980 the participants were mailed a document of game results and ECON's and the FAA's brief analyses of these results.² They were asked to respond promptly to the following questions.*

1. Which method did you prefer--the Trading Post Auction or the Administrative Allocation? Why?
2. In each of the two methods did you significantly alter your airline marketing approach as a result of the slot allocation? If so, in what way?
3. Do you consider the two methods to be fair? If not, in what way are they unfair?
4. Were you able to handle the total information flow comfortably in the time available in each method? Was more time required (a) for rescheduling, (b) for bidding, and/or (c) for submitting preference plans in the Administrative method?
5. Was the evaluation exercise sufficiently realistic to allow conclusions to be drawn from the real world? If not, how would you make it more realistic?
6. Assuming one had to implement one of the two alternative allocation methods, what changes would you recommend in each method to make it more practical?

Their responses are reproduced here in facsimile; they speak for themselves and hence we shall not discuss them other than to state that the factual errors which W. Jeffrey Rowe points out were corrected in this report.

- American Airlines - Donald F. Roach and R. Bradley Jensen
- Delta Airlines - W. Jeffrey Rowe
- Eastern Airlines - W. H. Pacelli

*Note that "Trading Post Auction" was the term then in use for the Slot Exchange Auction.

- Piedmont Airlines - R. L. McAlphin and R. L. James
- Trans World Airlines - R. J. Zablocki
- USAir - Jerry A. Frissora

American Airlines

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April 2, 1980

Mr. John M. Rodgers
Acting Chief, Economic Analysis Branch
Federal Aviation Administration
800 Independence Avenue, S. W.
Washington, D. C. 20591

Dear Mr. Rodgers:

By letter dated March 7, 1980, you forwarded to us an evaluation of the slot allocation exercise conducted during the week of February 11 at the FAA (the "Evaluation"). This allocation exercise explored two methods of allocating airport slots: an auction system and an administrative allocation system. On January 15, 1980, American submitted detailed comments on the auction system proposed by the Polinomics Research Laboratories. The general principles addressed in those comments apply as well to the present Evaluation. We have the following additional comments in connection with the two systems analyzed in the Evaluation:

I. BOTH THE AUCTION SYSTEM AND THE ADMINISTRATIVE ALLOCATION SYSTEM WERE BASED ON TWO INVALID PREMISES.

The Evaluation concluded that the airline teams were able to show considerable profit improvement under both the auction system and the administrative allocation system, and implies that this improvement was due to the institution of slot allocation. However, the mock airlines that the exercise participants were asked to manage were initially

operating at very low capacity utilization. The participants were able to dramatically increase the efficiency of the mock airlines simply by streamlining aircraft utilization and scheduling. The institution of the allocation methods clearly had nothing to do with the increased profits.

The Evaluation was cognizant of the problem*, but failed to recognize the degree to which the problem affected the results. The impact of this fundamental deficiency on the overall conclusion regarding the two allocation methods cannot be lightly swept aside. Under both methods, the improvements in profitability were clearly a function of common sense resource allocation, not the institution of allocation systems.** In the real world, airlines already operate at very high efficiency levels. It is simply not realistic to expect that an auction system would generate enough of an increase in efficiency to offset the cost of slot payments.

The second invalid premise of the auction and the

* Evaluation, pp. 16, 40.

** For example, the first action the red team took in response to the slot limitations imposed was to cancel the flights which were making the least profit. Because the profits were calculated using variable cost (i.e. direct operating and passenger related costs, but no depreciation and amortization) naturally the rate of return would go up. In the real world, however, the cost of aircraft ownership cannot be disregarded.

administrative allocation systems is that they both assume that airlines have complete flexibility to alter schedules at will. This is obviously not the case. A schedule change at one airport has a ripple effect which would impact all of the subsequent segments served by the affected flight. Furthermore, passengers have come to rely on, for example, American's 6:00 p.m. flight from LaGuardia to O'Hare. Airlines are therefore not free to capriciously revamp their schedules in order to accommodate a particular allocation method. Safeguards must be built into the system to avoid inconvenience to the traveling public.

II. THE AUCTION SYSTEM FAILED TO PRODUCE AN EQUILIBRIUM.

From an economic efficiency point of view, the auction was suppose to produce a supply/demand equilibrium that would accurately reflect the value of a given slot. However, in the auction that was conducted there was no convergence of the supply and demand curves to an equilibrium point. This appears to have been caused by the amount of uncertainty and speculation involved in the bidding process. Because the slots won in a given round of the auction were not guaranteed to the next round, it was usually necessary to increase the bid for a slot already won in a previous round. In subsequent rounds, it sometimes became prudent to drop a slot that

had been won in a previous round. Speculation and lack of convergence put an artificial upward pressure on prices. But since the auction was terminated after only three rounds, it was not possible for slot prices to reach a true supply/demand equilibrium.

III. THE ADMINISTRATIVE ALLOCATION METHOD SIMPLY DID NOT WORK.

The administrative allocation procedure was a two-step process where each carrier was awarded a specific number of slots according to an entitlement formula, and then slot assignments were made by a computer after each carrier had submitted a number of alternative plans specifying the hour by hour utilization of its awarded slots.

Both steps in this process are flawed. First, the weights in the entitlement formula were very arbitrary and cannot be shown to favor all carriers equally at all airports. As a result of this, carriers would end up tailoring their schedules to serve the entitlement formula, rather than to serve passenger convenience. For example, some carriers may run through plane service at a particular airport while others make turnarounds. In order to maximize the number of slots to which they would be entitled under the formula, carriers operating through plane service would find it beneficial to publish all of their multi-stop service as

connections in order to achieve the greatest number of enplanements. This would create unnecessary passenger inconvenience. Moreover, it is doubtful that the interested parties would ever be able to agree on fair definitions and weightings in the entitlement formula.

The most significant drawback of the administrative allocation procedure is that the computer program employed to find the solution did not, in fact, find the solution. The carriers were asked to submit a number of different scheduling alternatives which, as discussed above, they simply do not have the flexibility to do. Nevertheless, the computer program could not find a suitable hour by hour allocation to meet the carriers' needs. Since the computer was able only to make a partial allocation, it was necessary to get all the team players into a large room with the slot requests posted on a board and then solicit volunteers for sliding. This is precisely what the scheduling committee already does.

The failure of the computer program to find a suitable allocation for all carriers is a function of the inability of the system to focus on specific problem areas. In practice, the slot allocation problem is really a peculiar combination of events occurring at specific times. It is unrealistic to expect the computer to arrive at an acceptable solution merely by presenting it with a myriad of random slot

plans. This approach did not work during the FAA exercise and it will not work in the real world. Specific individual adjustments to resolve specific problem areas are always going to be necessary.

IV. A SUPERIOR ALTERNATIVE TO THE CURRENT SCHEDULING COMMITTEE SYSTEM HAS STILL NOT BEEN FOUND.

In its January 15, 1980 comments to the FAA and the CAB in connection with the Polinomics study, American set forth several reasons why the current committee system should be maintained in the absence of a superior alternative. Neither of the approaches explored in the February 11 FAA exercises proved to be superior. The committee system permits intelligent interaction on specific problem areas without going back to square one each time. This is the essence of the committee system and it is why the committee system works. Neither the auction system nor the administrative allocation system has been demonstrated to more equitably or efficiently accomplish what the committee system already accomplishes.

V. RECOMMENDATIONS

In its Polinomics study comments to the FAA and the CAB, American set forth several considerations regarding an auction-type system. These included recommendations that all slots should be auctioned (including general aviation and

small cities slots), that slot auctions should cover a six-month period and be held six months ahead of time, and that an open, multi-step auction process would be preferable. Any auction system that may ultimately be adopted must take into account these basic considerations.

Clearly, the two systems explored during the February 11 FAA exercises did not meet the desired objectives. Neither exercise can be considered to have tested the respective systems sufficiently for application to the real world. In fact, the only concrete conclusion that can be drawn is that neither system worked. It is again urged that current scheduling committees be maintained in order to avoid disruption of a process that effectively offers the traveling public the convenience it requires.

Very truly yours,



Donald F. Roach

Manager - Scheduling Systems
Development



R. Bradley Jensen

Manager - Schedule Planning

COMMENTS OF W. JEFFREY ROWE ON FAA SLOT ALLOCATION EVALUATION

W. Jeffrey Rowe
Analyst - Economic Research
Department 973
Delta Air Lines, Inc.
Hartsfield Atlanta International
Atlanta, Georgia 30320

GENERAL COMMENTS

The FAA is to be commended for its bold venture into assessment of policy options by computer simulation techniques. In my opinion, this type of analysis can offer valuable insight and a broader understanding of what proposed changes in the national air transportation system will accomplish. Nevertheless, this simulation exercise was flawed, as any such initial effort is bound to be. These flaws are detailed in the sections that follow, particularly section 5. My conclusion is that the defects in the exercise preclude using it to compare the two allocation methods with each other or with the scheduling committee method.

The simulation model is an extremely versatile tool and should not be abandoned in these ground-breaking difficulties. Another simulation exercise with airline participants (not necessarily the same ones) should be conducted, with some changes in the scenario (see section 5). Slot allocation should be simulated using (a) the scheduling committee, to establish a realistic baseline case, (b) common-price and discriminative-price auctions, and (c) a refined administrative allocation method. Each method should be simulated for several periods to allow schedules to reach an equilibrium and to minimize the chances of anomalous events appearing in the results. The time required for this additional study would be on the order of several weeks, and would therefore preclude attendance by airline participants in Washington. However, interaction between the participants and administrators could be accomplished via the same telephone line computer peripherals that afford the participants access to the simulation model.

1. PREFERRED ALLOCATION METHOD

The administrative allocation procedure exerted less pressure on the Blue team than the slot auction. This resulted from Blue having already developed a schedule during the period 2 auction which (a) met the slot quotas, and (b) produced Blue's largest pretax earnings during the exercise (before slot payments) - \$4.73 million. With this information in hand when the administrative allocation began, Blue felt that developing another slot-constrained schedule from the baseline schedule would be wasted effort in terms of the maximum-profit goal.

Blue's decision to implement its period 2 auction schedule in the administrative allocation simulation had a profound effect on the allocation process for all five airlines. For airport AAA, where Blue had used 83 slots in the baseline schedule, Blue requested only 61; this contraction by itself would have been enough to reduce the baseline (uncontrolled) movements in restricted hours from 213 to 191, below the daily quota of 195. Requests totaled only 176, or 19 less than the quota. Obviously the only challenge to meeting the slot quota at AAA was to arrange a few slides, and this was done quickly. The same comments apply to BBB, where the daily quota (180) exceeded requests (164) by 16 slots.

Airport CCC was more difficult to resolve because it was the only case where requests (167) were at the quota level (165). A fairly complex series of slides, coupled with a few outright reductions, was necessary to resolve CCC. These maneuvers were accomplished in short order by the teams in a scheduling committee-type meeting; yet the computerized assignment procedure might have continued indefinitely without any resolution.

As this discussion indicates, my preference for the administrative allocation method is qualified and is based upon circumstances in the exercise which would not parallel any real situation. In my opinion, although the exercise utilized a sophisticated simulation model capable of closely approximating reality, for various reasons (detailed in sections 4 and 5) the results of the exercise are not an adequate basis for selecting one allocation method over the other, or over the scheduling committee method.

2. MARKETING APPROACH UNDER SLOT CONSTRAINTS

The Blue team approach to market entry/exit and schedule adjustments on Blue's existing system was oriented toward maximizing profits under both methods of slot allocation, as well as in the initial simulation period when no slot constraints were imposed. Blue felt no need to pursue other goals as a result of either slot allocation method, and in fact would not have had the time to do so in any case (see section 4).

3. FAIRNESS OF ALLOCATION METHODS

The fairness of any slot allocation scheme to a given airline will depend on the particular viewpoint of that airline. Imposing a slot auction at a given airport might be less fair to an established carrier with extensive operations and connecting complexes at that airport, than it would be to a new carrier whose schedules are more flexible and can, if slot payments are too burdensome, shift its operations elsewhere. Conversely, imposing the administrative allocation on carriers with similar situations at the same airport might favor the larger carrier, which would get many slots based on its extensive pattern of service and large volume of connecting enplanements/deplanements, while the entrant would get just four slots. This is an important question, but it cannot be answered without some agreement as to what constitutes a fair slot allocation method. Such an agreement should balance the interests of passengers, shippers, airport authorities, local governments, air carriers, and other affected parties; given the broad constituencies involved, Congress might be an appropriate forum for this debate.

4. TIME CONSTRAINTS IN THE EXERCISE

In my opinion, there was not enough time to analyze the available information and develop plans of action based on it during any phase of the exercise. The Blue team neglected to reschedule many flights which our printouts identified as relatively unprofitable simply because time ran out. Likewise, we could have developed a more sophisticated bidding strategy had time allowed, particularly in the period 2 auction after we had the benefit of some bidding experience. I doubt that we would have acted differently given more time to prepare plans in the administrative allocation, since our plans simply represented various slides from a schedule we knew would be profitable (see section 1), and slides were the only changes we made to achieve resolution. However, had the quotas actually been such a serious constraint on operations in the administrative allocation that major rescheduling was required, we would have needed much more time. Lack of time to respond to all available information was one factor limiting the realism of the exercise (see section 5).

5. REALISM OF THE EXERCISE

This exercise was a pioneering effort in its use of computer simulation techniques to explore the effects of alternative policies on the national air transportation system; it proved that such simulations can serve as a tool in policy assessment. As might be expected in such a first-time endeavor, several features of the simulation scenario prevented the exercise from effectively approximating reality. Most serious was the quick transition from a route-regulated system having no slot constraints (the "initial state" at the beginning of the exercise) to a completely deregulated route environment with slot controls at the three busiest airports and an auction allocation system. ^{1/}

^{1/} The "initial state" of the system given to the participants in the FAA exercise was created in December, 1979, at MIT by faculty and students at the Flight Transportation Laboratory (FTL). According to Dennis Mathäisel of FTL, the airline route structures created at MIT reflected the dictates of a central authority requiring the smaller lines to serve the smaller cities and limiting competition in large markets.

5. REALISM OF THE EXERCISE (continued)

Only one rescheduling attempt was allowed the teams between these two states, corresponding to a six-month period. The results of this rescheduling (the "base state" in the FAA description) certainly did not represent an equilibrium state under route deregulation, nor did this state reflect any airport congestion problems, slot constraints, or other access problems. In reality, of course, slot controls have existed for more than a decade and domestic route deregulation has been proceeding apace for the past 18 months. In order to simulate the process of route deregulation under slot constraints, the exercise should have allowed for several rounds of scheduling, with slot allocation by scheduling committee, before alternative slot allocation methods were evaluated.

Another major oversight in the simulation was the lack of alternative airports at the slot-controlled cities. In reality, the three cities with slot-controlled airports can be accessed through other airports which are not slot-controlled (Chicago-Midway; New York-Newark; Washington-Dulles/BWI). The simulated network should have included such airports.

Lesser defects of the simulation were the omission of pricing freedom and the absence of transitional market entry/exit costs. In reality, airlines incur large costs to shift resources (personnel, facilities, ground equipment, advertising, etc.) from their existing system to new markets; in the model no such costs were assessed. For example, in the first scheduling attempt airline White (the smallest of the five airlines, flying only DC-9's) was able to raise its after-tax profits from \$320,179 to \$4,018,298 by entering thirteen markets, dropping three, and increasing daily nonstop flights from 35 to 50. One of the markets entered by White was the 1938-mile AAA-XXX market, where White competed with three other airlines flying 727's and 707's. In reality, such an ambitious expansion program by such a small carrier would not generate a 1,255 percent increase in net income in the first six months, as White did in the exercise.

To generate valid predictions of the impact of various slot allocation methods on a deregulated air transportation system, the scenario should have allowed complete, or at least some, pricing freedom. In fact, it allowed none. The teams were not able to set fares so as to exploit the differences in their segment costs dictated by differing aircraft types and network characteristics. This omission is particularly serious when considering the results of the slot auction simulations, when carriers with pricing freedom would have had the option of either increasing fares in markets involving the slot-controlled airports or, by not raising fares, cross-subsidizing the slot payments with profits from other routes.

Other problems with extrapolating the results of the slot auction simulation to a real slot auction arise when one considers that no real slot auction has yet been conducted or even proposed in detail.

In the Polinomics study, an auction is described in which carriers proposing to serve small communities from a slot-controlled airport would participate in a separate auction process, bidding among themselves for slots reserved exclusively to them. ^{2/} Congress' historical concern for and sensitivity to small community service suggest that some such mechanism could be part of a real slot auction procedure. Since no special treatment for small communities was incorporated in the simulation scenario (in fact, service disappeared completely from two small cities in the network), the results have no bearing on an auction process which does allow for such preferred treatment. Obviously, if some slots were removed from the general auction at a given level of demand, slot prices would go up.

Perhaps the most critical feature of a real slot auction system would be the distribution of slot revenues. Logically, the money should be used to expand capacity at the congested airport, allowing higher quotas, lower slot payments, and lower costs to the airlines. This effect could be noticeable within the six-month simulation period for some airports, and the results of a simulation including this feature would be valuable. If, on the other hand, one assumes there will be no relief from quotas associated with slot payments, the simulation scenario should allow for fare differentials (as suggested above) which would discourage traffic using the slot-controlled airports. In either case, more than two simulation periods under the auction allocation system would be needed to fully explore its effects.

As noted above (see section 1) the administrative allocation procedure, as simulated, acted to assign requests for 507 slots at the three controlled airports when 540 were available. Realism requires that the number of desired slots be higher than the quota by five to ten percent or more, as is now the case at Washington National Airport.

In addition, a realistic simulation of administrative allocation would include some new entrants and carriers providing essential air service to reduce the slots available to established carriers. As is the case for auction allocation, several simulation periods would be necessary to explore the major effects of administrative allocation on the air transportation system.

^{2/} D. Grether, M. Isaac, C. Plott, Alternative Methods of Allocating Airport Slots, section VI, at 12-14 (prepared by Polinomics Research Laboratories, Inc. for U.S. Civil Aeronautics Board, August, 1979).

In summary, the task of applying the MIT simulation tool to analyze the effects of alternative slot allocation methods is neither a success nor a failure; it is simply not finished. Simulation iterations, incorporating the variations mentioned herein must be undertaken before conclusions can be drawn from the exercise and applied to reality. To avoid the logistical problems and expense involved with convening a subsequent longer session in Washington, the participants could access a central computer by telephone lines from their home offices; they could then assimilate the exercise into their other activities. This would require more time for coordination in each phase of the exercise due to the geographical separation of the participants and administrators, but in my opinion this additional time would allow more thoughtful decisions by the participants and, therefore, a more realistic simulation (see section 4).

6. SUGGESTIONS FOR CHANGING THE ALLOCATION METHODS

The auction allocation method as it was simulated seems entirely practical. The question is whether the results it produces are the results that would be desired of a real auction allocation method. As noted in section 3, no definition of desirable results exists. A number of features that might be incorporated into an auction, but were not part of the exercise, are discussed above in section 5. Other possibilities include allowing retraction of bids, with the slots released to be sold on the aftermarket, and accepting successful bids at the bid price (discriminative price auction) rather than at the "common price". All of these variations should be studied further with definite performance criteria (in terms of passenger/shipper service, prices to consumers, costs to airlines, ease of entry, small community service, etc.) in mind.

The administrative allocation method, on the other hand, must be refined before it can be implemented. The exercise revealed that the computerized matching of plans (the assignment phase) may never result in a combination that satisfies the hourly quota. Once the daily allocations for each carrier are determined, the most effective procedure would be to convene a scheduling committee to arrange slides so that the hourly quota is met. If no face-to-face contact between carriers is permitted, then FAA will have to engage in a tedious process of soliciting plans, finding problem hours, and soliciting more plans to reduce operations in the problem hours, unless a better idea surfaces. Again, variations in the administrative allocation method should be studied in additional iterations of the simulation exercise, with performance measured against definite criteria.

ERRATA

The FAA description of the exercise contains some factual errors which should be corrected before the description is translated into a final report.

Page 1 - W. Jeffrey Rowe attended the exercise for Delta and participated on the Blue Team, not Ted Maples.

Page 18 - The figures presented in Table 3.4 as net earnings before taxes or slot payments for the period 2 slot auction simulation are actually net earnings before taxes for the administrative allocation.

Page 21 - The operating statistics presented in Table 3.7C for the period 2 slot auction actually correspond to the administrative allocation.



March 24, 1980

Mr. John M. Rodgers
Acting Chief, Economic Analysis Branch
Department of Transportation
Federal Aviation Administration
Washington, D. C. 20591

Dear John:

Attached are my comments on the Draft Evaluation of the slot allocation test conducted during the week of February 11.

It is my understanding that the test focused on three main issues:

1. The practicality of two alternatives to the Schedule Committee process for slot allocation.
2. The impact of those alternatives on carriers' financial performance.
3. The impact on service to individual communities.

I believe the test uncovered specific implementation problems associated with each of the two methods. These are detailed in the attached. However, the results do not permit a valid evaluation of the impact of either method on carrier profitability or service levels by city-pair.

Since the participants were unfamiliar at the outset with their own networks and with the decision rules built into the MIT model, you would expect financial performance to improve with each iteration. That reflects both the learning process and a trend towards competitive equilibrium.

Mr. John M. Rogers

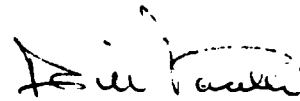
March 24, 1980

Therefore, the fact that profits did not deteriorate under the slot allocation methods tested does not suggest the absence of a significant economic penalty. Instead, I would conclude that the learning curve effect offset the cost of slot allocations.

Moreover, because of the limited time available to properly analyze the data and schedule alternatives, resource allocation decisions did not necessarily reflect the economics of service in specific city-pairs. In fact, a post-test review of the data suggests significant changes to service patterns. This is discussed further in the attached.

Therefore, I would urge that any definitive conclusions be limited in scope to the implementation issues. Clearly, additional work has to be done to determine the effect of the slot allocation alternatives on carrier financial performance and on service patterns.

Sincerely,



W. H. Pacelli
Specialist
Planning

Attachment

SLOT ALLOCATION EVALUATION TEST

Response to Questions on Page 41 of Draft Report

1. The two methods are based on different criteria. The Trading Post Auction gives priority to profit/revenue per flight and therefore longer haul flights. The Administrative method is based on passengers carried and airports served regardless of length of haul. In effect, that is a policy question, which I cannot address in these comments. Instead, I will focus on the practical implementation issues.

The test suggested serious problems with the Trading Post Auction in achieving the hour-by-hour adjustments needed to fully utilize the slots available. Indicative of this problem are slot prices of over \$700 in one hour while some slots in an adjacent hour were unused.

In addition, slot prices tended to be above those which one might expect based on economic theory. The upward pressure on slots was caused by (1) a basic tendency to protect existing operations, regardless of cost, (2) the uncertainty of slots in any given hour, resulting in bids for unneeded slots in adjacent hours, and (3) uncertainty about the real value of a slot, both to the individual airline and to competitors.

The Administrative allocation approach did provide more stability and generally was easier to work with. However, its utility was limited in the hour-by-hour assignment in that so many submissions of differing plans were necessary for a "computer solution." This would suggest some type of schedule committee to finalize hour-by-hour assignments.

2. We did not alter our marketing approach, but, had we had time to more fully evaluate the effect of slot reductions and price, we undoubtedly would have.

Had financial information been presented by segment and operating profit show rather than contribution, the resulting aircraft deployment would have been much different. For example, the revenue generated in the A-C market could have supported more flights than the B-C market. Yet, after Auction 1, there were 42 A-C flights vs 51 B-C flights. (See Exhibit A).

There was insufficient time to examine the effect of slot payment on flight profitability, particularly on the double slotted segments. It was discovered after the test that slot costs on short-haul flights between slotted airports so drastically lowered the profit that redeployment of these flights would have been necessary.

3. The term fair is very subjective and depends on the criteria used.
4. More time was needed to make schedule changes necessitated by not receiving desired slots and the price of a slot, especially in the Trading Post method.

Time allowed for the bidding process was totally inadequate. The amount of data that is generated and must be analyzed in order to make intelligent bids is very large. Only after inordinately high price levels (4.8% of total revenue) were reached in Auction 1 did some carriers drop out of the bidding. While, it is true that things settled down in Auction 2, it must be remembered that in the test certain pressures were absent. These pressures are new aircraft deliveries and market aggressiveness.

5. No. Several iterations should have been made prior to testing the slot allocation methods to give the teams a familiarity with the game and the route network. The "noise level" of the Blue team's losses and massive swings in load factor and utilization from period to period render analysis of the economic data highly suspect. It is obvious from tables presented in the Draft Report that Blue had trouble finding a niche in this exercise and impacted the entire industry. Other participants, to a less obvious extent, also were going through a learning process. It is doubtful, therefore, that any concrete conclusions can be drawn about the financial impact on the industry.
6. Trading Post Auction

This alternative needs a mechanism that relieves the upward pressure on the price of slots and facilitates the process of moving to adjacent hours. We are not sure what that should be, but believe the system is ineffective without it.

Administrative Allocation

The criteria used to allocate slots, we believe, should include through passengers because they are using the airport runway capacity every bit as much as connecting passengers. This alternative would function better as a slot assignment tool if flexibility could be allowed in the maximum per hour quota by carrier. Having a maximum per hour seemed to work against an airport solution rather than assist in reaching one. Also, once the slot allocations by carrier are determined, an interactive process between carriers (similar to the schedule committee) should be permitted to reach an airport resolution.

Exhibit A

	<u>A-C</u>	<u>B-C</u>
Passengers (Both Directions) <u>1/</u>	4,514.1	3,358.5
X Net Fare <u>2/</u>	\$ 51.66	\$ 18.88
	-----	-----
Net Revenue	\$233,198.40	\$63,408.48
+Average O-W Direct		
Cost of 727	2,946.11	1,047.89
	-----	-----
Maximum number of trips that could be economically operated	79	61

1/ Base state

2/ Published fare less 15% for general and administrative expenses and less \$14.00 for passenger handling cost.



PIEDMONT AIRLINES
SMITH REYNOLDS AIRPORT
WINSTON-SALEM N.C. 27102

March 20, 1980

Mr. John M. Rodgers
Acting Chief, Economic Analysis Branch
Department of Transportation
Federal Aviation Administration
Washington, D. C. 20591

Dear Mr. Rodgers:

The week we spent in Washington reviewing the two slot allocation methods was enjoyable as well as educational. Our only regret was that more time was not allocated to the Administrative Method, which in our view, could offer a feasible solution to a very complex problem.

Aside from the cost, we believe the trading post auction to be too cumbersome to administrate. It would require a team of airline personnel with the technological know-how in scheduling, computers, and finance. In addition, schedule stability would be much in doubt. This method would also favor the larger carriers with the longer hauls in that they would be in better shape financially to afford slots.

Although the administrative method attained little success during the testing period in Washington, it does appear to have a number of points worthy of consideration. Some of these are:

1. Carriers current slot allocation considered.
2. Number of passengers enplaned/deplaned (except for exempted flights serving essential air service points, flights would have to maintain good load factors to remain).
3. Number of cities served on a nonstop basis considered.
4. Restraint on new carriers entering a slot controlled airport.

It would appear a combination of the Administrative System and Schedule Committee could be an alternative to any method submitted thus far. With a firm approach toward total numbers, administered by the FAA, the Schedule Committee could in most instances, attain resolution by sliding thru out the day.

The following are some thoughts on the actual exercise.

Problem 1:

On Page 13 of the slot allocation evaluation, the indication is that there may be an efficiency involved with the auction system because of the comparison of profitability during the various iteration. Such a comparison, in our opinion, is not valid. Since each of the teams were given their base schedules, and except for a few minor changes, these schedules formed a base period. Any comparison to it fails to recognize efficiencies through the scheduling changes made by "scheduling experts" in the latter iteration. The slot allocation evaluation makes mention of this very fact in the last sentence on Page 16.

Problem 2:

The MIT model is an excellent model but does not compare to the real world scheduling practices. For example:

- (a) Inter-line connections were not considered.
- (b) The "schedulers" did not have a good feel of their cost levels.
- (c) There was no traffic advantage of market identity.
- (d) There was no cost penalty that we could determine for significantly reducing operations at one station or increasing it at another, i.e., at the extreme, a carrier could drop a city and enter another city with no cost penalty.
- (e) The model contained three types of airplanes including the DC-9, 727 and a 707. It is hard to determine, but we do not believe an aircraft preference factor was used and if there was one, it did not seem to be comparable to real world experience.
- (f) One of the greatest advantages in a slot auction system would be the use of wide-bodies equipment because of its efficiency in terms of cost, the public appeal of such aircraft and the greater number of passengers carried by this equipment in relation to narrow-bodied airplanes. This makes us wonder why such an aircraft was not used in the MIT model.
- (g) The larger airlines are much more sophisticated and better equipped to handle their massive systems in the real world. The MIT model does not reflect this inherent advantage.

Problem 3:

The model was set-up to maximize short term profit. Doing such, it overlooks real world realities. In our opinion, bigger carriers would be willing to sacrifice short term profit in order to become more dominant factors in the market in the long term. They would be in a better position to force small carriers out of markets and suffer short term losses in order to reap better long term profits.

Mr. John M. Rodgers
Page 3
March 20, 1980

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We would not advocate another meeting in the same posture as before. Cost of MIT Personnel, computer equipment, hotel rooms, etc., would be unreasonable for what we would expect to accomplish. We would suggest further refinement of the administrative system and a later review or evaluation exercise.

Sincerely,

PIEDMONT AIRLINES

R. L. McAlpin

R. L. McAlpin
Staff Assistant Vice President -
Airline Scheduling

R. L. James

R. L. James
Director - Route Development

RLM/lr

March 25, 1980

John M. Rodgers
Acting Chief, Economic Analysis Branch
Department of Transportation
Federal Aviation Administration
Washington, D.C. 20591

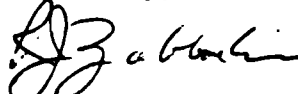
Dear Mr. Rodgers:

Enclosed are comments pertaining to the FAA slot allocation exercise as you requested.

It is the desire of Trans World Airlines to see the slot allocation problem resolved to the mutual satisfaction of all interested parties. In light of this, TWA fully backs the position the ATA has taken to persevere the current system for slot allocations until a new system is developed that will fully satisfy the needs of the industry.

The enclosed comments are in no way to be taken as an endorsement of either one or both of the methods under study, but hopefully, will assist in the search for a solution to this very serious problem.

Sincerely,



Richard J. Zablocki

Enc.

TRANS WORLD AIRLINES, INC.

- I. Which method did you prefer - the Trading Post Auction or the Administrative Allocation? Why?

The Administrative Allocation procedure, although flawed, seems to be the better method. The main objection to the Trading Post Auction was the considerable expense required to obtain the desired slots. This added expense obviously has to be passed on to the consumer either in the form of peak hour surcharges or across the board fare increases. This does not serve the best interests of the airline or the travelling public. With the Administrative procedure it was possible to acquire all of the desired slots that Airline White needed without incurring any additional costs. Unfortunately, the flaw in this method showed up in the hourly distribution of these slots. It is not realistic to expect to schedule an airline using an even distribution of operations throughout the day. Natural peaks will occur due to length of haul and connection bank timing, in addition to passenger preference.

- II. In each of the two methods did you significantly alter your airline marketing approach as a result of the slot allocation? If so, in what way?

The Trading Post Auction allowed Airline White to maintain its schedule intact simply by using a method of progressively inflated bidding for the desired slots. Since the number of peak hour slots that were desired by Airline White were minimal it was fairly safe to assume that a high bid would be less damaging for this Company than any of its competitors due to the overall number of bids tendered. Those airlines desiring more slots in the peak hours would or should be more conservative in their bidding to insure a minimum expense.

The Administrative Procedure actually worked differently for airport AAA than at airports BBB and CCC. The allocations at airport AAA seemed to be handled strictly by the rules of the game and in so doing created a situation for Airline White that was less than desirable. In offering alternative plans to reach an overall solution, Airline White found this situation coming to a resolution using its least desirable plan. This, in conjunction with the limits placed on the maximum number of slots an airline could request in an hour, in my opinion, was a serious blow to this airline's profitability.

At airports BBB and CCC the rules were somewhat more relaxed when a solution by the original procedures could not be reached. Through the committee method, Airline White was not only able to assist in reaching a solution by rescheduling, but did so in such a way as to improve its profit making potential. Slot allocation by means of a scheduling committee was a definite plus for Airline White.

- III. Do you consider the two methods to be fair? If not, in what way are they unfair?

The Trading Post method seems to favor the smaller airline that is not heavily scheduled at the slot restricted airports. As long as the airline was willing to pay the price, the slot was relatively easy to acquire. Although we did not fully see it during this demonstration, a serious escalation in the bids seems destined to take place every time the participants sense a particular round of bids may be final.

The small airline can afford to pay the high price and spread the cost out over its entire route structure, which for the most part is operating at unrestricted airports. The larger trunk carriers that are heavily concentrated at the restricted airports will have to either pay the high prices and pass these increased costs on to the consumer or reduce its operations.

The Administrative method, as an alternative, tended to be too restrictive. It is my opinion that an administrative procedure set up with the original guidelines will most likely enable the large, strong airlines to retain their strength and grow while creating a downward spiral for the smaller, weaker competitors. With each successive allocation period as the smaller airlines' share of traffic shrinks due to a reduced number of operations, their total number of slots allocated will decrease. Thus, less operations are allowed, less destinations are served and, of course, fewer enplanements and deplanements will be accounted for. The following period's allocation of slots will be still smaller to these airlines based on the previous results.

- IV. Were you able to handle the total information flow comfortably in the time available in each method? Was more time required (a) for re-scheduling, (b) for bidding, and/or (c) for submitting preference plans in the Administrative method?

As the representative for Airline White, the smallest yet one of the most profitable airlines, I had sufficient time to handle all aspects of the agenda. After the initial period of scheduling, the relative strength that was developed due to the overall profitability allowed me to have a lot of control over the various situations in terms of my own schedule.

- V. Was the evaluation exercise sufficiently realistic to allow conclusions to be drawn from the real world? If not, how would you make it more realistic?

The only major problem in terms of this exercise being realistic was the aspect whereby the airlines were able to change their schedules

with relative ease. There are many constraints that a scheduler must face in the process of developing a schedule, slots being only a minor issue. But, once a schedule has been developed, even a small 5 minute change has the potential to create problems at various other points on the route structure. Certainly, additions and deletions of service and likewise, major time changes can create a catastrophic chain reaction.

I raise this point to indicate the great deal of difficulty a scheduler could have when trying to come up with alternative plans for the Administrative method or trying to maneuver an operation so as to avoid a high cost slot in the Trading Post method. In the real world I think you will find that the airlines are not able to be as cooperative or be able to restore the same profit potential to a flight or series of flights that must go through forced schedule moves.

- VI. Assuming one had to implement one of the two alternative allocation methods, what changes would you recommend in each method to make it more practical?

Some changes that I think are worth experimenting with for the Trading Post Auction would be to eliminate bidding with money and instead devise a point system. Points would be allocated to each airline based on variables such as airline size, history, traffic and efficiency similar to the Administrative method. The airlines would then be free to bid on whatever slots they desire using these points. A post trading period would be desirable where the airlines would be allowed to swap slots on a one for one basis. This would allow the airlines that were not able to acquire their desired slots to try to make the best situation they can out of it.

The Administrative method might best be improved by simply limiting its use to the overall allocation of slots to the individual airlines. In conjunction with this, a scheduling committee type of operation could then take over and go through the current processes in use for deciding the hourly allocations. This would satisfy the needs of the new entrants and yet preserve the flexibility of the scheduling committees.

WASHINGTON NATIONAL AIRPORT · WASHINGTON, D.C. 20001

March 31, 1980

John M. Rodgers
Acting Chief of the
Economic Analysis Branch
Department of Transportation
Federal Aviation Administration
800 Independence Avenue
Washington, D.C. 20591

Dear Mr. Rodgers:

This is in reply to your letter of March 7, 1980 with which you forwarded the results of the management game. First let me apologize for the delay in responding but as I already mentioned to you I did not receive this report until March 17, 1980 and with the press of closing out our summer schedule plus digesting the information contained in this report, it was not possible to respond earlier.

Per your request the following are my thoughts and observations concerning this subject:

For reasons which will be discussed below, I do not feel that I can support either the trading post auction or the administrative allocation.

The base schedule on which the entire management game was predicated was developed in the short period of one afternoon. In the early stages I can say that I was not sufficiently familiar with either my own airline (Gold Airlines) or with the market place in which this airline would operate to provide profitability comparisons between periods of time. I know in my case that during the various auction periods I made improvements to my own airline as my familiarity increased with the markets available and the schedules of other carriers. While I certainly cannot speak for the other airlines, I am convinced that this was true of each participant. As a result, it is my impression that the base period was grossly understated in terms of industry profitability and the comparison of profitability results with later option periods was distorted. The implied result on page 13 that slot purchasing did not interfere with airline

profits (and costs to travelers) is not a logical conclusion. Again, it was the action of the schedulers becoming more familiar with industry traffic, the competition, their aircraft and the model manipulations that allowed the results to occur as they did.

Further to the model itself, I do not believe that there was sufficient realism to determine if the results could be applied to the real world airline operation. On the operational side, there were no constraints or costs considered for maintenance, airport facilities, ground servicing, crew restraints or airport curfews. On the traffic side which is indicated on page 4 as the heart of the game, it appears that the model contained unduly large amounts of traffic stimulation evidenced by the results generated by operating off-peak schedules. As an example Gold Airlines added a very late night short haul round-trip and generated a load factor of approximately 85% which did not appear realistic. I also found that in one particular market the break even level was only twelve passengers. This again demonstrates that the only reason the industry showed a profit increase after paying for slots is because the participants learned how to use the model's idiosyncrasies to their advantage. The equipment types used in this exercise did not offer sufficient disparity of capacity. In the real world, the price carriers are willing to pay for slots will be directly related to revenue potential and carriers with large capacity aircraft could easily outbid those with smaller aircraft. The largest aircraft used in the model was a B-707 and the smallest a DC-9 while in reality equipment could vary from jet type aircraft of as little as 74 seats to the Boeing 747s with potential capacity of 400 seats or greater.

Based on my participation, it is my impression that neither method is totally fair. Under the auction method the cost of obtaining the necessary slots would result in either increased operating costs or higher fares to the traveling public. These added costs could result in discouraging competition in cases where a new segment under consideration has one or both airports under slot allocation. Further, carriers themselves could speculate in slots by purchasing unnecessary slots and then attempting to sell them at a profit in the after market. In the exercise Gold Airlines did this with some degree of success. Carriers could even purchase slots in excess of their needs to stifle competition.

Under the administrative allocation system provision is made for new carriers to automatically receive four slots. However, incumbent carriers could find it much more difficult or perhaps impossible to either enter new markets or expand existing ones.

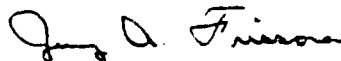
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Page Three

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Under this system they have no way of being reasonably certain of obtaining the slots necessary for such service. Infact, under this system I believe it possible for incumbent carriers to have to involuntarily reduce existing services to the public to accommodate a new carrier's slot request. This I believe would severely restrict the free market place.

Based on the above, I believe that a great deal of additional study is required on both plans before a final determination can be made as to the viability of either option. Considering the limited experience the industry has had with these two options, I believe that as currently constituted both fall far short of the intended goal of providing a vehicle which satisfies the interests of both the public and the airline industry. However, if either plan were mandated by the government I presume the industry would have a way of making it work, yet this study fails to identify many of the ramifications for the traveling public and the industry.

Very truly yours,



Jerry A. Frissora

JAF/kml

6. CONCLUSION

The testing of two slot allocation methods in the environment of the Airline Management Game has been demonstrated. In particular the Slot Exchange Auction has been subjected to a gaming/simulation test in conjunction with fairly realistic airline scheduling. The test was inconclusive in regard to (a) convergence to equilibrium, (b) the economic efficiency and equitability of the Slot Exchange method. Further testing should be undertaken before implementation can be seriously advocated. These further tests should provide for more time for bidding; more rounds of bidding; possible application of one or another stopping rule; improved realism in the game scenario; and, finally, an experimental design with controls for participant learning. Under these conditions the advantages and disadvantages of the Slot Exchange can be fully discovered in the testing environment so as to avoid faulty implementation or adoption of an inferior allocation method.

REFERENCES

1. Antonio Elias, The Development of an Operational Game for the U.S. Domestic Airline Industry, Flight Transportation Laboratory, Massachusetts Institute of Technology, Cambridge, MA, FTL Report R78-5, February 1979.
2. Federal Aviation Administration, Slot Allocation Evaluation, March 1980.

APPENDIX A
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Table A-1	Aircraft Data
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TABLE 3.1 AIRCRAFT DATA

MIT-FTA CASS FILE ID:FAA_0001 U N I V E R S E F I L E P R I N T O U T LAST MODIFIED 80/01/18 14:16:37.00

TYPE SEATS	RANGE (M)	SPEED (MPH)	DOC/M		DOC/D		DOC/S-M		TF/DP	TF/DAY
			\$	\$	\$	\$	MIN	MI:MM		
DC9	90	2000	480	893	103	703	0.02067	7	0:47	
727	130	2000	480	1159	140	1280	0.01857	7	1:06	
707	150	4000	480	1671	230	1216	0.02321	8	0:43	

EXPLANATION OF TERMS:

DOC/M is the direct operating costs per aircraft block hour. It includes all the costs that can be allocated to flight time, e.g. fuel, crew, direct maintenance, etc.

DOC/D is the direct operating costs per aircraft takeoff/landing cycle. It includes all the costs that can be allocated to a takeoff/landing cycle, such as dispatching, ground servicing, tire wear, etc. It does not include landing fees or slot charges.

DOC/D is the indirect operating costs that are independent of the flight time, such as maintenance burden, insurance, etc. It does not include depreciation or financial or lease costs.

The above three items are the components of the operating costs. The following three items are derived from the above costs, and are presented for reference only:

DOC/S-M the derived direct operating costs per seat-mile.

TF/DP The number of flight minutes that would cost the same as a landing/takeoff cycle.

TF/DAY the number of flight minutes that would cost the same as the daily indirect costs.

TABLE 3-2 NETWORK DATA

BITFTA CAS - FILE ID:FAA_0001 ***** AIRPORT DISTANCES AND BLOCK TIMES ***** LAST MODIF: 80/01/18 14:18:37.00

FR TO	MN	DCS	707	727
AAA BDB	517	1:30	1:30	1:30
AAA CCC	539	1:33	1:33	1:33
AAA DDD	508	1:35	1:35	1:35
AAA EEE	147	0:38	0:38	0:38
AAA FFF	151	0:38	0:38	0:38
AAA GGG	482	1:20	1:20	1:20
AAA HHH	755	1:54	1:54	1:54
AAA III	269	1:08	1:08	1:08
AAA JJJ	359	1:26	1:26	1:26
AAA KKK	461	1:14	1:14	1:14
AAA LLL	330	0:58	0:58	0:58
AAA MMM	149	0:35	0:35	0:35
AAA NNN	179	0:39	0:39	0:39
AAA OOO	300	0:54	0:54	0:54
AAA PPP	182	0:39	0:39	0:39
AAA RRR	1684	3:54	3:54	3:54
BBB AAA	517	1:30	1:30	1:30
BBB CCC	153	0:47	0:47	0:47
BBB DDD	353	1:08	1:08	1:08
BBB EEE	455	1:18	1:18	1:18
BBB FFF	553	1:31	1:31	1:31
BBB GGG	434	1:16	1:16	1:16
BBB HHH	259	0:54	0:54	0:54
BBB III	244	0:54	0:54	0:54
BBB JJJ	223	0:48	0:48	0:48
BBB KKK	422	1:11	1:11	1:11
BBB LLL	167	0:42	0:42	0:42
BBB MMM	530	1:25	1:25	1:25
BBB NNN	695	1:45	1:45	1:45
BBB OOO	436	1:13	1:13	1:13
BBB PPP	337	1:01	1:01	1:01
BBB RRR	2078	4:45	4:45	4:45
CCC AAA	539	1:33	1:33	1:33
CCC BBB	153	0:47	0:47	0:47
CCC DDD	202	0:49	0:49	0:49
CCC EEE	438	1:16	1:16	1:16
CCC FFF	612	1:38	1:38	1:38
CCC GGG	572	1:33	1:33	1:33
CCC HHH	360	1:07	1:07	1:07
CCC III	184	0:47	0:47	0:47
CCC JJJ	386	1:07	1:07	1:07
CCC KKK	303	0:56	0:56	0:56
CCC LLL	236	0:48	0:48	0:48
CCC MMM	508	1:22	1:22	1:22
CCC NNN	704	1:47	1:47	1:47
CCC OOO	540	1:26	1:26	1:26
CCC PPP	380	1:06	1:06	1:06
CCC RRR	2172	4:57	4:57	4:57
DDD AAA	508	1:35	1:35	1:35
DDD BBB	353	1:08	1:08	1:08
DDD CCC	202	0:49	0:49	0:49
DDD EEE	453	1:14	1:14	1:14
DDD FFF	690	1:45	1:45	1:45
DDD GGG	747	1:51	1:51	1:51
DDD HHH	540	1:26	1:26	1:26
DDD III	235	0:49	0:49	0:49

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**** AIRPORT DISTANCES AND BLOCK TIMES ****

LAST MODIF: 00/01/10 14:10:37.00

FR TO	MR	DCB	707	727
000 JJJ	595	1:20	1:28	1:28
000 KKK	178	0:37	0:37	0:37
000 LLL	370	1:01	1:01	1:01
000 MMM	504	1:10	1:10	1:10
000 NNN	722	1:45	1:45	1:45
000 OOO	678	1:30	1:30	1:30
000 PPP	474	1:14	1:14	1:14
000 RRR	2267	5:05	5:05	5:05
000 AAA	147	0:30	0:30	0:30
000 BBB	455	1:10	1:10	1:10
000 CCC	438	1:10	1:10	1:10
000 DDD	453	1:14	1:14	1:14
000 EEE	290	0:52	0:52	0:52
000 GGG	548	1:24	1:24	1:24
000 HHH	711	1:44	1:44	1:44
000 III	256	0:50	0:50	0:50
000 JJJ	558	1:22	1:22	1:22
000 KKK	315	0:52	0:52	0:52
000 LLL	278	0:47	0:47	0:47
000 MMM	74	0:22	0:22	0:22
000 NNN	272	0:47	0:47	0:47
000 OOO	386	1:01	1:01	1:01
000 PPP	179	0:35	0:35	0:35
000 QQQ	1829	4:08	4:08	4:08
000 RRR	151	0:30	0:30	0:30
000 SSS	553	1:31	1:31	1:31
000 TTT	612	1:30	1:30	1:30
000 UUU	688	1:45	1:45	1:45
000 VVV	290	0:52	0:52	0:52
000 WWW	386	1:04	1:04	1:04
000 XXX	768	1:51	1:51	1:51
000 YYY	466	1:10	1:10	1:10
000 ZZZ	529	1:19	1:19	1:19
000 AAA	593	1:27	1:27	1:27
000 BBB	380	1:00	1:00	1:00
000 CCC	300	0:50	0:50	0:50
000 DDD	244	0:43	0:43	0:43
000 EEE	203	0:30	0:30	0:30
000 FFF	233	0:42	0:42	0:42
000 GGG	1263	3:36	3:36	3:36
000 HHH	482	1:20	1:20	1:20
000 III	434	1:16	1:16	1:16
000 JJJ	572	1:33	1:33	1:33
000 KKK	747	1:51	1:51	1:51
000 LLL	540	1:24	1:24	1:24
000 MMM	380	1:04	1:04	1:04
000 NNN	509	1:10	1:10	1:10
000 OOO	528	1:25	1:25	1:25
000 PPP	251	0:44	0:44	0:44
000 QQQ	734	1:44	1:44	1:44
000 RRR	386	1:01	1:01	1:01
000 SSS	601	1:20	1:20	1:20
000 TTT	628	1:31	1:31	1:31
000 UUU	186	0:36	0:36	0:36
000 VVV	372	0:50	0:50	0:50
000 WWW	1890	3:51	3:51	3:51

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**** AIRPORT DISTANCES AND BLOCK TIMES ****

EGYPTA CASS - FILE 18:FAA_0001

PR	TO	MM	DCB	707	727
1000	AAA	755	1:54	1:54	1:54
1000	BBB	259	0:54	0:54	0:54
1000	CCC	360	1:07	1:07	1:07
1000	DDD	540	1:26	1:26	1:26
1000	EEE	711	1:44	1:44	1:44
1000	FFF	760	1:51	1:51	1:51
1000	GGG	500	1:18	1:19	1:19
1000	HHH	501	1:20	1:20	1:20
1000	JJJ	260	0:45	0:45	0:45
1000	KKK	661	1:35	1:35	1:35
1000	LLL	435	1:07	1:07	1:07
1000	MMM	785	1:51	1:51	1:51
1000	NNN	935	2:09	2:09	2:09
1000	OOO	597	1:27	1:27	1:27
1000	PPP	573	1:24	1:24	1:24
1000	QQQ	2200		4:55	
111	AAA	369	1:08	1:08	1:08
111	BBB	244	0:54	0:54	0:54
111	CCC	184	0:47	0:47	0:47
111	DDD	235	0:49	0:49	0:49
111	EEE	256	0:50	0:50	0:50
111	FFF	466	1:16	1:16	1:16
111	GGG	530	1:25	1:25	1:25
111	HHH	501	1:20	1:20	1:20
111	JJJ	430	1:08	1:08	1:08
111	KKK	201	0:40	0:40	0:40
111	LLL	151	0:33	0:33	0:33
111	MMM	324	0:55	0:55	0:55
111	NNN	525	1:20	1:20	1:20
111	OOO	447	1:10	1:10	1:10
111	PPP	239	0:44	0:44	0:44
111	QQQ	2036		4:36	
111	AAA	559	1:26	1:26	1:26
111	BBB	233	0:48	0:48	0:48
111	CCC	386	1:07	1:07	1:07
111	DDD	505	1:28	1:28	1:28
111	EEE	558	1:22	1:22	1:22
111	FFF	529	1:19	1:19	1:19
111	GGG	251	0:44	0:44	0:44
111	HHH	260	0:45	0:45	0:45
111	III	430	1:08	1:08	1:08
111	KKK	678	1:28	1:28	1:28
111	LLL	390	0:47	0:47	0:47
111	MMM	628	1:28	1:28	1:28
111	NNN	734	1:41	1:41	1:41
111	OOO	246	0:53	0:53	0:53
111	PPP	380	0:58	0:58	0:58
111	QQQ	1941		4:19	
111	AAA	481	1:14	1:14	1:14
111	BBB	422	1:11	1:11	1:11
111	CCC	393	0:56	0:56	0:56
111	DDD	179	0:37	0:37	0:37
111	EEE	315	0:52	0:52	0:52
111	FFF	593	1:27	1:27	1:27
111	GGG	734	1:44	1:44	1:44
111	HHH	661	1:35	1:35	1:35

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***** AIRPORT DISTANCES AND BLOCK TIMES *****

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FR TO	MM	DCU	707	727
RRR 111	201	0:40	0:40	0:40
RRR JJJ	628	1:28	1:28	1:28
RRR LLL	351	0:53	0:53	0:53
RRR MMM	350	0:53	0:53	0:53
RRR NNN	569	1:21	1:21	1:21
RRR OOO	624	1:28	1:28	1:28
RRR PPP	397	0:58	0:59	0:59
RRR RRR	2144		4:45	
LLL AAA	330	0:58	0:58	0:58
LLL BBB	187	0:42	0:42	0:42
LLL CCC	236	0:48	0:48	0:48
LLL DDD	378	1:01	1:01	1:01
LLL EEE	276	0:47	0:47	0:47
LLL FFF	380	1:00	1:00	1:00
LLL GGG	386	1:01	1:01	1:01
LLL HHH	435	1:07	1:07	1:07
LLL III	151	0:33	0:33	0:33
LLL JJJ	308	0:47	0:47	0:47
LLL KKK	351	0:53	0:53	0:53
LLL MMM	251	0:53	0:53	0:53
LLL NNN	508	1:13	1:13	1:13
LLL OOO	311	0:48	0:48	0:48
LLL PPP	153	0:29	0:29	0:29
LLL RRR	1935	4:18	4:18	4:18
AAA AAA	149	0:35	0:35	0:35
AAA BBB	538	1:25	1:25	1:25
AAA CCC	508	1:22	1:22	1:22
AAA DDD	584	1:18	1:18	1:18
AAA EEE	74	0:22	0:22	0:22
AAA FFF	380	0:50	0:50	0:50
AAA GGG	601	1:28	1:28	1:28
AAA HHH	785	1:51	1:51	1:51
AAA III	324	0:55	0:55	0:55
AAA JJJ	628	1:28	1:28	1:28
AAA KKK	350	0:53	0:53	0:53
AAA LLL	351	0:53	0:53	0:53
AAA MMM	218	0:37	0:37	0:37
AAA NNN	430	1:03	1:03	1:03
AAA OOO	244	0:48	0:48	0:48
AAA PPP	1799	4:01	4:01	4:01
AAA QQQ	179	0:38	0:38	0:38
AAA RRR	695	1:45	1:45	1:45
AAA CCC	784	1:47	1:47	1:47
AAA EEE	122	1:45	1:45	1:45
AAA FFF	172	0:47	0:47	0:47
AAA GGG	244	0:43	0:43	0:43
AAA HHH	628	1:31	1:31	1:31
AAA IHH	935	2:09	2:09	2:09
AAA JJJ	525	1:20	1:20	1:20
AAA KKK	734	1:41	1:41	1:41
AAA LLL	569	1:21	1:21	1:21
AAA MMM	508	1:13	1:13	1:13
AAA NNN	219	0:37	0:37	0:37
AAA OOO	442	1:05	1:05	1:05
AAA PPP	262	0:55	0:55	0:55
AAA RRR	1589	3:35	3:35	3:35

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**** AIRPORT DISTANCES AND BLOCK TIMES ****

MIYPTA CASS - FILE ID:FAA_0001

FR TO	WB	DC9	707	727
000 AAA	300	0:54	0:54	0:54
000 BBB	426	1:13	1:13	1:13
000 CCC	540	1:26	1:26	1:26
000 DDD	679	1:39	1:39	1:39
000 EEE	368	1:01	1:01	1:01
000 FFF	203	0:38	0:38	0:38
000 GGG	166	0:36	0:36	0:36
000 HHH	597	1:27	1:27	1:27
000 III	447	1:10	1:10	1:10
000 JJJ	346	0:53	0:53	0:53
000 KKK	623	1:28	1:28	1:28
000 LLL	311	0:48	0:48	0:48
000 MMM	436	1:03	1:03	1:03
000 NNN	442	1:05	1:05	1:05
000 PPP	229	0:38	0:38	0:38
000 QQQ	1642	3:42	3:42	3:42
000 RRR	192	0:39	0:39	0:39
000 SSS	337	1:01	1:01	1:01
000 TTT	380	1:06	1:06	1:06
000 UUU	474	1:14	1:14	1:14
000 VVV	179	0:35	0:35	0:35
000 WWW	232	0:42	0:42	0:42
000 XXX	372	0:59	0:59	0:59
000 YYY	573	1:24	1:24	1:24
000 ZZZ	239	0:44	0:44	0:44
000 AAA	368	0:58	0:58	0:58
000 BBB	397	0:59	0:59	0:59
000 CCC	153	0:29	0:29	0:29
000 DDD	244	0:40	0:40	0:40
000 EEE	362	0:55	0:55	0:55
000 FFF	229	0:38	0:38	0:38
000 GGG	1800	4:02	4:02	4:02
000 HHH	1684	3:54	3:54	3:54
000 III	2078	4:43	4:43	4:43
000 JJJ	2172	4:57	4:57	4:57
000 KKK	2267	5:05	5:05	5:05
000 LLL	1829	4:08	4:08	4:08
000 MMM	1569	3:36	3:36	3:36
000 NNN	1690	3:51	3:51	3:51
000 OOO	200	4:55	4:55	4:55
000 PPP	2036	4:36	4:36	4:36
000 QQQ	1941	4:19	4:19	4:19
000 RRR	2144	4:45	4:45	4:45
000 SSS	1935	4:18	4:18	4:18
000 TTT	1799	4:01	4:01	4:01
000 UUU	1509	3:35	3:35	3:35
000 VVV	1642	3:42	3:42	3:42
000 WWW	1800	4:02	4:02	4:02

BITPTA CASS - FILE 10:FRA_0001 ***** C O S T P E R S T A G E ***** LAST MODIF: 80/01/18 14:18:37.00

FR TO	NR	DC9	707	727
AAA 000	517	1452	2754	1891
AAA CCC	539	1493	2830	1944
AAA DDD	580	1524	2890	1985
AAA EEE	147	674	1239	881
AAA FFF	151	682	1313	891
AAA GGG	482	1297	2465	1690
AAA HHH	755	1805	3415	2349
AAA III	369	1117	2127	1458
AAA JJJ	559	1396	2649	1818
AAA KKK	481	1214	2308	1532
AAA LLL	330	970	1852	1265
AAA MMM	149	633	1222	828
AAA NNN	178	688	1327	901
AAA OOO	300	914	1748	1153
AAA PPP	182	695	1337	908
AAA RRR	1644	3593	6761	4670
000 AAA	517	1452	2754	1891
000 CCC	539	1493	2830	1944
000 DDD	580	1524	2890	1985
000 EEE	147	674	1239	881
000 FFF	151	682	1313	891
000 GGG	482	1297	2465	1690
000 HHH	755	1805	3415	2349
000 III	369	1117	2127	1458
000 JJJ	559	1396	2649	1818
000 KKK	481	1214	2308	1532
000 LLL	330	970	1852	1265
000 MMM	149	633	1222	828
000 NNN	178	688	1327	901
000 OOO	300	914	1748	1153
000 PPP	182	695	1337	908
000 RRR	1644	3593	6761	4670
000 CCC	517	804	1542	1050
000 DDD	353	1117	2127	1456
000 EEE	455	1277	2427	1664
000 FFF	553	1458	2768	1900
000 GGG	434	1238	2354	1613
000 HHH	259	912	1744	1190
000 III	244	913	1748	1193
000 JJJ	233	819	1570	1070
000 KKK	422	1171	2228	1526
000 LLL	187	734	1410	959
000 MMM	530	1372	2604	1787
000 NNN	695	1678	3179	2185
000 OOO	436	1197	2277	1560
000 PPP	337	1013	1932	1321
000 RRR	2078	8186	1586	1044
CCC AAA	539	1493	2830	1944
CCC BBB	153	804	1542	1050
CCC DDD	202	838	1602	1091
CCC EEE	438	1245	2367	1623
CCC FFF	612	1569	2973	2043
CCC GGG	572	1495	2834	1946
CCC HHH	360	1109	2096	1434
CCC III	184	803	1539	1048
CCC JJJ	366	1104	2103	1439
CCC KKK	303	949	1814	1239
CCC LLL	236	825	1581	1077
CCC MMM	508	1331	2528	1734
CCC NNN	704	1698	3210	2207
CCC OOO	540	1398	2639	1811
CCC PPP	280	1093	2082	1423
CCC RRR	2172	8515	1585	1085
000 AAA	588	1524	2890	1985
000 BBB	353	1117	2127	1456
000 CCC	202	838	1602	1091
000 DDD	453	1214	2308	1582
000 EEE	698	1668	3161	2173
000 FFF	747	1761	3332	2291
000 GGG	548	1390	2639	1811
000 HHH	235	838	1605	1094
000 III				

BITPTA CASS - FILE 10:FAA_0001 ***** C O S T P E R S T A G E ***** LAST MODIF: 00/01/10 14:10:27.00

FR TO	WB	DCB	707	727
000 JUJ	585	1415	2684	1842
000 RRR	179	659	1271	862
000 LLL	370	1015	1936	1323
000 MMM	504	1264	2402	1647
000 NNN	722	1669	3161	2173
000 OOO	678	1589	3012	2069
000 PPP	474	1208	2298	1574
000 RRR	267	8735		
EEE AAA	147	674	1299	881
EEE BBB	455	1277	2427	1684
EEE CCC	438	1245	2367	1623
EEE DDD	453	1214	2308	1582
EEE EEE	290	881	1685	1149
EEE GGG	548	1361	2583	1772
EEE HHH	711	1664	3151	2166
EEE III	258	847	1623	1108
EEE JJJ	558	1335	2535	1738
EEE KKK	315	883	1689	1152
EEE LLL	276	810	1553	1058
EEE MMM	74	434	850	570
EEE NNN	272	803	1539	1043
EEE OOO	386	1015	1936	1323
EEE PPP	179	629	1215	823
EEE RRR	1829	3603	7154	4943
FFF AAA	151	682	1313	891
FFF BBB	553	1459	2768	1900
FFF CCC	612	1569	2973	2043
FFF DDD	698	1669	3161	2173
FFF EEE	298	881	1685	1149
FFF GGG	368	1063	2026	1366
FFF HHH	760	1755	3321	2284
FFF III	486	1238	2394	1613
FFF JJJ	529	1281	2434	1658
FFF KKK	593	1400	2656	1823
FFF LLL	380	1003	1915	1309
FFF MMM	300	855	1638	1115
FFF NNN	244	750	1441	980
FFF OOO	203	674	1299	881
FFF PPP	233	730	1403	954
FFF RRR	1548	3120	6240	4315
GGG AAA	482	1297	2465	1690
GGG BBB	434	1236	2354	1613
GGG CCC	572	1495	2834	1946
GGG DDD	747	1761	3332	2291
GGG EEE	548	1361	2583	1772
GGG FFF	368	1063	2026	1366
GGG GGG	509	1288	2448	1678
GGG HHH	538	1372	2604	1787
GGG III	251	763	1466	937
GGG JJJ	734	1682	3147	2163
GGG KKK	286	1015	1926	1323
GGG LLL	601	1415	2684	1842
GGG MMM	628	1465	2776	1907
GGG NNN	186	643	1240	840
GGG OOO	372	988	1887	1289
GGG PPP	1690	2545	6670	4607

BITFPA CASS - FILE ID:FAA_0001

***** C O S T P E R S T A G E *****

***** LAST MODIF: 80/01/18 14:18:37.00 *****

FR TO	MM	DC9	707	727
MMH AAA	755	1805	3415	2349
MMH BBB	258	912	1744	1190
MMH CCC	360	1100	2096	1434
MMH DDD	548	1398	2639	1811
MMH EEE	711	1684	3151	2166
MMH FFF	760	1755	3321	2284
MMH GGG	509	1288	2448	1678
MMH III	501	1303	2475	1637
MMH JJJ	260	780	1497	1019
MMH KKK	661	1526	2893	1907
MMH LLL	435	1136	2106	1431
MMH MMM	785	1757	3325	2287
MMH NNN	935	2036	3847	2649
MMH OOO	537	1407	2670	1833
MMH PPP	573	1363	2587	1775
MMH RRR	2208		8446	
III AAA	369	1117	2127	1456
III BBB	244	914	1748	1193
III CCC	184	803	1539	1048
III DDD	235	838	1605	1094
III EEE	256	847	1623	1106
III FFF	466	1238	2354	1613
III GGG	538	1372	2604	1787
III HHH	501	1303	2475	1637
III IJJ	430	1128	2145	1468
III KKK	201	700	1347	915
III LLL	151	607	1173	734
III MMM	324	929	1778	1212
III NNN	525	1303	2375	1697
III OOO	447	1158	2234	1509
III PPP	239	771	1480	1007
III RRR	2036		7931	
JJJ AAA	559	1396	2649	1818
JJJ BBB	233	819	1570	1070
JJJ CCC	386	1104	2103	1439
JJJ DDD	535	1415	2684	1842
JJJ EEE	538	1335	2535	1738
JJJ FFF	529	1281	2434	1668
JJJ GGG	251	783	1486	997
JJJ HHH	760	1497	2800	1919
JJJ III	430	1126	2145	1468
JJJ KKK	628	1420	2695	1850
JJJ LLL	300	810	1553	1058
JJJ MMM	628	1420	2695	1850
JJJ NNN	734	1617	3064	2105
JJJ OOO	346	896	1713	1168
JJJ PPP	368	974	1859	1270
JJJ RRR	1941	3967	7481	5155
RRR AAA	461	1214	2308	1582
RRR BBB	422	1171	2228	1526
RRR CCC	303	949	1814	1239
RRR DDD	179	659	1271	862
RRR EEE	315	803	1689	1152
RRR FFF	593	1408	2656	1823
RRR GGG	734	1662	3147	2163
RRR HHH	661	1526	2893	1987

BITPTA CASS - FILE ID:FAA_0001 ***** C O S T P E R S T A G E ***** LAST MODIF: 00/01/18 14:18:57.00

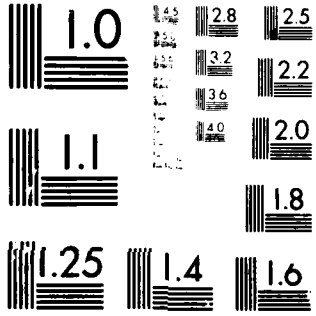
FR TO	NR	DC9	707	727
NRK III	201	700	1247	915
NRK JJJ	628	1420	2695	1850
NRK LLL	351	903	1727	1178
NRK MMM	549	1316	2489	1707
NRK OOO	624	1413	2681	1840
NRK PPP	397	990	1691	1292
NRK XXX	3144		8167	1265
LLL AAA	320	970	1852	1265
LLL BBB	107	734	1410	959
LLL CCC	236	825	1581	1072
LLL DDD	370	1015	1936	1323
LLL EEE	278	816	1553	1058
LLL FFF	380	1003	1915	1309
LLL GGG	388	1015	1936	1323
LLL HHH	435	1108	2106	1441
LLL III	151	607	1173	794
LLL JJJ	300	810	1553	1058
LLL KKK	351	905	1730	1181
LLL MMM	351	905	1730	1181
LLL NNN	508	1197	2277	1560
LLL OOO	311	820	1591	1084
LLL PPP	153	536	1041	703
LLL XXX	1935	3958	7440	5141
NRK AAA	149	633	1222	828
NRK BBB	530	1372	2604	1787
NRK CCC	508	1231	2528	1734
NRK DDD	504	1264	2402	1647
NRK EEE	74	434	850	570
NRK FFF	300	855	1636	1115
NRK GGG	601	1315	2604	1842
NRK HHH	785	1757	3325	2287
NRK III	324	928	1778	1212
NRK JJJ	628	1420	2695	1850
NRK KKK	356	903	1727	1178
NRK LLL	351	905	1730	1181
NRK MMM	219	659	1271	862
NRK OOO	420	1052	2005	1371
NRK PPP	244	706	1358	922
NRK XXX	1799	3703	6968	4812
NRK AAA	179	689	1327	901
NRK BBB	605	1678	3179	2185
NRK CCC	764	1898	3210	2207
NRK DDD	722	1669	3181	2173
NRK EEE	272	803	1539	1048
NRK FFF	244	750	1441	980
NRK GGG	628	1485	2778	1907
NRK HHH	935	2036	3847	2649
NRK III	525	1303	2475	1697
NRK JJJ	734	1617	3064	2105
NRK KKK	508	1310	2489	1707
NRK LLL	508	1197	2277	1560
NRK MMM	219	658	1271	862
NRK OOO	442	1074	2047	1400
NRK PPP	362	925	1769	1207
NRK XXX	1589	3312	6235	4305

LAST MODIF: 80/01/18 14:18:37.00

C O S T P E R S T A G E

BITFTA CASS - FILE ID:FAA_0001

PR TO	MM	DC9	707	727
000 AAA	300	914	1748	1193
000 BBB	456	1137	2277	1550
000 CCC	540	1390	2639	1811
000 DDD	679	1589	3012	2069
000 EEE	388	1015	1936	1323
000 FFF	203	674	1299	881
000 GGG	186	643	1240	840
000 HHH	597	1407	2670	1833
000 III	447	1158	2204	1509
000 JJJ	346	896	1713	1169
000 KKK	624	1313	2681	1870
000 LLL	311	830	1591	1084
000 MMM	430	1052	2005	1371
000 NNN	442	1074	2047	1400
000 OOO	229	678	1306	886
000 PPP	1642	3411	6420	4433
000 AAA	162	695	1337	908
000 BBB	337	1013	1922	1321
000 CCC	380	1093	2082	1425
000 DDD	474	1208	2298	1574
000 EEE	178	629	1215	823
000 FFF	233	730	1403	954
000 GGG	372	989	1887	1289
000 HHH	573	1363	2587	1775
000 III	239	771	1480	1007
000 JJJ	388	974	1859	1270
000 KKK	397	990	1891	1292
000 LLL	153	536	1041	703
000 MMM	244	706	1358	922
000 NNN	362	925	1769	1207
000 OOO	229	678	1306	886
000 PPP	1800	3705	6970	4815
000 AAA	1684	3593	6761	4670
000 BBB	2078	8188	8188	8188
000 CCC	2172	8515	8515	8515
000 DDD	2267	8735	8735	8735
000 EEE	1826	3803	7154	4943
000 FFF	1569	3320	6248	4315
000 GGG	1690	3543	6678	4607
000 HHH	2200	8446	8446	8446
000 III	2026	7931	7931	7931
000 JJJ	1941	3967	7461	5155
000 KKK	2144	8167	8167	8167
000 LLL	1935	3956	7440	5141
000 MMM	1799	3703	6966	4812
000 NNN	1589	3312	6235	4305
000 OOO	1642	3411	6420	4433
000 PPP	1800	3705	6970	4815



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

TABLE 3.3 AIRPORT DATA

BIT-FTA CASS FILE ID:FAA_0001 UNIVERSE FILE PRINTOUT LAST MODIFIED 86/01/10 14:16:37.00

MARKET SERVED DD:MM:SS DD:MM:SS

MARKET SERVED DD:MM:SS DD:MM:SS

MARKET SERVED DD:MM:SS DD:MM:SS

ID	CITY NAME	LATITUDE	LONGITUDE	TIME	ZONE	COMM	BASIC	COST	SEAT	REST
MARKET	SERVED	DD:MM:SS	DD:MM:SS	DD:MM:SS	DD:MM:SS	DD:MM:SS	DD:MM:SS	DD:MM:SS	DD:MM:SS	DD:MM:SS
AAA	ALPHA	41:02:00	82:00:00	2	30	12	0	0.00	0	0
BBB	BRAVO	36:00:00	79:00:00	1	25	14	0	0.00	0	0
CCC	CHARLIE	38:00:00	77:00:00	1	25	14	0	0.00	0	0
DDD	DELTA	41:00:00	75:00:00	1	25	10	0	0.00	0	0
EEE	ECHO	42:50:00	85:00:00	2	20	8	0	0.00	0	0
FFF	FOXTROT	39:00:00	90:00:00	2	20	8	0	0.00	0	0
GGG	GOLF	32:00:00	87:00:00	2	20	8	0	0.00	0	0
HHH	HOTEL	32:00:00	77:00:00	1	20	8	0	0.00	0	0
III	INDIA	40:00:00	80:00:00	1	20	10	0	0.00	0	0
JJJ	JULIET	33:30:00	82:00:00	1	10	5	0	0.00	1	0
KKK	KILO	43:00:00	78:00:00	1	10	5	0	0.00	1	0
LLL	LIMA	38:00:00	82:00:00	1	10	5	0	0.00	1	0
MMM	MINE	43:00:00	86:00:00	2	10	5	0	0.00	1	0
NNN	NOVEMBER	43:00:00	91:00:00	2	10	5	0	0.00	1	0
OOO	OSCAR	36:00:00	88:00:00	2	10	5	0	0.00	1	0
PPP	PAPA	39:00:00	85:00:00	2	10	5	0	0.00	1	0
RRR	RAY	30:00:00	120:00:00	4	35	12	0	0.00	0	0

TABLE 3.4 INITIAL SCHEDULES

FLIGHT SCHEDULES

WITFTA	CASS	INITIAL	TO	FROM	CLASS	TIME	DAY	TO	FROM	CLASS	TIME	DAY
TO PORTROT	FFF 2		TO HOTEL					TO INDIA		LLL 1		
FR CHARLIE	CCC 1		FR CHARLIE					FR DELTA		DDD 1		
13:59 15:47	GL 601	DC9 1	13:35 14:14	RD0320	727 0			12:15 15:35	GR 62	DC9 2		
16:50 18:51	BL 242	727 1	8:30 13:58	BL 210	BBB BL 272			14:00 14:52	GL1402	DC9 0		
21:57 23:35	GL 602	DC9 1	11:09 13:58	BL 214	BBB BL 272							
9:00 11:06	BL 721	AAA BL 240	FR DELTA					FR ECHO		EEE 2		
13:48 19:38	BL 211	BBB BL 273	FR DELTA					10:23 12:08	WT 12	DC9 0		
16:19 19:36	BL 792	AAA BL 273	12:25 14:14	RD0320	727 1			11:51 13:44	WT 301	DC9 2		
21:31 1:35	BL 743	AAA BL 244	FR HOTEL					FR JULIES		JJJ 1		
FR DELTA			FR HOTEL					20:40 22:01	GL 924	DC9 2		
17:56 18:51	BL 242	727 0	17:12 18:08	RD0032	DC9 1			FR LIMA		LLL 1		
9:00 13:30	BL 260	AAA BL 271	FR JULIET					8:04 10:28	GR 41	DC9 1		
13:16 19:36	BL 261	BBB BL 273	18:21 18:06	RD0032	DC9 0			9:15 11:09	GR 21	DC9 1		
15:10 18:36	BL 291	AAA BL 273	TO HOTEL					13:24 15:59	GR 42	DC9 1		
FR ECHO			TO HOTEL					13:40 15:25	GR 62	DC9 1		
15:57 17:36	BL 273	727 1	FR BRAVO					13:45 15:27	GR 22	DC9 1		
21:56 23:35	BL 244	727 1	7:50 10:38	RD0020	727 0							
FR JULIET			11:45 14:33	BL 281	727 0			FR ALPHA		AAA 2		
20:30 23:35	GL 602	DC9 2	17:50 20:38	RD0022	727 0			11:00 13:23	RD0011	727 0		
20:31 1:35	BL 282	AAA BL 244	FR BRAVO					15:08 19:41	GL 601	DC9 2		
FR KILG			6:30 9:54	RD0030	DC9 2			16:38 19:01	BL 382	727 0		
12:43 15:47	GL 601	DC9 2	8:00 8:53	BL 270	727 0			FR BRAVO		BBB 1		
TO GOLF			10:30 11:31	RD0041	DC9 0			6:30 8:52	RD0030	DC9 1		
FR ALPHA			12:30 13:23	UL 821	727 0			9:20 10:09	GL1400	DC9 0		
16:25 17:18	GL1142	DC9 0	16:00 16:53	RD0032	DC9 0			11:20 11:50	GL 301	DC9 0		
19:00 19:53	GL 804	727 0	16:18 17:11	RD0043	DC9 0			16:00 18:01	RD0032	DC9 1		
FR ALPHA			16:25 17:18	GL1142	DC9 0			18:15 17:04	GL1122	DC9 0		
7:03 7:09	RD0010	727 0	19:00 19:53	GL 804	727 0			18:52 19:41	GL 601	DC9 0		
9:19	BL 208	727 0	21:58 22:51	RD0045	DC9 0			FR CHARLIE		CCC 1		
17:09	RD0012	727 0	FR CHARLIE					01:06	RD0210	DC9 0		
17:15 22:34	GL1223	727 0	8:45 9:53	RD0041	DC9 0			10:49 11:50	GL 601	DC9 2		
FR BRAVO			15:16 17:11	RD0043	DC9 1			14:05 15:15	GL 822	DC9 0		
8:20 8:51	RD0030	DC9 0	18:43 19:50	GL 823	727 0			17:55 18:05	RD0230	DC9 0		
11:37 11:50	BL 272	727 0	20:50 22:51	RD0045	DC9 1			FR DELTA		DDD 1		
13:00 13:31	RD0031	DC9 0	FR DELTA					01:04	RD0210	DC9 1		
16:00 16:00	RD0032	DC9 0	11:00 13:23	GL 821	727 1			7:50 10:00	GL1400	DC9 1		
20:30 22:34	GL1223	727 1	12:15 13:42	WT 9	DC9 0			9:30 11:50	RD0210	DC9 1		
FR CHARLIE			12:45 14:12	RD0021	727 0			12:55 15:15	GL 822	DC9 1		
8:30 7:09	RD0300	727 0	14:55 17:18	GL1142	DC9 1			14:00 17:04	GL1123	DC9 1		
			15:22 17:53	GL 841	727 1			18:45 18:05	RD0230	DC9 1		
			17:25 19:53	GL 804	727 1			FR PORTROT		PPP 2		
								70:26				

F L I G H T S C H E D U L E S

<p>..... MITPTA CASS INITIAL TO PAPA PPP 2 FR ALPHA AAA 2 CAB 41.58 0:14 9:52 BL 200 727 0 13:08 13:46 BL 252 727 0 FR BRAVO BBB 1 CAB 57.07 CONNECTIONS 11:46 15:46 BL 794 AAA BL 252 13:12 15:46 BL 231 AAA BL 252 FR CHARLIE CCC 1 CAB 61.36 CONNECTIONS 8:00 11:52 BL 721 AAA BL 200 9:00 11:52 BL 740 AAA BL 200 12:12 15:46 BL 722 AAA BL 252 FR DELTA DDD 1 CAB 70.75 CONNECTIONS 9:00 11:52 BL 260 AAA BL 200 FR GOLF GGG 2 CAB 60.56 CONNECTIONS 11:39 15:46 BL 380 AAA BL 252 FR NOVEMBER NNN 2 CAB 59.56 12:11 13:46 BL 252 727 1 FR OSCAR OOO 2 CAB 46.28 8:00 9:52 BL 200 727 1 TO IRAY XXX 4 FR ALPHA AAA 2 CAB 191.63 8:00 10:14 GR 701 727 0 16:18 18:32 BL 792 707 0 17:00 19:14 GR 902 727 0 18:33 20:47 BL 791 707 0 FR BRAVO BOB 1 CAB 236.99 17:38 20:47 BL 791 707 1 CONNECTIONS 14:56 22:32 BL 211 CCC BL 792 FR CHARLIE CCC 1 CAB 246.38 8:55 10:14 GR 701 727 1 15:19 18:32 BL 792 707 1</p>	<p>..... TO IRAY XXX 4 FR CHARLIE CCC 1 15:30 19:14 GR 902 727 1 CONNECTIONS 16:24 0:47 BL 723 AAA BL 791 16:48 0:47 BL 751 AAA BL 791 FR DELTA DDD 1 CAB 249.87 CONNECTIONS 15:10 22:32 BL 291 AAA BL 792 16:37 0:47 BL 262 AAA BL 791</p>
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BITFTA CASS AIRPORT ACTIVITY PROFILE FOR STATION AAA

TIME O FLIGHT EQ	TIME O FLIGHT EQ	TIME O FLIGHT EQ	TIME O FLIGHT EQ
0:54 A BL 793 707	0:14 D BL 200 727	13:57 A GR 52 DC9	17:50 D RD0023 727
0:25 D GL 500 727	9:25 D GR 11 DC9	13:57 D GR 303 727	17:55 D GR 103 727
0:30 D GR 301 727	9:32 D GR 001 727	14:07 A BL 790 707	18:00 D GR 23 DC9
0:30 D RD0010 727	10:00 A BL 290 727	14:13 A RD0011 727	18:00 D GR 402 727
0:37 A GL 600 DC9	10:12 A GR 201 727	14:17 D GR 52 DC9	18:13 A BL 791 707
0:45 D GR 201 727	10:25 A BL 251 727	14:24 A GR 202 727	18:14 A BL 203 727
0:57 D GL 600 DC9	10:27 A BL 711 707	14:32 D BL 790 707	18:27 D BL 263 727
1:00 D BL 711 707	10:31 A BL 211 727	14:38 A GL 601 DC9	18:33 D BL 791 707
1:00 D GR 21 DC9	10:45 D BL 251 727	14:39 A BL 712 707	18:34 D BL 203 727
1:11 D GL 100 727	10:51 D BL 221 727	14:51 A GR 802 727	18:39 A GR 203 727
1:30 A GR 401 727	10:55 D GL1201 727	14:52 A BL 291 727	18:51 A BL 713 707
1:30 A RD0020 727	10:59 A BL 280 727	15:08 D GL 601 DC9	18:58 A BL 274 727
1:34 A GR 701 727	11:00 D RD0011 727	15:10 D GR 203 727	19:06 A BL 292 727
1:35 A GL1220 727	11:12 D BL 712 707	15:11 D GR 802 727	19:07 A GL 102 727
1:39 D GR 401 727	11:21 D BL 291 727	15:12 A BL 253 727	19:18 D BL 274 727
1:50 D GR 401 727	11:21 A BL 794 707	15:24 D BL 713 707	19:25 D GR 204 727
1:50 D RD0020 727	11:27 A BL 750 707	15:32 D BL 253 727	19:29 A RD0012 727
1:55 D GL1220 727	11:37 A GR 901 727	15:42 A GL1222 727	19:36 D BL 714 707
1:59 D BL 721 707	11:41 A GR 31 DC9	15:43 D BL 292 727	19:50 A BL 255 727
0:00 D BL 280 727	11:45 D BL 281 727	15:45 A GR 603 727	19:51 A BL 282 727
0:00 D BL 794 707	11:47 A BL 231 727	15:51 A GR 12 DC9	20:10 D BL 255 727
0:00 D GR 701 727	11:49 A GL 100 727	15:53 A BL 281 727	20:13 A BL 243 727
0:07 A BL 240 727	11:51 A BL 722 707	15:56 A BL 792 707	20:15 A BL 724 707
0:07 A BL 250 727	12:00 D GR 901 727	16:02 D GL1222 727	20:33 D BL 243 727
0:08 A GR 601 727	12:06 D BL 795 707	16:09 A BL 723 707	20:33 A BL 752 707
0:10 A BL 220 727	12:07 D BL 231 727	16:09 A GR 902 727	20:39 A GR 304 727
0:25 D GR 41 DC9	12:11 D BL 722 707	16:11 D GR 12 DC9	20:55 A GL1223 727
0:27 D BL 240 727	12:19 A BL 201 727	16:18 D BL 793 707	20:59 A GR 504 727
0:27 D BL 250 727	12:30 D GR 22 DC9	16:23 D BL 723 707	21:10 A BL 743 707
0:27 A GR 51 DC9	12:30 D BL 201 727	16:27 A BL 751 707	21:15 D GL1223 727
0:30 D BL 220 727	12:46 A GR 102 727	16:30 D GR 604 727	21:30 D BL 743 707
0:30 D BL 290 727	12:48 A BL 252 727	16:30 D RD0012 727	21:39 A WT 503 DC9
0:34 A GR 101 727	12:52 A BL 222 727	16:37 A BL 373 727	22:10 A GL 903 727
0:39 A BL 740 707	12:52 A BL 741 707	16:37 A GR 702 727	22:36 A BL 244 727
0:39 A WT 1 DC9	13:12 D GR 302 727	16:38 D BL 282 727	22:36 A GL 602 DC9
0:39 A WT 2 DC9	13:15 A GL1231 727	16:50 A GL 902 727	22:52 A GR 204 727
0:42 A BL 260 727	13:22 A GR 502 727	16:57 D BL 273 727	22:54 A GR 23 DC9
0:47 D GR 51 DC9	13:22 D GR 502 727	16:58 A BL 742 707	22:56 D BL 244 727
0:53 D GR 602 727	13:06 D BL 252 727	17:00 D GR 702 727	22:56 D GL 602 DC9
0:54 A BL 200 727	13:09 A GL 901 727	17:00 D GR 902 727	23:00 D WT503B DC9
0:54 D GR 101 727	13:12 D BL 222 727	17:09 A GR 103 727	
0:59 D BL 740 707	13:12 D BL 741 707	17:10 D GL 902 727	
0:59 D WT 1 DC9	13:12 A GR 302 727	17:11 A GR 22 DC9	
0:59 D WT 2 DC9	13:15 A GL1231 727	17:12 D BL 752 707	
0:02 D BL 260 727	13:22 A GR 502 727	17:18 D BL 742 707	
0:05 A GR 11 DC9	13:22 D GL 901 727	17:27 A BL 254 727	
0:07 A GL1200 727	13:35 A GR 42 DC9	17:30 A RD0022 727	
0:12 A GR 601 727	13:36 D GL1221 727	17:31 A GR 32 DC9	
	13:55 D GR 42 DC9	17:39 A GR 402 727	
		17:42 A BL 262 727	
		17:47 D BL 254 727	

REPORT ACTIVITY PROFILE FOR STATION AAA

MITTE CASS

PROPERTY NUMBER

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	
1	0	0	0	0	0	0	7	13	27	0	10	12	13	15	10	12	15	15	10	0	0	4	7	1

AIRPORT ACTIVITY PROFILE FOR STATION BBS

BITPTA CASS

TIME O FLIGHT EQ	TIME O FLIGHT EQ	TIME O FLIGHT EQ	TIME O FLIGHT EQ
0:00 D GR 601 727	12:00 D RD0031 DC9	17:07 D BL 262 727	23:03 A WT 400 DC9
0:30 D RD0030 DC9	12:01 A GL 601 727	17:12 A GR 42 DC9	
0:55 D GR 401 727	12:10 A GL 621 727	17:12 A GR 52 DC9	
0:59 D BL1200 727	12:15 D GL1141 DC9	17:37 A GR 602 727	
	12:16 A BL 241 727	17:38 D BL 791 707	
7:00 D GR 41 DC9	12:17 A GR 302 727	17:57 D GR 43 DC9	
7:00 D GR 51 DC9	12:18 D GR 801 727	17:57 D GR 802 727	
7:30 D BL 230 727	12:30 D GL 821 727		
7:35 A RD0040 DC9	12:30 D GR 42 DC9	18:00 D WT 500 DC9	
7:40 A GL 300 DC9	12:30 D GR 52 DC9	18:06 A GR 503 727	
7:55 D RD0040 DC9	12:36 D BL 241 727	18:11 A BL 292 727	
	12:37 D GR 302 727	18:15 A BL 233 727	
8:00 D BL 270 727		18:28 A GL1222 727	
8:00 D WT 300 DC9	13:00 D GL 602 727	18:31 D BL 292 727	
8:00 D GL 300 DC9	13:15 A RD0042 DC9	18:32 A GL 601 DC9	
8:10 A GR 11 DC9	13:26 A BL 261 727	18:35 A GL 804 727	
8:10 A BL 210 727	13:28 A GL 402 727	18:46 A GL1124 DC9	
8:25 A GL 800 727	13:35 D RD0042 DC9	18:51 D GR 504 727	
8:30 D GR 11 DC9	13:36 A BL 211 727	18:52 D GL 601 DC9	
8:30 D BL 210 727	13:39 A GR 401 727	18:55 A RD0044 DC9	
8:51 A GL 900 727	13:46 D BL 261 727	18:58 A BL 213 727	
8:56 A GR 301 727	13:58 D BL 211 727		
9:00 D GL 800 727	14:15 D GL 404 727	19:00 D GL 804 727	
9:00 A GL1400 DC9	14:20 A GR 62 DC9	19:08 D GL1124 DC9	
9:01 A GL 940 727	14:24 D GR 402 727	19:15 D RD0044 DC9	
9:05 A GR 61 DC9	14:30 A BL 272 727	19:18 D BL 213 727	
9:16 D GR 301 727	14:33 A BL 231 727	19:38 A BL 752 707	
9:30 D BL1400 DC9	14:40 D GR 62 DC9	19:44 A GR 304 727	
9:21 D BL 240 727	14:46 A GL 322 DC9	19:51 A GR 43 DC9	
9:25 D GR 61 DC9	14:53 A RD0031 DC9	19:58 D BL 752 707	
9:35 A GL1120 DC9	14:56 A GR 12 DC9	20:04 D GR 304 727	
10:00 A BL 270 727	15:08 D GL 322 DC9	20:08 A GL1205 727	
10:15 D GL 900 727	15:10 A GL1122 DC9	20:26 D GL1223 727	
10:18 A RD0041 DC9	15:15 D BL 273 727	20:26 A GR 402 727	
10:26 A BL 794 707	15:16 D GR 12 DC9	20:29 A GR 604 727	
10:27 A BL 230 727	15:18 D BL 233 727	20:48 A RD0032 DC9	
10:29 A GR 501 727	15:38 A BL 741 707	20:48 D BL 224 727	
10:30 D GL1121 DC9	15:58 A RD0043 DC9	20:48 A GL 924 DC9	
10:30 D RD0041 DC9		20:48 K GL 902 727	
10:41 A GL 301 DC9	16:00 D RD0032 DC9	20:53 A BL 263 727	
10:48 D BL 294 707	16:05 A GL1142 DC9	21:06 D GL 924 DC9	
10:57 A BL 214 727	16:15 D GL1122 DC9	21:13 D BL 263 727	
11:01 D GL 301 DC9	16:18 D RD0043 DC9	21:35 D GL 903 727	
11:09 A RD0030 DC9	16:23 D BL 742 707	21:38 A RD0045 DC9	
11:12 D BL 231 727	16:23 A GR 303 727	21:56 A GR 104 727	
11:14 D GR 502 727	16:25 D GL1142 DC9	21:58 D RD0045 DC9	
11:17 D BL 214 727	16:32 A GL 641 727	21:59 A GR 23 DC9	
11:27 D BL 272 727	16:43 D GR 303 727	22:16 D GR 104 727	
11:32 A GR 41 DC9	16:47 A BL 262 727	22:18 D GR 23 DC9	
11:42 A GR 51 DC9	16:53 A BL 790 707	22:29 A BL 274 727	
11:55 A GL1141 DC9			
11:56 A GR 901 727	17:00 D GL 841 727	23:02 A WT 500 DC9	
	17:00 D GL1403 DC9		

MIPTA CASS

AIRPORT ACTIVITY PROFILE FOR STATION 800

PROFILE SUMMARY

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0	0	0	0	0	0	4	6	10	9	11	10	12	9	9	7	12	9	13	8	11	7	3	3

AIRPORT ACTIVITY PROFILE FOR STATION CCC

DELTA CASS

TIME O FLIGHT EQ	TIME O FLIGHT EQ	TIME O FLIGHT EQ	TIME O FLIGHT EQ
6:26 D R00300 727	11:59 A GL1401 DC9	16:20 D GR 103 727	22:04 A BL 714 707
6:56 B GR 761 727	12:03 A BL 214 727	16:40 A GR 402 727	22:13 D GL 924 DC9
7:00 B BL 721 707	12:07 D GR 102 727	16:50 D BL 242 727	23:13 D GR 204 727
7:00 D GL 300 DC9	12:13 D BL 741 707	17:00 D GR 402 727	23:02 A GR 104 727
7:30 B BL 210 727	12:13 D GR 11 DC9	17:05 D BL 223 727	23:58 A BL 743 707
7:34 A R00200 DC9	12:19 D GL1401 DC9	17:15 D GL 102 727	
7:54 D R00200 DC9	12:20 A GL 402 727	17:25 A BL 212 727	
7:55 D GR 101 727	12:30 D GL 901 727	17:28 A R00330 727	
8:00 D BL 740 727	12:32 A GR 602 727	17:38 A GR 203 727	
8:26 A GL1140 DC9	12:40 D GL 402 727	17:52 A BL 713 707	
8:35 A GL 400 727	12:48 D BL 211 727	17:55 D R00230 DC9	
8:38 A WT 3 DC9	13:15 A R00320 727	18:00 D GR 203 727	
8:41 A R00040 DC9	13:17 D GR 603 727	18:01 A WT 100 DC9	
8:46 D GL1140 DC9	13:23 A GL1201 727	18:05 A GL 405 727	
8:50 A GL 820 727	13:25 A GR 202 727	18:10 D BL 213 727	
8:50 D WT 2 DC9	13:35 D R00320 727	18:12 D BL 713 707	
9:13 A GR 201 727	13:39 A GL 601 DC9	18:21 D WT 100 DC9	
9:19 D GL 820 727	13:40 A BL 712 707	18:23 A GL 823 727	
9:24 A BL 210 727	13:44 A R00220 DC9	18:39 A GR 12 DC9	
9:26 A GL 920 DC9	13:45 A GL 922 DC9	18:43 D GL 823 727	
9:28 A BL 711 707	13:45 D GR 202 727	18:51 A BL 723 707	
9:30 D R00041 DC9	13:59 D GL 601 DC9	18:59 A GL1142 DC9	
9:33 D GR 201 727	14:00 D BL 712 707	18:59 D GR 12 DC9	
9:39 A GL 100 727	14:00 D GL1201 727	19:00 D GL 406 727	
9:45 D GL 401 727	14:04 D R00220 DC9	19:00 A GL1205 727	
9:46 D GL 920 DC9	14:05 D GL 922 DC9	19:03 D GR 43 DC9	
9:48 D BL 711 707	14:21 A R00042 DC9	19:18 D GL1142 DC9	
9:50 D GL 100 727	14:28 A GR 901 727	19:20 D GL1205 727	
10:01 A GR 21 DC9	14:34 A BL 725 707	19:28 A GR 702 727	
10:09 D BL 214 727	14:39 A BL 722 707	19:36 D BL 724 707	
10:09 A GL 600 DC9	14:42 A BL 211 727	19:38 A GL 902 727	
10:10 A GR 31 DC9	15:01 A GL 404 727	19:45 A GL 323 DC9	
10:18 A GR 401 727	15:10 D R00043 DC9	19:46 A BL 742 707	
10:20 A R00310 DC9	15:19 D BL 792 707	20:00 D GL 902 727	
10:21 D GR 21 DC9	15:21 D GL 404 727	20:01 A R00044 DC9	
10:23 A GL1220 727	15:24 D BL 723 707	20:04 A BL 213 727	
10:27 A BL 721 707	15:26 A GL 101 727	20:23 A GR 103 727	
10:28 A BL 750 707	15:27 D BL 212 727	20:31 D BL 743 707	
10:28 A R00310 727	15:28 A BL 751 707	20:50 D R00045 DC9	
10:29 B GR 31 DC9	15:30 D GR 902 727	20:50 A WT 102 DC9	
10:30 B GR 401 727	15:31 A GR 22 DC9	21:08 D GR 104 727	
10:40 D R00310 DC9	15:34 A GR 102 727	21:10 D WT 102 DC9	
10:40 D BL 750 707	15:37 A GL 822 727	21:32 A BL 224 727	
10:40 D R00310 727	15:45 A GR 32 DC9	21:34 A GL 602 DC9	
	15:48 D BL 751 707	21:52 D BL 224 727	
11:00 D GL 600 DC9	15:51 D GR 22 DC9	21:52 A GL 624 DC9	
11:00 D GL1220 727	15:52 A GL 322 DC9	21:53 A GR 204 727	
11:01 A GL 500 727	16:00 D GL 922 727	21:57 D GL 602 DC9	
11:12 D BL 722 727	16:09 D GL 922 727		
11:22 A GR 101 727	16:12 D GL 322 DC9		
11:27 A BL 740 707	16:15 D GR 32 DC9		
11:53 A GR 11 DC9	16:30 A BL 342 727		

MEPFA CASS

AIRPORT ACTIVITY PROFILE FOR STATION CCG

PROFILE SUMMARY

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
0	0	0	0	0	0	2	6	8	12	16	8	10	11	8	16	8	8	13	10	7	0	3	8

TABLE 3.5 TRAFFIC DATA

09/01/31 13:11:03.00

T R A F F I C D A T A

INITIAL STATE

BLTPTA CASS

MARKET	DIST.	PAX/DAY	TOT KPM/DAY	TOT	ID	PAX/DAY	TOT	KCAR	KPM/DAY	KCAR
AAA-BBB	517	1000.7	4.10	561.0	4.91	BL	489.1	45.01	5.45	252.9
						CR	449.1	41.23	6.56	232.2
						GL	148.4	13.66	2.20	76.7
AAA-CCC	539	3276.6	0.59	1237.1	10.72	BL	981.5	43.11	10.94	529.0
						CR	849.7	41.71	13.07	511.9
						GL	345.5	15.10	5.12	186.2
AAA-DDD	780.0	2.96	462.1	4.04	CR	502.5	83.94	7.34	295.5	
						BL	177.6	22.60	1.98	104.4
						WT	63.0	8.02	4.56	37.1
						GL	42.0	5.45	0.63	25.2
AAA-EEE	147	290.4	1.13	43.0	0.38	BL	188.6	63.20	2.10	27.7
						WT	60.5	20.28	4.37	6.9
						GL	49.3	16.52	0.73	7.2
AAA-FFF	151	185.0	0.70	28.1	0.25	BL	137.7	74.09	1.53	20.0
						GL	48.2	25.91	0.71	7.3
AAA-GGG	482	204.8	0.77	98.7	0.66	RD	107.2	52.33	4.19	51.7
						BL	66.3	32.36	0.74	31.9
						GL	31.4	15.31	0.46	15.1
AAA-HHH	755	176.0	0.67	133.5	1.17	RD	116.6	65.97	4.56	88.1
						BL	60.2	34.03	0.67	45.4
AAA-III	389	90.5	0.34	33.4	0.29	CR	90.6	100.00	1.32	33.4
AAA-JJJ	559	109.6	0.41	81.2	0.54	BL	53.0	48.39	0.59	29.6
						RD	48.4	44.15	1.89	27.0
						GL	8.2	7.47	0.12	4.6
AAA-KKK	461	18.9	0.07	8.7	0.08	GL	18.9	100.00	0.28	8.7
AAA-LLL	330	45.7	0.17	15.1	0.13	CR	45.7	100.00	0.67	15.1
AAA-MMM	149	112.6	0.42	16.0	0.15	BL	98.1	87.09	1.09	14.6
						GL	14.5	12.91	0.22	2.2
AAA-NNN	179	134.5	0.51	24.1	0.21	BL	101.9	75.76	1.14	18.2
						GL	32.6	24.24	0.48	5.8
AAA-OOO	300	40.0	0.15	12.3	0.11	BL	40.9	100.00	0.46	12.3
AAA-PPP	182	70.0	0.26	12.7	0.11	BL	70.0	100.00	0.76	12.7
AAA-RRR	1804	331.1	1.25	957.6	4.07	CR	207.0	62.76	3.04	350.0
						BL	123.3	37.24	1.37	207.7
BBB-AAA	517	1000.7	4.09	560.8	4.90	CR	523.5	48.26	7.65	270.6
						BL	429.7	39.61	4.78	222.2
						GL	131.6	12.13	1.95	60.6
BBB-CCC	153	1310.5	4.94	200.5	1.75	BL	489.1	25.78	0.23	71.8

00/01/31 13:11:03.00

T R A F F I C D A T A

INITIAL STATE

MARKET CLASS

MARKET CLASS	DIST.	PAY/DAY	STOT KPM/DAY	STOT	ID	PAY/DAY	STOT	KCAR	KPM/DAY	KCAR	
SBS-000	383	016.0	3.08	288.4	2.52	GR	328.9	40.27	4.80	116.1	3.39
					GL	310.8	38.04	4.80	109.7	5.08	
					BL	30.3	11.13	1.01	32.1	0.72	
SBS-000	495	220.0	0.83	100.5	0.88	BL	214.3	97.03	2.39	97.5	2.18
					WT	4.6	2.06	0.33	2.1	0.58	
					GL	2.0	0.91	0.03	0.9	0.04	
SBS-000	583	105.7	0.40	58.4	0.51	BL	105.7	100.00	1.18	58.4	1.31
					RD	107.1	57.84	4.19	46.5	4.78	
					BL	48.7	26.29	0.94	21.1	0.47	
SBS-000	434	185.2	0.70	80.4	0.70	BL	48.7	26.29	0.94	21.1	0.47
					GL	29.4	15.87	0.44	12.8	0.59	
					BL	114.5	43.16	1.78	29.7	1.37	
SBS-000	299	265.3	1.00	88.7	0.60	GL	114.5	43.16	1.78	29.7	1.37
					RD	104.9	39.54	4.10	27.2	2.79	
					BL	45.9	17.30	0.51	11.6	0.27	
SBS-000	344	182.6	0.60	44.5	0.39	GR	111.4	61.04	1.63	27.2	0.79
					GL	67.4	26.90	1.00	16.4	0.76	
					WT	3.8	2.06	0.27	0.9	0.22	
SBS-000	233	188.4	0.71	43.9	0.38	GL	167.3	88.82	2.48	39.0	1.81
					RD	21.1	11.18	0.82	4.9	0.50	
					GL	78.5	100.00	1.18	33.1	1.53	
SBS-000	422	76.5	0.30	33.1	0.29	GL	78.5	100.00	1.25	16.0	0.47
					GR	85.7	100.00	1.25	16.0	0.47	
					BL	84.4	100.00	0.72	44.8	1.00	
SBS-000	187	85.7	0.32	16.0	0.14	GR	85.7	100.00	1.25	16.0	0.47
					BL	33.1	100.00	0.37	14.4	0.32	
					BL	41.0	100.00	0.48	13.8	0.31	
SBS-000	426	33.1	0.12	14.4	0.13	BL	41.0	100.00	0.48	13.8	0.31
					BL	41.0	100.00	0.48	13.8	0.31	
					BL	131.6	273.5	2.39	BL	131.6	100.00
CCC-000	539	2203.3	0.31	1187.6	10.38	BL	1043.8	47.38	11.63	562.6	12.58
					GR	965.7	42.83	16.11	520.5	18.20	
					GL	193.8	8.79	2.87	104.4	4.84	
CCC-000	153	1282.2	4.04	186.2	1.71	BL	438.1	24.17	4.88	67.0	1.50
					GL	388.1	30.27	5.75	58.4	2.75	
					GR	234.1	18.25	3.42	35.8	1.05	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
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					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
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CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
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					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282	1488.4	5.61	300.7	2.63	GL	714.5	48.00	10.58	144.3	6.68
					GR	240.0	16.12	3.51	48.5	1.42	
					WT	198.1	13.31	14.31	40.0	0.62	
CCC-000	282										

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T R A F F I C D A T A

INITIAL STATE

MUTTA CLASS

MUTTA CLASS	DIST.	PAK/DAY	STOT KPM/DAY	STOT	ID	PAK/DAY	STOT	SCAR KPM/DAY	SCAR
WANEY	438	147.8	0.55	64.4	BL	124.7	84.80	1.39	54.6
CCC-EEE	438	147.8	0.55	64.4	GL	22.4	15.20	0.33	9.8
CCC-FFF	612	87.2	0.33	53.4	BL	61.6	70.70	0.69	37.7
CCC-FFF	612	87.2	0.33	53.4	GL	25.5	29.30	0.38	15.6
CCC-666	972	120.1	0.45	68.7	RD	107.5	89.50	4.20	61.5
CCC-666	972	120.1	0.45	68.7	BL	12.6	18.50	0.14	7.2
CCC-NNN	308	182.8	0.69	65.8	GL	150.8	82.51	2.23	54.3
CCC-NNN	308	182.8	0.69	65.8	RD	32.0	17.48	1.25	11.5
CCC-111	184	112.7	0.43	20.7	GR	71.4	63.30	1.04	13.1
CCC-111	184	112.7	0.43	20.7	GL	41.4	36.70	0.61	7.6
CCC-JJJ	206	151.0	0.57	59.3	RD	99.8	86.08	3.90	30.5
CCC-JJJ	206	151.0	0.57	59.3	GL	51.2	33.92	0.76	10.8
CCC-AAA	303	244.5	0.82	74.1	GL	244.5	100.00	3.82	74.1
CCC-LLL	236	74.2	0.28	17.9	GR	74.2	100.00	1.08	17.5
CCC-NNN	908	41.7	0.16	21.2	BL	41.7	100.00	0.47	21.2
CCC-NNN	704	34.3	0.13	24.2	BL	34.3	100.00	0.38	24.2
CCC-000	840	19.8	0.07	10.7	BL	19.8	100.00	0.22	10.7
CCC-PPP	380	38.3	0.14	14.6	BL	38.3	100.00	0.43	14.6
800-AAA	808	785.4	2.96	461.8	GR	349.0	44.43	5.10	205.2
800-AAA	808	785.4	2.96	461.8	GL	200.7	25.55	2.97	118.0
800-AAA	808	785.4	2.96	461.8	BL	159.8	20.35	1.78	94.0
800-AAA	808	785.4	2.96	461.8	WT	75.9	9.68	5.48	44.8
800-888	253	812.1	3.06	286.7	GL	348.0	42.80	5.13	122.1
800-888	253	812.1	3.06	286.7	GR	345.1	42.50	5.04	121.8
800-888	253	812.1	3.06	286.7	BL	92.7	11.41	1.03	32.7
800-888	253	812.1	3.06	286.7	WT	28.3	3.48	2.04	10.6
800-CCC	282	1320.5	4.98	368.7	GL	827.8	47.33	9.39	126.8
800-CCC	282	1320.5	4.98	368.7	WT	330.5	17.46	16.66	46.6
800-CCC	282	1320.5	4.98	368.7	RD	188.3	14.26	7.36	38.8
800-CCC	282	1320.5	4.98	368.7	GR	186.3	14.11	2.72	37.6
800-CCC	282	1320.5	4.98	368.7	BL	87.7	6.64	0.98	17.7
800-EEE	483	98.2	0.37	44.5	WT	59.2	60.30	4.28	26.8
800-EEE	483	98.2	0.37	44.5	BL	38.0	39.70	0.43	17.7
800-FFF	698	51.8	0.19	26.8	BL	51.8	100.00	0.89	36.0
800-000	747	44.1	0.17	33.8	RD	44.1	100.00	1.72	33.0
800-NNN	548	118.9	0.45	65.1	GL	57.4	48.26	0.85	31.4
800-NNN	548	118.9	0.45	65.1	WT	40.8	34.40	2.95	22.4
800-NNN	548	118.9	0.45	65.1	RD	20.6	17.34	0.81	11.3

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INITIAL STATE		T R A F F I C D A T A											
MARKET	DIST.	PAZ/DAY	XTOT	KPM/DAY	XTOT	ID	PAZ/DAY	XTOT	KPM/DAY	XTOT	KPM/DAY	XTOT	KPM/DAY
000-III	235	98.9	0.37	22.8	0.20	GL	50.3	51.90	0.74	11.8	0.55	0.20	0.20
						WT	17.6	18.20	1.37	4.1	1.00		
000-JJJ	505	50.3	0.19	29.4	0.26	GL	33.2	66.08	0.49	19.4	0.90		
						RD	17.1	33.92	0.67	10.0	1.03		
000-NNA	179	186.6	0.70	33.4	0.29	GL	105.8	56.70	1.57	19.9	0.86		
						WT	80.8	43.30	5.84	14.5	3.40		
000-LLL	370	29.9	0.11	11.1	0.10	GR	16.0	52.48	0.23	5.9	0.17		
						WT	13.9	46.52	1.01	5.2	1.24		
000-MMM	504	18.9	0.07	9.5	0.08	BL	18.9	100.00	0.21	9.5	0.21		
000-NMM	722	19.7	0.07	13.5	0.12	GL	12.7	67.94	0.19	9.2	0.43		
						BL	6.0	32.06	0.07	4.3	0.10		
000-000	679	4.9	0.02	3.3	0.03	BL	4.9	100.00	0.05	3.3	0.07		
000-PPP	474	13.3	0.05	6.3	0.06	BL	13.3	100.00	0.15	6.3	0.14		
EEE-NAA	147	318.6	1.20	46.8	0.41	BL	192.5	60.44	2.15	28.3	0.63		
						WT	57.6	21.21	4.88	9.9	2.39		
						GL	58.5	18.35	0.87	8.6	0.40		
EEE-000	455	233.0	0.88	106.4	0.93	BL	213.2	91.18	2.38	37.0	2.17		
						WT	16.5	7.05	1.19	7.5	1.80		
						GL	4.1	1.77	0.08	1.0	0.09		
EEE-CCC	438	139.0	0.52	60.9	0.53	BL	126.8	91.24	1.41	55.5	1.24		
						GL	12.2	6.76	0.18	5.3	0.25		
EEE-000	453	86.8	0.33	39.3	0.34	BL	46.1	53.13	0.51	20.9	0.47		
						WT	40.7	46.87	2.94	18.4	4.43		
EEE-FFF	299	29.9	0.11	8.7	0.08	BL	29.9	100.00	0.33	8.7	0.19		
EEE-NMM	711	11.2	0.04	7.9	0.07	BL	11.2	100.00	0.12	7.9	0.18		
EEE-III	256	78.7	0.30	20.1	0.18	WT	78.7	100.00	5.68	20.1	4.84		
FFF-NAA	151	177.9	0.67	26.9	0.23	BL	163.2	91.74	1.82	24.6	0.55		
						GL	14.7	6.26	0.22	2.2	0.10		
FFF-000	553	122.9	0.46	67.9	0.59	BL	94.8	69.03	0.95	48.9	1.05		
						GL	38.0	30.97	0.56	21.0	0.97		
FFF-CCC	612	108.9	0.41	66.6	0.58	BL	96.2	88.40	1.07	59.9	1.32		
						GL	12.6	11.60	0.19	7.7	0.36		
FFF-000	608	36.3	0.14	25.3	0.22	BL	36.3	100.00	0.40	25.3	0.57		
FFF-EEE	299	32.5	0.12	9.4	0.08	BL	32.5	100.00	0.36	9.4	0.21		
FFF-JJJ	529	9.9	0.04	5.3	0.05	GL	9.9	100.00	0.15	5.3	0.24		

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T R A F F I C D A T A

INITIAL STATE

NETPTA CLASS

MARKET DIST.	PAK/DAY	XTOT KPM/DAY	XTOT KPM/DAY	STOT	ID	PAK/DAY	STOT	SCAR KPM/DAY	SCAR		
000-AAA	402	105.9	0.74	94.4	0.02	RD	107.1	54.68	0.19	51.6	5.31
						BL	50.4	30.88	0.67	29.1	0.65
						GL	28.3	14.46	0.42	13.6	0.63
000-000	434	194.7	0.73	84.5	0.74	RD	119.7	61.45	4.60	51.9	3.34
						BL	75.1	38.55	0.64	32.6	0.73
000-CCC	572	132.2	0.50	75.6	0.66	RD	120.7	91.32	4.72	89.1	7.10
						GL	11.5	0.68	0.17	0.6	0.30
000-000	747	47.9	0.18	35.8	0.31	RD	37.3	77.09	1.48	27.9	2.06
						GL	10.6	22.11	0.16	7.9	0.37
000-EEE	548	14.1	0.05	7.7	0.07	BL	14.1	100.00	0.16	7.7	0.17
000-NNH	509	4.2	0.02	2.1	0.02	RD	4.2	100.00	0.16	2.1	0.22
000-JJJ	261	22.7	0.09	5.7	0.05	RD	22.7	100.00	0.89	5.7	0.59
000-AAA	785	186.4	0.03	125.6	1.10	RD	85.3	51.28	3.34	64.4	0.63
						BL	81.1	48.72	0.90	61.2	1.37
000-000	259	236.9	0.09	61.4	0.54	RD	139.2	58.75	5.44	36.1	3.71
						GL	77.5	32.73	1.15	28.1	0.93
						BL	20.2	8.51	0.22	5.2	0.12
000-CCC	360	199.3	0.75	71.8	0.63	GL	188.2	84.37	2.49	60.5	2.80
						RD	26.7	13.40	1.04	9.8	0.99
						BL	4.4	2.23	0.05	1.6	0.04
000-000	548	131.3	0.50	72.0	0.63	GL	67.6	51.51	1.00	37.1	1.72
						WT	46.9	35.70	3.39	23.7	0.17
						RD	16.0	12.21	0.63	8.8	0.90
						BL	0.8	0.58	0.01	0.4	0.01
000-CCC	509	5.5	0.02	2.8	0.02	RD	5.5	100.00	0.21	2.8	0.29
000-JJJ	260	17.1	0.06	4.4	0.04	RD	17.1	100.00	0.67	4.4	0.46
111-AAA	369	98.9	0.37	36.5	0.32	CR	98.9	100.00	1.45	36.5	1.07
111-000	244	181.9	0.09	44.4	0.39	CR	106.7	58.67	1.56	28.9	0.76
						GL	75.2	41.33	1.11	19.3	0.85
111-CCC	184	93.8	0.25	17.2	0.15	CR	82.8	88.45	1.21	15.2	0.44
						GL	16.8	11.95	0.16	2.0	0.09
111-000	235	166.6	0.40	25.1	0.22	CR	42.8	48.12	0.82	10.1	0.29
						GL	34.9	32.72	0.52	8.2	0.28
						WT	29.0	27.16	2.09	6.8	1.64
111-EEE	256	77.5	0.29	19.6	0.17	WT	77.5	100.00	0.60	19.6	4.77
111-JJJ	430	13.8	0.05	5.9	0.05	GL	13.8	100.00	0.20	5.9	0.27
000-AAA	959	181.9	0.28	57.0	0.50	RD	52.7	52.87	2.18	28.0	2.00
						BL	40.7	39.82	0.45	22.7	0.51

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T R A F F I C D A T A

INITIAL STATE

BITPTA CASS

ID	PAX/DAY	NPM/DAY
BL	8973.8	4473.7
GL	6750.2	3159.8
CR	6846.2	3423.8
PD	2558.2	972.2
WT	1384.0	416.1

	26512.4	11465.4

TABLE 4.12 PERIOD 1 SCHEDULES

PAGE 2

AIRPORT ACTIVITY PROFILE FOR STATION AAA

REF--PTL CLASS

TIME O FLIGHT	EQ	T/F	PAK
20:16 A	MT 131 DC9	888	54.7
20:33 A	BL 206 727	888	46.3
20:33 D	ML 293 727	EEE	81.4
20:36 D	GL 1701 727	FFF	41.7
20:59 A	CA 306 727	000	51.8
21:18 A	BL 793 707	CCC	87.5
21:30 D	BL 793 707	CCC	89.2
22:27 A	MT 220 DC9	XXX	41.2
22:36 A	BL 244 727	EEE	63.2
22:47 D	MT 220 DC9	888	24.4
22:52 A	CA 14 DC9	CCC	56.0
22:56 A	CA 23 DC9	888	43.6
22:56 D	ML 244 727	FFF	46.5

AIRPORT ACTIVITY PROFILE FOR STATION BAA

MIT-PTL GASS

PROFILE SUMMARY

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOT
TOTALS:	1	0	0	0	0	0	5	17	24	11	12	14	15	17	13	14	19	15	16	9	12	2	4	0	222
BL	1	0	0	0	0	0	5	14	1	6	0	5	4	4	6	8	5	7	5	2	2	0	0	0	88
GL	0	0	0	0	0	1	3	2	4	3	1	5	2	3	3	3	1	4	0	5	0	0	0	0	42
GR	0	0	0	0	0	0	4	6	5	3	2	5	7	4	4	5	5	3	2	1	0	2	0	0	64
RD	0	0	0	0	0	0	2	0	0	0	1	0	0	1	0	1	2	0	1	0	0	0	0	0	8
WT	0	0	0	0	0	0	1	2	1	0	2	0	4	1	1	2	2	0	1	1	0	2	0	0	26

CARRIER	DEPARTURES	ARRIVALS	EMPLACEMENTS	DEPLACEMENTS	AV EMP/DEP	AV DEP/ARR	AV PAS/OP
BL	44	44	3101.3	3175.1	72.3	72.2	72.2
GL	21	21	1224.1	1271.1	58.3	57.7	57.9
GR	32	32	1874.0	1657.0	58.9	51.4	53.9
RD	6	6	204.8	195.3	34.1	48.4	50.3
WT	10	10	432.9	433.1	43.3	48.3	45.8

FILES USED:

USER ID NAME	UNIVERSE FILE:	FILE	LAST MODIFIED	LAST USED	UNIVERSE	LAST MODIFIED
1	BL BLUE	BLUE-01	80/02/11 10:02:17.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:18:37.00
2	GL GULLO	GULP-01	80/02/11 21:58:28.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:18:37.00
3	GR GREEN	GREEN-01	80/02/11 17:08:27.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:18:37.00
4	RD RED	RED-01	80/02/11 16:13:31.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:18:37.00
5	WT WHITE	WHITE-01	80/02/11 16:38:06.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:18:37.00

AIRPORT ACTIVITY PROFILE FOR STATION 888

OUT-CTR. CASE

TIME OF FLIGHT	EQ	T/F	PAK	TIME OF FLIGHT	EQ	T/F	PAK	TIME OF FLIGHT	EQ	T/F	PAK	TIME OF FLIGHT	EQ	T/F	PAK
11:13	A	WT 220	DC9	AAA	48-1			11:39	A	GL 120	727	DDD	07-4		
11:17	D	BL 272	727	GGG	98-6			11:37	D	BL 272	727	GGG	98-6		
11:19	A	GR 542	DC9	CCC	03-4			11:36	D	CL 121	727	DDD	07-4		
11:21	A	GL 311	DC9	CCC	90-0			11:34	A	RD0032	DC9	GGG	49-8		
11:22	A	GR 41	DC9	LLL	69-1			11:33	A	RD0043	DC9	CCC	61-0		
11:23	A	GR 501	DC9	CCC	74-7			11:32	D	GR 802	727	AAA	87-2		
11:24	B	BL 290	727	AAA	41-6			11:31	D	WT 420	DC9	AAA	98-5		
11:25	A	GL1000	DC9	JJJ	53-1			11:30	D	RD0032	DC9	MMM	73-8		
11:26	A	RD0040	DC9	GGG	49-8			11:29	D	WT 420	DC9	AAA	98-5		
11:27	A	GL 307	727	CCC	78-7			11:28	D	BL 742	707	AAA	97-0		
11:28	A	GL1000	DC9	JJJ	53-1			11:27	D	GR 63	DC9	CCC	90-1		
11:29	A	GL 307	727	CCC	78-7			11:26	A	GL1700	727	AAA	78-1		
11:30	A	GL1000	DC9	GGG	49-8			11:25	A	BL 742	707	AAA	97-0		
11:31	A	GL1000	DC9	GGG	49-8			11:24	A	GL 312	DC9	AAA	94-1		
11:32	A	GL1000	DC9	GGG	49-8			11:23	A	GL 312	DC9	AAA	94-1		
11:33	A	GL1000	DC9	GGG	49-8			11:22	A	GL 312	DC9	AAA	94-1		
11:34	A	GL1000	DC9	GGG	49-8			11:21	A	GL 312	DC9	AAA	94-1		
11:35	A	GL1000	DC9	GGG	49-8			11:20	A	GL 312	DC9	AAA	94-1		
11:36	A	GL1000	DC9	GGG	49-8			11:19	A	GL 312	DC9	AAA	94-1		
11:37	A	GL1000	DC9	GGG	49-8			11:18	A	GL 312	DC9	AAA	94-1		
11:38	A	GL1000	DC9	GGG	49-8			11:17	A	GL 312	DC9	AAA	94-1		
11:39	A	GL1000	DC9	GGG	49-8			11:16	A	GL 312	DC9	AAA	94-1		
11:40	A	GL1000	DC9	GGG	49-8			11:15	A	GL 312	DC9	AAA	94-1		
11:41	A	GL1000	DC9	GGG	49-8			11:14	A	GL 312	DC9	AAA	94-1		
11:42	A	GL1000	DC9	GGG	49-8			11:13	A	GL 312	DC9	AAA	94-1		
11:43	A	GL1000	DC9	GGG	49-8			11:12	A	GL 312	DC9	AAA	94-1		
11:44	A	GL1000	DC9	GGG	49-8			11:11	A	GL 312	DC9	AAA	94-1		
11:45	A	GL1000	DC9	GGG	49-8			11:10	A	GL 312	DC9	AAA	94-1		
11:46	A	GL1000	DC9	GGG	49-8			11:09	A	GL 312	DC9	AAA	94-1		
11:47	A	GL1000	DC9	GGG	49-8			11:08	A	GL 312	DC9	AAA	94-1		
11:48	A	GL1000	DC9	GGG	49-8			11:07	A	GL 312	DC9	AAA	94-1		
11:49	A	GL1000	DC9	GGG	49-8			11:06	A	GL 312	DC9	AAA	94-1		
11:50	A	GL1000	DC9	GGG	49-8			11:05	A	GL 312	DC9	AAA	94-1		
11:51	A	GL1000	DC9	GGG	49-8			11:04	A	GL 312	DC9	AAA	94-1		
11:52	A	GL1000	DC9	GGG	49-8			11:03	A	GL 312	DC9	AAA	94-1		
11:53	A	GL1000	DC9	GGG	49-8			11:02	A	GL 312	DC9	AAA	94-1		
11:54	A	GL1000	DC9	GGG	49-8			11:01	A	GL 312	DC9	AAA	94-1		
11:55	A	GL1000	DC9	GGG	49-8			11:00	A	GL 312	DC9	AAA	94-1		
11:56	A	GL1000	DC9	GGG	49-8			10:59	A	GL 312	DC9	AAA	94-1		
11:57	A	GL1000	DC9	GGG	49-8			10:58	A	GL 312	DC9	AAA	94-1		
11:58	A	GL1000	DC9	GGG	49-8			10:57	A	GL 312	DC9	AAA	94-1		
11:59	A	GL1000	DC9	GGG	49-8			10:56	A	GL 312	DC9	AAA	94-1		
12:00	A	GL1000	DC9	GGG	49-8			10:55	A	GL 312	DC9	AAA	94-1		
12:01	A	GL1000	DC9	GGG	49-8			10:54	A	GL 312	DC9	AAA	94-1		
12:02	A	GL1000	DC9	GGG	49-8			10:53	A	GL 312	DC9	AAA	94-1		
12:03	A	GL1000	DC9	GGG	49-8			10:52	A	GL 312	DC9	AAA	94-1		
12:04	A	GL1000	DC9	GGG	49-8			10:51	A	GL 312	DC9	AAA	94-1		
12:05	A	GL1000	DC9	GGG	49-8			10:50	A	GL 312	DC9	AAA	94-1		
12:06	A	GL1000	DC9	GGG	49-8			10:49	A	GL 312	DC9	AAA	94-1		
12:07	A	GL1000	DC9	GGG	49-8			10:48	A	GL 312	DC9	AAA	94-1		
12:08	A	GL1000	DC9	GGG	49-8			10:47	A	GL 312	DC9	AAA	94-1		
12:09	A	GL1000	DC9	GGG	49-8			10:46	A	GL 312	DC9	AAA	94-1		
12:10	A	GL1000	DC9	GGG	49-8			10:45	A	GL 312	DC9	AAA	94-1		
12:11	A	GL1000	DC9	GGG	49-8			10:44	A	GL 312	DC9	AAA	94-1		
12:12	A	GL1000	DC9	GGG	49-8			10:43	A	GL 312	DC9	AAA	94-1		
12:13	A	GL1000	DC9	GGG	49-8			10:42	A	GL 312	DC9	AAA	94-1		
12:14	A	GL1000	DC9	GGG	49-8			10:41	A	GL 312	DC9	AAA	94-1		
12:15	A	GL1000	DC9	GGG	49-8			10:40	A	GL 312	DC9	AAA	94-1		
12:16	A	GL1000	DC9	GGG	49-8			10:39	A	GL 312	DC9	AAA	94-1		
12:17	A	GL1000	DC9	GGG	49-8			10:38	A	GL 312	DC9	AAA	94-1		
12:18	A	GL1000	DC9	GGG	49-8			10:37	A	GL 312	DC9	AAA	94-1		
12:19	A	GL1000	DC9	GGG	49-8			10:36	A	GL 312	DC9	AAA	94-1		
12:20	A	GL1000	DC9	GGG	49-8			10:35	A	GL 312	DC9	AAA	94-1		
12:21	A	GL1000	DC9	GGG	49-8			10:34	A	GL 312	DC9	AAA	94-1		
12:22	A	GL1000	DC9	GGG	49-8			10:33	A	GL 312	DC9	AAA	94-1		
12:23	A	GL1000	DC9	GGG	49-8			10:32	A	GL 312	DC9	AAA	94-1		
12:24	A	GL1000	DC9	GGG	49-8			10:31	A	GL 312	DC9	AAA	94-1		
12:25	A	GL1000	DC9	GGG	49-8			10:30	A	GL 312	DC9	AAA	94-1		
12:26	A	GL1000	DC9	GGG	49-8			10:29	A	GL 312	DC9	AAA	94-1		
12:27	A	GL1000	DC9	GGG	49-8			10:28	A	GL 312	DC9	AAA	94-1		
12:28	A	GL1000	DC9	GGG	49-8			10:27	A	GL 312	DC9	AAA	94-1		
12:29	A	GL1000	DC9	GGG	49-8			10:26	A	GL 312	DC9	AAA	94-1		
12:30	A	GL1000	DC9	GGG	49-8			10:25	A	GL 312	DC9	AAA	94-1		
12:31	A	GL1000	DC9	GGG	49-8			10:24	A	GL 312	DC9	AAA	94-1		
12:32	A	GL1000	DC9	GGG	49-8			10:23	A	GL 312	DC9	AAA	94-1		
12:33	A	GL1000	DC9	GGG	49-8			10:22	A	GL 312	DC9	AAA	94-1		
12:34	A	GL1000	DC9	GGG	49-8			10:21	A	GL 312	DC9	AAA	94-1		
12:35	A	GL1000	DC9	GGG	49-8			10:20	A	GL 312	DC9	AAA	94-1		
12:36	A	GL1000	DC9	GGG	49-8			10:19	A	GL 312	DC9	AAA	94-1		
12:37	A	GL1000	DC9	GGG	49-8			10:18	A	GL 312	DC9	AAA	94-1		
12:38	A	GL1000	DC9	GGG	49-8			10:17	A	GL 312	DC9	AAA	94-1		
12:39	A	GL1000	DC9	GGG	49-8			10:16	A	GL 312	DC9	AAA	94-1		
12:40	A	GL1000	DC9	GGG	49-8			10:15	A	GL 312	DC9	AAA	94-1		
12:41	A	GL1000	DC9	GGG	49-8			10:14	A	GL 312	DC9	AAA	94-1		
12:42	A	GL1000	DC9	GGG	49-8			10:13	A	GL 312	DC9	AAA	94-1		
12:43	A	GL1000	DC9	GGG	49-8			10:12	A	GL 312	DC9	AAA	94-1		
12:44	A	GL1000	DC9	GGG	49-8			10:11	A	GL 312	DC9	AAA	94-1		
12:45	A	GL1000	DC9	GGG	49-8			10:10	A	GL 312	DC9	AAA	94-1		
12:46	A	GL1000	DC9	GGG	49-8			10:09	A	GL 312	DC9	AAA	94-1		
12:47	A	GL1000	DC9	GGG	49-8			10:08	A	GL 312					

AIRPORT ACTIVITY PROFILE FOR STATION 000

PROFILE SUMMARY

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOT
TOTALS:	0	1	0	0	0	0	3	11	11	8	12	11	10	9	13	10	10	12	16	15	10	3	0	0	172
BL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44
GL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	44
GR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
RD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	90
WT	0	1	0	0	0	0	0	1	1	2	1	0	2	2	0	1	1	0	2	1	1	2	0	0	18

CARRIER	DEPARTURES	ARRIVALS	EMPLACEMENTS	DEPLACEMENTS	AV EMP/DEP	AV DEP/ARR	AV PAX/DP
BL	22	22	1649.2	1644.4	75.0	74.7	74.9
GL	21	21	1298.6	1321.6	61.8	62.9	62.4
RD	25	25	1874.1	1747.7	67.0	69.9	68.4
WT	9	9	677.2	658.5	52.7	51.4	52.2
					53.0	50.9	52.0

FILES USED:

USER ID NAME	FILE	LAST MODIFIED	LAST USED	UNIVERSE	LAST MODIFIED
1 BL BLUE	BLUE-01	80/02/11 18:02:57.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:10:37.00
2 GL GOLD	GOLD-01	80/02/11 21:54:28.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:10:37.00
3 GR GREEN	GREEN-01	80/02/11 17:04:27.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:10:37.00
4 RD RED	RED-01	80/02/11 16:13:31.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:10:37.00
5 WT WHITE	WHITE-01	80/02/11 16:13:31.00	80/02/11 23:23:31.00	FAA_0001	80/01/18 14:10:37.00

WEST-PTL CASS AIRPORT ACTIVITY PROFILE FOR STATION CCG PAGE 1

TIME	D	FLIGHT	EQ	T/F	PAX	TIME	D	FLIGHT	EQ	T/F	PAX	TIME	D	FLIGHT	EQ	T/F	PAX
0425	D	GR 431	727	AAA	59-0	10131	D	GR 52	DC9	888	62-3	15110	D	R00043	DC9	888	74-9
0452	D	BL 753	707	888	104-0	10153	D	GL 311	DC9	888	62-3	15119	D	GR 32	DC9	AAA	63-7
7100	D	BL 721	707	AAA	90-4	11102	A	WT 300	DC9	888	44-0	15128	D	BL 723	707	AAA	93-8
7100	D	BL 710	727	888	90-7	11115	A	BL 727	707	AAA	74-9	15129	D	BL 722	727	AAA	93-8
7100	D	BL 710	727	888	90-9	11115	A	BL 727	707	AAA	74-9	15131	D	R00051	727	MMH	74-6
7134	A	R00200	DC9	JJJ	64-3	11122	A	GR 101	727	AAA	74-6	15131	D	GR 205	727	AAA	74-6
7144	A	GR 51	DC9	888	76-7	11122	D	WT 300	DC9	888	41-7	15131	A	GR 22	DC9	LLL	45-2
7144	A	WT 400	DC9	888	68-3	11127	A	BL 740	707	AAA	90-8	15134	A	GR 107	727	AAA	75-8
7152	A	GL 801	DC9	MMH	22-9	11128	A	WT 211	DC9	888	44-0	15137	A	GL 803	DC9	MMH	35-9
7155	D	R00200	DC9	000	80-4	11148	D	WT 211	DC9	888	44-0	15138	A	GL 101	727	888	86-1
7155	D	GR 101	727	AAA	78-9	11153	A	GR 110	DC9	AAA	17-9	15148	D	BL 205	727	AAA	66-0
8100	D	BL 740	707	AAA	86-0	12100	D	GL 111	727	AAA	72-8	15151	D	GR 22	DC9	ITL	64-0
8100	D	WT 200	DC9	000	86-0	12103	A	BL 214	727	888	94-4	15157	D	GL 803	DC9	KKK	72-8
8106	D	WT 400	DC9	AAA	67-1	12107	D	GR 102	727	AAA	69-7	16102	D	GL 101	727	AAA	74-4
8112	D	GL 801	DC9	AAA	64-3	12113	D	BL 751	707	AAA	89-5	16130	D	GR 103	727	AAA	71-3
8130	A	GL1131	DC9	700	62-1	12113	D	GR 110	DC9	000	68-8	16140	A	GR 103	727	000	97-5
8135	A	WT 101	DC9	000	54-7	12119	D	WT 110	DC9	EEC	37-9	16150	D	BL 723	727	EEC	37-9
8141	A	R00040	DC9	888	75-1	12148	D	BL 211	727	000	18-2	17100	D	GR 403	727	AAA	75-0
8150	D	GL1131	DC9	888	68-8	13115	A	GL1001	DC9	000	64-1	17104	D	BL 223	727	EEF	59-0
8155	D	WT 101	DC9	MMH	31-1	13115	A	R00320	727	000	103-3	17106	A	GL 602	727	000	99-2
8157	D	GL1000	DC9	000	54-5	13117	D	GR 603	727	000	103-3	17116	A	GR 63	DC9	888	86-1
9107	A	R00050	727	MMH	24-3	13124	A	GL1132	DC9	888	31-0	17125	A	BL 212	727	000	109-4
9113	A	GR 201	727	AAA	77-7	13125	A	GR 202	727	AAA	62-1	17126	D	GL 602	727	AAA	77-4
9123	A	BL 210	727	888	71-7	13126	D	GL1001	DC9	888	52-1	17126	D	AD0330	727	GCC	94-6
9126	A	BL 210	727	888	96-8	13135	D	R00320	727	GCC	31-2	17131	A	CA 312	727	GCC	94-6
9127	D	R00050	727	MMH	32-4	13140	A	BL 712	707	AAA	89-4	17136	A	AD0330	DC9	000	66-6
9128	A	BL 711	707	AAA	90-9	13140	A	GL1102	DC9	MMH	17-4	17136	D	GR 63	DC9	848	78-2
9128	A	GL 100	727	AAA	75-8	13144	D	GL1132	DC9	000	53-6	17144	A	CA 13	DC9	AAA	73-6
9130	D	R00041	DC9	888	61-3	13148	D	R00220	DC9	JJJ	56-4	17148	D	R00330	727	000	110-5
9133	D	GR 201	727	AAA	77-0	13148	D	GR 202	727	AAA	78-7	17151	D	BL 712	727	000	107-4
9133	D	GL1101	DC9	AAA	64-4	13159	A	WT 111	DC9	AAA	43-0	17151	D	BL 712	727	AAA	106-8
9148	D	GL 110	707	AAA	63-4	13159	A	GL 302	727	888	93-1	17155	D	GL1103	DC9	AAA	53-0
9152	A	WT 500	DC9	888	86-6	14100	D	BL 712	707	AAA	90-9	17155	D	R00230	DC9	JJJ	53-0
10101	A	GR 21	DC9	LLL	69-7	14100	D	GL1102	DC9	AAA	57-5	18101	A	GL1133	DC9	000	59-9
10109	D	BL 214	727	888	88-7	14104	D	R00220	DC9	000	64-5	18101	D	CA 13	DC9	AAA	68-6
10109	A	GR 31	DC9	111	67-0	14116	A	GR 62	DC9	888	69-3	18101	A	WT 131	DC9	000	63-9
10112	D	WT 500	DC9	EEF	34-2	14119	A	BL 795	707	AAA	78-2	18110	D	BL 213	727	888	98-4
10118	A	GR 402	727	AAA	67-8	14121	A	R00042	DC9	888	67-8	18112	D	BL 713	707	AAA	103-3
10120	A	R00210	DC9	000	73-1	14126	D	GR 62	DC9	888	67-8	18121	D	GL1103	DC9	MMH	35-9
10121	D	GR 21	DC9	111	65-3	14139	A	BL 722	707	AAA	78-5	18121	D	GL1103	DC9	888	54-2
10127	A	BL 204	727	AAA	78-7	14139	A	WT 510	DC9	888	99-0	18121	D	WT 131	DC9	888	61-2
10128	A	R00310	727	GCC	28-4	14142	A	BL 211	727	888	99-0	18129	D	GL1101	727	888	92-4
10129	D	GR 31	DC9	LLL	67-8	14143	A	GL 401	727	AAA	69-4	18135	A	GL 605	DC9	KKK	76-5
10129	D	GR 31	DC9	AAA	67-8	14149	D	GL 503	727	888	94-5	18143	A	R00045	DC9	888	78-2
10131	D	GR 402	727	000	100-4	14150	D	GR 32	DC9	AAA	57-2	18143	A	R00045	DC9	888	78-2
10140	D	R00210	DC9	JJJ	58-3	14159	D	WT 510	DC9	000	58-5	18151	D	BL 723	707	AAA	90-9
10148	D	BL 204	727	AAA	71-0	15103	D	GL 401	727	000	92-0	18155	D	GL 604	DC9	KKK	72-4
10148	D	R00310	727	000	98-0	15107	A	R00031	727	MMH	22-0						

AIRPORT ACTIVITY PROFILE FOR STATION CCG

BIT-OPL CASS

PROFILE SUMMARY

TOTALS:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOT
BL	0	0	0	0	0	0	2	9	12	13	10	8	14	15	16	6	17	15	9	13	5	4	2	2	100
CL	0	0	0	0	0	0	1	2	1	4	1	3	1	4	3	1	4	2	4	2	1	1	1	1	44
GR	0	0	0	0	0	0	1	2	1	2	1	3	1	3	4	2	4	2	3	4	2	1	1	1	48
RD	0	0	0	0	0	0	0	2	1	1	1	0	3	2	3	0	4	2	0	4	0	0	0	0	28
WT	0	0	0	0	0	0	0	1	4	1	1	1	1	1	3	0	0	0	2	0	1	0	0	0	20

CARRIER	DEPARTURES	ARRIVALS	EMPLACEMENTS	DEPLACEMENTS	AV EMP/DEP	AV DEP/ARR	AV PAX/DP
BL	22	22	1937.6	1906.1	86.1	86.8	87.4
CL	26	26	1649.6	1623.4	61.6	61.6	68.2
GR	26	24	1741.4	1729.6	72.6	72.1	72.3
RD	16	14	796.7	825.8	56.9	56.8	57.9
WT	10	10	491.2	507.9	49.1	50.8	50.8

FILES USED:

USER ID NAME	FILE	LAST MODIFIED	LAST USED	UNIVERSE	LAST MODIFIED
1 BL BLUE	BLUE-01	00/02/11 18:02:07.00	00/02/11 23:23:31.00	FAA_0001	00/01/18 14:16:37.00
2 CL GOLD	GOLD-01	00/02/11 21:54:28.00	00/02/11 23:23:31.00	FAA_0001	00/01/18 14:16:37.00
3 GR GREEN	GREEN-01	00/02/11 17:04:27.00	00/02/11 23:23:31.00	FAA_0001	00/01/18 14:16:37.00
4 RD RED	RED-01	00/02/11 14:13:31.00	00/02/11 23:23:31.00	FAA_0001	00/01/18 14:16:37.00
5 WT WHITE	WHITE-01	00/02/11 14:36:00.00	00/02/11 23:23:31.00	FAA_0001	00/01/18 14:16:37.00

TIME	FROM	TO	TYPE	CLASS	STATUS	REMARKS
14:50	14:50	15:00	FR	INDIA	0	14:50 15:00
15:00	15:00	15:10	FR	INDIA	0	15:00 15:10
15:10	15:10	15:20	FR	INDIA	0	15:10 15:20
15:20	15:20	15:30	FR	INDIA	0	15:20 15:30
15:30	15:30	15:40	FR	INDIA	0	15:30 15:40
15:40	15:40	15:50	FR	INDIA	0	15:40 15:50
15:50	15:50	16:00	FR	INDIA	0	15:50 16:00
16:00	16:00	16:10	FR	INDIA	0	16:00 16:10
16:10	16:10	16:20	FR	INDIA	0	16:10 16:20
16:20	16:20	16:30	FR	INDIA	0	16:20 16:30
16:30	16:30	16:40	FR	INDIA	0	16:30 16:40
16:40	16:40	16:50	FR	INDIA	0	16:40 16:50
16:50	16:50	17:00	FR	INDIA	0	16:50 17:00
17:00	17:00	17:10	FR	INDIA	0	17:00 17:10
17:10	17:10	17:20	FR	INDIA	0	17:10 17:20
17:20	17:20	17:30	FR	INDIA	0	17:20 17:30
17:30	17:30	17:40	FR	INDIA	0	17:30 17:40
17:40	17:40	17:50	FR	INDIA	0	17:40 17:50
17:50	17:50	18:00	FR	INDIA	0	17:50 18:00
18:00	18:00	18:10	FR	INDIA	0	18:00 18:10
18:10	18:10	18:20	FR	INDIA	0	18:10 18:20
18:20	18:20	18:30	FR	INDIA	0	18:20 18:30
18:30	18:30	18:40	FR	INDIA	0	18:30 18:40
18:40	18:40	18:50	FR	INDIA	0	18:40 18:50
18:50	18:50	19:00	FR	INDIA	0	18:50 19:00
19:00	19:00	19:10	FR	INDIA	0	19:00 19:10
19:10	19:10	19:20	FR	INDIA	0	19:10 19:20
19:20	19:20	19:30	FR	INDIA	0	19:20 19:30
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19:50	19:50	20:00	FR	INDIA	0	19:50 20:00
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20:10	20:10	20:20	FR	INDIA	0	20:10 20:20
20:20	20:20	20:30	FR	INDIA	0	20:20 20:30
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20:50	20:50	21:00	FR	INDIA	0	20:50 21:00
21:00	21:00	21:10	FR	INDIA	0	21:00 21:10
21:10	21:10	21:20	FR	INDIA	0	21:10 21:20
21:20	21:20	21:30	FR	INDIA	0	21:20 21:30
21:30	21:30	21:40	FR	INDIA	0	21:30 21:40
21:40	21:40	21:50	FR	INDIA	0	21:40 21:50
21:50	21:50	22:00	FR	INDIA	0	21:50 22:00
22:00	22:00	22:10	FR	INDIA	0	22:00 22:10
22:10	22:10	22:20	FR	INDIA	0	22:10 22:20
22:20	22:20	22:30	FR	INDIA	0	22:20 22:30
22:30	22:30	22:40	FR	INDIA	0	22:30 22:40
22:40	22:40	22:50	FR	INDIA	0	22:40 22:50
22:50	22:50	23:00	FR	INDIA	0	22:50 23:00
23:00	23:00	23:10	FR	INDIA	0	23:00 23:10
23:10	23:10	23:20	FR	INDIA	0	23:10 23:20
23:20	23:20	23:30	FR	INDIA	0	23:20 23:30
23:30	23:30	23:40	FR	INDIA	0	23:30 23:40
23:40	23:40	23:50	FR	INDIA	0	23:40 23:50
23:50	23:50	24:00	FR	INDIA	0	23:50 24:00

FLIGHT SCHEDULES

FILES USED

LAST MODIFIED

LAST USED

UNIFORMS LAST MODIFIED

FAA_0001 00/01/18 10:16:37.00

FAA_0001 00/01/18 10:16:37.00

FAA_0001 00/01/18 10:16:37.00

FAA_0001 00/01/18 10:16:37.00

FAA_0001 00/01/18 10:16:37.00

BLUF-01 00/02/13 10:29:50.00

BLUF-01 00/02/13 10:29:50.00

BLUF-01 00/02/13 10:29:50.00

BLUF-01 00/02/13 10:29:50.00

BLUF-01 00/02/13 10:29:50.00

UNIFORMS FILES

01 BLUF

02 BLUF

03 BLUF

04 BLUF

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TABLE 4.13 PERIOD 2 SCHEDULES

P L E A S E S E E M P L O Y E E S

TIME	NAME	STATUS	LOCATION	PHONE	EXT.	ROOM	DATE	TIME	NAME	STATUS	LOCATION	PHONE	EXT.	ROOM	DATE
7:00	ALPHA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	ALPHA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	BETA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	BETA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	GAMMA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	GAMMA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	DELTA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	DELTA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	EPSILON	FR CHARLIE	AL 205	727	0	1	10:31	11:00	EPSILON	FR CHARLIE	AL 205	727	0	1	10:31
7:00	ZETA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	ZETA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	ETA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	ETA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	THETA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	THETA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	IOTA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	IOTA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	KAPPA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	KAPPA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	LAMDA	FR CHARLIE	AL 205	727	0	1	10:31	11:00	LAMDA	FR CHARLIE	AL 205	727	0	1	10:31
7:00	MU	FR CHARLIE	AL 205	727	0	1	10:31	11:00	MU	FR CHARLIE	AL 205	727	0	1	10:31
7:00	NU	FR CHARLIE	AL 205	727	0	1	10:31	11:00	NU	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Xi	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Xi	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Omicron	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Omicron	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Pi	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Pi	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Rho	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Rho	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Sigma	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Sigma	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Tau	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Tau	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Upsilon	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Upsilon	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Phi	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Phi	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Chi	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Chi	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Psi	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Psi	FR CHARLIE	AL 205	727	0	1	10:31
7:00	Omega	FR CHARLIE	AL 205	727	0	1	10:31	11:00	Omega	FR CHARLIE	AL 205	727	0	1	10:31
7:00	FR CHARLIE	FR CHARLIE	AL 205	727	0	1	10:31	11:00	FR CHARLIE	FR CHARLIE	AL 205	727	0	1	10:31

FLIGHT SCHEDULES

TIME	FROM	TO	CARRIER	CLASS	FLIGHT	STATUS	DEPART	ARRIVE	OPERATOR	NOTES
06:00	MEMPHIS	MEMPHIS	FR	ALPHA	0001	0	06:00	06:00	FR ALPHA	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	BRAVO	0002	0	06:00	06:00	FR BRAVO	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	CHARLIE	0003	0	06:00	06:00	FR CHARLIE	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	DELTA	0004	0	06:00	06:00	FR DELTA	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	ECHO	0005	0	06:00	06:00	FR ECHO	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	FOXTROT	0006	0	06:00	06:00	FR FOXTROT	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	GOLF	0007	0	06:00	06:00	FR GOLF	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	INDIA	0008	0	06:00	06:00	FR INDIA	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	JULIET	0009	0	06:00	06:00	FR JULIET	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	KILO	0010	0	06:00	06:00	FR KILO	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	LIMA	0011	0	06:00	06:00	FR LIMA	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	MICHAEL	0012	0	06:00	06:00	FR MICHAEL	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	NOWHERE	0013	0	06:00	06:00	FR NOWHERE	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	OSCAR	0014	0	06:00	06:00	FR OSCAR	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	PAPA	0015	0	06:00	06:00	FR PAPA	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	QUEBEC	0016	0	06:00	06:00	FR QUEBEC	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	RADIO	0017	0	06:00	06:00	FR RADIO	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	SIERRA	0018	0	06:00	06:00	FR SIERRA	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	TANGO	0019	0	06:00	06:00	FR TANGO	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	UNIFORM	0020	0	06:00	06:00	FR UNIFORM	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	VICTOR	0021	0	06:00	06:00	FR VICTOR	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	WHISKEY	0022	0	06:00	06:00	FR WHISKEY	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	XRAY	0023	0	06:00	06:00	FR XRAY	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	YANKEE	0024	0	06:00	06:00	FR YANKEE	MEMPHIS
06:00	MEMPHIS	MEMPHIS	FR	ZULU	0025	0	06:00	06:00	FR ZULU	MEMPHIS

UNITED STATES DEPARTMENT OF JUSTICE
FEDERAL BUREAU OF INVESTIGATION
WASHINGTON, D.C. 20535

FILES USED:

UNIT	FILE	LAST MODIFIED	LAST USED	UNIVERSE	LAST MODIFIED
1	BLUF-01	80/02/12 17:11:07.00	80/02/13 07:18:33.00	FAA-0001	80/01/18 15:18:33.00
2	BLAD-01	80/02/13 02:52:55.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00
3	GREEN-01	80/02/12 21:12:45.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00
4	PCD-J1	80/02/12 20:22:46.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00
5	WHILE-01	80/02/12 13:48:29.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00

UNIVERSE FILE:

UNIT	FILE	LAST MODIFIED	LAST USED	UNIVERSE	LAST MODIFIED
1	BLUF-01	80/02/12 17:11:07.00	80/02/13 07:18:33.00	FAA-0001	80/01/18 15:18:33.00
2	BLAD-01	80/02/13 02:52:55.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00
3	GREEN-01	80/02/12 21:12:45.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00
4	PCD-J1	80/02/12 20:22:46.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00
5	WHILE-01	80/02/12 13:48:29.00	80/02/13 07:18:03.00	FAA-0001	80/01/18 15:18:33.00

PAGE 1

UNIT-FILE CASE	TIME OF FLIGHT	OR	T/F	PAK	ALPHABETIC ACTIVITY PROFILE FOR STATION CEE	TIME OF FLIGHT	OR	T/F	PAK	ALPHABETIC ACTIVITY PROFILE FOR STATION CEE	TIME OF FLIGHT	OR	T/F	PAK
1104 A	DL 312	809	44.6		11:28 A UT 211 809 48.0	16:58 A	DL 300	727	84.2	16:58 A	DL 300	727	84.2	
4100 B	DL 401	727	AAA	101.7	11:48 B UT 111 809 51.3	17:00 D	DL 402	727	AAA	17:00 D	DL 402	727	AAA	
6489 B	DL 201	727	800	110.2	11:53 A UT 110 809 44.4	17:05 D	DL 233	727	AAA	17:05 D	DL 233	727	AAA	
7100 B	DL 1711	707	AAA	134.4	11:58 A UT 110 809 32.3	17:14 D	DL 200	727	AAA	17:14 D	DL 200	727	AAA	
7120 B	DL 210	727	800	104.2	12:03 A DL 214 727 888 97.3	17:21 A	DL 151	809	80.4	17:21 A	DL 151	809	80.4	
7134 A	DL 200	727	AAA	107.5	12:13 D DL 111 809 42.3	17:22 D	DL 404	727	AAA	17:22 D	DL 404	727	AAA	
7146 A	DL 401	727	AAA	107.2	12:17 D DL 102 727 888 101.0	17:28 A	DL 404	727	AAA	17:28 A	DL 404	727	AAA	
7154 B	DL 400	727	800	100.8	12:18 B UT 110 809 44.4	17:41 A	DL 13	809	52.3	17:41 A	DL 13	809	52.3	
7155 B	DL 301	727	800	109.4	12:22 A DL 602 727 888 95.9	17:44 A	DL 112	727	800	17:44 A	DL 112	727	800	
7189 B	DL 311	727	800	109.2	12:45 B DL 311 727 888 94.5	17:46 A	DL 1700	727	800	17:46 A	DL 1700	727	800	
8100 B	DL 200	809	800	83.8	12:59 A DL 1081 809 83.9	18:00 A	DL 1133	809	86.1	18:00 A	DL 1133	809	86.1	
8104 B	DL 311	809	79.1		13:05 D DL 300 727 888 31.7	18:00 D	DL 300	727	800	18:00 D	DL 300	727	800	
8122 A	DL 1090	809	43.7		13:07 D DL 403 727 888 100.3	18:01 D	DL 13	809	78.8	18:01 D	DL 13	809	78.8	
8130 A	DL 1131	809	74.1		13:13 A DL 401 727 888 98.3	18:01 A	DL 131	809	42.4	18:01 A	DL 131	809	42.4	
8132 A	DL 1101	809	74.1		13:19 D DL 1081 809 34.2	18:04 D	DL 112	727	800	18:04 D	DL 112	727	800	
8133 B	DL 1100	809	74.1		13:25 B DL 101 727 888 90.2	18:05 B	DL 112	727	800	18:05 B	DL 112	727	800	
8134 B	DL 1100	809	43.9		13:25 B DL 101 727 888 90.2	18:23 A	DL 804	809	80.1	18:23 A	DL 804	809	80.1	
8135 B	DL 1131	809	39.8		13:44 D DL 1132 809 48.3	18:43 A	DL 43	809	74.4	18:43 A	DL 43	809	74.4	
8185 B	DL 101	809	44.4		13:44 D DL 1102 809 43.4	18:51 A	DL 1713	707	AAA	18:51 A	DL 1713	707	AAA	
8189 A	DL 1101	809	72.1		13:56 A UT 411 809 53.1	18:55 D	DL 804	809	80.4	18:55 D	DL 804	809	80.4	
9112 A	DL 201	727	AAA	103.5	13:59 A DL 302 727 888 97.7	19:01 A	DL 1103	809	50.4	19:01 A	DL 1103	809	50.4	
9119 B	DL 101	727	800	100.5	14:00 D DL 1132 809 48.8	19:01 D	DL 1701	727	800	19:01 D	DL 1701	727	800	
9124 A	DL 100	727	800	98.9	14:14 B UT 411 809 58.8	19:11 D	DL 1103	809	47.7	19:11 D	DL 1103	809	47.7	
9127 A	DL 401	727	AAA	103.2	14:14 B UT 411 809 58.8	19:21 D	DL 1103	809	50.3	19:21 D	DL 1103	809	50.3	
9128 A	DL 200	727	AAA	107.9	14:19 A UT 510 809 54.6	19:24 A	DL 703	809	36.8	19:24 A	DL 703	809	36.8	
9130 B	DL 400	727	800	108.7	14:42 A DL 211 727 888 97.9	19:34 A	DL 1714	707	AAA	19:34 A	DL 1714	707	AAA	
9131 B	DL 400	727	800	108.7	14:44 A DL 202 727 888 98.5	19:44 D	DL 802	809	25.1	19:44 D	DL 802	809	25.1	
9137 B	DL 100	727	800	108.6	14:59 B UT 510 809 58.9	19:59 A	DL 122	727	800	19:59 A	DL 122	727	800	
9152 A	DL 200	809	87.4		15:02 B DL 300 809 74.1	20:00 A	DL 404	727	800	20:00 A	DL 404	727	800	
10080 A	DL 311	809	111	68.8	15:05 A DL 403 727 888 94.3	20:04 A	DL 213	727	800	20:04 A	DL 213	727	800	
10080 B	DL 311	809	27.6		15:10 B DL 257 727 888 94.4	20:04 A	DL 420	809	44.0	20:04 A	DL 420	809	44.0	
10112 B	DL 210	727	800	109.0	15:24 D DL 1712 707 888 118.1	20:16 A	DL 45	809	48.8	20:16 A	DL 45	809	48.8	
10120 B	DL 311	809	111	68.8	15:27 B DL 212 727 888 104.3	20:19 D	DL 300	727	800	20:19 D	DL 300	727	800	
10120 C	DL 311	809	111	68.8	15:38 A DL 101 727 888 99.6	20:27 A	DL 102	727	800	20:27 A	DL 102	727	800	
10120 D	DL 311	809	111	68.8	15:44 A DL 102 727 888 101.6	20:32 A	DL 45	809	48.3	20:32 A	DL 45	809	48.3	
10127 A	DL 1711	707	AAA	114.4	15:50 B DL 608 727 888 98.6	20:43 D	DL 300	727	800	20:43 D	DL 300	727	800	
10130 A	DL 411	809	87.1		16:00 B DL 101 727 888 98.9	20:47 B	DL 102	727	800	20:47 B	DL 102	727	800	
10131 A	DL 411	809	87.1		16:00 B DL 101 727 888 98.9	20:52 A	DL 404	727	800	20:52 A	DL 404	727	800	
10131 B	DL 411	809	87.1		16:00 B DL 101 727 888 98.9	20:52 A	DL 404	727	800	20:52 A	DL 404	727	800	
10181 B	DL 311	809	48.8		16:24 B DL 44 809 79.2	21:00 D	DL 702	809	29.4	21:00 D	DL 702	809	29.4	
11102 A	DL 200	809	84.0		16:40 A DL 402 727 888 99.1	21:07 A	DL 504	727	800	21:07 A	DL 504	727	800	
11112 B	DL 1712	707	AAA	114.3	16:45 A DL 223 727 888 99.0	21:13 A	DL 204	727	800	21:13 A	DL 204	727	800	
11122 B	DL 200	809	88.9		16:48 B DL 205 727 888 112.1	21:13 B	DL 104	727	800	21:13 B	DL 104	727	800	
11128 A	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 A	DL 224	727	800	21:32 A	DL 224	727	800	

PAGE 2

UNIT-FILE CASE	TIME OF FLIGHT	OR	T/F	PAK	ALPHABETIC ACTIVITY PROFILE FOR STATION CEE	TIME OF FLIGHT	OR	T/F	PAK	ALPHABETIC ACTIVITY PROFILE FOR STATION CEE	TIME OF FLIGHT	OR	T/F	PAK
11128 B	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 A	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 B	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 C	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 D	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 E	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 F	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 G	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 H	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 I	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 J	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 K	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 L	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 M	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 N	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 O	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 P	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 Q	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 R	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 S	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 T	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 U	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 V	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 W	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 X	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 Y	DL 110	727	800	91.6	16:50 B DL 604 727 888 101.6	21:32 B	DL 205	727	800	21:32 B	DL 205	727	800	
11130 Z	DL 110	727	800	91.6	16:50 B DL 604 727 888 1									

TABLE 4.14 PERIOD 1 TRAFFIC DATA

ITERATION 01											
WTFTE CRSS	DIST.	PAK/DAY	STOT	MPM/DAY	STCY	IP	PAK/DAY	STOT	ICAR	MPM/DAY	SCAR
AAA-BMR	517	1129.5	4.41	588.0	8.28	AL	488.1	87.21	6.68	252.3	6.28
						GP	317.7	28.08	8.95	168.0	5.56
						GL	237.3	21.01	3.70	122.7	4.07
						LT	78.2	8.75	2.78	39.4	3.59
						RD	10.7	0.95	0.80	5.5	0.57
AAA-CCC	550	2188.0	6.55	1179.4	9.78	AL	791.7	36.18	10.78	824.7	10.62
						GP	770.7	35.22	12.07	815.4	10.10
						GL	589.5	28.70	8.48	291.3	9.48
						WT	85.1	3.89	3.11	85.9	8.18
AAA-UDD	588	459.5	3.36	505.8	4.19	AL	457.3	53.20	6.23	268.9	6.69
						GL	203.8	23.71	3.18	119.8	3.97
						GP	118.0	13.26	1.78	67.0	2.27
						WT	84.5	9.83	3.08	49.7	4.53
AAA-EEE	187	257.7	0.99	37.1	0.31	AL	211.7	83.98	2.88	31.1	0.77
						WT	40.5	16.06	1.88	6.0	0.58
AAA-FFF	191	169.0	0.66	25.5	0.21	AL	95.7	56.35	1.30	18.4	0.36
						WT	41.8	24.74	1.53	6.3	0.58
						GL	31.9	18.89	0.50	8.8	0.16
AAA-GGG	882	201.1	0.79	96.9	0.80	RD	88.8	88.18	3.31	47.8	4.38
						GL	41.1	20.82	0.68	19.8	0.66
						AL	47.8	20.27	0.55	19.4	0.89
						WT	30.8	15.11	1.11	14.7	1.38
AAA-HHH	745	171.5	0.67	129.5	1.07	RD	80.0	86.63	2.98	40.8	6.18
						AL	50.6	29.51	0.69	38.2	0.95
						GL	28.3	18.15	0.38	18.3	0.61
						GP	16.7	9.71	0.76	12.6	0.84
AAA-III	389	51.5	0.20	19.0	0.16	GR	39.9	77.89	0.62	18.7	0.50
						LT	11.6	22.51	0.82	8.3	0.39
AAA-JJJ	559	118.3	0.85	65.0	0.58	AL	57.8	89.77	0.79	32.4	0.81
						RD	57.8	89.67	2.15	37.3	3.30
						GL	0.7	0.57	0.01	0.8	0.01
AAA-KKK	881	15.0	0.06	6.9	0.76	GL	15.7	71.39	0.17	8.9	0.16
						WT	6.3	28.61	0.16	2.0	0.18
AAA-LLL	370	27.3	0.11	9.0	0.77	GR	27.3	100.00	0.83	9.0	0.31
AAA-MMM	179	69.4	0.27	12.5	0.10	LT	81.1	81.90	1.57	7.7	0.70
						GP	26.5	38.10	0.81	8.7	0.16
AAA-NNN	188	188.8	1.51	651.8	5.80	GR	152.8	39.95	2.38	257.0	8.72
						GL	112.0	28.96	1.75	188.7	6.26
						AL	88.7	22.98	1.21	189.4	3.72
						LT	31.5	8.65	1.22	58.4	5.18
AAA-PPP	517	1088.3	8.24	500.8	8.65	AL	520.4	88.57	7.17	272.5	6.78
						GP	288.8	22.77	3.85	127.6	8.31

WITFA CASE		FORMATION 01										TOTAL F T C DATA											
MARKET	DIST.	PAR/DAY	STOT	NUM/DAY	STOT	ID	PAR/DAY	STOT	SCAR	WPM/DAY	SCAR	MARKET	DIST.	PAR/DAY	STOT	NUM/DAY	STOT	ID	PAR/DAY	STOT	SCAR	WPM/DAY	SCAR
BMO-CCC	153	1692.3	6.61	258.9	2.15	GR	537.4	31.75	6.39	62.2	2.79	GL	111.2	15.79	2.67	88.5	2.91	WT	130.4	12.04	4.74	6.15	6.15
						AL	238.1	25.67	5.91	66.5	1.65	RD	9.1	0.88	0.38	8.7	0.88	WT	180.2	17.65	6.57	27.6	2.91
MHM-NDU	353	803.9	3.14	263.8	2.15	GR	402.4	50.11	6.29	182.2	8.82	GL	204.5	25.94	3.25	73.6	2.89	AL	186.2	23.16	2.53	65.7	1.68
						WT	6.8	0.80	0.23	2.3	0.21	WT	6.8	0.80	0.23	2.3	0.21	WT	186.2	23.16	2.53	65.7	1.68
GRN-EEC	454	233.7	0.91	106.6	0.88	AL	166.2	71.11	2.26	75.6	1.88	WT	48.2	20.64	1.76	21.9	2.00	GL	19.3	8.25	0.30	8.8	0.29
BMO-FFF	553	88.6	0.35	89.0	0.81	GL	60.7	68.49	0.95	33.5	1.13	AL	27.9	31.51	0.36	15.4	0.38	WT	60.7	68.49	0.95	33.5	1.13
BHM-666	838	172.3	0.67	78.7	0.62	RD	104.7	41.20	3.92	45.7	8.67	AL	35.5	20.60	0.88	15.4	0.38	GL	31.7	18.20	0.89	13.6	0.44
BRR-MMH	259	224.1	0.88	58.1	0.88	RD	175.5	78.30	6.54	45.5	8.65	GL	63.6	19.43	0.68	11.3	0.37	GR	5.1	2.27	0.08	1.3	0.08
BHM-III	284	105.5	0.41	25.8	0.71	GR	105.5	100.00	1.64	28.6	0.87	GL	131.8	74.29	2.04	30.6	1.02	WT	43.1	28.71	1.57	10.1	0.92
MHD-JJJ	233	174.8	0.88	80.7	0.38	GL	131.8	74.29	2.04	30.6	1.02	WT	43.1	28.71	1.57	10.1	0.92	WT	43.1	28.71	1.57	10.1	0.92
MRR-MRR	822	55.7	0.22	23.5	0.19	GL	42.6	76.87	0.66	18.0	0.80	WT	13.1	23.53	0.48	5.5	0.50	WT	42.6	76.87	0.66	18.0	0.80
MRR-LLL	187	88.0	0.17	6.2	0.07	GR	88.0	100.00	0.69	8.2	0.28	WT	13.1	23.53	0.48	5.5	0.50	WT	88.0	100.00	0.69	8.2	0.28
MRR-MRR	530	47.6	0.19	25.2	0.21	GL	47.6	102.00	0.78	24.2	0.88	WT	13.1	23.53	0.48	5.5	0.50	WT	47.6	102.00	0.78	24.2	0.88
BHM-MRR	805	67.7	0.28	83.8	0.16	GR	47.7	75.31	0.78	39.8	1.11	WT	15.5	28.69	0.56	10.8	0.98	WT	67.7	83.8	0.16	83.8	0.16
MRR-YYX	2078	330.8	1.31	495.6	5.77	AL	173.8	97.88	2.48	809.7	10.07	GR	49.9	20.69	1.08	14.9	4.88	GL	58.8	18.37	0.86	11.9	3.77
						WT	14.8	5.04	0.62	54.2	1.70	WT	14.8	5.04	0.62	54.2	1.70	WT	49.9	20.69	1.08	14.9	4.88
CCC-ABA	539	2121.1	8.29	1143.3	9.88	AL	798.9	37.31	10.88	831.2	10.78	GR	688.1	32.34	10.88	368.7	12.41	GL	55.7	26.20	8.67	298.5	9.88
						WT	81.8	3.88	2.97	83.9	8.00	WT	81.8	3.88	2.97	83.9	8.00	WT	55.7	26.20	8.67	298.5	9.88
CCC-MMA	153	1670.1	6.53	255.5	2.12	GR	588.5	32.60	8.50	83.3	2.87	AL	438.2	26.00	5.91	66.4	1.64	WT	1670.1	6.53	255.5	2.12	2.87

WTT-FYS (ASC)		TRAFFIC DATA									
MARKET	DIST.	PKR/DAY	STOT KPR/DAY	RTT	IN PKR/DAY	STOT	ICAR	KPR/DAY	SCAR	KPR/DAY	SCAR
LCC-UUM	GL	385.7	23.09	4.02	59.0	1.96					
	RD	182.4	10.94	6.80	27.9	2.86					
	WT	123.4	7.34	4.50	18.9	1.72					
LCC-UMI	GR	559.9	39.25	8.74	131.1	3.89					
	GL	383.1	25.46	5.67	71.3	2.63					
	RD	289.9	19.98	10.61	57.6	5.89					
LCC-ELL	WT	120.0	8.47	4.81	28.4	2.23					
	RL	97.7	6.85	1.33	19.7	0.49					
	GL	85.2	52.09	1.14	37.3	0.93					
LCC-FFF	WT	64.4	39.38	2.35	28.2	2.57					
	GL	14.0	8.57	0.22	4.1	0.20					
	HL	57.2	82.88	0.89	35.0	1.16					
LCC-GGG	HL	6.7	10.54	2.04	8.1	0.10					
	RD	62.5	48.05	2.33	35.8	3.44					
	GL	52.2	40.12	0.81	29.9	0.99					
LCC-MMH	HL	15.4	11.81	0.21	6.8	0.22					
	RD	110.2	58.74	6.10	39.7	4.06					
	GL	88.9	28.33	0.76	17.6	0.58					
LCC-JJJ	WT	42.0	20.95	1.53	15.1	1.32					
	RD	82.0	57.21	3.05	31.6	3.28					
	GL	57.1	39.87	0.89	22.0	0.73					
LCC-MRN	WT	4.2	2.92	0.15	1.6	0.15					
	GL	116.3	60.69	1.82	35.2	1.17					
	WT	75.3	39.31	2.75	22.8	2.08					
LCC-LLL	GL	40.2	0.16	9.5	0.08	0.63					
	GL	25.6	0.10	13.0	0.11	0.90					
	WT	16.2	0.08	11.8	0.09	0.59					
UUU-AAA	HL	366.3	46.17	6.99	215.4	5.34					
	GL	283.4	30.70	3.80	183.2	4.74					
	GR	140.3	17.68	2.19	82.5	2.80					
UUU-MMR	WT	83.2	5.88	1.58	25.4	2.32					
	GR	438.0	56.74	6.88	158.0	5.25					
	RL	251.0	32.90	3.86	80.6	2.23					
UUU-CCC	GL	65.7	6.51	1.02	23.2	0.77					
	WT	14.4	1.85	0.52	5.0	0.46					
	GR	866.0	37.85	7.28	98.2	3.90					
UUU-EEE	GL	418.3	26.83	6.47	87.7	2.77					
	RD	239.8	16.68	8.93	68.6	6.94					
	RL	187.2	17.58	2.45	36.8	0.91					
UUU-FFF	WT	136.8	9.51	4.98	27.6	2.52					
	WT	23.1	54.37	0.88	10.5	0.46					
	HL	19.8	45.63	0.26	8.8	0.22					

INJECTION OF WATER												
WATER CLASS	MARKET	DIST.	PAK/DAY	STOT	KPM/DAY	SEIT	IN	PAK/DAY	STOT	SCAR	KPM/DAY	XCAD
UUU-111	608	49.0	0.10	34.2	0.28	GL	27.7	46.46	0.43	19.3	0.64	
						WT	11.3	25.04	0.41	7.9	0.72	
UUU-666	787	65.8	0.24	48.8	0.41	RO	53.3	81.49	1.98	39.8	4.07	
						GL	10.6	16.21	0.17	7.9	0.24	
UUU-444	548	132.9	0.52	72.8	0.60	WT	53.8	40.19	1.95	29.5	2.67	
						GL	47.9	16.04	0.75	26.3	0.87	
UUU-111	244	47.8	0.14	11.2	0.69	WT	47.8	100.00	1.74	11.2	1.07	
						GR	31.6	23.75	0.49	17.3	0.49	
UUU-JJJ	545	55.1	0.22	32.3	0.27	RD	48.8	87.89	1.65	26.0	2.66	
						GL	7.5	15.61	0.12	4.4	0.15	
UUU-444	174	176.3	0.64	31.6	0.26	GL	136.3	77.31	2.13	74.4	0.81	
						WT	40.0	22.69	1.46	7.2	0.45	
UUU-444	187	292.3	1.14	43.0	0.36	ML	208.1	71.16	2.83	70.6	0.76	
						WT	84.2	20.82	3.07	12.4	1.13	
UEE-888	455	289.3	0.97	111.4	0.94	ML	192.4	72.17	2.62	87.5	2.18	
						WT	35.7	18.70	1.30	16.2	1.48	
EEE-CCC	455	182.8	0.56	62.6	0.52	ML	86.6	60.65	1.18	37.9	0.96	
						WT	46.5	12.57	1.70	20.8	1.44	
EEE-000	453	73.2	0.29	33.1	0.27	ML	35.6	48.63	0.48	14.1	0.40	
						WT	32.7	48.65	1.19	14.8	1.35	
EEE-FFF	200	23.8	0.09	6.8	0.66	ML	23.8	100.00	0.32	6.8	0.17	
						GL	4.9	6.72	0.08	2.2	0.07	
LEE-666	548	15.8	0.06	8.4	0.07	WT	15.8	100.00	0.54	8.4	0.77	
						GL	9.7	6.74	0.15	4.2	0.18	
LEE-444	711	13.2	0.05	9.7	0.08	ML	13.2	100.00	0.19	9.7	0.28	
						WT	55.8	100.00	2.02	18.2	1.29	
LEE-JJJ	558	6.2	0.02	3.8	0.03	GL	6.2	100.00	0.10	3.8	0.11	
						WT	41.8	24.03	1.51	4.2	0.47	
FFF-444	151	172.7	0.67	26.0	0.22	ML	92.8	53.89	1.24	18.0	0.35	
						WT	41.8	24.03	1.51	4.2	0.47	
FFF-444	553	101.8	0.40	56.3	0.47	GL	82.5	41.07	1.29	45.6	1.51	
						ML	14.3	18.9	0.24	10.7	0.27	
FFF-CCC	412	48.0	0.18	27.5	0.23	ML	25.8	47.42	0.35	15.8	0.39	
						GL	14.1	42.54	0.30	11.7	0.49	

WIFFIC DATA											
WIFFIC	CLASS	TYPE	TIME	STRT	STOP	STRT	STOP	STRT	STOP	STRT	STOP
MARKET	DIST.	DIR	DAY	STRT	STOP	DIR	DAY	STRT	STOP	DIR	DAY
FFF-NUD	80A	45.A	0.1A	32.0	0.27	GL	24.3	53.00	0.38	16.9	0.56
						WT	21.2	47.00	0.79	15.0	1.37
FFF-EFE	20A	20.1	0.08	5.8	0.05	AL	20.1	100.00	0.27	5.8	0.10
FFF-MHH	7A0	6.7	0.03	5.1	0.04	GL	6.7	103.00	0.10	5.1	0.17
666-AAA	6R2	190.1	0.74	91.7	0.76	RD	83.6	43.95	3.11	40.5	4.17
						GL	84.6	25.54	0.74	23.4	0.78
						AL	44.8	23.43	0.61	21.5	0.53
						WT	13.5	7.0F	0.49	6.5	0.59
666-BMA	4A	10A.9	0.74	82.0	0.68	AL	69.2	16.43	0.94	30.0	0.75
						RD	55.8	29.54	2.00	24.2	2.44
						GL	43.8	22.97	0.68	19.8	0.62
						WT	20.5	10.86	0.75	8.9	0.81
666-CCC	572	137.4	0.54	78.7	0.65	RD	71.7	52.10	2.47	41.0	4.20
						GL	65.9	47.90	1.03	37.7	1.25
666-000	747	68.6	0.27	51.2	0.42	RD	42.7	62.24	1.59	31.9	3.26
						GL	25.9	37.72	0.40	19.3	0.64
666-EFE	548	18.9	0.07	10.4	0.09	WT	14.8	74.07	0.54	4.1	0.74
						AL	4.2	21.93	0.06	2.3	0.06
666-MHH	509	9.8	0.04	5.0	0.04	RD	9.8	100.00	0.37	5.0	0.51
666-JJJ	251	33.8	0.13	8.5	0.07	RD	25.8	74.47	0.96	4.5	0.46
						WT	8.0	23.53	0.29	2.0	0.18
MHH-AAA	755	171.5	0.67	129.5	1.07	RD	82.8	44.24	3.08	42.5	6.39
						AL	43.7	25.44	0.59	31.0	0.82
						GL	27.0	15.72	0.42	20.4	0.44
						GR	10.9	6.34	0.17	4.2	0.28
						WT	7.1	4.14	0.26	5.4	0.49
MHH-BMA	259	241.7	0.94	62.4	0.52	RD	162.0	67.04	6.03	42.0	4.29
						WT	41.4	17.21	1.52	10.8	0.94
						GL	37.3	15.4	0.54	9.7	0.32
						GR	0.7	0.29	0.01	0.2	0.01
MHH-CCC	320	203.7	0.79	72.6	0.60	RD	133.2	66.05	4.94	44.0	4.90
						GL	34.5	14.12	0.57	13.2	0.44
						WT	31.9	15.84	1.14	11.5	1.05
MHH-UUU	548	114.0	0.44	63.4	0.53	GL	84.0	72.41	1.31	44.0	1.53
						GR	32.0	27.59	0.50	17.5	0.60
MHH-EFE	711	17.1	0.07	12.1	0.10	WT	17.1	100.00	0.62	12.1	1.11
MHH-FFF	700	6.0	0.03	5.1	0.04	GL	6.0	100.00	0.11	5.1	0.17
MHH-644	509	9.0	0.04	5.0	0.04	RD	7.9	40.37	0.30	4.0	0.41
						GL	1.4	18.64	0.03	1.0	0.03
MHH-JJJ	240	25.4	0.10	6.4	0.05	RD	19.4	74.31	0.72	5.0	0.42

MTC-PA CESS		TRAFFIC DATA									
MARKET	DIST.	PA/DAV	STOT	SPM/DAV	ST:Y	ID	PAK/DAV	STOT	SEAR	KPM/DAV	SEAR
III-AAA	369	78.3	0.29	27.8	0.23	GR	61.9	83.26	0.97	22.8	0.77
						BT	12.8	16.74	0.45	8.6	0.42
III-BHR	244	51.9	0.20	12.7	0.11	GR	51.9	100.00	0.81	12.7	0.43
						GR	42.8	100.00	0.66	7.8	0.26
III-CCC	184	42.4	0.17	7.8	0.06	GR	58.4	77.69	1.98	12.8	1.17
						GR	15.6	22.31	0.28	3.7	0.12
III-EEE	256	43.7	0.17	11.2	0.09	BT	43.7	100.00	1.59	11.2	1.02
						BT	3.2	100.00	0.11	1.7	0.15
III-FFF	578	3.2	0.01	1.7	0.01	BT	53.8	52.38	2.00	10.1	3.08
						AL	32.6	30.57	0.44	18.2	0.45
III-AAA	559	106.8	0.42	59.7	0.50	RD	20.4	19.05	0.32	11.4	0.78
						GL	121.2	71.19	1.69	24.2	0.98
III-BHR	233	170.3	0.67	39.7	0.33	GL	49.1	28.81	1.79	11.4	1.04
						WT	67.4	55.42	2.51	26.1	2.67
III-CCC	386	121.9	0.46	47.0	0.39	RD	40.2	37.00	0.63	15.5	0.51
						BT	18.1	11.58	0.51	5.4	0.50
III-DDD	585	55.0	0.21	32.2	0.27	RD	42.9	77.95	1.60	25.1	2.54
						GL	12.1	22.05	0.19	7.1	0.24
III-EEE	558	7.2	0.03	4.0	0.03	WT	4.4	67.70	0.17	2.0	0.23
						GL	2.8	36.30	0.04	1.5	0.05
III-FFF	529	7.6	0.03	4.0	0.03	GL	7.4	100.00	0.12	4.0	0.13
						GL	35.6	96.62	1.32	8.9	0.91
III-AAA	251	36.8	0.14	9.2	0.06	RD	1.2	3.36	0.02	0.3	0.01
						GL	21.9	100.00	0.82	5.7	0.58
III-BHR	260	21.9	0.09	5.7	0.05	RD	18.4	100.00	0.68	8.6	0.78
						WT	40.4	70.26	0.63	17.0	0.94
III-CCC	422	57.5	0.22	24.2	0.20	GL	17.1	29.74	0.62	7.2	0.64
						WT	170.5	78.03	2.66	51.7	1.71
III-DDD	303	218.5	0.85	66.2	0.55	GL	48.0	21.97	1.75	18.5	1.33
						WT	137.7	75.86	2.07	23.8	0.79
III-AAA	330	29.9	0.12	9.9	0.08	GR	42.2	28.14	1.54	7.6	0.69
						BT	29.9	100.00	0.47	9.9	0.33
III-BHR	187	88.5	0.17	8.3	0.07	RR	88.5	109.00	0.70	8.3	0.28
						GL	1.4	100.00	0.07	1.4	0.05

MARKET	DIST.	PAK/DAY	STCT	KPM/DAY	STCT	IN	PKR/DAY	STOT	SCAR	KPM/DAY	SCAR
MMW-BMM	570	47.4	0.14	25.1	0.21	6L	47.4	100.00	0.74	54.1	0.84
MMW-CCC	500	22.5	0.09	11.4	0.09	6L	22.5	100.00	0.35	11.4	0.34
MMW-AAA	179	51.9	0.20	9.7	0.08	4T	51.9	100.00	1.49	9.3	0.85
MMW-BMM	695	67.1	0.26	46.7	0.19	6B	47.0	71.35	0.75	34.3	1.13
						4T	19.7	24.64	0.70	13.4	1.22
MMW-CCC	744	25.4	0.10	18.0	0.15	6P	13.0	50.72	0.20	9.1	0.31
						4T	12.4	49.28	0.44	4.9	0.41
MMW-DDD	732	17.1	0.05	4.7	0.07	6R	12.1	100.00	0.19	4.7	0.30
MMW-AAA	1644	413.2	1.62	695.9	5.77	6P	141.6	34.26	2.21	234.4	6.09
						6L	131.7	31.88	2.04	221.0	7.35
						4L	107.1	25.91	1.46	180.3	4.49
						4T	32.4	7.95	1.20	55.1	5.08
MMW-BMM	2078	350.4	1.37	728.2	4.04	4L	205.0	54.51	2.79	426.0	10.60
						6L	63.4	14.08	0.99	131.7	4.14
						6P	61.7	17.62	0.96	124.3	4.35
						4T	20.3	4.80	0.74	47.2	3.65

MITCHELLS TYPING UNIT

	TD	PAK/DAY	KPM/DAY
RL	7345.9	4017.8	
GL	6407.2	3016.1	
GR	6804.7	2984.9	
RD	2665.3	977.7	
LT	2782.2	1096.9	
	25584.8	12055.5	

TABLE 4.15 PERIOD 2 TRAFFIC DATA

Y R A F F I C O A T S											
MARKET	UIST.	PAX/DAY	BLT	KPM/DAY	SI	LD	PAX/DAY	SI	SCAN	KPM/DAY	ACR
AAA-BMM	517	1126.8	4.30	582.8	4.77	PL	474.7	42.54	4.67	288.0	6.83
						GP	331.4	29.85	4.70	171.5	5.34
						GL	236.1	20.94	5.62	122.0	4.02
						BT	62.6	5.26	2.25	32.4	2.91
						BP	16.8	1.45	0.62	8.5	0.84
AAA-CCC	519	2248.2	4.58	1211.4	4.92	GP	487.5	39.47	12.58	478.3	14.90
						HL	774.7	38.44	10.77	417.5	10.83
						GL	499.7	22.23	7.66	269.3	8.67
						BT	86.8	3.84	3.10	46.8	4.19
AAA-DOU	588	435.6	3.19	491.4	4.02	HL	462.4	55.34	6.43	271.9	7.06
						GL	212.9	25.44	3.26	125.2	4.12
						BT	41.7	10.02	5.00	49.2	4.43
						GP	76.6	9.16	1.09	45.0	1.40
AAA-EEE	187	256.6	0.98	37.7	0.31	PL	215.9	54.13	3.00	31.7	0.42
						BT	40.7	15.47	1.46	6.0	0.54
AAA-FFF	141	168.4	0.64	25.5	0.21	PL	95.5	54.54	1.33	14.4	0.37
						BT	42.0	24.85	1.51	7.3	0.57
						GL	31.8	18.61	0.48	4.7	0.16
AAA-GGG	482	201.0	0.77	46.4	0.79	HD	65.7	42.63	3.25	41.3	4.11
						GL	43.3	21.56	0.66	27.9	0.69
						HL	41.0	20.80	0.57	19.8	0.51
						BT	31.0	15.41	1.11	14.9	1.34
AAA-HHH	755	159.5	0.61	120.5	0.99	HD	117.1	71.38	4.43	84.4	8.79
						GL	23.8	14.93	0.37	14.0	0.59
						GP	18.4	11.69	0.26	14.1	0.88
AAA-III	349	56.9	0.22	21.0	0.17	GP	45.3	79.61	0.64	14.7	0.52
						BT	11.6	27.39	0.42	4.1	0.39
AAA-JJJ	559	94.0	0.37	53.7	0.44	HD	84.8	48.31	3.21	47.4	4.72
						GL	11.2	11.64	0.17	6.2	0.21
AAA-KKK	441	12.7	0.05	5.4	0.05	BL	4.4	46.33	0.13	3.9	0.13
						BT	4.3	33.67	0.15	2.0	0.14
AAA-LLL	370	34.7	0.13	11.4	0.04	GP	34.7	100.00	0.49	11.4	0.34
AAA-MMM	149	101.7	0.39	15.2	0.12	GP	77.5	76.11	1.15	11.5	0.36
						BT	24.2	23.62	0.47	3.6	0.34
AAA-NNN	179	134.5	0.52	24.3	0.20	HL	62.1	45.83	0.86	11.1	0.29
						BT	40.4	29.96	1.46	7.3	0.45
						GL	31.0	22.87	0.48	5.5	0.14
						GP	14.4	14.35	0.03	4.3	0.01
AAA-PPP	1094	346.3	1.47	450.5	4.32	GP	154.0	39.44	2.14	259.3	8.07
						GL	111.6	24.94	1.72	144.5	6.21
						HL	87.3	22.60	1.21	147.0	3.41
						BT	34.1	4.57	1.19	55.7	5.02

UNIT-TO-UNIT		W A F F I C I U S									
UNIT	UNIT	PER DAY	PER DAY	PER DAY	PER DAY	PER DAY	PER DAY	PER DAY	PER DAY	PER DAY	PER DAY
BMB-AAA	517	1077.3	6.11	357.6	40.69	7.84	276.8	7.14			
	GP	240.4		22.34		3.81		124.4		3.87	
	GL	170.1		15.79		2.61		84.0		2.90	
	WT	119.8		11.02		4.28		61.7		5.54	
	PD	11.9		1.10		0.85		4.1		0.61	
BMB-CCC	153	1721.3	6.57	761.4	7.39	79.8	2.49				
	ML	405.8		21.54		5.64		62.0		1.61	
	GL	401.3		23.31		6.15		61.4		2.02	
	RD	214.4		12.42		8.12		32.6		3.24	
	BT	174.4		10.38		6.41		27.3		2.44	
BMB-DDD	353	794.4	3.04	781.1	7.10	51.82	5.85	145.7	4.44		
	GL	194.0		24.01		3.00		69.2		2.24	
	ML	181.8		22.81		2.51		64.2		1.87	
	WT	5.9		0.74		0.21		2.1		0.19	
BMB-EEL	455	233.7	0.49	106.4	0.47	47.91	2.21	72.2	1.27		
	WT	44.2		14.65		1.54		20.1		1.81	
	GL	30.9		11.20		0.47		14.0		0.46	
BMB-FFF	553	87.8	0.33	46.3	0.40	64.11	0.89	31.9	1.05		
	GL	24.4		31.89		0.41		14.4		0.42	
BMB-GGG	414	172.1	0.66	74.7	0.61	40.1	52.33	3.41	39.1	3.89	
	ML	52.2		30.33		0.71		22.7		0.59	
	GL	29.8		17.34		0.44		13.0		0.43	
BMB-HHH	259	220.0	0.84	57.0	0.47	40	173.4	74.92	6.58	45.0	4.47
	GL	41.1		14.64		0.63		10.6		0.35	
	GP	5.3		2.40		0.07		1.4		0.08	
BMB-III	244	83.9	0.32	20.5	0.17	63.0	100.00	1.19	20.5	0.64	
BMB-JJJ	233	168.4	0.64	34.2	0.26	61.8	48.55	1.77	24.9	0.89	
	WT	53.0		31.45		1.90		12.3		1.11	
BMB-KKK	422	54.8	0.21	23.1	0.14	61	42.8	74.11	0.64	14.1	0.60
	BT	12.0		21.89		0.43		5.1		0.44	
BMB-LLL	187	43.2	0.14	4.1	0.07	61	100.00	0.61	4.1	0.24	
BMB-MMM	510	41.9	0.31	43.8	0.26	61	47.84	6.51	14.0	0.59	
	GL	31.2		14.12		0.44		14.5		0.54	
	WT	14.7		18.00		0.53		7.8		0.70	
BMB-NNN	495	40.1	0.31	57.7	0.46	61	47.84	0.92	44.9	1.40	
	WT	15.5		19.34		0.54		10.6		0.97	
BMB-PPP	2078	125.0	1.24	674.3	5.53	41	171.7	52.43	2.39	154.7	9.26
	GL	54.9		14.14		0.93		14.6		4.97	
	WT	17.4		5.40		0.63		14.5		3.29	
BMB-RRR	510	7140.5	6.32	1175.4	9.47	41	413.4	37.24	11.57	434.2	13.44
	ML	777.4		30.31		10.71		414.2		10.77	
	GL	518.4		23.54		7.84		277.2		9.13	

WATER PRESS											
THERMISTOR DATA											
MODEL	INST.	PER/DAY	BT-1	ID	PER/DAY	BT-1	SCAR	KPM/DAY	SCAR	KPM/DAY	SCAR
				WT			%		%		%
CCC-MMM	153	167-02	6.39	250.3	2.10	GR	462.0	24.87	6.84	73.9	2.30
				GL	445.5	24.00			6.83	68.2	2.25
				ML	404.0	24.11			5.62	61.6	1.60
				RD	224.1	13.30			6.89	34.3	3.41
				WT	114.8	7.09			4.24	18.2	1.68
LCC-UDD	272	1414.0	5.40	280.0	2.14	GR	656.8	44.36	9.30	132.0	4.13
				GL	164.5	24.02			5.65	74.4	2.84
				RF	172.1	12.15			6.52	34.6	3.46
				WT	121.8	6.57			6.35	24.5	2.21
				ML	97.7	6.90			1.36	19.7	0.91
LCC-LLL	478	163.5	6.67	71.6	0.79	ML	85.2	52.09	1.18	37.3	0.97
				WT	64.4	34.34			2.31	24.2	2.54
				GL	14.0	4.57			0.21	6.1	0.20
LCC-FFF	817	68.7	0.25	39.8	0.72	GL	57.0	89.53	0.89	35.4	1.17
				ML	6.8	10.47			0.09	4.1	0.11
CCC-GUG	372	126.9	0.44	72.6	0.59	GL	66.7	57.15	1.01	37.9	1.25
				RD	42.7	33.63			1.62	28.4	2.43
				ML	14.0	14.21			0.25	10.3	0.27
LCC-MMM	340	201.0	0.77	72.4	0.49	RD	111.8	56.67	4.31	41.0	4.08
				GL	45.8	22.59			0.70	14.3	0.58
				WT	40.0	20.34			1.87	18.7	1.33
				GR	0.0	1.44			0.01	0.3	0.01
LCC-III	178	28.4	0.11	5.2	0.04	GR	28.4	100.00	0.40	5.2	0.16
LCC-JJJ	346	185.4	0.56	56.1	0.46	RD	42.0	54.83	3.14	32.0	3.18
				GL	62.0	43.17			0.94	24.3	0.40
LCC-KKK	373	198.4	0.74	56.9	0.44	GL	114.5	67.94	1.42	35.9	1.14
				WT	75.0	38.04			2.72	23.0	2.07
LCC-LLL	236	44.1	0.17	10.4	0.29	GR	44.1	100.00	0.62	10.4	0.32
LCC-PPP	508	24.6	0.10	13.5	0.11	GR	14.0	52.45	0.20	7.1	0.22
				WT	6.7	25.24			0.24	3.4	0.31
				GL	5.0	22.23			0.09	4.0	0.10
LCC-MMM	704	31.1	0.17	21.2	0.16	GL	15.5	89.95	0.24	10.9	0.34
				WT	7.3	25.11			0.24	5.5	0.50
				GR	7.8	24.94			0.11	5.5	0.17
UDD-BBA	588	784.8	3.70	162.5	3.70	ML	372.4	47.30	3.17	214.7	5.64
				GL	256.8	32.45			3.91	150.1	4.98
				GR	114.0	14.50			1.62	67.1	2.09
				WT	45.2	6.75			1.62	24.0	2.39
UDD-MMM	553	771.7	2.44	272.4	2.43	GR	444.2	58.04	6.34	184.7	4.94
				ML	240.1	31.89			3.42	141.7	2.24
				GL	61.1	7.92			0.94	21.6	0.71
				WT	14.8	2.17			0.50	5.8	0.42

MAGNET DIST. O.A./DAY		ALT. DEM/MSY		ST. I.		IN. PA./DAY		SL. I.		SCAP. MPH/DAY		SCAP.	
DUU-CCC	282	145.62	5.68	298.2	2.61	GP	56.61	39.00	6.00	314.6	3.57	2.76	2.76
						HL	41.42	28.44	6.35	43.7	0.97	37.2	0.97
						PL	184.3	12.65	2.56	37.2	0.97	31.1	0.97
						BT	154.6	16.61	6.86	31.2	3.11	27.4	2.86
						BT	135.8	9.33	4.86	27.4	2.86		
DUU-EEF	483	84.1	1.17	20.0	0.16	BT	23.1	52.44	0.63	10.5	0.98	9.5	0.25
						HL	21.0	47.56	0.29	9.5	0.25		
DUU-FFF	606	84.8	1.17	31.3	0.26	GL	27.5	41.80	0.42	15.2	0.43	9.5	0.77
						BT	12.2	27.20	0.44	9.5	0.77	3.8	0.09
						HL	5.1	11.40	0.07	3.8	0.09		
DUU-600	787	66.7	0.25	49.4	0.81	RD	54.7	87.93	2.22	43.8	4.36	4.7	0.18
						GL	6.2	9.34	0.10	4.7	0.15		
						BT	1.8	2.71	0.04	1.3	0.12		
DUU-MNN	586	132.9	0.51	72.8	0.50	BT	21.0	30.92	1.00	20.1	2.82		
						GL	42.6	32.07	0.65	23.8	0.77		
						GP	37.2	28.01	0.53	20.4	0.68		
DUU-III	235	86.0	0.18	10.8	0.09	BT	46.0	130.00	1.65	10.8	0.07		
DUU-JJU	595	55.1	0.21	32.3	0.26	RD	42.3	76.77	1.60	28.6	2.84		
						GL	7.8	18.11	0.12	4.6	0.15		
						BT	5.0	9.10	0.18	2.9	0.26		
DUU-WKK	179	175.7	0.27	31.5	0.26	GL	136.2	77.52	2.09	24.8	0.80		
						BT	39.5	22.48	1.02	7.1	0.68		
DUU-WNN	506	17.3	0.07	6.7	0.07	GP	11.2	68.92	0.16	5.7	0.18		
						BT	6.3	35.08	0.22	3.1	0.28		
DUU-WNN	722	18.3	0.07	13.2	0.11	HL	11.5	42.82	0.16	4.3	0.22		
						GL	5.8	29.76	0.04	3.9	0.13		
						GP	1.8	7.40	0.02	1.0	0.03		
ELL-AAA	187	295.2	1.13	43.8	0.46	HL	213.6	72.35	2.97	31.8	0.81		
						BT	81.6	27.65	2.93	12.0	1.08		
ELL-MNN	455	249.3	0.95	115.8	0.93	HL	186.1	78.64	2.59	48.7	2.20		
						BT	34.9	13.99	1.25	15.9	1.83		
						GL	24.8	11.37	0.43	12.9	0.82		
ELL-CCC	438	188.6	0.25	63.2	0.22	HL	81.8	56.68	1.18	35.8	3.93		
						BT	45.1	31.26	1.62	19.8	1.78		
						GL	17.8	12.06	0.27	7.6	0.25		
EFF-DUC	453	75.8	0.20	34.2	0.28	HL	35.0	42.54	0.50	14.2	0.62		
						BT	32.2	42.69	1.16	14.6	1.31		
						GL	7.8	9.77	0.11	3.3	0.11		
ELL-FFF	200	24.0	0.10	7.2	0.06	HL	24.0	107.00	0.35	7.2	0.19		
ELL-600	888	15.8	0.04	8.8	0.07	BT	15.8	112.00	0.55	8.8	3.74		
ELL-III	256	55.0	0.21	14.5	0.12	BT	55.0	112.00	2.00	14.3	1.29		

MILWAUKEE CRSS											
JULY 1957											
WEEK	DIST.	PAID/DAY	31.1	KPM/DAY	WT 1	IC	MAX/DAY	31.01	SCAR	KPM/DAY	SCAP
558	558	9.2	0.06	5.2	0.04	GL	9.2	100.00	0.18	5.2	0.17
559	559	171.2	0.65	25.0	0.21	ML	89.3	52.17	1.28	17.5	0.35
						WT	41.8	24.19	1.89	6.3	0.56
						GL	40.5	23.63	0.62	6.1	0.20
560	560	101.5	0.39	50.1	0.46	GL	80.5	79.34	1.23	44.5	1.47
						ML	21.0	20.66	0.29	11.6	0.30
561	561	46.7	0.18	28.6	0.23	ML	26.9	57.55	0.37	16.5	0.43
						GL	19.8	42.45	0.50	12.1	0.40
562	562	45.1	0.17	31.5	0.26	GL	24.3	53.79	0.37	14.9	0.54
						WT	20.9	46.21	0.75	10.6	1.31
563	563	20.5	0.08	5.9	0.05	ML	20.5	100.00	0.28	5.9	0.15
564	564	6.7	0.03	5.1	0.04	GL	6.7	100.00	0.10	5.1	0.17
565	565	191.1	0.73	42.1	0.75	RD	86.2	45.10	3.27	41.6	4.13
						ML	49.2	25.76	0.68	23.7	0.62
						GL	41.1	21.49	0.63	19.8	0.65
						WT	14.4	7.66	0.52	7.1	0.68
566	566	184.9	0.72	42.1	0.67	RD	67.0	33.29	2.38	27.3	2.72
						ML	54.9	29.06	0.74	23.8	0.62
						GL	48.9	25.89	0.75	21.2	0.70
						WT	22.2	11.74	0.60	9.6	0.87
567	567	124.0	0.48	71.5	0.59	GL	80.1	64.04	1.23	45.8	1.51
						RD	44.0	35.92	1.70	24.7	2.56
568	568	70.4	0.27	54.6	0.43	RD	41.3	58.63	1.56	30.8	3.07
						GL	14.7	26.53	0.29	13.4	0.46
						ML	19.8	14.84	0.15	7.8	0.20
569	569	18.3	0.07	10.0	0.04	WT	18.3	100.00	0.65	10.0	0.60
570	570	9.8	0.04	5.0	0.04	RD	9.8	100.00	0.37	5.0	0.50
571	571	33.8	0.13	8.5	0.07	RD	27.4	81.22	1.04	6.9	0.69
						WT	6.2	18.48	0.22	1.6	0.18
572	572	162.9	0.62	123.0	1.01	RD	107.8	65.93	4.07	41.1	8.07
						GL	34.9	22.06	0.55	21.1	0.89
						GP	13.2	8.13	0.18	10.0	0.33
						WT	6.3	3.87	0.23	4.8	0.43
573	573	238.0	0.91	61.4	0.50	RD	154.8	67.15	6.06	41.4	4.12
						GL	41.7	17.09	0.67	10.5	0.36
						WT	36.8	15.45	1.32	9.5	0.46
						GP	0.7	3.30	0.01	0.2	0.01
574	574	201.7	0.77	72.4	0.54	RD	137.9	68.39	5.24	40.7	4.94
						GL	32.8	16.01	0.89	11.6	0.34
						WT	31.5	17.66	1.13	11.3	1.02

WATER CLASS	PER/DAY	APP/DAY	SI	IN	PER/DAY	TIME	RCAN	KPM/DAY	SCAP		
MNH-000	508	115.9	0.44	63.5	0.52	GL	76.7	64.19	1.18	42.0	1.36
						GP	39.2	33.61	0.56	21.5	0.67
MNH-001	711	17.1	0.07	12.7	0.10	GL	17.1	10.00	0.61	12.2	1.10
MNH-002	760	6.8	0.03	5.1	0.04	GL	6.8	100.00	0.10	5.1	0.17
MNH-003	509	9.9	0.08	5.0	0.04	RD	7.9	80.42	0.30	4.0	0.40
						GL	1.9	19.58	0.01	1.0	0.03
MNH-004	240	25.2	0.10	6.5	0.05	RD	18.7	74.51	0.71	4.9	0.48
						WT	3.5	13.92	0.13	0.9	0.08
						GL	2.8	11.57	0.04	0.8	0.07
III-005	349	75.2	0.29	27.7	0.23	GP	62.7	41.85	0.89	21.2	0.72
						BT	12.4	14.55	0.45	4.6	0.41
III-006	244	59.8	0.23	14.6	0.12	GP	54.8	100.00	0.85	14.6	0.45
III-007	198	33.3	0.13	6.1	0.05	GR	33.3	100.00	0.47	6.1	0.19
III-008	235	72.1	0.28	17.0	0.14	BT	54.2	74.94	1.94	12.7	1.15
						GP	18.1	25.06	0.24	4.3	0.13
III-009	256	81.9	0.14	10.7	0.09	BT	41.9	100.00	1.50	10.7	0.97
III-010	514	3.2	0.01	1.7	0.01	WT	3.2	100.00	0.11	1.7	0.15
JJJ-011	549	103.3	0.39	57.4	0.47	RD	74.4	77.24	3.02	44.6	4.44
						GL	23.5	22.76	0.36	13.2	0.43
JJJ-012	233	149.5	0.65	34.4	0.52	GL	117.4	49.44	1.81	27.4	0.90
						BT	51.7	39.52	1.86	12.1	1.09
JJJ-013	386	125.2	0.48	48.3	0.40	RD	67.4	53.89	2.54	24.1	2.59
						GL	46.3	14.94	0.71	17.9	3.59
						WT	11.4	9.15	0.41	4.4	0.40
JJJ-014	545	54.0	0.21	32.2	0.26	RD	45.4	42.93	1.73	26.7	2.65
						GL	9.6	17.10	0.14	5.5	0.14
JJJ-015	548	10.3	0.04	5.7	0.05	GL	5.2	57.62	0.04	2.9	0.10
						WT	5.1	49.36	0.14	2.8	0.26
JJJ-016	529	7.6	0.03	4.0	0.03	GL	7.4	100.00	0.12	4.0	0.13
JJJ-017	251	34.5	0.14	4.2	0.04	RD	35.3	94.65	1.34	4.9	0.44
						GL	1.2	3.35	0.02	0.3	0.01
JJJ-018	240	21.9	0.04	5.7	0.05	RD	21.9	100.00	0.43	5.7	0.57
RRR-019	441	17.3	0.07	8.0	0.07	BT	17.3	100.00	0.62	8.0	0.72
RRR-020	422	57.1	0.22	44.2	0.20	GL	37.4	65.61	0.54	15.4	0.52
						BT	19.7	44.41	0.71	4.3	0.74
RRR-021	303	20.8	0.04	66.4	0.44	GL	174.3	79.52	2.60	51.1	1.75

WINDY PRESS		TEMPERATURE		WIND DIRECTION		WIND VELOCITY		WIND FORCE			
REPORT DIST.	DIR/DAY	AT/1000	AT/1000	DIR/DAY	DIR/DAY	DIR/DAY	DIR/DAY	DIR/DAY	DIR/DAY		
MMN-UUU	179	175.2	0.67	31.4	0.26	GL	131.5	25.05	2.02	21.5	0.78
						WT	43.6	28.91	1.57	7.8	0.70
LLL-AAA	310	31.7	0.12	10.5	0.09	GP	31.7	100.00	0.45	10.5	0.33
LLL-MMH	147	56.5	0.22	10.6	0.09	GP	56.5	100.00	0.80	10.6	0.33
LLL-UUU	370	8.6	0.03	3.2	0.03	GP	8.6	100.00	0.12	3.2	0.10
MMN-AAA	189	101.5	0.39	15.1	0.12	GP	68.2	67.19	0.97	10.2	0.32
						WT	33.3	32.81	1.19	5.0	0.45
MMN-MMH	510	60.9	0.23	32.3	0.26	GP	29.5	48.35	0.42	15.6	0.49
						GL	22.0	36.02	0.34	11.6	0.38
						WT	9.5	15.61	0.34	5.0	0.45
MMN-UUU	508	38.4	0.13	17.5	0.14	GL	16.1	46.80	0.25	8.2	0.27
						GP	14.2	41.17	0.20	7.2	0.22
						WT	4.1	12.02	0.15	2.1	0.19
MMN-UUU	504	23.1	0.09	11.6	0.10	WT	13.3	57.52	0.48	6.7	0.60
						GP	8.8	36.57	0.12	4.2	0.13
						GL	1.8	5.91	0.02	0.7	0.02
MMN-AAA	179	131.7	0.50	23.6	0.19	ML	57.3	43.52	0.80	10.3	0.27
						GL	38.9	29.57	0.60	7.0	0.23
						WT	35.5	26.92	1.27	6.3	0.57
MMN-BRR	695	162.4	0.39	71.2	0.58	GP	44.6	43.58	0.63	31.0	0.97
						ML	41.8	40.46	0.58	28.8	0.75
						WT	12.5	12.19	0.45	8.7	0.78
						GL	3.9	3.77	0.06	2.7	0.09
MMN-CCC	704	30.6	0.12	21.5	0.18	GP	12.2	19.91	0.17	8.6	0.27
						WT	11.1	16.47	0.40	7.8	0.71
						GL	7.2	23.61	0.11	5.1	0.17
MMN-UUU	722	15.1	0.06	10.9	0.09	GP	7.8	51.51	0.11	5.6	0.17
						GL	7.4	49.49	0.11	5.3	0.17
MMN-AAA	1688	415.0	1.54	498.8	5.72	GP	143.5	58.58	2.03	281.6	7.53
						GL	131.5	31.68	2.01	221.8	7.29
						ML	107.5	25.90	1.45	181.0	4.70
						WT	37.5	7.88	1.17	58.8	8.93
MMN-MMH	2078	349.0	1.33	765.2	5.94	ML	197.6	56.62	2.75	410.6	10.45
						GL	65.6	18.79	1.00	116.3	6.49
						GP	63.1	18.09	0.89	131.2	8.09
						WT	22.7	6.51	0.81	67.4	6.24

TOTAL TASS		T W A F T C O D A T A	
	TD	PAY/DAY	KPM/DAY
RL	7197.6		3854.0
GL	6525.5		3036.3
GM	7055.1		3711.1
WD	2639.6		1005.0
BT	2787.6		1110.3
	26201.3		12216.7

APPENDIX B
RESULTS OF DECEMBER 1979 EXERCISE

B.1 The Experiment at M.I.T./FTL

The pilot experiment was performed at M.I.T. the week of December 17-21, 1979. The five airline teams were assigned aircraft as follows:

<u>Team</u>	<u>DC-10</u>	<u>707</u>	<u>727</u>	<u>DC-9</u>
Blue	3	5	12	
Gold		5	10	
Green		5	5	
Red		3	5	2
White			4	1

Each team was represented by one or more players from ECON-FTA staff and the FAA. The total air transportation network involved four major hubs, of which three were slotted, four intermediate size airports and five minor airports. There were 60 aircraft in all, allocated among the five airlines as shown above. Each airline was told its route structure and could obtain detailed information on the demand in each market.

The scheduling of flights was undertaken during the set-up phase, prior to the first slot auction on December 18, 1979, without any slot restrictions. This prior effort also served to test various aspects of the scenario and to allow changes to be made in passenger demand, costs and other structural aspects of the airline management game (AMG). Then, using the flight schedule profile (number of flights by hour and airport) artificial hourly quotas were selected for the three major hubs:

<u>Airport</u>	<u>Quota (flights/hour)</u>
A	13
B	12
C	15

These were selected so that excess demand would surely occur at peak hours. For instance, the original schedules had 26 operations in one peak at Airport A.

The major iterations of the slot auction experiment were undertaken. Each iteration was conducted as follows:

Slot Auction	Bidding round 1
Slot Auction	Bidding round 2
Slot Auction	-----
Slot Auction	Bidding round k

Run market aggregation--print equilibrium prices
 Reschedule flights subject to slot allocation
 Trade slots in aftermarket is possible and necessary
 Airlines submit schedules to AMG
 Run AMG simulation

In the first iteration there were four rounds of bidding, in the second only two. The auction was terminated by a voting procedure: if four out of five teams voted to stop the auction, it was stopped; otherwise another round of bidding was taken. The auctioneer announced that he could terminate the bidding at any round after the first round based on other criteria, such as lack of change in prices and/or allocations, but in practice this was not applied during the pilot experiment.

B.2 Problems with the Experiment

There was some evidence of dynamic changes in bidding between rounds, probably due to a combination of learning by the players and deliberate bidding strategy, including speculation in slots. One could not say, looking at the results that the market "settled down." Probably many more rounds of bidding were needed for stabilization of the market. Time was not available at FTL for a large number of rounds. Initially, during Iteration 1, Rounds 1-3, the mechanics of processing bids was rather slow. By the time we had achieved efficiency in bid processing there was only one day of the experiment left, and hence the abbreviated auction in Iteration 2.

There were several major problems in the implementation of the experiment, as far as the scenario and groundrules were concerned.

1. Ambiguity about the players' freedom to change route structure
2. An "average" cost function which hurt the small airlines profitability
3. Start-up difficulties in player understanding of the bidding procedure and market mechanism
4. Fares were fixed and players could not change them
5. No cash flow constraints were imposed.

We discuss of these problems in turn.

1. Apparently some players (team Gold in particular) perceived the game as if deregulation were in full force, meaning that the airline could add or drop any routes it wished. Other players accepted their initially given routes as fixed and used only their ability to add or drop flights on those routes to make profits. This difference in groundrules between airlines emerges clearly in comparing the earnings results for teams Green and Gold^{*}; while Gold was able to substantially improve its profitability from Iteration 0 to Iteration 2 by competing vigorously in Green's markets, Green steadily lost ground. In a properly designed experiment, all players should have identical groundrules.

It doesn't matter so much whether the groundrules do or do not reflect deregulation. It is essential that this decision be made by the game administrator and announced unambiguously to all players.

In approaching their scheduling problem for a six-month season, airlines would mostly enter the slot market with their flight cycles already mapped out. Changes as a result of slot allocation in these cycles would tend to be marginal,

^{*}See Tables 4 and 5.

since an accommodation to slot restrictions can be expected via "sliding." The difference in behavior between airline players invalidates the simulation to this extent.

2. The cost allocation--e.g., the cost per passenger for handling passengers on each flight--was derived from averages for aircraft type, and hence did not allow for the lower overhead of a small airline (White) as compared with a large airline (Blue). This resulted in a situation where White could not possibly be profitable and Blue could hardly fail to make profits. It is impossible to say what effect this had on the players bidding. See problem (5) below for further discussion.

3. The bidding instructions were clear and unambiguous, but fairly complicated. Not enough time was available for players to learn bidding procedures and strategy. Apparently some players were mistakenly under the impression in Round 2 of Iteration 1 that all bids had to be submitted from scratch. This caused some confusion in the bid processing. Many players entered zero bids, which have no effect whatsoever on this type of market. To enable players to register demands for slots at essentially no cost to the airlines, we suggested a minimum bid of one dollar, which then allowed slot allocation to take place at a price of \$1.00 in off peak hours. From Round 3 of Iteration 1 on, the zero bid was taken as a cancellation of bids previously submitted in the same auction.

Players evidently thought they could individually influence the slot market to a greater extent than is the case. There was a considerable amount of strategic posturing in the bidding, which is a natural part of learning how to use the market, but which does not contribute useful information to the experiment.

Slot speculation was another example of unrealistic behavior--it is hard to believe the airlines would buy a great number of slots which they don't plan to use,

particularly if they must forfeit such slots after one month of nonuse. Nevertheless, speculation is a possibility which should be considered, and some thought might be devoted to penalizing more heavily slot holders who don't use their slots.

4. The fixed fares limited the players unnecessarily and do not reflect the competitive reality. This problem was significant because of the unusually high costs experienced by small airlines due to incorrect cost allocation (the "average" overhead problem--see (2)) and also entailed a lack of consideration of the airlines of whether or not to pass along slot costs to passengers.

5. The worst problem was occasioned by the absence of adequate financial constraints. Since money was virtually "free" to the players, their bidding exceeded industry net earnings by \$43,668 per day at one point in the first auction. Subsequent rounds of bidding failed to completely correct this problem. The final round, for instance, shows net industry earnings of \$62,239 per day and slot payments of \$43,840 per day. Since the earnings include operations at non-slotted airports, the operations at slotted airports may still show a loss.

TABLE B.1A SLOT PRICES AT END OF
ITERATION 1 (DOLLARS
PER OPERATION)

HOUR \ AIRPORT	A	B	C
0600	0	0	0
0700	151	63	0
0800	713	353	1
0900	2	101	100
1000	1	152	276
1100	1	328	0
1200	1	351	0
1300	100	14	305
1400	1	176	2
1500	126	14	500
1600	179	76	1
1700	301	2	2
1800	2	353	1
1900	1	100	14
2000	1	276	0
2100	0	177	0
2200	0	0	0

TABLE B.1B SLOT PRICES AT END OF ITERATION 2 (DOLLARS PER OPERATION)			
HOUR \ AIRPORT	A	B	C
0600	3	3	0
0700	740	3	2
0800	0	19	3
0900	155	5	103
1000	56	6	4
1100	42	253	3
1200	157	157	6
1300	332	5	3
1400	7	6	6
1500	182	6	58
1600	244	95	3
1700	351	5	3
1800	114	207	13
1900	6	6	3
2000	6	7	0
2100	0	7	0
2200	3	3	0

TABLE B.2 POTENTIAL SLOT REVENUES (MILLIONS OF DOLLARS PER HALF-YEAR SEASON)				
ITERATION AND ROUND \ AIRPORT	A	B	C	ALL
1.1	0.468	0.745	1.080	2.293
1.2	1.640	2.171	1.455	5.266
1.3	2.314	3.484	2.692	8.490
1.4	3.697	5.478	3.245	12.420
2.1	2.972	0.320	0.032	3.324
2.2	5.611	1.713	0.567	7.891

TABLE B.3 NET EARNINGS BEFORE TAXES OR SLOT PAYMENTS (IN MILLIONS OF DOLLARS PER HALF-YEAR SEASON)			
AIRLINE \ ITERATION	0*	1	2
BLUE	4.30	4.17	4.13
GOLD	-4.99	-1.07	1.69
GREEN	6.00	4.98	5.53
RED	0.270	0.067	0.720
WHITE	-1.020	-0.994	-0.867
ALL	4.560	7.153	11.203

*THERE WERE NO SLOT RESTRICTIONS IN THIS INITIAL ITERATION.

TABLE B.4 POTENTIAL SLOT PAYMENTS AFTER EACH BIDDING ROUND
(MILLIONS OF DOLLARS PER HALF-YEAR)

AIRLINE \ ITERATION AND ROUND	1.1	1.2	1.3	1.4	2.1	2.2
BLUE	0.478	1.548	1.863	4.030	1.881	2.469
GOLD	0.611	1.369	2.394	3.533	0.003	1.254
GREEN	0.603	1.945	1.736	3.001	0.878	2.102
RED	0.094	0.117	0.435	0.578	0.048	0.228
WHITE	0.472	0.541	0.670	0.854	0.075	0.080
ALL	2.258	5.520	7.098	11.996	2.885	6.133

TABLE B.5 NET EARNINGS AFTER SLOT PAYMENTS, BEFORE TAXES
(MILLIONS OF DOLLARS PER HALF-YEAR)

AIRLINE \ ITERATION	0	1	2
BLUE	4.300	0.140	1.661
GOLD	-4.990	-4.603	0.436
GREEN	6.000	1.979	3.428
RED	0.270	-0.511	0.492
WHITE	-1.020	-1.848	-0.947
ALL	4.560	-4.843	5.070

TABLE B.6 SYSTEMWIDE PERFORMANCE OF ALL FIVE AIRLINES

FACTOR \ ITERATION	0	1	2
1. LOAD FACTOR	0.627	0.620	0.650
2. AVERAGE STAGE LENGTH (MILES)	338	357	387
3. AVERAGE TRIP LENGTH "	423	437	456
4. RATION OF (3) to (2)	1.25	1.22	1.18
5. TOTAL FLIGHTS	222	211	187
6. TOTAL RUNWAY OPERATIONS	974	938	830
7. RUNWAY OPERATIONS AT AIRPORTS A, B, C	580	544	488
8. UNUSED SLOTS AT A, B, C	100	136	192

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