

STRATEGIC MASTER PLAN STUDY

PBI

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PALM BEACH COUNTY DEPARTMENT OF AIRPORTS

Table of Contents

I. - Introduction.	I-1
I.1 Goals and Objectives	I-2
I.2 Approach and Methodology	I-2
I.3 Conclusions and Recommendations	I-4
I.4 Summary	I-8
II. – Inventory of Existing Facilities.	II-1
2.1 On-Airport Facilities	II-1
2.1.1 Airfield Facilities	II-1
2.1.1.1 Runways, Taxiways and Hold Pads	II-4
2.1.1.2 Aircraft Apron/Ramp Areas	II-6
2.1.1.3 Airfield Drainage	II-11
2.1.1.4 Fencing and Security Gates	II-12
2.1.1.5 Lighting, Marking, Signage and Navigational Aids	II-16
2.1.2 Terminal Building and Concourses	II-20
2.1.2.1 Airline Ticket Counter and Airline Operations Area	II-23
2.1.2.2 Holdrooms and Gates	II-33
2.1.2.3 Concession Areas	II-33
2.1.2.4 Public Areas	II-34
2.1.2.5 Security Areas and FIS Facilities	II-34
2.1.2.6 Terminal Curbfront	II-36
2.1.2.7 Baggage Claim	II-39
2.1.2.8 Airport Management and Utility Areas	II-40
2.1.3 Terminal Roadways and Airport Service Roads	II-40
2.1.3.1 Existing Conditions	II-40
2.1.3.2 Significant Roadway Features	II-47
2.1.4 Rental Car Facilities	II-47
2.1.5 Auto Parking Facilities	II-50
2.1.6 General Aviation/Fixed Base Operators (FBO) Facilities	II-50
2.1.6.1 Galaxy Aviation	II-52
2.1.6.2 Jet Aviation	II-52
2.1.6.3 Signature Flight Support	II-52
2.1.7 Cargo Facilities	II-52
2.1.8 Airport Support Facilities	II-57
2.1.8.1 Airport Rescue and Fire Fighting (ARFF) Facilities	II-57
2.1.8.2 Airport Administration and Maintenance Facilities	II-57

2.1.8.3	Electrical Vaults.....	II-58
2.1.8.4	Fueling Facilities.....	II-58
2.1.8.5	Town of Golfview Property.....	II-58
2.2	Off-Airport Facilities	II-64
2.2.1	Off-Airport Roadways and Planned Roadway Improvements.....	II-64
2.2.1.1	Field Inventory.....	II-64
2.2.1.2	Traffic Counts.....	II-65
2.2.1.3	Historic Traffic Information	II-68
2.2.1.4	Roadway Improvement Plans	II-70
2.2.2	Adjacent Airport Owned Property.....	II-74
2.2.3	Off-Airport Transportation Network	II-74
2.2.4	Long-Range Transportation Plan.....	II-77
2.2.5	PBIA MPO Policies	II-79
2.2.5.1	Approvals.....	II-79
2.2.5.2	Funding.....	II-79
2.2.6	Intermodal Plan.....	II-80
2.2.7	ITS Program.....	II-81
2.2.8	Relevant Planned Developments	II-82
2.2.8.1	Developments of Regional Impact (DRI)	II-82
2.2.8.2	Non-DRI Developments	II-85
2.2.8.3	Tri-County Commuter Rail.....	II-85
2.3	Historical Aviation Activity.....	II-87
2.3.1	Airport Role.....	II-87
2.3.2	Airlines Serving the Airport.....	II-87
2.3.3	Commercial Passenger Activity	II-88
2.3.4	Connecting Passenger Activity	II-91
2.3.5	Origin and Destination Patterns	II-91
2.3.6	Service Patterns.....	II-98
2.3.7	Total Aircraft Operations.....	II-98
2.3.8	Commercial Fleet Mix	II-102
2.4	User Surveys.....	II-102
2.4.1	Airline Planning Questionnaire.....	II-106
2.4.2	Airport Tenant Survey	II-106
2.4.3	Air Cargo Survey & Freight Forwarder Survey.....	II-106
2.4.4	Fixed Base Operator (FBO) Survey.....	II-107
2.5	Airspace and Air Traffic Control Procedures	II-107
2.5.2.1	Airfield Operating Practices	II-116
2.5.2.2	Runway Use Configurations.....	II-116
2.5.2.3	Airfield Circulation Patterns.....	II-121

2.5.3	Airport Financial Data	II-125
2.5.4	Airport Tenant Leaseholds.....	II-125
2.5.5	Meteorological Conditions.....	II-125

III. – Demand Analyses	III-1
3.1 Overview.....	III-2
3.2 Aviation Demand Elements	III-3
3.3 Factors Affecting Aviation Demand	III-3
3.3.1 Aviation Industry Standards	III-4
3.3.2 Socioeconomic Factors	III-5
3.3.3 Domestic Yield and Fuel Cost	III-17
3.3.4 Impact of New Technologies and Competing Modes	III-17
3.4 Air Service Demand Analysis.....	III-20
3.4.1 Methodology.....	III-20
3.4.2 Domestic Baseline Deficiency Study.....	III-21
3.4.2.1 Markets with No Existing Non-stop Service	III-21
3.4.2.2 Local O&D Passengers vs. Non-stop Seats Offered	III-23
3.4.2.3 Local O&D Passengers vs. Total Onboard Passengers.....	III-24
3.4.2.4 Summary of Deficient U.S. Domestic Markets.....	III-25
3.4.3 Comparison of Existing Services by Low Cost Carriers.....	III-26
3.4.4 International Air Service Analysis	III-28
3.4.4.1 Methodology.....	III-28
3.4.5 Air Transportation Needs.....	III-30
3.4.5.1 Summary of Interview Results.....	III-30
3.4.5.2 Assessment of South Florida Airports	III-32
3.4.5.3 Conclusions	III-33
3.4.6 Airline Review.....	III-34
3.4.7 Seasonal Capacity Analysis	III-36
3.5 Passenger Enplanements	III-37
3.5.1 Baseline Scenario.....	III-38
3.5.1.1 Baseline-Domestic Originating Enplanements	III-38
3.5.1.2 Baseline-Domestic Connecting Enplanements	III-42
3.5.1.3 Baseline-International Enplanements.....	III-42
3.5.2 Alternate Service Patterns Demand Scenario.....	III-46
3.5.3 High Growth Demand Scenario.....	III-51
3.5.4 Comparison of Alternative Demand Scenarios.....	III-57
3.6 Cargo Activity.....	III-57
3.6.1 Baseline Scenario-Cargo Activity.....	III-62
3.6.2 Alternate Service Patterns Demand Scenario.....	III-66

3.6.3	High Growth Demand Scenario-Cargo Activity	III-66
3.7	Aircraft Operations	III-69
3.7.1	Commercial Aircraft Operations.....	III-69
3.7.1.1	Baseline Scenario-Commercial Aircraft Operations	III-75
3.7.1.2	Alternate Service Patterns Scenario-Commercial Aircraft Operations	III-77
3.7.1.3	High Growth Scenario-Commercial Aircraft Operations	III-77
3.7.2	All-Cargo Aircraft Operations	III-80
3.7.3	Air Taxi and General Aviation Aircraft Operations	III-80
3.7.4	Military Operations.....	III-86
3.7.5	Total Operations	III-86
3.8	Fleet Mix.....	III-93
3.8.1	Commercial Fleet Mix	III-93
3.8.2	All-Cargo Fleet Mix.....	III-96
3.8.3	General Aviation/Air Taxi Fleet Mix.....	III-96
3.8.4	Military Fleet Mix.....	III-96
3.9	Peaking Characteristics	III-96
3.9.1	PMAD Commercial Enplanements.....	III-99
3.9.2	PMAD Commercial Operations.....	III-99
3.9.3	PMAD Total Operations.....	III-99
3.10	Planning Activity Levels.....	III-112
3.10.1	Design Day Schedules	III-112
3.10.2	Methodology.....	III-112
3.10.3	Peaking Characteristics.....	III-116
IV.	Demand/Capacity Assessment and Facility Requirements	IV-1
4.1	Airfield Demand/Capacity Analysis	IV-2
4.1.1	Factors Affecting Airfield Capacity.....	IV-2
4.1.1.1	Runway Configuration.....	IV-3
4.1.1.2	Weather Conditions	IV-4
4.1.1.3	Aircraft Fleet Mix	IV-5
4.1.1.4	Touch and Go Operations.....	IV-6
4.1.2	Airfield Capacity and Delay Analyses	IV-6
4.1.2.1	Overview of Airfield Capacity Assessment.....	IV-6
4.1.2.2	Hourly Airfield Capacity	IV-7
4.1.2.3	Annual Service Volume.....	IV-14
4.1.2.4	Airfield Delays.....	IV-20
4.1.3	Capacity of Runways Serving Commercial Aircraft Operations	IV-20
4.1.4	Future Capacity Requirements.....	IV-25
4.1.5	Airfield Design Standards.....	IV-25

4.1.5.1	Runway Length and Width	IV-28
4.2	Terminal Facilities	IV-29
4.2.1	Terminal Facilities' Demand/Capacity Assessment	IV-29
4.2.1.1	Terminal Building.....	IV-30
4.2.1.1a	Aircraft Gates.....	IV-31
4.2.1.2	Departure Lounges.....	IV-34
4.2.1.3	Terminal Building Components.....	IV-36
4.2.2	Terminal Facility Requirements.....	IV-48
4.2.2.1	Gate Requirements.....	IV-48
4.2.2.2	Individual Functional Component Requirements	IV-60
4.3	Terminal Curbfront.....	IV-60
4.3.1	Terminal Curbfront Demand/Capacity Assessment.....	IV-60
4.3.2	Terminal Curbfront Facility Requirements	IV-68
4.4	Terminal Area Parking.....	IV-70
4.4.1	Public Parking Demand/Capacity Assessment.....	IV-82
4.4.2	Public Parking Facility Requirements.....	IV-82
4.4.3	Employee Parking Facility Requirements	IV-82
4.5	Airport Support Facilities	IV-82
4.5.1	Cargo Facilities	IV-86
4.5.2	Airport Rescue and Fire Fighting (ARFF)	IV-86
4.5.3	General Aviation (GA) and Fixed Base Operator (FBO) Facilities	IV-91
4.5.4	Aircraft Fueling Facilities	IV-92
4.6	Airport Roadway Systems	IV-97
4.6.1	Off Airport Roadway Demand/Capacity Assessment.....	IV-97
4.6.1.1	Traffic Projections	IV-98
4.6.1.2	Existing Intersection LOS Analyses	IV-99
4.6.1.3	Existing Arterial Capacity Analysis.....	IV-101
4.6.1.4	PAL 1 and PAL 2 Arterial Capacity Analysis	IV-106
4.6.2	Off Airport Roadway Requirements.....	IV-106
4.6.2.1	Interstate 95/Palm Beach International Direct Connector.....	IV-106
4.6.2.2	State Road 80 Interchange with Australian Avenue	IV-109
4.6.2.3	State Road 80 from West of Forest Hill Boulevard to East of I-95	IV-110
4.6.2.4	Australian Avenue Improvements	IV-110
4.6.2.5	Summary.....	IV-110
4.6.2.6	Short-Term and Long-Term Adopted Improvements	IV-111
4.6.3	On Airport Roadway Demand/Capacity Assessment	IV-114
4.6.4	Traffic Signage Deficiencies.....	IV-118
4.6.5	Potential Roadway Problems	IV-119
4.6.5.1	Potential Geometric Problems	IV-119

4.6.5.2 Potential Operational Problems	IV-122

V. – Strategic Options	V-1
5.1 Strategic Planning Approach	V-2
5.1.1 Recognizing Risk and Complexity.....	V-2
5.1.2 Analyzing the Situation.....	V-2
5.1.3 Dynamic Strategic Planning.....	V-3
5.2 Methodology.....	V-4
5.3 DOA Workshop.....	V-5
5.4 Identification of Development Alternatives	V-5
5.4.1 Airfield Alternatives	V-6
5.4.2 Terminal Building Alternatives.....	V-7
5.4.3 Cargo Facility Alternatives	V-24
5.4.4 General Aviation Development Alternatives	V-50
5.5 Screening of Development Alternatives	V-50
5.5.1 Screening of Airfield Alternatives	V-67
5.5.2 Screening of Terminal Alternatives	V-68
5.5.3 Screening of Terminal Alternatives	V-75
5.5.4 General Aviation/Fixed Base Operator Facility Alternatives.....	V-76
5.6 Refinement of Short-Listed Alternatives	V-79
5.6.1 Airfield Refinements.....	V-79
5.6.2 Terminal Refinements.....	V-82
5.6.3 Cargo Development Refinements	V-85
5.6.4 General Aviation/FBO Facility Refinements	V-85
5.7 Evaluation of Short-Listed Alternatives.....	V-98
5.7.1 Airfield Alternatives Evaluation	V-98
5.7.2 Terminal Development Alternatives Evaluation.....	V-103
5.7.3 Cargo Alternatives Evaluation.....	V-107
5.7.4 General Aviation/FBO Alternatives Evaluation.....	V-108
5.8 Preferred Composite Development Plan.....	V-111
5.8.1 Future Airfield Improvements	V-111
5.8.2 Terminal Facilities	V-114
5.8.3 Terminal Roadway.....	V-115
5.8.4 Short-Term and Long-Term Public Parking Facilities.....	V-120
5.8.5 Employee Parking Facilities	V-120
5.8.6 Park and Ride/Rental Car Facilities	V-120
5.8.7 Cargo Facilities.....	V-121
5.8.8 General Aviation/FBO Facilities.....	V-121
5.8.9 Aircraft Maintenance Facilities.....	V-122

5.8.10	Airport Maintenance Facilities.....	V-122
5.8.11	Navigation Aids.....	V-122
5.8.12	Collateral Development.....	V-123
5.8.13	Other On-Airport Roadway Improvements	V-123
5.8.13.1	Town of Golfview Property.....	V-123
5.8.13.2	8 th Street Loop.....	V-124

VI. – Transit and Intermodal Analysis	VI-1
6.1 Intermodal Passenger Transportation Services	VI-1
6.1.1 Assessment of the Palm Beach County Transit System	VI-1
6.1.2 Assessment of the Tri-Rail System	VI-3
6.1.3 Palm Tran/Tri-Rail Connectivity Analysis.....	VI-4
6.2 PBIA Intermodal Hub	VI-4
6.3 Connectivity Between PBIA and Proposed Intermodal Hub	VI-6
6.3.1 People Mover System	VI-6
6.3.2 Preliminary Screening of People Mover Conceptual Route Alternatives	VI-8
6.4 Downtown Multimodal Center	VI-11
6.5 Alternatives for Connectivity Between PBIA and Downtown Multimodal Center	VI-11
6.5.1 Tram/Trolley – Short Term Rail Alternative	VI-11
6.5.2 Light Rail System – LongTerm Rail Alternative	VI-14
6.6 Ground Transportation Services at PBIA	VI-15
6.7 Analysis of Future Rental Car Facilities	VI-16
6.7.1 Ready/Return Alternative 1-A: Short-Term Improvement	VI-17
6.7.2 Ready/Return Alternative 1-B:Long-Term Improvement.....	VI-17
6.7.3 Ready/Return Alternative 2	VI-17
6.7.4 Ready/Return Alternative 3	VI-19
6.7.5 Ready/Return Alternatives 4 and 5	VI-19
6.7.6 Ready/Return Alternative 6	VI-20
6.7.7 Evaluation of Ready/Return Rental Car Alternatives	VI-20
6.8 Initial Agency Coordination.....	VI-21
6.9 Funding	VI-21

VII. – Implementation Plan	VII-1
7.1 Factors Impacting Implementation and Development Phasing	VII-1
7.1.1 Volume and Character of Growth.....	VII-1
7.1.2 Relocation and Replacement of Displaced Facilities	VII-2
7.1.3 Replacement of Facilities.....	VII-2
7.1.4 General Criteria for Implementation.....	VII-2
7.1.5 Implementation Indicators	VII-3

7.2	Five-Year Airport Improvement Program.....	VII-4
7.2.1	Capital Improvement Program.....	VII-8
7.3	Phased Implementation Plan.....	VII-21
7.4	Monitoring and Assessing Timing Indicators.....	VII-40
7.4.1	Data Monitoring and Analysis.....	VII-40
7.5	Adjusting Development Patterns.....	VII-40
7.5.1	Airfield Development Actions.....	VII-47
7.5.2	Terminal Development Actions.....	VII-46
7.5.3	General Aviation/FBO Development Actions.....	VII-47
7.5.4	Cargo Development Actions.....	VII-48
Appendix A - Committee Members		A-1
Appendix B – Tenant/User Surveys		B-1
Appendix C – Air Service Data		C-1
Appendix D – Ramp Charts.....		D-1

List of Tables

II-1.1	Runway Characteristics	II-6
II-1.2	Terminal Area Pavement Condition	II-7
II-1.3	General Aviation/Fixed Base Operator Apron Pavement Conditions	II-11
II-1.4	NAVAIDS and Lighting System	II-19
II-1.5	Summary of Terminal Areas	II-21
II-1.6	Airline Passenger Check-in Facilities	II-32
II-1.7	Vehicular Dwell Time Survey	II-39
II-1.8	Number of Lanes Along PBLA Terminal Roads	II-42
II-1.9	Morning & Afternoon Peak Periods Inbound and Outbound Volumes	II-43
II-1.10	PBLA 24-Hour Traffic Counts	II-44
II-1.11	Summary of Rental Car Facilities	II-49
II-1.12	Automobile Parking Spaces	II-50
II-1.13	FBO Facilities	II-53
II-1.14	Cargo Facility Leaseholds	II-56
II-1.15	ARFF Building Space Utilization	II-57
II-1.16	Existing Fuel Facilities	II-60
II-2.1	Inventory of PBLA Off-Airport Roadways	II-64
II-2.2	Existing Lane Configuration of Main Intersections at PBLA	II-64
II-2.3	Summary of Traffic Signal Operations of Signalized Intersections at PBLA	II-65
II-2.4	Traffic Counts	II-66
II-2.5	Turning Movement Counts	II-67
II-2.6	Historic Traffic Growth	II-69
II-2.7	TIP Projects within the PBLA Study Area	II-77
II-2.8	Summary of MPO Priorities by Major Federal Funding Source (Thousand of Dollars)	II-80
I-2.9	Palm Beach County Five Year Program (Thousands of Dollars)	II-80
II-2.10	Centrepark Traffic Impact Analysis	II-83
II-2.11	Centrepark DRI Recommended Roadway Improvements	II-84
II-2.12	Centrepark DRI Recommended Link Improvements	II-84
II-2.13	Centrepark DRI Recommended Intersection Improvements	II-85
II-2.14	Tri-Rail Ridership at the Palm Beach Airport Station	II-86
II-3.1	Carriers at PBLA	II-88
II-3.2	Top 100 Destination Markets	II-95/96
II-3.3	Markets with Existing Non-stop Service	II-97
II-3.4	Non-stop Markets: Comparison of O&D Passengers to Seats	II-98
II-4.1	Airline Passenger Questionnaire Survey	II-106
II-4.2	Air Cargo and Freight Forwarder Questionnaire Survey	II-107

II-5.1	Federal and Bahamas Route Airways.....	II-111
II-5.2	PBI Instrument Approach Navigational Aids.....	II-114
II-5.3	Land and Hold Short Landing Distances at PBI.....	II-119
II-5.4	Airport Tenant Leaseholds	II-127
III-3.1	Historical Population.....	III-7
III-3.2	Forecast Population	III-8
III-3.3	Historical Nonfarm Employment	III-10
III-3.4	Forecast Nonfarm Employment.....	III-11
III-3.5	Historical Households	III-13
III-3.6	Forecast Households	III-14
III-3.7	Historical Personal Income Per Capita.....	III-15
III-3.8	Forecast Personal Income Per Capita	III-16
III-3.9	Domestic Yield and National Fuel Costs.....	III-18
III-4.1	Markets with the Largest Number of Originating Passengers	III-21
III-4.2	Western Markets without Non-stop Service.....	III-22
III-4.3	Eastern Markets without Non-stop Service.....	III-22
III-4.4	Potential Markets for Regional Jet Service	III-23
III-4.5	Markets with High Local O&D Passengers.....	III-23
III-4.6	Markets with High O&D Passenger Demand.....	III-24
III-4.7	Load Factors for High O&D Demand Markets	III-25
III-4.8	Markets with the Largest Load Factors	III-25
III-4.9	Summary of Deficient Domestic Markets	III-26
III-4.10	Summary of Lowfare Passenger Enplanements at South Florida Airports.....	III-27
III-4.11	Delta Express, MetroJet and Southwest Combined Services November 1998.....	III-27
III-4.12	Peak Schedule Period - March 1998 – Regional Distribution of Non-stop Seats	III-34
III-4.13	Peak Schedule Period – March 1998 – Weekly Non-stop Seats	III-35
III-4.14	PBIA Air Carrier Scheduled Services (12 Months Ending June).....	III-37
III-4.15	Weekly Seasonal Nonstop Capacity.....	III-38
III-5.1	Regression Analysis – O&D Passenger Enplanements	III-40/41
III-5.2	Historic Domestic O&D and Connecting Enplanements.....	III-43
III-5.3	Baseline Scenario – Connecting Enplanements	III-44
III-5.4	Baseline Scenario – International Enplanements.....	III-45
III-5.5	Baseline Scenario – Summary of Projected Passenger Enplanements	III-47
III-5.6	Seasonality Adjustment – Alternate Service Patterns Demand Scenario	III-49
III-5.7	Deficient Air Service Markets – Alternate Service Patterns Demand Scenario	III-50
III-5.8	Adjustment Factors for Historical Originating Domestic Enplanements –	III-52
	Alternate Service Patterns Demand Scenario	

III-5.9 Adjustment Factors for Historical International Passenger Enplanements –.....	III-53
Alternate Service Patterns Demand Scenario	
III-5.10 Alternative Service Patterns Demand Scenario – Summary of Projected	III-54
Passenger Enplanements	
III-5.11 Comparison of Terminal Area Forecasts for Total Passenger Enplanements.....	III-56
III-5.12 High Growth Demand Scenario – Summary of Projected Passenger Enplanements	III-58
III-5.13 Comparison of Total Passenger Enplanements for Alternate Demand Scenarios	III-61
III-6.1 Historical Cargo Tonnage	III-63
III-6.2 Baseline Scenario – Alternate Projections of Enplaned Mail.....	III-64
III-6.3 Baseline Scenario – Alternate Projections of Enplaned Freight.....	III-65
III-6.4 Baseline Scenario – Trend Analysis of Enplaned Cargo Tonnage.....	III-67
III-6.5 Alternate Service Patterns Demand Scenario – Trend Analysis of Enplaned Cargo Tonnage.....	III-68
III-6.6 High Growth Demand Scenario – Trend Analysis of Enplaned Cargo Tonnage	III-70
III-6.7 Comparison of Alternate Demand Scenarios – Enplaned Cargo Tonnage.....	III-72
III-7.1 Historical Aircraft Operations	III-73
III-7.2 Historical Average Seats Per Departure and Boarding Load Factors	III-74
III-7.3 Baseline Scenario – Commercial Aircraft Operations.....	III-76
III-7.4 Adjustment Factors – Alternate Service Patterns Demand Scenario.....	III-78
III-7.5 Alternate Service Patterns Demand Scenario – Commercial Aircraft Operations.....	III-79
III-7.6 High Growth Demand Scenario – Commercial Aircraft Operations.....	III-81
III-7.7 All-Cargo Aircraft Operations.....	III-82
III-7.8 Baseline Scenario – Air Taxi and General Aviation Aircraft Operations.....	III-83
III-7.9 Historical General Aviation Activity Split	III-84
III-7.10 Baseline Scenario – Distribution of General Aviation Operations.....	III-85
III-7.11 Alternate Service Patterns Demand Scenario – Air Taxi and General Aviation	III-87
Aircraft Operations	
III-7.12 Alternate Service Patterns Demand Scenario–Distribution of General Aviation	III-88
Operations	
III-7.13 High Growth Demand Scenario – Air Taxi and General Aviation Aircraft Operations.....	III-89
III-7.14 High Growth Demand Scenario – Distribution of General Aviation Operations	III-90
III-7.15 Comparisons of Total Aircraft Operations Projections	III-91
III-8.1 Historical Commercial Fleet Mix	III-94
III-8.2 Projected Commercial Fleet Mix.....	III-95
III-8.3 Projected All-Cargo Fleet Mix	III-97
III-8.4 Projected General Aviation Fleet Mix.....	III-98
III-9.1 Historic Monthly Commercial Enplanements	III-100
III-9.2 Historic Monthly Commercial Enplanements Adjusted for Seasonality	III-101
III-9.3 PMAD Commercial Enplanements	III-102

III-9.4	Historic Monthly Commercial Operations (Scheduled Activity Only)	III-103
III-9.5	Historic Monthly Commercial Operations Adjusted for Seasonality	III-104
	(Scheduled Activity Only)	
III-9.6	PMAD Commercial Operations – Year 2020.....	III-105
III-9.7	Historic Monthly General Aviation Operations	III-106
III-9.8	Historic Monthly Military Operations.....	III-107
III-9.9	Summary of Total PMAD Operations – Year 2005	III-108
III-9.10	Summary of Total PMAD Operations – Year 2010	III-109
III-9.11	Summary of Total PMAD Operations – Year 2015	III-110
III-9.12	Summary of Total PMAD Operations – Year 2020	III-111
III-10.1	Design Day Schedule Summary	III-116
III-10.2	PAL 1 Design Day Schedule.....	III-117/123
III-10.3	PAL 2 Design Day Schedule.....	III-124/130
III-10.4	Equipment Codes	III-131
III-10.5	Design Day Peak Hour Activity	III-1136
IV-1	Operating Conditions for Airfield Capacity and Aircraft Delay Analysis.....	IV-5
IV-2	Aircraft Classifications for Establishing Aircraft Mix Index	IV-6
IV-3	Aircraft Fleet Mix Distribution By Runway.....	IV-11
IV-4	Runway Capacity Analysis – VFR Results	IV-12
IV-5	Runway Capacity Analysis – Marginal VFR Results.....	IV-13
IV-6	Runway Capacity Analysis – IFR Results	IV-15
IV-7	Comparison of Annual Demand with Annual Service Volumes.....	IV-19
IV-8	Airfield Delay Estimates – Input Variables and Results	IV-21
IV-9	Commercial Aircraft Demand-Capacity Profile	IV-26
IV-10	Aircraft Approach Categories	IV-27
IV-11	Airplane Design Groups.....	IV-27
IV-12	Existing Runway Lengths.....	IV-28
IV-13	Runway Length Requirements	IV-29
IV-14	Summary of Terminal Areas	IV-30
IV-15	Demand/Capacity Assessment of Overall Terminal Facility.....	IV-31
IV-16	Peak-Hour Aircraft Gate Demand.....	IV-32
IV-17	Average Daily Departures per Gate for Select Florida Hub Airports.....	IV-33
IV-18	Recommended Departure Lounge (Holdroom) Space Requirements.....	IV-35
IV-19	Demand/Capacity Analysis of Existing Departure Lounges (Holdrooms).....	IV-37
IV-20	Passenger Terminal Planning Factors.....	IV-39
IV-21	Demand/Capacity Ratios for Terminal Components Based on Existing (1998) Demand.....	IV-40/41
IV-22	Demand/Capacity Ratios for Terminal Components Based on PAL 1 Demand	IV-42/43

IV-23	Demand/Capacity Ratios for Terminal Components Based on PAL 2 Demand	IV-44/45
IV-24	Comparison of Demand/Capacity Ratios for Terminal Components to Target	
	Planning Factors	IV-46/47
IV-25	Summary of Gate Requirements.....	IV-53
IV-26	Narrow Body Equivalent Gate (NBEG) Index.....	IV-55
IV-27	Conversion of Existing Gates to NBEG	IV-56
IV-28	Gate Requirements Based on Annual Enplanements per NBEG Actual and	
	Recommended Gate Utilization Ratios	IV-57
IV-29	PAL 1 Gate Frontage Requirements.....	IV-58
IV-30	PAL 2 Gate Frontage Requirements.....	IV-59
IV-31	Minimum Terminal Requirements	IV-61/62
IV-32	Recommended Terminal Requirements	IV-63/64
IV-33	Existing Enplaning Level Curbfront Demand Limits	IV-66
IV-34	Existing Deplaning Level Curbfront Demand Limits.....	IV-67
IV-35	Terminal Curbfront Demand/Capacity Results	IV-69
IV-36	Current (1998) Terminal Curbfront Requirements.....	IV-71/72
IV-37	SL 1 Terminal Curbfront Requirements	IV-73/74
IV-38	PAL 1 Terminal Curbfront Requirements	IV-75/76
IV-39	PAL 2 Terminal Curbfront Requirements	IV-77/78
IV-40	SL 2 Terminal Curbfront Requirements.....	IV-79/80
IV-41	Terminal Curbfront Requirements Summary	IV-81
IV-42	Public Parking Demand/Capacity Assessment.....	IV-83
IV-43	Public Parking Requirements	IV-84
IV-44	Employee Parking Requirements	IV-85
IV-45	Belly Cargo Facility Demand/Capacity Assessment	IV-87
IV-46	All-Cargo Cargo Facility Demand/Capacity Assessment.....	IV-88
IV-47	Cargo Facility Requirements Summary.....	IV-89
IV-48	General Aviation/FBO Facility Demand/Capacity Assessment	IV-93/94
IV-49	General Aviation/FBO Facility Requirements Summary	IV-95
IV-50	Fuel Facility Demand/Capacity Assessment.....	IV-96
IV-51	Annual Compound Growth Rate (CGR) per Intersection	IV-98
IV-52	Projected Average Annual Daily Traffic (AADT)	IV-99
IV-53	Existing Lane Configuration of Main Signalized Intersections at PBIA	IV-100
IV-54	Intersection Capacity Analysis – PM Peak Period	IV-101
IV-55	Summary of ART-PLAN Analysis – Deficient Links.....	IV-107
IV-56	TIP Projects within the PBIA Study Area	IV-112
IV-57	Existing and Future AWDT and AADT on PBIA Internal Roads	IV-114
IV-58	One-Way Roads LOS Volumes.....	IV-117

IV-59	Existing and Future LOS on PBIA's Internal Roads	IV-117
V-1	PAL 2 Facility Requirements	V-4
V-2	Screening of Airfield Alternatives.....	V-69
V-3	Average Walking Distance – Midpoint of Inner Curb to Furthest Gate.....	V-70
V-4	Screening of Terminal Alternatives.....	V-73/74
V-5	Evaluation of Cargo Alternatives	V-77
V-6	Screening of General Aviation/FBO Alternatives	V-80
V-7	Summary of PAL 2 Terminal Facility Requirements	V-85
V-8	Evaluation of Short-listed Airfield Alternatives.....	V-101/102
V-9	Evaluation of Short-listed Terminal Alternatives.....	V-105/106
V-10	Evaluation of Short-listed Cargo Alternatives.....	V-109
V-11	Evaluation of Short-listed General Aviation/FBO Alternatives	V-112
VI-1	Palm Tran Performance Indicators (FY 1996)	VI-2
VI-2	Fixed Route Bus Peak Load Factor- PBIA.....	VI-3
VI-3	Preliminary Screening of People Mover Route Alternatives for PBIA	VI-10
VI-4	Summary of Evaluation of Rental Car Ready/Return Alternatives	VI-20
VI-5	Summary of MPO Priorities by Major Federal Funding Source (Thousands of Dollars) ..	VI-22
VI-6	Palm Beach County Five Year Road Program (Thousands of Dollars)	VI-22
VII-1	Near Term Facility Requirements	VII-5/7
VII-2	Five Year Capital Improvement Program – Fiscal Years 2001 through 2005.....	VII-9
VII-3	Facility Enhancement Program – Fiscal Years 2001 through 2005.....	VII-10/12
VII-4	Demand Level Thresholds Airfield Facilities Implementation Plan.....	VII-26
VII-5	Phase I – Airport Facilities Implementation Plan	VII-28
VII-6	Phase II – Airport Facilities Implementation Plan.....	VII-31
VII-7	Phase III – Airport Facilities Implementation Plan	VII-35
VII-8	Phase IV – Airport Facilities Implementation Plan	VII-37
VII-9	Phase V – Airport Facilities Implementation Plan	VII-39
VII-10	Phase VI – Airport Facilities Implementation Plan	VII-42
VII-11	Statistics to be Collected for Aviation Activity Monitoring.....	VII-43
VII-12	Development Triggers and Indicators	VII-45
VII-13	Public Parking Demand Indicators.....	VII-46

List of Exhibits

I-1	Composite Development Plan	I-5
I-2	Decision Tree Matrix.....	I-7
II-1.1	PBIA Location Map	II-2
II-1.2	Airfield Pavement Evaluation Results.....	II-3
II-1.3	Existing Airfield Configuration.....	II-5
II-1.4	Airline Terminal Apron.....	II-8
II-1.5	East Side General Aviation Apron	II-9
II-1.6	West Side General Aviation Apron.....	II-10
II-1.7	Existing Drainage Basins Pre Phase I Improvements.....	II-13
II-1.8	Phase 2 Drainage Basin Layout 1994 – Stormwater Master Plan	II-14
II-1.9	FAA Security Program.....	II-15
II-1.10	Airfield Access Gates.....	II-17
II-1.11	NAVAIDS and Lighting Facilities Locations	II-18
II-1.12	Level 1 Main Terminal.....	II-22
II-1.13	Level 2 Main Terminal.....	II-24
II-1.14	Level 3 Main Terminal.....	II-25
II-1.15	Level 1 Concourse A.....	II-26
II-1.16	Level 2 Concourse B	II-27
II-1.17	Level 2 Concourse C	II-28
II-1.18	Level 1 Concourse B	II-29
II-1.19	Level 1 Concourse C	II-30
II-1.20	Ticket Counters Main Terminal-Level 3	II-31
II-1.21	Security Checkpoints.....	II-35
II-1.22	Deplaning Level Curbfront	II-37
II-1.23	Roadway and Enplaning Level Curbfront Facilities.....	II-38
II-1.24	Security Check Points	II-41
II-1.25	Traffic Counter Locations & Statistics	II-45
II-1.26	Observed On-Airport Potential Deficiencies.....	II-48
II-1.27	Automobile Parking Areas	II-51
II-1.28	Cargo Facilities.....	II-54
II-1.29	Air Freight (Buildings 1301 – 1310) Leaseholds	II-55
II-1.30	Maintenance Compound.....	II-59
II-1.31	ASII Fuel Farm.....	II-61
II-1.32	FBO Fuel Farms	II-62
II-1.33	Town of Golfview	II-63

II-2.1	I-95/PBIA Direct Connector	II-71
II-2.2	State Road 80 Interchange with Australian Avenue.....	II-72
II-2.3	Runway 9L West Buy Out Area.....	II-75
II-2.4	Hillcrest Buyout Area.....	II-76
II-3.1	Total Commercial Enplanements	II-89
II-3.2	Commercial Enplanements.....	II-90
II-3.3	Domestic Air Carrier Enplanements.....	II-92
II-3.4	International Enplanements.....	II-93
II-3.5	Connecting Ratios	II-94
II-3.6	Existing Non-stop Domestic PBIA Markets.....	II-99
II-3.7	Largest PBIA Markets without Non-stop Service.....	II-100
II-3.8	Historical Aircraft Operations	II-101
II-3.9	Enplaned Cargo.....	II-103
II-3.10	Enplaned Freight	II-104
II-3.11	Enplaned Mail	II-105
II-5.1	PBIA TRACON Airspace	II-108
II-5.2	IFR Airports in PBI Approach Control Airspace.....	II-109
II-5.3	Class C, D and D/E Airspace	II-110
II-5.4	Class E IFR Transition Airspace	II-112
II-5.5	Special Use Airspace and Airways.....	II-113
II-5.6	PBIA Arrival and Departure Airspace	II-115
II-5.7	Airfield Movement Areas.....	II-117
II-5.8	Runway System Use & Hourly Capacities	II-118
II-5.9	Existing Runway Use Configurations	II-120
II-5.10	East Flow Taxi Routings	II-122
II-5.11	West Flow Taxi Routings.....	II-123
II-5.12	Restricted Use Taxiways	II-124
II-5.13	Tenant Leaseholds.....	II-126
II-5.14	Wind Rose: VFR (Above 1,000'/3 miles).....	II-129
II-5.15	Wind Rose: IFR CAT II (Between 1,000'/3 miles & 200'/1/2 mile)	II-130
II-5.16	Wind Rose: IFR CAT II (Between 200'/1/2 mile & 100'/1/4 mile).....	II-131
II-5.17	Wind Rose: All Weather	II-132
II-5.18	Wind Occurrence by Percent Above 1000 Ft/3 Miles.....	II-133
II-5.19	Wind Occurrence by Percent Between 1000 Ft/3 Miles and 200 Ft/1/2 Mile.....	II-134
II-5.20	Wind Occurrence by Percent Between 200 Ft.1.2 Mile and 100 Ft/1/4 Mile.....	II-135
II-5.21	Wind Occurrence by Percent All Weather	II-136
III-3.1	Employment Statistics	III-12

III-5.1	Baseline Scenario – Total Passenger Enplanements.....	III-48
III-5.2	Alternate Service Patterns Demand Scenario – Total Passenger Enplanements	III-55
III-5.3	High Growth Demand Scenario – Total Passenger Enplanements.....	III-59
III-5.4	Comparison of Alternate Demand Scenario – Total Passenger Enplanements	III-60
III-6.1	Comparison of Alternate Demand Scenarios – Total Enplaned Cargo Tonnage	III-71
III-7.1	Comparison of Alternate Demand Scenarios – Total Aircraft Operations	III-92
III-10.1	Total Passenger Enplanements Projections	III-113
III-10.2	Total Aircraft Operations Projections	III-114
III-10.3	PAL 1 – Rolling 60min Count of Arriving Seats	III-132
III-10.4	PAL 1 – Rolling 60min Count of Departing Seats	III-133
III-10.5	PAL 2 – Rolling 60min Count of Arriving Seats	III-134
III-10.6	PAL 2 – Rolling 60min Count of Departing Seats	III-135
IV-1	Existing Airfield	IV-8
IV-2	Airfield Operating Configurations	IV-9
IV-3	1998 Hourly Airfield Capacities	IV-16
IV-4	PAL Hourly Airfield Capacities	IV-17
IV-5	PAL 2 Hourly Airfield Capacities	IV-18
IV-6	1998 Hourly Airfield Capacities Runway 9L-27R and 13-31	IV-22
IV-7	PAL 1 Hourly Airfield Capacities Runway 9L-27R and 13-31	IV-23
IV-8	PAL 2 Hourly Airfield Capacities Runway 9L-27R and 13-31	IV-24
IV-9	1998 (Actual)	IV-50
IV-10	PAL 1 Ramp Chart.....	IV-51
IV-11	PAL 2 Ramp Chart.....	IV-52
IV-12	Intersection Arterial LOS Existing (1999)	IV-102
IV-13	Intersection Arterial LOS PAL 1.....	IV-104
IV-14	Intersection Arterial LOS PAL 2.....	IV-105
IV-15	Off-Airport Roadways – Planned Roadway Improvements	IV-108
IV-16A	On-Airport Roadway - Traffic Counts	IV-115
IV-16B	On-Airport Roadway - Traffic Counts.....	IV-116
IV-16C	On-Airport Roadway - Traffic Counts.....	IV-116
IV-17A	On-Airport Roadway – Proposed Roadway Improvements	IV-120
IV-	On-Airport Roadway – Proposed Roadway Improvements	IV-121
V-1	No Changes to Existing Facility Alternative A-1	V-8
V-2	Airfield Development Alternative A-2.....	V-9
V-3	Airfield Development Alternative A-3.....	V-10
V-4	Airfield Development Alternative A-4.....	V-11

V-5	Airfield Development Alternative A-5.....	V-12
V-6	Airfield Development Alternative A-6.....	V-13
V-7	Airfield Development Concept Alternative A-7.....	V-14
V-8	Airfield Development Alternative A-8.....	V-15
V-9	Airfield Development Alternative A-9.....	V-16
V-10	Airfield Development Alternative A-10.....	V-17
V-11	Airfield Development Alternative A-11.....	V-18
V-12	Airfield Development Alternative A-12.....	V-19
V-13	Airfield Development Alternative A-13.....	V-20
V-14	Airfield Development Alternative A-14.....	V-21
V-15	Airfield Development Alternative A-15.....	V-22
V-16	Airfield Development Alternative A-16.....	V-23
V-17	Terminal Development Alternative T-1.....	V-25
V-18	Terminal Development Alternative T-2A.....	V-26
V-19	Terminal Development Alternative T-2B.....	V-27
V-20	Terminal Development Alternative T-2C.....	V-28
V-21	Terminal Development Alternative T-3A.....	V-29
V-22	Terminal Development Alternative T-3B.....	V-30
V-23	Terminal Development Alternative T-4A.....	V-31
V-24	Terminal Development Alternative T-4AB.....	V-32
V-25	Terminal Development Alternative T-5.....	V-33
V-26	Terminal Development Alternative T-6A.....	V-34
V-27	Terminal Development Alternative T-6B.....	V-35
V-28	Terminal Development Alternative T-6C.....	V-36
V-29	Terminal Development Alternative T-7.....	V-37
V-30	Terminal Development Alternative T-8A.....	V-38
V-31	Terminal Development Alternative T-8B.....	V-39
V-32	Terminal Development Alternative T-9A.....	V-40
V-33	Terminal Development Alternative T-9B.....	V-41
V-34	Terminal Development Alternative T-10.....	V-42
V-35	Terminal Development Alternative T-11.....	V-43
V-36	Terminal Development Alternative T-12.....	V-44
V-37	Terminal Development Alternative T-13.....	V-45
V-38	Terminal Development Alternative T-14.....	V-46
V-39	Terminal Development Alternative T-15.....	V-47
V-40	Terminal Development Alternative T-16.....	V-48
V-41	Terminal Development Alternative T-17.....	V-49
V-42	Cargo Facilities Development Alternative C-1.....	V-51

V-43	Cargo Facilities Development Alternative C-2.....	V-52
V-44	Cargo Facilities Development Alternative C-3.....	V-53
V-45	Cargo Facilities Development Alternative C-4.....	V-54
V-46	Cargo Facilities Development Alternative C-5.....	V-55
V-47	Cargo Facilities Development Alternative C-6.....	V-56
V-48	Cargo Facilities Development Alternative C-7.....	V-57
V-49	Cargo Facilities Development Alternative C-8.....	V-58
V-50	General Aviation/FBO Facilities Development Alternative G-1.....	V-59
V-51	General Aviation/FBO Facilities Development Alternative G-2.....	V-60
V-52	General Aviation/FBO Facilities Development Alternative G-3A.....	V-61
V-53	General Aviation/FBO Facilities Development Alternative G-3B.....	V-62
V-54	General Aviation/FBO Facilities Development Alternative G-4.....	V-63
V-55	General Aviation/FBO Facilities Development Alternative G-5.....	V-64
V-56	General Aviation/FBO Facilities Development Alternative G-6.....	V-65
V-57	Short-Term Airfield Alternative Refined Alternative 1 (PAL 2).....	V-83
V-58	Long-Term Refined Alternative 3B (PAL 2).....	V-84
V-59	Terminal Development Refined Alternative 1 (PAL 2).....	V-86
V-60	Terminal Development Refined Alternative 2A (PAL 2).....	V-87
V-61	Terminal Development Refined Alternative 6A (PAL 2).....	V-88
V-62	Terminal Development Refined Alternative 6B (PAL 2).....	V-89
V-63	Terminal Development Refined Alternative 6C (PAL 2).....	V-90
V-64	Terminal Development Refined Alternative 13 (PAL 2).....	V-91
V-65	Terminal Development Refined Alternative 14 (PAL 2).....	V-92
V-66	Cargo Facility Development Refined Alternative S8.....	V-93
V-67	Cargo Facility Development Refined Alternative S9.....	V-94
V-68	Cargo Facility Development Refined Alternative S12.....	V-95
V-69	General Aviation/FBO Facility Development Refined Alternative S2.....	V-96
V-70	General Aviation/FBO Facility Development Refined Alternative S6.....	V-97
V-71	Composite Development Plan.....	V-113
V-72	Short Term Terminal Expansion Option 3 – Level 1.....	V-116
V-73	Short Term Terminal Expansion Option 3 – Level 2.....	V-117
V-74	Short Term Terminal Expansion Option 3 – Level 3.....	V-118
V-75	Roadway Improvements Within PBIA.....	V-119
V-76	Golfview Property Access Improvements Alternative A.....	V-125
V-77	Golfview Property Access Improvements Alternative B.....	V-126
V-78	8 th Street Loop Access Improvements.....	V-127
V-79	South FBO Access Improvements.....	V-128

VI-1	Palm Tran/Tri-Rail Connectivity Analysis	VI-5
VI-2	I-95/PBIA Direct Connector	VI-7
VI-3	Connecting Between PBIA Terminal Building, Intermodal Hub and Ground	
	Transportation Center.....	VI-9
VI-4	Downtown Multimodal Center Preliminary Conceptual Plan	VI-12
VI-5	PBIA-Downtown Multimodal Center Connectivity Preliminary Conceptual	
	Transit Corridors	VI-13
VI-6	Candidate Sites for Rental Car Facilities	VI-18
VII-1	Capital Improvement Program Fiscal Year 2001	VII-13
VII-2	Capital Improvement Program Fiscal Year 2002	VII-14
VII-3	Capital Improvement Program Fiscal Year 2003	VII-16
VII-4	Capital Improvement Program Fiscal Year 2004	VII-18
VII-5	Capital Improvement Program Fiscal Year 2005	VII-20
VII-6	Concourse D (Stage 1) – Concourse B Initial 4 Gate Concept.....	VII-22
VII-7	Ultimate Concourse D Buildout – Concept B Construction Phasing – Plate No. 1	VII-23
VII-8	Ultimate Concourse D Buildout – Concept B Construction Phasing – Plate No. 2	VII-24
VII-9	Ultimate Concourse D Buildout – Concept B Construction Phasing – Plate No. 3	VII-25
VII-10	Phase I Proposed Development Plan	VII-29
VII-11	Phase II Proposed Development Plan.....	VII-30
VII-12	Phase III Proposed Development Plan	VII-34
VII-13	Phase IV Proposed Development Plan	VII-36
VII-14	Phase V Proposed Development Plan	VII-38
VII-15	Phase VI Proposed Development Plan	VII-41
VII-16	Decision Tree Matrix.....	VII-48

Section I

I. Introduction

The Strategic Master Plan Study and Business Plan for Palm Beach International Airport ("PBIA" or the "Airport") was a multi-faceted study initiated by the Palm Beach County Department of Airports (DOA) to achieve several goals. In structuring the study, the DOA recognized not only the dynamic nature of the aviation industry, the diversity of interests among airport users, and the uncertainties inherent in projecting future aviation activity at PBIA, but also the interests of the surrounding communities and the Airport's role in responding to growth in those communities. Consequently, the study was designed to provide a framework for decision-making given changing conditions as opposed to defining a specific development plan for implementation over a particular timeframe. Of particular interest was the definition of an approach to enhance air service at the Airport and a framework to identify development decisions to accommodate the aviation demands imposed by communities served by the Airport.

In January 1998, the DOA retained a team of consultants led by Ricondo & Associates, Inc. (R&A) to prepare a Strategic Master Plan Study and Business Plan for PBIA. Included within the R&A Team were several firms providing specialized expertise for this study. The following is a list of firms that comprised the R&A Team as well as the services each firm provided:

• Frederic R. Harris, Inc.	-	Intermodal and Ground Access Planning
• GKMGM Consulting Services, Inc.	-	Air Service/Market Analysis
• Unison Maximus, Inc. -	-	Concessions Planning and Collateral Development Analysis

As briefly described above, the purpose of the study was to provide a framework to guide future airport development in a manner that is responsive to the community's growth plans, the uncertainties inherent in the aviation industry, and the business goals of the Airport. Additionally, the study served to explore opportunities for enhancing the Airport's revenue generating potential and identify opportunities for improving air service patterns and market access to and from PBIA.

The elements included in this study encompassed several tasks to assist the Airport in developing expansion plans and facility development programs to meet future aviation demand. The specific tasks included in the study are as follows:

- Inventory/Data Collection
- Demand Scenarios (including the Air Service Analysis)
- Demand-Capacity Assessment
- Facility Requirements
- Strategic Options
- Intermodal Analysis
- Implementation Plan
- Business Plan (including Air Service Enhancement Strategies, Retail Concessions Plan, Collateral Development Study, and Financial Planning Analyses)
- Airport Plans Package (including the Airport Layout Plan)

1.1 Goals and Objectives

Goals and objectives are integral to the definition and validity of any plan. Specific goals and objectives serve to frame and direct the definition of options and, more importantly, help establish evaluation criteria to be used in assessing the viability of various options.

The following goals were identified for PBIA's Strategic Master Plan:

- To develop an Airport Strategic Plan and Facility Development/Enhancement Program for PBIA that is consistent with the County's anticipated growth and its goals and objectives
- To identify future development alternatives that improve the overall level of service and efficiency offered by PBIA to its users, its tenants, the public, and the local communities
- To identify intermodal access and circulation improvements that will enhance ground transportation services and increase opportunities for growth in aviation-related services and industries and community-serving non-aviation industries and activities at PBIA

Similarly, the principal goal established for the Business Plan is as follows:

- Enhance the financial strength of PBIA by establishing an Airport Development/Enhancement Program that is financially feasible and affordable to Palm Beach County and aims to minimize airline costs

Objectives are the specific ways to achieve the established goals. In a sense, they are the means to the end. The objectives identified for this study include the following:

- To identify cost-effective development options and land-uses for the Airport's property that maximize the direct and indirect benefits to Palm Beach County and PBIA
- To develop an integrated plan to guide short-term and long-term improvements at PBIA that is demand-driven and flexible in nature to allow for adjustments as conditions change
- To provide a framework to guide the implementation of necessary improvements in a cost-effective and business-like manner

The objectives identified for the Business Plan include the following:

- To identify viable business opportunities for both the short-term and long-term future that could contribute to increased market share and the enhancement of PBIA's financial strength
- To develop a financial/marketing framework for pursuing the goals defined for the Strategic Master Plan Study
- To develop an air service strategic plan for PBIA and identify air service opportunities for the Airport

1.2 Approach and Methodology

As part of the management and community involvement for the Strategic Plan, two committees, the Master Plan Committee and the Technical Committee, were established to provide input and guidance throughout the study. Each committee performed a distinct role during the study. The Master Plan Committee provided valuable input regarding community issues and concerns relating to

the Airport and its relationship to the overall community. Information regarding community goals and objectives, development initiatives and marketing efforts designed to improve the Airport's public service was solicited from this committee as well.

The Technical Committee provided technical assessments of the Strategic Plan relative to operational and technical issues. Meetings with both committees were held on a quarterly basis during the study. Appendix A contains a list of the members for both committees.

The approach for PBIA's Strategic Plan differs significantly from the typical approach utilized in traditional airport master plan studies. The traditional master plan involves the identification of a specific set of assumptions relative to the Airport's role, operating conditions, and community needs to derive a set of activity forecasts, facility requirements, and an incremental development plan. A key weakness of this approach is the reliance on a static set of assumptions. Typically, the approach for the traditional master plan limits the extent to which "what if" scenarios are modeled.

The Strategic Plan for PBIA was structured with an approach to explore future demand and growth needs based on the present role of the Airport and the current state of the aviation industry as well as those associated with an established group of "what if" alternate scenarios. These alternate scenarios represented growth opportunities for the Airport and the community by assessing potential aviation-related business ventures that are demand-driven and could be served by PBIA. Such opportunities, identified and evaluated under the Business Plan, included enhancements to existing air service patterns, potential new air service markets and new entrant carriers, revenue-enhancement opportunities by improving the Airport's retail concessions program, new aviation-related activities, and on-airport collateral development. The facility needs and demand patterns associated with these activities were then modeled under a set of demand scenarios.

The demand scenarios prepared under PBIA's Strategic Plan are analogous to the activity forecasts prepared as part of a traditional airport master plan. However, the demand scenarios are not intended to be reflective of a forecast of aviation demand that will materialize at a particular point in time, but rather are designed to illustrate the range of possibilities in aviation activity that may be experienced during a 20-year planning horizon. These demand scenarios are designed to reflect not only the passage of time but also to acknowledge the dynamic nature of the aviation industry and the uncertainties inherent in forecasting aviation demand at an airport. As such, the demand scenarios provide a basis for defining the level of flexibility necessary for facility planning and development decision-making in order to be able to react to potential changes in activity.

Three demand scenarios were derived for PBIA. The use of multiple demand scenarios allows the planning process to assess the need for facilities and the level of flexibility that must be provided in the development of future facilities. For all three demand scenarios, the Airport's market area is represented by Palm Beach County, Martin County, St. Lucie County, and Indian River County. The three demand scenarios for PBIA are briefly described below.

- **Baseline Scenario:** this scenario was defined to illustrate the level of aviation activity that may be experienced at the Airport if historic trends continue throughout the 20-year planning horizon. The goal of the Baseline Scenario is to define the demand levels representative of a continuation of existing use patterns for the Airport.
- **Alternate Service Patterns Scenario:** using the results of the Air Service Demand Analysis, also completed under this study, the Alternate Service Patterns Demand Scenario was

developed. This scenario is intended to define an activity profile representative of what would occur if the air service enhancements suggested by the Air Service Demand Analysis were implemented and the associated passenger demand materialize.

- **High Growth Scenario:** this scenario was derived to show future growth potential in aviation activity assuming that all of the recommendations provided by the Air Service Demand Analysis are implemented and aggressive growth is experienced in South Florida and the Airport's market area.

Aviation activity under each of the demand scenarios is represented in terms of passenger enplanements, cargo tonnage, and aircraft operations. Fleet mix and peaking characteristics for each of the demand scenarios were also estimated.

The demand scenarios were reduced to a finite number of planning activity levels and sensitivity levels. Planning Activity Levels (PAL's) are defined to correspond to a particular demand threshold identified as part of the demand scenarios. The PAL's include a more detailed analytical description of the activity parameters for that threshold. Similarly, Sensitivity Levels (SL's) are defined to assess the ability of the proposed facilities to accommodate changing demand. The SL's are defined at the same level of detail as the PAL's.

The PAL's and SL's were used to identify a diverse set of facility requirements and an airport development portfolio containing unique and varying development alternatives for PBIA. The various development alternatives were subjected to a two-step assessment process. The first step comprised an initial screening of alternatives using a set of qualitative factors to assess the various alternatives relative to each other. This initial screening process resulted in the identification of short-listed alternatives. The second step in the assessment process involved the evaluation of the short-listed alternatives using the quantitative set of factors aimed to measure the merits, advantages, and disadvantages of each short-listed alternative. The results of the evaluation process provided the preferred development patterns for the four primary airport components: airfield, terminal, general aviation, and cargo.

A Composite Development Plan for PBIA was prepared by refining and integrating the preferred development alternatives identified through the evaluation process. An Implementation Plan was developed to illustrate a phasing sequence for the 20-year Development Plan. In addition, a decision tree matrix was created using the preferred and short-listed development alternatives. The decision tree matrix represents a roadmap for future facility development actions offering multiple development patterns, each tailored to meet a unique set of demand profiles and operating conditions, that may be implemented by the DOA in response to changes in the aviation industry, the community's needs, and the role of PBIA. A set of primary and secondary demand indicators was also established to assist the DOA in the monitoring of growth patterns at the Airport and to help establish timelines for executing and implementing a specific development action.

1.3 Conclusions and Recommendations

The recommended development actions for PBIA were integrated into a Composite Development Plan, Shown in **Exhibit I-1**. The Composite Development Plan depicts the various development for the Airport. These are summarized below in no particular order of implementation.

- Conversion of Runway 9R-27L to an air carrier runway
- Development of additional concourse and terminal facilities to the east of Concourse C

- Potential expansion of existing Concourse B and C
- Relocation and expansion of the south side general aviation/FBO facilities
- Potential new aeronautical-use facilities (e.g. aircraft maintenance) and other collateral development
- New cargo facilities
- New taxiway systems and airfield circulation improvements
- Additional public and employee parking facilities (garage and surface)
- Implementation of the New Maintenance Compound
- Expansion of the on-airport rental car facilities
- Potential off-airport property that may be acquired in the future for airport-support functions

In addition to the airport improvements listed above, the Intermodal Analysis provided various transit and multimodal improvements for enhancing the intra-airport ground transportation facilities and integrating with the other multimodal improvements planned by the County. Among these recommended improvements were a Ground Transportation Center and a PBIA Intermodal Hub.

The Ground Transportation Center provided a centralized location for integrating the services provided by PBIA various ground transportation providers, including the on-airport rental car companies. The PBIA Intermodal Hub provides a location that could serve as a replacement to the Tri-Rail Mercer Road Station. In addition, it would serve as a transfer station between rail and other transportation modes accessing the proposed Multimodal Center (to be located in the Downtown Business District), PBIA's terminal building, and the future Ground Transportation Center.

Another key component of PBIA's Strategic Plan was the development of a decision tree, shown in **Exhibit I-2**. The decision tree will assist the DOA with the implementation of the Composite Development Plan while providing the flexibility to adjust to changing conditions in the aviation industry, and the needs of the community, and/or the operating characteristics of the Airport. The decision tree serves to illustrate the implementation characteristics of the proposed strategy, establish decision points, and possible alternatives to the development actions to be taken.

The decision tree for PBIA represents an integration of the short-listed alternatives and the preferred alternatives for each of the various airport components (airfield, terminal, general aviation, and cargo facilities) and summarizes the conditions under which each alternative offers the most appropriate development action. In addition, the decision tree helps to illustrate those development decisions that may compromise the flexibility to adjust the course of development in order to serve changing demand sources or unique needs.

The primary purpose of the decision tree is to identify patterns of development as conditions may change over time. In the context of strategic planning, these patterns of development and decision milestones are more significant than the specific development concepts (i.e., facility layouts) involved, since it is the patterns of development that will determine future development flexibility.

The remaining sections of this document provide a detailed description of the assumptions, methodologies, approaches, and conclusions associated with the various study tasks and technical analyses completed under this study.

1.4 Summary

The conclusions of the Strategic Plan can be outlined as follows:

The Airport's existing facilities are adequate for serving existing and near-term foreseeable demands.

The analyses conducted as part of the PBIA Strategic Plan indicate that there are no evident capacity deficiencies associated with the existing airport facilities. Existing facilities are adequate to serve current demand types and levels. In fact, the capacity of the existing facilities is generally adequate to serve near-term demand growth as projected under the Baseline Scenario. More aggressive changes in the type or level of demands experienced at the Airport, relative to historic trends, may require facility development to increase capacity.

PBIA's Capital Improvement Program (CIP) includes capacity enhancement projects to accommodate more aggressive near-term growth at the Airport.

The five-year CIP includes several capacity enhancement projects to preserve the operating characteristics and level-of-service performance of the Airport. These projects would allow the Airport to accommodate more aggressive changes in the type or level of demand than experienced historically. Demand growth and/or changes in characteristics as projected under the alternate demand scenarios could be accommodated through implementation of these CIP projects.

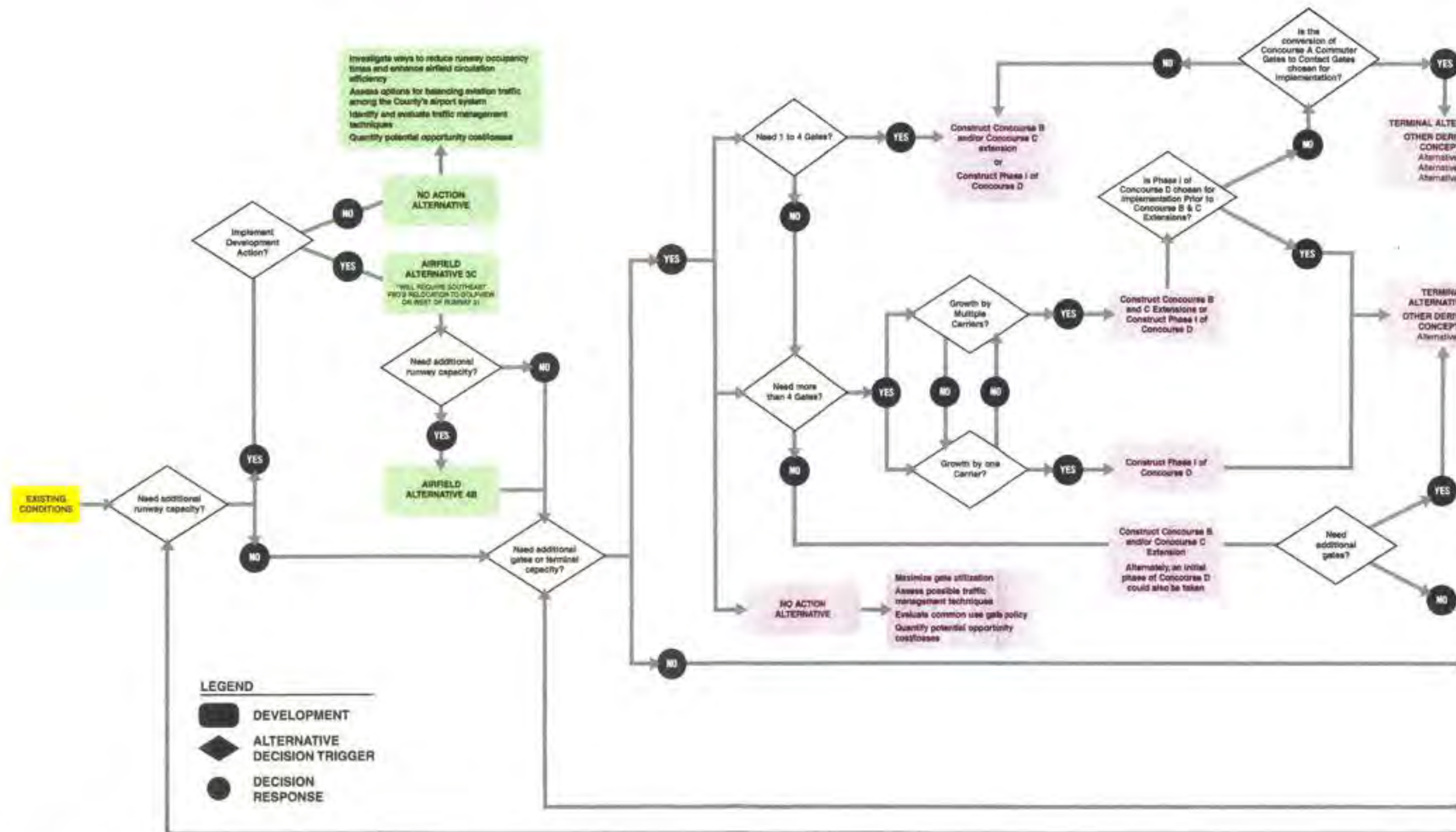
Beyond the near-term horizon, the Airport can accommodate future growth by selectively implementing elements of the Composite Development Plan.

The Composite Development Plan, depicted in Exhibit I-1, describes a long-term pattern of development for the Airport. The Decision Tree and Development Triggers included as part of this study provide a mechanism to identify the timing (based on need rather than chronology) for implementation of specific Airport improvements as well as a framework to continually reassess the development pattern appropriate for the prevailing conditions at the time of implementation. Thus, the long-term capacity needs of the Airport can be met through implementation of the Composite Development Plan as currently envisioned or as adjusted over time to reflect changing conditions and demand requirements.

The Composite Development Plan, Decision Tree, and Development Triggers collectively serve to help define and adjust a pattern of development for the Airport consistent with the needs at the time of implementation. Therefore, it is important to recognize that specific facility layouts may change over time, but the overall patterns of development and associated decision-making structure should remain substantially unchanged. Ultimately, it is the patterns of development, rather than specific facility layouts, that will determine the level of long-term development flexibility at the Airport.

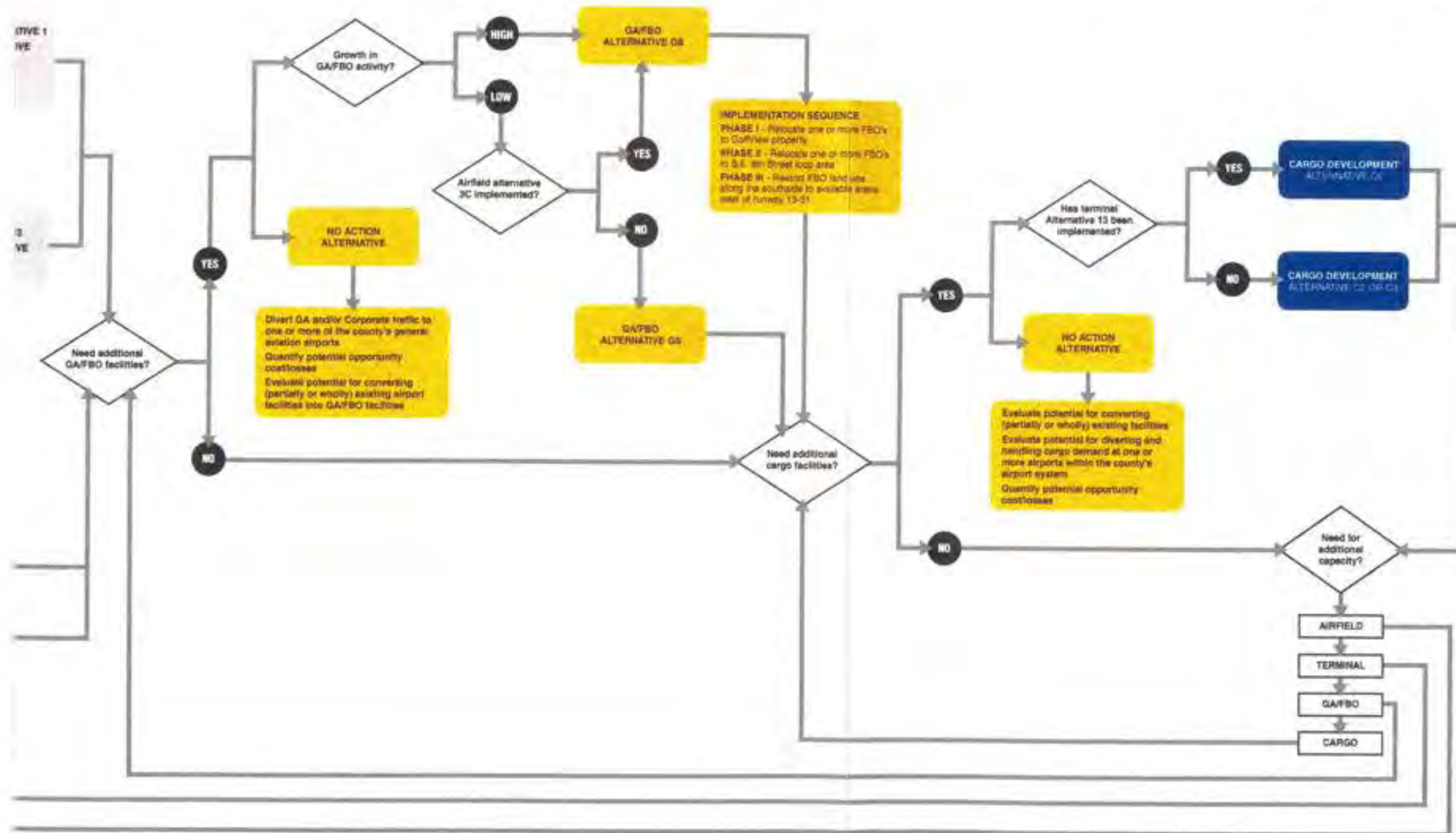
PBIA is well positioned to serve the community's aviation needs of today and the future.

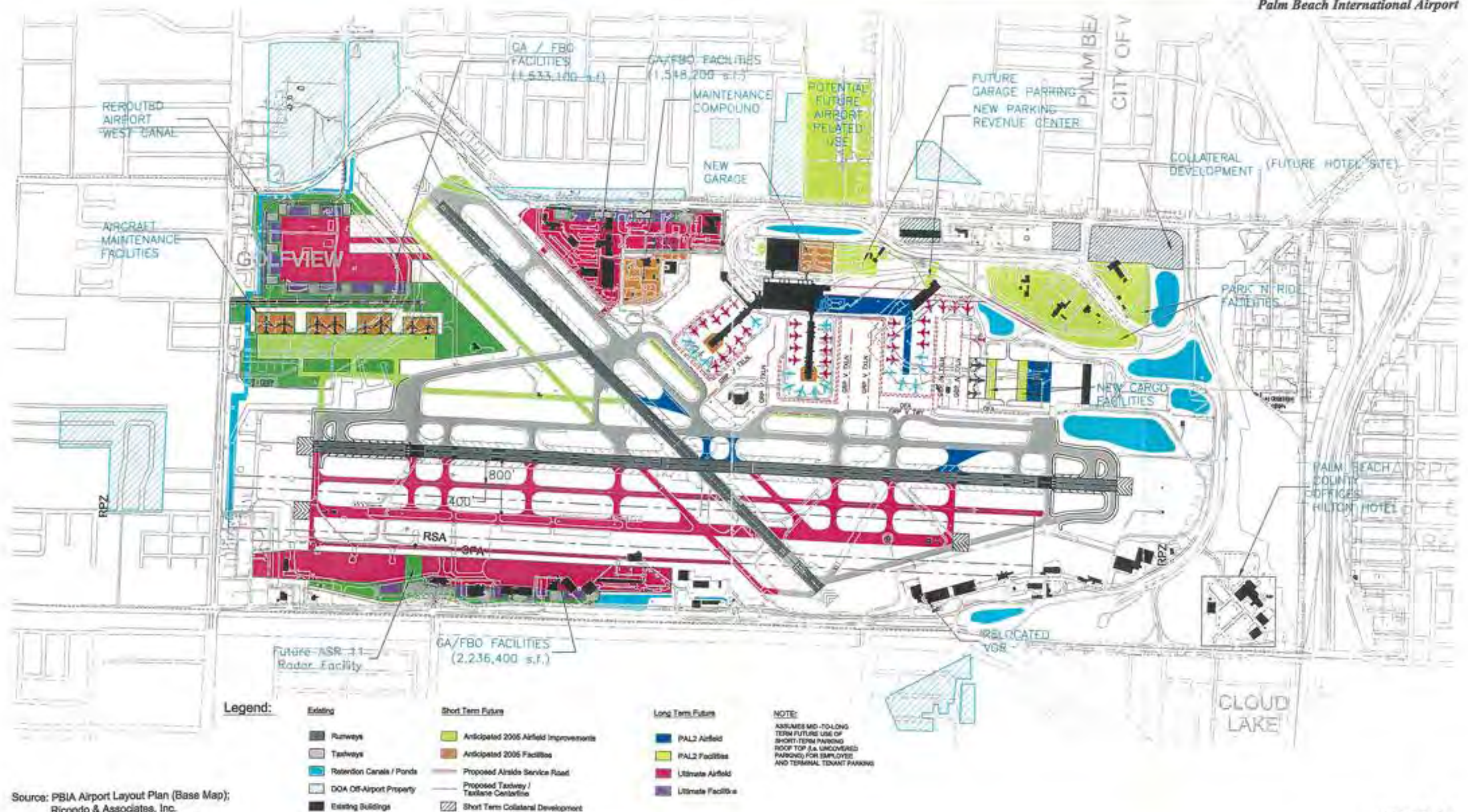
Existing facilities at PBIA are adequate to serve the current aviation needs of the community. As those needs change over the planning horizon, the Airport can be developed to accommodate those changes. Sufficient development flexibility exists at the Airport to allow future facilities to be



Note: Refer to implementation plan phasing sequence for development impacts, parking requirements/facilities, and ancillary/support facility development
Source: Ricondo & Associates, Inc.

DECISION TREE MATRIX Exhibit I-2





Source: PBIA Airport Layout Plan (Base Map);
Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

0 1200 ft. north

Exhibit I-1.dwg

Strategic Master Plan Study

Exhibit I-1

**Composite
Development Plan**

October 2000

developed consistent with needs as they may be experienced under a wide variety of growth scenarios.

Section II

II. Inventory of Existing Facilities

The inventory element of the Master Plan is designed to provide essential data regarding the physical, operational, and functional characteristics of the existing airport, its sub-components, and its environs. The data collected during the inventory element becomes the basis from which future facility requirements are defined. The inventory section includes a review of the physical and operational characteristics and environmental data, airspace and air traffic control procedures, meteorological data, and historical aviation activity statistics.

The objective of the inventory section is to provide the collected data in an organized manner to facilitate future use of the information. To this end, the section is organized in the following way:

- On-Airport Facilities
- Off-Airport Facilities
- Historical Activity
- User Surveys
- Policies, Procedures, and Miscellaneous Information

Each element is subdivided as necessary to present specific airport conditions and information.

2.1 On-Airport Facilities

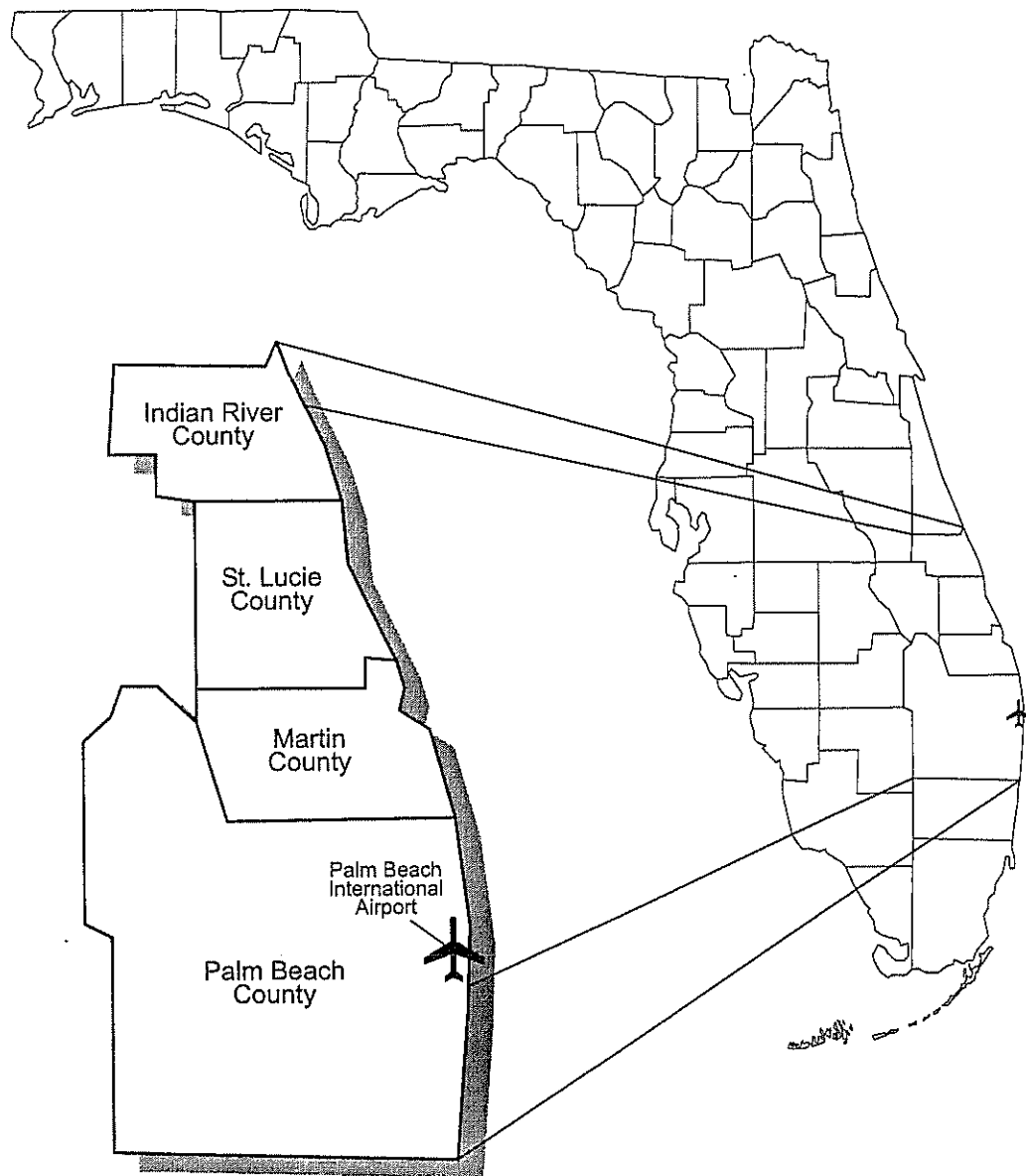
Exhibit II-1.1 shows the location of Palm Beach International Airport (PBIA or the Airport) in the eastern half of Palm Beach County. PBIA is located approximately three miles southwest of the Central Business District for West Palm Beach. The Airport Reference Point (ARP), which defines the midpoint of the airfield, is at Latitude 26° 40' 59.59" N and Longitude 080° 5' 44.22" W, and the official airport elevation is 19.0 feet mean sea level (MSL). The airfield elevation is based on the highest useable airfield pavement.

The following sections describe the on-airport facilities including the airfield, terminal building, auto parking and access, and other airport support facilities at PBIA.

2.1.1 Airfield Facilities

PBIA's airfield components can be subdivided into five general elements. The first includes the runways, taxiways, and hold pads, which represent the operational areas of the Airport. The second element is the terminal apron/aircraft parking aprons. The remaining elements include airfield drainage, fencing and security gates, and the lighting/marketing/signage and navigational aids. These elements are discussed in the following sub-sections.

The general pavement conditions described here are based on an airfield inspection conducted in 1998, while **Exhibit II-1.2** shows the results of a more detailed pavement condition inspection completed in 1996. As shown in Exhibit II-1.2, most of the pavement was reported to be in good to excellent condition in the 1996 study. However, there are some small low activity areas where the pavement has failed or is in very poor condition.



Source: Ricondo & Associates, Inc., September 1998.
Basemap - Cartesia Map Art, 1993.
Prepared By: Ricondo & Associates, Inc., September 1998.

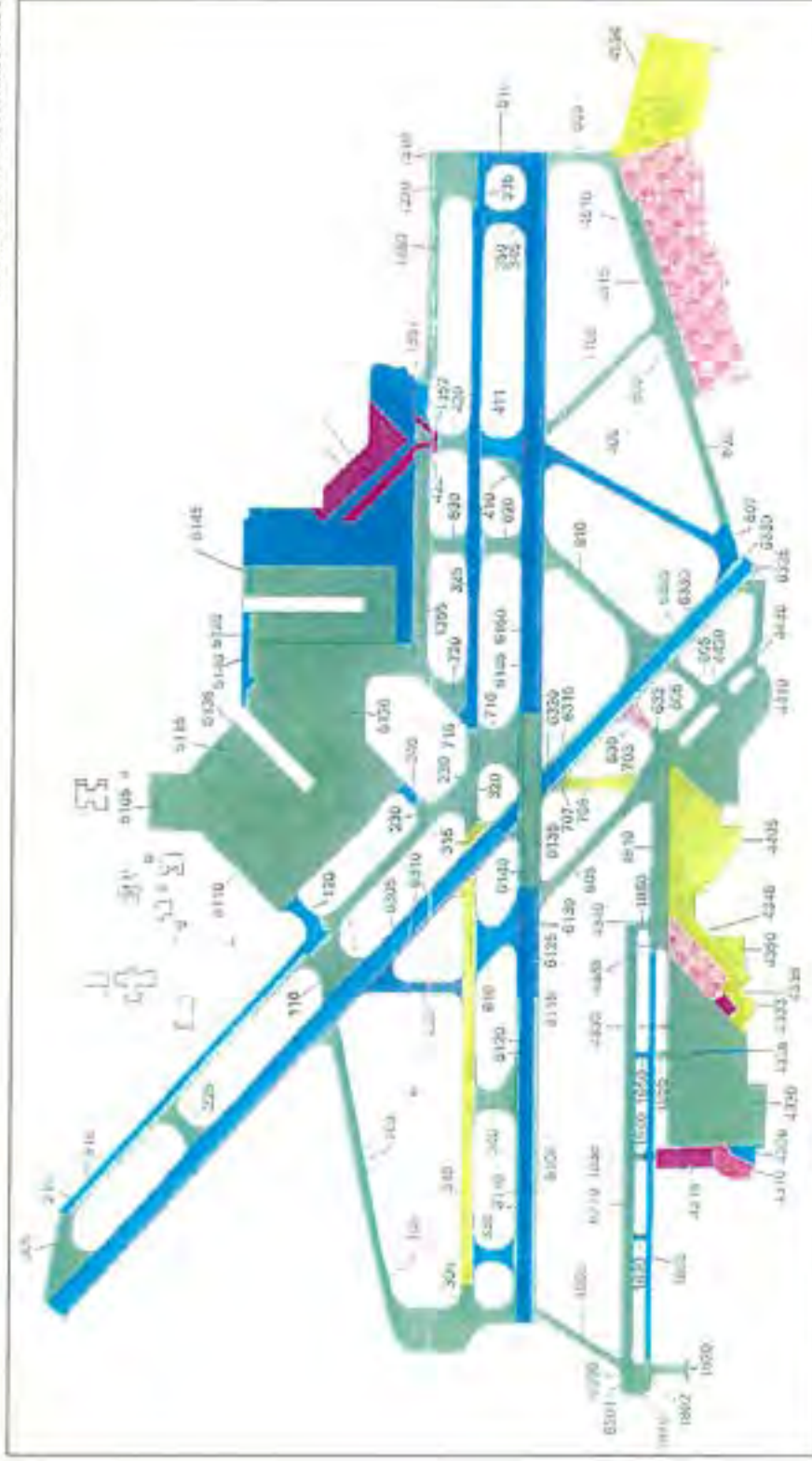
Exhibit II-1.1



exhibit not to scale

PBIA Location Map

support\projects\pbia\masterplan\inventory\location map.cdr (6)



- Legend:**
- Excellent
 - Very good
 - Good
 - Fair
 - Poor
 - Very poor
 - Failed

Sources : Airfield Pavement Condition for Palm Beach International Airport,
 Eckroose Green & Associates, Inc., March 1996
 Prepared By : Ricondo & Associates, Inc., November, 1998

Not To Scale
 north

PB:G0001 I-1_02.dwg

2.1.1.1 Runways, Taxiways, and Hold Pads

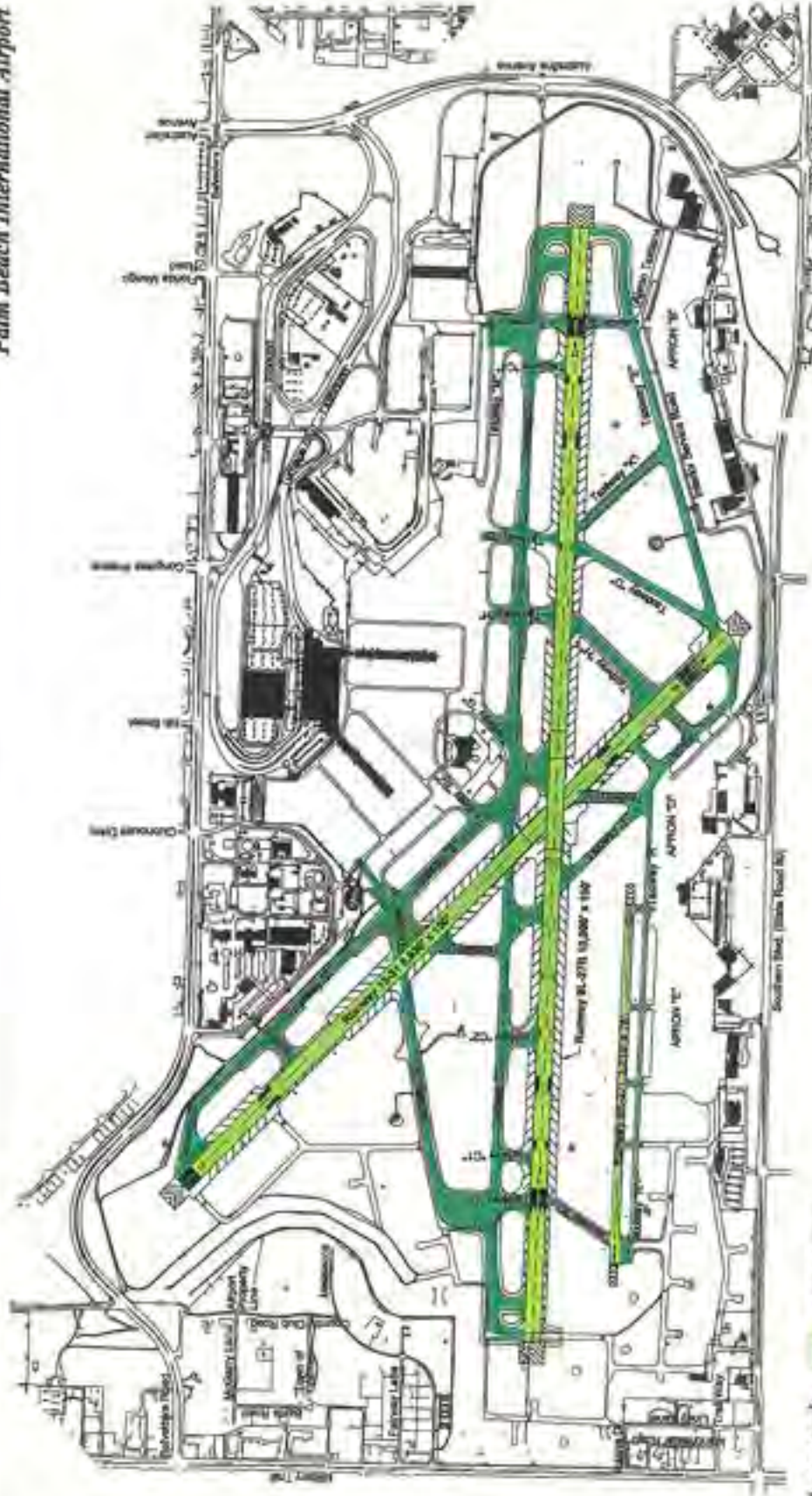
PBIA has three runways. Runways 9L-27R and 9R-27L are parallel and are separated by 700 feet. The third runway, Runway 13-31, is a crosswind runway, which is utilized when the wind does not favor the parallel runways. The existing airfield configuration for PBIA is shown in **Exhibit II-1.3**. The parallel runways each have full length parallel taxiways, while Runway 13-31 has two partial length parallel taxiways as well as independent connector taxiways serving each end of the runway. The information presented here regarding length, pavement condition, and runway end locations is based on a June 25, 1998, airfield inspection conducted by the Federal Aviation Administration's (FAA's) Southern Region.

The primary runway is Runway 9L-27R, which is 7,989 feet long by 150 feet wide with 200-foot-long blast pads at each end of the runway. This length does not include the 1,200-foot extension to Runway 9L and the 811-foot extension to Runway 27R, which are currently in the implementation process. For purposes of this study, Runway 9L-27R is assumed to have a length of 10,000 feet (i.e., the existing runway length plus the 2,000-foot extension currently under construction). The runway is grooved asphalt and is in good condition. Taxiway C parallels Runway 9L-27R and is located on the north side of the runway. This taxiway provides access to and from both ends of the runway. Access to the end of Runway 9L from the north side of the terminal apron is provided by Taxiway A, while Taxiway S connects Runway 9L with Runway 9R. Taxiway M parallels Taxiway C on the north side from the western edge of the Terminal Area Apron to Taxiway E, which connects Taxiway C and Taxiway M to Runway 27R. When extended, the landing thresholds for Runway 9L and Runway 27R will not be co-located with the extended runway. In both cases, the landing threshold will remain at the pre-extension location. The result is that Runway 9L will have a 1,200-foot displaced landing threshold and Runway 27R will have an 811-foot displaced landing threshold.

The parallel runway, Runway 9R-27L, is 3,210 feet long by 75 feet wide. This runway is in good condition and is constructed of asphalt. Access to this runway is provided by a parallel taxiway, Taxiway R, located 150 feet south of the runway centerline. Taxiway S also links this runway to Runway 9L.

Runway 13-31 is a crosswind runway, which is used primarily when winds do not favor use of the primary runway. This runway is 6,930 feet long and 150 feet wide and is constructed of grooved asphalt. The approach threshold for Runway 31 is displaced approximately 418 feet from the end of the runway. The threshold is displaced to provide the required clearance over Southern Boulevard (State Road 80 or SR 80) and tall trees located in the approach. Access to this runway is provided by two partial parallel taxiways, one located on the southwest side of the runway (Taxiway F) and the other located on the northeast side (Taxiway B). Taxiway B is the primary taxiway for aircraft taxiing to Runway 13 from the passenger terminal, while Taxiway F is the primary taxiway for aircraft taxiing to Runway 31 from the General Aviation facilities located on the south side of the Airport. Taxiways H and D provide access to Runway 31 from the passenger terminal ramp and Taxiway E provides access for aircraft from the southeast side general aviation facilities.

The load bearing capacity of a runway refers to the strength of the surface and the weight the surface can support. The weights presented are not maximum allowable weights or operating limitations. Instead, these weights are based on estimates of the capability of the pavement to support an average level of activity. The runway weight bearing capacities are expressed in terms of the various types of landing gear and the number of wheels distributing the weight onto the pavement surface. The categories of landing gear types considered for PBIA are single-wheel (S), dual-wheel (D), and dual-



Legend:

- Existing Runway
- Existing Taxiway
- Existing Buildings

Source : Airport Management Records, November 1998.
Prepared By : Ricorda & Associates, Inc., March 1999

0 1500 ft. ↑ north

PBIC0001 I-1_03.dwg

Strategic Master Plan Study

Exhibit II-1.3

Existing Airfield Configuration

October 2000

tandem (DT). Examples of these types of aircraft are the Israeli Westwind business jet, Boeing 727, and the Boeing 767, respectively. The load bearing capacities in Kips (1,000 pounds) and general runway characteristics are shown for each runway in **Table II-1.1**.

Table II-1.1

Runway Characteristics

Characteristics	Runway		
	9L/27R	9R/27L	13/31
Length (Feet)	10,000	3,210	6,930
Width (Feet)	150	75	150
Shoulder Width (Feet)	75	-	75
Blast Pad Length (Feet)	200	200	200
Load Bearing Capacity (Kips)			
Single Wheel (S)	85	25	100
Dual Wheel (D)	200	N/A	180
Dual Tandem (DT)	400	N/A	325
Composition	Asphalt	Asphalt	Asphalt
Runway Grade	0.03% Up	0.11% Down	0.02% Down
	East	East	Southeast
Runway Markings	Precision	Basic	Nonprecision
	Instrument		Instrument

Notes: N/A = Not applicable

Source: Airport Facility Directory, October 8, 1998
 Prepared by: Ricondo & Associates, Inc., November 1998

Most of the taxiways serving the different runways are 75 feet wide. The exceptions are Taxiways R, K, and S. Taxiways K and S are 50 feet wide, while Taxiway R is 40 feet wide. The taxiway system with taxiway designators is also shown in Exhibit II-1.3. The 1998 FAA inspection also noted that portions of Taxiway F, from south of Taxiway G to the end of Runway 31, may not be visible from the Airport Traffic Control Tower (ATCT) due to buildings and parked aircraft on the adjacent apron areas.

There is one hold pad on the airfield. As shown in Exhibit II-1.3, this hold pad is located at the intersection of Taxiway C and Taxiway A north of Runway 9L. It is used for aircraft awaiting departure clearance for Runway 9L. The hold pad is 500 feet long by 250 feet wide, including a 75-foot wide taxiway along the eastern edge, and is constructed from asphalt. The pavement is considered to be in excellent condition based on the 1996 pavement study conducted by the Airport. This hold pad will not be affected by the proposed extension of Runway 9L.

2.1.1.2 Aircraft Apron/Ramp Areas

There are four main apron areas on the Airport, namely the passenger terminal apron on the north side of the airfield, two general aviation aprons on the south side of the airfield, and the air cargo apron in the northeast corner of the Airport. Each area serves a different function or element of the aviation activity at PBIA.

The passenger terminal apron is comprised of 358,466 square yards. The pavement condition noted in the 1996 pavement study varies from good to excellent with most of the aircraft parking and

taxilane areas having a very good or excellent rating. A small portion of the apron is rated as very poor and is used by Delta Airlines for overnight parking. The terminal apron area supports all of the air carrier and regional carrier parking requirements as well as ground service equipment storage, service roads, aircraft push-back areas, and taxilanes. **Table II-1.2** lists the pavement condition, as reported in the 1996 pavement study, for the various pavement sections that make up the passenger terminal apron areas. **Exhibit II-1.4** illustrates the overall apron area for the airline terminal. The pavement condition for the terminal area is listed in Table II-1.2 and shown in Exhibit II-1.2.

Table II-1.2

Terminal Area Pavement Condition

Pavement Area	Feature #	Pavement Type	Pavement Condition
Commuter Apron	5105	AC	Excellent
West Taxilane - Concourse B Apron	5110	AC	Excellent
Concourse B Apron	5115	PCC	Excellent
Taxilane - Between Concourses B & C	5120	AC	Excellent
Concourse C Apron	5125	PCC	Excellent
East Taxilane - Concourse C Apron	5130	AC	Very good
Concrete Drive West of Concourse B	5135	PCC	Excellent
Concrete Drive Between Concourse B & C	5140	AC	Excellent
Concrete Drive East of Concourse C	5145	PCC	Excellent
Old Terminal Apron	5150	PCC	Very Poor
Old Terminal Apron	5155	UNK	Very Poor

AC – Asphalt Concrete

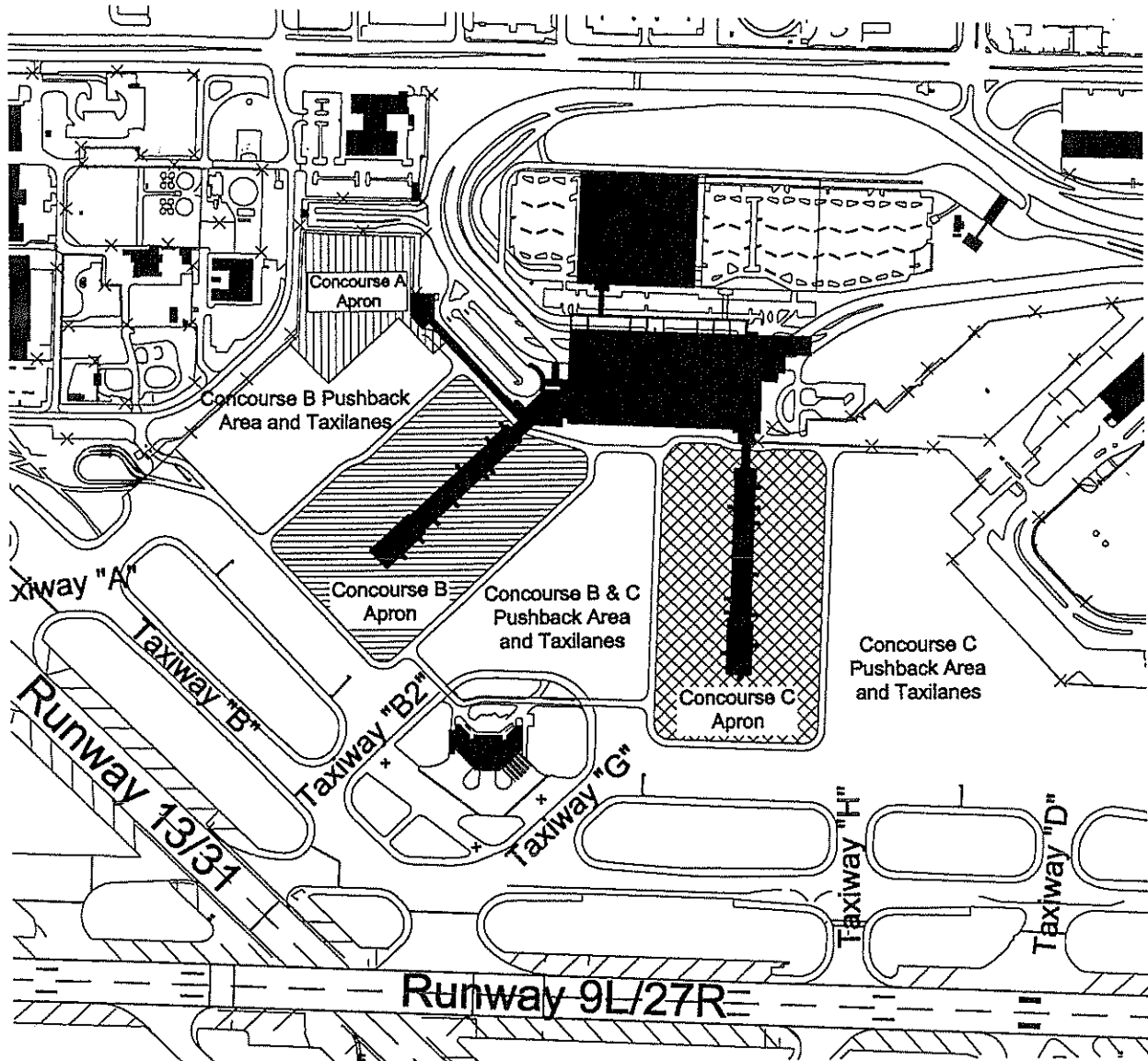
PCC – Portland Concrete Cement

UNK – Unknown

Source: Airfield Pavement Histories for Palm Beach International Airport, Turner, Collie & Braden, March 1996
Prepared by: Ricondo & Associates, Inc., November 1998

The two general aviation areas on the south side serve three major general aviation Fixed Base Operators (FBO's). The apron area west of Runway 13-31 (Apron D & Apron E) is primarily controlled by Galaxy Aviation, which leases approximately 42,661 square yards of Apron D and 55,032 square yards of Apron E. Signature Flight Support also has a pair of hangars west of the Galaxy Aviation facilities and leases approximately 79,534 square yards of Apron E. The pavement condition varies from "failed" in a small section on the west side of the apron to "excellent" in the most heavily used areas. Exhibit II-1.2 depicts the pavement conditions for this area, while **Exhibits II-1.5** and **II-1.6** depict the east and west general aviation aprons, respectively. **Table II-1.3** lists the pavement areas associated with Aprons B, D, & E as well as the pavement types and condition, as reported in the 1996 pavement study.

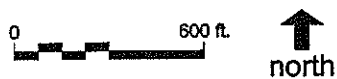
The apron east of Runway 13-31 (Apron B) is held by Signature Flight Support and Jet Aviation. There is approximately 131,075 square yards of apron available for aircraft parking with a 75-foot wide apron edge taxiway along the northern edge. The pavement, as noted in the 1996 pavement study, is considered to be in fair to poor condition.



- Legend:**
- Concourse A Apron
 - Concourse B Apron
 - Concourse C Apron
 - Existing Buildings

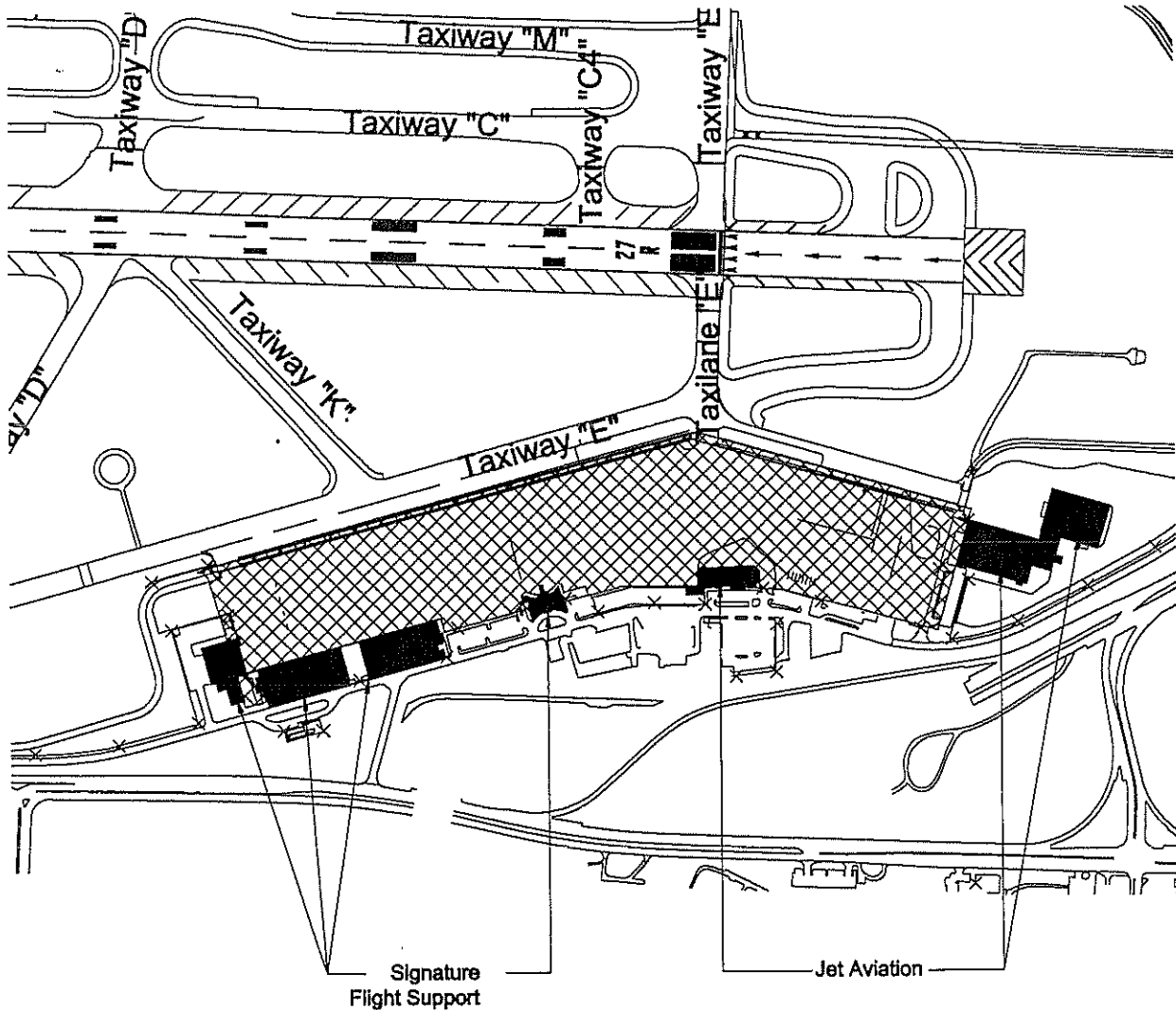
Source : Airport Management Records, November 1998
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-1.4



Airline Terminal Apron

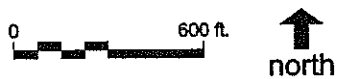
PBIG0001 I-1_04.dwg



Legend:  East Side General Aviation Apron (Apron B)
 Existing Hangars and Buildings

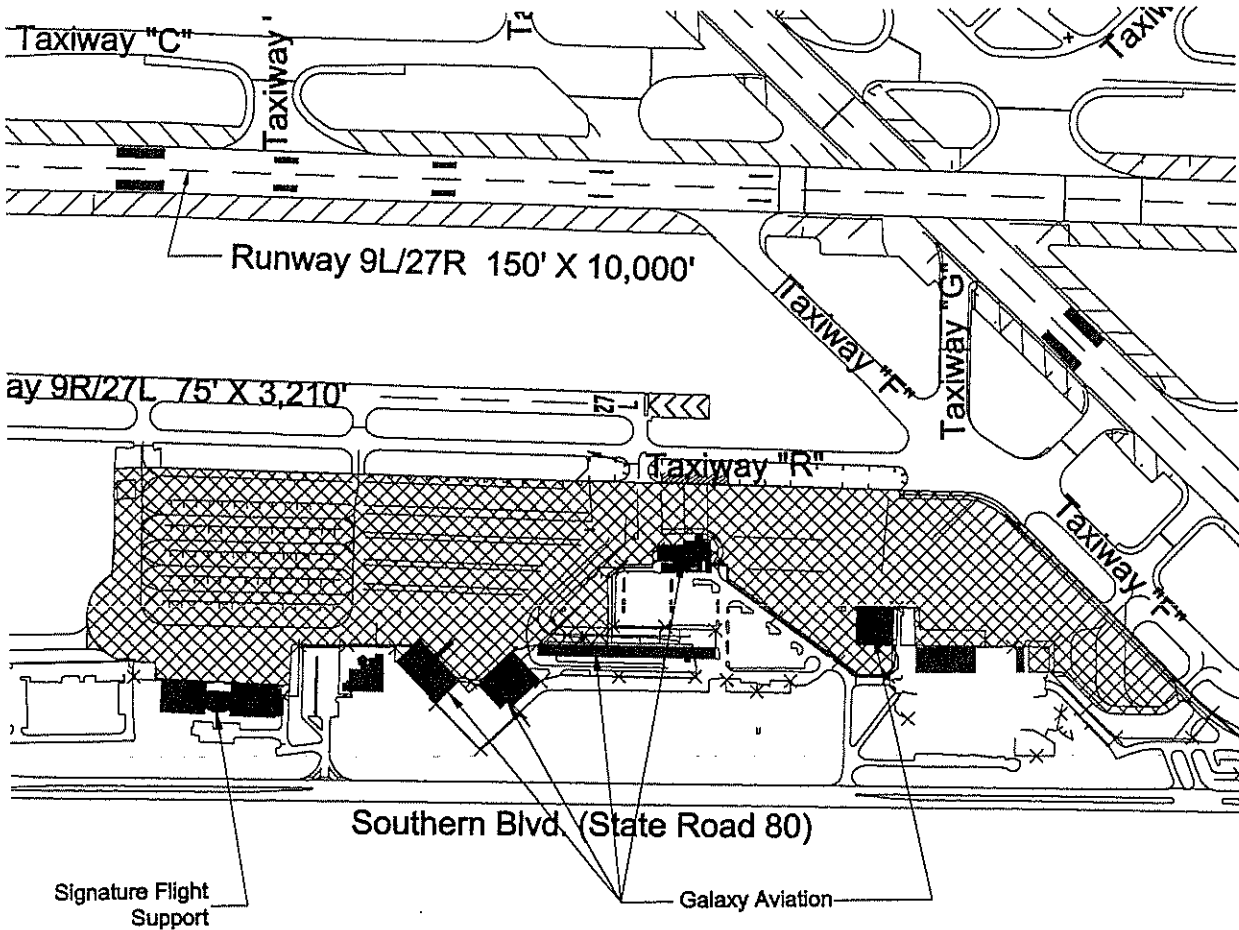
Source : Airport Management Records, November 1998
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-1.5



East Side General Aviation Facilities

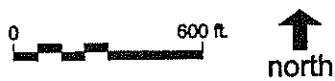
PBIG0001 I-1_05.dwg



Legend:  West Side General Aviation Apron (Aprons D and E)
 Existing Hangars and Buildings

Source : Airport Management Records, November 1998
 Prepared By : Ricondo & Associates, Inc., November, 1998

Exhibit II-1.6



West Side General Aviation Facilities

PBIG0001 I-1_06.dwg

Table II-1.3

General Aviation/Fixed Base Operator Apron Pavement Conditions

Apron Area	Feature #	Pavement Type	Pavement Condition
Apron E- Southwest Corner	4305	AC	Good
Apron E- Southwest Corner	4310	PCC	Failed
Apron E- West End	4315	AC on PCC	Very Poor
Apron E- West Central Tie Down Area	4320	AC	Excellent
Apron E- Central	4325	AC	Good
Apron E- Central	4330	AC	Excellent
Apron E East	4333	UNK	Very Poor
Apron E East	4335	AC	Poor
Apron E East	4338	UNK	Fair
Apron E East	4340	AC on PCC	Poor
Apron E East	4345	AC on PCC	Fair
Apron E- Southeast Corner	4350	AC	Fair
Apron D- West Side	4405	AC	Fair
Apron D- East Side	4410	AC	Excellent
Apron Area B -West Side	4515	PCC	Poor
Apron Area B -East Side	4520	PCC	Fair

AC – Asphalt Concrete
PCC – Portland Concrete Cement
UNK - Unknown

Source: Airfield Pavement Histories for Palm Beach International Airport, Turner, Collie & Braden, March 1996
Prepared by: Ricondo & Associates, Inc., November 1998

East of the passenger terminal apron and north of Taxiway M, is the air cargo apron. This area has approximately 7,840 square yards of concrete apron available for cargo and equipment marshalling, aircraft parking, and cargo make-up. The pavement was constructed in January 1996 and is in good condition.

2.1.1.3 Airfield Drainage

In the 1989 PBIA Master Plan, the surface drainage system was defined to consist of a combination of six drainage basins, four of which are gravity fed and two of which are pumped. The following lists the distribution of property covered by the drainage basins:

Basin 1 Gravity	8 Acres
Basin 2 Pumped	381 Acres
Basin 3 Gravity	15 Acres
Basin 4 Pumped	653 Acres
Basin 5 Gravity	5 Acres
<u>Basin 6 Gravity</u>	<u>274 Acres</u>
Total	1,336 Acres

Exhibit II-1-7 shows the areas covered by each basin. As shown in this exhibit, most of the gravity fed basins are small. The lone exception is Basin 6, which covers the northwest corner of the Airport. Most of this area is undeveloped. The major contributors to off-site drainage discharge are the two pumped basins, which incorporate most of the paved and developed areas of the Airport.

In 1994, the Department of Airports (DOA) updated the Stormwater Master Plan for the airfield. This study provided recommendations to be implemented in two phases. Phase 1 included the following stormwater drainage improvements:

- Route Basin 1 into Basin 2, which would require upgrading/replacing stormwater pipes and adding a five-acre lake.
- Incorporate Basin 5 into Basin 4.
- Divert portions of Basin 4, north of Basin 3, to Basin 3 to reduce flood levels in Basin 4 and to accommodate the addition of Basin 5 into Basin 4.
- Incorporate the remnants of the Spur Canal into a water management lake to meet the water quality and quantity requirements in Basin 3.
- Add a 1.7-acre water management lake to the northern area of Basin 4.
- Implement a culvert abandonment program to replace, remove, or plug (grout) culverts that date back to 1953 or earlier.
- Replace the South Pump Station.
- Renovate the East Pump Station.
- Install a telemetry system to operate and monitor both stormwater pump stations.

As of January 1999, the implementation of most of the Phase 1 recommendations have been completed. All of the recommended culvert and pipe replacements west of Runway 13-31 have been replaced or repaired. **Exhibit II-1.8** depicts the new drainage basin layout as proposed in the 1994 Stormwater Master Plan. The remaining recommendations that need to be addressed include the replacement of the South Pump Station, renovation of the East Pump Station, construction of the five-acre lake, and installation of the telemetry system.

The Phase 2 recommendations include completion of the replacement/renovation of the South and East pump stations and the replacement/renovation of the pipes and culverts located on the east side of Runway 13-31, which date back to 1953 or earlier. Phase 2 is currently under design and should enter the construction phase in fiscal year 2001/2002.

2.1.1.4 Fencing and Security Gates

PBIA is completely fenced with secured access to the Airfield Operating Area (AOA) and Security Identification Display Area (SIDA). The DOA has an FAA approved Security Program in place, which is currently being revised to define the AOA and SIDA as shown in **Exhibit II-1.9**.



Legend: ■ Pervious Areas ■ Non-Pervious Areas ■ Retention Ponds

Sources : Stormwater Master Plan for PBIA, Mock Roos & Associates, Inc., May 1994
 Prepared By : Ricordo & Associates, Inc., March 1999

Not To Scale



PB\G0001 I-1_07.dwg

Strategic Master Plan Study

Stormwater System Improvements Existing Drainage Basins Prior to The Phase 1 Improvements

Exhibit II-1.7

October 2000



Legend:

- Pervious Areas
- Non-Pervious Areas
- Retention Ponds

Sources : Stormwater Master Plan for PBIA, Mock Roos & Associates, Inc., May 1994
Prepared By : Ricoondo & Associates, Inc., March 1999

Not To Scale



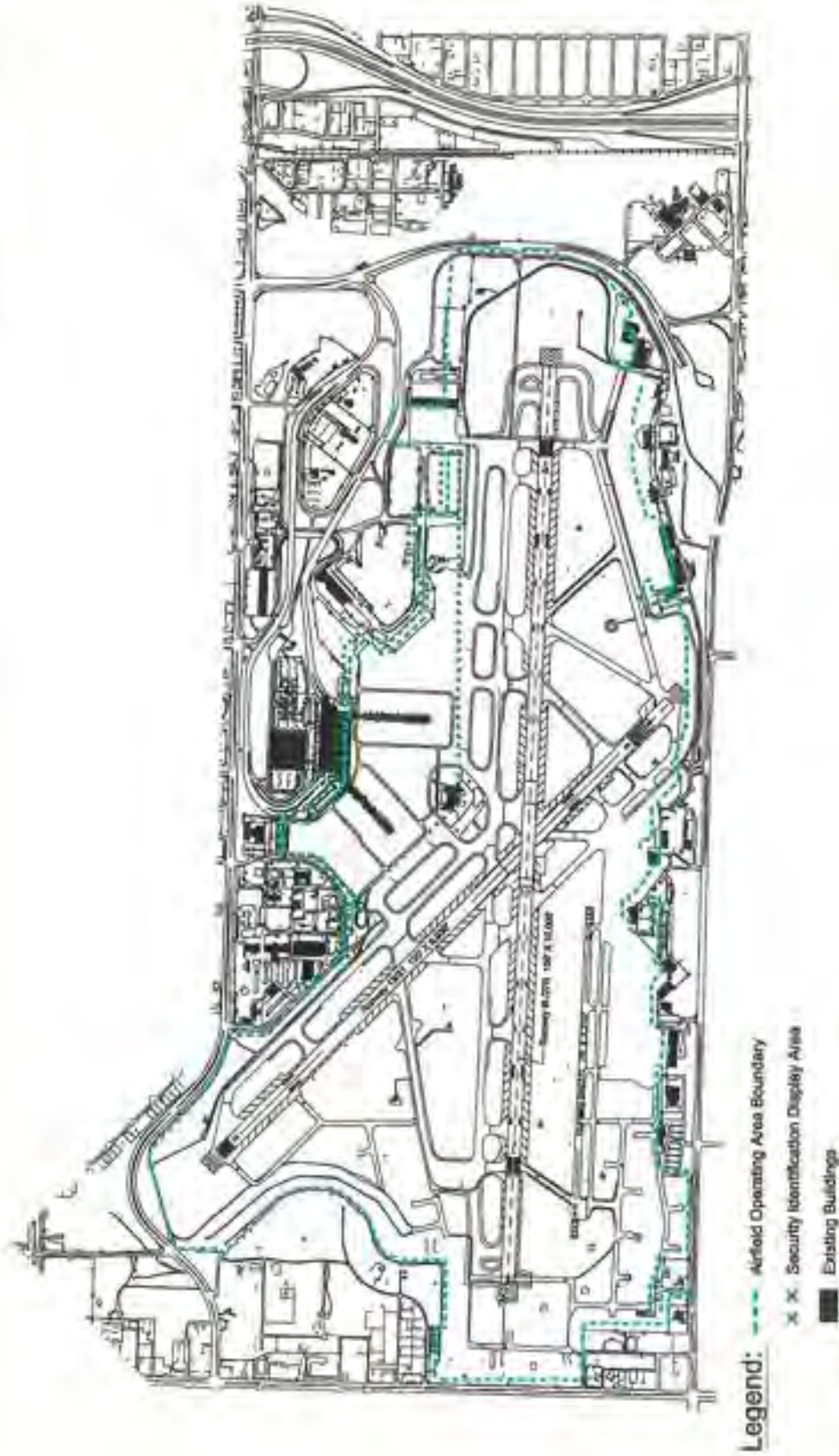
PBIC00001 I-1_08.dwg

Strategic Master Plan Study

Exhibit II-1.8

**Proposed Drainage Basins
1994 - Stormwater Master Plan**

October 2000



A controlled access system was installed in late 1992. In conjunction with the access system, a number of video cameras were installed to allow visual monitoring of the airfield and terminal area by the Airport Communications Center. The Airport Communications Center is located in the second level of the Terminal Building. Airport personnel possess badges with individual employee access codes. Personnel slide the badges through card readers to gain admittance to secure areas. Badges are also used by the DOA and airline personnel for controlled access to the employee parking areas.

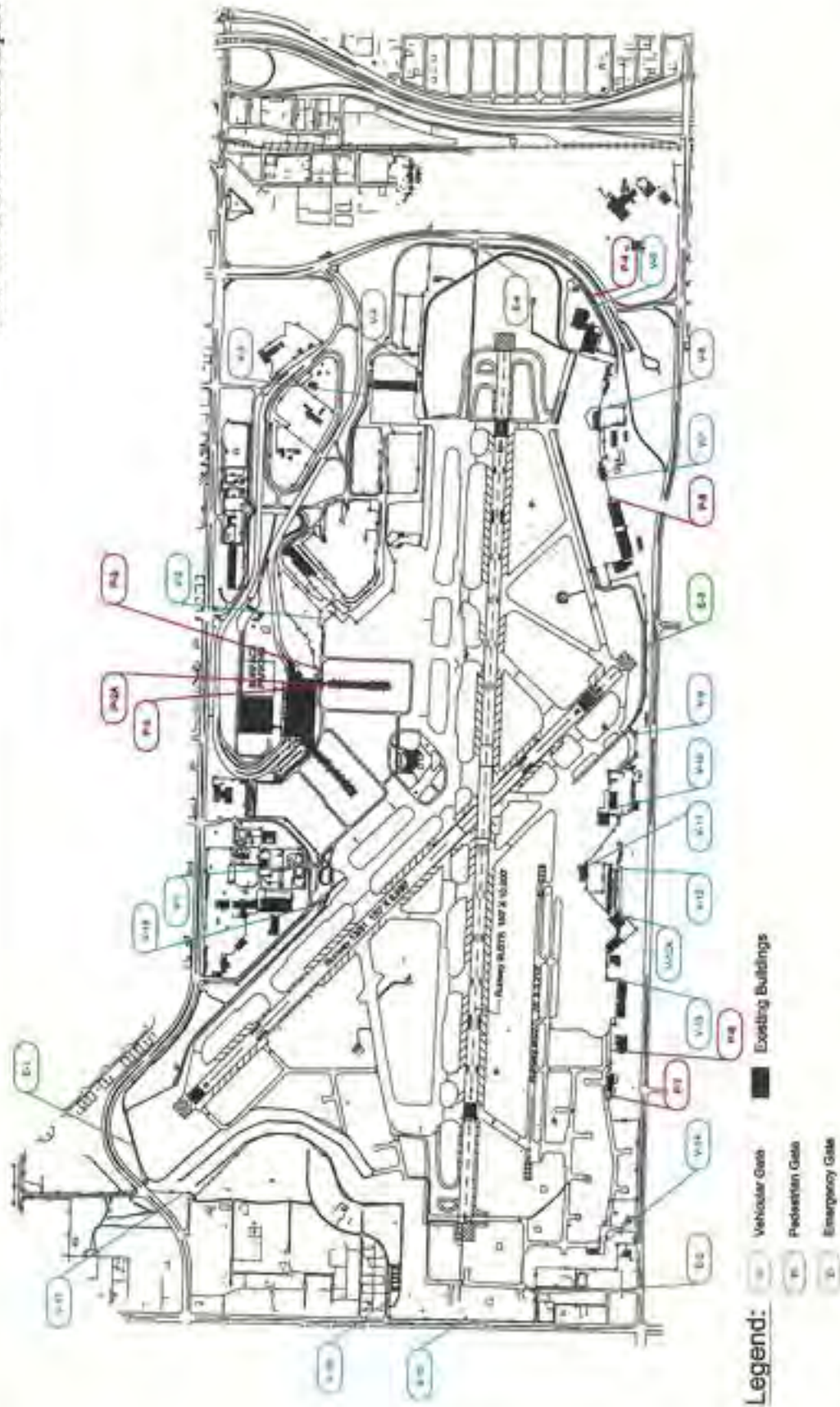
There are thirty airfield access points at PBIA, which are shown in **Exhibit II-1.10**. Of these, eighteen are vehicular gates and seven are pedestrian gates. There is also a restricted airfield access gate within the FAA leasehold, located on the south side of the Airport. In addition, there are four emergency gates. One of these emergency gates is located west of Runway 9R. Another is located east of Runway 27R, accessible from Australian Avenue. The third emergency gate is directly southeast of Runway 31, near the Southern Boulevard/Congress Avenue intersection, and the fourth emergency gate is north of Runway 31. The primary access points to the airfield are via the 8th Street access gate, located southwest of Building 846 and the Concourse A apron, and the vehicular access gate, located west of the Park and Ride lots.

2.1.1.5 Lighting, Marking, Signage, and Navigational Aids

Airfield lighting consists of taxiway and runway lighting as well as flood lighting for apron operations and apron edge definitions. The Airport is identified at night by a green and white rotating beacon, which is located on the roof of the terminal. Currently, all of the taxiways and apron edges at PBIA are equipped with Medium Intensity Taxiway Lights (MITL). Additionally, lighted wind socks are provided at the end of every runway except Runway 27L. **Exhibit II-1.11** shows the general location of the lighted wind socks, the rotating beacon, and other lighting facilities.

The primary runway, Runway 9L-27R, has High Intensity Runway Lights (HIRL), while the two other runways are equipped with Medium Intensity Runway Lights (MIRL). Runway 9L is also equipped with a Medium Intensity Approach Lighting System and Runway Alignment Indicator Lights (MALSR) and is marked in accordance with the standards for a precision instrument runway. Runway 27R is equipped with Runway End Identification Lights (REIL) and is also marked in accordance with the standards for a precision instrument runway. Runway 13-31 is marked according to the standards for a non-precision instrument runway, while Runway 9R-27L has basic runway markings.

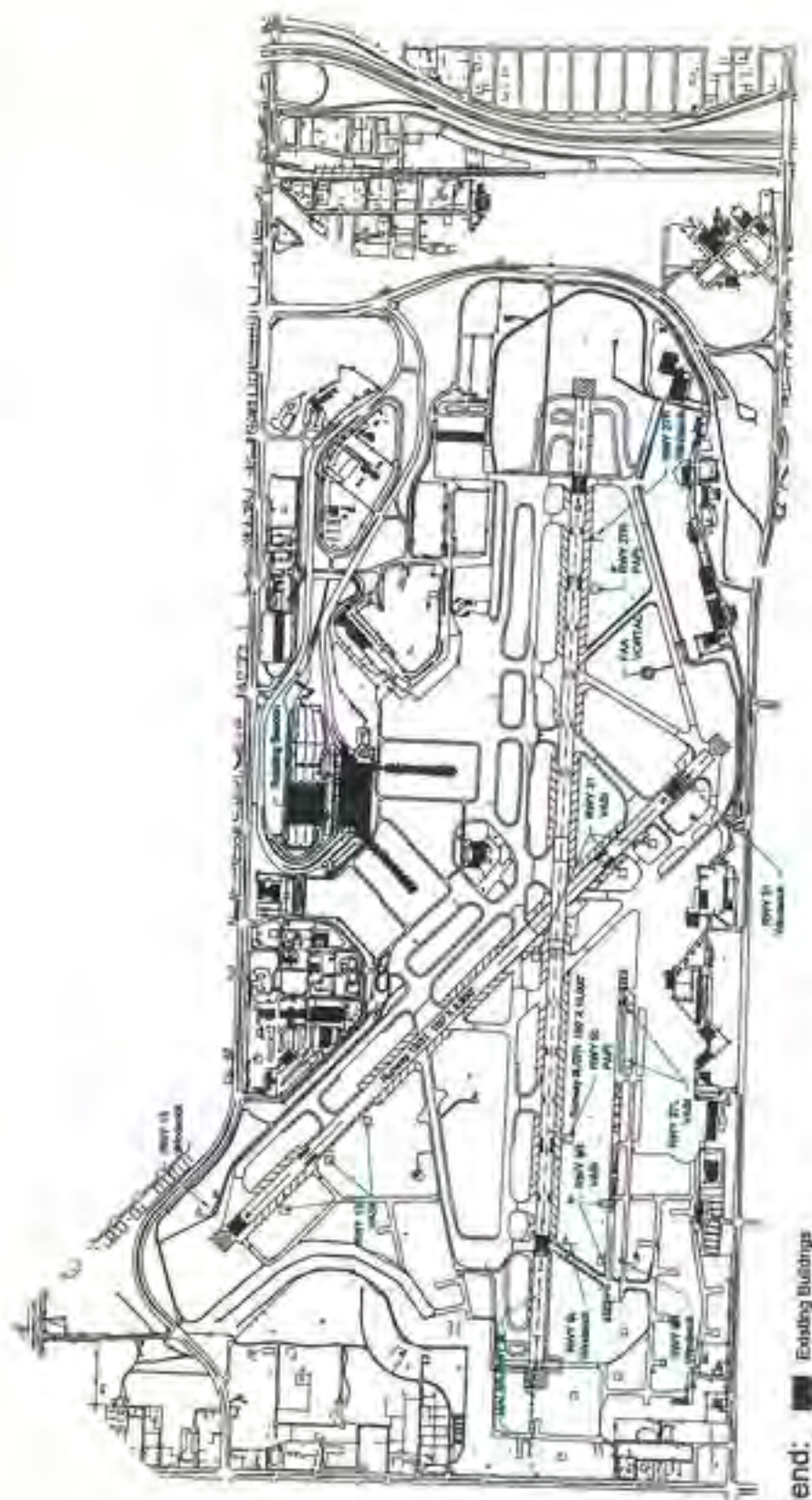
The Airport's airfield signage system was upgraded in the mid-1990s in order to satisfy FAA guidelines stipulated in Advisory Circular 150/5340-18C, Standards for Airport Sign Systems. The current signage system was installed in 1994 as part of an airfield signage and lighting improvements project. The airfield contains 411 illuminated sign systems manufactured by ADB Alnaco. Of these, 12 are runway distance remaining signs characterized by single module signs with white numerical inscriptions on a black background. These are located along runways 13-31 and 9L-27R. Another 40 are mandatory signs, which are further categorized into 36 holding position signs for taxiway/runway intersections and four holding position signs for runway/runway intersections. The mandatory signs on the Airport are multi-modular and are characterized by white inscriptions on a red background. The remaining 359 signs are either taxiway direction or runway exit signs, which provide directional information to pilots during ground operations. Most of these taxiway direction



Source : Airport Management Records, November 1998
 Prepared By : Ricordo & Associates, Inc., March 1999

Exhibit II-1.10

Airfield Access Gates



Legend: ■ Existing Buildings

Sources : Airport Master Record, FAA Form 5010, October 8, 1998
 1999 PBA Master Plan, URS Greiner, May 1999
 Prepared By : Ricomdo & Associates, Inc., March 1999

0 1000 ft. north

PBA0001 I-1, 11.dwg

Strategic Master Plan Study

Exhibit II-1, 11

NAVAIDS and Airfield Lighting Systems

October 2000

and runway exit signs are multi-modular and all are characterized by black inscriptions on a yellow background.

There are numerous navigational aids (NAVAIDS) serving the Airport. These NAVAIDS can be categorized as providing either electronic course guidance or visual course guidance. Table II-1.4 presents an inventory of PBI's NAVAIDS and the individual runways they serve. The electronic course guidance NAVAIDS are generally used for Instrument Approach Procedures (IAPs) published by the FAA. The Airport currently has seven published IAPs that are used for Runways 9L-27R and 9R-27L. Two of the approaches are based on Instrument Landing Systems (ILS), installed on Runway 9L and 27R. These Precision IAPs provide both vertical and horizontal guidance to the runway and utilize a localizer antenna (horizontal guidance signal) and a glide slope antenna (vertical guidance signal). The Runway 9L ILS approach also has two fan markers used to identify the Initial Approach Fix (IAF) and the Missed Approach Point (MAP). These fan markers are referred to as the Outer Marker (OM) and the Middle Marker (MM). The Runway 27R approach does not have fan markers that identify the IAF or the MAP. The IAF and MAP for this approach can be defined by radar or by Distance Measuring Equipment (DME). Additionally, a Runway Visual Range (RVR) is provided in the touchdown area for Runway 9L. The RVR provides visibility measurements in the touchdown location.

Table II-1.4

NAVAIDS and Lighting Systems

System Instrumentation	Runway					
	9L	27R	9R	27L	13	31
Precision	ILS	ILS				
Non-Precision	VOR/GPS/ NDB/ASR	VOR/GPS/ ASR			VOR/GPS/ ASR	VOR/GPS/ ASR
Lowest Approach Minimums (Ceiling/visibility)	200'/2400 RVR	200'/3/4 Mile			440'/1 Mile	440'/1 Mile
Glide Slope (GS)	✓	✓				
Localizer (LOC)	✓	✓				
Outer Marker (OM)	✓					
Middle Marker (MM)	✓					
Runway Visual Range (RVR)	✓					
Approach Lighting System						
Medium Intensity Approach Light System						
With Runway Alignment Indicator Lights (MALSR)	✓					
Visual Approach Slope Indicator (VASI) or Precision Approach Path Indicator (PAPI)			✓	✓		
Visual Approach Slope Indicator for High Cockpit Aircraft (VASI [3 Bar])		✓			✓	✓
Runway Lighting						
High Intensity Runway Lights (HIRL)	✓	✓				
Medium Intensity Runway Lights (MIRL)			✓	✓	✓	✓
Runway End Identifier Lights (REIL)		✓			✓	✓

Notes:

1. ILS - Instrument Landing System; NDB - Non Directional Beacon; VOR- Very High Omni Range; ASR - Approach Surveillance Radar
2. Minimums are lowest available on each runway. Runway 9L: ceiling (feet)/RVR (feet). All other runways Ceiling (feet)/Visibility (Miles).

Source: Jeppesen Airway Charts, October 8, 1998
Prepared by: Ricondo & Associates, Inc., April 1999

In addition to the ILS systems, a Very High Frequency Omni Range (VOR) with Tactical Air Navigation (TACAN) is located on the Airport. The TACAN function is an ultra high frequency guidance system used by the military, which also provides civilian users with DME. Referred to as a VORTAC, this VOR is used to define the Low Altitude (VICTOR) Airways and the High Altitude (JET) routes that traverse the Florida coastline. There are published IAPs for Runways 9L, 13, 27L and 31 based on course guidance from this VORTAC. These approaches are referred to as non-precision approaches, because the VOR only provides horizontal course guidance. Unlike the ILS, which provides a horizontal course signal along the extended runway centerline, the VOR approach course signal may not be directly aligned with the runway centerline. The VOR approach course may have a final approach course that is as much as 30° different than the runway alignment. Co-located with the OM associated with the Runway 9L ILS is a Non-Directional Beacon (NDB) called RUBIN. The combination NDB and OM is referred to as a Locator Outer Marker (LOM). There is one IAP for PBI based on this NAVAID to Runway 9L. Much like the VOR approach, this IAP is a non-precision procedure that provides only horizontal guidance to the runway.

2.1.2 Terminal Building and Concourses

Commercial passenger flights operating in or out of PBI use the passenger terminal facilities. The Airport's passenger terminal facilities consist of a main terminal building and three concourses, designated as Concourses A, B, and C. These terminal facilities were constructed in 1988 and presently serve major and commuter airlines in approximately 561,348 square feet of area. A summary breakdown of the aggregate space in the Airport's terminal facilities is shown in **Table II-1.5**.

The main terminal building is comprised of three levels. The first level, known as the arrival level, serves as the primary area for processing deplaning (arriving) passengers. It houses the bag claim and bag make-up facilities and provides access to the rental car agencies and other modes of ground transportation. Presently, National, Hertz, Budget, Dollar, Avis, and Alamo car rental companies maintain counters along the north wall. The Palm Beach County Sheriff's office is also located on the northeast corner of the main terminal building's ground floor. Adjacent to and west of National Car Rental's counter is Northwest Airlines' baggage service office and a traveler's aid counter. American Airlines' baggage service office is located at the far northeast section of the ground floor. On the southwest corner is the Federal Inspection Services (FIS) facility. The FIS facility encompasses a 19,820-square foot area to allow for the handling of commercial international arrivals. Sterile access for international passengers is available to the FIS facility from Concourses A and B. **Exhibit II-1.12** illustrates the current space utilization in the first level of the main terminal building.

The second level, known as the departure level, contains the concession facilities, including food and beverage, retail shops, and other services, and provides access to the departure lounges located in each of the three concourses. The DOA's operations offices and the Communications Center are centrally located in the second level. The TWA Ambassador's Club is located directly in front of the passenger security checkpoint for Concourse C. The ceilings on the second level of the main terminal building are elevated to nearly twice the height of the first and third level ceilings and are combined with translucent roofing, or skylights, to allow for natural lighting during daytime hours. Elevators and escalators allow for vertical passenger movements to the short-term parking garage and other levels of the main terminal building. Two pedestrian bridges, located along the eastern and

Table II-1.5

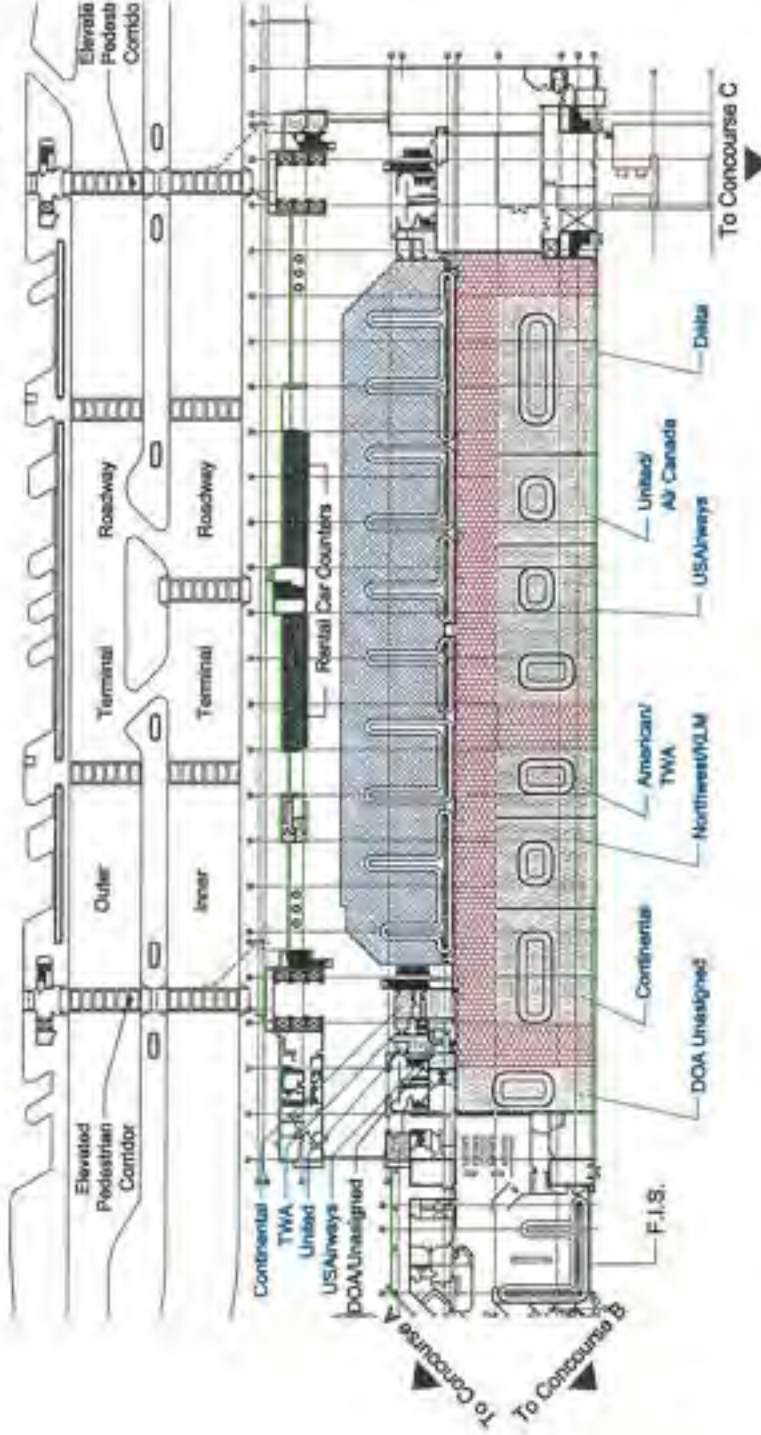
Summary of Terminal Areas

TERMINAL USE	Area (sq. ft.)
Airline Functions	
Ticket Counter	11,347
Airline Ticket Office	20,073
V.I.P. Rooms	6,258
Hold Rooms	58,248
Baggage Claim	30,895
Concourse Circulation Areas	38,518
Outbound Baggage	29,109
Operations/Curbside & Services Offices	52,315
Commuter Operating Areas	5,269
Tug Drive/Inbound Baggage	26,699
Subtotal	278,731
Concessions	
Food/Beverage	20,670
Kitchen Facilities	3,494
News/Gift/Sundry	10,384
Rental Car	2,864
Office/Storage	2,029
Other Revenue	5,435
Subtotal	44,876
Federal Inspection Services	
FIS	19,820
Public Areas	
Unenclosed Areas	28,357
Public Areas – Non-Secure	124,283
Subtotal	152,640
Non-Public Area	
Airport Administration	19,666
Mechanical/Electrical/Building Systems	45,615
Subtotal	65,281
Total All Areas	<u>561,348</u>

Source: Airport Management Records, November 17, 1997

Prepared by: Ricondo & Associates, Inc., October 1998

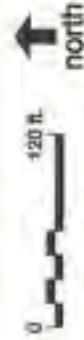
Palm Beach International Airport



Legend:

- Baggage Claim
- Tug Drives
- Baggage Make-up, Outside Offices, Operation Area Including Baggage Services & Commuter Operations Area
- Lease Boundary
- Building Outline
- Airline
- Occupant/Tenant

Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1984)
 Ricordo & Associates, Inc.
 Prepared By : Ricordo & Associates, Inc., March 1989



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Strategic Master Plan Study

Exhibit II-1.12

Level 1 **Main Terminal**

October 2000

western third of the building, provide access to the long term parking garage. **Exhibit II-1.13** shows the space allocations for facilities located in the second level of the main terminal.

The third level of the main terminal consists of airline ticket counters and airline administration and support offices and serves as the primary area for processing enplaning (departing) passengers. The ticketing lobby parallels the departure roadway. **Exhibit II-1.14** shows the current space utilization for the third level of the main terminal building.

Concourse A, known as the commuter concourse, is located on the ground level, or ramp level. It has four joint use gates and holdrooms, providing access to the 10 aircraft parking positions comprising the commuter apron. Concourse A and the main terminal building are joined together by a connector containing two parallel corridors, one for domestic passengers and one for international passengers. The international passenger corridor provides sterile access for arriving passengers accessing the FIS facility from the commuter apron. **Exhibit II-1.15** depicts the current space allocation for Concourse A.

Concourses B and C provide enplaning and deplaning passenger facilities for commercial jet flights. Both concourses are similar in layout, each one providing preferential-use airline gates and having two levels. Concourse B is comprised of seven narrowbody and six widebody aircraft gates. It is currently served by US Airways, Northwest, and Continental. Concourse C has one narrow body and 11 wide body aircraft gates. The airlines presently using Concourse C include Delta, Delta Express, United, American, Midway, and TWA.

The second levels of Concourses B and C, or the public levels, have a central circulation corridor with departure lounges, food and beverage or retail concessions, building support spaces, or other airline facilities located on either side. The Delta Crown Room is located on the second level in Concourse C. **Exhibits II-1.16** and **II-1.17** illustrate the current space allocation for the second level in Concourses B and C, respectively.

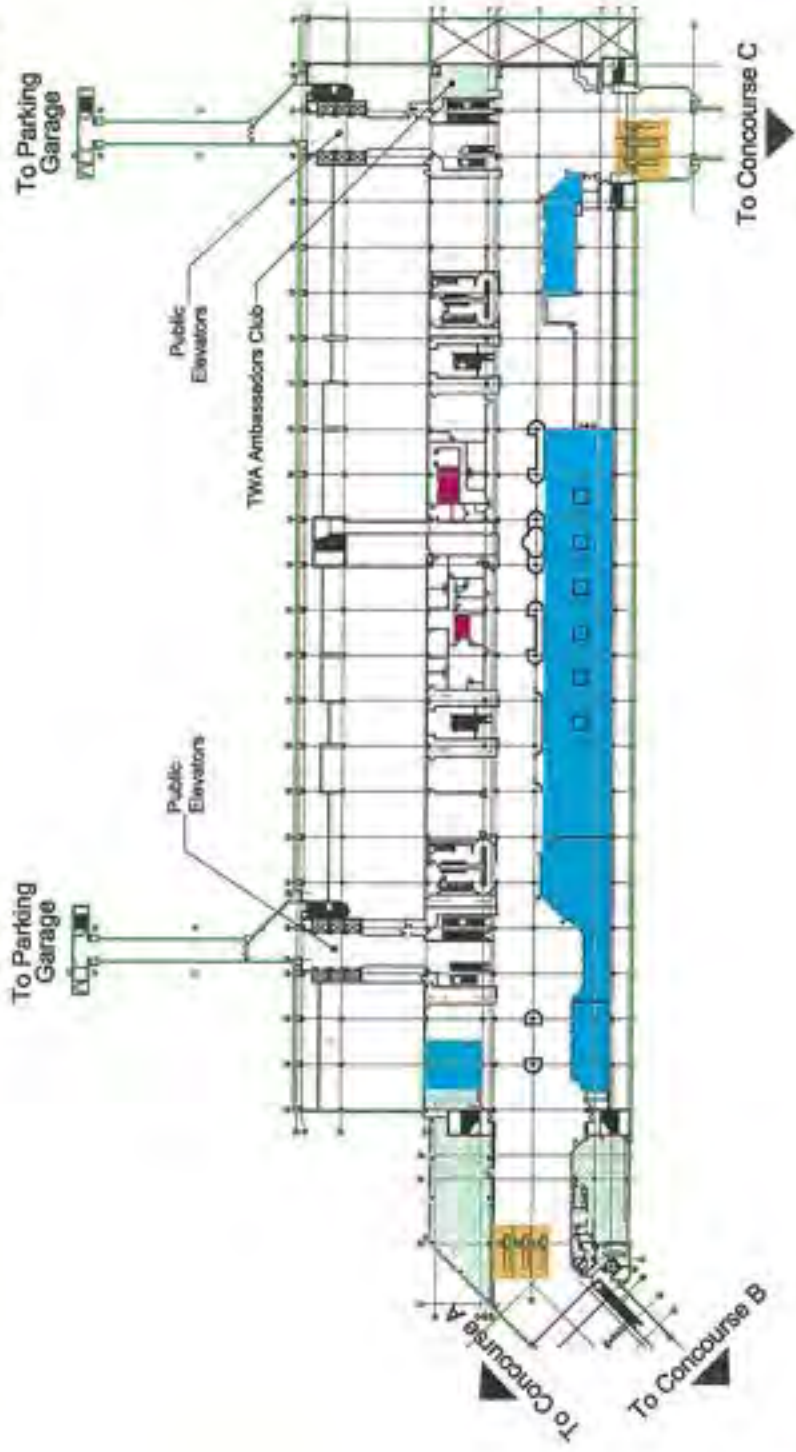
The ground levels of Concourses B and C are restricted to airline employees and other authorized personnel. They are comprised of mostly airline operations spaces such as offices, storage rooms, locker rooms, and employee facilities. Some of the Department of Airports' maintenance offices are also located in the ground level of Concourse B. **Exhibits II-1.18** and **II-1.19** illustrate the current space allocation for the ground levels of Concourses B and C, respectively.

2.1.2.1 Airline Ticket Counter and Airline Operations Area

Signatory airlines using the Airport perform ticketing operations at counters located in the ticketing lobby on the third level of the main terminal building. **Exhibit II-1.20** illustrates the location and airline allocation of each space within the third level of the main terminal building currently used for ticketing functions.

Ticket counters are airline-exclusive use spaces and are uniformly finished with airline identification media. Wall panels behind the ticket counters are customized by the airline with either electronic or manual flight information displays. Each airline installs its own computer system. Typical ticketing positions include one computer terminal located next to a shared passenger baggage pass-through. Standard ticket counter modules are used. Ticketing offices are directly behind the ticket counters,

Palm Beach International Airport



Legend:

- Concessions
- DOA Offices
- Security Checkpoints
- VIP Rooms
- Building Outline

Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1994
 Prepared By : Ricondo & Associates, Inc., March 1999

0 120 ft. north

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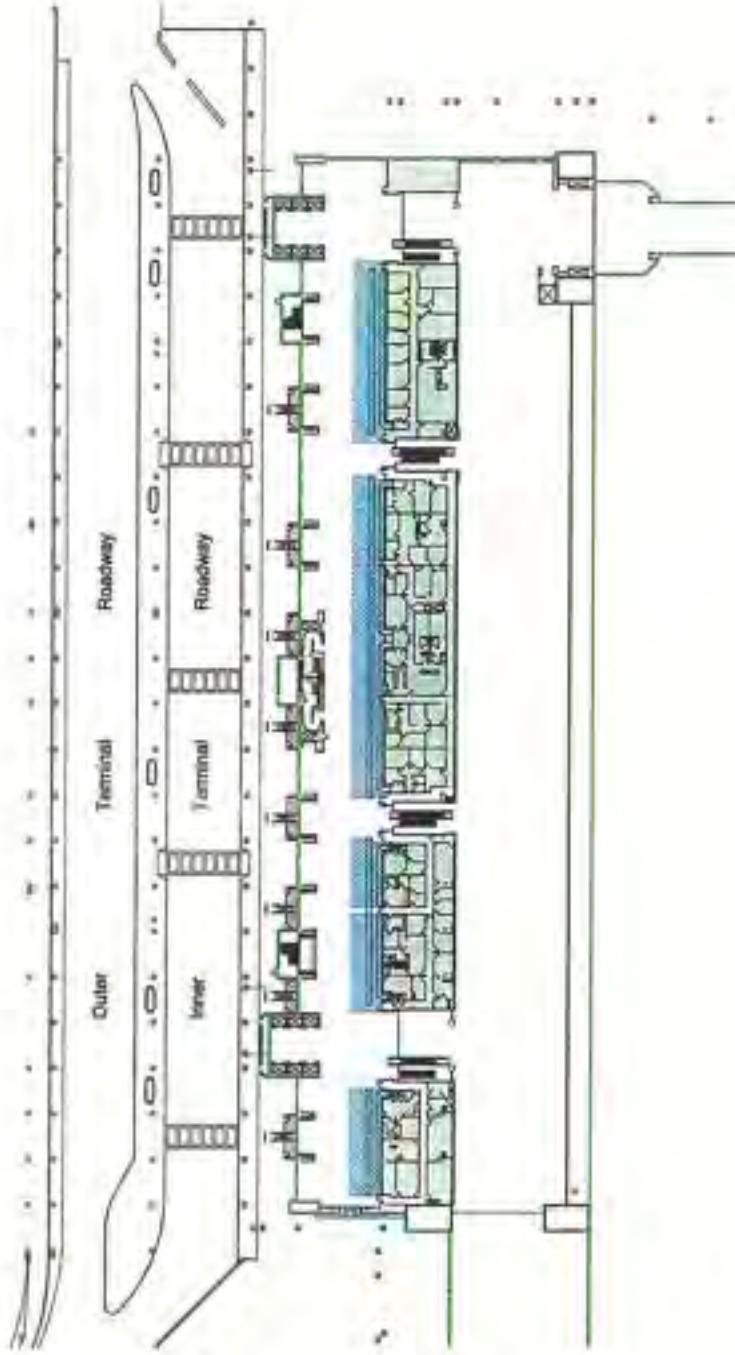
Strategic Master Plan Study

Exhibit II-1.13

Level 2
Main Terminal

October 2000

Palm Beach International Airport



Legend:

- Curbside Offices
- Ticket Counter
- Ticket Offices, Upper Level Offices
- Building Outline

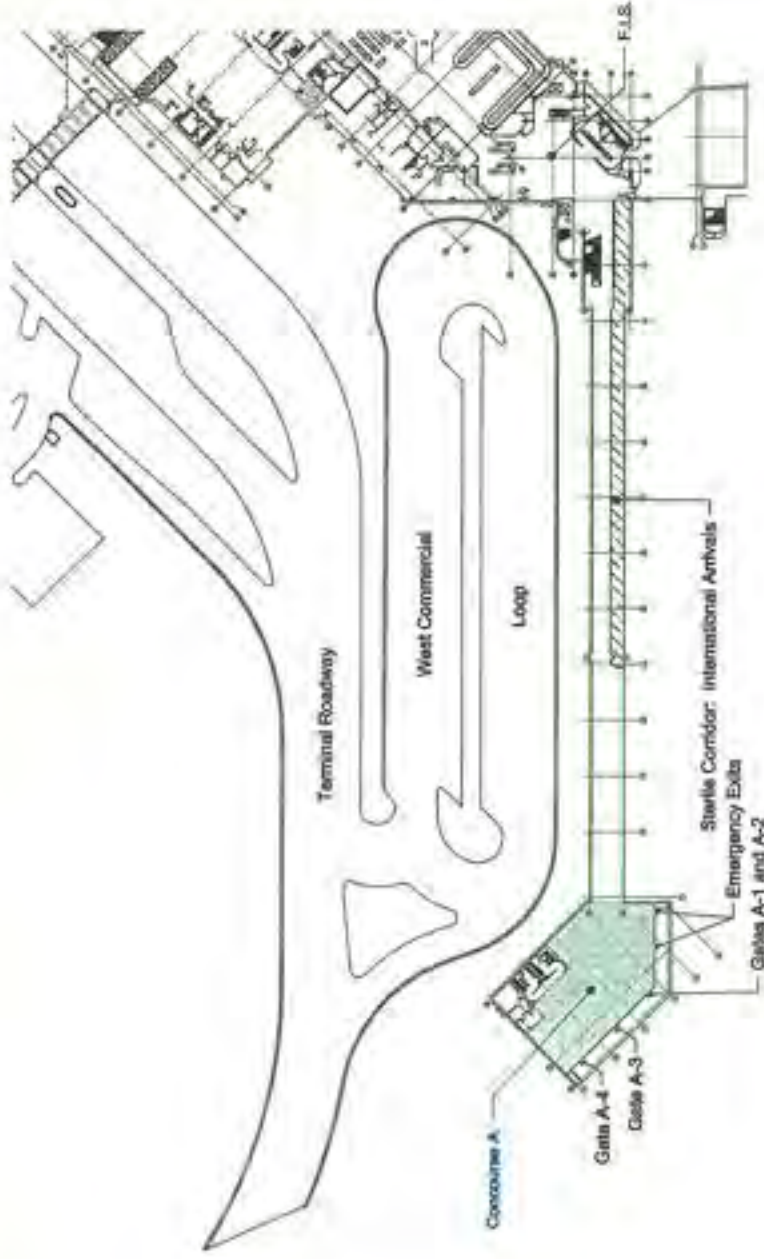


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Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1994
 Prepared By : Ricordo & Associates, Inc., March 1999

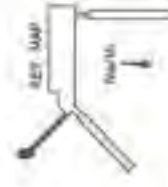
Exhibit II-1.14

Level 3 Main Terminal



Legend:

- Holdrooms
- Staircase Corridor
- Building Outline
- Gate A-1
- Gate A-2
- Gate A-3
- Gate A-4
- Occupant/Tenant



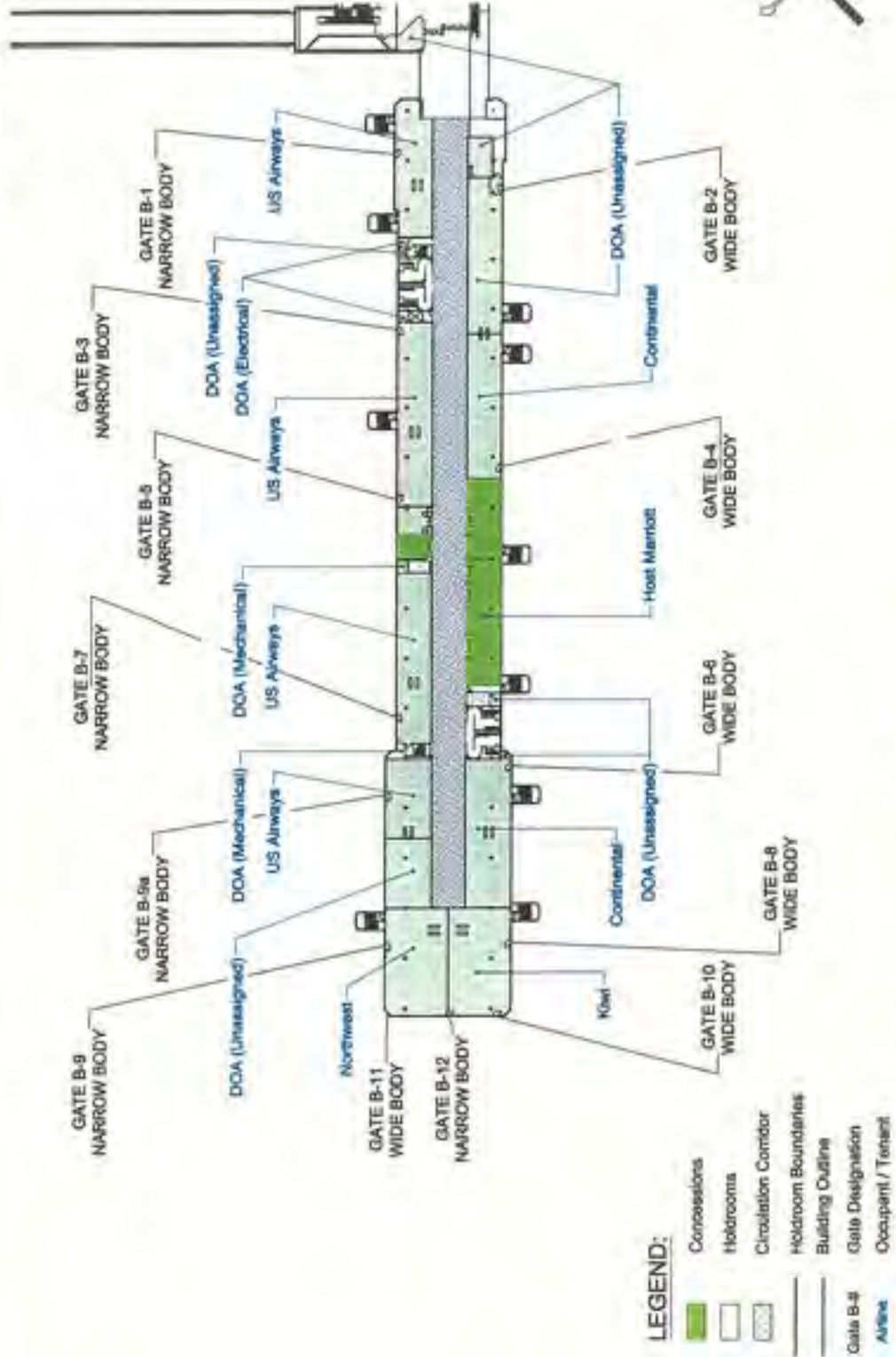
Source : Terminal Lease Drawings, Palm Beach International Airport, May 1994
 Prepared By : Ricoondo & Associates, Inc., March 1999

Exhibit II-1.15



Level 1

Concourse A



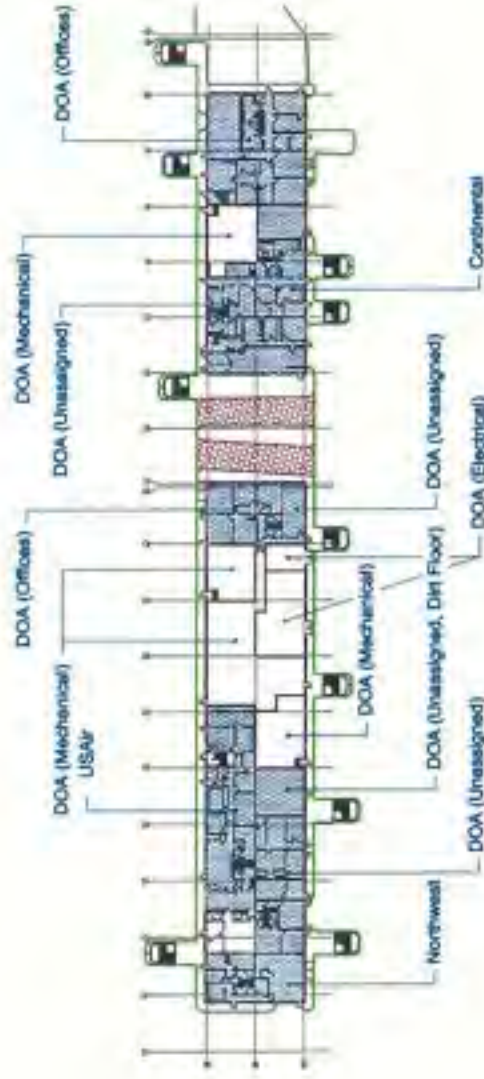
Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1994
 Prepared By : Ricordo & Associates, Inc., March 1999

Exhibit II-1.16

0 120 ft. north

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**Level 2
 Concourse B**



Legend:

- Baggage Services and Airline/Tenant Offices
- Tug Drives
- Building Outline
- Airline
- Occupant/Tenant

Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1994
 Prepared By : Ricondo & Associates, Inc., March 1999



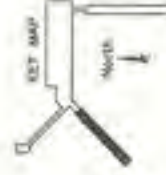
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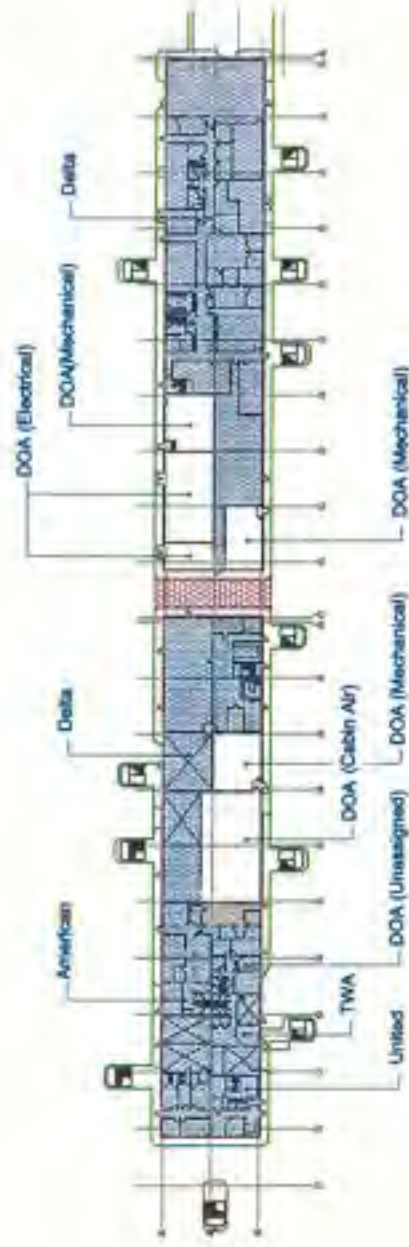
Strategic Master Plan Study

Exhibit II-1.18

**Level 1
 Concourse B**

October 2000





Legend:

- Baggage Services and Airline/Tenant Offices
- Tug Drives
- Building Outline
- Airline Occupant

Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1994
 Prepared By : Ricondo & Associates, Inc., March 1999



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Strategic Master Plan Study

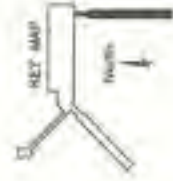
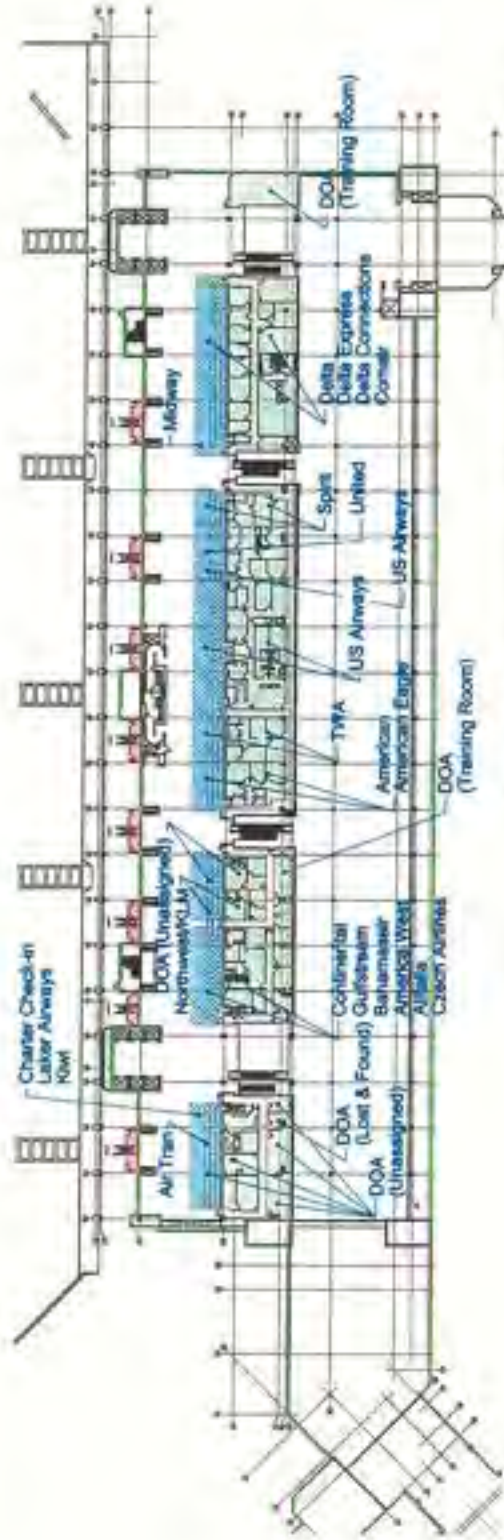


Exhibit II-1.19

**Level 1
Concourse C**

October 2000



Legend:

- Ticket Counter
- Ticket Offices & Upper Level Offices
- Building Outline
- Airline
- Occupant/Tenant



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TICKET COUNTER POSITIONS	
AIRLINE	
Air Train	2
KLM	2
Northwest/KLM	6
Continental	11
American/American Eagle	8
TWA	6
US Airways/US Airways Express	15
United	4
Air Canada	2
Spit	2
Delta	15
Midway	2
Laker Air	1
Charter Check-in	1

Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1994; Field Inspections, 1998
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-1.20

**Ticket Counters
Main Terminal - Level 3**

while baggage make-up areas are accessed through conveyor belts leading to the lower level. Airline leases include a 22-foot area in front of the ticket counter for queuing. Table II-1.6 summarizes the airline leasehold space designated for passenger check-in facilities. The spaces identified include ticket counter and queuing areas as well as curbside baggage check-in facilities. Airline ticket counter length is also summarized.

Table II-1.6

Airline Passenger Check-in Facilities

Space	Length (linear ft.)	Area (sq. ft.)
Ticket Counter and Queuing		
AirTran	12.50	275.00
American	34.92	768.24
Continental	61.75	1,358.50
Delta Airlines	114.00	2,508.00
Northwest	32.33	711.26
Trans World	32.25	709.50
United	32.33	711.26
US Airways	90.75	1,996.50
Unassigned	<u>104.92</u>	<u>2,308.24</u>
Total	515.75	11,346.50
Curbside Baggage Check-In ^{1/}		
AirTran		93.28
American		90.64
Continental		144.00
Delta Airlines		192.00
Northwest		93.28
Trans World		89.36
United		96.00
US Airways		376.00
Unassigned		<u>1,065.44</u>
Total		2,240.00

^{1/}Includes facilities to be located on the outer terminal curbfront.

Source: PBIA Airline-Airport Use and Lease Agreements, as of September 1998

PBIA, Landside Master Plan, prepared by HNTB, November 1993

Prepared by: Ricondo & Associates, Inc., October 1998

As of October 1998, Delta, American, Continental, Northwest, TWA, US Airways, Spirit, Laker, KIWI, and United Airlines leased ticket counter and office space from the County directly. Gulfstream and Bahamasair operations are handled by Continental. Similarly, alliance partners of airlines presently leasing space at the Airport are handled by the respective tenant airline. On occasion, charter flights are also handled by some of the tenant airlines. Unassigned ticket counter/office space is presently available at the far west end of the ticket lobby and adjacent to the Northwest ticket counters. Commuter airlines (Bahamasair, Continental Connection, US Airways Express, and American Eagle) perform ticketing operations at podiums placed either in their respective gate areas in Concourse A or in the ticketing lobby.

In addition, operations space such as offices, employee breakrooms, ground servicing, and bag handling equipment storage is located on the lower (ramp) level of Concourses B and C. Such space is currently occupied by Continental, Northwest, and US Airways in Concourse B and American, Delta, TWA, and United in Concourse C.

Baggage make-up areas are located on the first level. The make-up areas are separated from the baggage claim conveyor belts by a common-use tug lane. There is 29,109 square feet of space in the baggage make-up area, which has eight carousel conveyors.

2.1.2.2 Holdrooms and Gates

The 25 active gates in Concourses B and C are designed to be used in conjunction with enclosed loading bridges. The gates are located in a two-level linear pier concourse running northeast-southwest for Concourse B and north-south for Concourse C. Security checkpoints are located at both entrances to Concourses B and C. Gates B1-B12 and C1-C12 are arranged along a double-loaded corridor. Gates are open to the public circulation corridor and are typically paired (a single two-station podium serving each two-gate holdroom). In addition to the airline gate facilities, a number of concession facilities are interspersed throughout Concourses B and C.

Each airline operating at the Airport leases gate areas from Palm Beach County. Alliance partners for the tenant airlines operate from their leasing partner's gate. Four of the 29 gates are currently vacant. These include Gates B-2, B-10, B-9, and C-12. Of the unassigned gates, only Gate B-9 is a narrow body gate. The remaining vacant gates are widebody. Loading bridges are still located at each of the vacant gates and are used for charter and overflow operations.

2.1.2.3 Concession Areas

The Airport's retail program is operated by two master concessionaires. One operates the food and beverage concessions, while the other operates the news, gift, and specialty stores. Approximately 24,164 square feet of space is allocated to food and beverages concessions, which is operated by Host Marriott, and 10,384 square feet is allocated to news, gift, and specialty stores, which is operated by the Paradies Shops.

A majority of the concession space is allocated to a mall located on the second floor of the main terminal, which includes a wide variety of specialty foods, services, and general merchandise shops. The two story high mall extends the entire 650-foot length of the main terminal, with wall surfaces constructed of materials native to the Palm Beach County area as well as with areas of translucent roofing. The ends of the mall connect at the public level of the concourses at the security checkpoints. Elevators and escalators convey passengers to the other levels of the building, while horizontal "people tubes" (skyways) connect the mall to the long term parking in front of the terminal building.

The concessions mall is currently occupied by six food and beverage outlets and four news, gift, and specialty stores. The food and beverage outlets account for approximately 16,847 square feet of the 27,503 square feet of concessions within the mall while the remaining 7,162 square feet of mall concessions space is made up of news, gift, and specialty stores. There is an additional 3,494 square feet of space, which is located on the east side of the mall behind the Au Bon Pain and the Sbarro

Italian stores and is used as a kitchen for food preparation and storage by the food and beverage concessions.

The remaining concessions are located on Concourses B and C. Concourse B has approximately 4,284 square feet of concession space, made up of 2,604 square feet of food and beverage retailers and 1,680 square feet of news, gift, and specialty shops. Concourse C has approximately 1,219 square feet of food and beverage concessions and 1,542 square feet of news, gift, and specialty shops.

2.1.2.4 Public Areas

Public areas in the main terminal building and concourses are generally in good to excellent condition. There is approximately 124,283 square feet of non-secure public space located throughout the passenger terminal facilities. Non-secure public space is defined as circulation areas, including those in the ticketing lobby and bag claim area, and public restrooms.

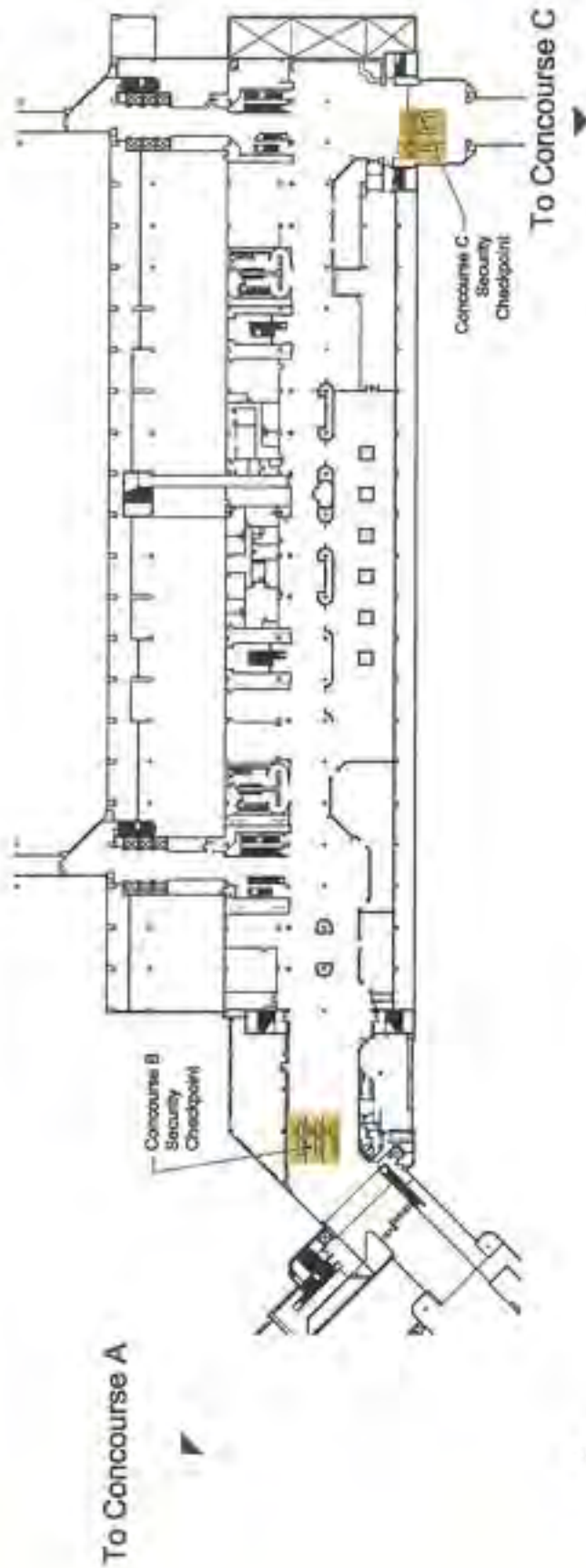
Restrooms are available in all public areas. Paging systems are available throughout the main terminal building and concourses. A construction contract is presently being procured for the installation of a Multi-User Flight Information Display System (MUFIDS). Directional signage and illuminated directory wall panels are placed throughout the main terminal building.

2.1.2.5 Security Areas and FIS Facilities

Passenger security screening checkpoints are located at the entrances to Concourses A, B, and C, as shown in **Exhibit II-1.21**, with three magnetometers and x-ray machines provided at each location. The passenger security screening checkpoint for Concourse B also serves passengers departing on commuter flights from Concourse A. With the exception of airport police, every person, badged or unbadged, must clear the checkpoints when entering the concourses. All aircraft boarding gates are located within the secured concourses. There is no direct access that would allow passengers arriving at one concourse to connect to flights at the other concourse without passing through security, except for passengers arriving through Concourse B and connecting to flights departing from Concourse A and vice versa.

The Federal Inspection Services (FIS) Facility is located on the first level of Main Terminal Building. FIS include U.S. Immigration and Naturalization (INS), U.S. Customs (USCS), U.S. Public Health (PHS), and U.S. Agriculture (APHIS). The approximate processing capacity of the FIS facility is 200 international arriving passengers per hour. Gates in Concourses A and B allow for the sterile transport of international passengers to the FIS facility.

Upon arrival to the FIS area, either through escalators/elevators from the international gates or through the ground level doors off the commuter apron, passengers first claim their baggage from one of the baggage conveyor belts located along the south wall. They then proceed through any of INS processing lanes for passport/visa inspection followed by baggage inspection. Cleared passengers then exit the FIS area into the domestic baggage claim area.



Legend:

 Security Checkpoint

Sources : Terminal Lensa Drawings, Palm Beach International Airport, May 1984
 Prepared By : Ricordo & Associates, Inc. March 1989

0 120 ft. north

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Strategic Master Plan Study

Exhibit II-1.21

Security Check Points

October 2000

2.1.2.6 Terminal Curbfront

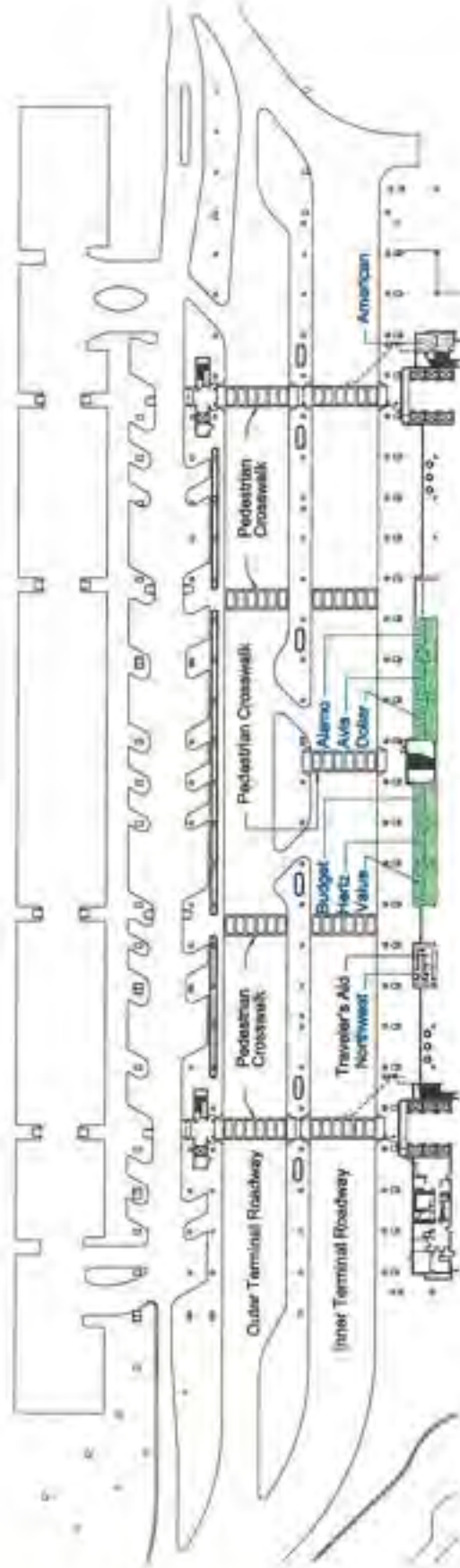
The existing terminal building has two adjacent parallel roadways and related curbs on both the enplaning and the deplaning level. On both levels, the inner roadway is reserved for private vehicular traffic, while the outer roadway is used by commercial vehicles such as rental car shuttles and hotel courtesy vehicles. Taxi and limousine services drop off passengers on the inner roadway of the enplaning level and pick up passengers at special loading areas on each end of the terminal on the deplaning level.

On both levels, the existing inner roadway has approximately 650 linear feet of usable curb length, not including pedestrian crosswalks, and provides three lanes for flow thru traffic. The existing enplaning outer roadway also has approximately 650 linear feet of associated curb, divided into two separate unloading areas. It also provides three lanes for flow-through traffic. There is no delineation of specific curbfront vehicle zones by type at the enplaning level of the terminal building. The deplaning outer roadway has approximately 600 linear feet of associated curb divided into two loading areas.

As previously mentioned, the signatory carriers at the Airport offer curbfront check-in for passengers departing on domestic flights. Curbfront check-in is not available for international flights. These services are provided by airline employed or airline contracted "skycap" personnel at mobile podiums located on the inner curb. In spring 1999, US Airways, Continental, and Delta will also provide curbfront check-in along the enplaning level outer curb during peak travel periods with access to the Main Terminal Building via two new escalators that will connect from the outer curb to the two existing people tubes, or skywalks. Baggage conveyors provide a direct transfer of baggage from the curbfront check-in locations to the baggage make-up areas. **Exhibits II-1.22 and II-1.23** depict the curbfront layout and space utilization for the enplaning and deplaning levels of the main terminal building.

During peak arrival and departure periods, congestion occurs along the inner curb on both levels. Palm Beach County Sheriff's personnel are staged at multiple locations along the curbfront areas in order to control traffic and prevent curbside parking.

A dwell time survey was conducted on Thursday, November 19, 1998, from 6:00 a.m. to 6:00 p.m. The survey recorded the number of vehicles utilizing the curb front of the terminal for both the enplaning and deplaning roadways. The time each vehicle remained parked was also recorded. The results are summarized in **Table II-1.7**.



LEGEND:

- Car Rentals
- Curbside Facilities
- Occupant/Tenant



PB/G0001 1-1_22.dwg

Sources : Stormwater Master Plan for PBIA, Ricordo & Associates, Inc., May 1994
 Prepared By : Ricordo & Associates, Inc., March 1999



Exhibit II-1.22

Deplaning Level Curbfront

Table II-1.7

Vehicular Dwell Time Survey

Curb	Time	Total No. Parked Vehicles	Parking Time (minutes)	Min. Time Parked (minutes)	Max. Time Parked (minutes)	Standard Deviation (minutes)
Arrivals	6:00-7:00	14	2.57			
	9:45-10:45	69	4.61			
	12:00-13:00	35	7.16			
	14:15-15:15	70	4.03			
Total	6:00- 18:00	472	5 min 36 sec	6 sec	63 min 36 sec	7.6
Departures	6:00-7:00	145	1.30			
	9:45-10:45	146	2.61			
	12:00-13:00	165	2.25			
	14:15-15:15	82	2.56			
Total	6:00-18:00	1,416	2 min 24 sec	7 sec.	44 min 26 sec	2.0

Source: Frederic R. Harris, Inc.

Prepared by: Ricondo & Associates, Inc., April 1999

Table II-1.7 indicates the following:

- The number of vehicles observed to be parking at the departure curb was three times higher than the number of vehicles counted at the arrival curb. In fact, during the morning peak between 6:00 a.m. and 8:00 a.m., parking vehicles formed two lanes at the departure terminal. However, the average parking duration at the departure curb was almost half the average parking duration recorded at the arrival curb.
- The longest average parking duration occurred during the mid-day peak period (12:00 p.m. to 1:00 p.m.) at the arrival curb. At the departure curb, the longest average parking duration occurred between 9:45 a.m. and 10:45 a.m.
- The maximum parking time occurred at the arrival curb lasting over one hour, approximately 20 minutes longer than the maximum parking time recorded at the departure curb.

2.1.2.7 Baggage Claim

Baggage claim areas in the main terminal building are considered joint use premises for the airlines. Lighted signs, switched on by the baggage handler, are located over each bag conveyor belt to indicate which airline's flights are being handled. Contracted skycaps are typically available for passengers desiring assistance. Airport-sponsored electronic signs in the baggage claim area provide information on local transportation. Rental car counters are located directly across from baggage carousels in the first level of the main terminal building.

American and Northwest maintain baggage service offices in the baggage claim areas. Passengers of other airlines must return to the main ticket counter for bag service. Commuter carriers do not use the baggage claim facilities.

The baggage claim area comprises 30,895 square feet of space and contains six bag claim stations.

2.1.2.8 Airport Management and Utility Areas

The DOA's Operations Division is centrally located on the north side of the main terminal building's second level. Space presently occupied by the Airport's Maintenance or Operations Division, for either administrative use/office space or storage, comprises approximately 19,666 square feet. Building utility spaces are also dispersed throughout the main terminal building and concourses. Approximately 45,615 square feet are dedicated for either mechanical, electrical, telephone, or other building support systems.

2.1.3 Terminal Roadways and Airport Service Roads

This section presents an inventory of terminal access roadway and other "on-airport" roadways. Specifically, this information includes a summary of available data, field data collection, traffic counts, and preliminary observations concerning potential operational and geometric constraints.

2.1.3.1 Existing Conditions

Field inventories were conducted during November 1998 with the intent of collecting information regarding terminal access roads, "on-airport" roadways, and the "off-airport" transportation network. Each roadway was visually inspected to verify information obtained from aerial photos and record drawings. The type of data includes:

- Roadway utilization
- Traffic patterns
- Number of lanes
- Interconnections with public lanes
- Signalization and signage
- Security requirements, and
- Vertical clearances

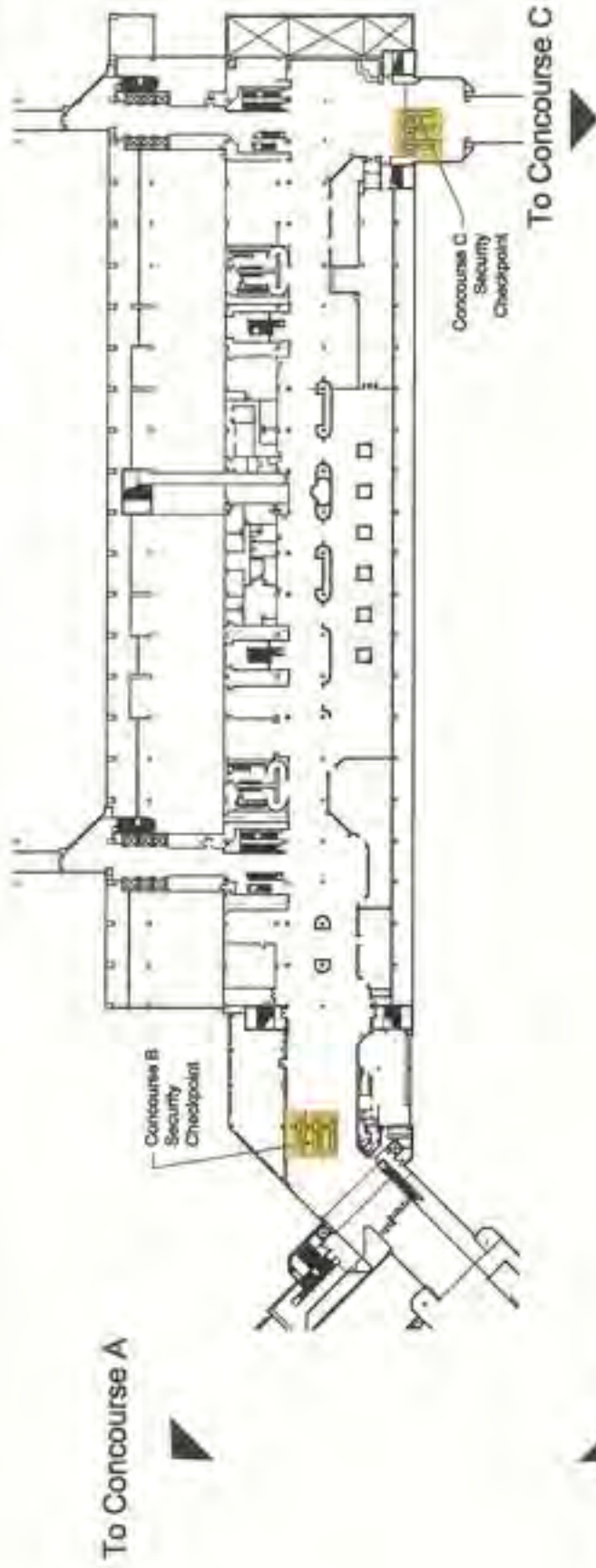
2.1.3.1.1 On-Airport Public Roadway System

A map of the PBI study area is provided in **Exhibit II-1.24**. This exhibit illustrates roadway utilization, number of lanes, main points of interconnection with public lanes, land uses within the PBI, and relevant roads.

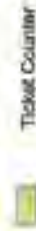
2.1.3.1.2 Number of Lanes

The PBI main internal circulatory road is a one-way loop with a posted speed limit of 35 mph all around the loop. The main entrance is accessed from Australian Avenue. There are two inbound and outbound points located along the main circulatory road in the westbound direction, one connecting at the Florida Mango Road/Belvedere Road intersection and the other at the Congress Avenue/Belvedere Road intersection.

There is another internal road, Perimeter Road, providing access to/from the PBI to Australian Avenue and Southern Boulevard. Perimeter Road is a two-lane circulatory road starting in the west at the Park-&-Ride lot. It runs east and parallel to the main internal road, then south and parallel to Australian Avenue, and then west and parallel to Southern Boulevard. Perimeter Road connects to Australian Avenue at one gated access point and to Southern Boulevard at two access points.



Legend:



Sources : Terminal Lease Drawings, Palm Beach International Airport, May 1994
 Prepared By : Ricondo & Associates, Inc., March 1999



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Strategic Master Plan Study

Exhibit II-1.24

Security Check Points

October 2000

Table II-1.8 provides the number of lanes along PBIA terminal roads within the perimeter of PBIA, which are graphically identified in Exhibit II-1.24.

Table II-1.8

Number of Lanes Along PBIA Terminal Roads

Road	From	To	No. Lanes
PBIA Entrance Eastbound	Australian Blvd.	Rental car exit	2
	Rental car merge	Florida Mango Road	3
	Florida Mango Road	Overpass Bridge	3
	Overpass Bridge		4
	Overpass Bridge	Congress Avenue	3
	Congress Avenue	Parking Garage Entrance	3
PBIA Entrance Westbound	Terminal Entrance	Terminal Exit	4
	Terminal Exit	Parking Garage Exit	4
	Parking Garage Exit	Overpass Bridge	5
	Overpass Bridge	Overpass Bridge	4
	Overpass Bridge	Rental car exit	4
	Rental car exit	Australian Avenue	2
Perimeter Road	Park-&-Ride lot	Australian Avenue	1
	PBIA Main Entrance	Southern Boulevard	1
	Southern Boulevard	East of Kirk Road	1
Rental Car access road	Rental car entrance	Rental car exit	2
Secondary access roads	Florida Mango Road	Park-&-Ride lot	1
	Main road WB Exit Ramp	Congress Avenue	1

Source: Frederic R. Harris, Inc.

Prepared by: Ricondo & Associates, Inc., April 1999

2.1.3.1.3 Traffic Counts

Traffic data was obtained from the Palm Beach County Traffic Division at fourteen public access points to/from the PBIA. The location of these points are described below:

- Location # 1: Belvedere Road and 13th Street
- Location # 2: Belvedere Road and 8th Street
- Location # 3: Belvedere Road and Congress Avenue
- Location # 4: Belvedere Road and PBIA Air Cargo
- Location # 5: Belvedere Road and Florida Mango
- Location # 6: Australian Avenue and PBIA Entrance
- Location # 7: Australian Avenue and Maintenance Access
- Location # 8: Southern Boulevard and Perimeter Road Access
- Location # 9: Southern Boulevard and Perimeter Road Access
- Location # 10: Southern Boulevard and Perimeter Road Access
- Location # 11: Southern Boulevard and Perimeter Road Access
- Location # 12: Southern Boulevard and Kirk Road
- Location # 13: Southern Boulevard and Perimeter Road Access
- Location # 14: Employee Parking Lot

This information is summarized in Table II-1.9 for the morning and afternoon peak periods.

Table I-1.9

Morning and Afternoon Peak Periods Inbound and Outbound Volumes

Location Number	Vehicles					
	Morning Peak Hour			Afternoon Peak Hour		
	IN	OUT	TOTAL	IN	OUT	TOTAL
1	66	55	121	64	70	134
2	82	85	167	52	104	156
3	272	118	390	274	196	470
4	72	43	115	60	23	83
5	139	148	287	130	183	313
6	681	488	1169	561	633	1194
7	47	37	84	46	79	125
8	45	15	60	13	38	51
9	69	6	75	26	35	61
10	63	28	91	13	59	72
11	16	27	43	5	27	32
12	19	19	38	42	48	90
13	7	12	19	4	16	20
14	112	16	128	32	74	106

Source: Frederic R. Harris, Inc.

Prepared by: Ricondo & Associates, Inc., April 1999

Traffic volume counts were conducted at 13 locations along the airport roadways from Tuesday, November 17, 1998 through Thursday, November 19, 1998. These counts are summarized in **Table II-1.10** and in **Exhibit II-1.25**. The count locations were selected to provide coverage on the main roadways and to calculate traffic on secondary roadways and exit/entrance ramps. The traffic counts provide an indication of the Average Daily Traffic (ADT), peak hour periods, and roadway utilization. The following observations were made from the traffic count results:

- 6,700 vehicles-per-day (vpd) enter PBIA from Australian Avenue, while 8,000 vpd exit the airport.
- 2,700 vpd use the "return to terminal" road increasing the ADT in the westbound direction by approximately 29 percent.
- Westbound traffic along the main PBIA road increases by 40 percent just west of Congress Avenue. The Belvedere Road/Congress Avenue intersection accounts for 28 percent of this increase. The remaining 12 percent is generated by Florida Mango Road and/or the central rental car facility.
- Of the traffic entering the terminal area, 13 percent (1,800 vpd) are destined for the short- and long-term parking garage, 50 percent (6,800 vpd) for the departure curb, and 37 percent (5,000) for the arrival curb.
- A total of 11,900 vpd were counted leaving the airport in the eastbound direction.
- 3,650 vpd exited the short- and long-term parking garage.

Table II-1.10

PBIA 24-Hour Traffic Counts

Location	Peak Period		11/17/98	11/18/98	11/19/98	Average
1	AM	9:45-10:45	673	660	757	697
	MD	12:00-1:00	422	477	525	475
	PM	14:45-15:45	499	420	521	480
	24-hr		6435	6342	7290	6689
2	AM	11:00-12:00	1155	1236	1451	1281
	MD	12:00-13:00	832	936	1099	956
	PM	15:00-16:00	923	884	975	927
	24-hr		12811	13188	15151	13717
3	AM	9:45-10:45	774	787	879	813
	MD	12:00-13:00	427	438	490	452
	PM	14:15-15:15	477	494	463	478
	24-hr		6852	6602	7011	6822
4	AM	10:00-11:00	1135	1106	1294	1178
	MD	12:00-13:00	749	893	1036	893
	PM	15:00-16:00	851	814	843	836
	24-hr		11185	11540	12961	11895
5	AM	9:45-10:45	195	211	239	215
	MD	12:00-1:00	161	186	237	195
	PM	14:30-15:30	190	205	174	190
	24-hr		2494	2543	2971	2669
6	AM	10:00-11:00	565	649	796	670
	MD	12:00-13:00	474	618	703	598
	PM	15:15-16:15	648	453	471	524
	24-hr		7246	7704	8920	7957
7 WB	AM	5:00-6:00	97	96	105	99
	MD	12:00-13:00	65	69	79	71
	PM	15:00-16:00	69	50	64	61
	24-hr		1012	992	1078	1027
7 EB	AM	7:15-8:15	111	72	66	83
	MD	12:15-13:15	89	138	94	107
	PM	13:00-14:00	111	130	123	121
	24-hr		1461	1521	1406	1463
8 WB	AM	10:00-11:00	24	47	54	42
	MD	12:00-13:00	38	58		48
	PM	15:00-16:00	47	65	48	53
	24-hr		588	627	647	621
8 EB	AM	10:45-11:45	20	48	33	34
	MD	12:30-13:30	32	29	35	32
	PM	15:00-16:00	29	30	28	29
	24-hr		349	406	383	379
9	AM	11:00-12:00	427	507	503	479
	MD	12:00-13:00	338	396	438	391
	PM	15:00-16:00	345	306	368	340
	24-hr		4851	5009	5474	5111
11	AM	10:45-11:45	23	90	42	52
	MD	12:00-1:00	31	45	48	41
	PM	16:30-17:30	64	29	26	40
	24-hr		406	482	464	451
12	AM	10:45-11:45	43	64	52	53
	MD	12:00-13:00	39	50	65	51
	PM	13:45-14:45	38	51	52	47
	24-hr		551	630	736	639
13 EB	AM	6:15-7:15	18	33	27	26
	MD	12:00-1:00	47	32	53	44
	PM	13:30-14:30	52	44	52	49
	24-hr		517	496	542	518
13 WB	AM	7:45-8:45	61	34	67	54
	MD	12:00-1:00	31	32	43	35
	PM	15:15-16:15	24	33	45	34
	24-hr		536	558	606	567

Source: Frederic R. Harris, Field Observations, February 1999

Prepared By: Ricondo & Associates, Inc. February 1999



Source: Frederic R. Harris, February 1999
 Prepared By: Ricondo & Associates, Inc.

Exhibit II-1.25

North
 Not To Scale

Traffic Counter Locations & Statistics

2.1.3.1.4 Traffic Signalization / Signage

Field inventories revealed that there are no traffic signalized intersections within the airport roadway network. The majority of the intersections and access points are controlled by yield signs and pavement markings indicating merge areas. The speed limit is posted at 35 mph along the main roadway and 15 mph inside the terminal area. Traffic signals exist on the perimeter of the Airport along major roads (i.e., Military Trail, Belvedere Road, Australian Avenue, and Southern Boulevard).

In 1998, a construction contract was awarded for the replacement and addition of landside signage systems along the main entrance road to the Airport between Australian Boulevard and the terminal curbfront. The objective of these improvements is to reduce the overall number of signs in the area and provide color-coded and simplified directional message signs for the public. Completion of this project is anticipated to be in the spring of 1999.

Traffic sign placement and quantity appear to be sufficient. Based on visual inspection, the existing signs meet the Manual of Uniform Traffic Control Devices (MUTCD) standards with a few exceptions. There is a regulatory sign in the southbound direction at the intersection of Belvedere Road and Congress Avenue, that restricts trucks and commercial vehicles over 13 feet from entering the airport. The sign has white letters on a green background, which is typically reserved for roadway guide signs. Regulatory signs should have a color scheme of black letters on a white background.

2.1.3.1.5 Security Requirements

Field inventories revealed only a few areas with security requirements. There is gated access into both the Park and Ride lot that is located at the end of the service road and the employee parking area located northwest of the park and ride lot.

The air cargo area south of Belvedere Road is readily accessible. Upon entering the air cargo roadway from Belvedere Road, there is a double yellow center line directing vehicles to the right (west), which leads to the commercial air cargo area. A left turn leads to a fueling facility. There is no active security preventing passenger vehicles from entering this area.

The perimeter road access to Australian Boulevard, along the east side of the Airport, is gated. This drive is designated for Airport maintenance use. There are other areas with passive security (signs and pavement markings) such as:

- Taxi storage area (west side of the main terminal roadway)
- Emergency vehicle access (east side of the terminal)

2.1.3.1.6 Vertical Clearances

There are two areas at the terminal that dictate vertical clearance requirements. Access to the terminal has a designated maximum height of 15 feet for the upper and lower drives. The parking garage has a maximum vertical clearance of seven feet. There is ground level parking for vehicles exceeding the parking garage limit. Both of the clearance restrictions are clearly designated by signs.

2.1.3.2 Significant Roadway Features

The main Airport circulation roadway provides good access to the terminal as well as short-term parking, long-term parking, rental car areas, and secondary roadways. However, there are a few areas that may become potential constraints as the Airport expands and traffic increases. These issues are described in the following sections and summarized on **Exhibit II-26**. They will be examined in greater detail as part of the Facility Requirements and Alternatives Analysis.

2.1.3.2.1 Geometric Design

The configuration of the Airport entrance at the intersection of Belvedere Road and Congress Avenue is a potential area of concern. The receiving lane into the Airport immediately curves to the west leading to a merge with the Airport circulation roadway. The radius of the curve is 50 feet. The length of the section between Belvedere Road and the merge point on the main circulation roadway is 300 feet. Field observations did not indicate a problem; however, as traffic increases and more vehicles utilize this entrance in the future, a potential geometric problem may arise.

The air cargo access drive south of Belvedere Road has a short receiving lane that leads to a "T"-intersection. The storage area before the "T" is 50 feet and the turning radius is 35 feet. Field observations did not indicate a problem; however, the short storage area could become a potential issue as traffic increases. The turning radius is adequate for passenger vehicles, but heavy vehicles may be constrained negotiating a right turn.

2.1.3.2.2 Potential Operational Issues

The exit of the lower drive of the terminal has three separate lanes merging together. These lanes come from the parking area, shuttle drive, and arrival passenger pick-up drive. Field observations indicate that the merge from the arrival passenger pick-up drive appears short and may conflict with the shuttle drive.

There are several left inside lane merges along the circulation roadway. Upon entering the main terminal roadway, the central rental car area has an inside lane entrance and an exit that merges into the inside lane. The central rental car area has another exit that merges with the inside lane upon leaving the terminal.

2.1.4 Rental Car Facilities

There are a total of six rental car companies that have service counters in the Airport terminal. Three of these companies have ready-car/return and storage/service facilities on Airport property located along the loop road on the northeast side of the Airport. The remainder of the rental car companies have facilities located off-airport. **Table II-1.11** lists the rental car companies and their on-airport facilities. The remote location of the on-airport ready-car and return lots requires shuttle bus transportation to and from the terminal building.



Source: Frederic R. Harris, February 1999
Prepared By: Ricondo & Associates, Inc.

Exhibit II-1.26



Observed On-Airport Roadway Potential Deficiencies

Table II-1.11

Summary of Rental Car Facilities

Company/Address	On/Off Airport	On-Airport Ticket Counter Lease (sq. ft.)	On-Airport Ground Lease (Sq. Ft.)	Building Size (Sq. ft.)
Alamo Rent A Car, Inc.	On/Off	494		---
Avis Rent A Car, Inc.	On	477	348,742	---
Budget Rent A Car, Inc.	On/Off	461	---	---
Dollar Rent A Car, Inc.	On	461	205,346	---
The Hertz Corporation	On	477	73,656	---
National Car Rental System, Inc.	On	494	728,353	4,588
Total Areas		2,86	1,356,097	4,588

Source: PBIA Airline-Airport Use and Lease Agreements as of September 1998
 Prepared by: Ricondo & Associates, Inc., October 1998

2.1.5 Auto Parking Facilities

PBIA maintains nine parking facilities. These facilities include the following: a short-term surface lot, a short-term four-level garage, two long-term surface lots, a long-term four-level garage, three Park and Ride (overflow surface) lots, and an employee surface lot. These are shown in Exhibit II-1.27. Table II-1.12 shows a breakdown of spaces by parking lot and usage.

Table II-1.12

Automobile Parking Spaces

Parking Facility	Employee	Public		
		Short Term	Long Term	Overflow/Park Ride
Premium Surface Lot Parking	---	154	---	---
Main Terminal Short Term Parking	---	1,084	---	---
Long Term Garage	---	---	1,914	---
West Long Term Surface Lot	---	---	200	---
East Long Term Surface Lot	---	---	700	---
Park and Ride (Overflow Lots #1 & #2)	---	---	---	3,542
Overflow Lot #3	---	---	---	382
Employee Lot east of terminal	550	---	---	---
Total	550	1,238	2,814	3,924

Sources: PBIA, Parking Demand & Capacity Analysis, prepared by RS&H, November 1995

PBIA, Landside Master Plan, prepared by HNTB, November 1993

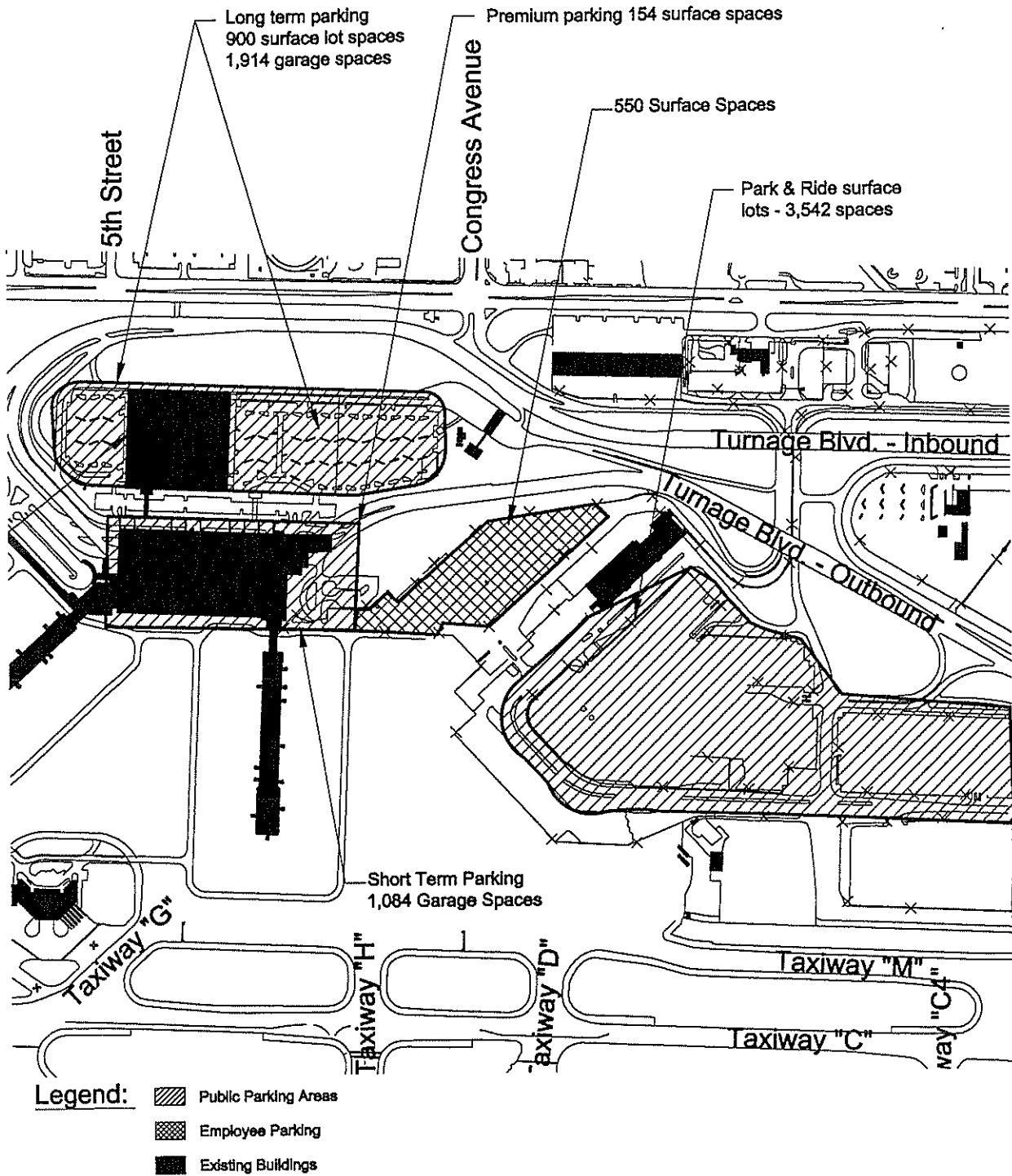
Prepared by: Ricondo & Associates, Inc., 1999

A new 3,600 space per long-term parking garage is proposed east of the existing long-term garage, on the area presently accommodating surface parking spaces. This new facility is currently under design and may be in operation in FY 2001/2002.

Employee parking is located east of the existing terminal on a former aircraft apron. This lot provides 550 spaces and access to the terminal building via partially covered pedestrian routes.

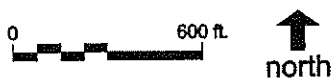
2.1.6 General Aviation/Fixed Base Operators (FBO) Facilities

There are three FBOs located at PBIA. These include Galaxy Aviation, Jet Aviation, and Signature Flight Support. Each FBO leases apron, hangar, and office space from the County. The following sub-sections provide a brief description of the facilities each FBO maintains.



Source : PBIA Airport Layout Plan, Dec. 1996
Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-1.27



Automobile Parking Areas

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2.1.6.1 Galaxy Aviation

Galaxy Aviation has approximately 97,693 square yards of apron space, which they use for approximately 100 tie-down spaces. Of the total tie-down spaces, approximately 70 of the spaces are used for aircraft based at PBIA. The remaining 30 spaces are used for transient aircraft parking.

In addition to apron parking, Galaxy has four aircraft storage hangars totaling 69,228 square feet. **Table II-1.13** lists the size of each hangar. Galaxy Aviation also maintains approximately 10,025 square feet of office space.

2.1.6.2 Jet Aviation

Jet Aviation has approximately 697,430 square feet (77,492 square yards.) of apron space, which they use for approximately 15 tie-down spaces. Five of the tie-down spaces are used for aircraft based at PBIA, while the remainder are used for transient aircraft parking.

In addition to apron parking, Jet Aviation has two aircraft storage hangars totaling 75,257 square feet. **Table II-1.13** lists the size of each hangar. Jet Aviation has plans to add three additional 30,000 square foot hangars. Jet Aviation also has approximately 12,000 square feet of office space, of which approximately 6,000 square feet is used for passenger waiting and processing.

2.1.6.3 Signature Flight Support

Signature Flight Support has approximately 133,117 square yards of apron space. Signature Flight Support maintains approximately 20 tie-down spaces, 15 of which are used for aircraft based at PBIA, while the remainder are used for transient aircraft parking.

In addition to apron parking, Signature Flight Support has four aircraft storage hangars totaling 99,498 square feet and one maintenance hangar totaling 19,838 square feet. **Table II-1.13** lists the size of each hangar. Attached to two of the hangars is approximately 12,772 square feet of office space. Signature Flight Support's current plans call for an additional 31,000 square feet of maintenance hangar with approximately 3,000 square feet of attached office space.

2.1.7 Cargo Facilities

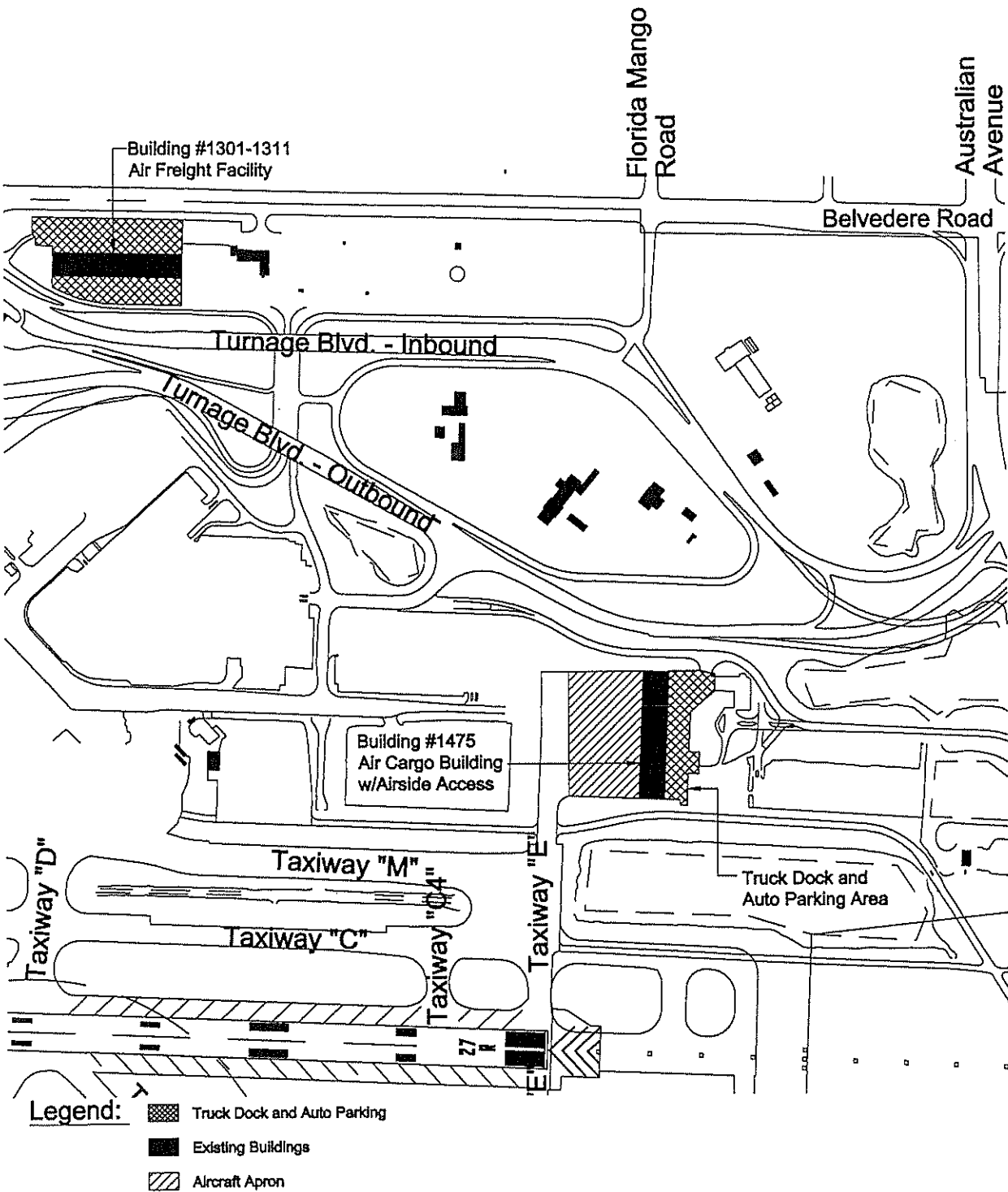
There are two Air Cargo facilities located at PBIA, as shown in **Exhibit II-1.28**. One has airside access with approximately 10,050 square yards of apron for aircraft parking, cargo marshalling, and ground service equipment storage. This facility is referred to as the Air Cargo Facility. Adjacent to this apron is a 40,000-square foot building, which is used to transfer, consolidate, and warehouse inbound and outbound cargo. Tenants in this building include United Parcel Service and the United States Postal Service. There is a 10,000 square foot loading dock and an 85,000-square foot truck docking area adjacent to this building.

The second facility is located in Building #1301-1311 and is referred to as the Air Freight Facility. This building is used by both freight forwarders and airlines. The building does not have any airside access for transferring cargo to and from aircraft. Cargo processed through this facility must be carted to and from the aircraft. This building provides approximately 29,349 square feet of space. **Table II-1.14** lists the tenants currently located in the Air Cargo and Air Freight facilities. **Exhibit II-1.29** shows the space and tenant allocations within the Air Freight Facility. Approximately 7,898

Table II-1.13

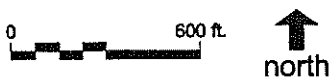
FBO Facilities

FBO	Building No.	Existing		No. of Hangars	Planned	
		Space (Sq. Ft.)	Use		Space	Use
Galaxy Aviation	1625	13,308	Aircraft Storage			
	1626	10,025	Office			
	1627	19,269	Aircraft Storage			
	1628	18,484	Aircraft Storage			
	1629	18,167	Aircraft Storage			
Jet Aviation	1509	45,257	Aircraft Maintenance/Storage	3	30,000	Aircraft Maintenance/Storage
	1515	18,000	Office/Passenger Processing			
	1516	30,000	Aircraft Maintenance/Storage			
Signature Flight Support	1500	6,233	Office attached to 1500A	1	31,000	Aircraft Maintenance
	1500A	33,378	Aircraft Storage	1	3,000	Office attached to new hangar
	1500C	19,838	Aircraft Maintenance			
	1500D	34,415	Aircraft Storage			
	1631	16,715	Aircraft Storage			
	1632	14,990	Office attached to 1633			
	1633	6,539	Aircraft Storage			



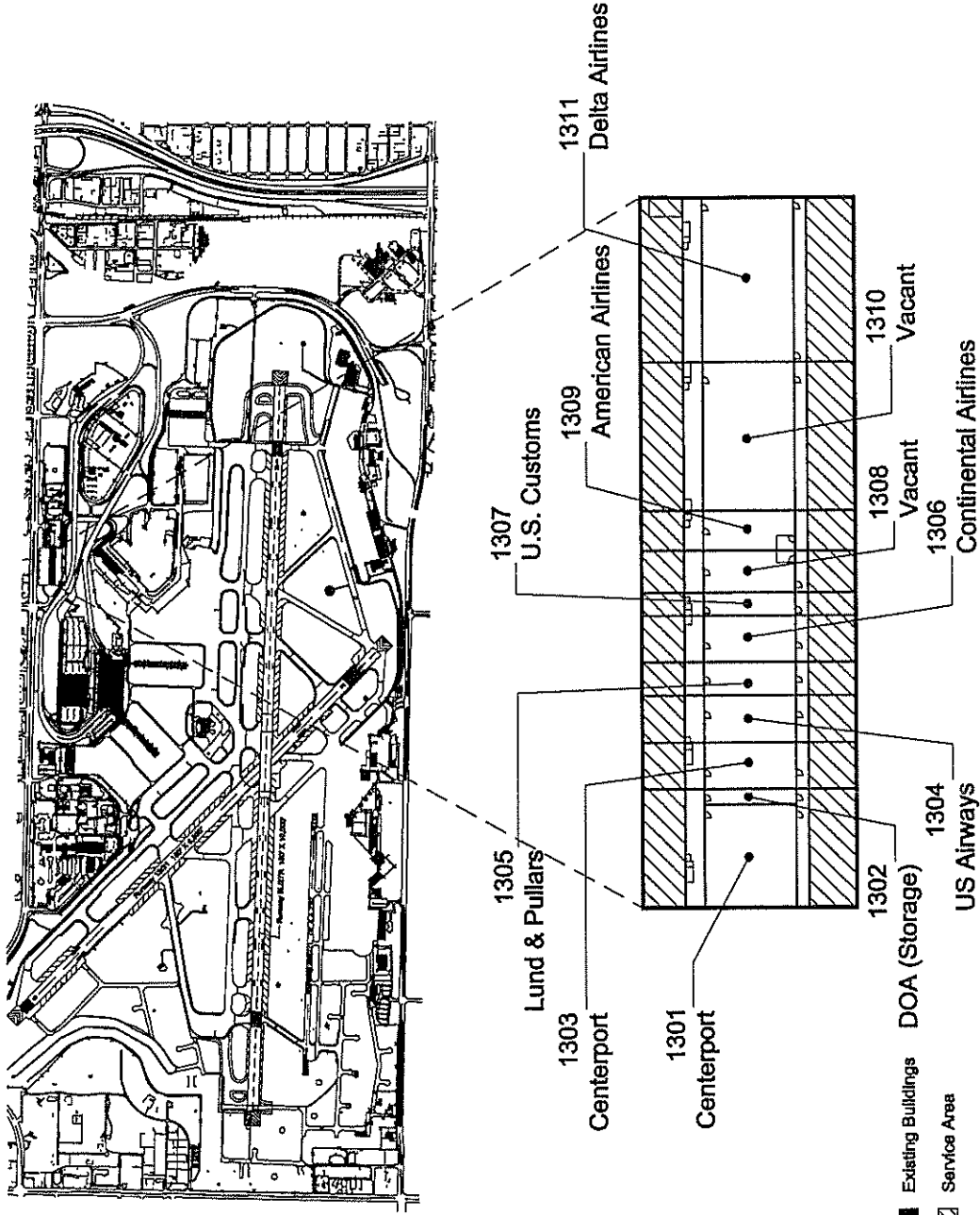
Source : PBIA Airport Layout Plan, Dec. 1996
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-1.28



Cargo Facilities

PBIG0001 I-1_28.dwg



Legend:

- Existing Buildings
- Service Area

Sources : Airport Management Records
Prepared By : Ricondo & Associates, Inc.

N.T.S.



Air Freight Facility (Buildings 1301 - 1310) Leaseholds

Exhibit II-1.29

square feet of interior space is unused, while 943 square feet of space is used by the Airport for storage.

Table II-1.14

Cargo Facility Leaseholds

	Tenant Building	Unit	Interior Space (sq. ft.)	Dock Space (sq. ft.)	Thru-Way Ramp (sq. ft.)	Equipment Staging (sq. ft.)	Total Area (sq. ft.)
Air Freight Facility							
Centerport	1300	1301	4,870	1,019	-	-	5,889
DOA (Storage)	1300	1302	943	203	-	-	1,146
Centerport	1300	1303	1,895	400	-	-	2,295
US Airways	1300	1304	1,901	401	-	-	2,302
Lund & Pullara	1300	1305	1,417	301	-	-	1,718
Continental Airlines	1300	1306	1,901	401	-	-	2,302
U.S. Customs Service	1300	1307	245	-	-	-	245
Vacant	1300	1308	1,586	357	-	-	1,943
American Airlines	1300	1309	1,485	344	-	-	1,829
Vacant	1300	1310	6,312	1,313	-	-	7,625
Delta Airlines	1300	1311	6,794	1,416	-	-	8,210
Facility Total			29,349	6,155	-	-	35,504
Air Cargo Facility ¹							
United Parcel Service	1475	A	6,000	1,500	4,500	13,200	25,200
U.S. Postal Service	1475	B	14,000	3,500	10,500	-	28,000
Vacant	-		20,000	5,000	70,000	-	95,000
Facility Total			40,000	10,000	85,000	13,200	148,200

^{1/} Note: Air Cargo Facility also includes approximately 10,050 square yards of aircraft apron.

Source: Airport Management Records
Prepared by: Ricondo & Associates, Inc., October 1998

2.1.8 Airport Support Facilities

Airport support facilities includes all of the ancillary services such as Airport Rescue and Fire Fighting (ARFF), airport maintenance facilities, FAA facilities, electrical vaults, and fuel facilities. Also included in this section is the Town of Golfview property.

2.1.8.1 Airport Rescue and Fire Fighting (ARFF) Facilities

The Airport has one ARFF station located near the intersection of Taxiway C and Taxiway G. The station has a "D" ARFF index, with a response time of 2.4 minutes to the midpoint of the furthest runway. The facility is staffed by 36 employees, 11 people per shift. The ARFF building space utilization is summarized in **Table II-1.15**. The ARFF unit has seven fire fighting vehicles, four command vehicles/trailers, four administrative vehicles, one emergency medical response vehicle, and one electrical generator. An additional crash truck and a disaster supply truck were added in 1999. The building is currently at capacity for vehicle storage. The addition of the new vehicles will require either expansion of the existing facility or outside storage of some vehicles.

Table II-1.15

ARFF Building Space Utilization

<u>Functional Area</u>	<u>Space (Sq. Ft.)</u>
Office	1,007
Storage	852
Toilet	734
Corridor	779
Vehicle Bays	8,320
First Aid	220
Exercise	298
Training	600
Equip./Gen	196
Service	1,483
Alert	323
Bunk room	1,003
Day Room	969
Total	16,784

Source: Crash/Fire/Rescue Station As-Built Drawing, July 3, 1979, RS&H
 Ricondo & Associates, Inc. Analysis
 Prepared by: Ricondo & Associates, Inc., 1999

2.1.8.2 Airport Administration and Maintenance Facilities

The Maintenance Division is composed of the Terminal Maintenance Division and the Airside/Landside Site Maintenance Division. Both of these are further divided into functional groups and report to the Director of Maintenance and Operations. The various maintenance operations are conducted in several facilities located throughout the Airport. The storage requirements for the numerous maintenance work groups are greater than the storage space available at each of the existing maintenance facilities. Therefore, the Maintenance Division's storage needs are satisfied through the use of vacant facilities that are located within the airport's property. The DOA has undertaken a project to consolidate all of the maintenance storage requirements into one facility, which will act as a base of operations for all maintenance functions.

The airport maintenance compound's proposed location is west of the passenger terminal apron. This site is currently used, in part, by the Airside/Landside site Maintenance Division for the storage of its ground maintenance equipment and the stockpiling of organic material. Building G, the base of operations for the Airside/Landside Site Maintenance Division, is also situated on the site along with a few small storage sheds. **Exhibit II-1.30** depicts the maintenance compound site.

Current plans for the compound site include a new administration building with shops and equipment storage, an additional warehouse building with chemical and heavy storage facilities, and designated heavy and light equipment outdoor storage areas. The site will also include expanded public and County only automobile parking and two detention areas.

2.1.8.3 Electrical Vaults

The electrical vault is located approximately 370 feet north of the Taxiway C centerline and 725 feet west of the Taxiway F centerline. The current Airport Layout Plan (ALP) shows a future relocation of the electrical vault to a site approximately 250 feet northeast of its current position.

2.1.8.4 Fueling Facilities

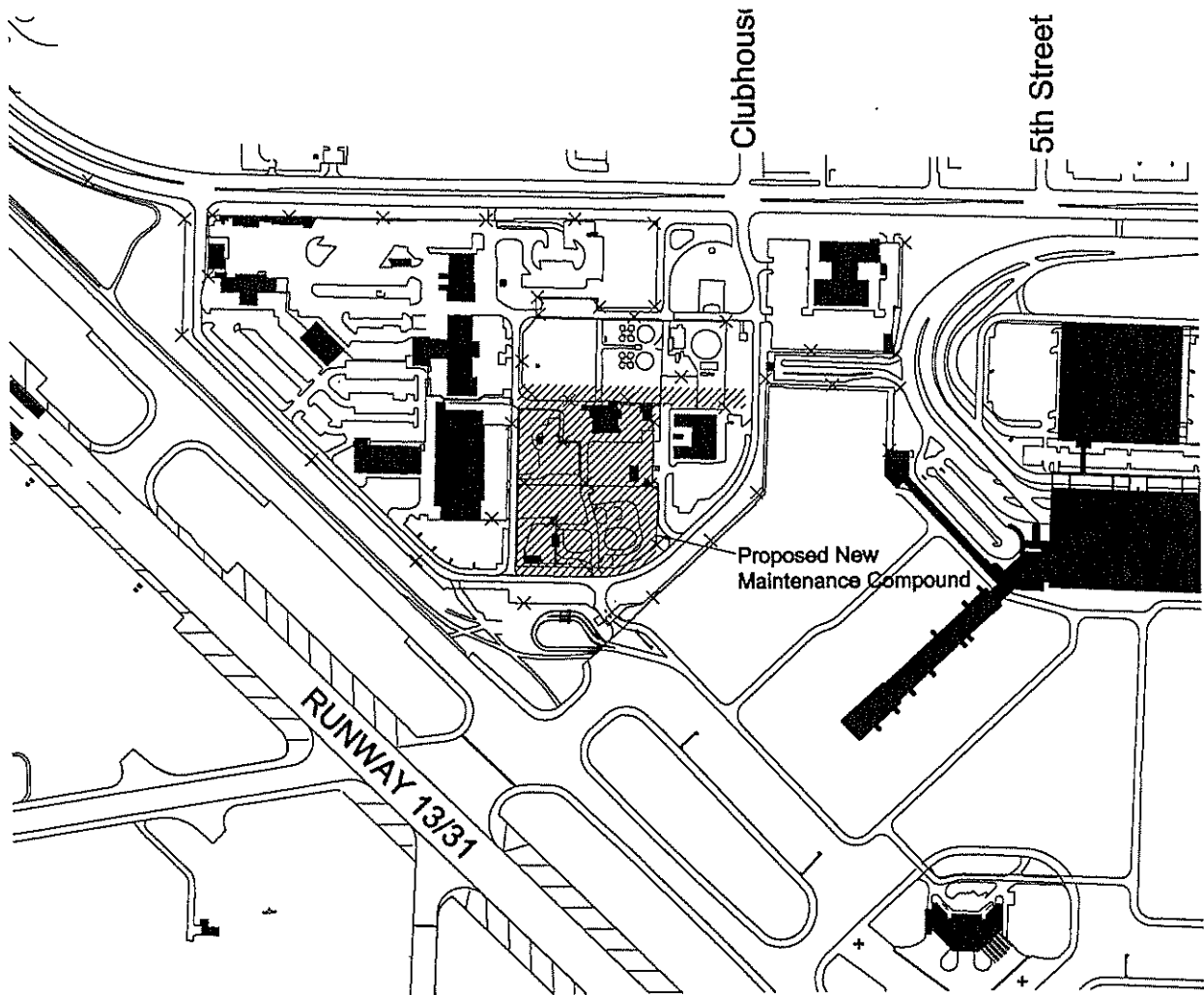
The fuel storage facilities for the airport are divided up among four operators including Aircraft Services International, Inc. (ASII), Galaxy Aviation, Jet Aviation, and Signature Flight Support. **Table II-1.16** lists the fuel storage tanks located on the Airport. ASII currently has a total fuel capacity of approximately one million gallons of jet fuel, which includes approximately 700,000 gallons of capacity formerly operated by Delta Air Lines. The ASII fuel storage tanks are located in the Airport's fuel farm, which encompasses a 70,710 square foot-area along the inbound lane of the Airport's entrance roadway, as shown in **Exhibit II-1.31**.

The fuel tanks owned by Galaxy Aviation, Jet Aviation, and Signature Flight Support are located adjacent to their FBO facilities. **Table II-1.16** lists the number of fuel tanks each FBO maintains as well as their total fuel capacity. **Exhibit II-1.32** shows the location of the fuel storage tanks for each FBO. Each FBO maintains a fleet of fuel trucks, which are used to dispense fuel into aircraft.

2.1.8.5 Town of Golfview Property

The Town of Golfview is located on the west side of the Airport, between the approach ends of Runways 13 and 9L, as shown in **Exhibit II-1.33**. In 1990, the Town of Golfview was offered for sale by the property owners in Golfview. While some inquiries were made about the potential purchase of the town, it did not sell while listed on the open market. Negotiations between the Town of Golfview and Palm Beach County resulted in an agreement that was approved by the Board of County Commissioners in 1997.

The acquisition of the town involves 53 fee parcels owned by members of the Golfview Property Owners Association (GPOA) and seven parcels owned by Non-GPOA individuals. The GPOA parcels were purchased in one transaction, while the Non-GPOA parcels are being handled on an individual basis. Acquisition of the GPOA property was completed in June of 1998.



Legend:  Proposed New Maintenance Compound Site
 Existing Buildings

Source : PBIA Airport Layout Plan, Dec. 1996; New Maintenance Compound Project Book
Prepared By : Ricondo & Associates, Inc., November, 1998

Exhibit II-1.30

0 600 ft.



Maintenance Compound

PBIG0001 I-1_30.dwg

Strategic Master Plan Study

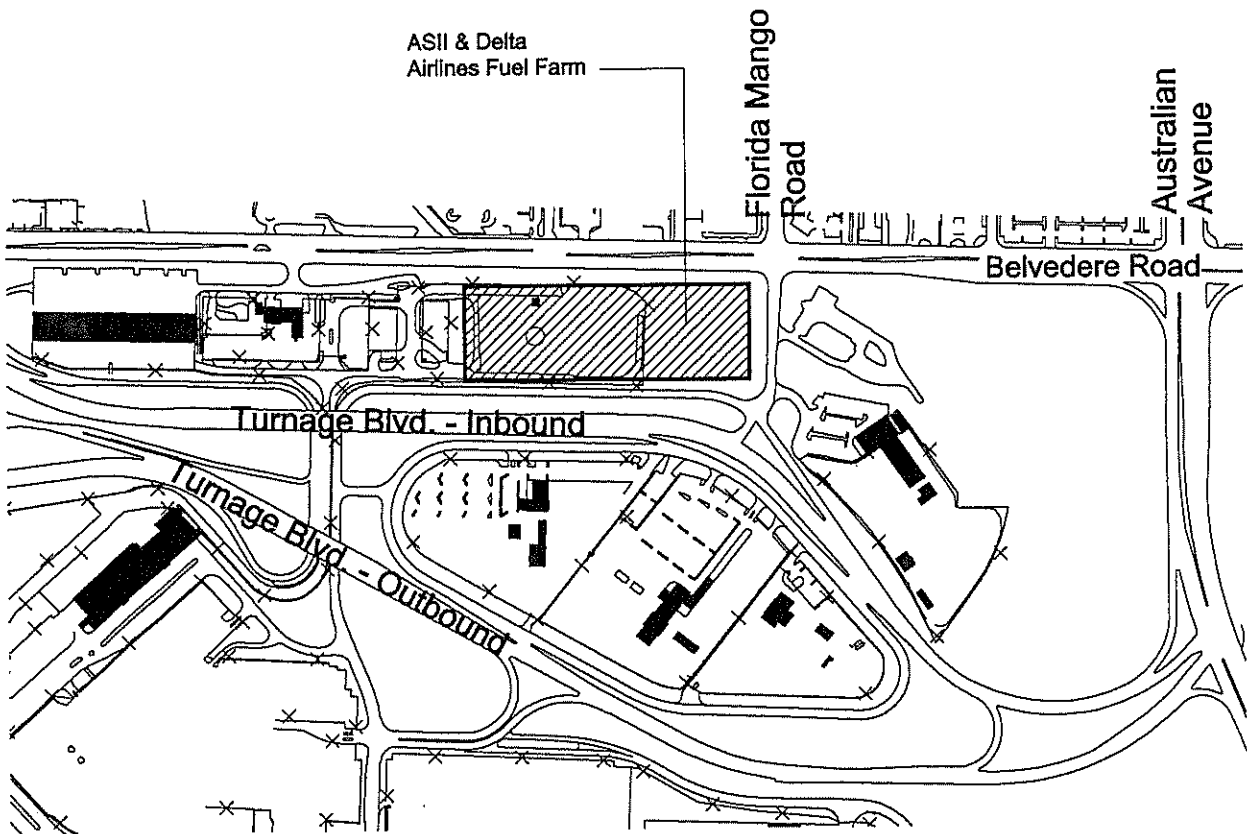
October 2000

Table II-1.16

Existing Fueling Facilities

Fuel Type	Owner	No. of Tanks	Tank Size	Total Capacity	Installed
			(Gallons)	(Gallons)	
AVGas	Galaxy Aviation	0	0	0	
	Jet Aviation	1	12,000	12,000	
	Signature Flight Support	1	15,000	15,000	
	Total AVGas	2		27,000	
Jet A	ASII	6	20,000		
	ASII	6	30,000		
	ASII (Delta Airlines)	2	350,000		
	Galaxy Aviation	0	0	120,000	1960s
	Jet Aviation	1	30,000	180,000	1960s
	Signature Flight Support	1	100,000	100,000	1970s
	Total Jet A	16		1,130,000	

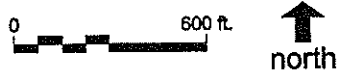
Source: Fixed Base Operator Survey, Ricondo & Associates, Inc., November 1998
 Prepared by: Ricondo & Associates, Inc., 1999



Legend: ■ Existing Buildings
▨ Fueling Facility

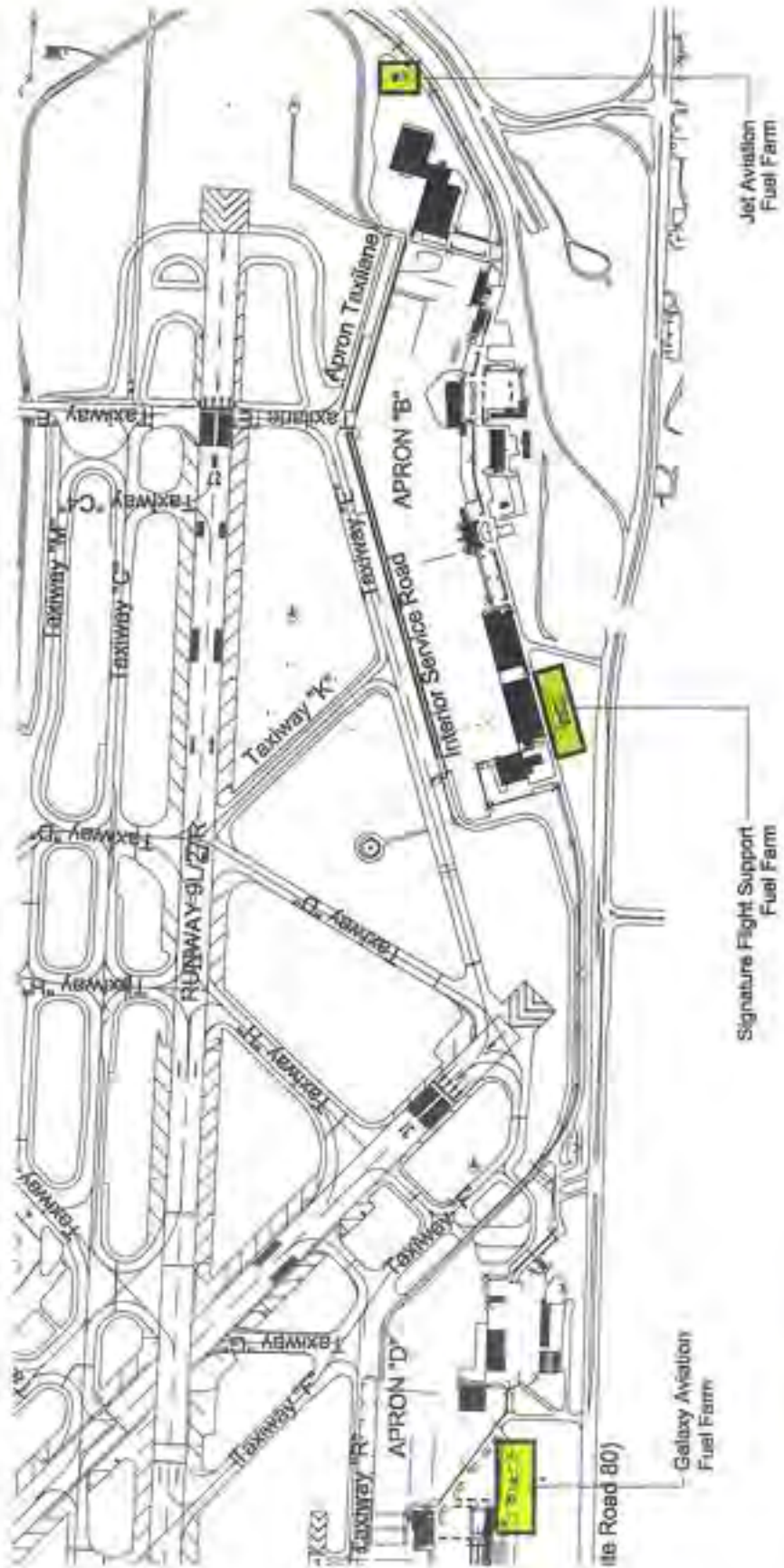
Source : Airport Management Records, May, 1994
Prepared By : Ricondo & Associates, Inc., January, 1999

Exhibit II-1.31



ASII Fuel Farm

PBIG0001 I-1_31.dwg



Legend: ■ Existing Buildings
■ Fuel Farms

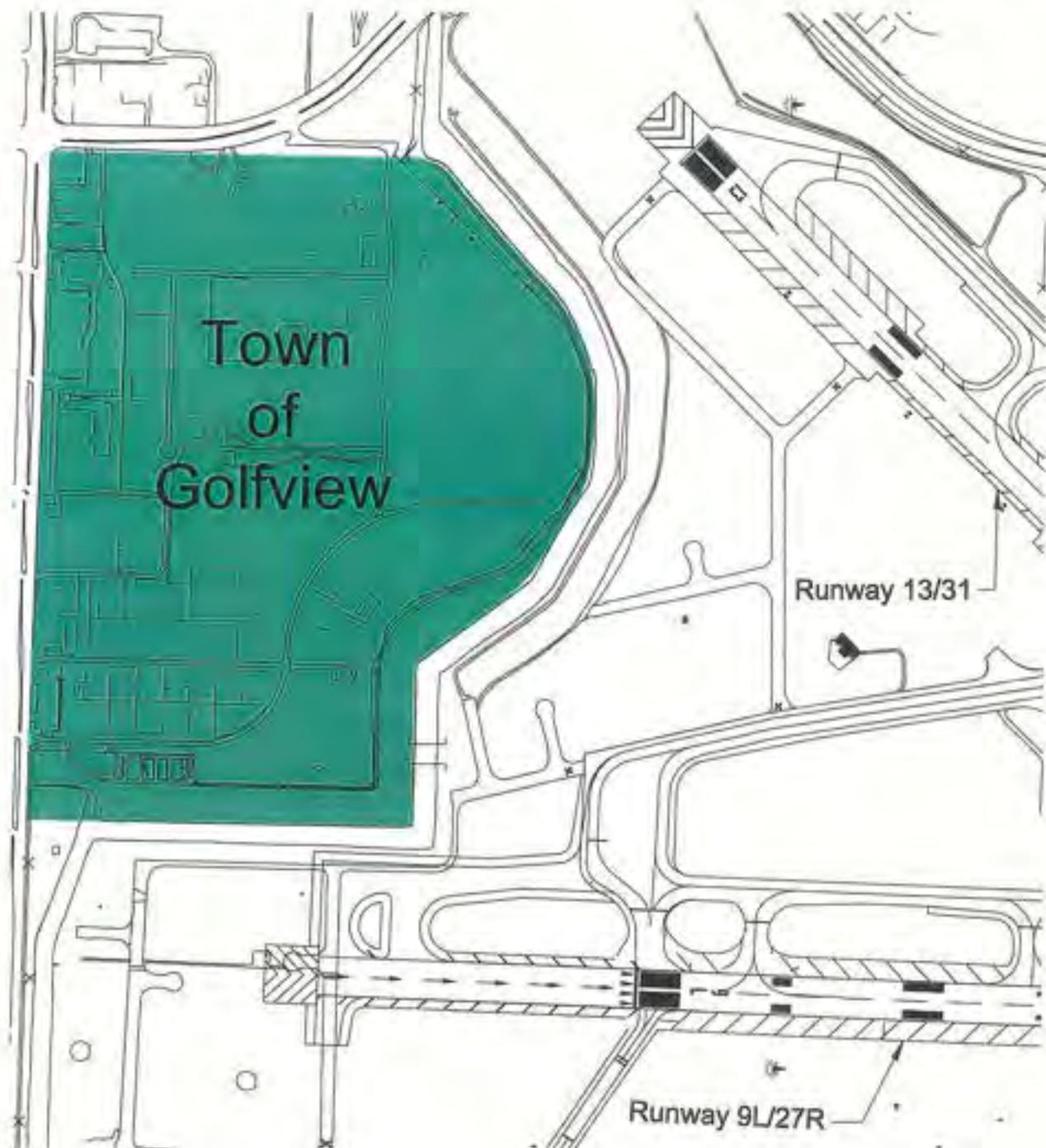
Source : Airport Management Records, November 1998
Prepared By : Ricordo & Associates, Inc., January 28 1999



PB00001 I-1_32.dwg

Exhibit II-1.32

FBO Fuel Farms



Legend: ■ Existing Buildings

Source : PBIA Airport Layout Plan, Dec. 1996
Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-1.33

0 600 ft.



PB1G0001 I-1_33.dwg

Town of Golfview

2.2 Off-Airport Facilities

2.2.1 Off-Airport Roadways and Planned Roadway Improvements

2.2.1.1 Field Inventory

PBIA is located outside the municipal limits of West Palm Beach in an unincorporated area of Palm Beach County administered by the Palm Beach County Board of County Commissioners. PBIA is bordered by Australian Avenue to the east, Belvedere Road to the north, Military Trail to the west and Southern Boulevard to the south. Access to passenger terminal facilities is via the major entrance road (PBIA Entrance Road) off of Australian Boulevard between Belvedere Road and Southern Boulevard. An inventory of the main roads serving PBIA are presented in Table II-2.1.

Table II-2.1

Inventory of PBIA Off-Airport Roadways

Road	From	To	Type of Road	Speed Limit
Australian Ave.	Belvedere Rd	PBIA Entrance	3LD	45 mph
	PBIA Entrance	Via I-95	4LD	45 mph
	Via I-95	Southern Blvd.	One way	45 mph
Southern Blvd.	Congress Avenue	Military Trail	4LD	45 mph
Military Trail	Southern Blvd.	Belvedere Rd.	6LD	45 mph
Belvedere Rd.	Military Trail	Australian Blvd.	6LD	45 mph

Notes: 3LD = 3 lanes divided
4LD = 4 lanes divided
6LD = 6 lanes divided

Source: Frederic R. Harris, Inc., 1999

Prepared by: Ricondo & Associates, Inc., 1999

The lane configuration of the main signalized intersections serving the PBIA is summarized in Table II-2.2. Traffic signal operation characteristics for these intersections are summarized in Table II-2.3.

Table II-2.2

Existing Lane Configuration of Main Intersections at PBIA

Road	Location	Number of Lanes Approaching Intersection											
		Northbound			Southbound			Eastbound			Westbound		
		L	T	R	L	T	R	L	T	R	L	T	R
Military Trail @	Southern Blvd.	1	3	S	1	3	S	2	2	S	2	2	S
	Belvedere Rd.	1	3	S	1	3	1	2	2	1	2	2	1
Belvedere Rd. @	Congress Ave.	1	1	F	3	SL	1	1	3	1	1	2	F
	5 th Street	-	-	-	1	-	1	1	3	-	1	3	S
	Florida Mango	1	1	S	1	1	1	1	3	S	1	3	S
	Australian Ave.	2	3	F	1	3	2	2	3	1	2	3	1
Australian Ave @	PBIA Entrance	2	3	1	1	3	F	2	-	F	-	-	-
Southern Blvd. @	Congress Ave.	1	-	2F	-	-	-	-	2	F	2	2F	-
	Kirk Road	S	1	1	S	1	1	1	2	S	1	2	1

S= shared lane SL= shared w/left turns F= free turn L= left T= through R= right

Source: Frederic R. Harris, Inc., 1999

Prepared by: Ricondo & Associates, Inc., 1999

Table II-2.3

Summary of Traffic Signal Operations of Signalized Intersections at PBIA

Road	Location	Left Turn Operation	Overlap Phase	Pedestrian Signals
<i>Military Trail</i>	Southern Blvd.	Protected only		Present at all approaches
	Belvedere Rd.	Protected only, Lead/Lag	Right Turn	Present at all approaches
<i>Belvedere Rd.</i>	Congress Ave.	Split Phase	SB Right turn	Present at all approaches
	5 th Street	EBLT Permitted		No pedestrian signals
	Florida Mango Rd.	EB/WB: Prot & Perm		EB & NB Pedestrian signal
		NB/SB: Permitted		
<i>Australian Ave</i>	Australian Ave.	Protected only		Present at all approaches
	PBIA Entrance	Protected only		No pedestrian signal
<i>Southern Blvd</i>	Congress Ave.	LT protected only		No pedestrian signal
	Kirk Road	WB: Protected-Permitted	NB Right turn	
		EB: Permitted only		
		SB: Permitted		

Source: Frederic R. Harris, Inc., 1999

Prepared by: Ricondo & Associates, Inc., 1999

For comparison purposes, the Year 2000 total traffic forecast by the PBIA Development of Regional Impact (DRI) is included in **Table II-2.4**. The compound growth rate was obtained by using the 1997 ADT and the 2000 PBIA DRI Total Average Daily Traffic (ADT). As shown in Table II-2.4, the computed growth rates indicate that at the time of the DRI (1984), a much higher volume of traffic was expected along Southern Boulevard, Belvedere Road, and Australian Avenue. It was expected that the PBIA would generate higher traffic volumes, thereby straining the intersections of Australian Avenue at Turnage Road and Australian Avenue at Belvedere Road. However, the ADT for I-95 has exceeded the expectation of the DRI.

2.2.1.2 Traffic Counts

Twenty-four hour traffic counts and turning movement counts (TMC) for major intersections and roads surrounding the PBIA were provided by the Palm Beach County Traffic Engineering Division.

Table II-2.4 summarizes approach volumes for the morning (a.m.) and afternoon (p.m.) peak periods as well as 24-hour daily totals.

The Year 2000 improvements recommended in the PBIA DRI included the following:

- A grade separated intersection at Turnage Boulevard and Australian Avenue
- An urban interchange at Belvedere Road and Australian Avenue, and
- The widening of Belvedere Road to six lanes from I-95 to Congress Avenue

Table II-2.5 summarizes turning movement counts performed at major intersections during the mid-day and afternoon peak periods.

Table II-2.4
Traffic Counts

Road	Location	Date	Direction	AM	PM	ADT	PBIA DRI-2000	
							ADT	Growth/yr
Southern Blvd.	E of I-95	1/8/97	EB	1,260	1,081	13,854	3,350	10.00%
			WB	1,100	1,412	15,271		
			Total			29,125	33,500	4.78%
	W of I-95	3/4/97	EB	1,878	1,488	22,284	24,610	46.00%
			WB	1,217	2,140	23,366		
			Total			45,650	53,500	5.43%
	W of SR 809/Military Trail	2/3/97	EB	1,597	989	15,169	3,164	9.00%
			WB	747	1,302	14,287		
			Total			29,456	35,150	6.07%
	E of SR 809/Military Trail	2/3/97	EB	1,482	915	14,815	3,587	9.00%
Belvedere Rd.			WB	845	1,600	16,437		
			Total			31,052	39,850	8.67%
	500' E of Kirk Road	1/9/97	EB	1,749	951	15,520		
			WB	895	1,863	17,923		
			Total			33,443	NA	
	1200' E of Military Trail	1/6/97	EB	1,882	732	13,709	4,697	14%
			WB	667	1,891	13,556		
			Total			27,265	33,550	7.16%
	W of Australian	4/14/97	EB	1,478	1,466	17,870	6,153	14%
			WB	1,105	1,637	17,972		
Australian Ave.			Total			35,842	43,950	7.03%
	1000' W of I-95	1/8/97	EB	1,623	1,644	20,838		
			WB	1,124	1,699	18,665		
			Total			39,503	NA	
	950' E of I-95	3/4/97	EB	1,236	457	13,114	11,749	31.00%
			WB	926	1,313	14,524		
			Total			27,638	37,900	11.10%
	500' S of Turnage Road	1/9/97	NB	1,501	819	13,837	31,610	58.00%
			SB	712	1,908	15,326		
			Total			29,163	54,500	23.17%
I-95	400' S of Belvedere Road	1/9/97	NB	1,414	830	13,453	22,875	50%
			SB	702	1,789	13,429		
			Total			26,882	45,750	19.39%
	N of Belvedere Road	2/13/97	NB	5,335	5,777	66,484	10,062	9%
			SB	5,448	6,870	91,238		
			Total			157,722	111,800	-10.84%
	N of Southern Blvd.	4/22/97	NB	6,694	5,271	82,135	0	0.00%
			SB	5,718	5,371	82,891		
			Total			165,026	99,000	-15.66%
	N of Okeechobee	1/16/97	NB	5,693	5,520	75,925		
Military Trail			SB	5,576	5,435	72,081		
			Total			148,006	NA	
	500 S of Southern Blvd.	1/9/97	NB	2,035	1,474	22,748	597	1%
			SB	1,160	2,213	23,852		
			Total			46,600	59,700	8.61%
	S of Belvedere	2/19/97	NB	2,188	1,917	27,399	0	0.00%
			SB	1,558	2,792	34,249		
			Total			61,648	56,000	-3.15%
	650' N of Okeechobee	2/3/97	NB	1,577	1,775	22,492		
			SB	1,426	2,053	21,652		
Haverhill Rd.			Total				NA	
	250' S of Okeechobee	1/7/97	NB	1,742	1,499	21,610		
			SB	1,043	1,923	20,293		
			Total			41,903	NA	
	600' N of Belvedere	1/9/97	NB	1,897	1,634	22,984	2,305	5.00%
			SB	1,161	2,164	22,696		
			Total			45,680	46,100	0.31%
	200' N of Southern Blvd.	1/14/97	NB	964	938	11,576		
			SB	650	1,070	11,422		
			Total			22,998	NA	
Congress Ave.	500' N of Belvedere Road	1/8/97	NB	1,165	855	11,940		
			SB	683	1,201	11,695		
			Total			23,635	NA	
	300' S of Cherry	1/7/97	NB	670	782	7,896	1,472	8.00%
			SB	601	1,042	9,227		
			Total			17,123	18,400	2.43%
	S of Southern Blvd.	2/3/97	NB	1,761	1,011	15,617	2,862	9.00%
			SB	898	1,889	14,710		
			Total			30,327	31,800	1.59%

Source: Frederic R. Harris Field Observations, February 1999
Prepared By: Ricondo & Associates, Inc. February 1999

Table II-2.5

Turning Movement Counts

TMC's along Southern Boulevard																				
Southern Blvd. @	Date	Period	SB			NB			WB			EB			Approach volumes			Approach volumes		
			L	T	R	L	T	R	L	T	R	L	T	R	%L	%T	%R	L	T	R
I-95 East	1/21/97	AM	0	0	0	0.0%				0	645	544	0.0%	730	1,012	0	41.9%	0	645	1,012
		PM	0	0	0	0.0%	574	0	227	71.7%	0	1,072	341	0.0%	502	834	0	37.6%	0	1,072
I-95 West	1/21/97	AM	389	0	452	46.3%	0	0	0	276	773	0	26.3%	0	1,366	422	0.0%	0	698	1,225
		PM	352	0	650	35.1%	0	0	0	353	1,347	0	20.8%	0	970	551	0.0%	0	904	1,997
Australian Blvd.	1/16/97	MD	423	6	159	71.9%	19	6	10	54.3%	2	937	442	0.1%	525	774	17	39.9%	25	1,115
		PM	490	12	584	45.1%	16	9	9	47.1%	7	1,640	288	0.4%	615	1,046	15	36.7%	912	34
Congress Ave.	1/14/97	MD	0	0	0	0.0%	169	0	772	18.0%	680	863	0	44.1%	0	753	44	0.0%	0	724
		PM	0	0	0	0.0%	197	0	855	18.7%	1,264	1,635	0	43.6%	0	777	220	0.0%	0	1,484
Kirk Road	2/6/98	MD	2	4	6	16.7%	61	4	108	35.3%	110	1,050	17	9.3%	9	833	71	1.0%	30	185
		PM	13	5	2	65.0%	55	4	95	35.7%	657	1,255	21	34.0%	14	762	105	1.6%	39	767
Military Trail	1/16/97	MD	178	935	137	14.2%	104	951	115	8.9%	125	538	174	14.9%	164	575	94	19.7%	1,289	1,154
		PM	213	1,549	228	10.7%	216	1,295	123	13.2%	247	865	135	19.8%	171	646	116	18.3%	1,601	1,912
TMC's along Belvedere Road																				
Belvedere Rd. @	Date	Period	SB			NB			WB			EB			Approach volumes			Approach volumes		
			L	T	R	L	T	R	L	T	R	L	T	R	%L	%T	%R	L	T	R
Parker Ave.	2/9/98	MD	77	126	85	26.7%	89	158	40	31.0%	31	682	82	3.9%	48	589	86	5.6%	288	243
		PM	79	439	107	12.6%	174	175	47	43.9%	78	943	96	7.0%	82	678	196	8.6%	353	713
I-95 East	2/10/98	MD	0	0	0	0.0%	402	0	187	68.3%	0	670	199	0.0%	430	588	0	42.2%	629	0
		PM	0	0	0	0.0%	725	1	313	69.8%	1	1,111	240	0.1%	323	818	0	28.3%	564	1
I-95 West	2/10/98	MD	0	0	0	0.0%	482	0	149	76.4%	206	878	0	19.0%	0	916	435	0.0%	0	641
		PM	0	0	0	0.0%	219	0	147	59.8%	328	1,510	0	17.8%	0	907	784	0.0%	0	1,112
Mercer Ave.	10/15/97	MD	94	0	114	45.2%	0	0	0	0.0%	19	1,297	89	1.4%	74	1,250	0	5.6%	163	19
		PM	199	0	261	43.3%	0	0	0	0.0%	12	1,114	93	1.0%	72	1,391	0	4.9%	165	12
Florida Mgo.	2/12/98	MD	172	23	151	49.7%	93	22	69	50.5%	104	1,041	128	8.2%	134	961	40	11.8%	284	167
		PM	266	22	288	46.2%	95	9	77	52.5%	53	1,633	158	2.9%	127	1,525	30	7.6%	294	105
Congress Ave.	11/18/97	MD	402	119	149	60.0%	66	51	59	37.5%	142	694	563	10.2%	245	698	135	22.7%	859	396
		PM	764	83	353	63.7%	44	43	34	36.4%	58	1,310	558	3.0%	183	796	78	17.3%	784	219
Military Trail	2/3/97	MD	139	860	128	12.3%	106	1,065	274	7.3%	269	417	159	31.8%	140	528	101	18.3%	1,364	1,230
		PM	105	1,745	331	4.8%	182	1,233	289	10.7%	600	1,147	211	30.6%	173	454	122	23.1%	1,617	2,467
Haverhill Rd.	1/13/97	MD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
		PM	76	699	205	7.8%	165	528	126	20.1%	319	1,105	89	21.1%	166	473	102	22.4%	783	1,120
TMC's along Australian Avenue																				
Australian Ave. @	Date	Period	SB			NB			WB			EB			Approach volumes			Approach volumes		
			L	T	R	L	T	R	L	T	R	L	T	R	%L	%T	%R	L	T	R
Australian Ave.	2/25/97	MD	4	581	423	0.4%	526	551	0	48.8%	0	459	0	0	459	0	49.7%	0	949	4
		PM	5	1,777	238	0.2%	291	707	0	29.2%	0	344	0	0	344	0	53.1%	0	529	5

Source: Frederic R. Harris Field Observations, February 1999
 Prepared By: Ricoult & Associates, Inc. February 1999

2.2.1.3 Historic Traffic Information

A 1997-1998 Year Compound Growth Rate table was prepared based on the West Palm Beach Urban Study Area Traffic Count Program to obtain historic traffic growth information within the PBIA study area. This information is presented in **Table II-2.6**. Following the method provided by the Palm Beach County Traffic Division, the compound growth rate was computed using Annual Average Daily Traffic (AADT) values for the current year and the current year less three years where first and third quarter count information was available. Growth rates were not computed where sufficient information was unavailable. The information summarized in Table II-2.6 indicates the following traffic trends of the PBIA traffic network for the past five years.

- Along Southern Boulevard:
 - Traffic between Haverhill Road and Military Trail has been growing steadily since 1993; however, the 1997-1998 traffic data showed that traffic decreased during that year.
 - In general, traffic has grown steadily between Congress Avenue and Interstate 95 (I-95) and traffic has decreased west of Congress Avenue, between Military Trail and Congress Avenue.
- Along Belvedere Road:
 - The segment of road between Haverhill Road and Military Trail has experienced substantial growth during the past three years.
 - From Military Trail Road to Australian Avenue, traffic has increased slowly but steadily for the past three years.
 - The segment between Australian Avenue and I-95 has experienced a consistent decrease in traffic since 1993.
- Australian Avenue:
 - Traffic has been consistently decreasing between the PBIA Entrance (Turnage Road) and Belvedere Road.
- I-95:
 - Traffic along I-95, between Southern Boulevard and Summit Boulevard, has grown steadily since 1993.
- Military Trail:
 - The segment of road between Westgate Avenue and Summit Boulevard has experienced a decrease in traffic, particularly during 1997-1998.
- Congress Avenue:
 - Traffic has been decreasing slowly but steadily between Westgate Avenue and Belvedere Road.
- Between Southern Boulevard and Summit Boulevard, traffic growth has been slow but consistent.

Table II-2.6

Historic Traffic Growth

Road	Between	ADT										Growth Rate
		93	93-94	94	94-95	95	95-96	96	96-97	97	97-98	
Southern Blvd.	Haverhill Road	29,265	27,106	27,073	27,487	26,936	27,691	28,369	28,277	28,211	27,619	0.38%
	Military Road	29,418	29,198	29,363	29,421	30,780	31,125	29,761	28,460	27,613	29,023	-0.12%
	Kirk Road	0	0	0	0	33,552	33,040	31,763	32,221	32,769	32,399	0.00%
	Congress Ave.	49,972	48,837	49,239	49,421	49,954	48,890	48,429	50,159	50,377	49,750	0.37%
	Australian Ave.	43,877	43,347	42,279	43,236	43,372	43,341	43,370	43,506	44,133	44,370	0.47%
Belvedere Rd.	I-95	28,799	27,249	27,817	27,682	25,937	26,835	27,702	27,454	28,061	28,493	0.90%
	Haverhill Road	22,884	22,530	21,907	21,953	20,673	20,314	21,927	22,349	23,060	23,311	0.68%
	Military Trail	29,052	28,834	27,702	25,589	23,867	23,195	25,814	26,885	26,645	29,092	0.18%
	Congress Ave.	34,699	35,267	36,807	35,916	32,902	33,226	36,962	36,454	37,617	39,438	2.26%
	Australian Ave.	40,994	42,546	41,546	42,226	43,870	40,303	35,491	35,091	35,829	37,274	-2.61%
Australian Ave.	I-95	29,178	27,280	27,788	26,917	24,792	26,362	27,137	26,429	26,580	27,191	-0.07%
	Royal Palm Way	19,261	20,343	20,523	20,668	20,106	19,499	19,653	20,367	20,301	20,659	0.31%
	Belvedere Road	26,215	27,266	26,952	26,567	29,713	29,659	26,942	25,553	24,955	25,733	-1.15%
SR 9/1-95	Turnage Road	0	0	0	0	0	33,376	33,731	31,624	27,566	27,864	0.00%
	Australian Avenue	0	0	0	0	0	162,842	157,671	165,101	160,783	156,009	0.00%
	Belvedere Road	151,092	0	0	166,928	166,928	160,422	158,519	160,821	152,627	158,033	0.00%
Military Trail	Southern Blvd.	152,373	160,047	157,848	159,789	161,526	162,952	167,910	169,546	171,486	164,038	0.49%
	Westgate Avenue	44,189	42,709	41,036	40,869	42,254	44,170	44,425	44,178	43,116	43,113	0.19%
	Belvedere Road	49,929	49,036	49,202	48,677	48,788	49,574	49,624	55,308	52,218	43,727	-2.27%
Congress Ave.	Southern Blvd.	42,390	40,628	40,933	42,112	44,075	45,476	45,476	45,754	46,600	38,788	-0.92%
	Belvedere Road	17,061	17,608	17,063	15,973	17,593	17,729	17,661	17,190	17,013	17,434	-0.20%
	Summit Blvd.	26,700	27,158	26,938	26,586	27,942	27,510	26,754	28,117	28,809	29,436	1.62%

Source: Frederic R. Harris Field Observations, February 1999

Prepared By: Ricoondo & Associates, Inc. February 1999

2.2.1.4 Roadway Improvement Plans

The Florida Department of Transportation (FDOT) and Palm Beach County have five key roadway improvement projects in various phases of development and implementation. The description of each project is summarized below.

2.2.1.4.1 Interstate 95/PBIA Direct Connector

The purpose of the I-95/PBIA Direct Connector is to provide connectivity between I-95 and the Airport for traffic that would otherwise continue to strain the local traffic network via the Belvedere Road and Southern Boulevard interchanges.

This project involves construction of a new interchange directly connecting PBIA with I-95 (see **Exhibit II-2.1**). Two single-lane elevated inbound ramps will be constructed to carry traffic from I-95 to PBIA, one each from the northbound and southbound directions. These structures combine to form a single ramp into PBIA. Similarly, outbound PBIA traffic to I-95 will use a combined elevated ramp that will separate into single-lane northbound and southbound ramps. Year 2020 design hour traffic projections indicate that traffic entering PBIA from the Direct Connector ramps will be 1,300 vehicles/hour (i.e., 700 vehicles per hour from I-95 northbound and 600 vehicles per hour from I-95 southbound), while traffic exiting PBIA will be 1,500 vehicles per hour (i.e., 700 vehicles per hour to I-95 southbound and 800 vehicles per hour to I-95 northbound). The Direct Connector movements will be located on structure parallel and immediately south of Belvedere Road. The estimated construction cost is \$85 million. Construction completion is programmed for the Year 2003.

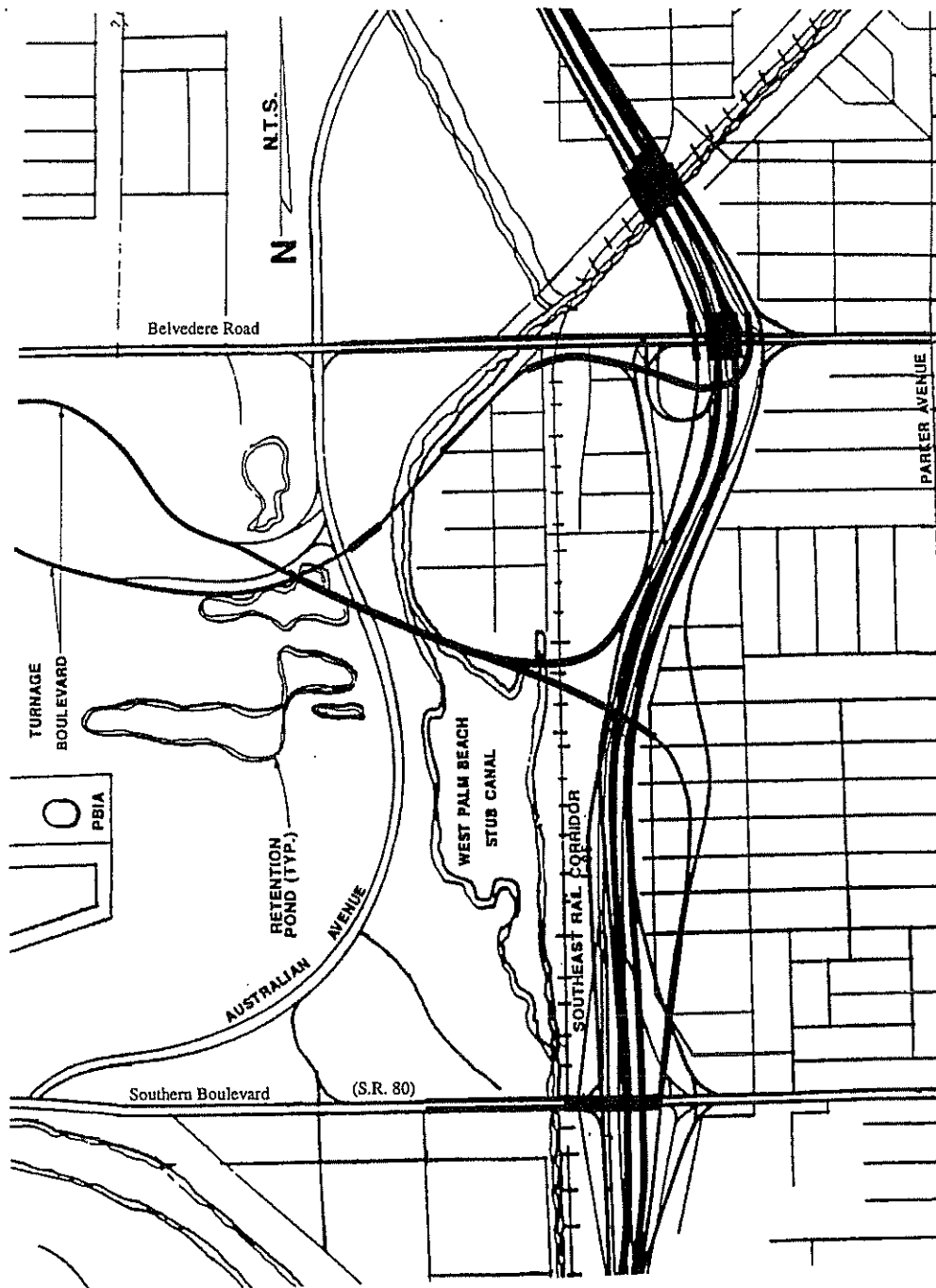
2.2.1.4.2 State Road 80 (SR 80) Interchange with Australian Avenue

SR 80 is a major four-lane east-west thoroughfare within Palm Beach County connecting the Town of Palm Beach on the east coast of Florida with Fort Myers on the west coast of Florida. Australian Avenue and Congress Avenue (State Road 807 or SR 807) is a north-south county thoroughfare that connects Southern Boulevard to Blue Heron Boulevard in Riviera Beach to Yamato Road in Boca Raton. Australian Avenue and Congress Avenue, together with Southern Boulevard, provide major access to Downtown West Palm Beach, while Southern Boulevard provides access for commuters from the western communities of Palm Beach County.

Presently, Australian Avenue and SR 807 terminate at Southern Boulevard 0.75 miles apart. Both northbound and southbound traffic must utilize Southern Boulevard to continue either north on Australian Avenue or south on Congress Avenue. This additional traffic, coupled with the east/west traffic along Southern Boulevard, results in traffic level of service "F" for this section of roadway.

Proposed improvements include an interchange to connect SR 807 (Congress Avenue), Australian Avenue, and SR 80 with a grade separation within the vicinity of PBIA. Specifically, the project will include the following (see **Exhibit II-2.2**):

- A direct connection between Australian Avenue and Congress Avenue.
- A new alignment will eliminate utilizing Southern Boulevard for Australian Avenue and Congress Avenue. This Australian Avenue/Congress Avenue Connector will be a six-lane divided (urban section) roadway with 12-foot wide travel lanes, 22-foot wide median with

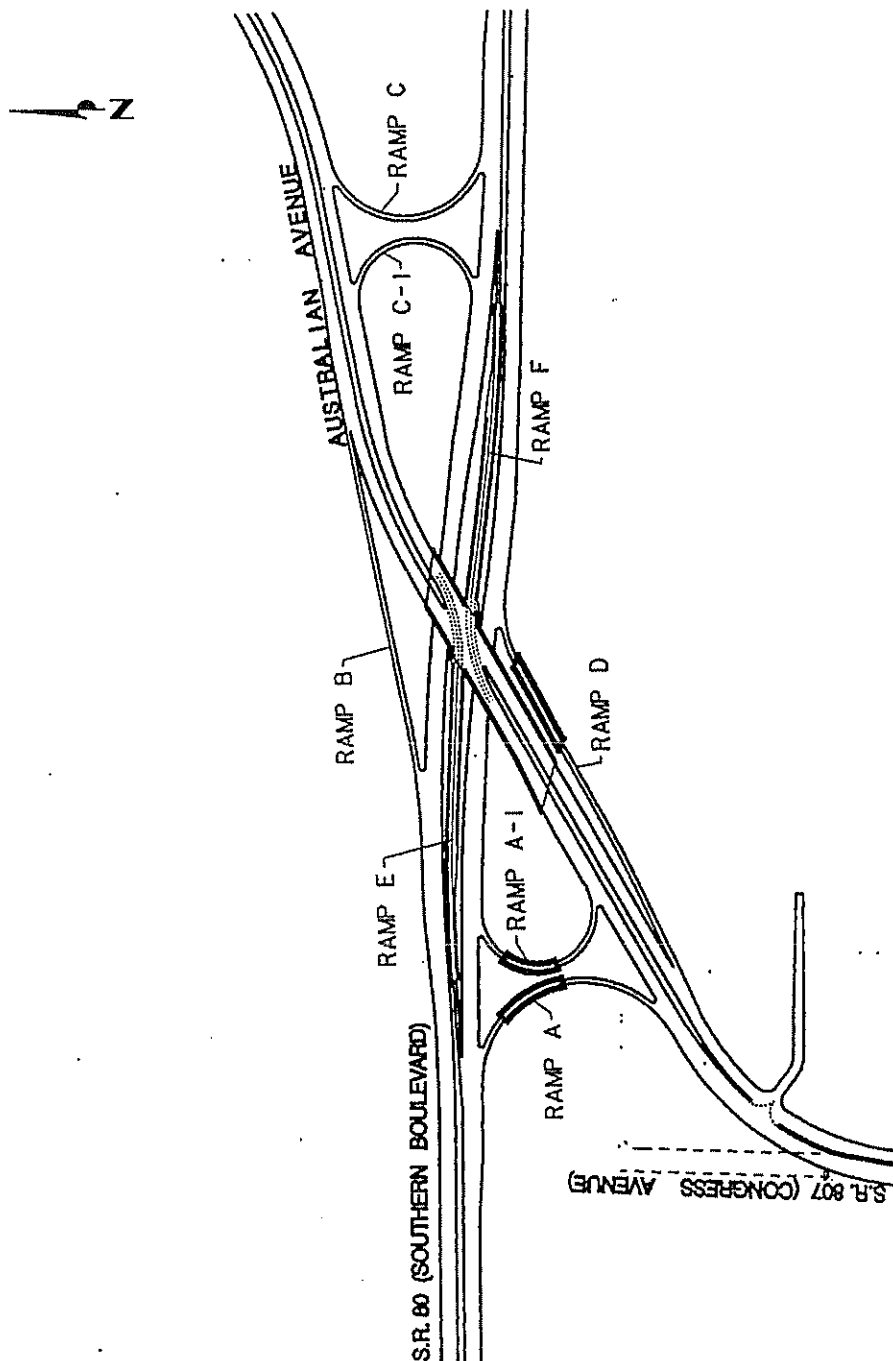


Source: Frederic R. Harris, February 4, 1999
Prepared By: Ricondo & Associates, Inc.

Exhibit II-2.1

↑
North
Not To Scale

I-95/PBIA Direct Connector



Source: Frederic R. Harris, February 4, 1999
Prepared By: Ricondo & Associates, Inc.

Exhibit II-2.2

↑
North
Not To Scale

State Road 80 Interchange With Australian Avenue

curb and gutter, four-foot wide bike lanes on both sides between the outermost lane and the outside curb and gutter, and six-foot wide sidewalks.

- Directional ramps will serve the following traffic movements: (1) SR 80 eastbound to SR 807 southbound; (2) Australian Avenue southbound to SR 80 eastbound; (3) Australian Avenue northbound to SR 80 westbound; and (4) SR 80 westbound-to-Australian Avenue northbound. The ramp typical sections will have a design speed of 25-35 mph and will consist of single-lane ramps (15-16 feet wide) and shoulders. Sidewalks and a curb and gutter will be provided on one side of the ramps located within the northwest and southeast quadrants.
- Southern Boulevard will be constructed as an eight-lane divided urban section with 12-foot wide travel lanes, 22-foot wide median with curb and gutter, four-foot wide bike lanes on both sides between the outermost lane and outside curb and gutter, and seven-foot wide sidewalks.

2.2.1.4.3 State Road 80 (SR 80) from West of Forest Hill Boulevard to East of I-95

The SR 80 improvement project was initiated in response to the rapidly growing development within western Palm Beach County. The purpose of SR 80 improvements is to provide a high capacity corridor to accommodate both current, as well as, future traffic demands within the east/west directions. This project will also include grade-separated interchanges at major intersections (i.e., Jog Road, Haverhill Road, SR 7, Turnpike, Military Trail, and SR 80 Overpass at I-95).

This project involves the widening and reconstruction of an 11.5-mile section of SR 80. The highway is proposed to be widened from a five-lane undivided roadway to an eight-lane divided roadway (i.e., six through lanes and two auxiliary lanes) between Forest Hill Boulevard and Military Trail and from a four-lane divided roadway to an eight-lane divided roadway (i.e., six through lanes and two auxiliary lanes) between Military Trail and I-95. Year 2022 traffic projections along this segment of SR 80 indicate 71,800 vehicles per day K (peak hour percentage) = 10.2 percent, D (directional distribution) = 56.8 percent in the peak direction, and T (percentage of trucks) = 5 percent. There are four bridge structures and five box culverts along this section of SR 80 and 10 bridge structures spanning the C-51 Canal (West Palm Beach Canal) in proximity to intersections with the roadway.

SR 80 improvements along the west end of the project (i.e., Forest Hill Boulevard to SR 7) are programmed for a Year 2002 contract letting. However, the balance of the SR 80 improvements is beyond the Five-Year Work Plan, as these improvements will require significant right-of-way acquisition.

2.2.1.4.4 South Outer Perimeter Road (Phase II)

The South Outer Perimeter Road (Phase II) improvement project is being implemented by Palm Beach County. This 1.3 mile project provides a two-lane undivided roadway within the vicinity of Kirk Road along the south side of PBIA. This project is currently under construction.

2.2.1.4.5 Australian Avenue Improvements

The Australian Avenue Improvements project provides for the upgrading of Australian Avenue from the Hilton Hotel Complex to south of the PBIA Entrance. The project involves the reconstruction of a .5 mile road segment, resulting in a six-lane divided section. The Year 2020 traffic projections indicate that 71,000 vehicles per day will use this section of Australian Avenue [K (peak hour percentage) = 10.2 percent, D (directional distribution) = 56.8 percent in the peak direction, and T (percentage of trucks) = 2.5 percent]. The design speed for this roadway segment will be 45 mph. FDOT will enter into a Joint Participation Agreement with Palm Beach County to implement this project.

2.2.2 Adjacent Airport Owned Property

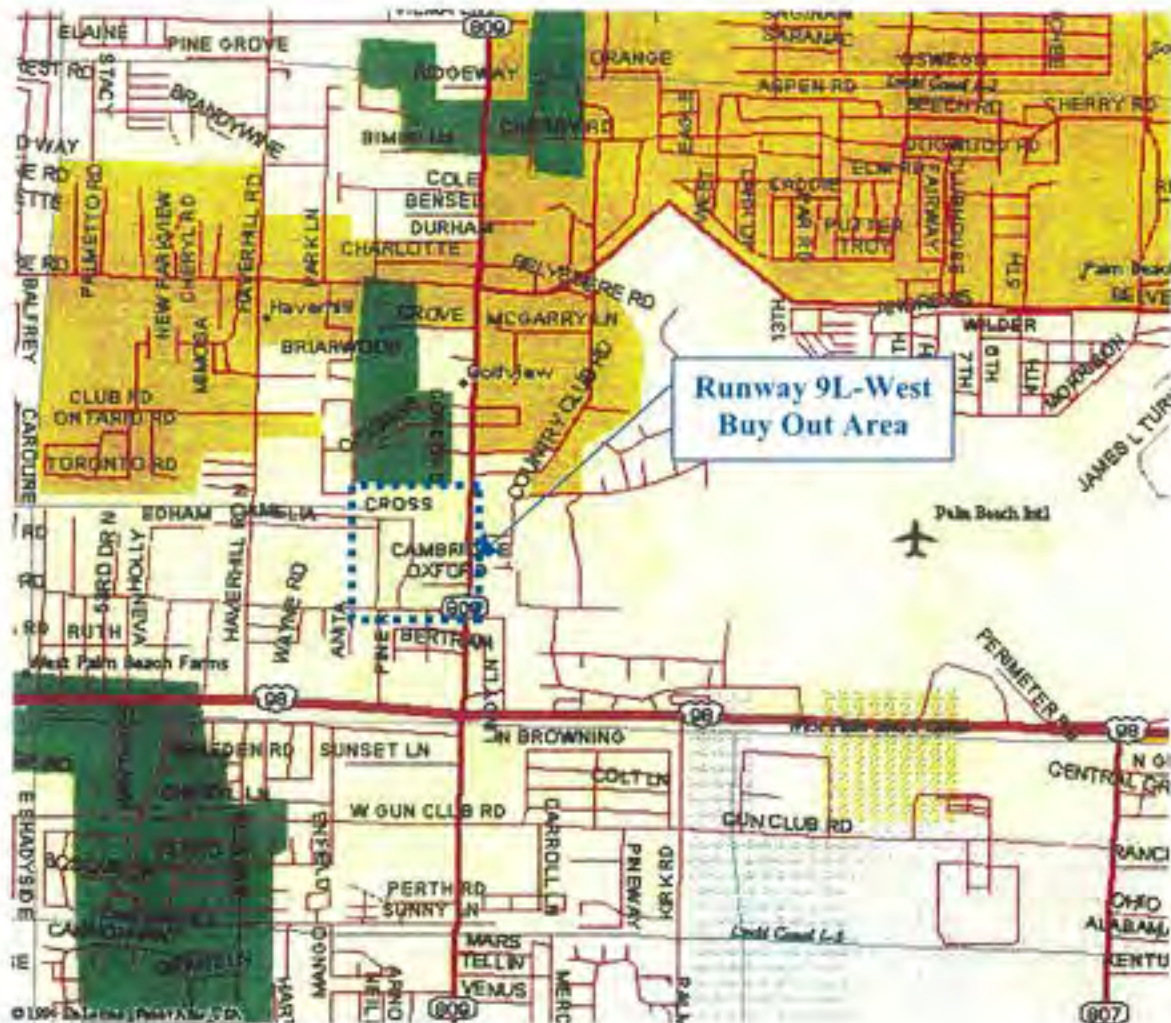
In addition to the Town of Golfview, the Airport has acquired land in an area just west of Military road. This area is referred to as the Runway 9L-West Property and includes approximately 50 parcels. **Exhibit II-2.3** shows the general location of the Runway 9L-West property in relation to the Airport and Runway 9L.

The 1992 Federal Aviation Regulation (FAR) Part 150 Update, the Noise Exposure Map, and the 1993 FAR Part 150 Update, Revised Noise Compatibility Program, recommended the continued practice of acquiring property impacted by the 75 DNL noise contour. This continued policy on the part of the Airport has resulted in the acquisition of approximately 346 parcels of land in the Hillcrest neighborhood. The Hillcrest neighborhood is located on the east side of the Airport and is shown in **Exhibit II-2.4**.

2.2.3 Off-Airport Transportation Network

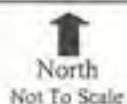
The FY 1999-2003 Transportation Improvement Program (TIP) is a staged five-year program encompassing all regionally significant transportation improvements to all modes of travel within Palm Beach County. The TIP contains all transportation projects funded by federal, state, and local sources located primarily on the State Highway System. The TIP is developed through a continuing comprehensive and coordinated effort involving the Florida Department of Transportation (FDOT), the Palm Beach Board of County Commissioners, the Port of Palm Beach, and municipalities within the County. The TIP is based on and reflects FDOT's FY 99-03 Five-Year Work Program for Palm Beach County and generally moves forward the projects in the time frame from previous work programs. The County Five-Year Road Program is also included.

In order to be included in the TIP, a major improvement project must be consistent with the policies and priorities of the Palm Beach County Metropolitan Planning Organization's (MPO) adopted Long-Range Transportation Plan (LRTP). The intent of the TIP is not only to address current problems but also to construct the needed facilities for the LRTP. The current LRTP is the 2015 Cost Feasible Transportation System Plan. The LRTP contains elements for roadways, mass transit, bicycles, and pedestrians. The 2015 Plan was prepared using estimates of available revenues from local option gas taxes and impact fees. TIP projects are funded using existing revenue sources. The projects are funded using the various funding sources and are appropriate for the available funds in each category. Modifications to the Plan have been made to reflect changes in anticipated development levels and proposals for specific roadway links. These modifications are reviewed and approved by the MPO. The 2015 Plan is included in the County Comprehensive Plan and in local municipal

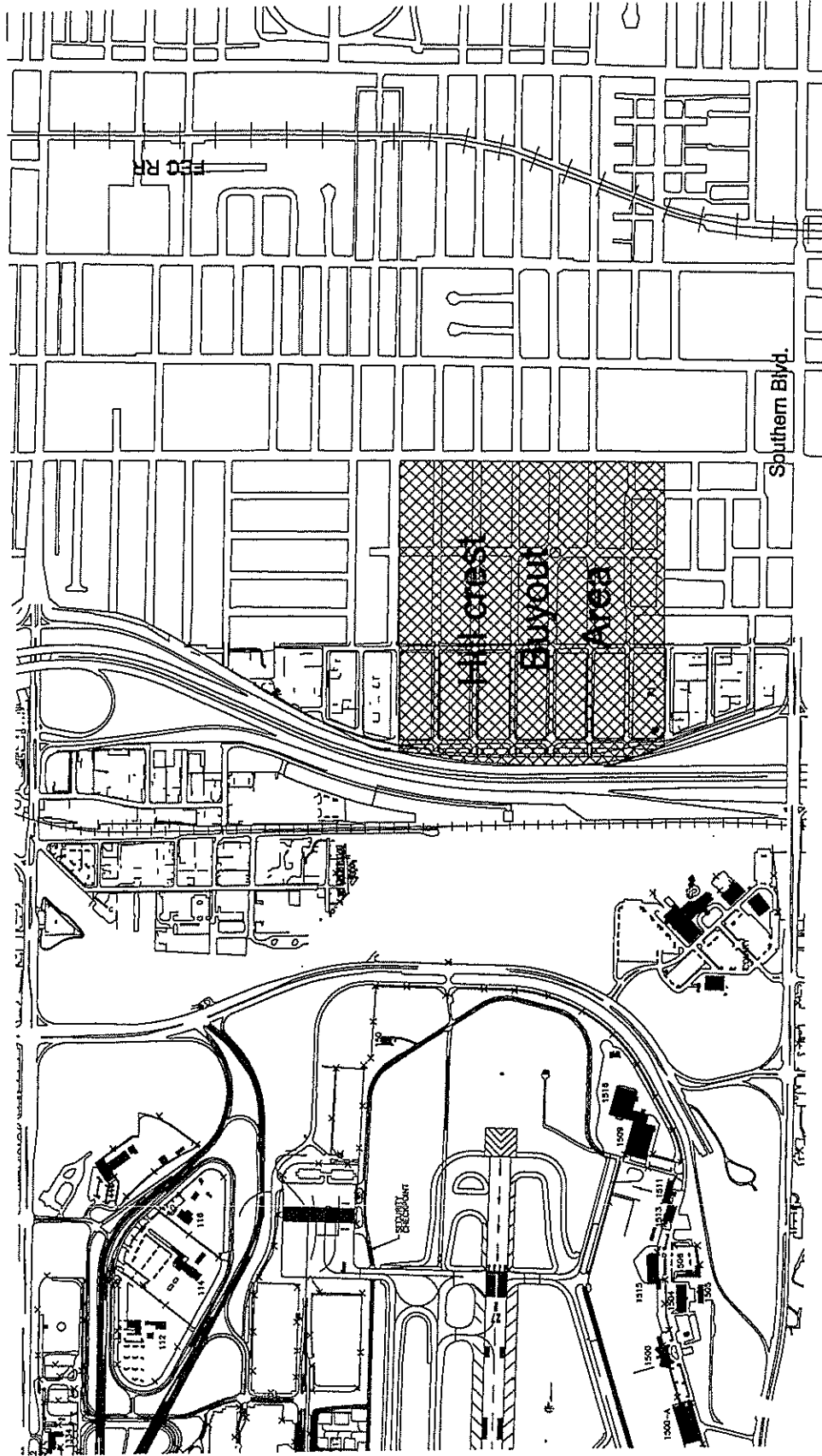


Source: Relocation Plan Runway 9L-West, O.R. Colan Associates, Inc.
May, 1997
Prepared By: Ricondo & Associates, Inc.

Exhibit II-2.3



Runway 9L-West Buy Out Area



Sources : Stormwater Management Plan for PBIA Buyout Area,
 Ricondo & Associates, Inc., June 1993.
 Prepared By : Ricondo & Associates, Inc.

N.T.S.
 north

PBIG0001-1_024.dwg

Strategic Master Plan Study

Exhibit II-2.4

Hillcrest Buyout Area

October 2000

comprehensive plans. This inclusion ensures consistency with local comprehensive plans to the maximum extent feasible. Typically, the airport master plan is used for consistency in selection of aviation projects in the TIP.

The MPO sets priorities for major projects, adding capacity to the transportation system (i.e., additional lanes, additional buses, significant reconstruction). Projects contained in the TIP generally reflect the continuation of priorities established in previous years during the TIP process. Transportation projects identified in the TIP, that relate to the PBIA Strategic Master Plan are presented in **Table II-2.7** below.

Table II-2.7

TIP Projects within the PBIA Study Area

Project	Description	Dist. (miles)	Type of Work
I-95/PBIA Direct Connect #4147515	Southern Blvd to Belvedere Rd	1.4	New Interchange & Direct Connect to PBIA
Southern Blvd #4118841	Haverhill Rd to west of Congress	2.0	Add Lanes & Reconstruction
Military Trail #4118631	Okeechobee Bl. to north of Blue Heron Bl.	5.3	Add Lanes & Reconstruction
Southern Blvd #4118757	Interchange at Australian Ave & Congress Ave	0.0	New Construction
Southern Blvd Interchange #4157574	Southern Blvd	0.3	Interchange (Major)
Southern Blvd #4118031	Congress Ave to west of I-95	2.2	Add Lanes & Reconstruction
I-95 HOV #4147526	Belvedere Rd to Okeechobee Rd	1.8	Interchange (Major)
I-95 HOV #4147556	Forest Hill to Congress Avenue	3.7	Add Lanes & Reconstruction

Notes: ROW = Right-of-Way
CST = Construction
MSC = Miscellaneous
RRU =
PE = Preliminary Engineering

Source: Frederic R. Harris, Inc.
Prepared by: Ricondo & Associates, Inc., April 1999

2.2.4 Long-Range Transportation Plan

The West Palm Beach Urban Study Area Year 2015 Plan Update represents the MPO's current Long-Range Transportation Plan (LRTP). The LRTP is a 20-year plan based on regional needs identified through the process of forecasting future travel demands, evaluating system alternatives, and selecting those options that best achieve the mobility needs of the region. The Needs Plan contains all the road, highway, rail, pedestrian and pathway facilities, bicycle facilities, and transit system improvements that would be needed to maintain the County's adopted level of service "D" standard on all roadways. Revenues available to implement the Needs Plan are insufficient to cover all projects in the Plan. Revenue sources available for funding highway and transit projects within Palm Beach County include fuel taxes, transportation impact fees, ad-valorem taxes, fare box and

other transit revenues, and motor vehicle tag fees. As a result, the Year 2015 Cost Feasible Plan was selected as representing the best combination of multi-modal improvements to meet the long-range transportation needs of Palm Beach County. The L RTP also provides the framework for the development of the TIP.

The Year 2015 Cost Feasible Plan includes the following roadway improvement projects within the PBIA Study Area:

- *Southern Boulevard* – Proposed interchanges will be located at the following intersections: State Road 7 (SR 7), Turnpike, Jog Road, Haverhill Road, Military Trail, and Congress Avenue. In addition, an upgrade to an eight-lane section is proposed along Southern Boulevard between Forest Hill Boulevard and I-95. These interchange improvement projects will enable Southern Boulevard to operate as a high capacity corridor in providing increased throughput capacity while still providing local access within the corridor.
- *Okeechobee Road* – Proposed interchange at SR 7 combined with an upgrade to eight lanes between SR 7 and I-95
- *I-95* – Upgrade of I-95 between Linton Boulevard and Okeechobee Boulevard to a 10-lane section including eight through lanes and two High Occupancy Vehicle (HOV) lanes and upgrade of I-95 between Okeechobee Boulevard and PGA Boulevard to a eight-lane section including six through lanes and two HOV lanes
- *Ronald Reagan Turnpike* – Upgrade of the Turnpike to a six-lane section with new interchanges located at the following intersections: Clint Moore Road, Southern Boulevard, Hypoluxo Road, and the Beeline Highway (or 45th Street)
- *Urban Interchanges* – The following urban interchanges are included in the Year 2015 Cost Feasible Plan: Belvedere Road & Australian Avenue; Southern Boulevard & Australian Avenue; Southern Boulevard & Jog Road; SR 7 & Lake Worth Road; SR 7 & Southern Boulevard; PGA Boulevard & Old Dixie Highway; Southern Boulevard & Haverhill Road; Southern Boulevard & Military Trail; and SR 7 & Okeechobee Boulevard.
- *Palm Tran* – Increased frequency in bus service to reduce headways to 30 minutes.
- *Tri-Rail* – Tri-Rail services are expected to be extended to Jupiter north of Indiantown Road with improved headways to 30 minutes. With the extension of Tri-Rail, approximately five new Tri-Rail stations are anticipated.
- *Intermodal Facilities* – The Tri-Rail station, located in Downtown West Palm Beach, will include connections for buses, bikes, pedestrians, taxis, paratransit, intercity rail, high speed rail, and Greyhound. The facility will be designed to accommodate a future transit linkage to PBIA.

The Year 2020 Future Directions Plan serves to forecast the additional transportation improvements that are expected to be financially feasible for the five-year period between 2016 and 2020 in an effort to define the overall Year 2020 cost feasible transportation system. For the highway component, all improvements that are determined to be needed by the Year 2015 were found to be financially feasible by the Year 2020. For the transit component, four express bus routes were identified for the Future Directions Plan in addition to the Year 2015 Cost Feasible Plan.

2.2.5 Palm Beach County Metropolitan Planning Organization Policies

The MPO was consulted to coordinate policies and procedures regarding the approval process and funding options for proposed airport improvement projects.

2.2.5.1 Approvals

The MPO approval process, regarding policies and procedures concerning airport expansion projects, is similar to the traditional approval process for all other transportation projects:

- *PBIA Initiates Airport Improvement Project* – PBIA develops the project scope, budget, and schedule and identifies funding sources.
- *Airport Improvement Project is Presented to the TAC and CAC* – The proposed project is presented to the Palm Beach County Technical Advisory Committee (TAC) and Citizens Advisory Committee (CAC) for review and approval. The TAC is composed of planning and engineering staff from municipal, county, and state agencies and organizations to provide input on the technical aspects of the program. The CAC is composed of representatives from the community with interests in transportation and planning to provide citizen perspectives on transportation projects and impacts.
- *Airport Improvement Project is Presented to the MPO* – The proposed project is presented to the MPO, who upon review and approval, incorporates the project in the TIP and/or LRTP.
- *FDOT Notification* – The proposed project is presented to FDOT for inclusion in the State Transportation Improvement Program.
- *Federal Agencies Notification* – The proposed project is presented to the appropriate federal agency(s) for review and approval.

Each step of the approval process features public involvement. Projects that require Project Development & Environmental Studies will require the preparation and implementation of a formalized public involvement program for the specific project.

2.2.5.2 Funding

Funding of transportation improvements related to PBIA has historically been segregated into two basic components: (1) Airport Improvement Projects within PBIA boundaries that are funded by PBIA; and (2) PBIA transportation access improvements outside the PBIA boundaries that are funded by a combination of federal, state, and county dollars. Although the Transportation Equity Act for the 21st Century (TEA-21) provides an opportunity to fund intermodal projects by combining “airport” and “non-airport” funds, there are no projects identified in the TIP or LRTP that utilize these non-traditional funding techniques.

The TIP provides a summary of MPO priorities by major federal funding source, as shown in **Table II-2.8**.

Table II-2.8

Summary of MPO Priorities By Major Federal Funding Source (Thousands of Dollars)

Description	Funding Code	Total Pgm	FY 98/99	FY 99/00	FY 00/01
National Highway	NH	92,983	1,600	56,533	34,850
Bridge Replacement	BRT	1,650	1,650	0	0
Interstate Maintenance	IM	17,709	4,366	6,459	6,884
Surface Trans Program	STP	115,096	101,090	8,663	10,219
Congestion Mitigation	CMAQ	10,102	5,217	559	4,326
Federal Aviation Admin	FAA	2,161	527	815	819
Federal Transit Admin	FTA	60,224	19,488	21,248	19,488
Other Federal Funds	--	17,072	6,956	2,771	7,345
Grand Total	--	316,997	140,894	96,489	79,614

Source: Frederic R. Harris, Inc.
 Prepared by: Ricondo & Associates, Inc.

In addition, Palm Beach County's Five-Year Road Program will be funded by the resources shown in Table II-2.9 below.

Table II-2.9

Palm Beach County Five-Year Road Program (Thousands of Dollars)

Road Program Revenues	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03
Local Option Gas Taxes	27,486	28,173	28,878	29,600	30,340	144,477
Impact Fees	13,069	13,069	13,069	13,069	13,069	65,345

Source: Frederic R. Harris, Inc.
 Prepared by: Ricondo & Associates, Inc., April 1999

FDOT District 4 is currently developing the revised Five-Year Work Program based on the anticipated funding increases resulting from TEA-21. TEA-21 authorizes a total of \$217 billion for highway and mass transit programs for FY 1998-2003, including \$42 billion for mass transit programs and \$175 billion for highways. By contrast, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) authorized \$121 billion for highways and \$34 billion for mass transit for FY 1992-1997. Due to changes in the state apportionment formulas, as well as increased funding levels, the State of Florida will receive a 55.7 percent increase in average annual funding. At this time, it is too early to predict the specific impacts on Palm Beach County and the PBIA region.

The revenue streams presented in Table II-2.8 will be adjusted based on these findings. Preliminary indications estimate that Palm Beach County will receive an additional \$100 million over the next five years. This additional revenue is anticipated to be used to accelerate the upgrading of Southern Boulevard as a quasi-expressway to accommodate the high growth in traffic generated in West Palm Beach County.

2.2.6 Intermodal Plan

The Intermodal Transportation Master Plan and Transit Facility Schematic Design Study provides an assessment of possible alternatives for a potential transit connection between PBIA and the Port of Palm Beach. The study introduces a potential long-term transit connection linking PBIA with the

proposed Intermodal Facility in Downtown Palm Beach and with the Port of Palm Beach. The recommended PBIA-to-Intermodal Facility corridor is Australian Avenue with a connection to US 1 to provide access to the Seaport.

The Intermodal Facility will be developed within Downtown Palm Beach at the existing Amtrak station situated along the west side of Tamirand Avenue between Clematis Street and Banyan Boulevard. This Facility will provide integration with Palm Tran buses, Tri-Rail, Amtrak, Greyhound, and other transportation modes.

2.2.7 ITS Program

Intelligent Transportation Systems (ITS) are the application of technology to improve the efficiency and quality of transportation. At the federal level, the USDOT's "Operation Timesaver" goal is to develop ITS infrastructures within metropolitan regions by the Year 2005. At the state level, the FDOT is in the process of developing a statewide ITS Strategic Plan to integrate the various ITS initiatives throughout Florida. At the regional level, the Southeast Florida Intelligent Corridor System provides the framework for the implementation of ITS projects within the Tri-County area. At the county level, Palm Beach County is partnering with the state in developing an Advanced Traffic Management System (ATMS).

The ATMS will enhance the existing computer-controlled signalization system to include state-of-the-art controllers and communications systems to enable county traffic operations staff to better monitor and control traffic on the Palm Beach County roadway network. These enhancements will include the completion of a fiber optic backbone, the installation of CCTV cameras at strategic locations, and improvements to central control. Currently, 447 of Palm Beach County's 891 signalized intersections are under computer control with an additional 101 signals under construction. The ATMS will bring the remaining 343 signals under computer-control and share information with FDOT's proposed I-95 Changeable Message Sign System. In addition, funding for an ITS Operations Facility is included in the TIP to more efficiently share and disseminate real-time information to travelers within Palm Beach County.

The ITS Program will enable PBIA users to access real-time travel information via Changeable Message Signs situated along I-95 as well as PBIA access/egress points, information kiosks and monitors situated within the Airport terminals, and on-board computers installed in rental cars. The PBIA area is currently served by a Highway Advisory Radio (HAR), which provides static broadcasts on radio station WPLP (Station 1630 AM). The radio messages provide information on directions to PBIA, parking facilities, curbside parking restrictions, and other security instructions within the terminal (e.g., no smoking, photo ID requirement). The ITS Program has the potential to add a "real-time" dimension to the HAR to advise PBIA users of roadway delays on congested access routes and alternatives, parking availability, and curb side enforcement strategies.

2.2.8 Relevant Planned Developments

Relevant planned development encompasses both DRI and "non-DRI" developments.

2.2.8.1 Developments of Regional Impact (DRI)

There are three major developments within the PBIA study area. A brief description of each DRI is provided below.

2.2.8.1.1. Centrepark DRI

The Centrepark DRI is generally bounded by I-95 on the east, Australian Avenue on the west, and Mercer Avenue on the southeast. Centrepark is a 40.66-acre planned development consisting of office buildings, parking structures, retail and financial facilities, restaurants, and a luxury hotel. Approximately 32.90 acres will be devoted to commercial development (i.e., office, hotel, retail, financial, and restaurant); 1.00 acres to forest; 3.60 acres to water retention lakes; and 3.16 acres to new roadway. Access to Centrepark will be from the eastward extension of Worthington Road across Australian Avenue, terminating at Mercer Avenue. The Regional roadway system within the study area includes the following roads:

- I-95
- U.S. 1
- Southern Blvd. (S.R. 80)
- Military Trail (S.R. 809)
- Congress Avenue (S.R. 807)
- Okeechobee Blvd. (S.R. 704)
- Belvedere Road
- Australian Avenue, and
- Mercer Avenue from Belvedere Road to Australian Avenue.

The latter three roadways provide transportation services to PBIA and, therefore, are specifically identified as part of the regional roadway network.

Three intersections located along Belvedere Road were identified as critical at the time of the analysis, as they would be impacted by the DRI. These intersections were:

- Belvedere Road @ Australian Avenue
- Belvedere Road @ I-95 East ramp, and
- Belvedere Road @ I-95 West ramp

2.2.8.1.1.1. Project Traffic

Construction of the Centrepark project was anticipated to be implemented in two phases, with the first phase scheduled for completion in 1989 and the second phase in 1996. The DRI's primary north-south access point would be the Belvedere Road/I-95 interchange. Project traffic would have two egress points: 1) via Australian Avenue south to Belvedere Road, then east to I-95, and 2) via Mercer Avenue south to Belvedere Road, then east to I-95.

The development is expected to generate 17,453 daily trips at buildout, distributed in the following manner:

- 5,928 ADT to the north on Australian Avenue
- 6,451 ADT to the south on Mercer Avenue and/or Australian Avenue
- 1,046 ADT to the east on the roadway network
- 4,010 ADT to the west on the surrounding roadway network
- 1,050 trips were anticipated to remain internal at buildout, satisfying the hotel and office/commercial needs.

2.2.8.1.1.2 Projected Traffic

Table II-2.10 summarizes the roads identified as failing as a result of the traffic impact analysis at the buildout year:

Table II-2.10

Centrepark Traffic Impact Analysis

Phase II 1996									
Road	From	To	Lanes	Existing ADT	Capacity	Level Of Service	Back-Ground	Project	Level of Service
BELVEDERE ROAD	Congress	Australian	4 LNA	33,700	30,000	D	42,740	2,560	F
I-95	Mercer	I-95	4 LNA	-	-	-	30,800	5,730	E
	Forest	Southern	6LNEX	100,000	95,000	D	144,955	2,745	F
	Southern	Belvedere	6LNEX	97,800	95,000	D	136,670	2,930	F
	Belvedere	Okeechobee	6LNEX	92,400	95,000	C	127,945	1,255	F
AUSTRALIAN BLVD.	Okeechobee	PBL Blvd.	6LNEX	81,600	95,000	B	113,505	3,195	E
	Southern	Belvedere	4 LNA	25,000	30,000	B	33,970	3,830	E

Notes: #LNA = # of Lanes in Arterial Roadway
#LNEX = # of Lanes in Expressway

Sources: Centrepark DRI, Frederic R. Harris, Inc.
Prepared by: Ricondo & Associates, Inc., April 1999

It is important to note that the DRI traffic impact analysis assumed that a direct connection between I-95 and PBIA would be completed by 1996 with 35,000 daily trips assigned to this interchange.

Table II-2.11 summarizes the recommended intersection improvements and Table II-2.12 summarizes the recommended roadway link improvements as a result of Centrepark traffic impacts.

Table II-2.11

Centrepark DRI Recommended Roadway Improvements

Road	Intersection	Phase I	Phase II
Airport / I-95			Direct Connection
Australian Avenue	Mercer Avenue Belvedere Rd	EBRT lane Thru lanes at all approaches	NBLT lane NBLT & NBRT lane SB and WB LT lanes
	Mercer Avenue Extension	NB & SB thru lanes EBLT lane	

Source: Frederic R. Harris, Inc.

Prepared by: Ricondo & Associates, Inc., April 1999

Table II-2.12

Centrepark DRI Recommended Link Improvements

Road	From	To	Without Project	With Project
I-95	Palm Beach Lakes	Forest Hill Blvd.	Widen to 8 lanes	No improvements
	I-95	Airport Interchange	Construct new facility	No improvements
Australian Blvd.	Belvedere Rd.	Old Okeechobee Rd.	No improvements	Widen to 6 lanes
Belvedere Rd.	Congress Avenue	Australian Avenue	Widen to 6 lanes	No improvements
Southern Boulevard	Military Trail	Congress Avenue	Widen to 6 lanes	No improvements
Mercer Extension	Belvedere Rd.	Australian	Construct new roadway link	No improvements

Source: Frederic R. Harris, Inc.

Prepared by: Ricondo & Associates, Inc., April 1999

Within the Centrepark study area the impacts would be most crucial at the following five intersections:

- Belvedere Road/Mercer Avenue
- Belvedere Road/Australian Avenue
- Belvedere Road/I-95 East
- Belvedere Road/I-95 West
- Australian Avenue/Mercer Extension

The transportation assessment of the Centrepark DRI determined that the following roadway improvement conditions needed to be included in the Development Order:

- Widening of Belvedere Road to six lanes, from Australian Avenue to Mercer Avenue.
- Upgrading of the Belvedere Road/Australian Avenue and Belvedere Road / Mercer Avenue intersections to the conditions shown in **Table II-2.13**.
- Widening of Australian Avenue to six lanes, from Southern Boulevard to Old Okeechobee Road.
- Construct a direct I-95/airport interchange.
- Construct an urban interchange at either Belvedere Road and Australian Avenue, or widen Belvedere Road to eight lanes from Congress Avenue to I-95.

Table II-2.13

Centrepark DRI Recommended Intersection Improvements

Intersection	NB			SB			EB			WB		
	L	T	R	L	T	R	L	T	R	L	T	R
Belvedere @ Australian Ave.	2	3	1	2	3	1	1	3	1	1	3	1
Mercer Ave.		1	1	2	1	1	1	3	-	1	2	2

Source: Frederic R. Harris

Prepared by: Ricondo & Associates, Inc., April 1999

2.2.8.1.2 Airport International Park Project

The Airport International Park is located along Worthington Road, bordered by Australian Avenue on the west side and Belvedere Road on the south side. The development consists of the following land uses:

Office:	105,000 s.f.
Industrial:	158,333 s.f.
Retail:	200,000 s.f.

This development is currently being reviewed by the Department of Community Affairs. The status of the project is not clear at the present time. The developer has been obliged to provide information regarding land use gross acreage, number of parking spaces for approved land use, etc. to the Department of Community Affairs so that a decision as to whether this project should be classified as a DRI.

2.2.8.1.3 Golfview Estates

The Palm Beach County MPO and the DRI Coordination Department of the Treasure Coast Regional Planning Council (TCRPC) were contacted to gather information about this development.

Neither department had any information pertaining to this project. In addition, a TCRPC DRI Coordinator indicated that applications for approval for Golfview Estates development have not yet been submitted.

2.2.8.2 Non-DRI Developments

Telephone conversations with the Palm Beach County Planning Department, TCRPC, and the City of West Palm Beach staff indicated that applications for smaller developments have not been submitted for approval and that the PBIA study area is relatively built out.

2.2.8.3 Tri-County Commuter Rail

Tri-Rail provides commuter rail service along the 71-mile corridor between Miami International Airport and north of West Palm Beach at Magnolia Park. The system features 19 stations:

<u>Miami-Dade County</u>	<u>Broward County</u>	<u>Palm Beach County</u>
• Miami International Airport	• Hollywood	• Boca Raton
• Hialeah Market	• Sheridan Street	• Delray Beach
• Metrorail Transfer	• Fort Lauderdale Airport	• Boynton Beach

- Opa-Locka
- Golden Glades
- Fort Lauderdale
- Cypress Creek
- Pompano Beach
- Deerfield Beach
- Lake Worth
- Palm Beach Airport
- West Palm Beach
- Mangolia Park

Tri-Rail provides a current service of 14 trains/day in both the northbound and southbound directions, Monday through Friday. This service is reduced to seven trains/day on Saturdays and six trains/day on Sundays in both directions.

Tri-Rail operates along the South Florida Rail Corridor, which is owned by FDOT. This corridor is being upgraded to provide double tracks to improve capacity and reduce train headways. This "double-track" improvement program is estimated to cost approximately \$357 million. For funding purposes, the program is divided into a total of 10 phases. Currently, Phases 1, 2, and 3 are funded. The section that traverses the Palm Beach Airport Station (i.e., Lake Worth to West Palm Beach) is Phase 8, which is not presently funded. Tri-Rail is also participating in the upgrade of the existing West Palm Beach Station by adding parking as part of the ultimate Intermodal Transit Facility Program.

Tri-Rail access to PBIA is provided at the Palm Beach Airport Station located along the east side of Mercer Avenue, north of Belvedere Road. The station includes simple canopies with LED displays providing passenger information. Other station amenities include automatic ticket machines, newspaper racks, telephones, Tri-Rail information, bus pull-outs, benches, and limited on-street parking. Based on field observations, only 15-20 vehicles park at the Palm Beach Airport Station with no security. Bus bays for Airport Shuttle/Palm Tran interface do not include shelters or Palm Tran schedules. However, Tri-Rail and Palm Tran have recently initiated a new shuttle route where buses are scheduled to meet Tri-Rail scheduled departure. With the addition of the new shuttle, Tri-Rail now provides free and direct bus service between PBIA and Tri-Rail which takes only six minutes.

Tri-Rail ridership at the Palm Beach Airport Station during the past nine years is summarized in Table II-2.14.

Table II-2.14

Tri-Rail Ridership at the Palm Beach Airport Station

Year	Passengers Boarding		Passengers Alighting		Total
	Northbound	Southbound	Northbound	Southbound	
1997	2,704	60,029	61,898*	1,626*	126,257
1996	1,835	66,125	68,813	1,146	137,919
1995	1,512	76,023	81,979	974	160,488
1994	2,239	96,924	N/A	N/A	N/A
1993	1,915	100,259	105,848	1,409	209,431
1992	1,927	76,107	78,741	976	157,751
1991	778	60,726	60,223	438	122,165
1990	362	44,845	44,300	556	90,063
1989	230	18,512	19,522	293	38,557

* Annual estimate is based on actual ridership for first half of the year.

Source: Frederic R. Harris, Inc.

Prepared by: Ricondo & Associates, Inc., April 1999

In reviewing Tri-Rail ridership statistics, the following observations are noted:

- Ridership at the Palm Beach Airport Station steadily increased during Tri-Rail's formative years reaching a peak of 209,431 in Year 1993. Ridership has since declined, which is consistent with overall ridership for the entire Tri-Rail system.
- Ridership at the Palm Beach Airport Station represents 3.0 - 3.5 percent of total Tri-Rail system ridership. Considering that these ridership counts were conducted under an "18 station" condition, the average station ridership is 5.6 percent. Therefore, the Palm Beach Airport Station is generating less ridership than the average Tri-Rail station.
- There is a 15 percent range in monthly ridership at the Palm Beach Airport Station. This indicates that this station is not dramatically sensitive to seasonal peaks. The seasonal peak is the period December - March.
- As there are only two stations located north of the Palm Beach Airport Station, approximately 98 percent of the station's ridership is generated by trips arriving and destined to the south. This may change as additional Tri-Rail stations are added to the north in the future.

According to the LRTP, Tri-Rail is expected to be extended to Jupiter north of Indiantown Road with improved headways to 30 minutes. With the extension of Tri-Rail, approximately five new Tri-Rail stations are anticipated with the possibility of switching from the South Florida Rail Corridor to the FEC Corridor.

2.3 Historical Aviation Activity

The development of demand scenarios for PBIA requires a detailed understanding of the Airport's historical activity patterns and the characteristics of this historical activity as well as the role that the Airport serves in the region's transportation system. This section presents a review of the historical air traffic and passenger enplanement levels, as well as the current air service, to provide a basis for the forecasting analysis.

2.3.1 Airport Role

PBIA currently serves as the primary commercial service airport for Palm Beach County. Ft. Lauderdale-Hollywood International and Miami International Airports are 42 and 63 miles south of PBIA, respectively. In 1997, approximately 5,820,869 passengers used PBIA for commercial air service, ranking the Airport 58th in the U.S. for commercial service passenger activity.

In addition to scheduled commercial service activity, PBIA experiences significant levels of general aviation activity, associated with both business and pleasure flying, as well as cargo activity. General aviation operations account for approximately 53 percent of the 1997 annual activity on the airfield and varies from small single engine piston trainers to multi-engine business jets. All cargo operations represented less than one percent of PBIA's total operations.

2.3.2 Airlines Serving the Airport

Based on 1997 management records, the Airport is served by 13 domestic airlines and four domestic regional airlines. In addition to the domestic scheduled airlines, there are two international passenger

airlines, one cargo operator, and five charter carriers that regularly operate at PBIA. Table II-3.1 lists the scheduled carriers that currently operate at PBIA.

Table II-3.1

Carriers at PBIA

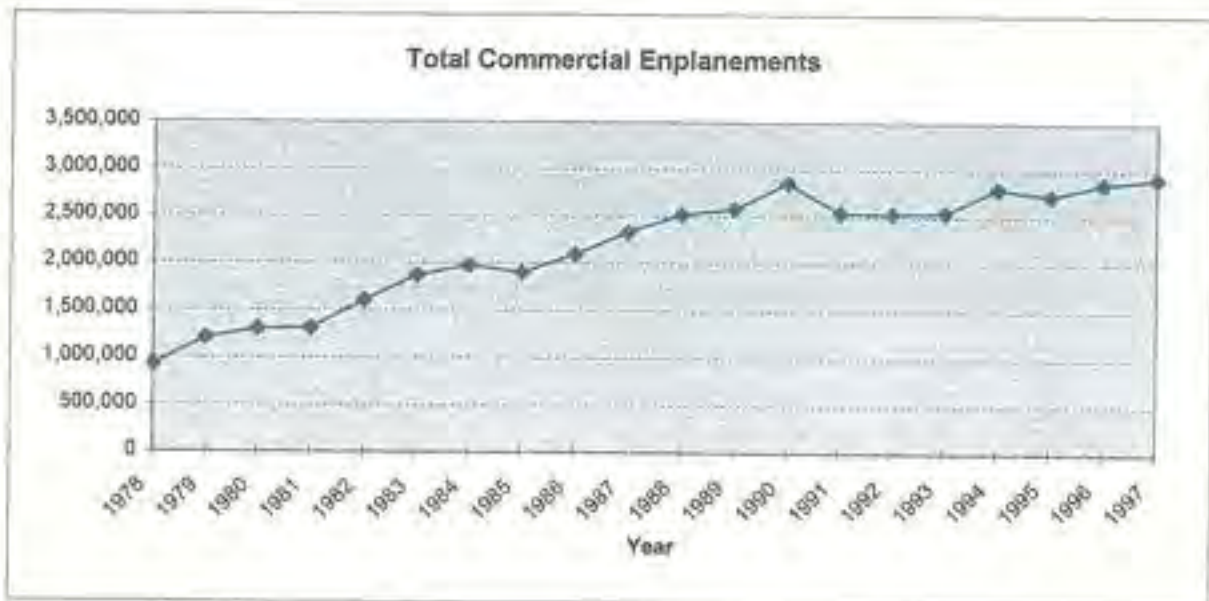
Carrier Name	Category	Type
Air Canada	International	Air Carrier
Air Transat A.T.	International	Charter
AirTran Airlines	Domestic	Air Carrier
America West	Domestic	Air Carrier
American Airlines	Domestic	Air Carrier
American Eagle	Domestic	Commuter
Bahamasair	International	Commuter
Carnival	Domestic	Air Carrier
Casino Airlink	Domestic	Charter
Comair	Domestic	Commuter
Continental Airlines	Domestic	Air Carrier
Gold Transportation	Domestic	Charter
Gulfstream Int'l	Dom & Int'l	Commuter
Henson	Dom & Int'l	Charter
Kiwi Airlines	Domestic	Air Carrier
Laker Airways	International	Air Carrier
Midway Airlines	Domestic	Air Carrier
Northwest Airlines	Domestic	Air Carrier
Paradise Island Airlines	International	Commuter
Reno Air	Domestic	Air Carrier
Royal Aviation	International	Charter
Spirit Airlines	Domestic	Air Carrier
Trans World Airlines	Domestic	Air Carrier
United Airlines	Domestic	Air Carrier
United Parcel Service	Domestic	Cargo
US Airways	Domestic	Air Carrier
US Airways Express	Domestic	Commuter

Source: Airport Management Records, 1998
Prepared by: Ricondo & Associates, Inc., April 1999

2.3.3 Commercial Passenger Activity

A summary of total commercial passenger enplanements at PBIA is shown in Exhibit II-3.1. As shown, enplanements totaled 2,917,014 in 1997, representing a 2.28 percent increase over 1996 levels. For the period from 1978 through 1997, total passengers grew at an annual average rate of 6.3 percent. During this 20-year period, growth was experienced in almost every year, except 1985, 1991, 1992, and 1995. The large decline in 1991 is consistent with the decline in enplanements experienced on a national level as a result of the Gulf War as well as the reduction in operations by Eastern and Pan Am Airlines. Exhibit II-3.2 depicts a summary of the enplanements by category: air carrier domestic and international. As shown in Exhibit II-3.2, domestic enplanements comprise the majority of total enplanements at 98.2 percent. Since 1978, domestic enplanements have roughly ranged within one percentage point of 98.2 percent, with 1989 and 1990 being the only exceptions.

<u>Year</u>	<u>Total Enplanements</u>	<u>% Change</u>
1978	919,580	
1979	1,203,585	30.88%
1980	1,299,838	8.00%
1981	1,304,257	0.34%
1982	1,601,782	22.81%
1983	1,867,794	16.61%
1984	1,972,863	5.63%
1985	1,901,839	-3.60%
1986	2,093,833	10.10%
1987	2,332,750	11.41%
1988	2,518,739	7.97%
1989	2,583,523	2.57%
1990	2,856,757	10.58%
1991	2,541,922	-11.02%
1992	2,534,978	-0.27%
1993	2,544,757	0.39%
1994	2,801,615	10.09%
1995	2,729,122	-2.59%
1996	2,852,014	4.50%
1997	2,917,014	2.28%



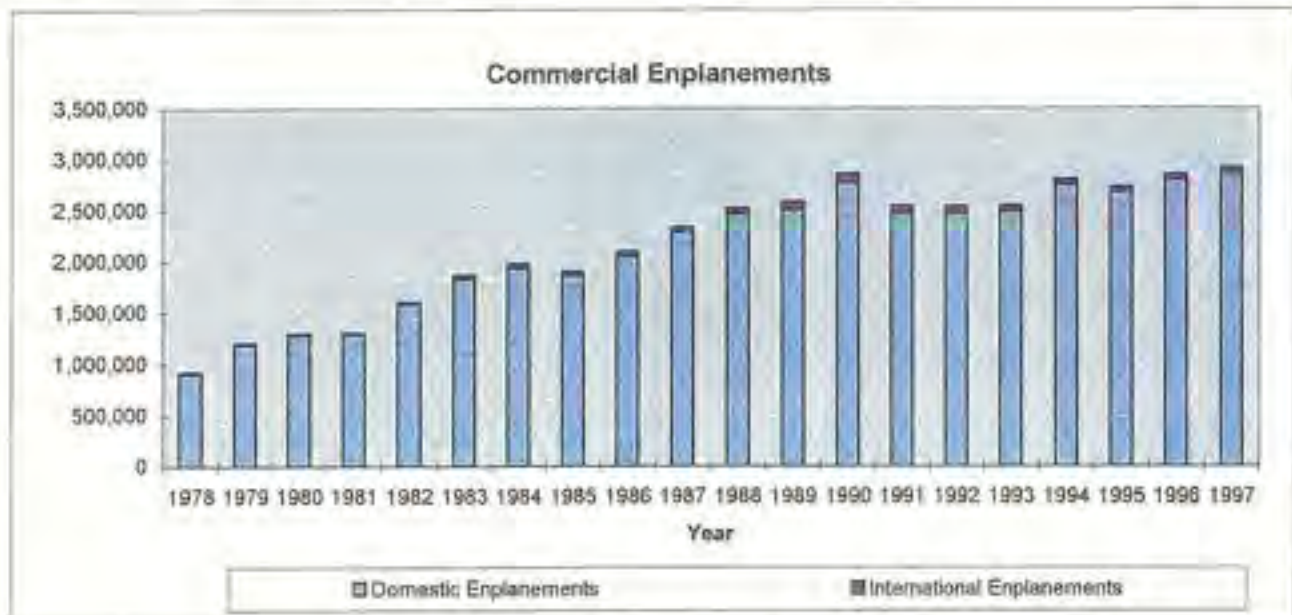
Source: 1979-1988: Airport Traffic Statistics; 1989-1997: Airport Management Records.
 Prepared by: Ricordo & Associates, Inc.

Exhibit II-3.1

Total Commercial Enplanements

Palm Beach International Airport

Year	Domestic Enplanements	Percent of Total	International Enplanements	Percent of Total	Total Enplanements
1978	905,731	98.5%	13,849	1.5%	919,580
1979	1,187,413	98.7%	16,172	1.3%	1,203,585
1980	1,285,865	98.9%	13,973	1.1%	1,299,838
1981	1,292,190	99.1%	12,067	0.9%	1,304,257
1982	1,581,158	98.7%	20,624	1.3%	1,601,782
1983	1,830,553	98.0%	37,241	2.0%	1,867,794
1984	1,931,803	97.9%	41,060	2.1%	1,972,863
1985	1,858,032	97.7%	43,807	2.3%	1,901,839
1986	2,047,847	97.8%	45,986	2.2%	2,093,833
1987	2,285,275	98.0%	47,475	2.0%	2,332,750
1988	2,486,453	97.9%	52,286	2.1%	2,518,739
1989	2,505,122	97.0%	78,401	3.0%	2,583,523
1990	2,764,745	98.8%	92,012	3.2%	2,856,757
1991	2,474,784	97.4%	67,138	2.6%	2,541,922
1992	2,470,387	97.5%	64,591	2.5%	2,534,978
1993	2,492,869	98.0%	51,888	2.0%	2,544,757
1994	2,749,612	98.1%	52,003	1.9%	2,801,615
1995	2,677,452	98.1%	51,670	1.9%	2,729,122
1996	2,797,696	98.1%	54,318	1.9%	2,852,014
1997	2,865,496	98.2%	51,518	1.8%	2,917,014



Source: 1979-1988: Airport Traffic Statistics; 1989-1997: Airport Management Records.
Prepared by: Ricondo & Associates, Inc.

Exhibit II-3.2

Commercial Enplanements

Domestic air carrier enplanements have grown from a level of 1,285,865 in 1980 to the 1997 level of 2,865,496, representing average annual growth of 4.8 percent. With the exception of 1985, 1991, 1992, and 1995, which experienced declines in enplanements consistent with national trends, each year during this period experienced positive growth over the preceding year. **Exhibit II-3.3** depicts both the growth in domestic air carrier enplanements at PBIA and for the nation. As shown in Exhibit II-3.3, PBIA's level of activity has fluctuated in comparison to that of the nations.

International enplanements have more than tripled between 1980 and 1997; however, total growth in international enplanements has experienced fluctuations similar to domestic enplanements.

Exhibit II-3.4 compares PBIA international traffic with international enplanements for the nation. As shown, the fluctuations in the growth of international enplanements at PBIA have varied as a percentage of the national activity level. PBIA international activity, at its peak in 1990, represented approximately 0.2 percent of the international enplanements for the nation. In more recent years, the international enplanements at PBIA have represented closer to 0.1 percent of the international enplanements for the U.S.

2.3.4 Connecting Passenger Activity

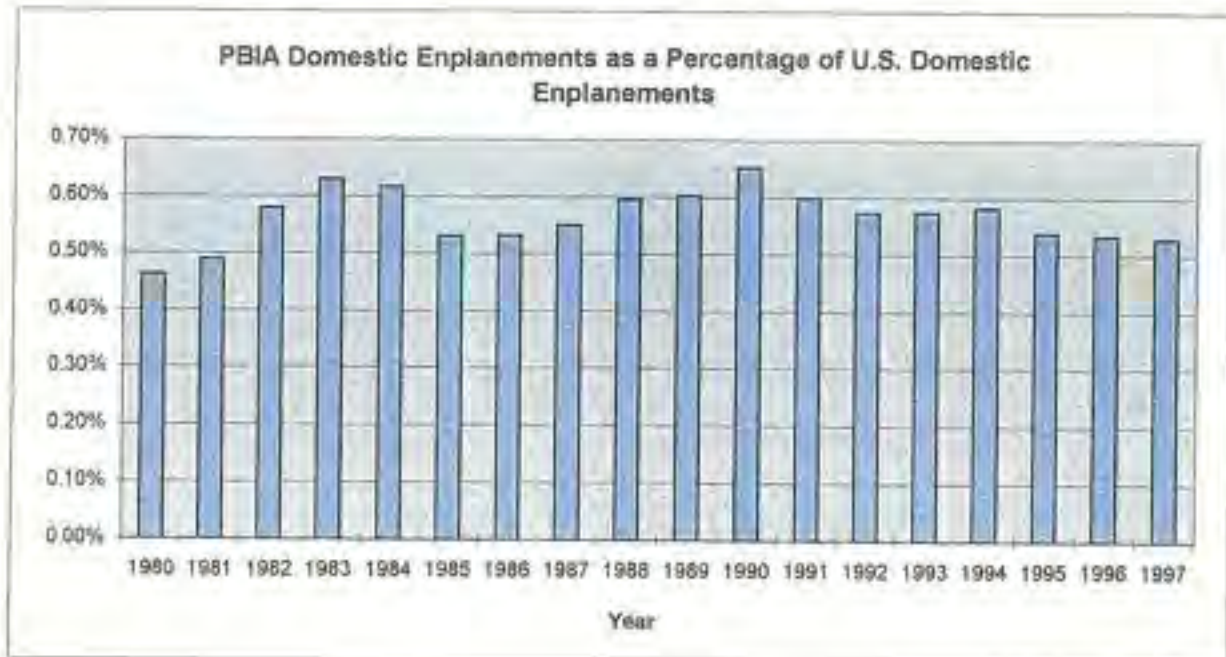
Exhibit II-3.5 compares the level of originating passenger enplanements as reported by USDOT to the level of total passenger enplanements obtained from airport management records to provide an estimate of the level of connecting activity experienced at the Airport. USDOT's reported origin-destination traffic is obtained from a continuous 10 percent ticket survey of Large Certificated Air Carriers and provides an estimate of the number of passengers originating their trip from Palm Beach as well as their ultimate destination. The total passenger count is submitted to the Airport by the individual carriers. As shown in Exhibit II-3.5, connecting activity has ranged from approximately 3.8 percent to 17.7 percent during the last 20 years with the last seven years reporting in the 3.8 percent to 6.4 percent range. Since PBIA is not a major hub facility, the source of this connecting traffic is likely associated with connection between airlines, primarily from short stage length commuter routes to longer haul air carrier routes. In addition, depending on the reporting practices of the various airlines serving the Airport, some of this activity is likely associated with through passenger activity (i.e., passengers passing through PBIA on single flight service to another destination).

2.3.5 Origin and Destination Patterns

Table II-3.2 depicts the top 100 destination markets for PBIA based on a year ending first quarter of 1998. This data provides the non-stop miles for each market, the local O&D passengers, the number of zero fare passengers, the average fares, the number of enplaned passengers that flew on each leg as a domestic portion of an international trip, and the number of trips initiated from PBIA. As shown, New York (La Guardia and Newark International) and Boston (Boston Logan International) are the top two markets, accounting for approximately 30 percent of all passengers originating at PBIA. **Table II-3.7** shows the service levels (frequencies and seats) for the top 100 markets for the 1998 winter schedule (March 1-7) as well as the number of local roundtrip O&D passengers.

Palm Beach International Airport

Year	PBIA Domestic Enplanements	% Change	U.S. Domestic Enplanements	% Change	PBIA Enplanements as a % of U.S. Enplanements
1980	1,285,865		278,200,000		0.46%
1981	1,292,190	0.49%	264,700,000	-4.85%	0.49%
1982	1,581,158	22.36%	272,800,000	3.06%	0.58%
1983	1,830,553	15.77%	290,700,000	6.56%	0.63%
1984	1,931,803	5.53%	313,400,000	7.81%	0.62%
1985	1,858,032	-3.82%	350,400,000	11.81%	0.53%
1986	2,047,847	10.22%	385,200,000	9.93%	0.53%
1987	2,285,275	11.59%	415,500,000	7.87%	0.55%
1988	2,466,453	7.93%	414,200,000	-0.31%	0.60%
1989	2,505,122	1.57%	415,600,000	0.34%	0.60%
1990	2,764,745	10.36%	424,100,000	2.05%	0.65%
1991	2,474,784	-10.49%	413,300,000	-2.55%	0.60%
1992	2,470,387	-0.18%	430,300,000	4.11%	0.57%
1993	2,492,869	0.91%	434,000,000	0.86%	0.57%
1994	2,749,612	10.30%	472,100,000	8.78%	0.58%
1995	2,677,452	-2.62%	496,300,000	5.13%	0.54%
1996	2,797,696	4.49%	524,500,000	5.68%	0.53%
1997	2,865,496	2.42%	542,300,000	3.39%	0.53%



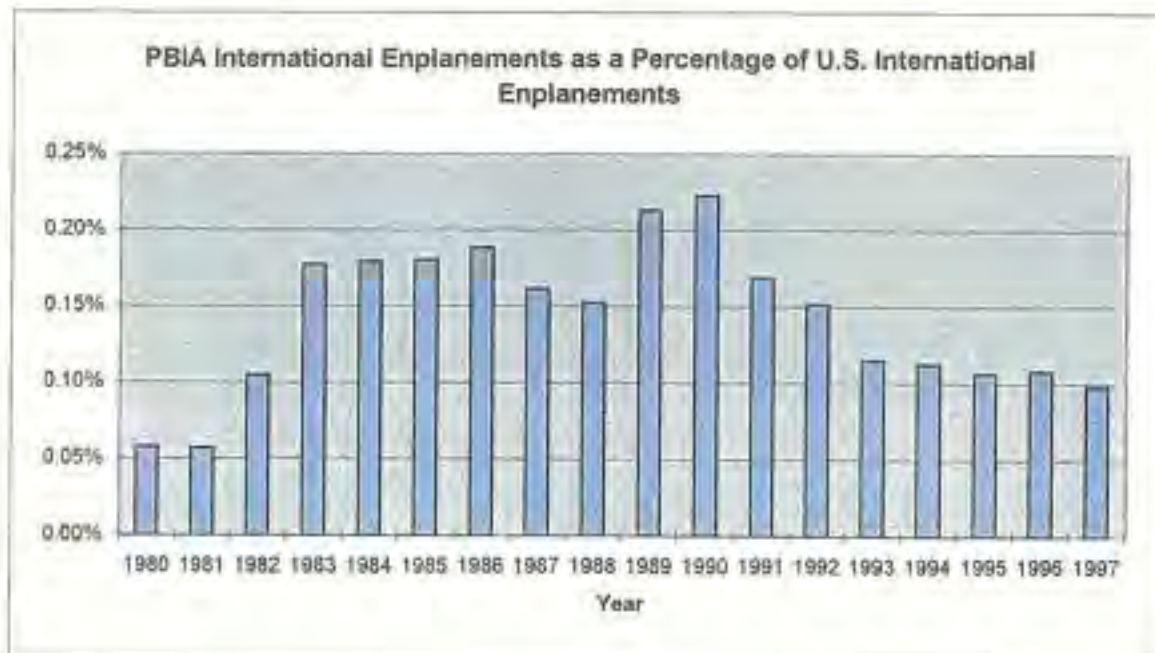
Source: 1979-1986: Airport Traffic Statistics; 1989-1997: Airport Management Records.
Prepared by: Federal Aviation Administration.

Exhibit II-3.3

Domestic Air Carrier Enplanements

Palm Beach International Airport

Year	International Enplanements	% Change	U.S. Commercial Air Carriers International Enplanements	% Change	PBIA Int'l Enplanements as a % of U.S. Int'l Enplanements
1980	13,973		24,200,000		0.06%
1981	12,067	-13.84%	21,100,000	-12.81%	0.06%
1982	20,624	70.91%	19,700,000	-6.64%	0.10%
1983	37,241	80.57%	21,000,000	6.60%	0.18%
1984	41,060	10.25%	22,900,000	9.05%	0.18%
1985	43,807	6.69%	24,300,000	6.11%	0.18%
1986	45,986	4.97%	24,400,000	0.41%	0.19%
1987	47,475	3.24%	29,400,000	20.49%	0.16%
1988	52,286	10.13%	34,300,000	16.67%	0.15%
1989	78,401	49.95%	36,800,000	7.29%	0.21%
1990	92,012	17.36%	41,300,000	12.23%	0.22%
1991	67,138	-27.03%	39,700,000	-3.87%	0.17%
1992	64,591	-3.79%	42,800,000	7.30%	0.15%
1993	51,888	-19.67%	45,200,000	6.10%	0.11%
1994	52,003	0.22%	46,300,000	2.43%	0.11%
1995	51,670	-0.64%	48,600,000	4.97%	0.11%
1996	54,318	5.12%	50,300,000	3.50%	0.11%
1997	51,518	-5.15%	52,500,000	4.37%	0.10%



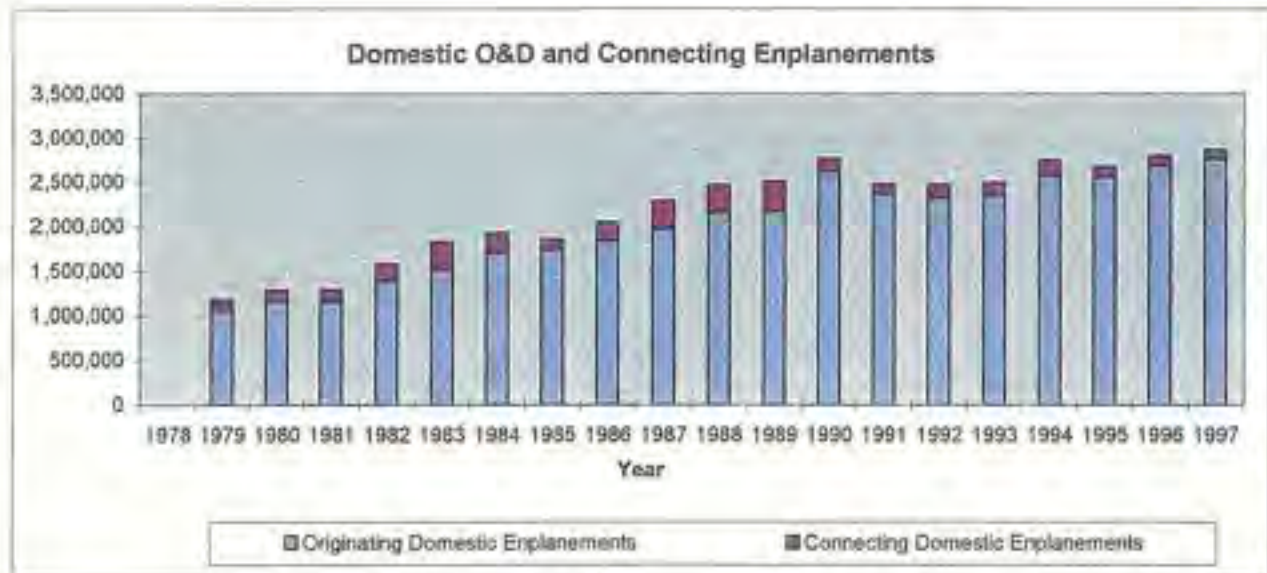
Source: 1979-1988: Airport Traffic Statistics; 1989-1997: Airport Management Records.
Prepared by: Federal Aviation Administration.

Exhibit II-3.4

International Enplanements

Palm Beach International Airport

Year	Originating Domestic Enplanements	Percent of Total	Connecting Domestic Enplanements	Percent of Total	Total Domestic Enplanements
1978	n/a		n/a		905,731
1979	1,057,720	89.08%	129,593	10.92%	1,187,413
1980	1,150,580	90.25%	125,285	9.74%	1,285,865
1981	1,147,240	88.78%	144,950	11.22%	1,292,190
1982	1,388,180	87.80%	192,978	12.20%	1,581,158
1983	1,506,580	82.30%	323,973	17.70%	1,830,553
1984	1,700,560	88.03%	231,243	11.97%	1,931,803
1985	1,740,770	93.69%	117,262	6.31%	1,858,032
1986	1,840,240	89.86%	207,607	10.14%	2,047,847
1987	1,968,230	86.13%	317,045	13.87%	2,285,275
1988	2,157,940	87.49%	308,513	12.51%	2,466,453
1989	2,171,460	86.68%	333,662	13.32%	2,505,122
1990	2,623,750	94.90%	140,995	5.10%	2,764,745
1991	2,371,670	95.83%	103,114	4.17%	2,474,784
1992	2,330,300	94.33%	140,087	5.67%	2,470,387
1993	2,345,870	94.10%	146,999	5.90%	2,492,869
1994	2,573,780	93.61%	175,832	6.39%	2,749,612
1995	2,553,570	95.37%	123,882	4.63%	2,677,452
1996	2,685,240	95.98%	112,456	4.02%	2,797,696
1997	2,757,840	96.24%	107,656	3.75%	2,865,496



Source: 1979-1988: Airport Traffic Statistics; 1989-1997: Airport Management Records.
Prepared by: Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT.

Exhibit II-3.5

Connecting Ratios

Table II-3.2

Top 100 Destination Markets

Airport	Market	Nonstop Miles	Local O&D Passengers	Zero Fare Passengers	%	Average Fare	Fared		Domestic Portion of International Trip	%	Trips Initiated	
							Passenger Average Fare				From PBI	%
LGA	New York	1,035	855,030	46,950	5.50%	\$ 121.76	\$ 128.84		7,370	0.90%	255,920	29.90%
EWR	New York	1,024	599,900	26,790	4.50%	\$ 124.09	\$ 129.89		10,920	1.80%	179,380	29.90%
BOS	Boston	1,197	354,960	18,090	5.10%	\$ 123.92	\$ 130.58		4,070	1.10%	115,680	32.60%
ATL	Atlanta	545	293,420	5,280	1.80%	\$ 97.10	\$ 98.88		42,040	14.30%	131,330	44.80%
PHL	Philadelphia	951	248,020	12,530	5.10%	\$ 122.28	\$ 128.79		9,070	3.70%	79,060	31.90%
BDL	Hartford Ct/Springfield	1,133	228,800	7,290	3.20%	\$ 114.54	\$ 118.34		330	0.10%	73,550	32.40%
ORD	Chicago(O'Hare)	1,144	175,240	16,220	9.30%	\$ 152.04	\$ 167.54		5,390	3.10%	57,220	32.70%
DCA	Washington	857	153,510	5,430	3.50%	\$ 121.39	\$ 125.84		1,360	0.90%	61,520	40.10%
DTW	Detroit	1,087	125,400	11,560	9.20%	\$ 132.36	\$ 145.80		9,470	7.60%	40,550	32.30%
PIT	Pittsburgh	952	92,700	6,650	7.20%	\$ 127.63	\$ 137.49		5,290	5.70%	35,150	37.90%
DFW	Dallas/Fort Worth	1,103	89,480	6,640	7.40%	\$ 156.51	\$ 189.06		5,800	6.50%	39,720	44.40%
BWI	Baltimore	883	87,070	4,210	4.80%	\$ 111.49	\$ 117.15		1,450	1.70%	29,090	33.40%
ISP	Islip	1,052	86,510	770	0.90%	\$ 132.67	\$ 133.86		20	0.00%	40,410	46.70%
TPA	Tampa	174	88,920	340	0.50%	\$ 78.26	\$ 78.64		590	0.90%	34,010	49.30%
LAX	Los Angeles	2,330	67,680	9,880	14.60%	\$ 181.58	\$ 212.62		5,080	7.50%	35,140	51.90%
PVD	Providence	1,148	65,990	2,720	4.10%	\$ 115.14	\$ 120.09		370	0.60%	21,210	32.10%
CLE	Cleveland	1,020	55,380	4,200	7.60%	\$ 134.58	\$ 145.63		210	0.40%	17,780	32.10%
RDU	Raleigh/Durham	838	53,610	1,930	3.60%	\$ 116.49	\$ 120.84		200	0.40%	21,900	40.90%
DEN	Denver	1,679	52,760	8,040	15.20%	\$ 169.34	\$ 199.79		140	0.30%	31,870	60.40%
CLT	Charlotte	590	50,230	2,060	4.10%	\$ 144.40	\$ 150.58		710	1.40%	21,830	43.50%
MCO	Orlando	142	47,800	180	0.40%	\$ 61.78	\$ 62.02		710	1.50%	29,280	61.30%
SFO	San Francisco	2,567	47,730	9,480	19.90%	\$ 196.67	\$ 245.41		1,540	3.20%	26,700	55.90%
LAS	Las Vegas	2,158	43,550	5,120	11.80%	\$ 156.44	\$ 177.28		30	0.10%	38,120	87.50%
CVG	Cincinnati	892	42,700	2,940	6.90%	\$ 145.23	\$ 155.97		7,850	18.40%	16,040	37.60%
ALB	Albany	1,163	41,700	2,340	5.60%	\$ 118.72	\$ 125.77		100	0.20%	14,240	34.10%
CMH	Columbus	931	40,860	1,760	4.30%	\$ 109.05	\$ 113.99		270	0.70%	12,430	30.60%
BUF	Buffalo	1,123	39,490	2,610	6.60%	\$ 114.59	\$ 122.70		170	0.40%	14,340	36.30%
MIKE	Milwaukee	1,205	37,430	1,790	4.80%	\$ 105.65	\$ 110.95		70	0.20%	13,170	35.20%
PHX	Phoenix	1,960	36,670	4,510	12.30%	\$ 166.67	\$ 190.04		130	0.40%	22,680	61.80%
MSP	Minneapolis/St. Paul	1,451	36,070	4,580	12.70%	\$ 185.55	\$ 212.54		2,150	6.00%	14,260	39.50%
ROC	Rochester	1,141	35,100	2,500	7.10%	\$ 118.55	\$ 127.64		110	0.30%	10,450	29.80%
SYR	Syracuse	1,155	34,630	2,460	7.10%	\$ 118.70	\$ 127.78		150	0.40%	11,230	32.40%
IND	Indianapolis	967	32,540	1,300	4.00%	\$ 114.18	\$ 118.93		160	0.50%	12,200	37.50%
STL	St. Louis	1,023	31,620	4,270	13.50%	\$ 174.05	\$ 201.23		490	1.50%	10,580	33.50%
SEA	Seattle/Tacoma	2,690	31,480	5,010	15.90%	\$ 202.80	\$ 241.19		820	2.60%	16,080	51.10%
SWF	Newburgh	1,077	31,330	1,070	3.40%	\$ 110.17	\$ 114.07		70	0.20%	9,850	31.40%
JFK	New York	1,028	30,490	1,330	4.40%	\$ 110.15	\$ 115.17		5,240	17.20%	6,150	20.20%
SAN	San Diego	2,257	30,320	3,850	12.70%	\$ 177.16	\$ 202.93		80	0.30%	17,020	56.10%
IAH	Houston	956	29,060	2,640	9.10%	\$ 145.84	\$ 160.41		1,890	6.50%	13,030	44.80%
BNA	Nashville	758	28,470	790	2.80%	\$ 134.34	\$ 138.17		50	0.20%	14,290	50.20%
IAD	Washington	858	27,530	930	3.40%	\$ 115.37	\$ 119.40		220	0.80%	9,420	34.20%
MCI	Kansas City	1,212	25,180	1,500	6.00%	\$ 134.94	\$ 143.49		90	0.40%	8,900	35.30%
TLH	Tallahassee	364	23,160	190	0.80%	\$ 138.61	\$ 139.76		60	0.30%	10,820	46.70%
SDF	Louisville	858	22,480	830	3.70%	\$ 108.52	\$ 112.68		150	0.70%	7,460	33.20%
ORF	Norfolk/Va. Beach/Wmbg	740	21,780	850	3.90%	\$ 126.98	\$ 132.14		320	1.50%	9,290	42.70%
SNA	Orange County	2,298	19,890	2,480	12.50%	\$ 174.48	\$ 199.33		20	0.10%	9,860	49.60%
RIC	Richmond/Wmbg	763	19,800	860	4.30%	\$ 146.36	\$ 153.00		280	1.40%	7,080	35.80%
MEM	Memphis	822	19,540	600	3.10%	\$ 131.64	\$ 135.81		20	0.10%	8,830	45.20%
DAY	Dayton	941	19,430	750	3.90%	\$ 123.30	\$ 128.25		70	0.40%	7,410	38.10%
MSY	New Orleans	659	18,910	760	4.00%	\$ 139.97	\$ 145.83		70	0.40%	12,730	67.30%
PWM	Portland	1,292	18,700	1,090	5.80%	\$ 122.10	\$ 129.65		230	1.20%	7,990	42.70%
MHT	Manchester	1,222	18,170	830	4.60%	\$ 108.62	\$ 113.82		50	0.30%	5,860	32.30%
GRR	Grand Rapids	1,158	16,010	1,510	9.40%	\$ 132.83	\$ 146.66		70	0.40%	5,480	34.20%
AUS	Austin	1,099	15,490	1,140	7.40%	\$ 148.21	\$ 159.99		70	0.50%	6,490	41.90%
SLC	Salt Lake City	2,061	15,040	2,560	17.00%	\$ 179.64	\$ 216.49		1,450	9.60%	10,330	68.70%
BTW	Burlington	1,286	15,010	1,010	6.70%	\$ 121.08	\$ 129.81		130	0.90%	5,910	39.40%
JAX	Jacksonville	279	14,560	60	0.40%	\$ 112.46	\$ 112.92		440	3.00%	6,130	42.10%
MDT	Harrisburg	951	14,310	540	3.80%	\$ 118.88	\$ 123.54		40	0.30%	4,610	32.20%
SAT	San Antonio	1,138	14,210	630	4.40%	\$ 168.69	\$ 176.52		40	0.30%	8,660	60.90%
GSO	Greensboro/H.PI/Win-Salem	648	13,530	750	5.50%	\$ 156.92	\$ 166.13		30	0.20%	6,130	45.30%
ABE	Allentown	999	13,150	710	5.40%	\$ 116.02	\$ 122.64		20	0.20%	4,220	32.10%
BHM	Birmingham	619	12,550	400	3.20%	\$ 165.19	\$ 170.63		70	0.60%	5,580	44.50%
slc	San Jose	2,541	12,230	2,310	18.90%	\$ 244.08	\$ 300.92		60	0.50%	5,280	43.20%

Table II-3.2
Top 100 Destination Markets

Airport	Market	Nonstop Miles	Local O&D Passengers	Zero Fare Passengers	%	Average Fare	Fare		Domestic Portion of International Trip	%	Trips Initiated	
							Passenger Average Fare	Domestic Portion of International Trip			From PBI	%
PDX	Portland	2,669	12,220	2,540	20.80%	\$ 208.06	\$ 262.66	1,290	10.60%		5,620	46.00%
AVL	Asheville	620	11,950	560	4.70%	\$ 116.14	\$ 121.85	40	0.30%		7,850	65.70%
CAK	Akron/Canton	984	11,360	120	1.10%	\$ 108.16	\$ 109.31	0	0.00%		4,300	37.90%
TYS	Knoxville	670	11,250	650	5.80%	\$ 148.16	\$ 157.24	140	1.20%		5,380	47.80%
ABQ	Albuquerque	1,671	10,720	1,300	12.10%	\$ 155.49	\$ 176.94	30	0.30%		5,750	53.60%
MDW	Chicago	1,128	10,300	10	0.10%	\$ 119.69	\$ 119.81	0	0.00%		3,720	36.10%
LEX	Lexington	825	9,910	400	4.00%	\$ 112.95	\$ 117.70	20	0.20%		3,180	32.10%
AVP	Wilkes-Barre/Scranton	1,040	9,870	430	4.40%	\$ 124.19	\$ 129.85	20	0.20%		3,430	34.80%
GSP	Greenville/Spartanburg	580	9,480	560	5.90%	\$ 164.95	\$ 175.30	40	0.40%		3,850	40.60%
BGR	Bangor	1,398	8,590	340	4.00%	\$ 128.86	\$ 134.17	50	0.60%		4,250	49.50%
SBN	South Bend	1,094	8,490	600	7.10%	\$ 132.83	\$ 142.93	50	0.60%		3,420	40.30%
TOL	Toledo	1,049	7,920	370	4.70%	\$ 122.53	\$ 128.54	30	0.40%		3,000	37.90%
CHS	Charleston	428	7,560	310	4.10%	\$ 159.87	\$ 166.70	110	1.50%		4,020	53.20%
RNO	Reno	2,442	7,250	1,190	16.40%	\$ 179.24	\$ 214.43	10	0.10%		5,700	78.60%
MSN	Madison	1,248	7,130	630	8.80%	\$ 125.13	\$ 137.26	10	0.10%		2,540	35.60%
HNL	Honolulu	4,858	7,110	1,720	24.20%	\$ 287.82	\$ 379.67	250	3.50%		5,300	74.50%
TUS	Tucson	1,891	7,100	1,050	14.80%	\$ 179.42	\$ 210.55	30	0.40%		4,240	59.70%
SMF	Sacramento	2,531	7,030	990	14.10%	\$ 181.46	\$ 211.20	10	0.10%		2,980	42.40%
HPN	Westchester County	1,057	6,800	390	5.70%	\$ 128.22	\$ 136.02	30	0.40%		2,910	42.80%
OKC	Oklahoma City	1,197	6,390	350	5.50%	\$ 148.82	\$ 157.44	10	0.20%		2,680	41.90%
ONT	Ontario	2,284	6,350	800	12.60%	\$ 186.29	\$ 213.14	10	0.20%		2,780	43.80%
PNS	Pensacola	504	6,290	190	3.00%	\$ 151.82	\$ 156.55	140	2.20%		3,460	55.00%
OAK	Oakland	2,559	6,210	1,330	21.40%	\$ 172.68	\$ 219.74	10	0.20%		2,720	43.80%
CAE	Columbia	504	6,200	220	3.50%	\$ 173.90	\$ 180.29	80	1.30%		3,000	48.40%
OMA	Omaha	1,351	6,140	330	5.40%	\$ 188.67	\$ 199.38	40	0.70%		2,470	40.20%
LAN	Lansing	1,138	6,050	390	6.40%	\$ 116.52	\$ 124.55	0	0.00%		2,000	33.10%
FNT	Flint	1,141	6,040	130	2.20%	\$ 113.24	\$ 115.73	0	0.00%		2,190	36.30%
MBS	Saginaw	1,183	6,030	340	5.60%	\$ 125.99	\$ 133.52	30	0.50%		1,830	30.30%
TUL	Tulsa	1,138	6,020	510	8.50%	\$ 181.18	\$ 197.95	10	0.20%		2,350	39.00%
Cos	Colorado Springs	1,651	5,920	960	16.20%	\$ 175.49	\$ 209.46	10	0.20%		3,150	53.20%
ROA	Roanoke	733	5,780	470	8.10%	\$ 135.64	\$ 147.65	40	0.70%		2,430	42.00%
ERI	Erie	1,061	5,720	200	3.50%	\$ 121.62	\$ 126.03	20	0.30%		2,220	38.80%
HSV	Huntsville/Decatur	677	5,460	220	4.00%	\$ 200.89	\$ 209.32	10	0.20%		2,660	48.70%
BGM	Binghamton	1,095	5,400	310	5.70%	\$ 126.44	\$ 134.14	20	0.40%		1,980	36.70%
JAN	Jackson	715	5,340	240	4.50%	\$ 160.93	\$ 168.50	20	0.40%		2,440	45.70%
SAV	Savannah	381	5,290	160	3.00%	\$ 151.51	\$ 156.24	60	1.10%		3,070	58.00%
MOB	Mobile	566	5,180	150	2.90%	\$ 133.59	\$ 137.57	30	0.60%		2,460	47.30%

Source: Passenger Air Service Demand Analysis, GKM Consulting Services, Inc., October 1998
Prepared by: Ricondo & Associates, Inc., November 1998

Table II-3.3

Markets With Existing Nonstop Service

Airport	Market	Existing Weekly Service - March 1-7, 1998						U.S. DOT Origin - Destination			
		Nonstop Miles	Nonstop (Roundtrip)		One-Stop (One-Way)		Survey - YE 1098		Roundtrip Onboard Passengers	Local O&D	
			Frequencies	Seats	Frequencies	Seats	R/T Local O&I	R/T Passengers Per Week		Passengers As A Percent of Onboard	
CMH	Columbus	931	10	1,320	7	749	40,660	782	14,338		283.60%
JAX	Jacksonville	279	58	1,102	12	336	14,560	280	5,577		261.10%
BDL	Hartford Ct/Springfield	1,133	28	5,040	0	0	226,800	4,362	102,686		220.90%
CLE	Cleveland	1,020	16	2,002	7	994	55,360	1,065	26,773		206.80%
BOS	Boston	1,197	68	10,816	1	150	354,960	6,826	225,288		157.60%
ISP	Islip	1,052	28	4,438	0	0	86,510	1,664	68,424		126.40%
BWI	Baltimore	883	28	3,080	7	896	87,070	1,674	70,187		124.10%
JFK	New York	1,028	14	1,848	7	994	30,490	586	26,648		114.40%
LGA	New York	1,035	280	40,888	0	0	855,030	16,443	843,621		101.40%
ORD	Chicago(O'Hare)	1,144	72	10,554	7	976	175,240	3,370	178,598		98.10%
EWB	New York	1,024	238	35,102	8	1,172	599,900	11,537	627,046		95.70%
STL	St. Louis	1,023	16	2,112	7	924	31,620	608	38,670		81.80%
PHL	Philadelphia	951	112	15,316	14	2,037	248,020	4,770	317,967		78.00%
DCA	Washington	857	70	8,960	14	1,708	153,510	2,952	207,860		73.90%
DTW	Detroit	1,087	100	13,932	7	994	125,400	2,412	219,282		57.20%
RDU	Raleigh/Durham	638	60	5,880	0	0	53,610	1,031	97,520		55.00%
PIT	Pittsburgh	952	70	9,394	0	0	92,700	1,783	188,448		49.20%
IAH	Houston	956	42	5,282	7	973	29,060	559	67,959		42.80%
MCO	Orlando	142	260	11,870	0	0	47,800	919	128,129		37.30%
CVG	Cincinnati	892	56	7,952	0	0	42,700	821	149,672		28.50%
ATL	Atlanta	545	324	58,372	0	0	293,420	5,643	1,052,198		27.90%
DFW	Dallas/Fort Worth	1,103	154	22,106	0	0	89,480	1,721	350,678		25.50%
CLT	Charlotte	590	126	17,108	0	0	50,230	966	349,071		14.40%

Source: Passenger Air Service Demand Analysis, GKMG Consulting Services, Inc., October 1998

Prepared by: Ricondo & Associates, Inc.

2.3.6 Service Patterns

As shown previously in Table II-3.3, PBIA currently has non-stop service between 23 U.S. destinations. With the exception of the Dallas and Houston markets, all PBIA non-stop markets are east of the Mississippi River. Currently, nine out of the 100 top markets that average at least 100 passengers per day each way are without non-stop air service and are listed in Table II-3.4. Exhibit II-3.6 graphically depicts the non-stop domestic service patterns from PBIA, while Exhibit II-3.7 depicts the largest markets without non-stop air service. International service at PBIA is limited to flights to/from Toronto, Canada and Nassau, Treasure Cay, Marsh Harbour, and Freeport in the Bahamas.

Table II-3.4

Non-stop Markets: Comparison of O&D Passengers to Seats

PBIA To/From	Local O & D Passengers as a % of Non-stop Seats
Hartford	124.1%
Boston	89.1%
Baltimore	72.5%
New York-LGA	60.2%
Chicago-ORD	54.2%
Islip	50.0%
Washington-DCA	48.0%
Newark	46.8%

Source: Passenger Air Service Demand Analysis, GKM Consulting Services, Inc., October 1998
Prepared by: Ricondo & Associates, Inc., April 1999

2.3.7 Total Aircraft Operations

Exhibit II-3.8 depicts the total aircraft operations at PBIA for the period 1979 through 1997. During this period, operations at the Airport have decreased from 271,674 annual operations in 1979 to 202,085 in 1997. This represents a 1.6 percent average annual decrease in operations over this period. While 1979 represented the peak year for this period, the 201,779 annual operations in 1995 represented the 18-year low.

While overall traffic has steadily decreased since 1979, commercial traffic, including air carrier and commuter, has shown steady growth. The air taxi industry has also been a growing source of commercial non-scheduled operations at the Airport. Air Carrier activity has grown from 49,257 annual operations in 1979 to 74,098 annual operations in 1997. Annual air carrier and commuter operations peaked at 91,771 in 1990 before falling off to 77,225 in 1991. The most recent cycle in air carrier and commuter activity peaked at 78,642 operations in 1996, but only trailed off to 74,098 in 1997. The decrease in 1991 is consistent with a nation wide decrease due to the Persian Gulf War. Between 1992 and 1996, traffic appeared to be on a general rise; however, air carrier and commuter activity fell off again in 1997. Some of this decrease may be due, in part, to the introduction of low cost service by Southwest Airlines in January 1996 at nearby Fort Lauderdale-Hollywood International Airport.



Source: Domestic and International Passenger Air Service Study, GKM Consulting Services, Inc., November 1998
Prepared By: Ricondo & Associates, Inc.

Exhibit II-3.7



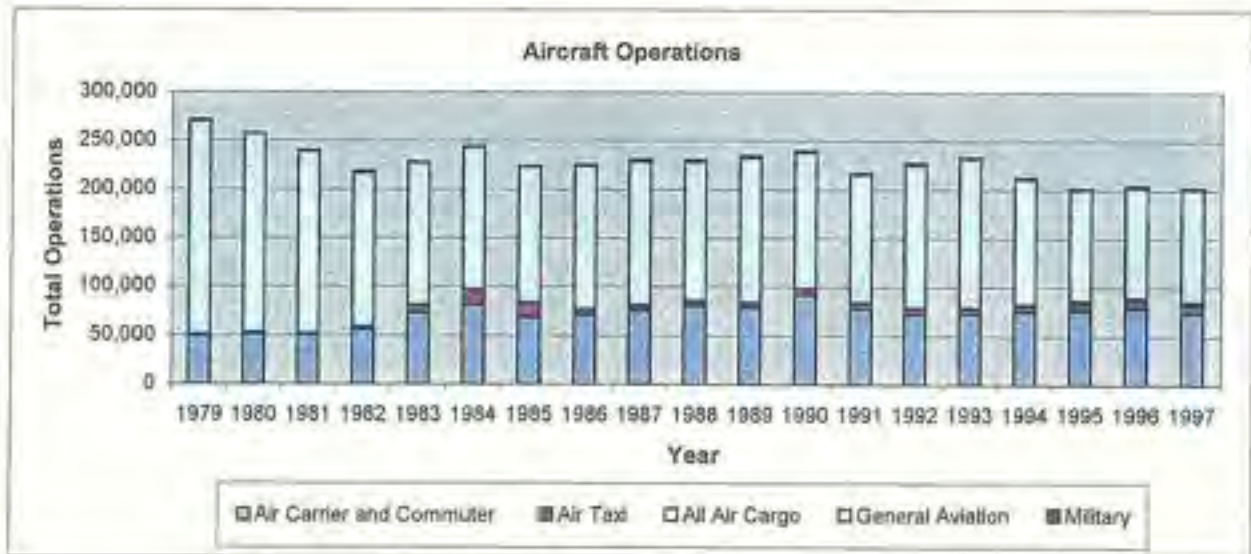
North
Not To Scale

Largest PBIA Markets Without Non-Stop Service

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Year	Air Carrier and Commuter	Air Taxi	All Air Cargo	General Aviation	Military	Total
1979	49,257	1,271	n/a	220,076	1,070	271,674
1980	50,982	1,979	n/a	203,995	831	257,787
1981	50,389	1,285	n/a	187,491	1,028	240,171
1982	55,397	3,408	n/a	158,262	1,395	218,462
1983	73,153	7,837	n/a	146,372	1,195	228,557
1984	80,909	15,208	n/a	147,212	846	244,265
1985	68,829	14,080	n/a	140,431	994	224,334
1986	71,321	5,699	n/a	147,074	1,276	225,370
1987	75,844	4,522	n/a	148,836	1,831	231,033
1988	80,862	4,036	n/a	143,841	2,157	230,896
1989	78,908	4,442	n/a	149,349	2,089	234,788
1990	91,771	6,206	n/a	140,345	1,869	239,991
1991	77,225	6,044	n/a	132,024	1,721	217,014
1992	72,396	6,328	n/a	146,645	2,127	227,496
1993	73,031	5,807	n/a	163,075	1,648	233,561
1994	75,532	5,774	542	129,270	1,522	212,640
1995	76,373	7,694	1,463	114,617	1,632	201,779
1996	78,642	8,450	1,501	114,422	1,349	204,364
1997	74,098	8,562	1,745	116,480	1,200	202,085

n/a: not available



Source: 1979-1988: Airport Traffic Statistics; 1989-1997: Airport Management Records.
Prepared by: Ricondo & Associates, Inc.

Exhibit II-3.8

Historical Aircraft Operations

Air taxi operations have grown at a rate of approximately 4.2 percent per year for the 1979 to 1997 period. In more recent years (1990-1997), the growth in air taxi operations has averaged just under 5.4 percent per year. Air taxi operations are typically on-call charter operations conducted by small, medium, and large fixed based operators. Fractional ownership groups like Executive Jet, NetJets, and others use registered call signs and typically show up as air taxi operations. Fractional ownership groups have been identified as major contributor to the resurgence in corporate and air taxi activity.

General aviation activity has declined from 220,076 annual operations in 1979 to 116,480 in 1997. This represents a 47 percent decrease in activity. The trend towards decreased general aviation activity is consistent with the national trend. It is likely that the large decline in general aviation activity between 1993 and 1995 was due, in part, to the opening of the North County General Aviation Airport in May 1994.

2.3.8 Cargo Activity

In 1978, PBIA enplaned approximately 3,452 tons of air cargo, approximately 1,972 tons of which were freight/express and 1,481 tons were mail. **Exhibit II-3.9** depicts the freight and mail activity at PBIA for the period 1978 through 1997. As shown, enplaned freight grew at a steady pace from 1978 to 1993, with only a two years of declining tonnage (1984 and 1992). Freight tonnage since 1993 has increased at an average annual rate of 15.1 percent, with 1997 representing the only year with a decrease in freight traffic. Historically, 98 percent of the freight enplaned has been domestic, with the exception of 1996 when it represented approximately only 75 percent of total enplaned freight. **Exhibit II-3.10** shows a comparison of the enplaned domestic and international freight for the period 1978 through 1997. As shown, international freight represents a small percentage of the total enplaned freight at PBIA.

Mail tonnage for the period 1978 through 1985 was relatively consistent, ranging from 932 tons to 1,481 tons a year. As shown in **Exhibit II-3.11**, PBIA does not regularly handle international mail.

2.4 User Surveys

As part of the Study, the following surveys were conducted:

- Airline Planning Questionnaire
- Airport Tenant Survey
- Air Cargo Survey and Freight Forwarder Survey
- Fixed Base Operator (FBO) Survey
- Concessionaire Survey
- Car Rental Survey

These survey instruments were distributed in October of 1998. The results of the survey efforts are used throughout the study to support various analyses. In many cases, individual airline or other tenant responses are not disclosed due to the proprietary nature of the data.

Year	Enplaned Freight (Tons)	Enplaned Mail (Tons)	Total Cargo
1978	1,972	1,481	3,453
1979	1,808	932	2,740
1980	2,411	1,278	3,688
1981	2,274	1,412	3,686
1982	2,113	1,181	3,294
1983	2,244	1,023	3,267
1984	1,473	1,332	2,805
1985	1,842	1,315	3,157
1986	1,817	2,070	3,887
1987	1,910	2,480	4,390
1988	1,792	2,838	4,630
1989	2,841	4,136	6,977
1990	2,579	4,354	6,933
1991	3,452	4,465	7,917
1992	3,134	5,512	8,646
1993	3,246	5,822	9,068
1994	5,438	5,871	11,309
1995	6,051	7,192	13,243
1996	6,725	8,406	15,131
1997	5,698	8,452	14,150

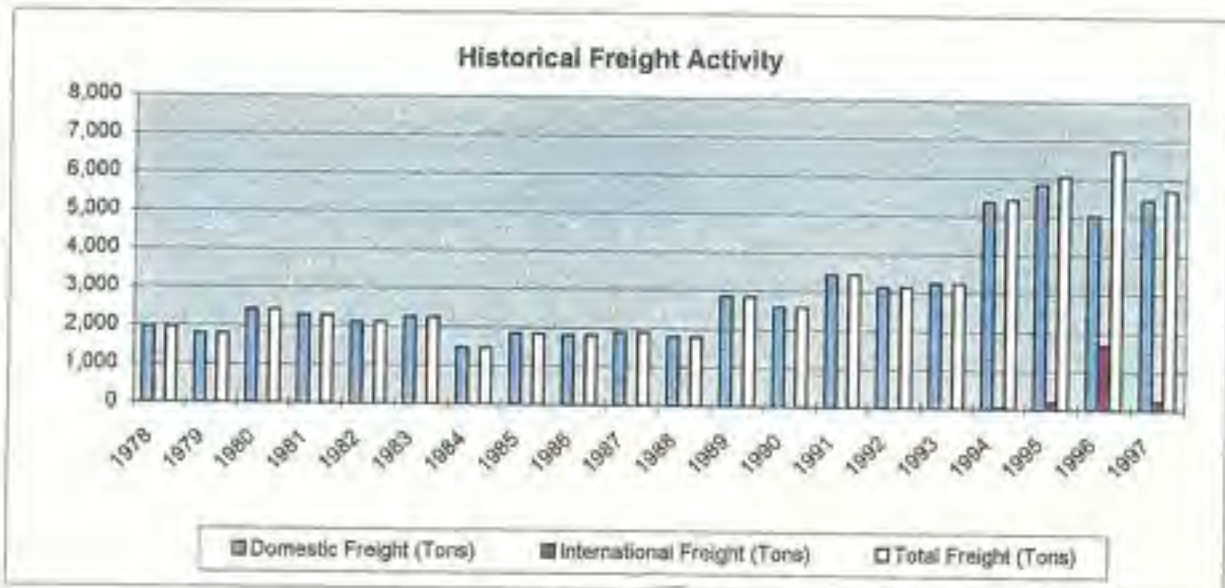


Source: Airport Management Records.
Prepared by: Federal Aviation Administration.

Exhibit II-3.9

Enplaned Cargo

Year	Domestic Freight (Tons)	International Freight (Tons)	Total Freight (Tons)
1978	1,972	0	1,972
1979	1,808	0	1,808
1980	2,411	0	2,411
1981	2,274	0	2,274
1982	2,113	0	2,113
1983	2,244	0	2,244
1984	1,473	0	1,473
1985	1,842	0	1,842
1986	1,817	0	1,817
1987	1,910	0	1,910
1988	1,792	0	1,792
1989	2,841	0	2,841
1990	2,578	1	2,579
1991	3,451	1	3,452
1992	3,134	0	3,134
1993	3,246	0	3,246
1994	5,386	52	5,438
1995	5,848	203	6,051
1996	5,046	1679	6,725
1997	5,460	238	5,698



Source: Airport Management Records.
Prepared by: Federal Aviation Administration.

Exhibit II-3.10

Enplaned Freight

Year	Domestic Mail (Tons)	International Mail (Tons)	Total Mail (Tons)
1978	1,481	0	1,481
1979	932	0	932
1980	1,278	0	1,278
1981	1,412	0	1,412
1982	1,181	0	1,181
1983	1,023	0	1,023
1984	1,332	0	1,332
1985	1,315	0	1,315
1986	2,070	0	2,070
1987	2,480	0	2,480
1988	2,838	0	2,838
1989	4,136	0	4,136
1990	4,354	0	4,354
1991	4,465	0	4,465
1992	5,512	0	5,512
1993	5,822	0	5,822
1994	5,871	0	5,871
1995	7,192	0	7,192
1996	8,389	17	8,406
1997	8,452	0	8,452



Source: Airport Management Records.
Prepared by: Federal Aviation Administration.

Exhibit II-3.11

Enplaned Mail

2.4.1 Airline Planning Questionnaire

The airlines that operate at PBIA were surveyed to obtain input pertaining to their facilities at the Airport. Airline Planning questionnaires were mailed to all air carrier and regional airlines at PBIA in October of 1998. These carriers are listed in **Table II-4.1**. The survey consists of questions concerning passenger facilities, passenger activity levels, aircraft facilities, and future plans or requirements. To date, six of the 20 airlines receiving questionnaires have responded. A copy of the Airline Planning Questionnaire is included in Appendix B.

Table II-4.1

Airline Passenger Questionnaire Survey

Airline
Air Canada
AirTran Airlines
AirTransat, A.T., Inc.
American Airlines, Inc.
American Eagle Airlines, Inc.
America West Airlines, Inc.
Comair, Inc.
Continental Airlines, Inc.
Delta Airlines, Inc.
Kiwi International Holdings, inc.
Miami Aircraft Support
Midway Airlines Corporation
Northwest Airlines, Inc.
Paradise Island Airlines, Inc.
Reno Air, Inc.
Royal Aviation, Inc.
Trans World Airlines, Inc.
United Airlines, Inc.
US Airways, Inc.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., April 1999

2.4.2 Airport Tenant Survey

Tenant surveys were mailed to 30 tenants, including the airlines. The survey consists of questions concerning company revenues and expenses, facility requirements, and employee compensation. A copy of the Airport Tenant Survey is included in Appendix B.

2.4.3 Air Cargo Survey & Freight Forwarder Survey

Both the Air Cargo Survey and the Freight Forwarder Survey were mailed to the air cargo, freight forwarders, and airlines that use the Air Cargo and Air Freight buildings. The survey consists of questions regarding facilities, air and ground tonnage processed, operating schedules, and future facility plans or requirements. A total of 10 surveys were distributed and to date one has been completed and returned for analysis. The surveys were mailed in October of 1998. A list of the companies surveyed is shown in **Table II-4.2**. Copies of the Air Cargo Survey and the Freight Forwarder Survey are included in Appendix B.

Table II-4.2

Air Cargo and Freight Forwarder Questionnaire Survey

Air Cargo

American Airlines, Inc.
 Continental Airlines, Inc.
 Delta Airlines, Inc.
 United Parcel Service, Inc.
 US Airways, Inc.
 U.S. Postal Service

Freight Forwarders

Centerport, Inc.
 Lund & Pullara, Inc.
 U.S. Customs Service
 UM Express, Inc.

Source: Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., April 1999

2.4.4 Fixed Base Operator (FBO) Survey

The three FBOs, Jet Aviation, Galaxy Aviation, and Signature Flight Support, were surveyed regarding the types of services they provide, a description of the fleet mix they serve (based and transient), passenger and aircraft activity statistics, and facility information. The surveys were distributed in October of 1998 and to date two have been returned. A copy of the FBO Survey is included in Appendix B.

2.5 Airspace and Air Traffic Control Procedures

The Palm Beach airspace inventoried includes the airspace delegated to the Terminal Radar Approach Control (TRACON) facility located at PBIA by the Air Route Traffic Control Center (ARTCC) located in Miami. **Exhibit II-5.1** depicts the lateral and vertical limits of the controlled airspace serving the Airport. Controlled airspace is airspace of defined dimensions which Air Traffic Control (ATC) services are provided to flights operating under Instrument Flight Rules (IFR) or visual flight rules in accordance with the classification of the airspace. This particular airspace contains classifications C, D, and E along with special use airspace and other airspace areas.

Exhibit II-5.2 shows all the public and private airfields within the lateral limits of the Palm Beach TRACON's airspace. The major air carrier airport in the vicinity is Palm Beach International Airport (PBIA). General Aviation is primarily served by North Palm Beach County Airport (F45), Palm Beach County Park (LNA), Palm Beach County Glades (PHK), Witham (SUA), and Boca Raton (BCT), in addition to PBIA. Gwinn Airport (UTX) is a private airfield serving United Technologies' Pratt and Whitney subsidiary.

Class C airspace serves airports that have an operational control tower, are served by a radar approach control, and have a certain number of IFR operations or passenger enplanements. PBIA qualifies for Class C airspace, the dimension of which is illustrated in **Exhibit II-5.3**. The PBIA Class C airspace consists of a surface area with a five nautical mile (NM) radius with the exception of approximately one NM due south of PBIA, which is used to accommodate the LNA traffic pattern. This inner circle extends from the surface to 4,000 feet Mean Sea Level (MSL). An outer circle with



Source: Miami ARTC Center and Palm Beach ATC Tower Letter of Agreement, May 30, 1997.

Basemap - National Oceanic and Atmospheric Administration, Miami Sectional Chart, August 13, 1998.

Prepared By: Ricordo & Associates, Inc., February 1999.

Exhibit II-5.1



PBIA TRACON Airspace

support/projects/pbi/masterplan/inventory/ATC-airspace/newmap.cdr (6)

Strategic Master Plan Study

October 2000



Source: National Oceanic and Atmospheric Administration
Miami Sectional Chart
Prepared By: Ricordo & Associates, Inc., February 1999

Exhibit II-5.2



IFR Airports in PBIA Approach Control Airspace



Source: National Oceanic and Atmospheric Administration
Miami Sectional Chart
Prepared By: Ricordo & Associates, Inc., February 1999

Exhibit II-5.3



Class C, D and D/E Airspace

a 10 NM radius extends from 1,200 feet MSL to 4000 feet MSL. Aircraft must establish two-way radio communications with the PBI TRACON prior to entering the airspace and thereafter maintain those communications while within the airspace. Aircraft operating Visual Flight Rules (VFR) are only separated from aircraft operating under Instrument Flight Rules (IFR) within the airspace.

Airspace from the surface to 2,500 MSL surrounding those airports with an operational control tower is categorized as Class D airspace. Exhibit II-5.3 depicts the Class D airspace associated with Gwinn Airport. Gwinn also has Class E airspace that serves as an extension to the Class D airspace. This extension provides controlled airspace to contain the standard instrument approach procedures for Gwinn without imposing a communication requirement on aircraft operating under VFR. This extension is also illustrated in Exhibit II-5.3. This Class D/E airspace is effective from 1200 to 2300 Universal Coordinated Time (UTC).

Exhibit II-5.4 shows the remainder of the Class E airspace under the jurisdiction of the Palm Beach TRACON. Class E airspace, used for transition to or from the terminal or enroute environment at PHK, UTX, F45, PBI, LNA, and BCT, is depicted in Exhibit II-5.4. These Class E airspace areas begin at 700 Above Ground Level (AGL).

There are two Special Use airspace areas in the inventoried airspace. These are depicted in Exhibit II-5.5. The first area is Restricted Area 2936 just west of UTX. This area, controlled by the PBI TRACON, extends from the surface to 10,000 feet MSL is rarely used. Activities in Restricted Areas must be confined due to the nature or limitation imposed upon aircraft operations that are not part of those activities. The second Special Use airspace is Alert Area 291A. Alert Areas may contain a high volume of pilot training or unusual type of aerial activity. Alert Area 291A extends from the surface to 2,500 feet MSL. Also depicted in Exhibit II-5.6 is Military Training Route (MTR) IR020. Operations on IR 020 are conducted in accordance with IFR and include one or more segments above 1,500 feet AGL. Illustrated in Exhibit II-5.6 and summarized in Table II-5.1 are the Federal (V) and Bahamas Route (BR) Airways.

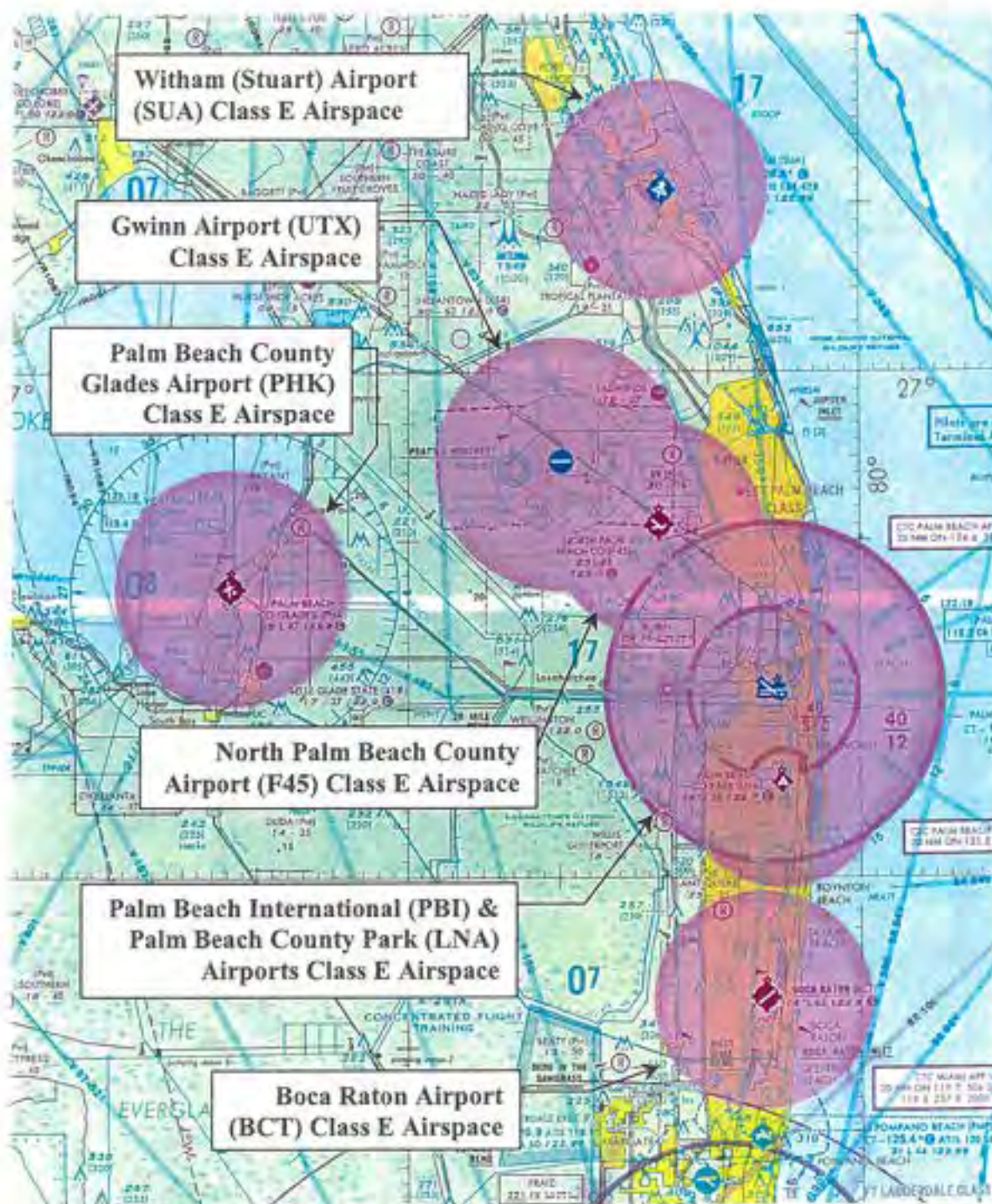
Table II-5.1

Federal and Bahamas Route Airways

<u>Federal Airways</u>	<u>Bahamas Routes</u>
AR1	BR21V
A699	BR69V
V3	BR63V
V51	BR54V
V159	BR55V
V267	BR68V
V295	BR10L
V437	
V492	
V531	

Source: Miami Sectional Aeronautical Chart, August 13, 1998
National Oceanic and Atmospheric Administration
Prepared by: Ricondo & Associates, Inc., April 1999

Navigational Aids (NAVAIDS) are electronic devices located on the ground/ground level, which provide point-to-point guidance information or position data to aircraft in flight. Table II-5.2



Source: National Oceanic and Atmospheric Administration
Miami Sectional Chart
Prepared By: Ricondo & Associates, Inc., February 1999

Exhibit II-5.4



Class E IFR Transition Airspace



Source: National Oceanic and Atmospheric Administration
Miami Sectional Chart
Prepared By: Ricondo & Associates, Inc., February 1999

Exhibit II-5.5



Special Use Airspace & Airways

summarizes the location, type, and utilization of the electronic NAVAIDS supporting operations at PBI.

Table II-5.2

PBI Instrument Approach Navigational Aids

Navaid	Location	Type	Utilization
IPBI	PBIA	ILS	Precision instrument approach Runway 09L
IPWB	PBIA	ILS	Precision instrument approach Runway 27R
PBI	PBIA	VORTAC	Non precision instrument approaches Runways 09L, 13, 27R & 31 Standard Terminal Arrivals, Standard Instrument Departures, PBIA Missed Approach Procedures, Victor Airways, and Bahamas Routes
PHK	38 NM WNW PBIA	VORTAC	Standard Terminal Arrivals, Standard Instrument Departures
RUBIN	6.7 NM W PBIA	NDB	Non-precision approach Runway 09L, Runway 09L ILS component

Source: Jeppesen Airway Charts, October 8, 1998
Prepared by: Ricondo & Associates, Inc., April 1999

The airspace delegated to the PBIA ATCT by the Miami Air Route Traffic Control Center (MIA ARTCC) is depicted in Exhibit II-5.6. MIA ARTCC and PBI ATCT transition arrivals and departures via the appropriate Arrival Transition Areas (ATAs) and Departure Transition Areas (DTAs) on routing or vector headings that ensure aircraft transition within the confines of the appropriate ATA/DTA. Radar separation at the appropriate ATA/DTA shall not be less than five nautical miles (NM) and must be constant or increasing.

Exhibit II-5.6 illustrates the ATAs serving PBIA. The primary turbojet ATAs are SWOMP, ULLMN, WALIK, and MRLIN. The SWOMP ATA corresponds to the SURFN Seven Standard Terminal Arrival Route (STAR). This STAR is the primary arrival route for traffic originating along the eastern seaboard of the United States and Eastern Canada. Turbojet aircraft cross SWOMP at 8,000 MSL, while prop and turboprop traffic will cross at 6,000 feet MSL. The ULLMN ATA corresponds to the LLAKE Two STAR, which serves as the primary arrival route for the remaining areas of the United States and Canada. Turbojet aircraft cross ULLMN at 10,000 feet MSL while prop and turboprop traffic will cross at 4,000 feet or 7,000 feet MSL. The WALIK and MRLIN ATAs serve traffic from the Bahamas and eastern Caribbean. Turbojet traffic will cross WALIK at 6,000 feet MSL and MRLIN at 5,000 feet MSL. Prop and turboprop will cross WALIK at 4,000 feet MSL or 6,000 feet MSL and MRLIN at 4,000 feet MSL.

The STOOP and ARKES ATAs serve turboprop and prop aircraft exclusively. These ATAs are also depicted in Exhibit II-5.6. Traffic will cross STOOP at 5,000 feet MSL or 6,000 feet MSL and will cross ARKES at 7,000 feet MSL. The STOOP ATA also serves SUA. Traffic arriving SUA via STOOP will cross STOOP at 4,000 feet MSL. Aircraft arriving SUA from the west are routed via the ULLMN ATA at normal ATA altitudes.

Aircraft depart the PBIA ATCT airspace via the DTAs shown in Exhibit II-5.6. The TBIRD DTA serves aircraft destined to the central and western United States and Canada. Aircraft departing the TBIRD DTA, requesting an altitude at or below 10,000 feet MSL, will do so via V531. When PBIA is operating to the east, traffic departing the TBIRD DTA with a final requested altitude at or above 11,000 feet MSL will exit the DTA on a heading of 290°. When PBIA is operating to the west,



Source: Miami ARTC Center and Palm Beach ATC Tower Letter of Agreement, May 30, 1997.
 Basemap - National Oceanic and Atmospheric Administration, Miami Sectional
 Chart, August 13, 1998.
 Prepared By: Ricondo & Associates, Inc., February 1999.

Exhibit II-5.6



PBIA Arrival & Departure Airspace

support\projects\pbia\masterplan\inventory\ATC-airspace\newmap.cdr (6)

Strategic Master Plan Study

October 2000

traffic departing the TBIRD DTA with a final requested altitude at or above 11,000 feet. MSL will exit the DTA on a heading of 320°. Aircraft destined to the eastern seaboard of the United States and Eastern Canada use the BLUFI DTA. Traffic exiting the BLUFI DTA does so established on the PBI VORTAC 057° radial.

Aircraft with a destination of the Bahamas or eastern Caribbean use the TURPS DTA on 090° heading. The LAMOR DTA serves aircraft destined to western Florida and exits on a heading of 270°, while the SMUGS DTA serves northern Florida and exits the DTA on a 320° heading.

All SUA departures to the north, northeast, and northwest are routed via the SUAW DTA and assigned a heading of 290°. SUA east and southeast departures are routed via the BLUFI DTA and assigned a heading of 090°. Aircraft departing SUA to the west or southwest with a final requested altitude at or below 10,000 feet MSL use the LAMOR DTA, while those aircraft requesting an altitude above 10,000 feet MSL are routed via the SAUW DTA.

BCT aircraft destined to the northeastern United States or Caribbean depart via the TURPS DTA. Aircraft departing BCT and destined to the central or western United States or Canada are routed via the LAMOR DTA.

Routings for aircraft overflying the PBIA ATCT airspace are depicted in Exhibit II-5.6. Overflights landing in the Miami Terminal Area from the north are routed on or east of V437 direct to the PHK VORTAC then via V437 to BRIKL intersection. Turboprop aircraft landing in the Miami Terminal Area from the north are routed via STOOP intersection and V295. Caribbean overflights landing in the Miami Terminal Area are routed via the MRLIN ATA and BR68V.

2.5.2.1 Airfield Operating Practices

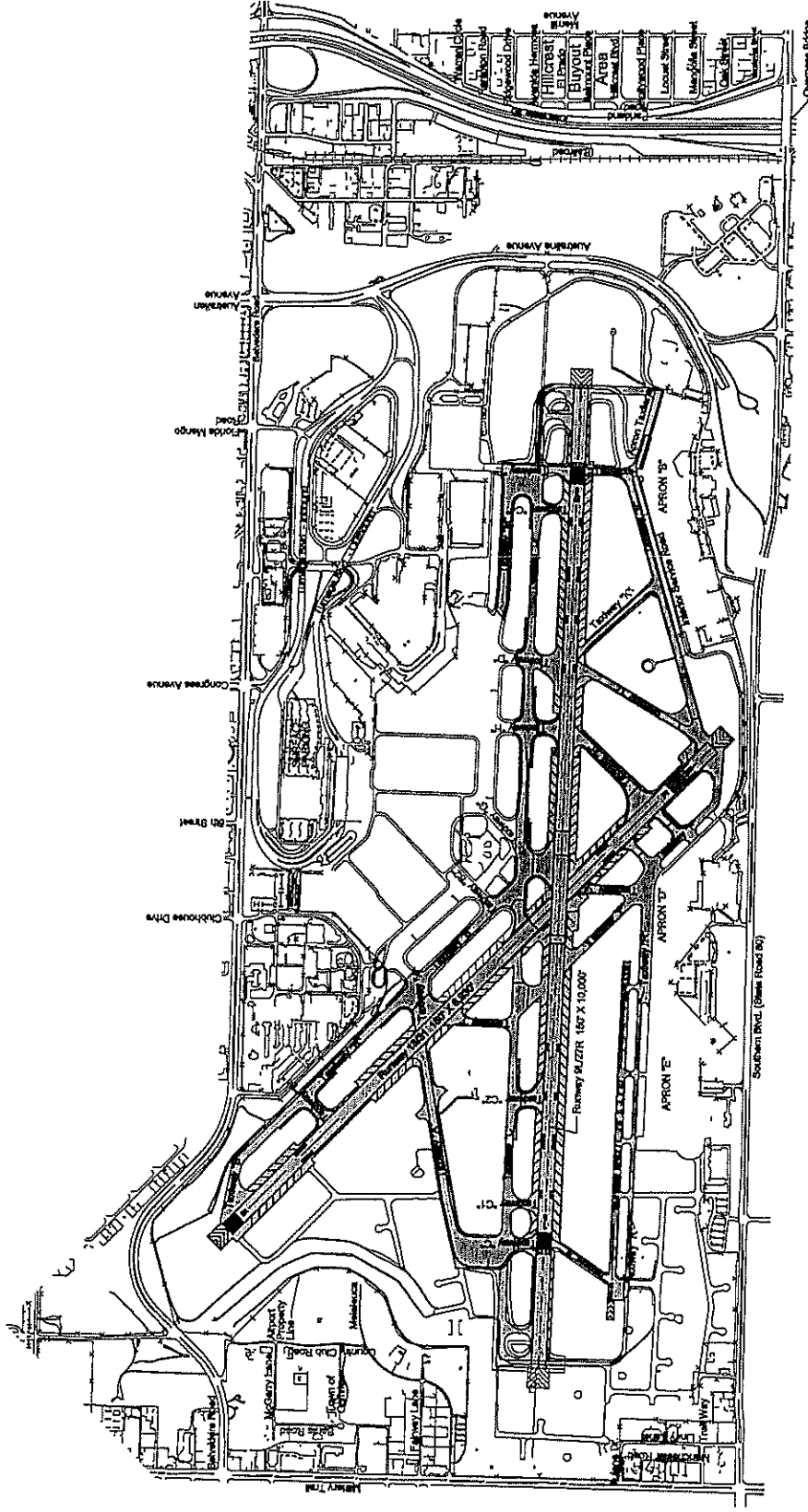
The airport movement area is defined as the runways, taxiways, helipads, and other areas that are utilized for the taxi, takeoff, and landing of aircraft. The airport movement area is exclusive of loading ramps, parking areas, and other surface areas that are not identified as movement areas on Exhibit II-5.7.

The PBIA ATCT provides airport traffic services between all vehicles and aircraft within the airport movement area shown in Exhibit II-5.7. The PBIA ATCT also provides advisory service to those aircraft in non-movement areas, as long as that area is visible from the control tower.

The DOA establishes rules and regulations, which ensure that ground vehicles, equipment operators, and personnel obtain ATCT approval prior to entry onto the airport movement area. DOA also provides signage and uniform marking to inform operators of the limits of the airport movement area. DOA provides PBIA ATCT with the identity of vehicles that are permitted to operate on the movement area as well as the official airport diagram defining all movement/non-movement areas.

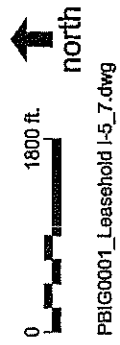
2.5.2.2 Runway Use Configurations

The 1989 Master Plan was reviewed to establish runway use configurations for the current and proposed future airfield. Exhibit II-5.8 depicts the runway system use, percent of the time the runway configuration is used, and hourly capacities reported in the 1989 Master Plan. The 1989 Master Plan called for no new additional runways, but it proposed the extension of two of the runways.



Legend:  Airfield Movement Areas

Source : Airport Management Records
Prepared By : Ricoondo & Associates, Inc., March 1999



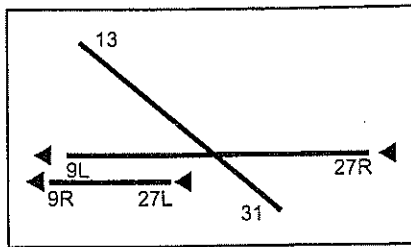
Airfield Movement Areas

PBIG0001_Leasehold I-5_7.dwg

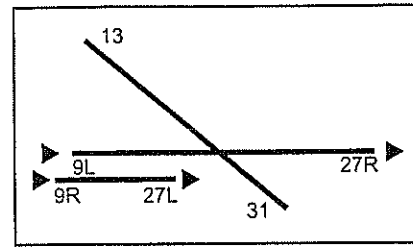
Strategic Master Plan Study

October 2000

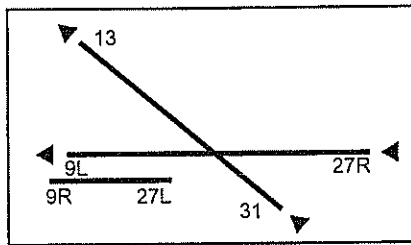
Exhibit II-5.7



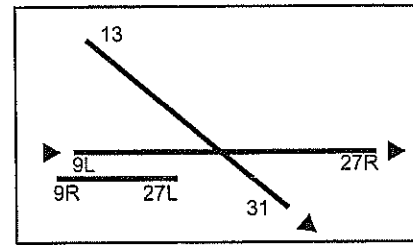
Weather Condition: VFR
Percent Use: 25.5%
Hourly Capacity: 75-85 Operations



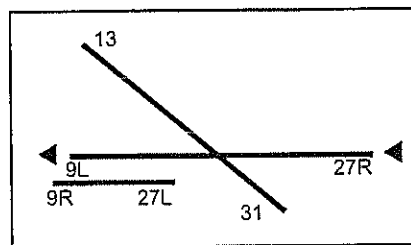
Weather Condition: VFR
Percent Use: 59.5%
Hourly Capacity: 75-85 Operations



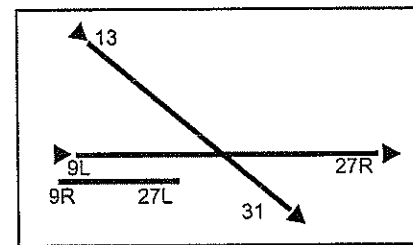
Weather Condition: VFR
Percent Use: 5.0%
Hourly Capacity: 58 Operations



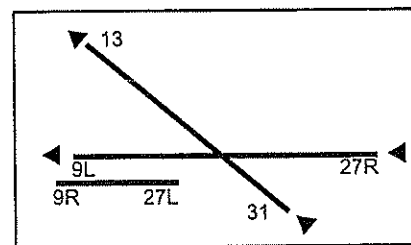
Weather Condition: VFR
Percent Use: 4.5%
Hourly Capacity: 58 Operations



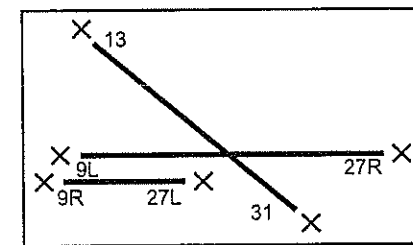
Weather Condition: VFR
Percent Use: 3.0%
Hourly Capacity: 56-58 Operations



Weather Condition: IFR
Percent Use: 1.0%
Hourly Capacity: 55-56 Operations



Weather Condition: IFR
Percent Use: 1.0%
Hourly Capacity: 54-55 Operations



Weather Condition: Below Minimums
Percent Use: 0.5%
Hourly Operations: 0

LEGEND

Arrivals
Departures



Source: Greiner, Inc., Palm Beach International Airport Master Plan, July 1989.
Prepared By: Ricondo & Associates, Inc., March 1999

Exhibit II-5.8



north

1998 Master Plan-Runway System Use & Hourly Capacities

Exhibit II-5.9 illustrates the present day airfield operating practices. When the airfield is landing to the east in VFR conditions, turbojet aircraft will typically use Runway 09L, while turboprop and piston aircraft arriving from the north will use Runway 13. Single engine and light twin piston aircraft arriving from the south will use Runway 09R. Runway 09L is the primary arrival runway during periods of IFR weather. When the airfield operates to the west, turbojet aircraft will use Runway 27R for landing, while some commuter aircraft arriving from the south will use Runway 31. Single engine and light piston twin aircraft arriving from the north will use Runway 27L or Runway 27R and Runway 27L when arriving from the south. Runway 27R is the primary arrival runway during IFR conditions.

Runway 09L is the primary turbojet departure runway when the airfield is operating to the east. Piston single engine and light piston twin engine aircraft will depart on Runway 09R, while southbound turboprop commuter aircraft use Runway 13. When the airfield is landing to the west, turbojet aircraft will use Runway 27R. Northbound general aviation aircraft will use Runway 31. Piston single engine and light piston twin engine aircraft parked in the southwest general aviation area will use Runway 27L.

One significant difference of present day operating practices from those reported in the 1989 Master Plan is the use of Runway 13/31. This was accomplished by applying the provisions of FAA Order 7110.114, Land and Hold Short Operations (LAHSO). LAHSO is an air traffic control procedure that permits the issuance of landing clearances to aircraft that are able to land and hold short of the intersecting runway, taxiway, or other designated spot on the arrival runway. It is a procedure designed to increase airport capacity and to more efficiently move aircraft within the terminal airspace and on the airport surface. **Table II-5.3** lists the hold short locations and available landing distance for those locations. LAHSO operations can only be conducted during daytime, VFR conditions.

Table II-5.3

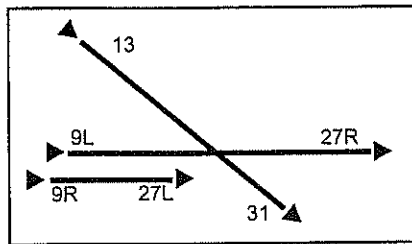
Land and Hold Short Landing Distances at PBIA

Runway	Hold Short Location	Available Landing Distance Ft.
09L	Prior to RWY 13/31 Intersection	3,450
13	Prior to RWY 09L/27R Intersection	4,445
27R	Prior to RWY 13/31 Intersection	4,250

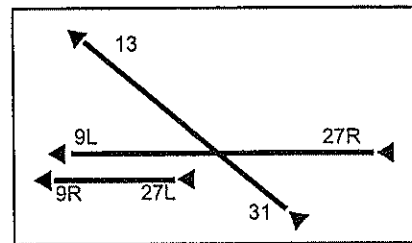
Source: Jeppesen Airway Charts, October 8, 1998
Prepared by: Ricondo & Associates, Inc., April 1999

Present day procedures allow landings on Runway 13 to occur simultaneously with landing/takeoff operations on Runway 09L/27R. Similarly, landings on Runway 09L or Runway 27R can occur simultaneously with aircraft landing/departing on Runway 13/31. Using the LAHSO procedure should provide somewhat better hourly capacity statistics than are shown in Exhibit II-5.8.

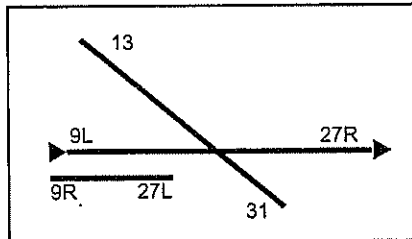
The crosswind runways, while available, are rarely used during IFR weather conditions due to the fact that both ends of Runway 09L/27R have precision instrument approaches. Runway 13/31 has only non-precision instrument approaches. When the 1989 Master Plan was written, Runway 27R was served by only non-precision approaches. IFR hourly capacities may show a small improvement because of the improved instrumentation on Runway 27R.



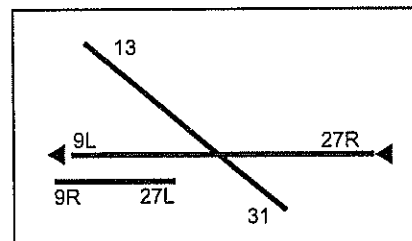
VFR East Flow Operations



VFR West Flow Operations



IFR East Flow Operations



IFR West Flow Operations

Legend: Departure
Arrival

Source: Ricondo & Associates, Inc.
Prepared By: Ricondo & Associates, Inc., March 1999

Exhibit II-5.9

N.T.S.



Existing Runway Use Configurations

While there are differences between operating configurations from 1988 to the present, the airfield is still operated to the east approximately 65–70 percent of the time. The west configuration is used approximately 30–35 percent of the time and is preferred for night noise abatement operations.

2.5.2.3 Airfield Circulation Patterns

Exhibit II-5.10 depicts the airfield circulation patterns when the airfield is operating to the east. Aircraft parked at Concourse A or the west side of Concourse B use Taxiway B for departures on Runway 13 and Taxiways A and C when departing Runway 09L. Traffic from Concourse C and the east side of Concourse B use Taxiways C and B when departing Runway 13 or Taxiway C when taking off on Runway 09L. General Aviation aircraft parked at the southeast corner of the airfield is routed one of three ways to Runway 09L. The first way uses Taxiways E and C, a second routing uses Taxiways K and C, and a third routing uses Taxiways E, F, R, S and C. The routing used depends on the current ground traffic situation. Southeast corner general aviation traffic departing Runway 09R will use Taxiways E, F, and R. General aviation aircraft parked west of Runway 13 will use Taxiway R to depart on Runway 09R or Taxiways R, S, and C to depart on Runway 09L. The main passenger terminal can be accessed via Taxiways C and B. The general aviation area, located in the southeast corner, can be accessed via Taxiways E or K. Taxiways R, F, G, or F provide access to the general aviation area

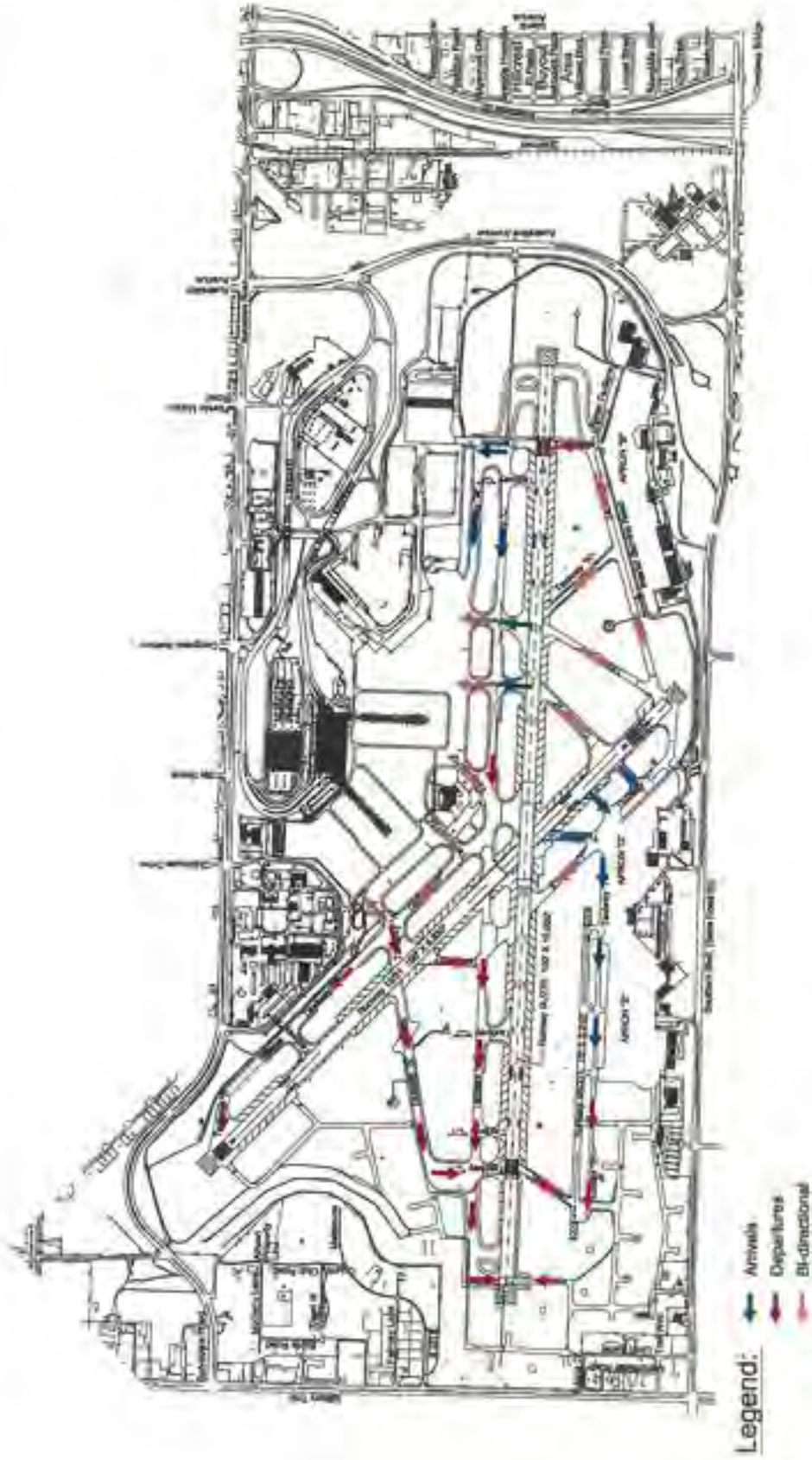
Taxiway flows when the airfield is operating to the west are illustrated in **Exhibit II-5.11**. Runway 27R can be accessed for departure from the main terminal via Taxiways B and/or C. The proposed taxiway east of Taxiway E will be used by general aviation traffic parked at the airfield's southeast corner and departing Runway 27R. Aircraft parked in this same location and using Runway 31 do so via Taxiway E. General aviation aircraft parked west of Runway 31 and using Runway 31 for departure use Taxiway F. Aircraft requiring Runway 27R can use Taxiways F, E, and the new connector east of E, or Taxiways G/H and C depending on traffic conditions. Aircraft using Runway 27L for departure use Taxiway F.

When landing to the west, the main passenger terminal can be accessed via Taxiways A, B, and/or C. The general aviation area located in the southeast corner can be accessed via Taxiways D, K, F, G, and/or E. Taxiway R provides access to the general aviation area west of Runway 31.

The displaced landing thresholds on Runway 09L/27R pose a unique situation to ATC. Departing aircraft cannot use the taxiway extensions leading to the departure end of the runway while aircraft are landing on that runway. These areas of restricted use are shown in **Exhibit II-5.12**. ATC will have to ensure that these taxiways are clear prior to aircraft landing on the runway. These taxiways lie in both the Runway Protection Zone and TERPS approach surfaces.

The impact of these restrictions will be greatest during periods of heavy arrival/departure demand. Arrivals will have increased intrail spacing in order to accommodate departures requiring the full length of the runway. The time a departure will take to taxi to the full length of the runway will be longer than normal due to added distance from the queuing area to the runway departure end. Typically, arrivals to a mixed-use runway are spaced five miles in trail. PBIA ATC estimates that this spacing could increase to seven to 10 miles intrail depending on aircraft type and taxiing speed.

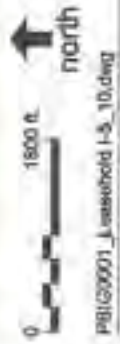
The airfield was observed operating east in October 1998. Taxiway B was used as a departure queue for Runway 13, Taxiways A, C, and S were used as departure queues for Runway 09L, and Taxiway R was used as a departure queue for Runway 09R. At no time did departure queues exceed four



Legend:

- Arrivals
- Departures
- Bi-directional

Source : Airport Management Records
Prepared By : Ricondo & Associates, Inc., March 1999



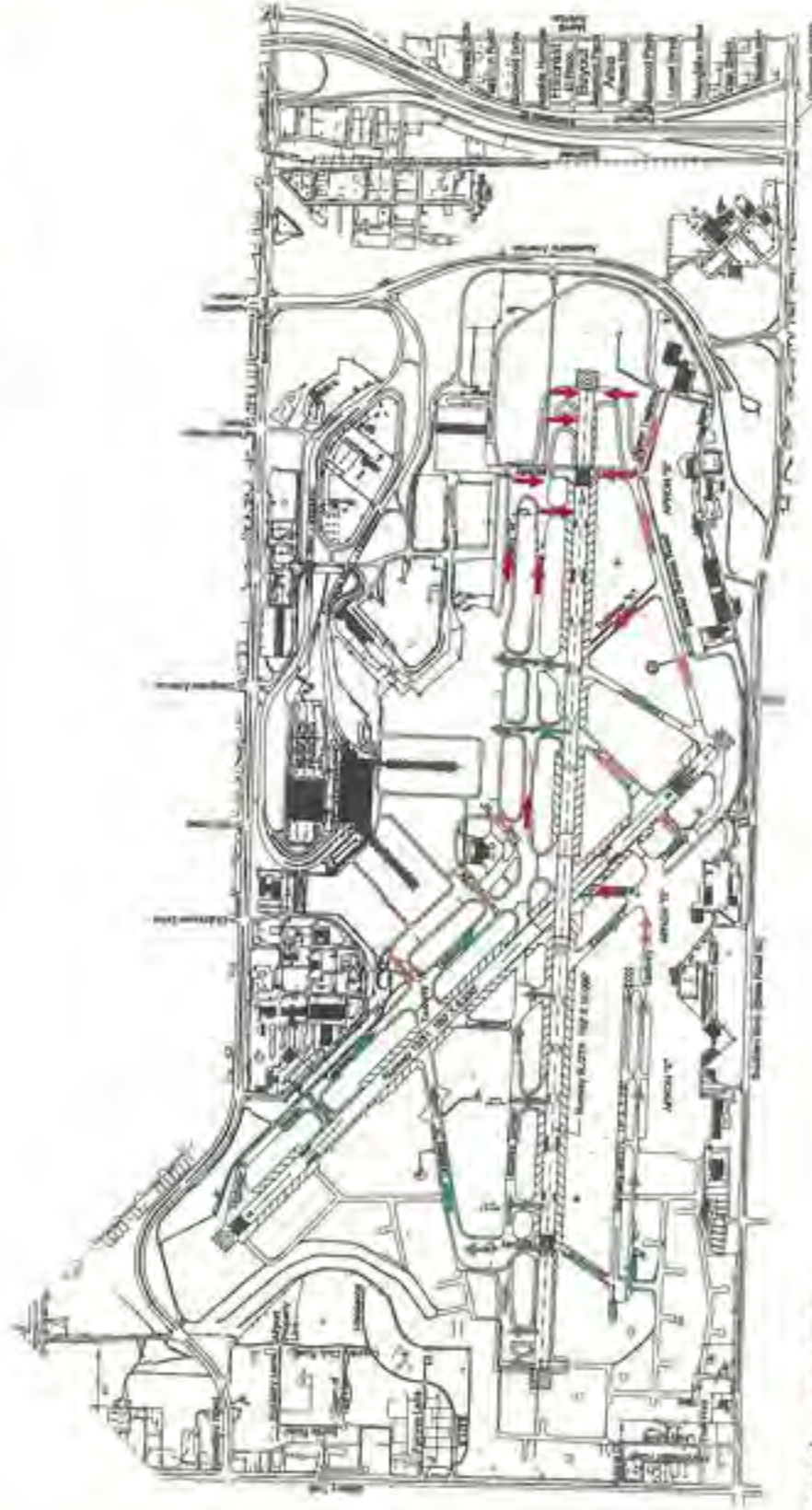
PBIC00001_Layout01-1-3_10.dwg

Strategic Master Plan Study

October 2000

Exhibit II-5.10

East Flow Taxi Routings



Legend:

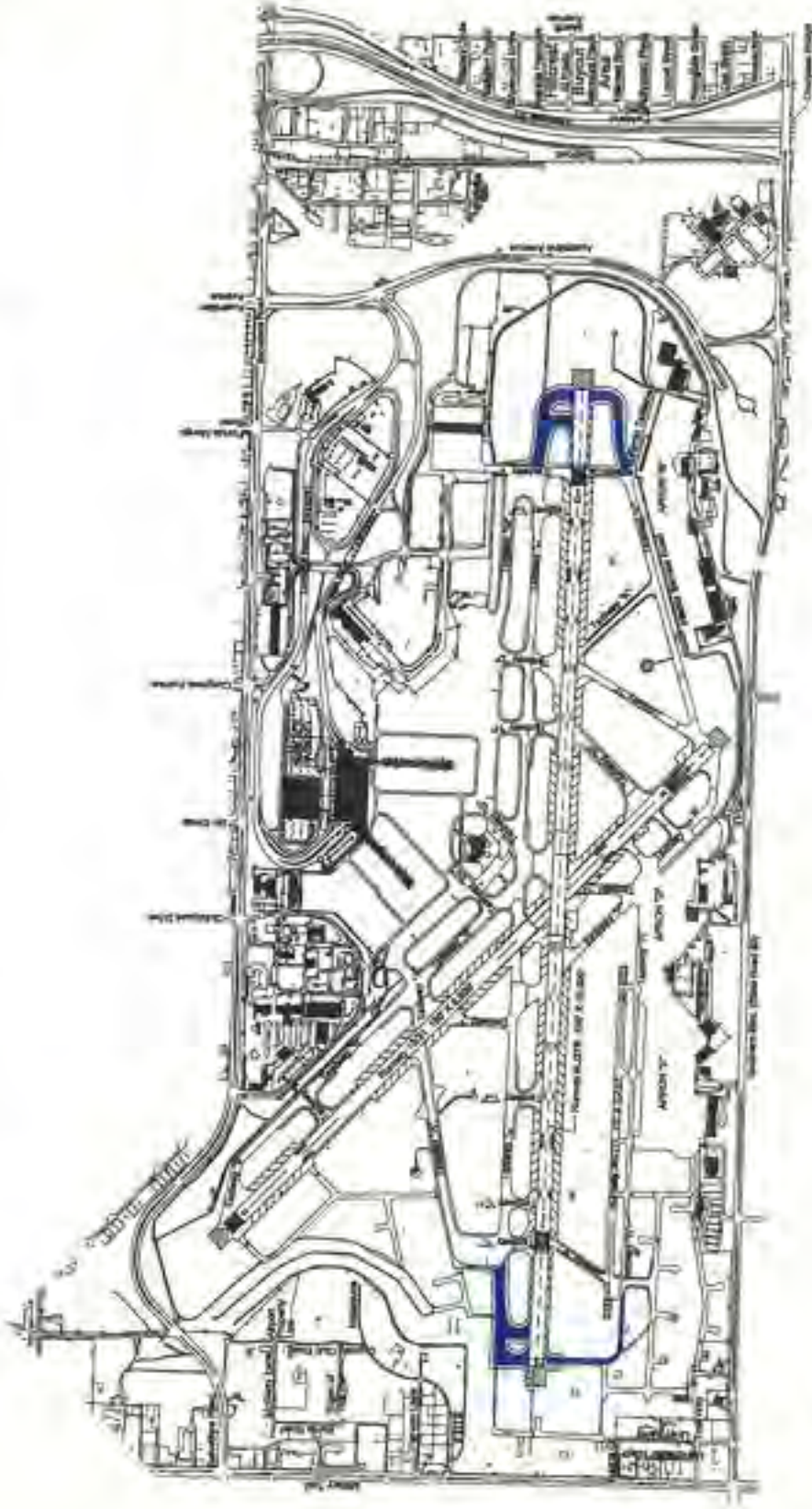
- ← Arrivals
- Departures
- ↔ Bi-directional

Source : Airport Management Records
 Prepared By : Ricondo & Associates, Inc., November, 1998



Exhibit II-5.11

West Flow Taxi Routes



Legend: ■ Restricted Taxiways

Source : PBIA Airport Layout Plan, Dec. 1998
 Prepared By : Ricordo & Associates, Inc., March 1999



Exhibit II-5.12

Restricted Use Taxiways

Strategic Master Plan Study

October 2000

aircraft in depth or adversely impact other ground operations. Arrivals and departures easily entered and exited the apron area between concourses.

2.5.3 Airport Financial Data

Certain financial information and data was required to support the financial analyses completed as part of the Business Plan. This information, which was provided by the County, included the following:

- Identification of sources and trends in funds received along with accompanying restrictions, if any
- An analysis of the most recent seven years of airport grants history
- The most recent five years of audit statements Summaries of the most recent five years of airport operating budgets
- Abstracts/summaries of all tenant/use lease agreements
- Sources of inter-government transfers committed to airport usage

Specific financial information will be presented within the Business Plan.

2.5.4 Airport Tenant Leaseholds

Exhibit II-5.13 depicts the general land lease areas held by Airport tenants. **Table II-5.4** lists the various tenants and the amount of area leased. Copies of the current leaseholds were collected to support subsequent analyses performed in this study. As necessary, leasehold information will be presented to support analyses conducted as part of this Study.

2.5.5 Meteorological Conditions

The historical wind and weather data was analyzed and segregated to determine the traditional wind and weather patterns associated with the West Palm Beach area. The data, obtained from the National Climatic Data Center, consists of 87,619 hourly observations representing 10 years from January 1, 1986 to December 31, 1995. For this study, the ceiling, visibility, wind velocity, and wind direction were the key criteria used in segregating the data.

The measured levels of the meteorological ceiling and visibility at a given time define the rules that govern the procedures for Visual Flight Rules (VFR) or Instrument Flight Rules (IFR). In turn, these conditions set the standards that authorize or prohibit various air traffic control procedures. The primary effect of low ceiling and/or visibility conditions on airport capacity is to increase spacing requirements between aircraft in the controlled airspace environment. The increased spacing between aircraft reduces the number of aircraft that can operate on a runway during any given period. FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, defines three categories of meteorological conditions based on cloud ceilings and visibilities. The categories include:



Legend:

AS II	Range Systems Engineering	FI	Flight Safety Development	MC	Sky Charts	PM	PBC
AU	Company (AUTEC)	PV	FMA	NC	National Car Rental	PS	PBC
AV	Avia	HC	Hertz	NW	National Weather Service	PT	PBC
DA	Della Airlines	HS	Human Services Associates	RP	PHC	PV	PBC
DR	Dollar	JA	Jet Aviation	PG	PBC	SF	Signature Flight Support
				PK	PBC	TB	3rd Bomb Group Restaurant

Source : Ricordo & Associates, Inc. April 1994
 Prepared By : Ricordo & Associates, Inc., July 30, 1997



PBAG0001_Lesshold I-5_13.dwg

Strategic Master Plan Study

Exhibit II-5.13

Tenant Leasehold

October 2000

Table II-5.4

Airport Tenant Leaseholds

<u>Tenant</u>	<u>Land Lease Area</u>	<u>Passenger Terminal Lease Area</u>	<u>Total Leased Area</u>
Alamo Rental Car	- Sq. Ft.	494.13 Sq. Ft.	494.13 Sq. Ft.
American Airlines	1,829.00 Sq. Ft.	15,309.40 Sq. Ft.	17,138.40 Sq. Ft.
ASII	104,052.83 Sq. Ft.	- Sq. Ft.	104,052.83 Sq. Ft.
Range Systems Engineering Company (Autec)	80,591.24 Sq. Ft.	- Sq. Ft.	80,591.24 Sq. Ft.
Avis Rental Car	348,742.00 Sq. Ft.	477.38 Sq. Ft.	349,219.38 Sq. Ft.
AMPCO Parking	All Public Parking Lots		- Sq. Ft.
Boyce Trans Traveler Services	- Sq. Ft.	11,012.13 Sq. Ft.	11,012.13 Sq. Ft.
Budget Rental Car	- Sq. Ft.	460.63 Sq. Ft.	460.63 Sq. Ft.
CA One Services	27,761.20 Sq. Ft.	- Sq. Ft.	27,761.20 Sq. Ft.
Casino Airlink	- Sq. Ft.	- Sq. Ft.	- Sq. Ft.
Continental Airlines	2,302.00 Sq. Ft.	22,416.24 Sq. Ft.	24,718.24 Sq. Ft.
CenterPort Air Freight	8,184.00 Sq. Ft.	- Sq. Ft.	8,184.00 Sq. Ft.
Delta Airlines	48,672.00 Sq. Ft.	54,883.64 Sq. Ft.	103,555.64 Sq. Ft.
Donald Trump Golf Club Development	9,339,264.00 Sq. Ft.	- Sq. Ft.	9,339,264.00 Sq. Ft.
Dollar Rental Car	205,346.00 Sq. Ft.	460.63 Sq. Ft.	205,806.63 Sq. Ft.
Flight Safety International	92,660.00 Sq. Ft.	- Sq. Ft.	92,660.00 Sq. Ft.
FAA	1,197,812.88 Sq. Ft.	- Sq. Ft.	1,197,812.88 Sq. Ft.
Galaxy Aviation	1,154,683.86 Sq. Ft.	- Sq. Ft.	1,154,683.86 Sq. Ft.
Hertz Rental Car	73,656.00 Sq. Ft.	477.38 Sq. Ft.	74,133.38 Sq. Ft.
Human Services Association	183,910.32 Sq. Ft.	- Sq. Ft.	183,910.32 Sq. Ft.
International Total Services	- Sq. Ft.	195.54 Sq. Ft.	195.54 Sq. Ft.
Jet Aviation	1,092,920.40 Sq. Ft.	- Sq. Ft.	1,092,920.40 Sq. Ft.
J.L. Unlimited	- Sq. Ft.	2,426.40 Sq. Ft.	2,426.40 Sq. Ft.
Lund & Pullara Air Freight	1,718.00 Sq. Ft.	- Sq. Ft.	1,718.00 Sq. Ft.
Sky Chefs	146,263.56 Sq. Ft.	- Sq. Ft.	146,263.56 Sq. Ft.
Northwest Airlines	- Sq. Ft.	9,539.70 Sq. Ft.	9,539.70 Sq. Ft.
National Car Rental	728,353.00 Sq. Ft.	494.13 Sq. Ft.	728,847.13 Sq. Ft.
National Weather Service	7,853.98 Sq. Ft.	- Sq. Ft.	7,853.98 Sq. Ft.
Palm Beach Transportation	28,800.00 Sq. Ft.	- Sq. Ft.	28,800.00 Sq. Ft.
Palm Beach County	1,229,040.30 Sq. Ft.	- Sq. Ft.	1,229,040.30 Sq. Ft.
The Paradises Shops	- Sq. Ft.	13,308.24 Sq. Ft.	13,308.24 Sq. Ft.
PBC Transportation Authority	342,957.59 Sq. Ft.	- Sq. Ft.	342,957.59 Sq. Ft.
Smarte Carte	- Sq. Ft.	130.20 Sq. Ft.	130.20 Sq. Ft.
Signature Flight Support	1,564,917.05 Sq. Ft.	- Sq. Ft.	1,564,917.05 Sq. Ft.
391st Bomb Group Restaurant	212,791.00 Sq. Ft.	- Sq. Ft.	212,791.00 Sq. Ft.
TWA Airline	- Sq. Ft.	9,744.85 Sq. Ft.	9,744.85 Sq. Ft.
United Airlines	- Sq. Ft.	7,487.18 Sq. Ft.	7,487.18 Sq. Ft.
US Customs	345.00 Sq. Ft.	- Sq. Ft.	345.00 Sq. Ft.
UM Express	1,943.00 Sq. Ft.	- Sq. Ft.	1,943.00 Sq. Ft.
United Parcel	25,200.00 Sq. Ft.	- Sq. Ft.	25,200.00 Sq. Ft.
US Postal Service	28,000.00 Sq. Ft.	- Sq. Ft.	28,000.00 Sq. Ft.
US Airways	2,302.00 Sq. Ft.	29,133.58 Sq. Ft.	31,435.58 Sq. Ft.
Valujet Airlines	- Sq. Ft.	3,074.75 Sq. Ft.	3,074.75 Sq. Ft.
	17,747,657.14 Sq. Ft.	165,245.22 Sq. Ft.	17,912,902.36 Sq. Ft.

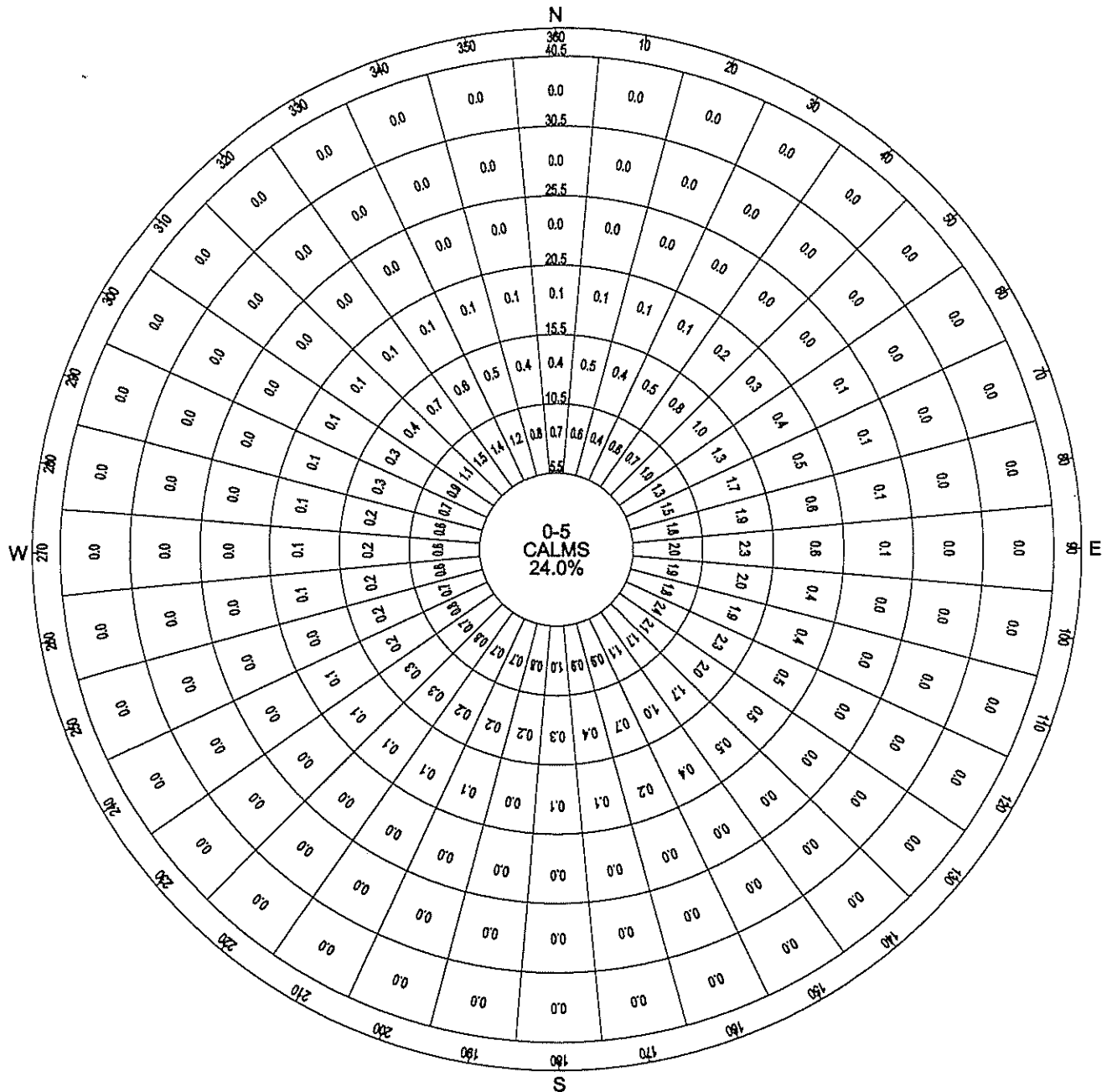
Source: Airport Management Records, November 1998

Prepared By: Ricondo & Associates, Inc.

Category	Conditions
VFR	Ceiling above 1,000 ft. AGL Visibility 3 miles or greater
IFR CAT I ILS	Ceiling between 200 ft. and 1,000 ft. AGL Visibility between ½ mile and 3 miles
IFR CAT II ILS	Ceiling between 100 ft. and 200 ft. AGL Visibility between 1/4 mile and 1/2 miles

Each hourly wind observation was segregated into the appropriate meteorological category. A wind rose was then developed for each of the three meteorological categories. An additional wind rose was developed for all weather conditions combined. These wind roses are shown on Exhibits II-5.14 through II-5.17. The percent occurrence of wind by direction for each condition is presented on Exhibits II-5.18 through II-5.21.

The VFR weather condition occurs 98.12 percent of the time around the West Palm Beach area. As shown in Exhibit II-5.14, VFR weather generally consists of winds from the east off of the ocean. During poorer IFR weather conditions, which occur only 1.88 percent of the time, winds tend to come from the west and northwest, as shown in Exhibits II-5.19 and II-5.20.



Note: Ceiling/Visibility conditions occur 98.12% of the time at PBIA.

Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations

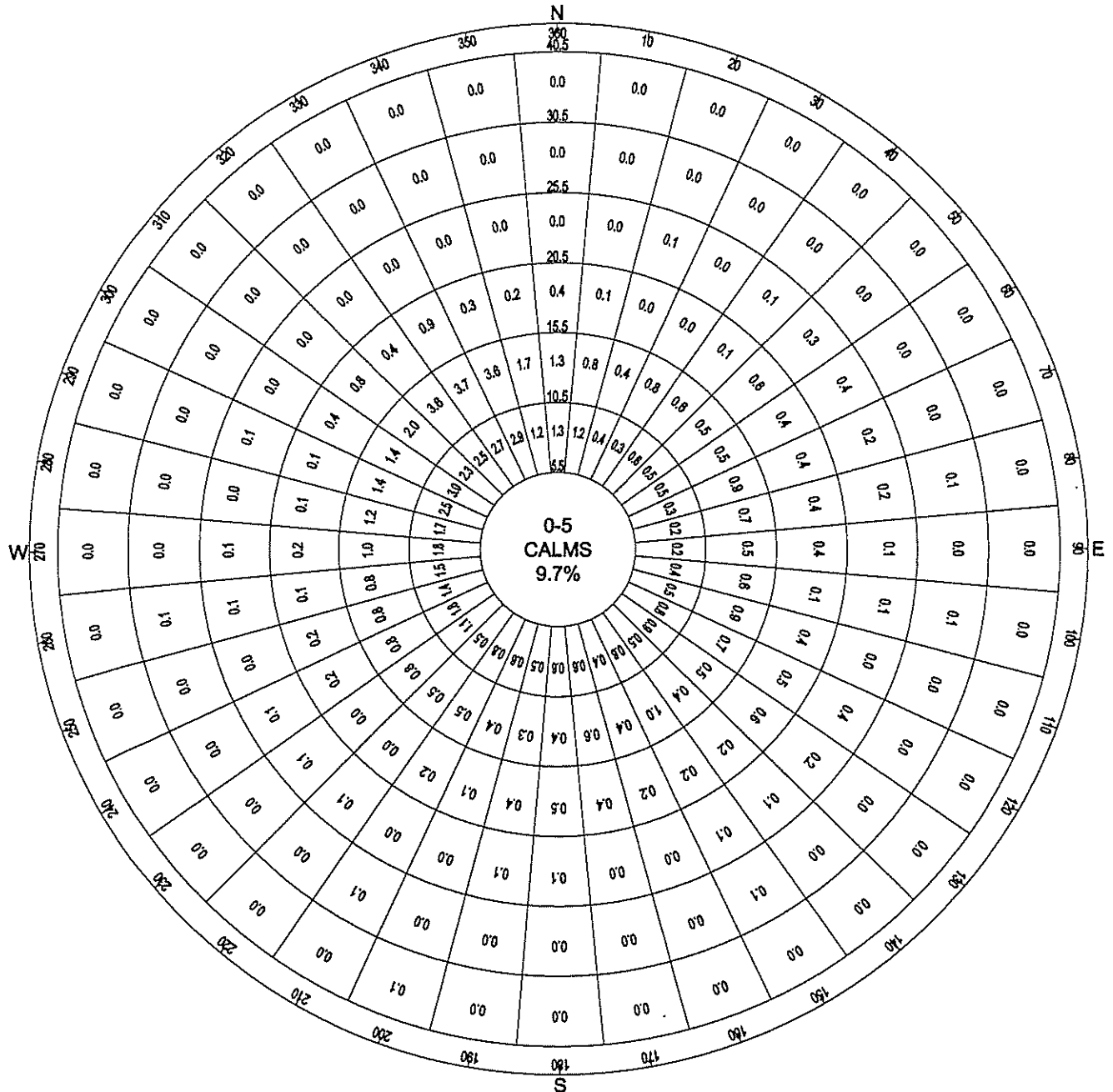
Prepared By : Ricondo & Associates, Inc., October 1998

Exhibit II-5.14



Wind Rose Ceiling/Visibility - Above 1000 Ft/3 Miles

I-5_14.DWG



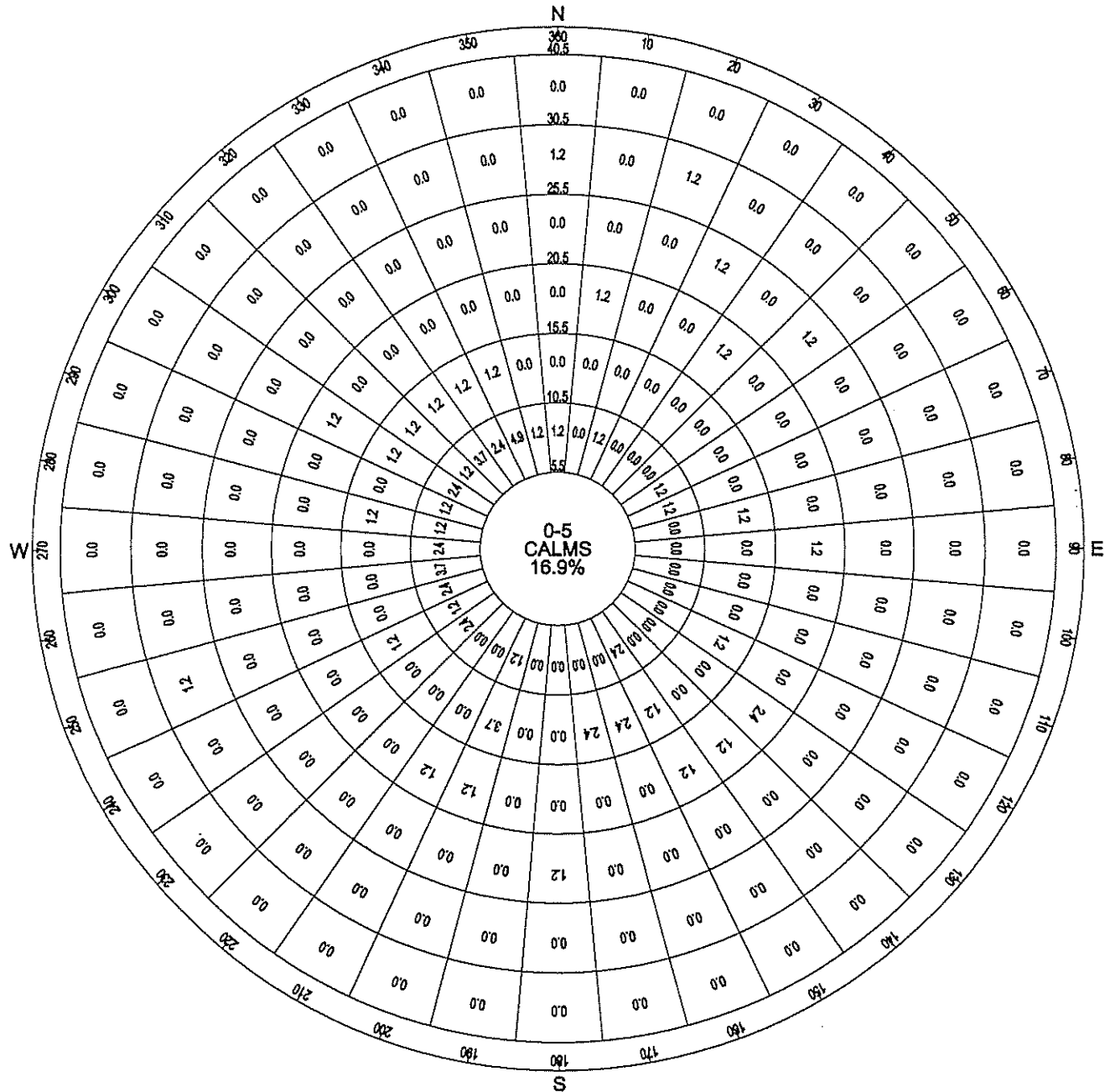
Note: Ceiling/Visibility conditions occur 1.63% of the time at PBIA.
 Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-5.15



Wind Rose Ceiling/Visibility - Between 1000 Ft/3 Miles and 200 Ft/1/2 Mile

II-5_15.DWG



Note: Ceiling/Visibility conditions occur 0.09% of the time at PBIA.

Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations

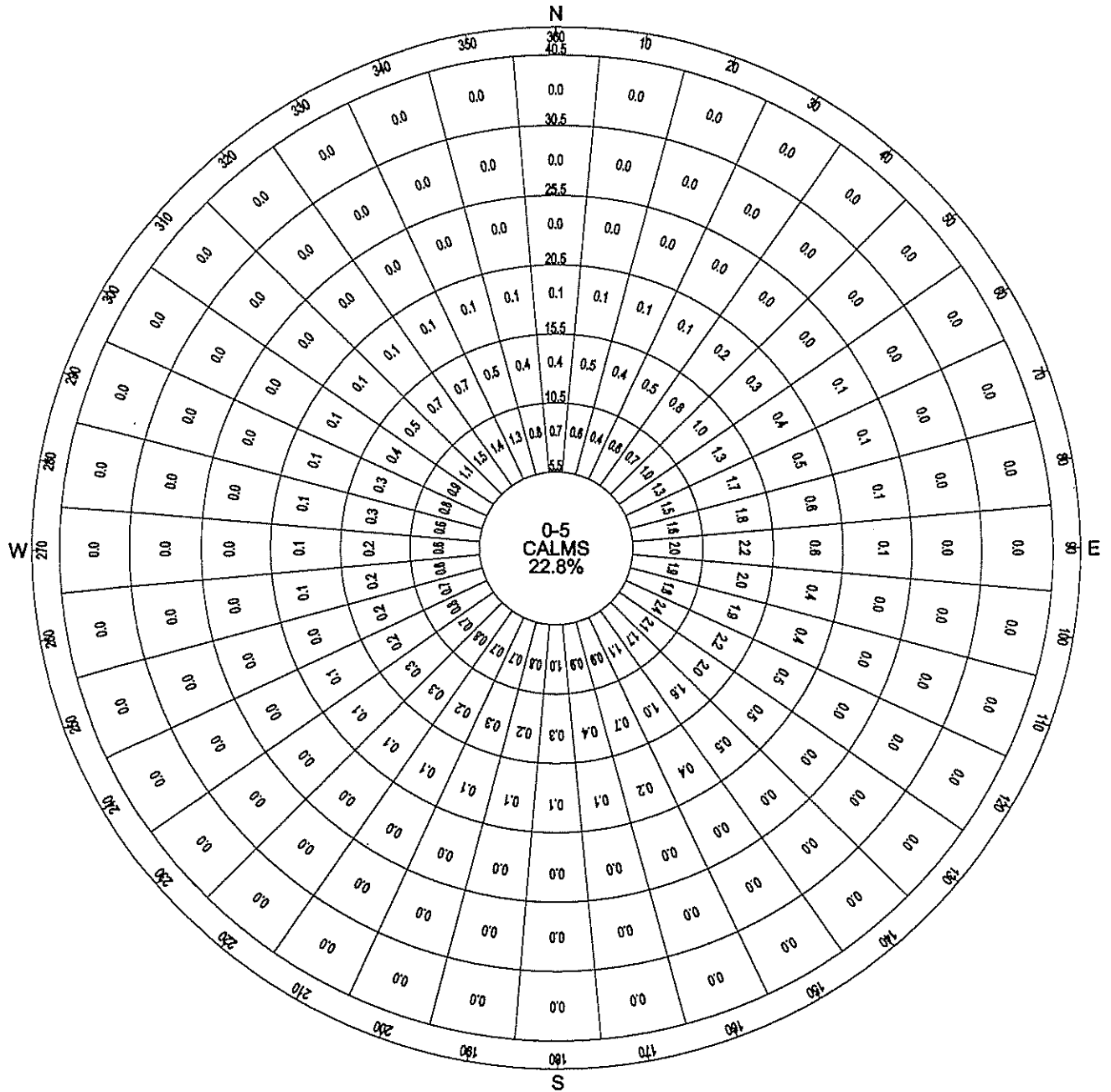
Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-5.16



Wind Rose Ceiling/Visibility - Between 200 Ft/1/2 Mile and 100 Ft/1/4 Mile

II-5.16.DWG



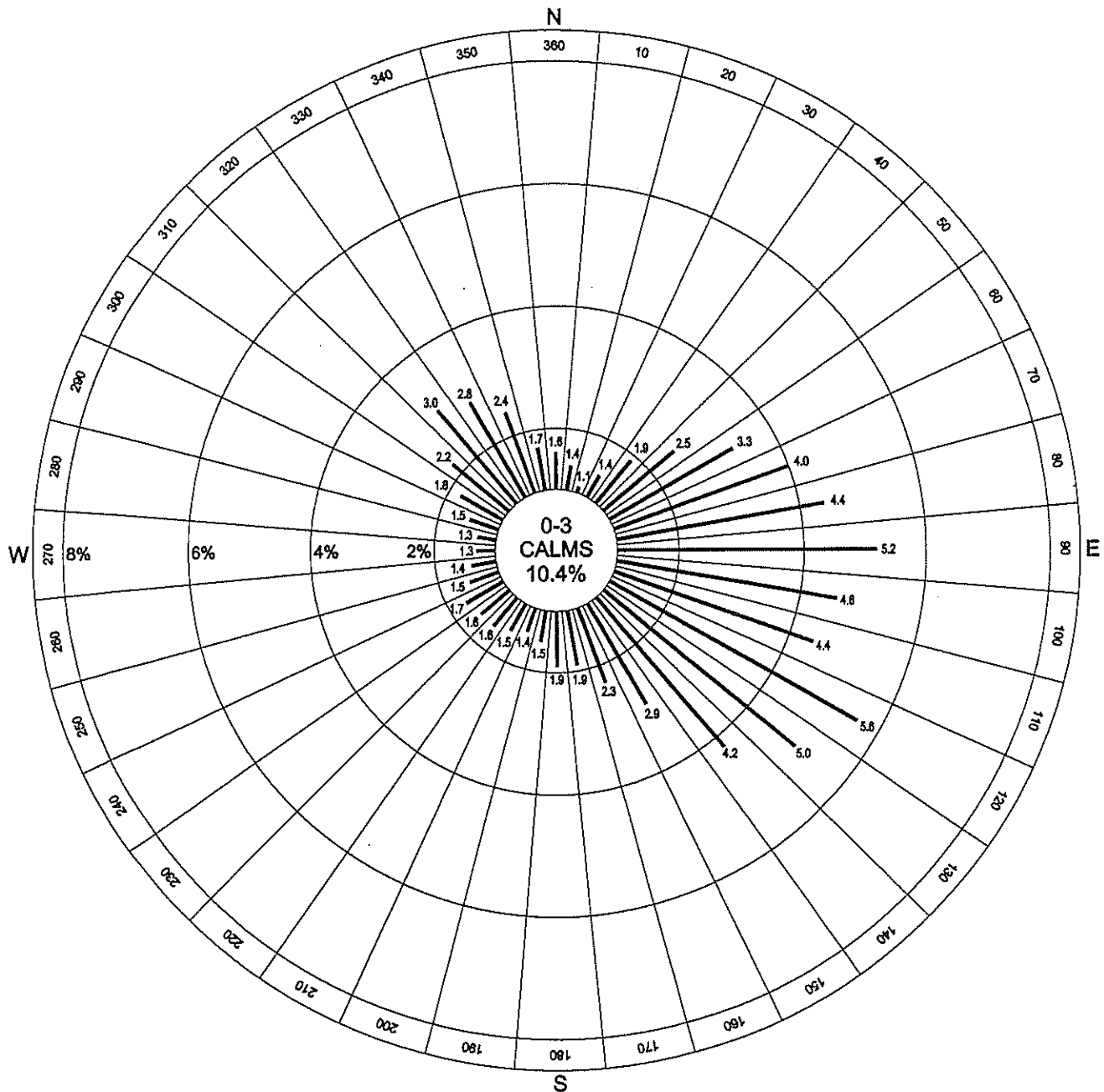
Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-5.17



**Wind Rose
 All Weather**

II-5_17.DWG



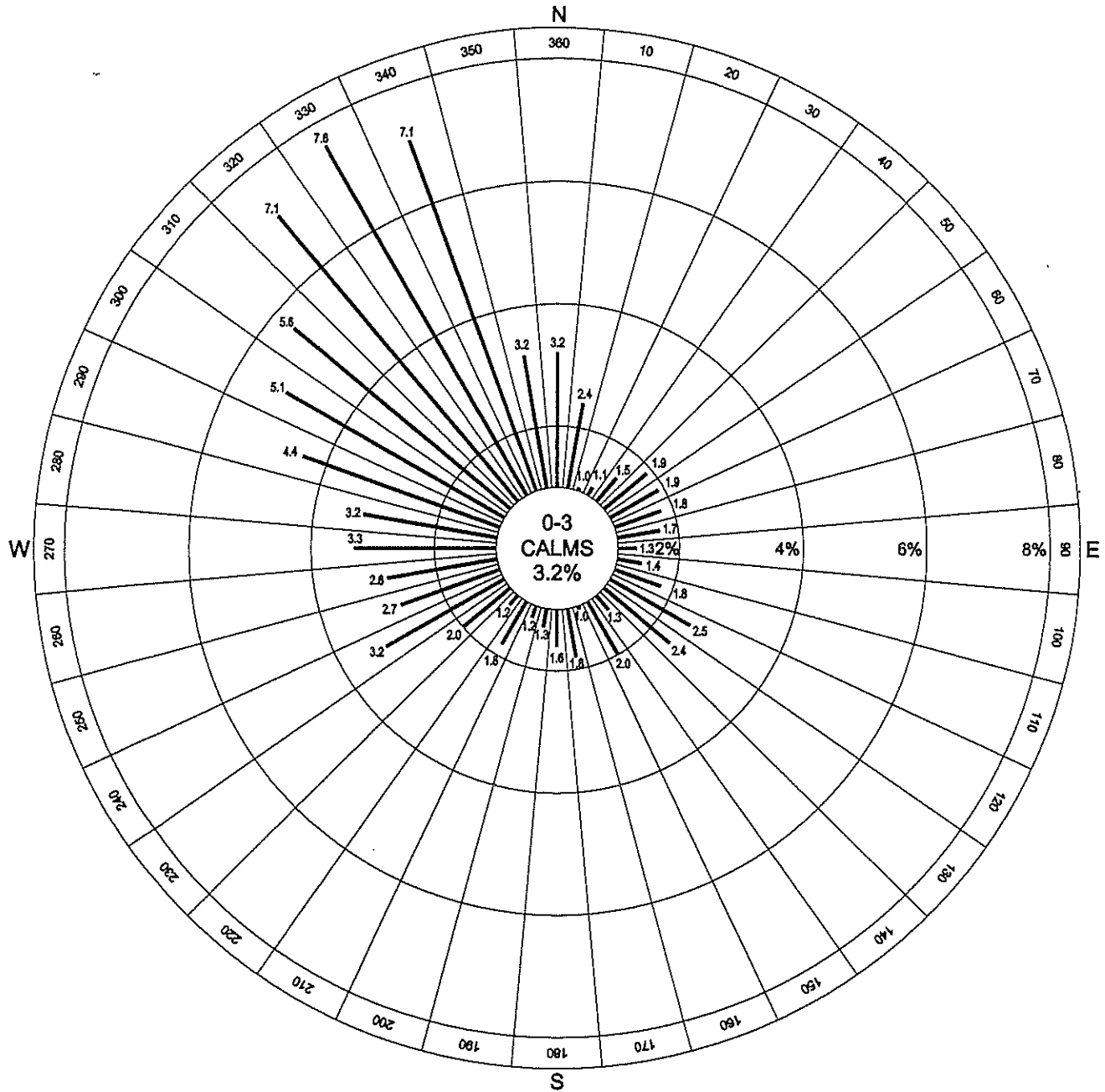
Note: Calms represent wind speeds less than 3 knots to emphasize percent occurrence by direction.
 For the given weather condition winds less than 5 knots occur 24.0% of the time.
 Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-5.18



Percent Occurrence of Wind by Direction Ceiling/Visibility - Above 1000 Ft/3 Miles

II-5.18.DWG



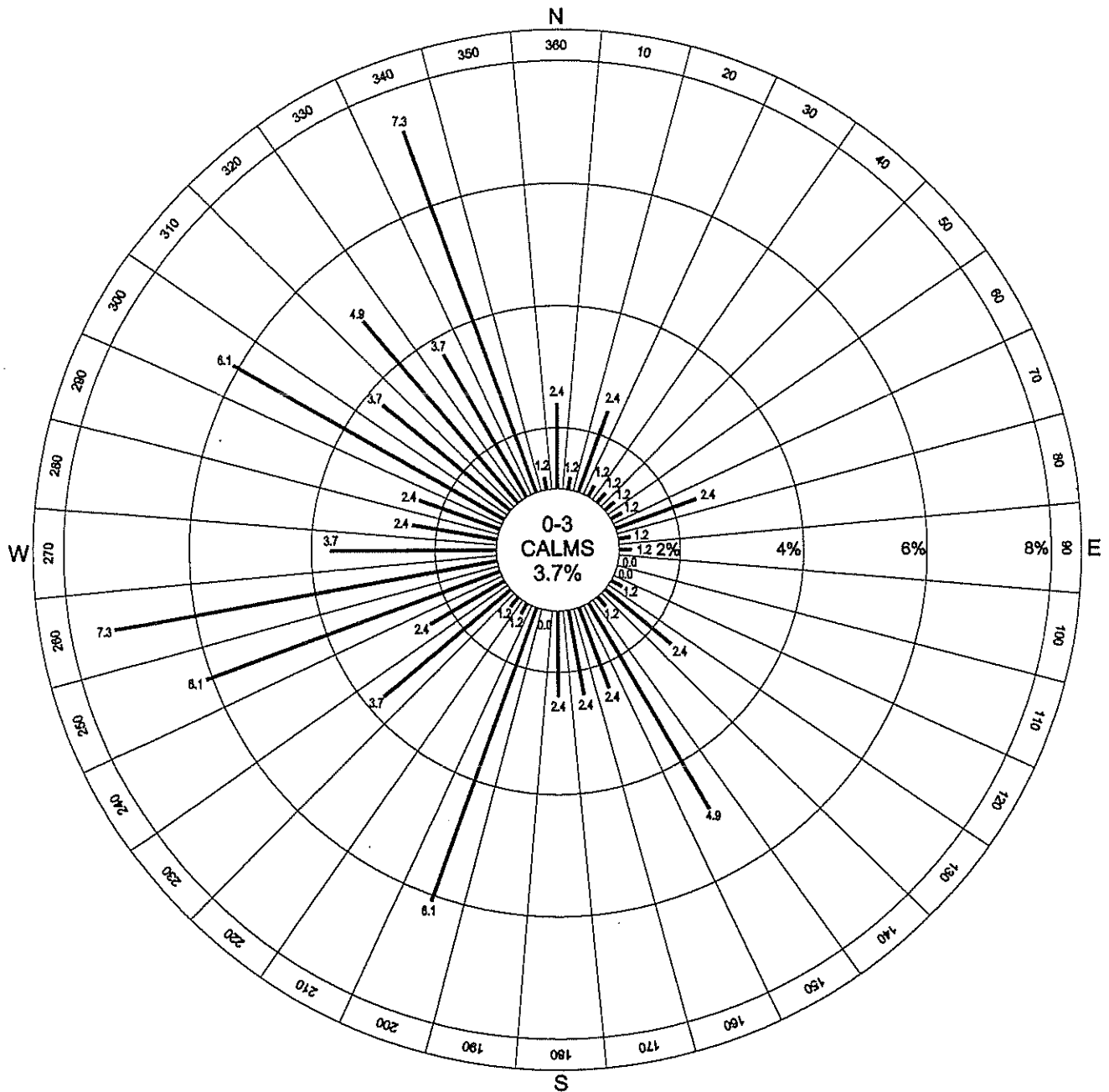
Note: Calms represent wind speeds less than 3 knots to emphasize percent occurrence by direction.
 For the given weather condition winds less than 5 knots occur 9.7% of the time.
 Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-5.19



Percent Occurance of Wind by Direction Ceiling/Visibility - Between 1000 Ft/3 Miles and 200 Ft/1/2 Mile

II-5_19.DWG



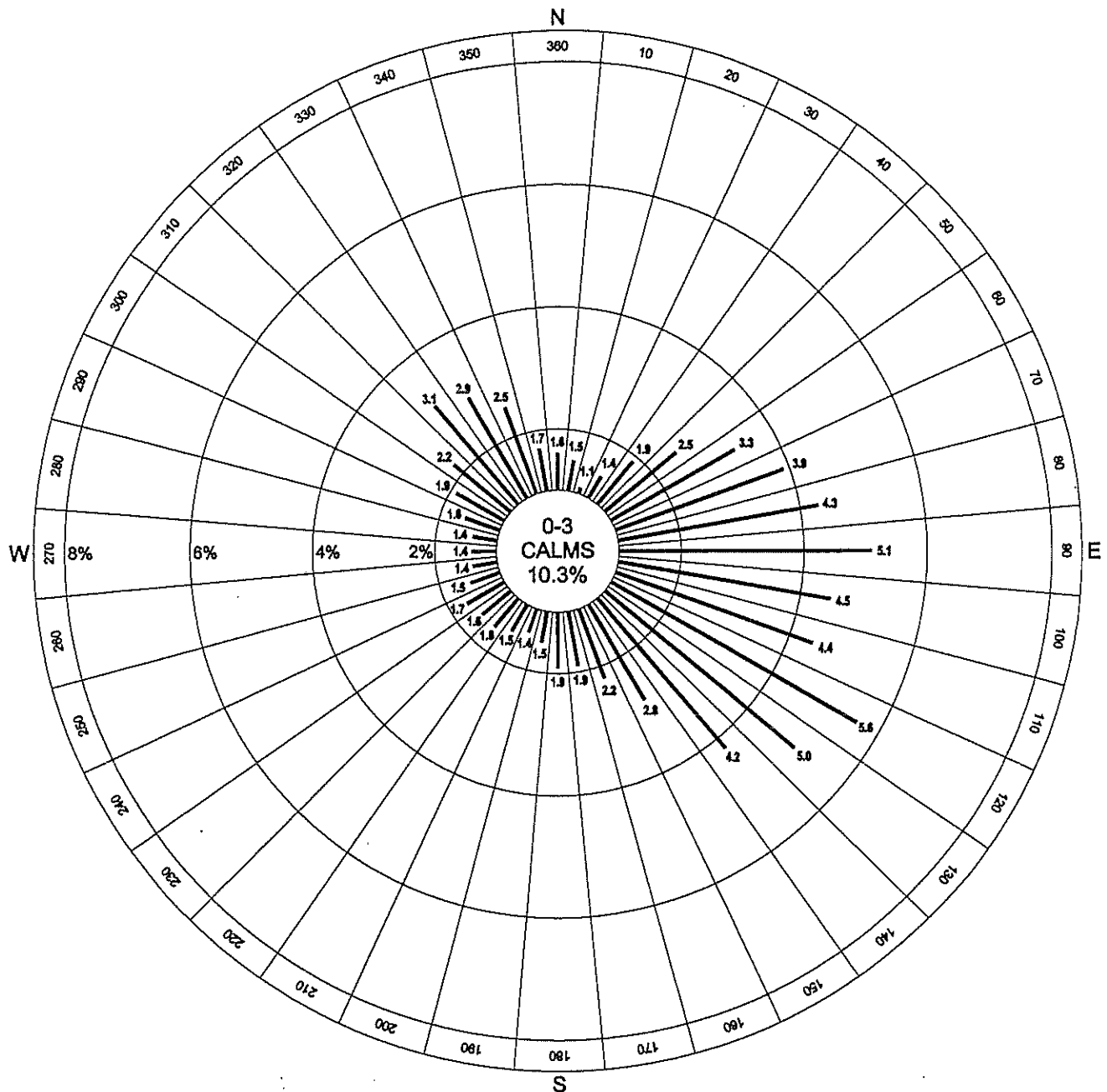
Note: Calms represent wind speeds less than 3 knots to emphasize percent occurrence by direction.
 For the given weather condition winds less than 5 knots occur 16.9% of the time.
 Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations
 Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-5.20



Percent Occurrence of Wind by Direction Ceiling/Visibility - Between 200 Ft/1/2 Mile and 100 Ft/1/4 Mile

II-5_20.DWG



Note: Calms represent wind speeds less than 3 knots to emphasize percent occurrence by direction.

For the given weather condition winds less than 5 knots occur 22.8% of the time.

Source : National Climatic Data Center, January 1, 1986 to December 31, 1995, hourly observations

Prepared By : Ricondo & Associates, Inc., March 1999

Exhibit II-5.21



Percent Occurance of Wind by Direction All Weather

II-5.21.W03



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STRATEGIC MASTER PLAN STUDY

PBI

Prepared for:

Palm Beach International Airport

VOLUME II
SECTIONS 3-4

JANUARY 2001

Prepared by:

Ricondo & Associates, Inc.

In association with

Unison-Maximus Consulting Solutions
GKMG Consulting Services

PALM BEACH COUNTY DEPARTMENT OF AIRPORTS

Section III

III. Demand Analyses

In order to provide a strategic plan for the Airport that is capable of responding to changes in the type and/or level of demand, an understanding of potential changes in future aviation activity is important. Demand scenarios provide a basis for defining the level of flexibility necessary for facility planning and development decision-making to be able to react to potential changes in activity.

Demand scenarios are used to define activity levels and characteristics that may materialize during different conditions at the Airport. These different conditions are designed not only to reflect the passage of time, but also to acknowledge the dynamic nature of the airline industry and the uncertainties inherent in forecasting aviation demand at an airport. The use of multiple demand scenarios in the planning process allows for the assessment of the need for facilities and the level of flexibility that must be provided in the development of future facilities. Thus, demand scenarios are not intended to be reflective of a forecast of aviation demand that will materialize at a particular point in time, rather they are designed to illustrate the range of possibilities in aviation activity that may be experienced during the planning horizon.

As part of the demand analyses effort, several demand scenarios were developed for purposes of projecting aviation activity during the planning horizon, which ends in the year 2020. Aviation activity under the various demand scenarios is represented in terms of passenger enplanements, enplaned cargo, and aircraft operations. Fleet mix and peaking characteristics for each of the demand scenarios were also estimated.

In addition to the demand scenarios referenced above, an Air Service Demand Analysis was conducted. The Air Service Demand Analysis assessed and defined the potential for enhancing air service at the Airport given current demand characteristics. This analysis was performed using U.S. Department of Transportation statistics, air carrier scheduled flight information published in the Official Airline Guide, and socioeconomic data for the region served by the Airport. Field interviews with local businesses and tourism agencies were also conducted to support the quantitative analysis.

The demand analyses prepared as part of this study are described in the following sections:

- Overview
- Aviation Demand Elements
- Factors Affecting Aviation Demand
- Air Service Demand Analysis
- Passenger Enplanements
- Cargo Activity
- Aircraft Operations
- Fleet Mix
- Peaking Characteristics
- Planning Activity Levels
- Design Day Schedule

At the time these demand scenarios were developed, complete data was not available for 1998. As a result, 1997 was used as a base year for projections of aviation activity under the various demand scenarios.

3.1 Overview

Given the current state of the airline industry and the multitude of factors affecting aviation activity in South Florida, a series of alternate demand scenarios was defined. These demand scenarios represent possible growth alternatives, as opposed to forecasts, for the Airport and its role in the aviation system. Demand scenarios were developed based upon assumptions regarding the ultimate outcome of events affecting the industry as a whole as well as South Florida specifically. Assumptions under each scenario were developed primarily based on historical use patterns and aviation demand characteristics for the Airport's market areas as well as the three major South Florida airports, which include Miami International Airport (MIA), Fort Lauderdale-Hollywood International Airport (FLL), and Palm Beach International Airport (PBI).

Three demand scenarios were defined to represent possible aviation growth at the Airport:

Scenario #1 - Baseline Scenario

This scenario was defined to illustrate the level of aviation activity that may be experienced at the Airport if historic trends continue throughout the planning horizon. The Airport's market area is defined to include Palm Beach, Martin, St. Lucie, and Indian River Counties. The goal of the Baseline Scenario is to define a demand level that represents a continuation of existing use patterns for the Airport.

Scenario #2 - Alternate Service Patterns Scenario

The Alternate Service Patterns demand scenario was developed using the results of the Air Service Demand Analysis. This scenario is intended to define an activity profile representative of what would occur if the air service changes suggested by the Air Service Demand Analysis, presented in a later section, were implemented and the associated passenger demands materialize.

Scenario #3 - High Growth Scenario

This scenario was derived to show future growth potential in aviation activity assuming that the recommendations presented in the Air Service Demand Analysis are implemented and accelerated growth is experienced in South Florida and in the Airport's market area.

Demand levels were defined for each demand scenario throughout the planning horizon. Various techniques were used to define these demand levels including regression analysis, trend analysis, market share assessments, and comparisons to other airports, particularly the other South Florida airports.

The various demand projections were ultimately compared to other industry forecasts, such as the Federal Aviation Administration's Terminal Area Forecasts and the Boeing Current Market Outlook Forecasts, for reasonableness.

The resulting demand scenarios cover a wide range of activity levels and characteristics. By assessing the impacts of these demand scenarios on facility requirements, it is possible to define a series of development options that can be incrementally implemented, as demand dictates, to accommodate future activity.

3.2 Aviation Demand Elements

For purposes of this study, aviation demand is categorized into various elements. These elements are listed and briefly described below.

- **Domestic Origin and Destination (O&D) Enplanements** include departing commercial air carrier passengers who reside or work in the Airport's market area and passengers who live elsewhere but have traveled to PBIA for work or personal reasons. Resident passenger demand is determined principally by the strength and character of employers in the region, the resident population, and income levels. Non-resident travel is determined by the region's attractiveness as a center of business and as a pleasure destination.
- **Domestic Connecting Enplanements** represent passengers on air carrier airlines passing through the Airport as part of travel between two other cities. Connecting passenger levels are oftentimes the result of an airline's decision to use an airport for hubbing activities.
- **International Enplanements** represent those passengers on flights whose destination is outside the United States. At PBIA, international activity is performed by both air carrier and commuter airlines. Like the level of activity in any market pair, the level of international enplanements is an indication of the economic and social ties between the local community and international points.
- **Cargo Activity**, which includes both belly cargo and all-cargo tonnage, is comprised of two components: freight and mail. Freight shipments are typically high value or time sensitive products such as electronic equipment or food products. Freight may also include express shipments which typically move on a time-definite basis, i.e., next day service, and usually weigh 100 pounds or less. Airmail is first-class U.S. post carried items which are mostly transported in the belly compartment of regularly scheduled commercial passenger aircraft.
- **Aircraft Operations** are defined as aircraft arrivals and departures associated with either domestic or international activity. Commercial operations consist of all scheduled and non-scheduled activity by air carrier and commuter airlines. All-cargo operations consist of arriving and departing aircraft activity performed by fleet owned by air cargo operators at the Airport. General Aviation operations include non-commercial and non-military activity such as corporate, private, and helicopter operations. Military operations include aircraft and helicopter activity administered by the U.S. Department of Defense.

Aviation activity projected under the three demand scenarios is broken down into the various elements described above. In addition, aviation activity can also be segregated by user category, namely air carrier, commuter, all-cargo, general aviation, and military.

3.3 Factors Affecting Aviation Demand

Development of the various demand scenarios considers historical activity trends, the Airport's position relative to the South Florida market, and the effect that an array of external factors and actions may have on the ability of the Airport to capture its theoretical market potential. These factors include aviation industry standards and the strategies of the various airlines serving PBIA and are indicative of an airline's attitudes concerning the frequency and city-pair service to the Airport, alterations in hubbing practices, the growing use of regional aircraft on short haul routes, and aircraft fleet changes.

Passenger characteristics are another factor which may affect travel patterns. Air transportation demand served by the Airport stems from the market area's socioeconomic factors. Demographics represent the distribution and density of people living within the Airport's market area. Economic factors, such as employment and per capita personal income (PCPI), are representative of the production, distribution, and consumption of wealth within the local economy. When combined, these socioeconomic factors determine the current strength of the market area's economy and are the primary factors used to project aviation activity, particularly local origin and destination passenger traffic.

The impacts of new aviation and communication technologies, as well as alternate modes of transportation, affect the demand for air service. In addition, competition from other airports and the position of PBIA relative to these airports affect demand levels at the Airport.

3.3.1 Aviation Industry Standards

A number of trends that impact costs, growth, and market performance influence airline decision-making as it relates to business strategies and market opportunities. These relate to the concepts of hubbing, regional/short-haul service markets, and global airline alliances.

Hubbing

Many airlines are reverting to a more centralized hub and spoke system as they retreat from smaller hubs throughout their operating networks. American has retreated from San Jose, Nashville, and Raleigh to concentrate on Dallas/Ft. Worth, Chicago, and Miami. Delta is cutting back in Dallas to focus on Atlanta and Continental has eased service in Denver. Airlines are focusing on expanding their base of operations from their more profitable hubs, concentrating on more profitable, long-haul routes, and trying to reduce their cost structure.

This increase in hubbing activity has created growth opportunities for point-to-point carriers like Southwest, Airtran, and several rejuvenated regional carriers such as Atlantic Coast Airlines and Commair. They are filling the voids at non-hub airports and concentrating on regional or "short-haul" routes, defined as flights that are less than 500 miles in stage length. In several markets, the larger carriers have ceded service to these regional carriers with the notion that they can improve profitability by serving long-haul travel demand.

Regional Aircraft and Service

Regional jets are smaller, less expensive jets capable of efficiently serving traditional turboprop markets with passenger comfort and convenience levels associated with jet aircraft. As a result, demand for these jets has escalated in recent years. Regional jets fly routes averaging 400 miles with some extending up to 700 miles. They are enabling regional airlines to carve out new niches in the travel industry and have threatened larger jet operators by flying point-to-point routes less expensively.

To accomplish efficiency and battle costs, some of the major airlines have attempted to establish "airlines within airlines," often employing the new regional jets. Continental Airlines started the trend with Cal Lite three years ago, which offered a discount service on selected routes. Since then, United Airlines has followed with shuttle service on the West Coast and regional service through Atlantic Coast Airlines, which recently announced plans to increase operations to and from Washington-Dulles International Airport. Delta Airlines is deploying its Delta Connection/Delta Express service with great success. Results have varied, however, as evidenced by the unsuccessful

Cal Lite operation. This concept has been difficult to implement successfully, in part, because it represents a new service offering that is not perceived as characteristic of some airlines. Furthermore, airlines have experienced difficult negotiations with pilots over their role in these sub-airlines or regional airlines.

Airline Alliances

Clearly, inter-airline alliances are revolutionizing the nature of air travel worldwide. Often, alliances take the form of code-sharing and promotional agreements. Passengers can make a complete reservation on multiple airlines with code-sharing/reservation agreements and often have reciprocal frequent-flier or airport lounge benefits. American Airlines-British Airways-Iberian Airlines-TACA (among others) is a formidable alliance, paired against Northwest-KLM-Continental-Air France-Virgin and the Star Alliance. The Star Alliance, composed of United-Lufthansa-SAS-Air Canada-THAI-Varig, has recently added Delta as a code-share partner.

As a condition of allowing international alliances antitrust immunity, the United States government is demanding enhanced "Open Skies" freedom for airlines. Particularly, the U.S. government seeks unrestrained capacity and frequency on all international routes and the right to fly routes within another country. "Open Skies" also entails liberal charter agreements, liberal cargo regimes, open code-sharing opportunities, and open entry for all routes among other provisions. Although the U.S. has aggressively sought these policies, the process has been abetted by continuing liberalization coupled with the growth of the European Union.

While the exact impacts of these airline alliances are still unknown given their infant stage, many possible scenarios can be envisioned. For instance, it can be argued that major gateway airports may see some increases in international airline operations as the alliance airlines consolidate their operations at the hubs and begin to coordinate their schedules to take better advantage of connecting flights by alliance partners. Conversely, the alliances may result in reductions in service at particular airports as route structures are consolidated.

3.3.2 Socioeconomic Factors

PBIA primarily serves Palm Beach County and the three adjacent counties to the north, which include Martin, St. Lucie, and Indian River. It is the primary commercial service airport within the service region. The southern portion of Palm Beach County is also partially served by Fort Lauderdale-Hollywood International Airport.

Socioeconomic statistics related to population, employment, and income are typically used in forecasting origin and destination (O&D) traffic. Since O&D passengers are the primary component of PBIA's traffic, these socioeconomic factors can provide a good indicator of the air travel demand at the Airport.

The historical and forecast socioeconomic data used in this Study were obtained from the National Planning Association Data Services, Inc. (NPA). The NPA is an independent non-political organization located in Washington, D.C., which conducts research in the public interest. Its historical data is generated from government sources such as the U.S. Census Bureau, the U.S. Department of Labor, and the U.S. Department of Commerce. Data is also provided by NPA's own independent research activities. NPA has formulated its own mathematical models of the United States to provide forecast data. NPA data used in this report includes total population, total non-farm employment, total households, and personal income per capita.

In addition, forecast growth projections for each of the socioeconomic variables mentioned above were requested from the various municipalities comprising Palm Beach County as well as from the other counties included in the Airport's market area. The objective was to compare the projections provided by the various municipalities and adjacent counties to the projections obtained from the NPA. Approximately one-half of the municipalities provided this information. However, many of the municipalities that provided socioeconomic statistics lacked projections for some or all of the variables selected for this Study. Therefore, only the socioeconomic data included in the Comprehensive Plans provided by the four market area counties was available for comparison to the NPA data.

In general, the aggregate of the counties' projections for future socioeconomic growth indicate slower growth than that projected by the NPA with the exception of personal income per capita. As a result, the socioeconomic forecasts obtained from the NPA were adopted for the demand analysis. Each of the four socioeconomic variables are further described below. Historical and projected statistics, as obtained from both the NPA and the market area counties, are also discussed in the following pages.

Population

Population is a fundamental component in most aviation forecasting efforts. When considered alone, lower than average or decreasing population growth in an area is a strong indicator of the need for a more conservative projection of aviation activity. However, in the case of Palm Beach County and South Florida as a whole, strong population growth indicates an active aviation environment.

Palm Beach County ranks as the third most populous county in the state of Florida, with only Dade and Broward counties having larger populations. In 1990, Palm Beach County accounted for 6.7 percent of the state's total population.

Population in the market area increased at an average annual compound growth rate of 3.73 percent from 1978 through 1997. The state and national averages for this period were 2.52 percent and 0.99 percent, respectively. From 1978 to 1997, St. Lucie County had the highest population growth rate at 4.55 percent, followed by Martin County at 3.86 percent, and Palm Beach County at 3.63 percent. This trend suggests that the market area has benefited from the recent migration of people to South Florida. According to NPA, the market area's population is projected to grow at a slower growth rate of 2.71 percent from 1998 to 2020.

Tables III-3.1 and III-3.2 summarize the historical and projected total population for the Airport's market area. Population forecasts obtained from both the NPA and the various counties in the market area are shown in Table III-3.2. As shown, independent county forecasts are, on the average, 2.8 percent lower than the corresponding NPA forecast.

Non-farm Employment

The economy of the Airport's market area has expanded to create employment opportunities for its growing population. In fact, the market area's economy has expanded to create employment at nearly twice the rate of the nation in the period beginning in 1980 and ending in 1997.

Employment levels in the PBIA market area were significantly higher than those for the state of Florida and the nation. From 1978 to 1997, employment in the market area grew at an average annual compound growth rate of 4.52 percent as compared to the 3.49 percent annual compound growth rate for Florida and 1.94 percent annual compound growth rate for the nation. Of the four

Table III-3.1

Historical Population

Year	Total Population (in Thousands)									
	US	Florida	Growth	Palm Beach	Growth	Martin	Growth	St. Lucie	Growth	Indian River
1978	222,103	9,132		518		57		77		53
1979	224,566	9,471	1.11%	551	6.29%	61	7.76%	82	6.21%	58
1980	227,226	9,841	1.18%	586	6.34%	65	6.32%	89	8.20%	61
1981	229,466	10,193	0.99%	621	5.94%	69	5.45%	95	7.27%	64
1982	231,665	10,471	0.96%	646	4.08%	73	5.84%	101	6.10%	68
1983	233,793	10,750	0.92%	667	2.66%	76	4.21%	106	4.72%	70
1984	235,825	11,040	0.87%	694	3.96%	79	4.20%	111	5.00%	74
1985	237,924	11,351	0.89%	723	2.82%	82	3.95%	116	4.31%	76
1986	240,133	11,668	0.93%	753	4.20%	86	4.58%	121	4.68%	79
1987	242,290	11,997	0.90%	785	4.18%	90	5.32%	128	5.22%	81
1988	244,500	12,306	0.91%	815	3.85%	94	3.81%	134	4.98%	84
1989	246,820	12,638	0.95%	842	3.32%	97	4.08%	142	5.80%	88
1990	249,440	13,018	1.06%	870	3.34%	102	4.62%	152	7.49%	91
1991	252,124	13,286	1.08%	891	2.41%	104	2.16%	157	3.07%	92
1992	255,002	13,501	1.14%	912	2.32%	105	0.91%	161	2.51%	94
1993	257,753	13,712	1.08%	936	2.63%	107	1.97%	165	2.40%	94
1994	260,292	13,956	0.99%	960	2.55%	109	1.80%	169	2.52%	95
1995	262,761	14,181	0.95%	978	1.88%	111	1.61%	172	1.76%	97
1996	265,179	14,419	0.92%	996	1.87%	114	2.64%	176	2.28%	98
1997	267,636	14,654	0.93%	1,019	2.25%	116	2.09%	180	2.01%	99
Avg. Annual Growth Rate			0.99%		3.63%		3.86%		4.55%	
										3.73%

Source: National Planning Association

Prepared by: Ricordo & Associates, Inc., December 1998

Table III-3.2
Forecast Population

Year	Total Population (in Thousands)											
	Palm Beach			Martin			St. Lucie			Indian River		
	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.
1998	1,041	1,035	-0.54%	120	123	2.78%	185	193	n/a	101	104	2.33%
1999	1,065	1,052	-1.25%	124	126	3.39%	191	207	8.46%	103	108	4.54%
2000	1,094	1,068	-2.38%	128	129	3.70%	197	219	11.02%	106	112	5.84%
2001	1,122	1,085	-3.30%	133	132	3.51%	204	235	15.35%	109	117	7.85%
2002	1,150	1,103	-4.11%	137	135	3.35%	210	252	20.02%	111	122	10.00%
2003	1,178	1,121	-4.84%	142	138	3.22%	216	270	25.03%	114	128	12.27%
2004	1,205	1,139	-5.49%	146	141	3.09%	223	290	30.40%	116	133	14.68%
2005	1,232	1,170	-5.04%	151	143	4.82%	229	253	10.65%	119	124	4.39%
2006	1,259	1,190	-5.45%	155	146	2.86%	235	261	10.92%	121	126	4.16%
2007	1,285	1,211	-5.81%	159	150	2.75%	241	268	11.28%	124	129	3.99%
2008	1,312	1,232	-6.12%	163	153	2.66%	247	276	11.74%	126	131	3.87%
2009	1,338	1,253	-6.39%	168	156	2.58%	253	284	12.27%	129	133	3.79%
2010	1,365	1,271	-6.87%	172	160	2.51%	259	290	12.03%	131	136	3.42%
2011	1,391	1,292	-7.15%	176	163	2.43%	265	296	11.66%	133	138	3.26%
2012	1,417	1,313	-7.39%	180	167	2.35%	271	302	11.38%	136	140	3.15%
2013	1,443	1,334	-7.76%	184	170	2.29%	277	308	11.16%	138	143	3.06%
2014	1,469	1,355	-7.76%	188	174	2.22%	283	314	11.00%	141	145	3.01%
2015	1,496	1,374	-8.13%	192	178	2.17%	288	319	10.50%	143	147	2.72%
2016	1,521	1,396	-8.23%	196	182	2.10%	294	325	10.46%	146	149	2.59%
2017	1,547	1,419	-8.29%	200	186	2.04%	300	331	10.48%	148	152	2.50%
2018	1,573	1,442	-8.33%	204	190	1.99%	306	338	10.55%	150	154	2.43%
2019	1,599	1,465	-8.34%	208	194	1.94%	311	345	10.67%	153	156	2.39%
2020	1,624	1,489	-8.33%	212	198	1.89%	317	351	10.84%	155	158	2.15%
Avg. Annual Growth Rate:												
1998-2000	2.56%	1.59%		3.61%	2.46%		3.34%	6.81%		2.41%	4.21%	
2000-2005	2.52%	1.91%		3.44%	2.18%		3.20%	3.12%		2.39%	2.08%	
2005-2010	2.15%	1.73%		2.82%	2.28%		2.64%	2.92%		2.06%	1.85%	
2010-2015	1.92%	1.62%		2.40%	2.28%		2.27%	1.97%		1.85%	1.70%	
2015-2020	1.72%	1.67%		2.07%	2.28%		1.98%	2.05%		1.67%	1.55%	
Value obtained from respective County source.												
Sources:												
National Planning Association; The Comprehensive Plan for St. Lucie County, 1990; Indian River County - 2020 Comprehensive Plan, 1998;												
Palm Beach County Planning, Building and Zoning Dept. - 1994-95 Maps Graphs & Data Book; Martin County - Comprehensive Growth Management Plan												
Prepared by: Ricordo & Associates, Inc., December 1998												
Avg. Difference =												
										2.74%	2.54%	
										2.68%	2.12%	
										2.27%	1.96%	
										2.00%	1.74%	
										1.79%	1.78%	

counties comprising the Airport's market area, Martin County has historically had the highest growth rate in nonfarm employment, averaging 5.19 percent from 1978 to 1997, and is projected to have the highest growth rate from 1998 to 2020, averaging 3.81 percent. NPA's nonfarm employment forecast for the market area reflects an average annual compound growth rate of 2.9 percent from 1997 to 2020.

Tables III-3.3 and III-3.4 summarize historical and projected nonfarm employment for the Airport's market area including a comparison of individual county forecasts and those obtained from NPA. Exhibit III-3.1 shows a 1990 breakdown of employment by industry for each county in the market area, as reported by the U.S. Department of Labor, Bureau of Labor Statistics. As shown, wholesale and retail trade represents the largest employment sector for all four counties. For Indian River, Palm Beach, and St. Lucie counties, the government sector is the second largest employment provider. For Martin County, manufacturing is the second largest employment sector.

Households

Households, in this case, are defined as the total number of single and multi family residences. It includes condominiums, townhomes, and duplex units. It does not, however, include hotel, motel, or resort units.

The total number of households in the PBIA market area has increased at a significantly higher rate than that of the state of Florida and the nation. From 1978 to 1997, households in the market area grew at an average annual compound growth rate of 4.12 percent as compared to the 2.83 percent annual compound growth rate for Florida and 1.40 percent annual compound growth rate for the nation. NPA's total households forecast for the market area reflects an average annual compound growth rate of 3.17 percent from 1998 to 2020.

Tables III-3.5 and III-3.6 summarize the historical and projected total number of households for the Airport's market area. Included in Table III-3.6 are both the forecasts obtained from individual counties in the Airport's market area and those obtained from NPA.

Personal Income Per Capita

The relative wealth of the population has a significant influence on locally generated travel. It is a logical conclusion that an area with a wealthy population will generate a greater amount of air travel demand than an area of comparable size with a poorer population.

The market area's economic strength, as gauged by personal income, compares favorably with Florida and the United States. Total personal income per capita (PIPC) in the market area grew at an average annual compound rate of 2.49 percent from 1978 to 1997. During the same period, PIPC for the state of Florida grew at an average annual compound rate of 1.73 percent while PIPC for the nation grew at an average rate of 1.57 percent. However, over the 1998 to 2020 forecast period, PIPC is expected to increase at a slower pace than the historical growth rates for the market area. NPA forecasts total PIPC for the period 1998 to 2020 to increase at an average annual rate of 0.96 percent for the market area. Tables III-3.7 and III-3.8 summarize the historical and projected PIPC for the Airport's market area. Table III-3.8 shows forecasts obtained from both the NPA and from each of the counties in the Airport's market area.

Table III-3.3
Historical Nonfarm Employment

Year	Total Nonfarm Employment (in Thousands)										Total	Growth
	US	Florida	Palm Beach	Growth	Martin	Growth	St. Lucie	Growth	Indian River	Growth		
1978	105,928	4,132	239		23		30		24		317	
1979	109,521	4,352	261	3.39%	26	9.11%	34	10.78%	26	6.54%	346	9.24%
1980	110,430	4,589	280	0.83%	29	7.16%	36	14.09%	27	7.37%	372	7.40%
1981	111,551	4,779	297	1.02%	31	6.25%	37	5.49%	29	7.22%	394	5.99%
1982	110,861	4,870	308	-0.62%	33	3.63%	38	7.18%	29	2.28%	408	3.60%
1983	112,136	5,077	327	1.15%	34	6.39%	40	3.68%	30	1.05%	432	5.84%
1984	117,379	5,428	358	4.68%	37	9.44%	42	7.59%	32	2.76%	470	8.76%
1985	121,003	5,718	381	3.09%	39	5.92%	45	6.41%	34	7.02%	500	6.37%
1986	123,602	5,964	403	2.15%	41	5.78%	48	5.26%	36	6.75%	529	5.85%
1987	127,092	6,051	414	2.82%	43	2.69%	50	6.22%	36	6.82%	543	2.72%
1988	131,394	6,352	441	3.38%	47	6.38%	53	3.81%	40	0.22%	581	6.90%
1989	134,117	6,566	453	2.07%	49	2.81%	57	8.75%	42	7.31%	601	3.59%
1990	136,033	6,694	456	1.43%	51	2.72%	58	5.83%	43	6.42%	608	1.11%
1991	135,680	6,692	458	-0.26%	50	0.79%	58	2.72%	43	1.85%	608	1.11%
1992	136,362	6,737	456	0.50%	49	0.27%	58	-2.15%	42	-0.12%	605	-0.39%
1993	138,993	6,978	476	1.93%	51	-0.40%	60	-0.20%	43	0.00%	630	4.13%
1994	142,691	7,219	494	2.66%	52	4.52%	61	3.01%	44	3.44%	651	3.35%
1995	146,462	7,456	509	2.64%	55	3.71%	62	1.88%	46	1.70%	672	3.11%
1996	149,377	7,674	533	1.99%	58	3.01%	63	5.20%	48	1.58%	703	4.67%
1997	152,266	7,906	554	1.93%	60	4.77%	65	6.35%	50	2.36%	729	3.74%
Avg. Annual Growth Rate				1.94%		4.56%		5.19%		4.20%		4.52%

Source: National Planning Association
Prepared by: Filocondo & Associates, Inc., December 1998

Table III-3.4

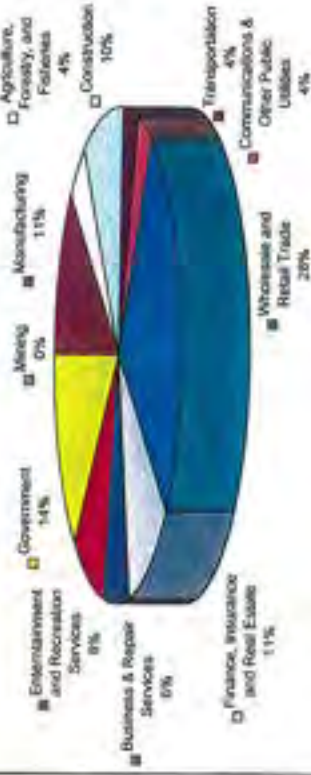
Forecast Nonfarm Employment

Year	Total Nonfarm Employment (in Thousands)											
	Palm Beach				Martin				St. Lucie			
	NPA	County	% Diff.		NPA	County	% Diff.		NPA	County	% Diff.	
1998	575	529	-8.14%		62	60	-3.82%		68	n/a	n/a	
1999	595	504	-15.28%		65	59	-8.70%		70	n/a	n/a	
2000	615	478	-22.28%		68	59	-13.05%		72	n/a	n/a	
2001	635	492	-22.42%		71	59	-17.05%		74	n/a	n/a	
2002	654	507	-22.37%		73	58	-20.61%		76	n/a	n/a	
2003	672	523	-22.24%		76	58	-23.90%		78	n/a	n/a	
2004	691	538	-22.12%		79	57	-26.99%		80	n/a	n/a	
2005	710	550	-22.50%		81	57	-29.87%		82	n/a	n/a	
2006	729	567	-22.24%		84	57	-32.53%		85	n/a	n/a	
2007	748	584	-21.92%		87	56	-35.02%		87	n/a	n/a	
2008	766	602	-21.44%		89	56	-37.26%		89	n/a	n/a	
2009	784	620	-20.92%		92	56	-39.36%		91	n/a	n/a	
2010	801	638	-20.32%		94	55	-41.32%		93	n/a	n/a	
2011	819	658	-19.70%		97	55	-43.18%		95	n/a	n/a	
2012	834	678	-18.71%		99	55	-44.71%		96	n/a	n/a	
2013	848	698	-17.70%		101	54	-46.18%		98	n/a	n/a	
2014	864	719	-16.74%		103	54	-47.63%		100	n/a	n/a	
2015	878	741	-15.63%		105	54	-48.96%		102	n/a	n/a	
2016	892	763	-14.45%		107	53	-50.20%		103	n/a	n/a	
2017	905	786	-13.14%		109	53	-51.33%		105	n/a	n/a	
2018	918	810	-11.77%		111	53	-52.42%		106	n/a	n/a	
2019	931	834	-10.38%		112	52	-53.48%		108	n/a	n/a	
2020	944	860	-8.91%		114	52	-54.49%		109	n/a	n/a	
Avg. Annual Growth Rate:												
1997-2000	3.44%	-4.79%			4.62%	-0.62%			3.25%	n/a		
2000-2005	3.09%	3.02%			4.01%	-0.63%			2.92%	n/a		
2005-2010	2.57%	3.21%			3.17%	-0.61%			2.53%	n/a		
2010-2015	1.92%	3.21%			2.29%	-0.61%			1.87%	n/a		
2015-2020	1.50%	3.21%			1.74%	-0.61%			1.46%	n/a		

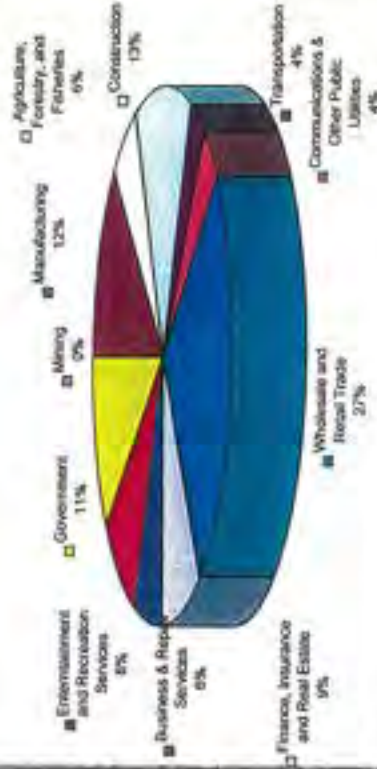
Value obtained from respective County source.

Sources: National Planning Association; The Comprehensive Plan for St. Lucie County, 1990; Indian River County - 2020 Comprehensive Plan, 1998;
Palm Beach County Planning, Building and Zoning Dept. - 1994-95 Maps Graphs & Data Book; Martin County - Comprehensive Growth Management Plan
Prepared by: Fibondo & Associates, Inc., December 1998

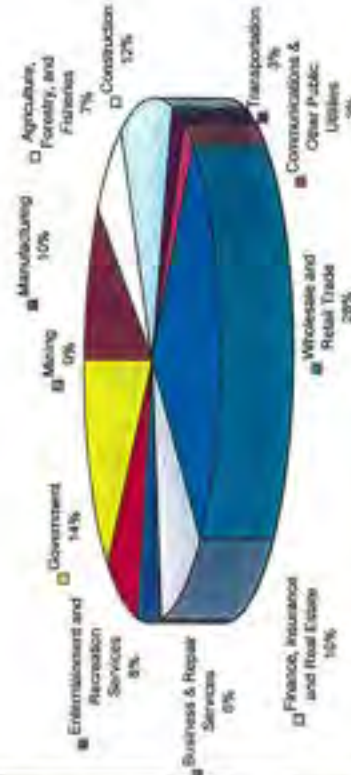
Palm Beach County



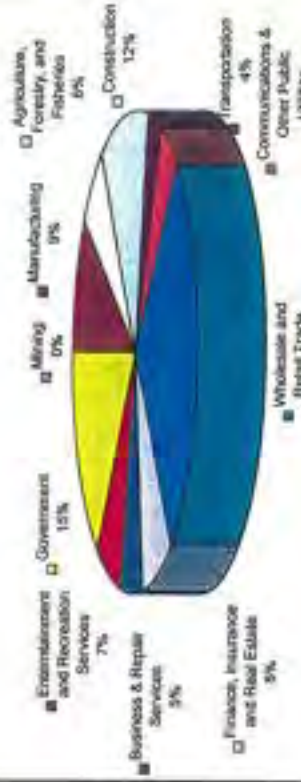
Martin County



Indian River County



St. Lucie County



Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Exhibit III-3.1

Employment Statistics

Table III-3.5
Historical Households

Year	Total Households (in Thousands)										Total	Growth
	US	Florida	Palm Beach	Growth	Martin	Growth	St. Lucie	Growth	Indian River	Growth		
1978	76,853	3,398	203		22		28		20		273	
1979	78,796	3,575	219	5.20%	24	7.83%	30	9.12%	22	10.08%	295	8.06%
1980	80,738	3,785	237	5.86%	26	8.36%	33	10.08%	24	6.89%	319	8.41%
1981	82,131	3,948	253	4.31%	28	6.79%	36	8.37%	25	6.70%	342	6.92%
1982	82,948	4,059	264	2.81%	30	4.26%	38	6.43%	27	6.24%	358	4.79%
1983	83,644	4,165	273	2.61%	31	3.38%	40	4.83%	28	4.83%	371	3.72%
1984	85,202	4,325	287	3.84%	33	5.20%	42	6.24%	30	6.46%	391	5.43%
1985	86,552	4,473	301	3.42%	34	4.94%	44	4.98%	31	3.96%	410	4.86%
1986	87,743	4,608	315	3.02%	36	4.60%	47	4.97%	32	4.58%	430	4.88%
1987	88,855	4,748	329	3.04%	38	4.55%	49	5.42%	34	3.73%	450	4.69%
1988	90,232	4,886	344	2.91%	40	4.38%	52	5.28%	35	4.19%	470	4.47%
1989	91,483	5,033	357	3.01%	41	3.82%	55	6.06%	37	5.19%	490	4.24%
1990	92,137	5,146	366	2.24%	43	2.69%	58	6.48%	38	3.47%	506	3.28%
1991	93,179	5,237	374	1.77%	44	2.14%	60	2.80%	39	1.28%	517	2.13%
1992	94,654	5,340	384	1.96%	44	2.69%	62	2.87%	39	1.76%	530	2.52%
1993	95,358	5,379	391	0.74%	45	1.76%	63	1.54%	39	-0.33%	538	1.53%
1994	95,988	5,451	399	1.33%	46	2.10%	64	1.36%	40	0.79%	548	1.94%
1995	97,386	5,551	408	1.85%	46	2.11%	65	1.82%	40	1.65%	559	2.04%
1996	98,751	5,648	416	1.74%	48	1.95%	67	2.36%	41	1.22%	571	2.01%
1997	100,105	5,769	427	2.14%	49	2.72%	68	2.49%	41	1.99%	586	2.63%
Avg. Annual Growth Rate				2.83%		4.01%		4.28%		3.93%		4.12%

Source: National Planning Association
Prepared by: Ricondo & Associates, Inc., December 1998

Table III-3.6

Forecast Households

Year	Total Households (in Thousands)																								
	Palm Beach					Martin					St. Lucie					Indian River					Total				
	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	
1998	437.96	438.41	0.10%	50.69	50.93	0.46%	70.65	n/a	n/a	42.47	n/a	n/a	42.47	n/a	n/a	602	n/a	n/a	602	n/a	n/a	602	n/a	n/a	
1999	449.91	450.27	0.08%	52.60	53.02	0.80%	73.13	n/a	n/a	43.56	n/a	n/a	43.56	n/a	n/a	619	n/a	n/a	619	n/a	n/a	619	n/a	n/a	
2000	463.49	461.50	-0.43%	54.71	55.21	0.91%	75.87	n/a	n/a	44.81	n/a	n/a	44.81	n/a	n/a	639	n/a	n/a	639	n/a	n/a	639	n/a	n/a	
2001	476.98	473.98	-0.63%	56.81	57.48	1.18%	78.60	n/a	n/a	46.06	n/a	n/a	46.06	n/a	n/a	658	n/a	n/a	658	n/a	n/a	658	n/a	n/a	
2002	490.38	486.80	-0.73%	58.90	59.85	1.61%	81.31	n/a	n/a	47.29	n/a	n/a	47.29	n/a	n/a	678	n/a	n/a	678	n/a	n/a	678	n/a	n/a	
2003	503.82	499.96	-0.77%	61.00	62.32	2.16%	84.04	n/a	n/a	48.53	n/a	n/a	48.53	n/a	n/a	697	n/a	n/a	697	n/a	n/a	697	n/a	n/a	
2004	517.27	513.48	-0.73%	63.09	64.88	2.84%	86.76	n/a	n/a	49.77	n/a	n/a	49.77	n/a	n/a	717	n/a	n/a	717	n/a	n/a	717	n/a	n/a	
2005	530.69	504.60	-4.92%	65.19	67.04	2.83%	89.48	n/a	n/a	51.01	n/a	n/a	51.01	n/a	n/a	736	n/a	n/a	736	n/a	n/a	736	n/a	n/a	
2006	544.09	514.04	-5.52%	67.28	69.17	2.80%	92.19	n/a	n/a	52.25	n/a	n/a	52.25	n/a	n/a	756	n/a	n/a	756	n/a	n/a	756	n/a	n/a	
2007	557.48	523.65	-6.07%	69.37	71.37	2.88%	94.89	n/a	n/a	53.48	n/a	n/a	53.48	n/a	n/a	775	n/a	n/a	775	n/a	n/a	775	n/a	n/a	
2008	570.78	533.44	-6.54%	71.44	73.64	3.07%	97.58	n/a	n/a	54.71	n/a	n/a	54.71	n/a	n/a	795	n/a	n/a	795	n/a	n/a	795	n/a	n/a	
2009	584.02	543.42	-6.95%	73.50	75.98	3.37%	100.26	n/a	n/a	55.93	n/a	n/a	55.93	n/a	n/a	814	n/a	n/a	814	n/a	n/a	814	n/a	n/a	
2010	597.20	553.58	-7.30%	75.56	78.39	3.75%	102.92	n/a	n/a	57.16	n/a	n/a	57.16	n/a	n/a	833	n/a	n/a	833	n/a	n/a	833	n/a	n/a	
2011	610.37	563.93	-7.61%	77.60	80.89	4.23%	105.57	n/a	n/a	58.37	n/a	n/a	58.37	n/a	n/a	852	n/a	n/a	852	n/a	n/a	852	n/a	n/a	
2012	623.47	574.48	-7.86%	79.63	83.46	4.81%	108.20	n/a	n/a	59.58	n/a	n/a	59.58	n/a	n/a	871	n/a	n/a	871	n/a	n/a	871	n/a	n/a	
2013	636.60	585.22	-8.07%	81.66	86.11	5.45%	110.83	n/a	n/a	60.80	n/a	n/a	60.80	n/a	n/a	890	n/a	n/a	890	n/a	n/a	890	n/a	n/a	
2014	649.79	596.16	-8.25%	83.69	88.85	6.17%	113.47	n/a	n/a	62.02	n/a	n/a	62.02	n/a	n/a	909	n/a	n/a	909	n/a	n/a	909	n/a	n/a	
2015	663.00	607.31	-8.40%	85.72	91.68	6.95%	116.11	n/a	n/a	63.25	n/a	n/a	63.25	n/a	n/a	928	n/a	n/a	928	n/a	n/a	928	n/a	n/a	
2016	676.13	618.67	-8.50%	87.73	94.59	7.82%	118.72	n/a	n/a	64.47	n/a	n/a	64.47	n/a	n/a	947	n/a	n/a	947	n/a	n/a	947	n/a	n/a	
2017	689.21	630.24	-8.56%	89.74	97.60	8.76%	121.33	n/a	n/a	65.68	n/a	n/a	65.68	n/a	n/a	966	n/a	n/a	966	n/a	n/a	966	n/a	n/a	
2018	702.22	642.02	-8.57%	91.72	100.70	9.79%	123.91	n/a	n/a	66.89	n/a	n/a	66.89	n/a	n/a	985	n/a	n/a	985	n/a	n/a	985	n/a	n/a	
2019	715.16	654.03	-8.55%	93.69	103.91	10.90%	126.47	n/a	n/a	68.09	n/a	n/a	68.09	n/a	n/a	1,003	n/a	n/a	1,003	n/a	n/a	1,003	n/a	n/a	
2020	728.01	666.26	-8.48%	95.64	107.21	12.10%	129.02	n/a	n/a	69.29	n/a	n/a	69.29	n/a	n/a	1,022	n/a	n/a	1,022	n/a	n/a	1,022	n/a	n/a	

72.75%
8.47%
11.17%
79%

Avg. Annual Growth Rate:

1997-2000	2.91%	2.63%																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</

Avg. Annual Growth Rate:

1997-2000	2.91%	2.63%
2000-2005	2.90%	1.87%
2005-2010	2.51%	1.94%
2010-2015	2.20%	1.94%
2015-2020	1.96%	1.94%

Value obtained from respective County source.

Sources:

National Planning Association; The Comprehensive Plan for St. Lucie County, 1990; Indian River County - 2020 Comprehensive Plan, 1998;
Palm Beach County Planning, Building and Zoning Dept. - 1994-95 Maps Graphs & Data Book; Martin County - Comprehensive Growth Management Plan

Prepared by:

Ricordo & Associates, Inc., December 1998

Table III-3.7

Historical Personal Income Per Capita

Personal Income Per Capita (in 1992 US Dollars)

Year	PBIA Market Area Counties										Avg.	Growth
	US	Growth	Florida	Growth	Palm Beach	Growth	Martin	Growth	St. Lucie	Growth	Indian River	Growth
1978	\$16,929		\$16,227		\$20,604		\$19,616		\$14,567		\$18,818	
1979	\$17,283	2.09%	\$16,659	2.66%	\$21,523	4.46%	\$20,133	2.64%	\$15,269	4.82%	\$18,990	0.91%
1980	\$17,203	-0.46%	\$17,022	2.18%	\$22,269	3.47%	\$21,882	8.69%	\$16,052	5.12%	\$19,683	3.65%
1981	\$17,486	1.65%	\$17,391	2.17%	\$23,462	5.36%	\$22,492	2.79%	\$15,494	-3.47%	\$20,764	5.49%
1982	\$17,402	-0.48%	\$17,280	-0.64%	\$23,215	-1.05%	\$22,272	-0.98%	\$15,340	-0.99%	\$19,495	-6.11%
1983	\$17,576	1.00%	\$17,772	2.85%	\$24,667	6.25%	\$22,874	2.70%	\$15,980	4.17%	\$20,118	3.20%
1984	\$18,578	5.70%	\$18,468	3.92%	\$25,724	4.29%	\$23,938	4.66%	\$15,131	-5.31%	\$20,968	4.22%
1985	\$19,050	2.54%	\$19,040	3.10%	\$27,103	5.36%	\$25,522	6.62%	\$15,454	2.14%	\$22,559	7.59%
1986	\$19,468	2.19%	\$19,556	2.71%	\$27,997	3.30%	\$26,527	3.94%	\$16,029	3.72%	\$23,668	4.91%
1987	\$19,750	1.45%	\$19,872	1.61%	\$28,863	3.09%	\$27,072	2.06%	\$16,180	0.94%	\$24,696	4.35%
1988	\$20,235	2.46%	\$20,322	2.26%	\$29,793	3.22%	\$28,850	6.57%	\$17,534	8.37%	\$26,409	6.94%
1989	\$20,547	1.54%	\$20,849	2.59%	\$30,777	3.30%	\$30,804	6.77%	\$17,386	-0.85%	\$27,562	4.36%
1990	\$20,652	0.51%	\$20,649	-0.96%	\$32,164	4.51%	\$31,336	1.73%	\$16,405	-5.64%	\$27,526	-0.13%
1991	\$20,334	-1.54%	\$20,212	-2.11%	\$31,770	-1.23%	\$30,613	-2.31%	\$15,982	-2.58%	\$27,305	-0.80%
1992	\$20,631	1.46%	\$20,060	-0.75%	\$31,883	0.36%	\$30,523	-0.29%	\$15,852	-0.82%	\$27,342	0.14%
1993	\$20,814	0.89%	\$20,787	3.62%	\$32,589	2.22%	\$31,177	2.14%	\$16,144	1.85%	\$27,997	2.40%
1994	\$21,099	1.37%	\$20,902	0.56%	\$32,398	-0.59%	\$30,899	-0.89%	\$16,228	0.52%	\$28,473	1.70%
1995	\$21,651	2.61%	\$21,447	2.60%	\$33,565	3.60%	\$31,602	2.28%	\$16,649	2.60%	\$29,947	5.18%
1996	\$22,120	2.17%	\$21,904	2.13%	\$34,471	2.70%	\$32,138	1.70%	\$16,890	1.45%	\$31,116	3.90%
1997	\$22,712	2.67%	\$22,407	2.29%	\$34,991	1.51%	\$32,768	1.96%	\$17,493	3.57%	\$31,692	1.85%
Avg. Annual Growth Rate		1.57%		1.73%		2.85%		2.78%		1.03%		2.83%
												2.49%

Source: National Planning Association

Prepared by: Filcondo & Associates, Inc., December 1998

Table III-3.8

Forecast Personal Income Per Capita

Year	Personal Income Per Capita (In 1992 US Dollars)											
	Palm Beach			Martin			St. Lucie			Indian River		
	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.	NPA	County	% Diff.
1998	\$35,159	\$35,465	0.87%	\$32,922	n/a	n/a	\$17,882	n/a	n/a	\$31,848	n/a	n/a
1999	\$35,590	\$35,947	1.00%	\$33,292	n/a	n/a	\$18,354	n/a	n/a	\$32,165	n/a	n/a
2000	\$35,875	\$36,554	1.89%	\$33,539	n/a	n/a	\$18,767	n/a	n/a	\$32,371	n/a	n/a
2001	\$35,692	\$37,050	3.80%	\$33,279	n/a	n/a	\$19,027	n/a	n/a	\$32,088	n/a	n/a
2002	\$35,910	\$37,553	4.58%	\$33,468	n/a	n/a	\$19,412	n/a	n/a	\$32,239	n/a	n/a
2003	\$36,127	\$38,062	5.36%	\$33,660	n/a	n/a	\$19,806	n/a	n/a	\$32,396	n/a	n/a
2004	\$36,373	\$38,579	6.06%	\$33,876	n/a	n/a	\$20,213	n/a	n/a	\$32,574	n/a	n/a
2005	\$36,626	\$39,264	7.20%	\$34,100	n/a	n/a	\$20,632	n/a	n/a	\$32,764	n/a	n/a
2006	\$36,893	\$39,845	8.00%	\$34,339	n/a	n/a	\$21,061	n/a	n/a	\$32,968	n/a	n/a
2007	\$37,172	\$40,435	8.78%	\$34,590	n/a	n/a	\$21,501	n/a	n/a	\$33,185	n/a	n/a
2008	\$37,466	\$41,033	9.52%	\$34,859	n/a	n/a	\$21,962	n/a	n/a	\$33,423	n/a	n/a
2009	\$37,751	\$41,641	10.30%	\$35,119	n/a	n/a	\$22,414	n/a	n/a	\$33,651	n/a	n/a
2010	\$38,036	\$42,257	11.10%	\$35,381	n/a	n/a	\$22,864	n/a	n/a	\$33,879	n/a	n/a
2011	\$38,323	\$42,882	11.90%	\$35,643	n/a	n/a	\$23,315	n/a	n/a	\$34,109	n/a	n/a
2012	\$38,645	\$43,517	12.61%	\$35,951	n/a	n/a	\$23,814	n/a	n/a	\$34,388	n/a	n/a
2013	\$38,959	\$44,161	13.35%	\$36,250	n/a	n/a	\$24,303	n/a	n/a	\$34,659	n/a	n/a
2014	\$39,271	\$44,815	14.12%	\$36,545	n/a	n/a	\$24,782	n/a	n/a	\$35,197	n/a	n/a
2015	\$39,591	\$45,478	14.87%	\$36,848	n/a	n/a	\$25,268	n/a	n/a	\$35,467	n/a	n/a
2016	\$39,904	\$46,151	15.66%	\$37,149	n/a	n/a	\$25,748	n/a	n/a	\$35,753	n/a	n/a
2017	\$40,229	\$46,834	16.42%	\$37,463	n/a	n/a	\$26,239	n/a	n/a	\$36,048	n/a	n/a
2018	\$40,563	\$47,527	17.17%	\$37,787	n/a	n/a	\$26,737	n/a	n/a	\$36,344	n/a	n/a
2019	\$40,900	\$48,230	17.92%	\$38,114	n/a	n/a	\$27,231	n/a	n/a	\$36,648	n/a	n/a
2020	\$41,244	\$48,944	18.67%	\$38,448	n/a	n/a	\$27,730	n/a	n/a			
Average Differential			10.05%									

Avg. Annual Growth Rate:

1997-2000	0.84%	1.36%
2000-2005	0.42%	1.48%
2005-2010	0.77%	1.48%
2010-2015	0.82%	1.48%
2015-2020	0.84%	1.48%

Value obtained from respective County source.

Sources:

National Planning Association; The Comprehensive Plan for St. Lucie County, 1990; Indian River County - 2020 Comprehensive Plan, 1998;

Palm Beach County Planning, Building and Zoning Dept. - 1994-95 Maps Graphs & Data Book; Martin County - Comprehensive Growth Management Plan

Prepared by: Ricordo & Associates, Inc., December 1998

In summary, the socioeconomic factors impacting air travel demand in the market area are positive. The key factors of population, nonfarm employment, households, and personal income per capita are all expected to show continued growth. The industry sectors representing the greatest level of employment have a high propensity toward business-related travel. The large number of corporations which have migrated and established either bases or centers of operation in the market area, coupled with the vast tourism attraction offered by the South Florida area, collectively provide a positive outlook for increased air travel demand in the region.

3.3.3 Domestic Yield and Fuel Cost

Domestic Yield

The yield data used for this demand analysis is based on the FAA's Aviation Forecasts for the period of 1998-2009. The FAA's national yield data is based on a multi-variant analysis of complex information and reflects what the FAA believes to be the probable results of the interaction between both macro-economic factors, such as aggregate demand, fuel prices, and inflation, and industry trends.

Since 1980, domestic yield has continually declined, reaching a low of approximately 13.7 cents per domestic passenger mile in 1997. While inflation-adjusted (constant dollar) domestic yields have declined significantly at an average annual compound rate of 2.53 percent from 1990 to 1997, that level of decline is not expected to continue. As a result, from 1998 to 2009, the FAA foresees a 1.1 percent average annual decrease in domestic yield. The more modest decline in domestic yield projected through 2009 is reflective of the maturity of the competitive market for domestic air service.

Table III-3.9 presents historical domestic yield data as well as the FAA domestic yield projections used in this Study.

Fuel Cost

From 1980 to 1990, fuel prices decreased significantly, as illustrated in Table III-3.9. The world economy during this period was in a volatile state. In 1990, some new problems emerged. Oil prices increased as a result of the Iraq invasion into Kuwait and the subsequent U.S. embargo. The effects on air travel were fairly severe. By the end of 1991 however, the Gulf War was over, Iraq was out of Kuwait, and fuel prices had dropped to the late 1980 levels. Since 1991, fuel prices continued to decrease until stabilizing at approximately 66 cents per gallon in 1997.

The short-term outlook reflects stable fuel prices with moderate decreases thereafter. Having been victimized by jarring fuel shortages during the past 20 years, the industrialized nations are now better prepared for consuming oil in a more efficient manner, thus, allowing them to withstand any unforeseen oil shocks.

The source for fuel cost data used for this demand analysis is also the FAA's Aviation Forecasts for the period 1998-2009. Both historical and projected fuel cost statistics are shown in Table III-3.9.

3.3.4 Impact of New Technologies and Competing Modes

New technologies that change the way individuals conduct business are constantly being developed. In the traditional transportation industries (railroads, highways, and aviation), these new advances mean more efficient ways of transporting people, projects, and information as well as providing service. The Internet, which was born during the computer technological explosion of the mid

Table III-3.9

Domestic Yield and National Fuel Costs

	Year	Domestic Yield		Fuel Cost	
		Cents/Rev. Pax Mile	% Change	Cents/Gallon	% Change
Historical	1980	21.2		163.2	
	1981	22.8	7.54%	177.9	9.02%
	1982	20.5	-10.21%	161.5	-9.23%
	1983	18.9	-7.76%	143.5	-11.15%
	1984	19.8	4.87%	129.7	-9.59%
	1985	18.2	-8.27%	118.6	-8.57%
	1986	16.3	-10.56%	91.1	-23.16%
	1987	15.6	-3.94%	70.9	-22.18%
	1988	16.4	4.93%	73.8	4.08%
	1989	16.7	2.07%	70.9	-3.96%
	1990	16.1	-3.59%	81.2	14.53%
	1991	15.5	-3.97%	89.1	9.77%
	1992	14.8	-4.58%	71.7	-19.51%
	1993	15.2	2.77%	66.7	-7.05%
	1994	14.5	-4.54%	59.3	-11.02%
	1995	14.0	-3.24%	57.0	-3.91%
	1996	14.2	1.28%	62.8	10.09%
	1997	13.7	-3.52%	65.7	4.69%
	1998	13.7	-0.07%	66.5	1.23%
Forecast	1999	13.4	-2.12%	66.4	-0.15%
	2000	13.1	-2.24%	66.3	-0.15%
	2001	12.8	-2.21%	66.1	-0.30%
	2002	12.7	-0.78%	66.0	-0.15%
	2003	12.6	-0.79%	65.8	-0.30%
	2004	12.5	-0.79%	65.7	-0.15%
	2005	12.4	-0.80%	65.6	-0.15%
	2006	12.3	-0.72%	65.4	-0.30%
	2007	12.2	-0.81%	65.3	-0.15%
	2008	12.1	-0.74%	65.1	-0.31%
	2009	12.0	-0.82%	65.1	0.00%

Source: FAA Aviation Forecasts for Fiscal Years 1998-2009
 Prepared by: Ricondo & Associates, Inc., December 1998

1990s, also provides a method of transporting data and information through e-mail, homepages, and file transfer protocol sites (FTP) much like the traditional modes of transportation. Future advances in computer technology may result in smarter and more efficient methods of communications and transportation services.

High Speed Rail

Railroad technology has been steadily increasing since the development of electric high speed trains in Europe and Japan. These "Bullet" trains, which can travel up to speeds of 300 miles per hour, have been successful in diverting traffic away from airlines in Europe and Japan. However, it is important to note that success of the bullet train has largely been due to geographic and political considerations. Japan is a unique country with limited open property, which is not conducive to the development of a large network of airports like the United States. Furthermore, Japan has a large population in very dense areas, which is more conducive to mass transit facilities like high speed rail. Japan also has a well established network of mass transit facilities that can interconnect with high speed rail. In Europe, some governments have regulated transportation systems that impose restrictions on the various transportation industries, thereby favoring certain modes of transportation. An example of this is the Paris to Lyons city pair market. High speed rail advocates point to the success of the bullet train that serves these two cities and the lack of air service caused by it. However, government regulatory bodies impose fare restrictions on airlines serving the Paris to Lyons route, which makes it uneconomical for the carriers to continue service and compete with the high speed train.

At this time, the state leased its funding commitment and support for this project. Presently, the FOX subject is on-pause with an uncertain future. It is also important to note that most of the European countries, as well as Japan, had an extensive passenger railroad system in place before the development of the electric high speed trains, which provided them an existing infrastructure from which to build their advanced train systems. Development of new high speed rail projects, like the one proposed for South Florida, is expensive and requires significant capital investments just to serve a single market, unlike an airport that can serve several markets. Railroad transportation also suffers from the inability to quickly react to the development of new markets without significant infrastructure changes.

Intelligent Transportation Systems

Development of new Intelligent Transportation Systems (ITS) revolves mostly around highways ("smart highways"). ITS is currently under development in many heavily congested urban areas like Chicago, Boston, Los Angeles, and Houston and is planned to be implemented in the 75 largest urban areas of the United States by the year 2006. Included in ITS is the implementation of the following systems:

- Regional multi-modal traveler information centers
- Electronic fare collection and fare payment systems
- Freeway/transit management systems
- Emergency/Incident Management Services
- Traffic signal coordination control systems

These systems are intended to make automobile travel more efficient and safer. It is unlikely that any of these systems will result in any real reduction in air travel from PBIA since they work more towards improving local and regional highway networks, rather than a national network. In Florida, these systems will result in more efficient use of the highway networks between West Palm Beach

and Miami, Ft. Lauderdale, Orlando, and Jacksonville. The number of air travelers from the West Palm Beach area that drive to Miami or Orlando will not likely increase unless air service levels decrease at PBIA. It is more likely that, as air service at PBIA increases, fewer passengers will be lost to other markets such as Miami, Orlando, or Ft. Lauderdale.

Computer Technology

The rapid growth in computer technology in the mid-1990s resulted in the development of the Internet. The Internet can be considered a transportation system since information and data can be transported across the world very rapidly using e-mail, homepages, and FTP sites. In addition to these traditional Internet services, Desktop Videoconferencing (DTVC) is being developed, which combines personal computing with audio, video, and communications technologies to provide real-time interaction from a typical personal computer. Development of DTVC is still in its infancy and has yet to be proven. However, use of traditional telephone-videoconferencing, upon which DTVC is based, has been around since the late 1980s. The impact of telephone-videoconferencing on air travel has been negligible. It is likely that DTVC will be popular because of its lower cost than traditional telephone-videoconferencing, but it is unlikely that it will have a significant impact on air travel at PBIA.

3.4 Air Service Demand Analysis

The Air Service Demand Analysis provides an in-depth assessment of PBIA's top 100 O&D markets. Current air service provided in those markets, as well as historical passenger indices, is received and evaluated in order to create a clear understanding of passenger movements and target potential air service needs.

The analysis utilizes three main data sources:

- U.S. DOT Origin and Destination Survey (Year Ending First Quarter of 1998)
- U.S. DOT T-100 Statistics (Year Ending First Quarter of 1998)
- OAG Airline Schedules for two sample seasonal periods and a three month period in 1998:
 - Winter – 1 (March 1-7, 1998)
 - Summer – 2 (August 1-7, 1997)
 - 1998 Months (March, August, and November)

The following sections provide a summary of the methodology and results of the Air Service Demand Analysis. A complete version of this Air Service Demand Analysis, including all supporting quantitative analysis and data services, is included as part of this Study in Appendix C.

3.4.1 Methodology

For each of PBIA's top 100 O&D markets, historical data concerning the local market, the ratio of local traffic to available seats, the ratio of local traffic to onboard traffic, load factors, and other data were analyzed to determine PBIA's deficient domestic markets.

Deficient markets were grouped into three categories:

- Markets without existing nonstop service;
- Markets where the local O&D traffic exceeds the available nonstop seats; and
- Markets where the local O&D traffic is a high percentage of the on-board traffic.

The second category, markets where the local O&D traffic exceeds the available nonstop seats, is important because it indicates that even if all of the local O&D passengers wanted to travel nonstop, there would be insufficient seats to accommodate them. Obviously, some local O&D traffic is being forced to take one-stop service, and therefore, nonstop service is deficient.

The third category, markets where the local O&D traffic represents a high percentage of the onboard traffic, involves an analysis to determine whether local passengers are being "squeezed off" nonstop flights by flow traffic. Two steps were involved in the analysis. First, the ratio of local O&D passengers to onboard passengers was examined to determine if the ratio is high – above 70 percent. Second, the load factors of the airline or airlines carrying the bulk of the traffic in that market were reviewed. If the load factor is high (i.e., above 70 percent), then it was concluded that local O&D passengers are being displaced. If load factors are below this threshold, then it was concluded that local O&D passengers are not being displaced.

In addition, the directionality of passenger traffic at PBIA was analyzed. As expected, the analysis concluded that PBIA is fundamentally a destination market, with 80 percent of the passengers in PBIA's top 100 markets initiating trips in a city other than West Palm Beach. In only 21 of the top 100 markets did more passengers initiate trips from West Palm Beach. **Table III-4.1** displays the largest markets in which more passengers originated travel at West Palm Beach.

Table III-4.1

Markets with the Largest Number of Originating Passengers

PBI To/From:	Passengers Originating at PBI	1998 O&D Passengers
Los Angeles	51.9%	67,680
San Francisco	55.9%	47,730
Denver	60.4%	52,760
Orlando	61.3%	47,800
Las Vegas	87.5%	43,550

Source: GKM Consulting Services
Prepared by: Ricondo & Associates, Inc., April 1999

3.4.2 Domestic Baseline Deficiency Study

3.4.2.1 Markets with No Existing Nonstop Service

Currently, PBIA has nonstop commercial jet service to 23 U.S. destinations. Except for Dallas and Houston, all nonstop markets are east of the Mississippi River. Markets both east and west of the Mississippi River that currently do not have nonstop service from the Airport were analyzed. West of the Mississippi, there are five markets that averaged at least 100 passengers per day and are without nonstop air service. These are listed in **Table III-4.2**.

Table III-4.2**Western Markets without Nonstop Service**

PBI To/From:	Nonstop Miles	Passengers Per Day
Los Angeles	2,330	185
Denver	1,679	145
San Francisco	2,567	131
Las Vegas	2,158	119

Source: GKMG Consulting Services
 Prepared by: Ricondo & Associates, Inc., April 1999

East of the Mississippi, there are four markets that averaged at least 100 passengers per day and are without nonstop air service. These are summarized in **Table III-4.3**.

Table III-4.3**Eastern Markets without Nonstop Service**

PBI To/From:	Nonstop Miles	Passengers Per Day
Providence	1,148	181
Albany	1,163	114
Buffalo	1,123	108

Source: GKMG Consulting Services
 Prepared by: Ricondo & Associates, Inc.

It is believed that, in the absence of other determining factors, the combination of low passenger traffic and relatively high nonstop mileage reduces the likelihood for potential new services to distant markets west of the Mississippi. Nevertheless, PBIA should attempt to obtain one-stop flights to further develop traffic in these markets in advance of nonstop service. In particular, the Airport should seek carriers to provide nonstop service to Providence (Delta, US Airways) and Los Angeles (Delta, United).

Another consideration is that markets east of the Mississippi and within a 1,000 miles radius of PBIA are potential candidates for Regional Jet (RJ) service. The markets that average at least 50 passengers per day are listed in **Table III-4.4**.

Table III-4.4**Potential Markets for Regional Jet Service**

PBI To/From:	Nonstop Miles	Passengers
		Per Day
Indianapolis	967	89
Nashville	758	78
Washington/Dulles	858	75
Louisville	858	62
Norfolk	740	60
Richmond	763	54
Memphis	822	54
Dayton	941	53

Source: GKMG Consulting Services
 Prepared by: Ricondo & Associates, Inc., April 1999

Certainly, Indianapolis, Nashville, and Washington/Dulles are strong candidate markets for RJ service. Potential air carriers operating regional jets from whom PBI might seek to provide this type of service, include: Atlantic Coast, Midway, Delta Connection Carriers (ASA and Comair), American Eagle and Continental Express.

3.4.2.2 Local O&D Passengers vs. Nonstop Seats Offered

This analysis compared local O&D passengers to the available weekly seating capacity offered by carriers operating in the market with nonstop flights. For example, the PBI-Hartford market has ratios of 219.4 percent based on two daily nonstop's during the summer and 86.5 percent during the winter, when air service doubled to four daily nonstops, for an average combined ratio of 124.1 percent. The combined ratio indicates, that because of the summer service reductions, there are an average 24.1 percent more people traveling in the market than there are year-round nonstop seats.

While ratios of over 100 percent suggest that certain passengers are not able to fly non-stop due to capacity constraints, ratios of over 75 percent also have potential for displacement due to capacity constraints during "peak" flight times and other scheduling issues. Markets with summer ratios of 75 percent or more were analyzed using the winter/summer combined ratio. The results are summarized below in **Table III-4.5**.

Table III-4.5**Markets with High Local O&D Passengers**

PBI To/From:	Local O&D Passengers As a Percent of Nonstop Seats
Hartford	124.1%
Boston	89.1%
Baltimore	72.5%
New York-LGA	60.2%
Chicago-ORD	54.2%
Islip	50.0%
Washington-DCA	48.0%
Newark	46.8%

Source: GKMG Consulting Services
 Prepared by: Ricondo & Associates, Inc., April 1999

Hartford and possibly Boston are the only markets that indicate deficient levels of existing nonstop service.

3.4.2.3 Local O&D Passengers vs. Total Onboard Passengers

As previously mentioned, this analysis involved a two-step process. First, a ratio (percentage) of local O&D passengers to onboard passengers traveling on the nonstop flight (derived from U.S. DOT T-100 data) was calculated to determine potential capacity constraints for local O&D passengers. Markets with a ratio (percentage) of 70 percent or higher were identified.

As an example, the ratio for PBIA-Boston is 158 percent. This ratio indicates that there were at least 58 percent more passengers traveling in the local market who did not utilize the nonstop service, presumably due to capacity constraints. For the winter schedule period, the result was 14 markets with ratios greater than 70 percent. These are listed in **Table III-4.6**.

The second step was to identify the load factors in the markets listed in Table III-4.6 by the airline or airlines carrying the bulk of the traffic. This is shown in **Table III-4.7**.

Table III-4.6

Markets with High O&D Passenger Demand

PBI To/From:	Local O&D Passengers As a Percent of Total Onboard Passengers
Columbus	283.6%
Jacksonville	261.1%
Hartford	220.9%
Cleveland	206.8%
Boston	157.6%
Islip	126.4%
Baltimore	124.1%
New York-JFK	114.4%
New York-LGA	101.4%
Chicago-ORD	98.1%
Newark	95.7%
St. Louis	81.8%
Philadelphia	78.0%
Washington-DCA	73.9%

Source: GKM Consulting Services

Prepared by: Ricondo & Associates, Inc., April 1999

Table III-4.7**Load Factors for High O&D Demand Markets**

PBI To/From:	Airline	Load Factor
Columbus	America West	40.5%
Jacksonville	US Express (Mesa)	41.3%
Hartford	Delta	82.9%
Cleveland	Continental	77.9%
Boston	Delta	83.4%
Islip	Kiwi	68.5%
Baltimore	US Airways	79.7%
New York-JFK	TWA	72.8%
New York-LGA	Delta	82.7%
Chicago-ORD	United	78.8%
Newark	Continental	82.8%
St. Louis	TWA	73.2%
Philadelphia	US Airways	81.5%
Washington-DCA	US Airways	82.8%

Source: GKM Consulting Services
 Prepared by: Ricondo & Associates, April 1999

Of these 14 markets, load factors were 70 percent or greater in 11 markets, six of which had extremely high load factors exceeding 80 percent. These are shown below in **Table III-4.8**.

Table III-4.8**Markets with the Largest Load Factors**

PBI To/From:	Airline	Load Factor
Boston	Delta	83.4%
Hartford	Delta	82.9%
Newark	Continental	82.8%
Washington-DCA	US Airways	82.8%
New York-LGA	Delta	82.7%
Philadelphia	US Airways	81.5%
Baltimore	US Airways	79.7%
Chicago-ORD	United	78.8%
Cleveland	Continental	77.9%
St. Louis	TWA	73.2%
New York-JFK	TWA	72.8%

Source: GKM Consulting Services
 Prepared by: Ricondo & Associates, Inc., April 1999

3.4.2.4 Summary of Deficient U.S. Domestic Markets

Based on the preceding analysis, the markets identified in **Table III-4.9** are deficient under each of the three categories and emerge as potential candidates for enhanced air service.

Table III-4.9

Summary of Deficient Domestic Markets

No Nonstop Service (Deficiency #1) At Least 100 Passengers Per Day		Existing Nonstop Service (Deficiency #2) Local O&D Passengers Greater Than Available Seats		(Deficiency #3) Local O&D Greater Than Onboard And High Load Factor
Los Angeles	* Indianapolis	Hartford		Hartford
Providence	* Nashville	Boston		Boston
Denver	* Washington-IAD			Newark
San Francisco	Louisville			Washington-DCA
Las Vegas	Norfolk			New York/LaGuardia
Albany	Richmond			Philadelphia
Buffalo	Memphis			
Milwaukee	Dayton			
Phoenix	New Orleans			

* At least 75 passengers per day

Source: GKM Consulting Services

Prepared by: Ricondo & Associates, Inc., April 1999

3.4.3 Comparison of Existing Services by Low Cost Carriers

Three airports serve South Florida: PBIA, as well as MIA & FLL, which are located approximately 60 and 40 miles south of PBIA, respectively. Due to the close proximity of these three major airports, it is important to consider the market dynamics that exist among them.

In 1996, Southwest Airlines entered Florida with service to Tampa, Fort Lauderdale, and Orlando. Since then, Southwest has continued to add flight frequencies and began serving Jacksonville. To counter Southwest, Delta created a separate business unit, Delta Express, a low-fare carrier which began operations in October 1996. Delta Express currently operates from its Orlando Hub to four Florida cities: Tampa, Fort Lauderdale, Palm Beach, and Fort Myers (which connect at Orlando to 18 cities in the Northeast and Central United States). Subsequently, US Airways launched its own low-fare operation, MetroJet, in June 1998. Presently, MetroJet serves five Florida cities from its Baltimore hub: Tampa, Fort Lauderdale, Orlando, Jacksonville, and Miami. Similarly, MetroJet operates to additional Northeast markets and in 1999 will be serving a total of 10 cities in the Northeast and Central United States.

Since FLL is Southwest's only South Florida market, it has seen the majority of new low-fare services that have been introduced. Low Fare Carrier passenger enplanements at the three South Florida Airports for the year ended March 1998 are summarized in Table III-4.10.

Table III-4.10**Summary of Lowfare Passenger Enplanements at South Florida Airports**

Low Fare Airline	Year Ended 1 st Quarter, 1998 Enplanements			
	PBIA	FLL	MIA	Total
Southwest	--	708,710	--	708,710
AirTran/ValueJet	36,296	123,167	--	159,463
American Trans Air	160	91,596	--	91,756
Spirit	--	80,941	--	80,941
Kiwi	57,678	--	--	57,678
AirTran Airways	206	2,675	126	3,007
Eastwind	--	2,230	--	2,230
Western Pacific	--	--	527	527
	94,340	1,009,319	653	1,104,312
Percent of Total	8.5%	91.4%	0.1%	100%

Source: GKMKG Consulting Services
 Prepared by: Ricondo & Associates, Inc., April 1999

Since neither Delta Airlines nor US Airways separately report O&D passenger statistics to DOT, it is not possible to include Delta Express and MetroJet passenger O&D statistics in the Study. Nonetheless, based on the number of flights these carriers operate, each account for substantial passenger volumes. Preliminary OAG data for November 1998 indicates that Delta Express, MetroJet, and Southwest will offer a combined total of 70,000 seats per week to/from FLL, compared with only 3,000 seats per week to/from PBIA, as shown in **Table III-4.11**.

Table III-4.11**Delta Express, MetroJet, and Southwest Combined Services November 1998**

Published To/From	PBIA	FLL
Tampa	--	19,174
Orlando	2,996	14,820
Baltimore	--	9,688
Jacksonville	--	8,262
Boston	--	5,992
Islip	--	2,996
Washington/Dulles	--	2,996
Newark *	--	2,996
Hartford *	--	2,996
St. Louis	--	244
Total Weekly Seats	2,996	70,164

*Effective December 1998

Source: GKMKG Consulting Services
 Prepared by: Ricondo & Associates, Inc., April 1999

3.4.4 International Air Service Analysis

3.4.4.1 Methodology

Because the U.S. DOT International O&D Survey does not include the majority of foreign flag carriers' operations, the numbers derived from the survey describe only the size of a market relative to others in the analysis.

Limitations on the availability of quantitative data and differences in market operations require a different methodology to derive an international air service analysis. The international analysis is comprised of relative potential passenger "pools" and qualitative judgments based on past market performance. Since PBIA has only five existing international markets with nonstop service, Toronto and Freeport, Marsh Harbour, Treasure Cay, and Nassau in the Bahamas, gateway traffic flows and travel itineraries to selected international destinations were analyzed. Field research contributed to the assessment of PBIA's top international markets and the potential for new service. Most international air travelers in the market area today are driving to MIA. Therefore, MIA nonstop traffic data was also analyzed for selected international markets.

As an initial step, the U.S. DOT International O&D Survey data was segmented into five major world regions for study focus: Europe, Latin America/Caribbean, Canada, Asia/Pacific, and Middle East/Africa. For each region, the top 20 Origin and Destination Markets were ranked based on the U.S. DOT International O&D Survey for South Florida (i.e., PBIA, FLL, and MIA). Below is a summary for each region.

Europe

Europe is South Florida's second largest international aviation region. For the year ended in the first quarter of 1998, traffic to/from Europe reached 14.5 percent of South Florida's total international traffic.

Europe is one of South Florida's best served international regions, with nonstop service in 12 of the top 20 markets. On average, however, travel between European and South Florida airports required connecting via another U.S. gateway and involved two nonstop flight segments.

The top 20 markets accounted for approximately 85 percent of all South Florida-Europe traffic. London was the largest single market, accounting for 24.4 percent of traffic. Frankfurt and Paris each accounted for 11.8 percent of traffic.

PBIA-Europe market over this period represented 6.9 percent of total South Florida-Europe traffic.

PBIA has no nonstop service to Europe. As a result, the passengers that traveled in the market per day connected at another gateway, almost half of whom connected at Atlanta and the other half of whom connected at one of the two international airports in New York.

PBIA shares 16 of South Florida's top 20 European markets. London was PBIA's largest market, followed by Frankfurt and Paris.

Latin America/Caribbean

Not surprisingly, given South Florida's ethnic composition and business focus internationally, its largest international aviation region is Latin America. The region accounted for 73.1 percent of the

international traffic in South Florida. Markets in the Caribbean (the Bahamas, Haiti, and the Dominican Republic) occupy four of the five top ranks and accounted for 28.6 percent of Latin American traffic.

Latin America is South Florida's best served international aviation region. All of the top 20 markets have nonstop service. Nine of the region's top 20 markets also appear on PBIA's top 20 list. Nassau was the single largest market in Latin America by a slight margin, with 9.4 percent of traffic.

The PBIA-Latin America market accounted for just 1.7 percent of South Florida's traffic to the region. PBIA has nonstop service to four of its top 20 markets in the region, all in the Bahamas, accounting for 76.5 percent of all traffic in the region.

Canada

Canada, is the third largest international air region for South Florida. Canada accounted for 7.6 percent of South Florida's international traffic for the year ended the first quarter of 1998.

Toronto and Montreal, the only markets with nonstop flights, were the largest individual markets and together accounted for 59.0 percent of traffic. Combined with Vancouver, Toronto and Montreal represented more than three-quarters of the region's traffic. Like Europe, travel between other cities in Canada and South Florida required a connection via another gateway and involved two nonstop flight segments.

PBIA-Canada traffic represented almost 15.0 percent of South Florida's traffic to the region in terms of passenger. Of its top 20 Canadian markets, PBIA only has nonstop service to Toronto. Like South Florida as a whole, travel to Toronto and Montreal predominate, accounting for 66.6 percent of traffic. As such, Montreal is the most viable international market for new scheduled service, since service to Montreal represents almost 33 percent of the traffic in the PBIA-Canada market. A portion of PBIA-Canada traffic flowed over Atlanta (22.7 percent) and involved two nonstop flight segments.

Asia/Pacific

The South Florida-Asia/Pacific market accounted for just 3.8 percent of the region's international traffic. No South Florida airport has nonstop flights to the Asia/Pacific region. Because of the long distances involved in travel to Asia most flights to the region require an average of three nonstop flight segments.

Tokyo was by far the largest single market for South Florida (26.6 percent of traffic), followed by Manila (12.8 percent of traffic).

The passengers in the PBIA-Asia/Pacific market represent just 6.9 percent of South Florida's traffic in the region. As for South Florida as a whole, Tokyo is PBIA's single largest market with 17.7 percent of traffic. Los Angeles International Airport is the primary U.S. gateway over which PBIA-Asia/Pacific traffic flows, accounting for 36.1 percent of traffic.

Middle East/Africa

The Middle East/Africa region was the smallest international aviation market for South Florida, accounting for just 1.0 percent of traffic in 1998. Only Capetown has nonstop service to South Florida airports (MIA). Tel Aviv was by far the largest single market, accounting for 56.3 percent of traffic. Istanbul is the second largest market in the region (12.2 percent of traffic).

Because there are no nonstop flights from PBIA, the Airport's traffic to the region flowed over New York's Kennedy International Airport, or through Atlanta's Hartsfield International Airport.

3.4.5 Air Transportation Needs

To validate the results of the Passenger Air Service Demand Analysis, interviews were conducted with five travel agencies, four hotel/resorts, and five corporations located in Palm Beach County during the week of October 19, 1998. In addition, representatives of two County government agencies concerned with air service at PBIA were interviewed: the Palm Beach County Convention and Visitors Bureau and the Business Development Board of Palm Beach County.

The interview participants represented a cross-section of firms in their respective categories, varying in size, business focus, and sales volume. Travel agents interviewed were identified based on their 1997 sales as reported to the Airlines Reporting Corporation. Hotel/Resorts and corporations were identified based on information provided by the Convention and Visitors Bureau and Business Development Board of Palm Beach County, respectively, and included some of the largest employers in the County.

3.4.5.1 Summary of Interview Results

Travel Agencies

- In 1997, the five travel agencies interviewed reported average sales of \$6,115,101 and total sales of \$30,575,506. Corporate air travel reservations represent, on average, about 60 percent of their sales and leisure air travel reservations for about 40 percent. One agency serves almost all leisure air travel. Corporate air travel reservations range from 60 to 90 percent of sales for the remaining four agents.
- According to the travel agencies, PBIA's service area extends northward from Boca Raton to Vero Beach.
- Domestic air travel reservations are, on average, greater than international air travel reservations by almost three to one at the agencies visited.
- The agencies estimated their flight scheduling at South Florida airports. One large agency schedules flights for almost all of its clients at either PBIA or FLL, with PBIA flights ranging from a low of 30 percent during the winter (because of extremely full flights) to a high of 60 percent during the summer. Another agency schedules about 40-50 percent of its clients' flights at PBIA. The remaining large agency schedules about 70 percent of its clients' flights at FLL.
- The top domestic destinations scheduled by the travel agencies are located in the Northeast: New York, Boston, and Philadelphia. Other top destinations cited were Dallas and Chicago in the Midwest, and Los Angeles, San Francisco, and Seattle on the West Coast.
- The agencies overwhelmingly used Delta Airlines for domestic air travel.
- The top International destinations scheduled by the agencies are London and Frankfurt, followed by Dusseldorf, Munich, Paris, Hong Kong, Singapore, and various cities in South America and Asia.
- The international carriers on which the agencies primarily schedule flights are American Airlines, British Airways, Lufthansa Airlines, and United Airlines.

- The agencies estimated their flight reservations at international gateways. Atlanta (ATL) and Miami (MIA) were cited as the gateways to Europe and/or Latin America by three agencies each. Los Angeles (LAX) and San Francisco (SFO) were cited as gateways to Asia by two agencies each. Cincinnati-Northern Kentucky International Airport (CVG), New York's J.F. Kennedy International Airport (JFK), and Dallas-Ft. Worth International Airport (DFW) were cited as gateways to various international destinations by one agency each.
- The agencies identified the domestic destinations to which they believe new or increased nonstop service from PBI is most needed and economically viable. Service to Los Angeles was cited most often, followed by Denver, Las Vegas, Phoenix, San Francisco, Seattle, and Nashville.
- All the agencies believe that existing nonstop services from PBI to New York-LaGuardia Airport, Boston Logan International Airport, and Philadelphia International Airport need to be enhanced by increasing the number of frequencies and/or substituting larger equipment on existing frequencies.

Hotel/Resorts

- For the hotel/resorts interviewed, corporate related bookings, on average, account for 65 percent of their sales and leisure bookings represent about 35 percent of sales.
- Domestic travelers account for the overwhelming majority of bookings, ranging from 80 to 94 percent of total bookings.
- The majority of hotel/resort guests arrive/depart from PBI, almost 80 percent, although one hotel reports that its guests use PBI and FLL about equally.
- Delta Airlines, Continental Airlines, and US Airways transport most of the hotel/resorts' domestic guests.
- American Airlines, British Airways, Virgin Atlantic, and Lufthansa transport most of the hotel/resorts' international guests.
- By a large margin, New York is the hotel/resorts' top domestic market, followed by markets in the Mid-Atlantic, Midwest, and Southeast.
- Germany and the United Kingdom are the largest origins of international guests.
- The hotel/resorts estimated their guests' use of international gateways: all four cited Miami as the primary gateway; two also cited Orlando, and one cited Atlanta.
- The hotel/resorts identified Los Angeles, Chicago, Dallas, and San Francisco as the domestic destinations to which they believed new or increased nonstop service from PBI is most needed and economically viable.
- The hotel/resorts believe existing nonstop services from PBI to New York's-LaGuardia Airport, Boston-Logan International Airport, and Philadelphia International Airport need to be enhanced by increasing frequencies and/or substituting larger equipment on existing frequencies.
- According to the hotel/resorts, the seasonal variation in the tourist market in Palm Beach County is reflected in a decrease in room rates during the Summer off-season rather than any decrease in occupancy rates.

Corporations

- The five corporations interviewed estimated they spend an average of \$2,460,000 annually for air travel with total annual expenditures of \$7,380,000.
- According to the corporations, convenient and efficient air service is critical to their operations.
- Four of the five corporations interviewed estimated that their staffs use PBIA and FLL about equally for business travel.
- All five corporations identified Delta Airlines as their primary air carrier, three of which have preferred provider contracts with the carrier.
- The corporations interviewed identified their top domestic destinations as:
 - Washington, D.C.
 - Philadelphia
 - New York
 - Hartford
 - Denver
 - San Diego
 - San Francisco
 - Los Angeles
 - Seattle
 - Minneapolis
 - Dallas
 - Detroit
 - Pittsburgh
- The corporations identified London and Frankfurt as their most-visited international destinations.
- Two corporations estimated their use of international gateways. One corporation books travel through PBIA for travel to Europe and Asia, and uses MIA for travel to Latin America. The other corporation uses MIA, followed by Atlanta-Hartsfield International Airport, for most of its international travel.
- The corporations identified Los Angeles, San Francisco, Hartford, Nashville, Denver, Portland, Houston, and Phoenix as the domestic destinations to which they believe new or increased nonstop service from PBIA would be most useful to them.

3.4.5.2 Assessment of South Florida Airports

Convenience and Facilities

The interview participants universally praised PBIA as an efficient and user-friendly facility. Specifically, they cited the airport's convenient location, ease of access via I-95, ample parking,

limited traffic and terminal congestion, rapid throughput, and courteous staff as its most positive attributes. PBIA was described as particularly convenient for business travelers whose firms are located in north Palm Beach County. Indeed, the Business Development Board of Palm Beach County has successfully used the convenience of PBIA as a major selling point when marketing the County to businesses considering relocating to South Florida. As a result, PBIA is the preferred airport for both business and leisure travelers, according to the interview participants.

By contrast, the interview participants described FLL as plagued by traffic congestion, limited and expensive parking, and slow baggage claim and throughput. FLL's primary advantage is its proximity to the large business base located in south Palm Beach County, principally in Boca Raton. Likewise, participants feel that MIA suffers from the same drawbacks as FLL, in addition to frequent flight delays, and they usually avoid it if possible.

Air Service

The consensus of the travel professionals interviewed (travel agents and hotel sales managers) is that over the last several years PBIA has become much less a seasonal destination, with traffic demand much more evenly balanced over the year. As a result, they believe that any effort to enhance service at PBIA should, at a minimum, begin by preserving winter service levels throughout the traditional shoulder and summer season reductions.

Among all interview participants, criticism of air services at PBIA centered on the lack of total frequencies and available seats to current destinations served and lack of nonstop flights to current and desired destinations. Interview participants complained of difficulty in obtaining seats during the winter high season, particularly during holidays, and service reductions during the summer low season. The lack of nonstop flights to major destinations at PBIA forces some travelers to use FLL instead. They also complained that carriers routinely overbook their flights at PBIA, resulting in denied boardings, albeit voluntary. In addition, several corporations stated that connections from PBIA are not conveniently scheduled. Finally, several interview participants complained of a lack of carrier choice at PBIA.

Because FLL has more extensive flight schedules and more nonstop flights than PBIA, a significant volume of business traffic originating in Palm Beach County uses FLL. In fact, one large travel agency interviewed stated that it books its business clients on flights at FLL as a matter of course.

The advantage of using MIA is its abundance of nonstop flights to both domestic and international destinations in Europe and Latin America. As a result, interview participants primarily use MIA for nonstop flights to international destinations. Most interview participants did not believe that nonstop international service was justifiable at PBIA.

Fares

Opinions varied as to the competitiveness of fares out of PBIA. Some interview participants believe that fares at PBIA are relatively competitive with those at FLL. Others stated that fares out of FLL were considerably lower and, as a result, travel agencies tended to schedule flights at FLL for those clients whose primary criteria for flight selection was cost. Generally, however, the \$25-35 fare premium paid to use PBIA is accepted to avoid the "hassle" and congestion at FLL and MIA.

3.4.5.3 Conclusions

The interview findings were fundamentally consistent with those of the quantitative analysis. Of the 24 markets identified as deficient under each of the criteria described in Section III.4.3, 15 were also identified as such by one or more of the interview participants. In particular, new nonstop service to

Los Angeles International Airport from PBIA was deemed essential by almost all interview participants. Other cities cited by interview participants as requiring new or increased nonstop service include Providence, Denver, San Francisco, Las Vegas, Phoenix, Nashville, Hartford, Boston, Newark, Washington-National, New York-La Guardia, and Philadelphia.

3.4.6 Airline Review

The air service demand analysis shows that PBIA and FLL have fundamentally similar U.S. route structures in terms of nonstop markets served. The major distinction between the airports is that FLL receives far more services by low-cost carriers, such as Southwest Airlines, and enjoys greater nonstop flight frequencies. To gain a clearer understanding of existing air carrier operations at PBIA, published weekly nonstop scheduled flights at PBIA and FLL for March, August, and November 1998 were analyzed. As an initial step, a breakdown of seat capacity for each of the nine U.S. regions for March 1998 in addition to Canada, Latin America/Caribbean, and Europe, was prepared and is presented in Table III-4.12.

Table III-4.12

Peak Schedule Period – March 1998 – Regional Distribution of Nonstop Seats

	PBIA Percent	Cumulative Percent	FLL Percent	Cumulative Percent
South Atlantic	32.3	32.3	40.0	40.0
Middle Atlantic	37.3	69.6	25.6	65.5
East N. Central	14.9	84.5	14.4	80.0
West S. Central	9.2	93.7	8.2	88.2
West N. Central	1.3	95.0	2.9	91.1
New England	4.4	99.4	2.0	93.1
Pacific	0.0	99.4	0.7	93.8
Mountain	0.0	99.4	0.0	93.8
East S. Central	0.0	99.4	0.0	93.8
Canada	0.3	99.7	1.0	94.8
Latin America	0.3	100.0	5.0	99.8
Europe	0.0	100.0	0.2	100.0
Total	100.0	100.0	100.0	100.0

Source: GKM Consulting Services
Prepared by: Ricondo & Associates, Inc.

As shown in Table III-4.12, three U.S. regions account for about 80 percent of the scheduled seat capacity at PBIA and FLL. These are:

- The South and Middle Atlantic regions extending from New York, south to Florida, and;
- The East North Central region, which includes Chicago, Indianapolis, Detroit, Cleveland, Cincinnati, and Milwaukee.

The remaining regions are:

- The West South Central region, which includes Dallas and Houston;
- The West North Central region, which includes Minneapolis and St. Louis;
- The New England region, which includes Boston and Hartford;
- The Pacific region, which includes Los Angeles, and;

- The International region, which includes services from PBIA and FLL to Canada and the Bahamas, and FLL service to San Juan, Montego Bay, and Frankfurt.

Narrowing the analysis to focus on existing capacity in the combined PBIA/FLL market reveals that international routes and service to the Pacific region (LAX) currently account only for five percent of seats, while 90 percent of the nonstop seats are on routes to the Eastern Seaboard and Central U.S. markets.

As shown in **Table III-4.13**, FLL had over 60,000 more weekly nonstop scheduled seats than PBIA in March 1998. Seat capacities for each region are summarized below:

Table III-4.13

Peak Schedule Period – March 1998 – Weekly Nonstop Seats

<u>PBIA/FLL to:</u>	<u>PBIA Nonstop Seats</u>	<u>FLL Nonstop Seats</u>	<u>FLL Indexed to PBIA</u>
South Atlantic States	31,006	62,422	2.01
Middle Atlantic States	33,799	38,292	1.13
East N. Central States	13,204	22,339	1.69
	78,009	123,053	1.58
West S. Central States	7,667	12,298	1.60
West N. Central States	1,056	4,282	4.05
	8,723	16,580	1.90
New England States	4,680	3,493	0.75
Pacific States	0	1,316	---
	4,680	4,809	1.03
Mountain States	0	0	---
East S. Central States	0	0	---
	0	0	---
Canada	244	1,324	5.43
Latin America	350	8,603	24.58
Europe	0	458	---
	594	10,385	17.48
Total	92,006	154,827	1.68

Source: Official Airline Guide

Prepared by: Ricondo & Associates, Inc., April 1999

South Atlantic

- PBIA has half as many seats to the South Atlantic region as FLL, as the majority of Southwest, Delta Express, and US Airways MetroJet flights operate from FLL. In addition, Delta operates about 5,000 more weekly seats to Atlanta from FLL than from PBIA.

Middle Atlantic

- Seat capacity in the Middle Atlantic region was more evenly balanced between the airports than in other markets– to New York, Delta operates two daily flights to JFK from FLL and none from PBIA, while TWA operates five daily flights to LGA from PBI but none from FLL. PBIA also has a seat advantage to Newark, where Kiwi operates from PBIA, but not from FLL.
- In addition, Spirit Airlines began daily PBIA nonstop service to Atlantic City and Islip, N.Y. in October and November 1998, respectively.

East North Central

- Chicago and Detroit account for more than two-thirds of the nonstop seats to the East North Central region from PBIA and FLL. While Detroit was equally served by Northwest from both PBIA and FLL, Chicago was more unbalanced, with American and United each operating three daily nonstop flights to Chicago (ORD) from FLL versus two daily nonstop flights from PBIA.
- In addition, FLL has more nonstop services than PBIA: American Trans Air serves Chicago/Midway and Indianapolis from FLL, and Midwest Express has service to Milwaukee.
- Spirit Airlines began daily PBIA - Detroit nonstop service in October 1998.

West South Central

- Dallas and Houston are the only West South Central nonstop markets served from both PBIA and FLL. On average, FLL had two more daily frequencies than PBIA.

West North Central

- Minneapolis and St. Louis are the only West North Central nonstop markets served from PBIA and FLL. Northwest operates Minneapolis nonstop flights only at FLL and TWA had two more daily nonstop flights at FLL than PBIA.

New England

- In the New England states, Delta operated two daily Boston nonstop flights from both PBIA and FLL, and the only nonstop Hartford service. In addition, Boston had one daily American nonstop flight from FLL and one daily Kiwi flight from PBIA.

Pacific

- The only Pacific nonstop service was American's daily nonstop flight between FLL and Los Angeles.

Mountain/East S. Central

- Neither PBIA nor FLL have nonstop flights to the Mountain region (Denver/Phoenix) or East South Central region (Memphis/Nashville).

International

- Canadian nonstop service consists of daily flights to Montreal from FLL and weekend service from both PBIA and FLL to Toronto.
- Nonstop services from PBIA and FLL to Latin America are limited to Caribbean destinations, and the principal nonstop gateway used is MIA.
- The only European nonstop services were once weekly services to Frankfurt operated by Condor and to Reykjavik by Icelandair from FLL.

3.4.7 Seasonal Capacity Analysis

Traditionally, air carriers operating at PBIA seasonally increase nonstop services in December. Flights then peak in March and are reduced the following June. During the 1997/98 season, an average of eight additional daily nonstop flights were operated for the July-December period and, correspondingly, the average load factor increased nearly three percentage points as passenger demand exceeded capacity growth (average seats per departure declined slightly) over the 1996/1997 July-December period. For the 1997/98 peak travel period, however, PBIA air carriers reduced

nonstop frequencies by an average of 11 daily flights between January-June. Consequently, the average load factor increased to 79.7 percent, up 5.3 points, compared to the corresponding period in 1996/1997. This comparison is shown in **Table III-4.14**.

Table III-4.14

PBIA Air Carrier Scheduled Services (12 Months Ending June)

	1996/1997	1997/1998	Variance
July – December			
Average Daily Flights	117	125	8
Average Seats Per Flight	148	146	(2)
Average Load Factor (Pct.)	72.6	75.5	+2.9 Points
January – June			
Average Daily Flights	156	145	(11)
Average Seats Per Flight	149	150	1
Average Load Factor (Pct.)	74.4	79.7	+5.3 Points
Annual Load Factor (Pct.)	73.6	77.8	+4.2 Points

Source: DOT T-100 Statistics
Prepared by: GKM/G, April 1999

As was previously stated, the consensus of the travel professionals interviewed (travel agents and hotel sales managers) is that over the last several years PBIA has become less a seasonal destination, with traffic demand more evenly balanced over the year.

Criticism of air services at PBIA centered on the lack of total frequencies and available seats. Difficulty in obtaining seats during the winter high season, particularly during holidays, and service reductions during the summer low season at PBIA force some travelers to use FLL instead. Moreover, as shown below in **Table III-4.15**, PBIA suffers disproportionate seasonal air service reductions relative to FLL--about double in August 1998.

In summary, the air service demand analysis concluded that enhancements to air service at the Airport can be attained by converting some of the seasonal service presently offered by many carriers at PBIA to year round service. In addition, new service to those markets defined in the air service demand analysis, primarily to markets identified in the northeastern United States as well as those west of the Mississippi, can be supported.

3.5 Passenger Enplanements

Typically, the level and characteristics of passenger activity at an airport are determined by local factors. The desirability of the Airport's market service area as a destination for business and leisure travel and the local population/economy's generation of business and leisure travelers are two primary factors determining commercial passenger activity. This is especially true at airports serving primarily origin/destination traffic. Both the type and amount of local economic activity and the availability of competing transportation modes play important roles in determining activity levels. Connecting activity is both a function of local factors, primarily geographic location relative to connecting markets and O/D base, and external factors associated with airline route structure development.

Table III-4.15

Weekly Seasonal Nonstop Capacity

	PBIA	FLL
March 1998		
Nonstop Departures	616	1,047
Average Seats Per Departure	149	148
Nonstop Seats	92,006	154,827
INDEX	1.00	1.00
August 1998		
Nonstop Departures	401	924
Average Seats Per Departure	142	143
Nonstop Seats	56,784	132,259
INDEX	0.62	0.85
November 1998		
Nonstop Departures	436	980
Average Seats Per Departure	148	147
Nonstop Seats	64,716	143,900
INDEX	0.70	0.93

Source: Official Airline Guide, GKMKG Consulting Services
 Prepared by: Ricondo & Associates, Inc., April 1999

The following sections present the passenger enplanement projections developed under the three demand scenarios. A review of the historical levels of passenger activity is presented in Section II, Inventory.

3.5.1 Baseline Scenario

The Baseline Scenario assumes a continuation of the trends and relationships currently present at the Airport and its market area. Economic growth consistent with past trends and reflecting the current projections of national and local planning agencies provides the basis for this scenario. PBIA remains primarily an origination/destination airport serving the domestic and international travel needs of the resident population and visitors. Projections of activity for each passenger category are discussed separately in the following sections.

3.5.1.1 Baseline - Domestic Originating Enplanements

Domestic origin and destination (O&D) passengers are those passengers traveling within the United States whose air trip begins or ends at the Airport. They do not change aircraft at the Airport. The total number of O&D passengers is a reflection of a region's attractiveness as a place to live, work, and conduct business. Domestic O&D passengers include both resident and non-resident air travelers.

Historical domestic originating enplanements at the Airport have increased at a steady rate for the last decade, except for the significant increase of almost 21 percent experienced from 1989 to 1990. Originating enplanements represent more than 90 percent of total domestic enplanements at PBIA.

The methodology adopted for projecting domestic originating enplanements at PBIA involves a regression analysis. This methodology entails collecting and analyzing historical data and uses standard statistical techniques to identify relationships between elements of historical information to project future activity. Historical domestic originating enplanement data from 1978 to 1997 was

paired against socioeconomic data (e.g., population, nonfarm employment, total households, and PIPC) and either domestic yield or average national fuel costs to establish a statistical relationship between the socioeconomic variables and the demand for air travel.

The regression analyses of socioeconomic data with aviation passenger statistics provides a structured set of relationships between these factors and air travel demand. Four steps were required to set up the regression analysis:

- Selecting the dependent variable;
- Selecting the independent variables;
- Developing the regression equation; and
- Identifying forecast values for the independent variables.

The dependent variable for this analysis is the Airport's annual domestic originating enplanements. The independent variables include the four socioeconomic factors listed above and previously described in addition to domestic yield and average national fuel costs. The NPA and FAA Aviation Forecasts presented earlier were adopted as the forecast values for the independent variables.

Regression equations relating various combinations of the independent variables to 20 years of historical aviation demand were created. **Table III-5.1** presents the results of nine dependent-independent variable combinations. In addition, a trend line of historical domestic O&D passenger enplanements is also presented.

The equations presented in Table III-5.1 are all reasonable future predictors of originating enplanements based upon the high correlation coefficient, termed R-squared. The correlation coefficient is a statistical measure showing the relationship between changes in the values of independent variables with changes in the values of dependent variables. In statistical analysis, the closer the R-squared value is to 1.0, the higher the confidence that shifts in the independent variables will produce the predicted shift in the dependent variable.

A short-listing of the 10 regression equations was performed in order to identify the preferred high growth and low growth projections. A review of the resulting R-squared values, the independent variables involved, and future activity growth rates for each projection formed the basis for the selection of the preferred high growth and low growth equations. Based on this review, Scenario #7 was selected as the low growth equation and Baseline #9 was chosen as the high growth equation. Since arguments can be made in favor of either equation as a future representation of domestic originating enplanements given historical activity levels and future socioeconomic characteristics as forecast by the NPA, an average of equations #7 and #9 was derived and selected as the preferred projection of future domestic originating enplanements.

Under the preferred Baseline Scenario, originating enplanements are expected to grow to a level of 5,049,000 in the year 2020, representing 83 percent growth over the 1997 level of 2,757,840 originating enplanements. This represents an average annual growth rate of 2.7 percent, which compares to an average growth of 3.4 percent annually for the past 10 years and 3.4 percent annually for the past five years.

Table III-5.1 (Page 1 of 2)

Regression Analysis - O&D Passenger Enplanements

Year	Historical O&D Enplanements	O&D Enplanement Projections											(Preferred) Baseline 7 & 9 Avg.
		Baseline 1 (Trend)	Baseline 2	Baseline 3	Baseline 4	Baseline 5	Baseline 6	Baseline 7	Baseline 8	Baseline 9	Baseline 10		
1979	1,057,720												
1980	1,160,580												
1981	1,147,240												
1982	1,388,180												
1983	1,506,580												
1984	1,700,560												
1985	1,740,770												
1986	1,840,240												
1987	1,968,230												
1988	2,157,940												
1989	2,171,460												
1990	2,623,750												
1991	2,371,670												
1992	2,330,300												
1993	2,345,870												
1994	2,573,780												
1995	2,553,570												
1996	2,685,240												
1997	2,757,840												
2005		3,640,000	3,390,000	3,444,000	3,569,000	3,908,000	3,802,000	3,386,000	3,483,000	3,787,000	3,896,000	3,586,000	
2010		4,121,000	3,784,000	3,849,000	4,042,000	4,560,000	4,399,000	3,764,000	3,920,000	4,386,000	4,521,000	4,075,000	
2015		4,602,000	4,187,000	4,248,000	4,516,000	5,213,000	4,996,000	4,138,000	4,359,000	4,986,000	5,149,000	4,562,000	
2020		5,083,000	4,592,000	4,647,000	4,989,000	5,866,000	5,592,000	4,512,000	4,793,000	5,586,000	5,777,000	5,049,000	
R-squared		0.9403	0.9672	0.9615	0.9640	0.9659	0.9691	0.9672	0.9691	0.9705	0.9639		

Sources: Airport Management Records; Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT

Ricordo & Associates, Inc.

Prepared by: Ricordo & Associates, Inc., December 1998

Table III-5.1 (Page 2 of 2)

Regression Analysis - O&D Passenger Enplanements

Equations:

Baseline 1:
Projected O&D Enplanements = (Year*X1)+Coeff.

Baseline 2:
Projected O&D Enplanements = (Population*X1)+(Personal Income Per Capita*X2)+Coeff.

Baseline 3:
Projected O&D Enplanements = (Population*X1)+(PIC*X2)+(Fuel Cost/X3)+Coeff.

Baseline 4:
Projected O&D Enplanements = (Households*X1)+(PIC*X2)+(Fuel Cost/X3)+Coeff.

Baseline 5:
Projected O&D Enplanements = (Households*X1)+(Nonfarm Empl*X2)+(Fuel Cost/X3)+Coeff.

Baseline 6:
Projected O&D Enplanements = (Population*X1)+(Nonfarm Empl*X2)+(Yield/X3)+Coeff.

Baseline 7:
Projected O&D Enplanements = (Population*X1)+(PCPI*X2)+(Yield/X3)+Coeff.

Baseline 8:
Projected O&D Enplanements = (Households*X1)+(Personal Income Per Capita*X2)+(Yield/X3)+Coeff.

Baseline 9:
Projected O&D Enplanements = (Households*X1)+(Nonfarm Empl*X2)+(Yield/X3)+Coeff.

Baseline 10:
Projected O&D Enplanements = (Total Population*X1)+(Nonfarm Empl*X2)+(Fuel Cost/X3)+Coeff.

Sources:

Airport Management Records, Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT

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Prepared by: Ricordo & Associates, Inc., December 1998

3.5.1.2 Baseline - Domestic Connecting Enplanements

The level of connecting activity at an airport is a function of the level and patterns of service offered at the facility. At major hub airports, the hubbing carrier intentionally utilizes the airport as a point of transfer between flights to maximize service opportunities to various markets given equipment and frequency levels. Conversely, at non-hub airports, on-line passenger transfers can occur to serve specific market pairs that are not conveniently served through the carrier's hub.

Table III-5.2 presents the historical originating and connecting passenger activity experienced at the Airport. While connections have ranged from four percent to approximately 18 percent between 1979 and 1997, percentages have stabilized over the past eight years averaging 4.4 percent of the total enplanements.

Assuming, as the Baseline Scenario does, that the current air service and demand characteristics remain unchanged throughout the planning horizon, connecting ratios can be expected to remain near their current levels. PBIA's current role as a spoke on various airlines' hub and spoke systems and as a base of operations for carriers providing point-to-point service suggests minimal planned

connections occurring at the Airport. Connections, therefore, are estimated to remain at a level of approximately 4.4 percent of total domestic enplanements under the Baseline Scenario, consistent with recent levels. As shown in Table III-5.3, this translates to approximately 232,000 domestic connecting passenger enplanements in the year 2020, compared to the 1997 level of 107,656 domestic connecting passenger enplanements.

3.5.1.3 Baseline - International Enplanements

International activity at the Airport consists primarily of service to Canada and the Caribbean Islands. International enplanements relative to total enplanements at PBIA have ranged between 0.9 percent in 1981 and 3.2 percent in 1990. The low level of international activity experienced in 1981 can be attributed to the ceasing of operations by Mackey International. In 1980, Mackey International had 9,480 international enplanements as compared to its 4,164 international enplanements in 1981. The higher levels experienced in 1990 are attributable to increased activity by Air Canada, Bahamasair, Paradise Island, and Carnival Airlines. In the last five years, international enplaning passenger activity has averaged two percent of total enplanements. Since 1978, the Airport's departing international passenger activity has averaged 0.14 percent of the total amount of international enplanements by U.S. Commercial Air Carriers.

For purposes of the Baseline Scenario, international enplanements are assumed to maintain their recent historical relationship to total U.S. international enplanements, averaging 0.14 percent of the total national activity. Since the FAA forecast for this activity extends through the year 2009, an extrapolation of the FAA forecast of total U.S. international enplanements was performed in order to project international passenger enplanements at the Airport through the year 2020.

Table III-5.4 depicts the historical level of international enplanements at the Airport and future projections based on the methodology described above. Under the Baseline Scenario, international enplanements at PBIA are estimated to reach 271,000 in the year 2020. This growth represents an average annual grow rate of 7.5 percent.

Table III-5.2

Historic Domestic O&D and Connecting Enplanements

Year	Originating Domestic Enplanements	Percent of Total	Connecting Domestic Enplanements	Percent of Total	Total Domestic Enplanements
1979	1,057,720	89.08%	129,693	10.92%	1,187,413
1980	1,160,580	90.26%	125,285	9.74%	1,285,865
1981	1,147,240	88.78%	144,950	11.22%	1,292,190
1982	1,388,180	87.80%	192,978	12.20%	1,581,158
1983	1,506,580	82.30%	323,973	17.70%	1,830,553
1984	1,700,560	88.03%	231,243	11.97%	1,931,803
1985	1,740,770	93.69%	117,262	6.31%	1,858,032
1986	1,840,240	89.86%	207,607	10.14%	2,047,847
1987	1,968,230	86.13%	317,045	13.87%	2,285,275
1988	2,157,940	87.49%	308,513	12.51%	2,466,453
1989	2,171,460	86.68%	333,662	13.32%	2,505,122
1990	2,623,750	94.90%	140,995	5.10%	2,764,745
1991	2,371,670	95.83%	103,114	4.17%	2,474,784
1992	2,330,300	94.33%	140,087	5.67%	2,470,387
1993	2,345,870	94.10%	146,999	5.90%	2,492,869
1994	2,573,780	93.61%	175,832	6.39%	2,749,612
1995	2,553,570	95.37%	123,882	4.63%	2,677,452
1996	2,685,240	95.98%	112,456	4.02%	2,797,696
1997	2,757,840	96.24%	107,656	3.76%	2,865,496

Sources: Airport Management Records
Origin-Destination Survey of Airline Passenger Traffic,
U.S. DOT
Prepared by: Ricondo & Associates, Inc., December, 1998

Table III-5.3

Baseline Scenario – Connecting Enplanements

Year	Historic O&D Enplanements	Historic Connecting Enplanements	Projected O&D Enplanements	Projected Connecting Enplanements
1979	1,057,720	129,693		
1980	1,160,580	125,285		
1981	1,147,240	144,950		
1982	1,388,180	192,978		
1983	1,506,580	323,973		
1984	1,700,560	231,243		
1985	1,740,770	117,262		
1986	1,840,240	207,607		
1987	1,968,230	317,045		
1988	2,157,940	308,513		
1989	2,171,460	333,662		
1990	2,623,750	140,995		
1991	2,371,670	103,114		
1992	2,330,300	140,087		
1993	2,345,870	146,999		
1994	2,573,780	175,832		
1995	2,553,570	123,882		
1996	2,685,240	112,456		
1997	2,757,840	107,656		
2005			3,586,000	164,000
2010			4,075,000	187,000
2015			4,562,000	209,000
2020			5,049,000	232,000

Sources: Airport Management Records
Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT
Ricardo & Associates, Inc.

Prepared by: Ricardo & Associates, Inc., December, 1998

Table III-5.4

Baseline Scenario - International Enplanements

Year	Historic O&D Enplanements	Connecting Enplanements	Total International Enplanements Historic	U.S. Commercial Air Carriers International Enplanements Historical & Forecast	Baseline Scenario
					Total Projected International Enplanements Forecast
1979	1,057,720	129,693	16,172	n/a	
1980	1,160,580	125,285	13,973	24,200,000	
1981	1,147,240	144,950	12,067	21,100,000	
1982	1,388,180	192,978	20,624	19,700,000	
1983	1,506,580	323,973	37,241	21,000,000	
1984	1,700,560	231,243	41,060	22,900,000	
1985	1,740,770	117,262	43,807	24,300,000	
1986	1,840,240	207,607	45,986	24,400,000	
1987	1,968,230	317,045	47,475	29,400,000	
1988	2,157,940	308,513	52,286	34,300,000	
1989	2,171,460	333,662	78,401	36,800,000	
1990	2,623,750	140,995	92,012	41,300,000	
1991	2,371,670	103,114	67,138	39,700,000	
1992	2,330,300	140,087	64,591	42,600,000	
1993	2,345,870	146,999	51,888	45,200,000	
1994	2,573,780	175,832	52,003	46,300,000	
1995	2,553,570	123,882	51,670	48,600,000	
1996	2,685,240	112,456	54,318	50,300,000	
1997	2,757,840	107,656	51,518	52,500,000	
2005				81,100,000	115,000
2010				n/a	154,000
2015				n/a	204,000
2020				n/a	271,000

Values interpolated

Sources: Airport Management Records; FAA - Aviation Forecasts (FY 1998-2009);
Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT;
Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December, 1998

Table III-5.5 and **Exhibit III-5.1** provide a summary and graphical representation of the various enplaning passenger projections of the Baseline Scenario. The Baseline Scenario results in passenger enplanements at the Airport reaching 5,552,000 in the year 2020. This level of passenger enplanements represents a 90.3 percent increase over existing activity levels and an average annual growth of 2.8 percent.

3.5.2 Alternate Service Patterns Demand Scenario

Using the results of the Air Service Demand Analysis, the impact of changes in service patterns at the Airport was assessed. Specifically, the Air Service Demand Analysis concluded that PBI has become less of a seasonal destination, with traffic demand being more evenly balanced over the full year. For many flights presently scheduled on a seasonal basis only, sufficient demand exists to justify and support year-round service. The Air Service Demand Analysis also identified several markets that possess sufficient demand to support nonstop service but lack direct service from the Airport. Except for Montreal, all the markets identified as potential candidates for nonstop service are domestic, with the majority of these located in the eastern half of the United States.

This demand scenario is intended to define an activity profile representative of what would occur if the air service changes suggested by the Air Service Demand Analysis were implemented and the associated passenger demands materialize. The methodology adopted for the Alternate Service Patterns Demand Scenario replicates the methodology utilized for the Baseline Scenario. However, in this case, the Airport's historical activity profile is adjusted to reflect the changes to air service patterns recommended by the demand analysis. Specifically, the Airport's historical activity from 1990 to 1997 was adjusted in two ways. First, the higher levels of passenger traffic experienced during the first four months of each year, which in all cases represented the highest passenger activity levels, were treated as re-occurring cycles that continue for the remainder of the year. The result of this first adjustment is an approximation of the magnitude of aviation activity that could have existed if seasonal air service patterns had been sustained for the full year. The second adjustment entailed the addition of passenger traffic for those markets identified as potential candidates for nonstop service.

Table III-5.6 shows historical activity in passenger enplanements experienced at the Airport since 1990 and the revised activity levels resulting from the first adjustment described above (i.e., maintaining the seasonally high service patterns throughout the full year). As shown, the results of this adjustment represent an average increase in passenger activity of 28.8 percent.

Table III-5.7 summarizes the markets shown to have sufficient demand to support new or increased air service as concluded by the Air Service Demand Analysis. The markets are categorized into three types of deficiencies, consistent with the Air Service Demand Analysis:

- Deficiency 1: Markets without existing nonstop service;
- Deficiency 2: Markets where local O&D traffic exceeds the available nonstop seats; and
- Deficiency 3: Markets where the local O&D traffic is a high percentage of the on-board traffic.

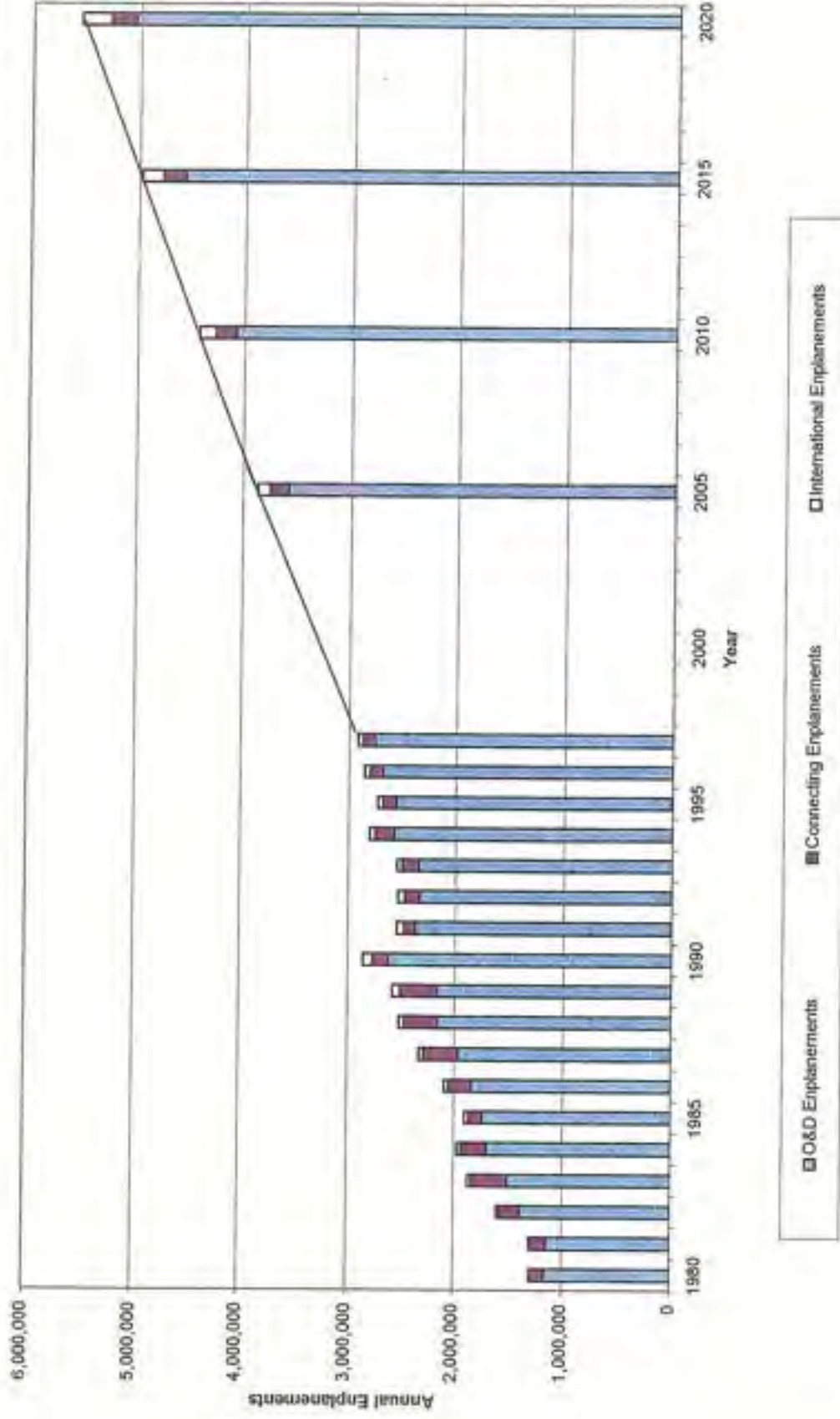
For purposes of this demand scenario, the daily passenger activity levels defined for the Deficiency 1 markets were used. This information served to develop a factor for new air service activity that could be applied to the adjusted enplanement activity levels shown in **Table III-5.6**. The resulting

Table III-5.5**Baseline Scenario - Summary of Projected Passenger Enplanements**

Calendar Year	Enplanements			
	Domestic			
	Originating	Connections	International	Total
1997 (Actual)	2,757,840	107,656	51,518	2,917,014
2005	3,586,000	164,000	115,000	3,865,000
2010	4,075,000	187,000	154,000	4,416,000
2015	4,562,000	209,000	204,000	4,975,000
2020	5,049,000	232,000	271,000	5,552,000

Sources: Airport Management Records
Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT
Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998



Source: Airport Management Records; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

Exhibit III-5.1

Baseline Scenario - Total Passenger Enplanements

Table III-5.6
Seasonality Adjustment - Alternate Service Patterns Demand Scenario

Year	Passenger Enplanements								
	Domestic			International			Total		
	Historical	Adjusted	% Change	Historical	Adjusted	% Change	Historical	Adjusted	% Change
1990	2,764,745	3,587,127	29.7%	92,012	145,593	58.2%	2,856,757	3,732,720	30.7%
1991	2,474,784	3,341,691	35.0%	67,138	105,192	56.7%	2,541,922	3,446,883	35.6%
1992	2,470,387	3,109,521	25.9%	64,591	103,812	60.7%	2,534,978	3,213,333	26.8%
1993	2,492,869	3,027,921	21.5%	51,888	81,798	57.6%	2,544,757	3,109,719	22.2%
1994	2,749,612	3,394,755	23.5%	52,003	78,063	50.1%	2,801,615	3,472,818	24.0%
1995	2,677,452	3,485,040	30.2%	51,670	73,089	41.5%	2,729,122	3,558,129	30.4%
1996	2,797,696	3,666,084	31.0%	54,318	69,420	27.8%	2,852,014	3,735,504	31.0%
1997	2,865,496	3,585,590	25.1%	51,518	65,670	27.5%	2,917,014	3,651,260	25.2%
Average			27.7%			47.5%			28.2%

Sources: Historical - Airport Management Records;

Adjusted - Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-5.7

Deficient Air Service Markets - Alternate Service Patterns Demand Scenario

Deficient Market ¹	Air Service Demand Analysis - Results			
	Passengers/Day	Annual Passengers	Local Originating Passengers as a Percent of Nonstop Seats	Load Factor
Deficiency 1:	Markets without existing nonstop service.			
Los Angeles	181	66,065	n/a	n/a
Providence	181	66,065	n/a	n/a
Denver	145	52,925	n/a	n/a
San Francisco	131	47,815	n/a	n/a
Las Vegas	119	43,435	n/a	n/a
Albany	114	41,610	n/a	n/a
Buffalo	108	39,420	n/a	n/a
Milwaukee	103	37,595	n/a	n/a
Phoenix	100	36,500	n/a	n/a
Indianapolis	89	32,485	n/a	n/a
Nashville	78	28,470	n/a	n/a
Washington-IAD	75	27,375	n/a	n/a
Louisville	62	22,630	n/a	n/a
Norfolk	60	21,900	n/a	n/a
Richmond	54	19,710	n/a	n/a
Memphis	54	19,710	n/a	n/a
Dayton	53	19,345	n/a	n/a
New Orleans	52	18,980	n/a	n/a
Total New Enplanements		642,035		
Deficiency 2:	Markets where local O&D traffic exceeds the available nonstop seats; and			
Hartford	n/a	n/a	124.1%	n/a
Boston	n/a	n/a	89.1%	n/a
Deficiency 3:	Markets where the local O&D traffic is a high percentage of the on-board traffic.			
Boston	n/a	n/a	n/a	83.4%
Hartford	n/a	n/a	n/a	82.9%
Newark	n/a	n/a	n/a	82.8%
Washington-DCA	n/a	n/a	n/a	82.8%
New York-LaGuardia	n/a	n/a	n/a	82.7%
Philadelphia	n/a	n/a	n/a	81.5%

Notes: n/a: not available ¹ as defined in the Air Service Demand Analysis
Source: GKM Consulting Services
Prepared by: Ricondo & Associates, Inc., December 1998

passenger enplanement levels were then utilized to develop alternate enplanement projections, defined here as the Alternate Service Patterns Demand Scenario for passenger activity. **Table III-5.8** summarizes the application of these adjustment factors to the Airport's historical passenger activity levels. As shown, the application of these adjustment factors to historical O&D passenger enplanements levels results in an average annual increase of approximately 53.2 percent. This average annual increase was then applied to the preferred baseline projections of domestic O&D passenger enplanements, thus yielding the domestic originating passenger enplanements projections for this alternate demand scenario. Alternate domestic connecting enplanement projections were also developed using the same methodology utilized for the Baseline Scenario.

Similarly, projections of international enplanements for this alternate demand scenario were developed considering the extrapolation of seasonality trends throughout the full year as well as the addition of service to new markets. **Table III-5.9** summarizes the adjustments used to develop the international passenger enplanement projections. The application of the adjustment factors shown in **Table III-5.9** to historical passenger enplanements at PBIA results in an average increase in international enplanements of approximately 78.7 percent. Alternate international passenger enplanement projections were derived by applying the growth in total U.S. international enplanements forecast by the FAA to the adjusted levels of international enplaning passenger activity.

Table III-5.10 and **Exhibit III-5.2** provide a summary and graphical representation of the various enplaning passenger projections of the Alternate Service Patterns Demand Scenario. The passenger enplanement levels at the Airport under this scenario reach 8,393,000 in the year 2020. This level of passenger enplanements represents a 188 percent increase over existing activity levels, 51 percent greater growth than the Baseline Scenario.

3.5.3 High Growth Demand Scenario

A High Growth Demand Scenario was also derived to show future growth potential assuming that the recommendations presented in the Air Service Demand Analysis are implemented and that accelerated growth is experienced in the Airport's market.

The FAA's Terminal Area Forecasts (TAF) for FLL and PBIA were reviewed in order to assess travel demand projections established for the Broward County-Palm Beach County region. A summary of TAF passenger enplanement forecasts for FLL and PBIA is shown in **Table III-5.11**. It is important to note that historic data obtained from the FAA-TAF varies from that obtained from Airport Management Records since TAF data represents fiscal year activity. As shown, the historical and forecast growth rates for the two airports combined remain the same, averaging an annual growth of 3.5 percent in passenger enplanements. However, the forecast for each airport differs, with FLL projected to grow at an average annual growth rate of 3.9 percent, as compared to the average annual growth rate of 2.7 percent forecast for PBIA. The FAA forecasts reflect FLL increasing its market share of the region's air travel demand market relative to PBIA. However, the FAA also projects a higher average annual growth rate for PBIA during the forecast period (2.7 percent) than the historical growth rate experienced between 1990 and 1997, which averaged 0.5 percent per year. Conversely, a decrease in the average annual growth rate for FLL passenger enplanements is forecast (3.9 percent) as compared to the 5.1 percent average annual growth experienced between 1990 and 1997.

Table III-5.8

Adjustment Factors for Historical Originating Domestic Enplanements - Alternate Service Patterns Demand Scenario

Seasonality Adjustment:

Calendar Year	Historical Originating Domestic Enplanements	Total Domestic Enplanements Adjusted for Seasonality	Connecting Enplanements	Seasonally Adjusted Originating Domestic Enplanements
1990	2,623,750	3,587,127	182,934	3,404,193
1991	2,371,670	3,341,691	139,234	3,202,457
1992	2,330,300	3,109,521	176,330	2,933,191
1993	2,345,870	3,027,921	178,550	2,849,371
1994	2,573,780	3,394,755	217,088	3,177,667
1995	2,553,570	3,485,040	161,248	3,323,792
1996	2,685,240	3,666,084	147,362	3,518,722
1997	2,757,840	3,585,590	134,710	3,450,880

New Service Adjustment:

Calendar Year	Seasonally Adjusted O&D Enplanements	New Nonstop Service	Total Adjusted Originating Domestic Enplanements	Diff. From Historical
1990	3,404,193	642,035	4,046,228	154.2%
1991	3,202,457	642,035	3,844,492	162.1%
1992	2,933,191	642,035	3,575,226	153.4%
1993	2,849,371	642,035	3,491,406	148.8%
1994	3,177,667	642,035	3,819,702	148.4%
1995	3,323,792	642,035	3,965,827	155.3%
1996	3,518,722	642,035	4,160,757	154.9%
1997	3,450,880	642,035	4,092,915	148.4%

Average Adjustment of Historical 153.2%

Sources: Airport Management Records, Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

Table III-5.9

Adjustment Factors for Historical International Passenger Enplanements - Alternate Service Patterns Demand Scenario

Seasonality Adjustment:

Calendar Year	Historical International Enplanements	Total International Enplanements Adjusted for Seasonality
1990	92,012	145,593
1991	67,138	105,192
1992	64,591	103,812
1993	51,888	81,798
1994	52,003	78,063
1995	51,670	73,089
1996	54,318	69,420
1997	51,518	65,670

New Service Adjustment:

Calendar Year	Seasonally Adjusted International Enplanements	New Nonstop Service to Montreal	Total Adjusted International Enplanements	Difference From Historical
1990	145,593	18,250	163,843	178.07%
1991	105,192	18,250	123,442	183.86%
1992	103,812	18,250	122,062	188.98%
1993	81,798	18,250	100,048	192.82%
1994	78,063	18,250	96,313	185.21%
1995	73,089	18,250	91,339	176.77%
1996	69,420	18,250	87,670	161.40%
1997	65,670	18,250	83,920	162.89%
Average Adjustment of Historical				178.75%

Sources: Airport Management Records, Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

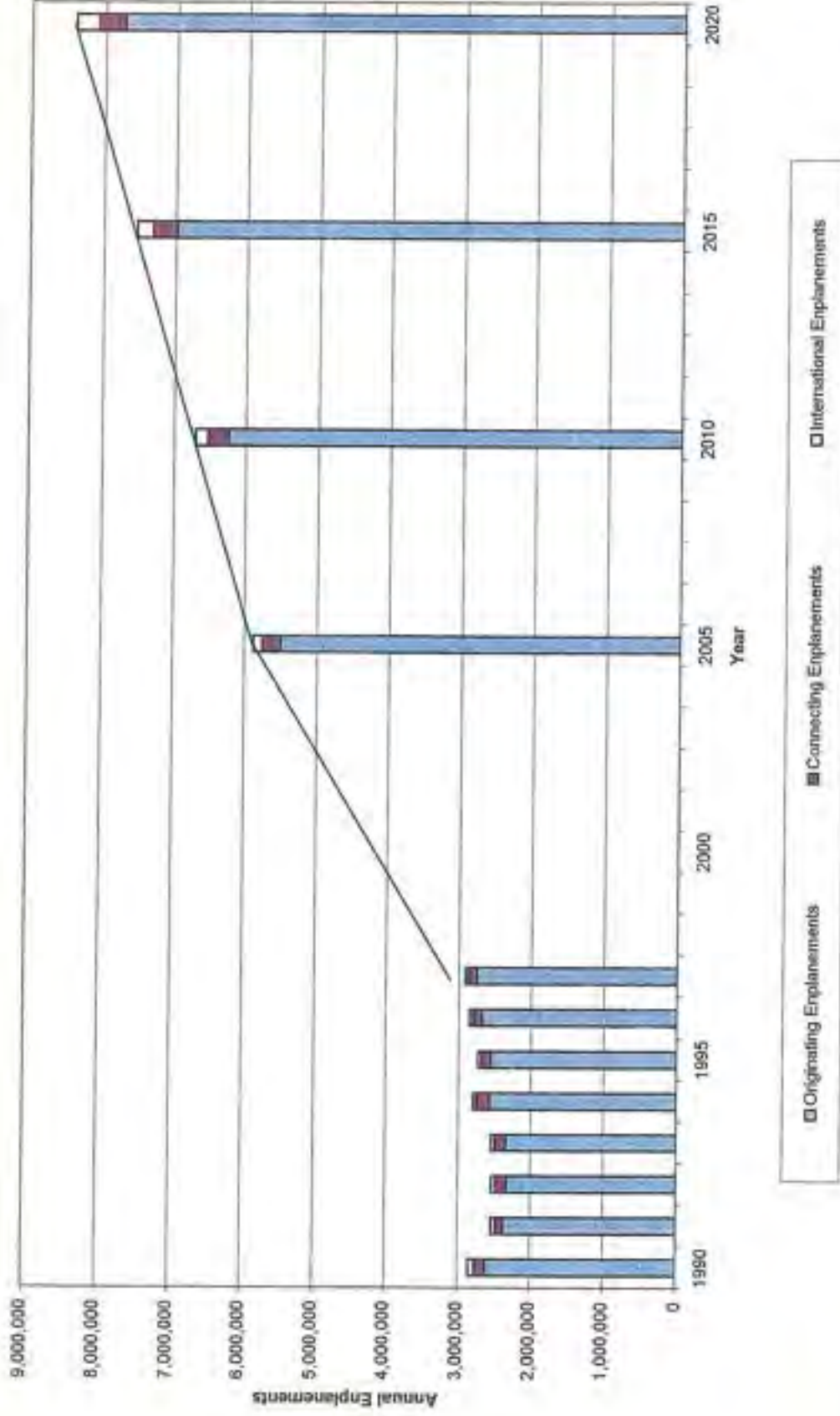
Table III-5.10

Alternate Service Patterns Demand Scenario - Summary of Projected Passenger Enplanements

Year	Historical Enplanements				Alternate Service Patterns Demand Scenario			
	O&D	Connecting	International	Total	O&D	Connecting	International	Total
1979	1,057,720	129,693	16,172	1,203,585				
1980	1,160,580	125,285	13,973	1,299,838				
1981	1,147,240	144,950	12,067	1,304,257				
1982	1,388,180	192,978	20,624	1,601,782				
1983	1,506,580	323,973	37,241	1,867,794				
1984	1,700,560	231,243	41,060	1,972,863				
1985	1,740,770	117,262	43,807	1,901,839				
1986	1,840,240	207,607	45,986	2,093,833				
1987	1,968,230	317,045	47,475	2,332,750				
1988	2,157,940	308,513	52,286	2,518,739				
1989	2,171,460	333,662	78,401	2,583,523				
1990	2,623,750	140,995	92,012	2,856,757				
1991	2,371,670	103,114	67,138	2,541,922				
1992	2,330,300	140,087	64,591	2,534,978				
1993	2,345,870	146,999	51,888	2,544,757				
1994	2,573,780	175,832	52,003	2,801,615				
1995	2,553,570	123,882	51,670	2,729,122				
1996	2,685,240	112,456	54,318	2,852,014				
1997	2,757,840	107,656	51,518	2,917,014				
2005					5,494,000	252,000	130,000	5,876,000
2010					6,242,000	286,000	174,000	6,702,000
2015					6,988,000	320,000	230,000	7,538,000
2020					7,734,000	355,000	304,000	8,393,000

Sources: Airport Management Records
Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT
Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998



Source: Airport Management Records, Ricordo & Associates, Inc.
 Prepared by: Ricordo & Associates, Inc., December 1998

Exhibit III-5.2

Alternate Service Patterns Demand Scenario - Total Passenger Enplanements

Table III-5.11

Comparison of Terminal Area Forecasts for Total Passenger Enplanements

Year	PBIA			FLL			Combined Airport Totals	
	Total Enpls	Growth Rate	Share of Local Traffic	Total Enpls	Growth Rate	Share of Local Traffic	Total Enpls	Growth Rate
1990	2,786,973	n/a	38.6%	4,426,430		61.4%	7,213,403	
1991	2,529,640	-9.2%	38.7%	4,008,600	-9.4%	61.3%	6,538,240	-9.4%
1992	2,519,833	-0.4%	38.4%	4,038,592	0.7%	61.6%	6,558,425	0.3%
1993	2,435,893	-3.3%	36.3%	4,266,363	5.6%	63.7%	6,702,256	2.2%
1994	2,721,921	11.7%	34.9%	5,074,130	18.9%	65.1%	7,796,051	16.3%
1995	2,687,516	-1.3%	36.5%	4,679,592	-7.8%	63.5%	7,367,108	-5.5%
1996	2,916,037	8.5%	34.1%	5,642,370	20.6%	65.9%	8,558,407	16.2%
1997	2,851,554	-2.2%	32.0%	6,051,173	7.2%	68.0%	8,902,727	4.0%
1998	2,948,157	3.4%	32.3%	6,166,093	1.9%	67.7%	9,114,250	2.4%
1999	3,044,951	3.3%	31.5%	6,606,973	7.2%	68.5%	9,651,924	5.9%
2000	3,141,732	3.2%	31.4%	6,849,855	3.7%	68.6%	9,991,587	3.5%
2001	3,238,472	3.1%	31.1%	7,190,738	5.0%	68.9%	10,429,210	4.4%
2002	3,335,115	3.0%	30.7%	7,531,620	4.7%	69.3%	10,866,735	4.2%
2003	3,431,744	2.9%	30.4%	7,872,502	4.5%	69.6%	11,304,246	4.0%
2004	3,528,358	2.8%	30.0%	8,213,364	4.3%	70.0%	11,741,722	3.9%
2005	3,624,956	2.7%	29.8%	8,554,266	4.2%	70.2%	12,179,222	3.7%
2006	3,721,637	2.7%	29.5%	8,895,149	4.0%	70.5%	12,616,786	3.6%
2007	3,818,098	2.6%	29.2%	9,236,030	3.8%	70.8%	13,054,128	3.5%
2008	3,914,643	2.5%	29.0%	9,579,913	3.7%	71.0%	13,494,556	3.4%
2009	4,011,162	2.5%	28.8%	9,917,795	3.5%	71.2%	13,928,957	3.2%
2010	4,107,685	2.4%	28.6%	10,258,677	3.4%	71.4%	14,366,362	3.1%
2011	4,204,213	2.3%	28.4%	10,599,559	3.3%	71.6%	14,803,772	3.0%
2012	4,300,748	2.3%	28.2%	10,940,441	3.2%	71.8%	15,241,189	3.0%
2013	4,397,292	2.2%	28.0%	11,281,324	3.1%	72.0%	15,678,616	2.9%
2014	4,493,846	2.2%	27.9%	11,622,206	3.0%	72.1%	16,116,052	2.8%
2015	4,590,412	2.1%	27.7%	11,963,090	2.9%	72.3%	16,553,502	2.7%
Average Growth Rates and Market Shares:								
1990-1997		0.5%	35.9%		5.1%	64.1%		3.5%
1998-2015		2.7%	29.6%		3.9%	70.4%		3.5%

Source: 1998 FAA Terminal Area Forecasts

Prepared by: Ricondo & Associates, Inc., December 1998

A High Growth Scenario for passenger enplanements was derived using the results of the Alternate Service Patterns Demand Scenario, the NPA's socioeconomic projections, and the FAA's forecast air travel demand growth for the Broward County-Palm Beach County region. Specifically, the projections for total passenger enplanements derived under the Alternate Service Patterns Demand Scenario, resulting in an average annual growth rate of 2.5 percent, were adjusted to reflect the FAA's projected growth rate for the two-county region, averaging an annual growth rate of 3.5 percent. Then, using the ratios for originating enplanements to total enplanements, connecting enplanements to total enplanements, and international enplanements to total enplanements, high growth projections for each component of passenger activity were derived. This approach reflects a positive outlook for PBIA's potential for capturing an increased market share of the local air travel demand, particularly from the southern half of Palm Beach County and the northern half of Broward County.

Table III-5.12 and Exhibit III-5.3 provide a summary and graphical representation of the enplaning passenger projections under the High Growth Demand Scenario. Passenger enplanements at the Airport reach 10,128,000 in the year 2020 under this scenario. This level of passenger enplanements represents a 247 percent increase over 1997 activity levels, which is 82 percent greater than the Baseline Scenario.

3.5.4 Comparison of Alternative Demand Scenarios

The three demand scenarios cover a wide range of enplanement levels and characteristics in the ultimate planning year. As shown in Exhibit III-5.4, enplanements in the year 2020 range from 5,552,000 under the Baseline Scenario, to 10,128,000 under the High Growth Demand Scenario, which represent an average annual growth of 2.8 percent and 5.6 percent per year, respectively, for the period 1997 through 2020. Actual average annual growth at the Airport for the period 1990 through 1997 was -0.3 percent per year.

For comparative purposes, Exhibit III-5.4 also presents the most recent FAA TAF for Palm Beach International Airport and Boeing's 1997 Current Market Outlook forecast for domestic air travel. The *FAA Terminal Area Forecast, FY 1998 - 2015*, was published in 1998 based on data available through 1997. As depicted, both the FAA and Boeing forecasts project activity through the year 2015 at levels slightly less than those projected under the Baseline Scenario.

Table III-5.13 presents the demand levels for each service category under each of the demand scenarios.

3.6 Cargo Activity

Freight, and in the case of PBIA, express cargo is generally transported by air carriers in the belly compartment of commercial passenger aircraft or, more often, on all-cargo aircraft. Freight shipments can range from a few pounds to several tons. Air freight distribution channels typically involve freight forwarders at both the origin and destination airports who act as agents between the shipper and consignee. In contrast, fully integrated operators like the United Parcel Service (UPS) control the entire distribution channel from shipper to consignee.

Express cargo is the fastest growing segment of air cargo, as several dominant express operators such as FedEx, UPS, Airborne Express, and DHL have expanded their integrated networks throughout the world. Express cargo is usually time-sensitive and involves overnight or second-day delivery. Air

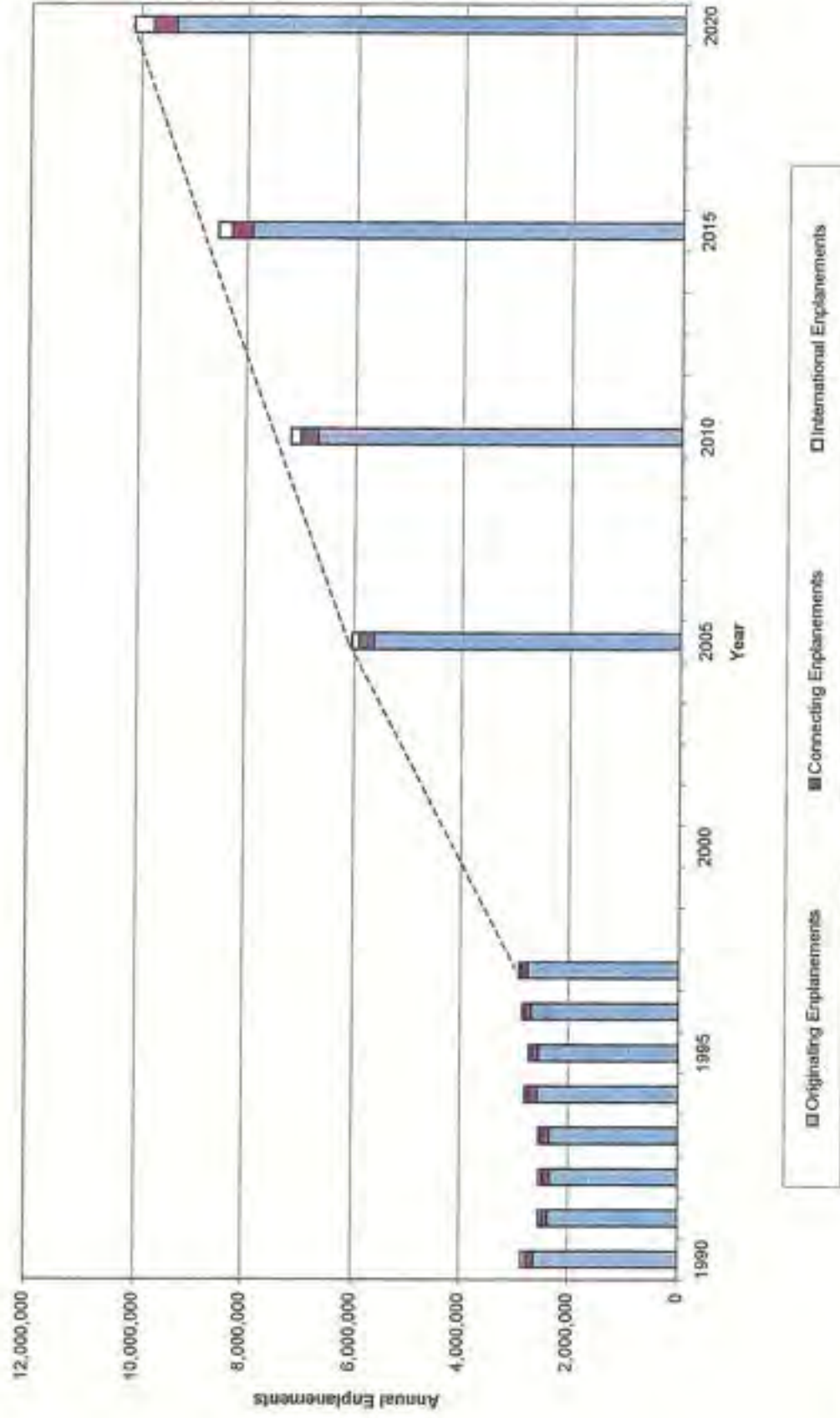
Table III-5.12

High Growth Demand Scenario - Summary of Projected Passenger Enplanements

Calendar Year	High Growth Demand Scenario - Passenger Enplanements			
	Domestic	Connections	International	Total
	Originating			
1997 (Actual)	2,757,840	107,656	51,518	2,917,014
2005	5,646,000	259,000	133,000	6,038,000
2010	6,682,000	306,000	186,000	7,174,000
2015	7,902,000	362,000	260,000	8,524,000
2020	9,333,000	428,000	367,000	10,128,000

Sources: Airport Management Records
 Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT
 Ricondo & Associates, Inc.

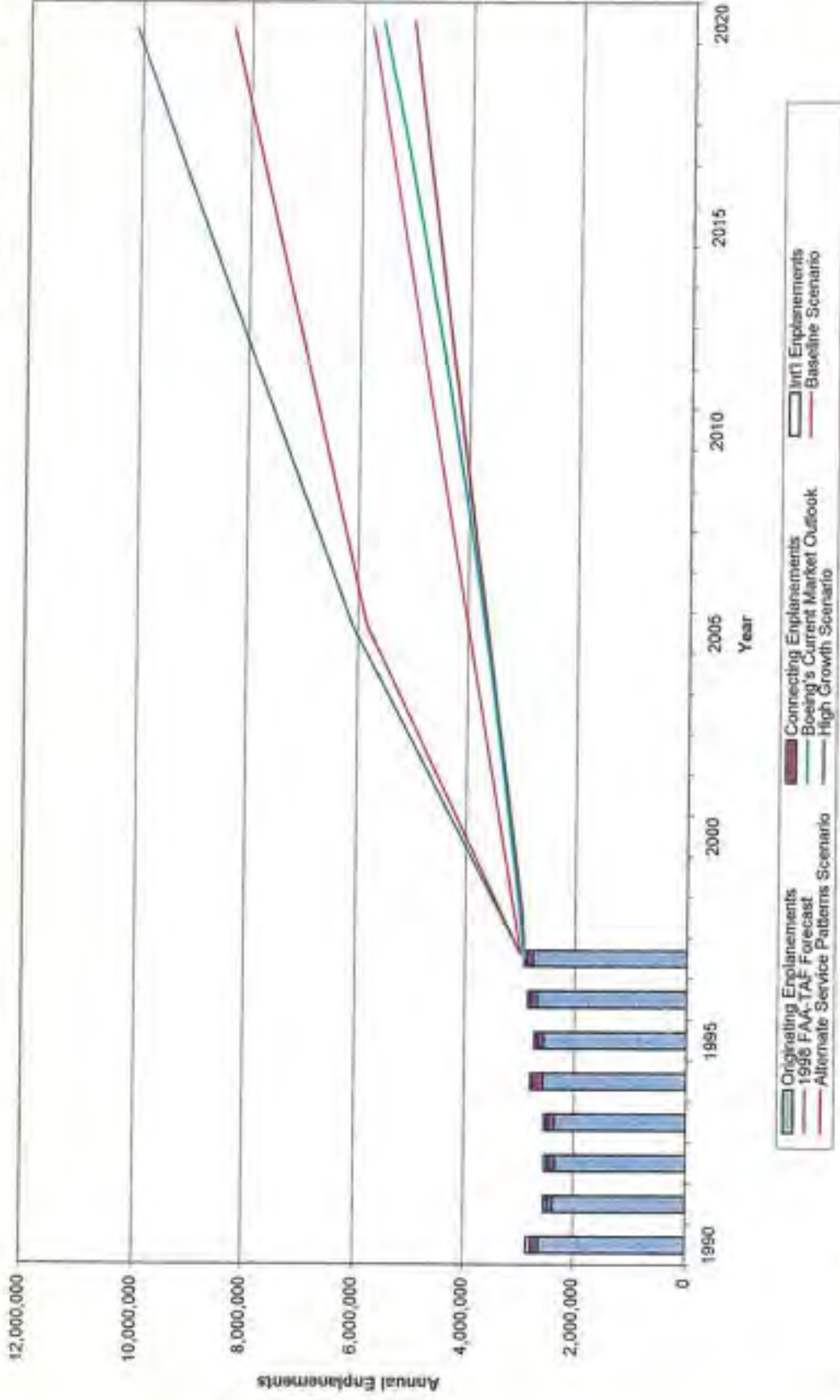
Prepared by: Ricondo & Associates, Inc., December 1998



Source: Airport Management Records; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc. . December 1998

Exhibit III-5.3

High Growth Demand Scenario - Total Passenger Enplanements



Source: Airport Management Records; Ricordo & Associates, Inc.
 Prepared by: Ricordo & Associates, Inc., December 1998

Exhibit III-5.4

Comparison of Alternate Demand Scenario - Total Passenger Enplanements

Table III-5.13
Comparison of Total Passenger Enplanements For Alternate Demand Scenarios

Year	Historic Enplanements			Baseline Scenario			Alternate Service Patterns Scenario			High Growth Scenario		
	Domestic	International	Total	Domestic	International	Total	Domestic	International	Total	Domestic	International	Total
1997 (Actual)	2,865,496	51,518	2,917,014									
2005				3,750,000	115,000	3,865,000	5,745,000	130,000	5,875,000	5,905,000	133,000	6,038,000
2010				4,262,000	154,000	4,416,000	6,529,000	174,000	6,703,000	6,988,000	186,000	7,174,000
2015				4,771,000	204,000	4,975,000	7,309,000	230,000	7,539,000	8,264,000	260,000	8,524,000
2020				5,281,000	271,000	5,552,000	8,089,000	304,000	8,393,000	9,761,000	367,000	10,128,000

Sources: Airport Management Records
Origin-Destination Survey of Airline Passenger Traffic, U.S. DOT
Ricordo & Associates, Inc.
Prepared by: Ricordo & Associates, Inc., December 1998

mail, the smallest of the three air cargo components at PBIA, is first-class post carried almost entirely in the belly compartment of commercial passenger aircraft.

The level of cargo activity at an airport is dependent on the economic characteristics of the community, the level of passenger service offered at the facility and the associated belly capacity, competition from other modes of transportation, and decisions by cargo carriers regarding use of the facility as a cargo hub/terminal. In addition, decisions and operating practices by the U.S. Postal Service can also affect the amount of airmail processed at an airport. To account for these factors, future cargo activity projections were developed consistent with the demand scenarios defined for passenger activity. Like the passenger projections described earlier, 1997 served as the base year for the cargo projections.

The following sections define the cargo activity projections under the alternative demand scenarios and the distribution between belly-cargo and all-cargo activity.

3.6.1 Baseline Scenario - Cargo Activity

Table III-6.1 presents historical cargo activity at the Airport since 1979. As shown, based on airport management records, enplaned freight/express tonnage and enplaned air mail tonnage, as a percent of total cargo, have been almost equal since 1994. Total air cargo at the Airport since 1985 has grown at a rapid pace, averaging 13.3 percent. Most of this growth has been attributed to the increase in mail tonnage experienced during this period. In 1985, PBIA enplaned 1,315 tons of mail as compared to the 8,452 tons of mail processed in 1997. Freight and express tonnage during this same period increased from 1,842 enplaned tons in 1985 to 8,880 enplaned tons in 1997.

Regression analyses were used to define relationships between various socioeconomic indicators and cargo activity levels. In order to define future cargo levels under the Baseline Scenario, a regression analysis of enplaned mail and enplaned freight/express against the various socioeconomic variables utilized to project O&D passenger enplanements was performed. **Tables III.6.2** and **III.6.3** present the predicted values under the resulting regression equations. In general, all of the regression equations yielded R-Squared values indicative of a poor correlation between cargo activity and the local socioeconomics.

In addition, a trend analysis of historical belly cargo tonnage per commercial operation was performed. The resulting ratios of belly cargo tonnage to commercial operations were then paired with baseline projections of total commercial operations (discussed in a subsequent section) to produce projections of belly cargo tonnage. In order to segregate mail tonnage from freight tonnage, the average distribution of each cargo component relative to total cargo tonnage for the period between 1994 and 1997 was held constant for the planning horizon. Specifically, the average distributions of mail tons and freight tons relative to total belly cargo tonnage between 1994 and 1997 are 70.63 percent and 29.37 percent, respectively. The period between 1994 and 1997 was chosen for this purpose since it is most reflective of the current cargo operating characteristics at the Airport, under which nearly 50 percent of the freight tonnage is transported on all-cargo aircraft. Since 1994, this all-cargo tonnage has been handled by UPS. Prior to 1994, UPS transported its freight in the belly compartment of commercial aircraft operating at PBIA.

A trend analysis was also performed on the all-cargo tonnage. This analysis resulted in projections of future all-cargo tonnage assuming that the trends experienced at the Airport since 1994 (i.e., when UPS began its all-cargo operations) continue during the planning horizon.

Table III-6.1

Historical Cargo Tonnage

Year	Enplaned		% of Total		Total Enplaned		% of Total		Enplaned		% of Total		Freight Minus		% of Total		Total Enplaned	
	Mail Tons	Cargo	Mail Tons	Cargo	Freight Tons	Cargo	Freight Tons	Cargo	All-Cargo Tons	Cargo	All-Cargo Tons	Cargo	All-Cargo Tons	Cargo	All-Cargo Tons	Cargo	All-Cargo Tons	Cargo Tons
1979	932	34.01%			1,808	65.99%			0	0.00%			1,808	65.99%			2,740	
1980	1,278	34.64%			2,411	65.36%			0	0.00%			2,411	65.36%			3,688	
1981	1,412	38.32%			2,274	61.68%			0	0.00%			2,274	61.68%			3,686	
1982	1,181	35.86%			2,113	64.14%			0	0.00%			2,113	64.14%			3,294	
1983	1,023	31.31%			2,244	68.69%			0	0.00%			2,244	68.69%			3,267	
1984	1,332	47.49%			1,473	52.51%			0	0.00%			1,473	52.51%			2,805	
1985	1,315	41.66%			1,842	58.34%			0	0.00%			1,842	58.34%			3,157	
1986	2,070	53.26%			1,817	46.74%			0	0.00%			1,817	46.74%			3,887	
1987	2,480	56.50%			1,910	43.50%			0	0.00%			1,910	43.50%			4,390	
1988	2,838	61.30%			1,792	38.70%			0	0.00%			1,792	38.70%			4,630	
1989	4,136	59.28%			2,841	40.72%			0	0.00%			2,841	40.72%			6,977	
1990	4,354	62.80%			2,579	37.20%			0	0.00%			2,579	37.20%			6,933	
1991	4,465	56.40%			3,452	43.60%			0	0.00%			3,452	43.60%			7,917	
1992	5,512	63.75%			3,134	36.25%			0	0.00%			3,134	36.25%			8,646	
1993	5,822	64.20%			3,246	35.80%			0	0.00%			3,246	35.80%			9,068	
1994	5,871	51.91%			5,438	48.09%			1,211	10.71%			4,227	37.38%			11,309	
1995	7,192	54.31%			6,051	45.69%			2,987	22.56%			3,064	23.14%			13,243	
1996	8,406	55.55%			6,725	44.45%			4,242	28.04%			2,483	16.41%			15,131	
1997	8,452	59.73%			5,698	40.27%			3,182	22.49%			2,516	17.78%			14,150	

Sources: Airport Management Records

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-6.2

Baseline Scenario - Alternate Projections of Enplaned Mail

Year	Historical Enplaned Mail Tons	Projected Enplaned Tons of Mail			
		Predictor Variable			
		Population	PIPC	Households	Nonfarm Employment
1979	932				
1980	1,278				
1981	1,412				
1982	1,181				
1983	1,023				
1984	1,332				
1985	1,315				
1986	2,070				
1987	2,480				
1988	2,838				
1989	4,136				
1990	4,354				
1991	4,465				
1992	5,512				
1993	5,822				
1994	5,871				
1995	7,192				
1996	8,406				
1997	8,452				
2005		11,200	8,600	11,500	12,200
2010		13,600	9,800	14,200	14,800
2015		16,000	11,100	16,900	17,100
2020		18,300	12,400	19,500	19,000
R-Squared		0.8989	0.8562	0.8791	0.8604

Sources: Airport Management Records; National Planning Association; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-6.3

Baseline Scenario - Alternate Projections of Enplaned Freight

Year	Historical Enplaned Freight Tons	Projected Enplaned Tons of Freight			
		Predictor Variable			
		Population	PIPC	Households	Nonfarm Employment
1979	1,808				
1980	2,411				
1981	2,274				
1982	2,113				
1983	2,244				
1984	1,473				
1985	1,842				
1986	1,817				
1987	1,910				
1988	1,792				
1989	2,841				
1990	2,579				
1991	3,452				
1992	3,134				
1993	3,246				
1994	5,438				
1995	6,051				
1996	6,725				
1997	5,698				
2005		7,100	5,600	7,200	7,500
2010		8,400	6,200	8,600	8,900
2015		9,700	6,900	10,000	10,100
2020		10,900	7,500	11,400	11,100
R-Squared		0.6119	0.5322	0.5739	0.5633

Sources: Airport Management Records; National Planning Association; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-6.4 shows the results of these trend analyses. As shown, enplaned belly mail tons are projected to increase from the 1997 level of 8,452 tons to 24,200 tons in the year 2020. Enplaned freight is projected to increase from 2,516 tons in 1997 to 10,100 tons in the year 2020, while enplaned all-cargo tonnage is shown to grow from 3,182 tons in 1997 to 9,200 tons in the year 2020.

Since most of the regression equations produce relatively low R-Squared values, thus implying a poor correlation between cargo activity and the various socioeconomic variables examined, the results of the trend analysis were selected as the preferred Baseline projection of future cargo activity.

3.6.2 Alternate Service Patterns Demand Scenario

Since it can be argued that increased commercial aviation activity translates to increased belly cargo tonnage capacity, alternate cargo activity projections were derived using the preferred baseline scenario as a base. Specifically, the ratios derived for future cargo tonnage per operation, using the historical relationships observed between cargo tonnage and aircraft operations, were utilized. In addition, the future levels of commercial aircraft operations projected under this demand scenario (described in a subsequent section) were paired against the aforementioned ratios for deriving the alternate belly cargo tonnage projections. The average historical breakdown of mail and freights as a percent of cargo experienced between 1994 and 1997 was used to derive individual mail and freight tonnage projections.

For this demand scenario, the enplaned all-cargo tonnage levels projected under the Baseline Scenario are assumed to remain constant. These all-cargo tonnage levels represent an average annual growth rate of 6.4 percent between 1997 and the year 2010 and an average annual growth rate of 4.8 percent for the entire planning horizon (i.e., between 1997 and the year 2020). Since the focus of this demand scenario is to assess potential changes in the type and level of demand due to the normalizing of seasonal trends and the addition of new commercial service, it can be concluded that all-cargo activity will not likely be affected by these air service adjustments.

Table III-6.5 depicts the enplaned cargo activity projected under the Alternate Service Patterns Demand Scenario. As shown, enplaned belly freight/express cargo activity is projected to total 13,800 tons in the year 2020, while enplaned mail is projected to total 33,200 tons. As previously stated, enplaned all-cargo tonnage is projected to remain constant with the Baseline Scenario, totaling 9,200 tons in the year 2020.

3.6.3 High Growth Demand Scenario - Cargo Activity

Using the same methodology described above to derive cargo tonnage projections under the Alternate Service Patterns Demand Scenario and the future levels of commercial aircraft operations projected under the High Growth Scenario, cargo activity projections reflective of more aggressive growth patterns were developed. Under this demand scenario, it is also assumed that one or more all-cargo operators, in addition to UPS, will begin operations at PBIA prior to the year 2005. To reflect this, the enplaned all-cargo tonnage projected for the year 2005 under the Baseline Scenario was increased by a factor of 20 percent. In addition, the more aggressive growth rate in enplaned all-cargo tonnage projected between 1997 and 2010, averaging 6.4 percent under the Baseline and Alternate Service Pattern Scenarios, is held constant from 2005 through 2020 under the High Growth Scenario.

Table III-6.4

Baseline Scenario - Trend Analysis of Enplaned Cargo Tonnage

Year	Total Enplaned		Total Commercial Operations	Enplaned Belly		Enplaned Belly Cargo		Trend Analysis		Total Enplaned Cargo Tons
	Cargo Tons (excluding All-Cargo)	Cargo Tons		Cargo Tons	Mail Tons	Enplaned Freight Tons	All-Cargo Tons			
1979	2,740	0.1113	49,257				0		2,740	
1980	3,688	0.1447	50,982				0		3,688	
1981	3,686	0.1464	50,369				0		3,686	
1982	3,294	0.1189	55,397				0		3,294	
1983	3,267	0.0893	73,153				0		3,267	
1984	2,805	0.0693	80,999				0		2,805	
1985	3,157	0.0917	68,829				0		3,157	
1986	3,887	0.1090	71,321				0		3,887	
1987	4,390	0.1158	75,844				0		4,390	
1988	4,630	0.1145	80,862				0		4,630	
1989	6,977	0.1768	78,908				0		6,977	
1990	6,933	0.1511	91,771				0		6,933	
1991	7,917	0.2050	77,225				0		7,917	
1992	8,646	0.2389	72,396				0		8,646	
1993	9,068	0.2483	73,031				0		9,068	
1994	10,098	0.2674	75,532				1,211		11,309	
1995	10,256	0.2686	76,373				2,987		13,243	
1996	10,889	0.2769	78,642				4,242		15,131	
1997	10,968	0.2960	74,098				3,182		14,150	
2005		0.3735	99,500	18,600	13,100	5,500	5,800		24,400	
2010		0.4340	108,100	23,500	16,600	6,900	7,000		30,500	
2015		0.4945	116,100	28,700	20,300	8,400	8,100		36,800	
2020		0.5550	123,700	34,300	24,200	10,100	9,200		43,500	

Sources: Airport Management Records; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Table III-6.5

Alternate Service Patterns Demand Scenario - Trend Analysis of Enplaned Cargo Tonnage

Year	Total Enplaned Cargo Tons (excluding All-Cargo)	Total Commercial Operations	Enplaned Belly		Enplaned Belly Cargo		Trend Analysis		Total Enplaned Cargo Tons
			Cargo Tons	Per Departure	Enplaned Cargo Tons	Enplaned Mail Tons	Enplaned All-Cargo Tons	Enplaned Freight Tons	
1979	2,740	49,257	0.1113				0		2,740
1980	3,688	50,982	0.1447				0		3,688
1981	3,686	50,369	0.1464				0		3,686
1982	3,294	55,397	0.1189				0		3,294
1983	3,267	73,153	0.0893				0		3,267
1984	2,805	80,999	0.0693				0		2,805
1985	3,157	68,829	0.0917				0		3,157
1986	3,887	71,321	0.1090				0		3,887
1987	4,390	75,844	0.1158				0		4,390
1988	4,630	80,862	0.1145				0		4,630
1989	6,977	78,908	0.1768				0		6,977
1990	6,933	91,771	0.1511				0		6,933
1991	7,917	77,225	0.2050				0		7,917
1992	8,646	72,396	0.2389				0		8,646
1993	9,068	73,031	0.2483				0		9,068
1994	10,098	75,532	0.2674				1,211		11,309
1995	10,256	76,373	0.2686				2,987		13,243
1996	10,889	78,642	0.2769				4,242		15,131
1997	10,968	74,098	0.2960				3,182		14,150
2005		145,300	0.3735		27,100	19,100	5,800	8,000	32,900
2010		154,700	0.4340		33,600	23,700	7,000	9,900	40,600
2015		162,400	0.4945		40,200	28,400	8,100	11,800	48,300
2020		169,200	0.5550		47,000	33,200	9,200	13,800	56,200

Sources: Airport Management Records; Ricoondo & Associates, Inc.

Prepared by: Ricoondo & Associates, Inc., December 1998

The enplaned cargo tonnage projections for the High Growth Scenario are shown in Table III-6.6. As shown, enplaned belly freight/express cargo activity is projected to total 16,700 tons in the year 2020, while enplaned mail is projected to total 40,000 tons. Enplaned all-cargo tonnage is projected to grow to 17,500 tons in the year 2020.

A graphical comparison of the three total cargo activity projections is shown in Exhibit III-6.1. Table III-6.7 shows a tabular comparison of the three projections of cargo activity for the various demand scenarios.

3.7 Aircraft Operations

For the most part, the level of aircraft operations at an airport is dependent on the amount of people and goods needing transportation (passengers, cargo, etc.) and the type (fleet mix) of aircraft used to provide the transportation. This is certainly true for commercial passenger and cargo activity, but is somewhat less of an issue for general aviation and military activity. As such, the development of future projections of the commercial operations includes the consideration of future fleet mix characteristics.

A summary of historic aircraft operations at PBI, broken down by the various service categories (commercial, air taxi, all-cargo, general aviation, and military), is provided in Table III-7.1. An aircraft operation is defined as an aircraft landing or an aircraft take off. The following sections describe the development of aircraft operations forecasts for each of the demand scenarios.

3.7.1 Commercial Aircraft Operations

The determination of commercial passenger aircraft operations associated with the various demand scenarios was predicated on the enplanement levels projected under each scenario as well as the anticipated fleet mix and boarding load factors. Average aircraft seating capacities and boarding load factors associated with commercial activity at the Airport since 1990 were analyzed and assumptions were made regarding their future patterns under each demand scenario. These values were applied to the enplanement levels to define future operations. Historical data for average seats per departure and boarding load factors is presented in Table III-7.2.

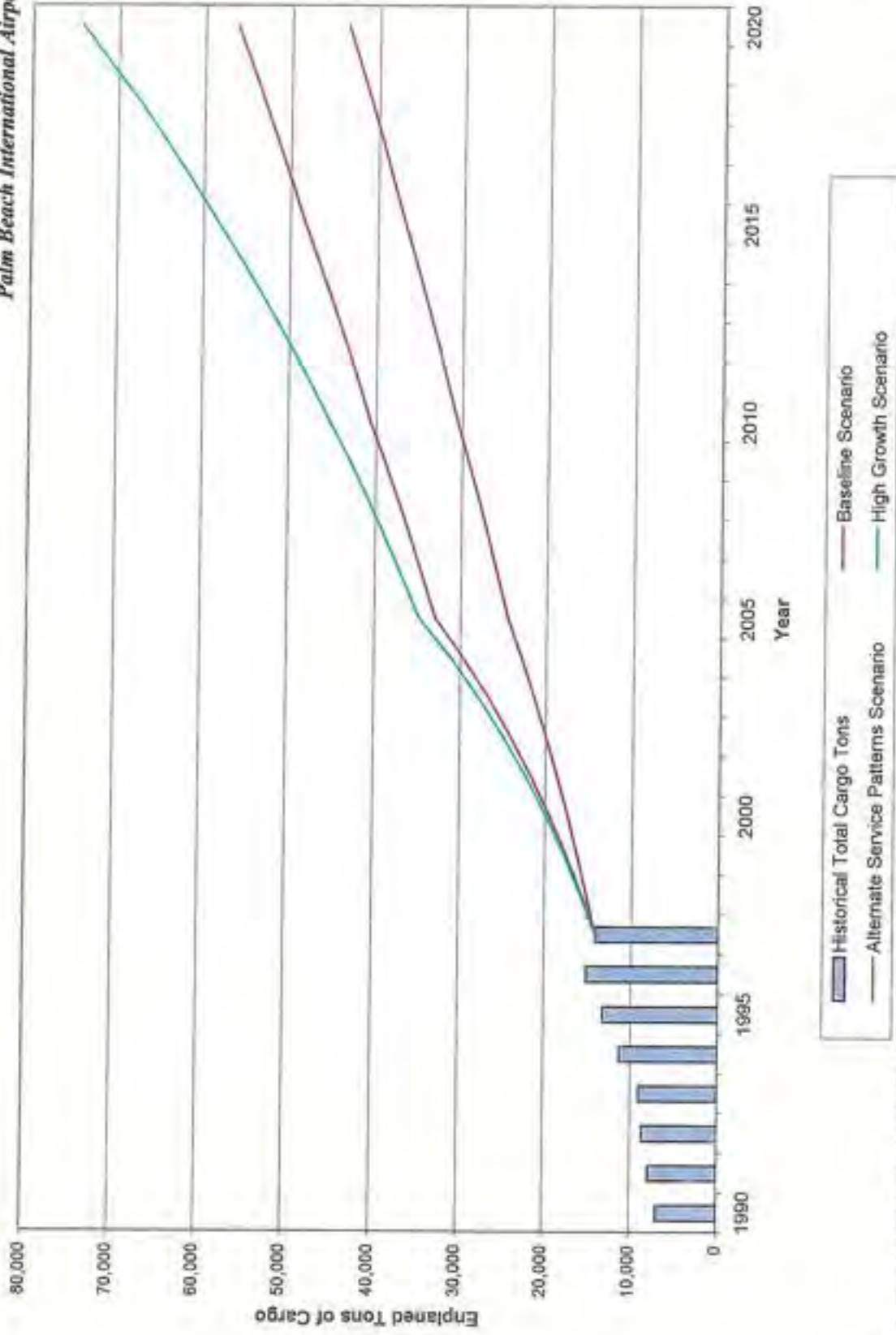
The boarding load factor (BLF) represents the number of passengers divided by the number of available aircraft seats. It can be used in conjunction with the aircraft seating capacities and enplanements to define aircraft operations. As shown in Table III-7.2, the BLF for air carriers has continually increased since 1990. The BLF for commuters experienced a decreasing trend from 1991 to 1995, but has since began to increase. Based on responses provided by some airlines through the Airline Planning Questionnaire, BLF for air carrier operations has been maintained between 62 and 67 percent for the planning horizon. The BLF for commuter operations has been maintained between 52 and 53 percent.

Table III-6.6

High Growth Demand Scenario - Trend Analysis of Enplaned Cargo Tonnage

Year	Total Enplaned Cargo Tons (excluding All-Cargo)	Total Commercial Operations	Enplaned Belly Cargo Tons Per Departure	Enplaned Belly Cargo		Trend Analysis		Total Enplaned Cargo Tons
				Enplaned Cargo Tons	Enplaned Mail Tons	Enplaned All-Cargo Tons	Enplaned Cargo Tons	
1979	2,740	49,257	0.1113			0		2,740
1980	3,688	50,982	0.1447			0		3,688
1981	3,686	50,369	0.1464			0		3,686
1982	3,294	55,397	0.1189			0		3,294
1983	3,267	73,153	0.0893			0		3,267
1984	2,805	80,999	0.0693			0		2,805
1985	3,157	68,829	0.0917			0		3,157
1986	3,887	71,321	0.1090			0		3,887
1987	4,390	75,844	0.1158			0		4,390
1988	4,630	80,862	0.1145			0		4,630
1989	6,977	78,908	0.1768			0		6,977
1990	6,933	91,771	0.1511			0		6,933
1991	7,917	77,225	0.2050			0		7,917
1992	8,646	72,396	0.2389			0		8,646
1993	9,068	73,031	0.2483			0		9,068
1994	10,098	75,532	0.2674			1,211		11,309
1995	10,256	76,373	0.2686			2,987		13,243
1996	10,889	78,642	0.2769			4,242		15,131
1997	10,968	74,098	0.2960			3,182		14,150
2005		149,300	0.3735	27,900	19,700	6,900		34,800
2010		165,500	0.4340	35,900	25,400	9,400		45,300
2015		183,600	0.4945	45,400	32,100	12,800		58,200
2020		204,200	0.5550	56,700	40,000	17,500		74,200

Sources: Airport Management Records; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998



Source: Airport Management Records; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998.

Exhibit III-6.1

Comparison of Alternate Demand Scenarios - Total Enplaned Cargo Tonnage

Table III-6.7

Comparison of Alternate Demand Scenarios - Enplaned Cargo Tonnage

ACTUAL		PROJECTED															
Enplaned Freight (Tons)		Enplaned Mail Tons		Total Enplaned Cargo Tons		Baseline Scenario				Alternate Service Patterns Scenario				High Growth Scenario			
Year	Belly Cargo	All-Cargo	Enplaned Freight (Tons)	Belly Cargo	All-Cargo	Enplaned Freight (Tons)	Belly Cargo	All-Cargo	Enplaned Freight (Tons)	Belly Cargo	All-Cargo	Enplaned Freight (Tons)	Belly Cargo	All-Cargo	Enplaned Freight (Tons)	Belly Cargo	All-Cargo
1997	2,516	3,182	8,452		14,150												
2005	18,600	5,800	13,100	24,400	24,400	27,100	27,100	5,800	19,100	32,900	27,900	6,900	19,700	34,800			
2010	23,500	7,000	16,600	30,500	30,500	33,600	33,600	7,000	23,700	40,600	35,900	9,400	25,400	45,300			
2015	28,700	8,100	20,300	36,800	36,800	40,200	40,200	8,100	28,400	48,300	45,400	12,800	32,100	58,200			
2020	34,300	9,200	24,200	43,500	43,500	47,000	47,000	9,200	33,200	56,200	56,700	17,500	40,000	74,200			

Sources: Airport Management Records

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.1
Historic Aircraft Operations

Year	Air Carrier and Commuter	Air Taxi	All Cargo	General Aviation	Military	Total Aircraft Operations
1979	49,257	1,271	n/a	220,076	1,070	271,674
1980	50,982	1,979	n/a	203,995	831	257,787
1981	50,369	1,285	n/a	187,491	1,026	240,171
1982	55,397	3,408	n/a	158,262	1,395	218,462
1983	73,153	7,837	n/a	146,372	1,195	228,557
1984	80,999	15,208	n/a	147,212	846	244,265
1985	68,829	14,080	n/a	140,431	994	224,334
1986	71,321	5,699	n/a	147,074	1,276	225,370
1987	75,844	4,522	n/a	148,836	1,831	231,033
1988	80,862	4,036	n/a	143,841	2,157	230,896
1989	78,908	4,442	n/a	149,349	2,089	234,788
1990	91,771	6,206	n/a	140,345	1,669	239,991
1991	77,225	6,044	n/a	132,024	1,721	217,014
1992	72,396	6,328	n/a	146,645	2,127	227,496
1993	73,031	5,807	n/a	153,075	1,648	233,561
1994	75,532	5,774	542	129,270	1,522	212,640
1995	76,373	7,694	1,463	114,617	1,632	201,779
1996	78,642	8,450	1,501	114,422	1,349	204,364
1997	74,098	8,562	1,745	116,480	1,200	202,085

n/a: not available

Source: Airport Management Records

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.2

Historic Average Seats Per Departure and Boarding Load Factors

Calendar Year	Total Enplanements			Total Commercial Departures		
	Air Carrier	Commuters	Total	Air Carrier	Commuters	Total
1990	2,719,810	136,947	2,856,757	35,132	10,754	45,886
1991	2,431,607	110,315	2,541,922	30,068	8,545	38,613
1992	2,420,355	114,623	2,534,978	27,817	8,382	36,198
1993	2,416,358	128,399	2,544,757	27,787	8,729	36,516
1994	2,666,174	135,441	2,801,615	28,710	9,056	37,766
1995	2,600,936	128,186	2,729,122	28,350	9,837	38,187
1996	2,694,292	157,722	2,852,014	27,175	12,147	39,321
1997	2,771,459	145,555	2,917,014	26,629	10,421	37,049

Calendar
Year

Calendar Year	Average Seats Per Departure		Total Departing Seats		Average Boarding Load Factor		
	Air Carrier	Commuters	Air Carrier	Commuters	Air Carrier	Commuters	Combined Avg.
1990	148.3	21.9	5,209,047	236,006	52.2%	58.0%	52.5%
1991	152.5	22.2	4,586,600	189,764	53.0%	58.1%	53.2%
1992	153.0	24.7	4,256,900	207,034	56.9%	55.4%	56.8%
1993	151.2	28.0	4,200,902	244,031	57.5%	52.6%	57.3%
1994	154.8	29.3	4,444,904	265,634	60.0%	51.0%	59.5%
1995	147.1	29.4	4,169,877	289,227	62.4%	44.3%	61.2%
1996	144.8	27.2	3,936,077	330,390	68.5%	47.7%	66.8%
1997	145.5	27.3	3,873,344	284,965	71.6%	51.1%	70.1%

Sources: Avg. Seats Per Departure: Official Airline Guide

Total Enplanements and Total Commercial Departures: Airport Management Records

Total Departing Seats and Average Boarding Load Factors: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Commercial operations at the Airport have increased from 49,257 in 1979 to 74,098 in 1997, which represents an average annual increase of 2.3 percent. These operations peaked in 1984 at 80,999. Approximately 24 percent of total commercial operations performed at PBIA between 1990 and 1995 were by commuter aircraft. In 1996 and 1997, commuter operations represented, on average, 29 percent of total aircraft operations. This increase is mostly attributed to increased operations by Gulfstream International Airlines and US Airways Express.

The following sections present assumptions regarding the future values of aircraft seating capacity and boarding load factors under each demand scenario and the resulting commercial operations for each service category.

3.7.1.1 Baseline Scenario - Commercial Aircraft Operations

The approach for projecting commercial aircraft operations, inclusive of both air carrier and commuter activity, involved two methodologies. Under the first method, ratios of total passenger enplanements to commercial departures were derived for the period beginning in 1990 and ending in 1997. The eight-year average of this ratio was kept constant for the short-term planning horizon (i.e., through the year 2005). This reflects the planned operational characteristics provided by some of the respondents of the Airline Planning Questionnaire for this near term period, during which no changes in enplanements per operation or fleet mix are anticipated. A trend analysis of this ratio was performed to derive ratios of passenger enplanements to commercial departures for the remainder of the planning horizon.

For the mid- and long-term planning horizon, the FAA estimates a growth in enplanements per operation averaging 1.3 percent per year at the national level.

The second method for projecting future commercial operations involved a market share analysis. Under this method, total commercial operations at the Airport between 1990 and 1997 were compared against total U.S. commercial operations at airports with Air Traffic Control Towers. The eight-year average of the ratio of PBIA commercial operations to total U.S. commercial operations was then kept constant for the planning horizon. The application of this ratio to the FAA's forecast of future U.S. commercial operations at Airports with Air Traffic Control Towers for Fiscal Years 1998-2009, extrapolated through the year 2020, resulted in a second set of baseline projections for total commercial operations at PBIA.

Table III-7.3 depicts the annual commercial operations projected under the Baseline Scenario using the two methodologies described above. Since the two methodologies result in a range of future activity that appears feasible, the average of these two sets of projections was derived and defined as the preferred Baseline Scenario.

As shown under the preferred Baseline Scenario, commercial passenger aircraft operations are expected to grow to 123,700 in the year 2020 from the 1997 level of 74,098, representing an annual average growth rate of approximately 2.3 percent.

Table III-7.3

Baseline Scenario - Commercial Aircraft Operations

Year	Historic			Commercial Operations - Baseline 1			Commercial Operations - Baseline 2			(Preferred)	
	Air Carrier and Commuter Operations	Enplanements		Trend Analysis Of Enplanements To Commercial Operations Ratio	Projected Total Commercial Aircraft Operations (incl. Commuters)	Total Aircraft Operations at Airports with ATCT Towers	PBI/A Comm Operations as a % of Total U.S. Operations	Projected Total Commercial Aircraft Operations (incl. Commuters)	Baseline Scenario Total Commercial Aircraft Operations (incl. Commuters)		
		Commercial	Total								
1990	91,771	2,856,757		31.13		217,000,000	0.0423%				
1991	77,225	2,541,922		32.92		214,000,000	0.0361%				
1992	72,396	2,534,978		35.02		217,423,000	0.0333%				
1993	73,031	2,544,757		34.84		222,571,000	0.0328%				
1994	75,532	2,801,615		37.09		231,634,000	0.0326%				
1995	76,373	2,729,122		35.73		234,135,000	0.0326%				
1996	78,642	2,852,014		36.27		230,830,000	0.0341%				
2005				36.39	106,300	268,940,000	0.0345%	92,800		99,600	
2010				38.99	113,300	298,642,379	0.0345%	103,000		108,200	
2015				41.77	119,100	327,562,221	0.0345%	113,000		116,100	
2020				44.62	124,400	356,482,064	0.0345%	123,000		123,700	

Sources:

Airport Management Records; Federal Aviation Administration; Ricordo & Associates, Inc.

Prepared by: Ricordo & Associates, Inc., December 1998

3.7.1.2 Alternate Service Patterns Scenario - Commercial Aircraft Operations

Alternate projections of commercial aircraft operations were derived using adjustment factors for both seasonality and new service. In adjusting the historical levels of commercial aircraft operations, the historical relationship between aircraft operations and passenger traffic was maintained. In other words, since the enplanement activity for the first four months of each year between 1990 and 1997 became the basis for the seasonality adjustment factors used to derive the alternate enplanement projections, the same four month period (i.e., January through April) was utilized to derive the alternate aircraft operations projections. While in most cases this four-month period represented the peak period for both passenger traffic and aircraft operations, peak international passenger traffic and aircraft operations have not always occurred during the same period.

The number of new flights added to serve deficient markets identified in the Air Service Demand Analysis considered the types of existing service (i.e., nonstop versus multi-stop or connecting) and the frequency of the existing service. For Deficiency 1 markets, two new daily nonstop departures and two new daily nonstop arrivals were added for markets with 130 or more passengers per day. For markets with less than 130 passengers per day, one new daily nonstop departure and one daily nonstop arrival were added. This results in a total of 44 new daily domestic operations. In addition, one new international arrival and one new international departure, for service to Montreal, were provided. For Deficiency 2 and 3 markets, no new flights were added, since it can be argued that they can be served with larger aircraft and/or by converting some multi-stop or connecting flights into nonstop flights.

Table III-7.4 summarizes factors used to prepare the alternate aircraft operations projections. As shown, the average adjustment of historical levels of aircraft operations yields an increase in activity by 33.9 percent.

Table III-7.5 depicts the annual commercial operations for the Alternate Service Patterns Demand Scenario resulting from the application of the adjustment factors described above and the derivation of adjusted ratios of total enplanements to commercial departures. Similar to the Baseline Scenario, the eight-year average of the adjusted ratios of passenger enplanements to commercial departures for the period between 1990 and 1997 was held constant for the short-term planning horizon (i.e., the year 2005). A trend analysis of this ratio was performed to derive ratios of passenger enplanements to commercial departures for the remainder of the planning horizon. The passenger enplanement projections derived under the Alternate Service Patterns Demand Scenario were paired with the new ratios of enplanements to aircraft departures, resulting in the alternate commercial aircraft operations projections shown in Table III-7.5. Under the Alternate Service Patterns Demand Scenario, commercial passenger aircraft operations are expected to grow to 169,200 in the year 2020 from the 1997 level of 74,098, thereby representing an annual average growth rate of approximately 3.7 percent.

3.7.1.3 High Growth Scenario - Commercial Aircraft Operations

Using the High Growth passenger enplanement projections and the methodology adopted for deriving the commercial aircraft operations under the Alternate Service Patterns Demand Scenario,

Table III-7.4

Adjustment Factors - Alternate Service Patterns Demand Scenario

Seasonality and New Service Adjustment:

Year	Historic	Total Air Carrier & Regional Operations				Difference From Historical
		Adjusted for Seasonality	New Nonstop Domestic Service	New Nonstop Int'l Service	Total Adjusted Air Carrier & Regional Operations	
1990	91,771	97,922	16,060	730	114,712	125.0%
1991	77,225	85,280	16,060	730	102,070	132.2%
1992	72,396	82,896	16,060	730	99,686	137.7%
1993	73,031	74,740	16,060	730	91,530	125.3%
1994	75,532	83,569	16,060	730	100,359	132.9%
1995	76,373	86,319	16,060	730	103,109	135.0%
1996	78,642	95,430	16,060	730	112,220	142.7%
1997	74,098	87,399	16,060	730	104,189	140.6%
Average Adjustment of Historical						133.9%

Sources: Air Service Demand Analysis; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.5

Alternate Service Patterns Demand Scenario - Commercial Aircraft Operations

Year	Historic Mgmt. Records Air Carrier And Commuter Operations	Seasonality Adjustment		Trend Analysis of Seasonally Adjusted Historical Enplanements To Commercial Operations	Projected Total Commercial Aircraft Operations (incl. Commuters)
		Adjusted Total Enplanements	Adjusted Air Carrier and Commuter Operations		
1990	91,771	4,393,005	114,712	38.30	
1991	77,225	4,107,168	102,070	40.24	
1992	72,396	3,873,618	99,686	38.86	
1993	73,031	3,770,004	91,530	41.19	
1994	75,532	4,133,103	100,359	41.18	
1995	76,373	4,218,414	103,109	40.91	
1996	78,642	4,395,789	112,220	39.17	
1997	74,098	4,311,545	104,189	41.38	
Projected:					
2005		5,876,000		40.45	145,300
2010		6,703,000		43.34	154,700
2015		7,539,000		46.43	162,400
2020		8,393,000		49.60	169,200

Sources: Airport Management Records; Federal Aviation Administration; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

future projections of aircraft operations assuming more aggressive growth patterns were developed. **Table III-7.6** depicts the annual commercial aircraft operations for the High Growth Scenario.

As shown in Table III-7.6, in the year 2020, commercial aircraft operations are expected to grow to 204,200 from the 1997 level of 74,098, thereby representing annual average growth of approximately 4.5 percent.

3.7.2 All-Cargo Aircraft Operations

All-cargo operations at the Airport have been performed by the United Parcel Service (UPS) since 1994. UPS accounts for all of the historical all-cargo aircraft activity at PBIA between 1994 and 1997. All of this activity has been accommodated on either Boeing 757 or DC8 aircraft. Future operations by all-cargo aircraft were defined based on the projected level of enplaned tons in all-cargo service and the average enplaned tons per aircraft departure (i.e., 4.46 tons per operation, derived using the historical data from 1995 through 1997).

It is assumed that this ratio of cargo tons per all-cargo departure will be maintained under the three demand scenarios during the planning horizon.

Table III-7.7 depicts the resulting level of all-cargo operations for the three demand scenarios. For all three scenarios, increases in all-cargo operations were projected using the ratio of enplaned all-cargo tonnage to all-cargo aircraft departure presented above. As shown, future projections of all-cargo aircraft operations for the year 2020 range from 4,100 aircraft operation under the Baseline and Alternate Service Pattern Scenarios, to 7,800 operations under the High Growth Scenario.

3.7.3 Air Taxi and General Aviation Aircraft Operations

General aviation activity includes operations by private pilots and businesses/corporations. Non-scheduled air taxi operations are primarily associated with for-hire charter services or other commercial use (aerial photography, traffic advisory services, etc.). Non-scheduled air taxi activity is defined here as the difference between the air taxi tower counts and scheduled cargo/passenger commuter activity reported to the Airport.

As shown in **Table III-7.8**, general aviation activity at PBIA has averaged 0.0384 percent of general aviation traffic on a national level since 1990. Several factors have limited, and may continue to impact, growth in general aviation activity on a national level and at PBIA. These factors include product liability, equipment and operating costs, airline deregulation, etc. The presence of other less congested general aviation facilities in or near Palm Beach County further contributes to these limited growth patterns. Nonetheless, given the large amount of corporate traffic that continues to operate at the Airport due to its close proximity to the central business district, moderate growth in general aviation activity, consistent with the national levels forecast by the FAA, is anticipated.

Table III-7.6

High Growth Demand Scenario - Commercial Aircraft Operations

Year	Historic	Seasonality Adjustment		Trend Analysis Of Seasonally Adjusted Historical Enplanements to Commercial Operations	Total Commercial Aircraft Operations (Incl. Commuters)
	Mgmt. Records Air Carrier And Commuter Operations	Adjusted Total Enplanements	Adjusted Air Carrier and Commuter Operations		
1990	91,771	4,393,005	114,712	38.30	
1991	77,225	4,107,168	102,070	40.24	
1992	72,396	3,873,618	99,686	38.86	
1993	73,031	3,770,004	91,530	41.19	
1994	75,532	4,133,103	100,359	41.18	
1995	76,373	4,218,414	103,109	40.91	
1996	78,642	4,395,789	112,220	39.17	
1997	74,098	4,311,545	104,189	41.38	
Projected:					
2005		6,038,000		40.45	149,300
2010		7,174,000		43.34	165,500
2015		8,524,000		46.43	183,600
2020		10,128,000		49.60	204,200

Sources: Airport Management Records; Federal Aviation Administration; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.7
All-Cargo Aircraft Operations

Year	Historical			
	All-Cargo Aircraft Departures	Total Enplaned All-Cargo Tons	All-Cargo Tons/Departure	
1994	271	1,211	4.47	
1995	732	2,987	4.08	
1996	751	4,242	5.65	
1997	873	3,182	3.65	

PROJECTED

	Baseline Scenario			Alternate Service Patterns Scenario			High Growth Scenario		
	Total Enplaned All-Cargo Tons	All-Cargo Tons Per Departure	Total All-Cargo Operations	Total Enplaned All-Cargo Tons	All-Cargo Tons Per Departure	Total All-Cargo Operations	Total Enplaned All-Cargo Tons	All-Cargo Tons Per Departure	Total All-Cargo Operations
2005	5,800	4.46	2,600	5,800	4.46	2,600	6,900	4.46	3,100
2010	7,000	4.46	3,100	7,000	4.46	3,100	9,400	4.46	4,200
2015	8,100	4.46	3,600	8,100	4.46	3,600	12,800	4.46	5,700
2020	9,200	4.46	4,100	9,200	4.46	4,100	17,500	4.46	7,800

Note: Totals may not add due to rounding.
Sources: Airport Management Records; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.8
Baseline Scenario - Air Taxi and General Aviation Aircraft Operations

Year	Historical		Total GA and Air Taxi Operations	Total GA Operations at Airports with ATCT Towers	PIA GA as a % of Total U.S. GA	Baseline Scenario GA Aircraft Operations	Baseline Scenario Air Taxi Aircraft Operations	Baseline Scenario Air Taxi & GA Aircraft Operations
	Air Taxi Operations	GA Operations						
1990	6,206	140,345	146,551	390,000,000	0.0360%			
1991	6,044	132,024	138,068	376,000,000	0.0351%			
1992	6,328	146,645	152,973	369,453,000	0.0397%			
1993	5,807	153,075	158,882	352,278,000	0.0435%			
1994	5,774	129,270	135,044	346,925,000	0.0373%			
1995	7,694	114,617	122,311	322,656,000	0.0355%			
1996	8,450	114,422	122,872	292,491,000	0.0391%			
1997	8,562	116,480	125,042	281,212,000	0.0414%			
2005				293,328,000	0.0384%	112,800	11,300	124,100
2010				307,681,000	0.0384%	118,300	13,300	131,600
2015				321,562,000	0.0384%	123,600	15,200	138,800
2020				334,842,000	0.0384%	128,700	17,100	145,800

Note: Totals may not add due to rounding.

Sources: Airport Management Records; FAA - Aviation Forecasts (FY 1998-2009); Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

The Baseline Scenario assumes that general aviation traffic at the Airport will also grow consistent with the FAA's projections through the year 2009, maintaining its current market share of U.S. general aviation traffic. The FAA forecast was extrapolated through the year 2020 in order to derive general aviation aircraft operation projections for the full planning horizon. Under this assumption, general aviation traffic under the Baseline Scenario in the year 2020 will grow to 128,700 annual operations, as shown in Table III-7.8. Tables III-7.9 and III-7.10 depict the composition of historical general aviation activity between itinerant and local traffic and the levels projected under the Baseline Scenario. For purposes of this breakdown, the average distribution experienced between 1994 and 1997 was utilized for deriving the future split in general aviation activity. The composition experienced since 1994 was used, since it is reflective of the current general aviation characteristics at the Airport given the relocation of a significant amount of GA activity to North Palm Beach County Airport.

Table III-7.9

Historic Composition of General Aviation Activity

Year	Itinerant as a % of Total	Local as a % of Total
1979	73.6%	26.4%
1980	78.6%	21.4%
1981	81.9%	18.1%
1982	82.9%	17.1%
1983	87.7%	12.3%
1984	88.3%	11.7%
1985	90.5%	9.5%
1986	86.4%	13.6%
1987	84.7%	15.3%
1988	84.8%	15.2%
1989	84.3%	15.7%
1990	85.0%	15.0%
1991	81.1%	18.9%
1992	78.0%	22.0%
1993	79.5%	20.5%
1994	74.5%	25.5%
1995	75.5%	24.5%
1996	83.1%	16.9%
1997	81.5%	18.5%
Average		
1977-1997	82.2%	17.8%
1994-1997	78.6%	21.4%

Source: 1998 FAA Terminal Area Forecasts

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.10 Baseline Scenario - Distribution of General Aviation Operations						
Calendar Year	Historical General Aviation Operations			Baseline Scenario Total Gen. Av. Ops	Baseline Scenario Itinerant Gen. Av. Ops	Baseline Scenario Local Gen. Av. Ops
	Itinerant as a % of Total	Local as a % of Total	Total General Aviation Ops.			
1997 (Actual)	81.5%	18.5%	116,480			
2005	78.6%	21.4%		112,800	88,700	24,100
2010	78.6%	21.4%		118,300	93,000	25,300
2015	78.6%	21.4%		123,600	97,200	26,400
2020	78.6%	21.4%		128,700	101,200	27,500

Sources: 1998 FAA Terminal Area Forecasts; Airport Management Records; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

A trend analysis of historical air taxi operations from 1990 to 1997 was performed to derive the baseline demand for future air taxi operations. These projections are also shown in Table III-7.8. The results of this trend analysis indicate an average annual growth rate of 3.4 percent between 1997 and the year 2010. Beyond the year 2010, air taxi operations are projected to grow at an average annual growth rate of 2.5 percent. Air taxi operations under the Baseline Scenario are projected to reach 17,100 in the year 2020.

For the Alternate Service Patterns Demand Scenario, air taxi activity is assumed to remain at the same levels as those projected under the baseline scenario, since changes in the commercial air service patterns will not necessarily affect air taxi. General aviation aircraft operations under this scenario are projected to grow consistent with the growth rate forecast by the FAA for total U.S. general aviation operations at airports with air traffic control towers. The same methodology used in the Baseline Scenario for deriving itinerant and local general aviation activity was employed in both alternate demand scenarios. The projections derived under the Alternate Service Patterns Demand Scenario and the associated general aviation traffic splits are shown in Tables III-7.11 and III-7.12. As presented, air taxi and general aviation operations are projected to grow to 17,100 and 139,900 in the year 2020, respectively.

Under the High Growth Scenario, air taxi aircraft operations are projected to grow at a more aggressive rate. This was achieved by applying the average growth rate for air taxi operations projected under the Baseline Scenario (i.e., 3.4 percent) to the full planning horizon. This assumes that the higher growth rate anticipated for the short-term planning horizon will also be sustained for the long-term future. Although this results in no change in the projected level of air taxi operations through the year 2010, it does provide a slightly higher level of air taxi activity by the year 2020. For the period 1998 through 2015, general aviation aircraft operations are projected to grow consistent with the average annual growth rate of 1.0 percent projected by the FAA in the TAFs for PBIA. The projections derived under the High Growth Demand Scenario and the associated general aviation composition are shown in Tables III-7.13 and III-7.14. As presented, air taxi and general aviation operations are projected to grow to 18,600 and 146,900, in the year 2020, respectively.

3.7.4 Military Operations

Operations by military aircraft have ranged from 831 to 2,157 annual operations over the last 18 years, averaging 1,451 annual operations for the period. The level of military operations at PBIA is related to the military activities and training practices at nearby bases as well as national and international events. It is assumed that military activity at the Airport will remain at an average level of 1,500 annual operations throughout the planning period.

3.7.5 Total Operations

Table III-7.15 and Exhibit III-7.1 depict the total aircraft operations anticipated under each of the three demand scenarios. For comparison purposes, the FAA-TAF for total aircraft operations at PBIA are also shown. As depicted, total operations in the year 2020 are expected to range between a low of 275,100 under the Baseline Scenario to a high of 379,000 under the High Growth Scenario, representing annual average growth rate of 1.6 percent and 3.8 percent, respectively. For comparison, total airport operations projected for the year 2020 under the Baseline Scenario is

Table III-7.11

Alternate Service Patterns Demand Scenario - Air Taxi and General Aviation Aircraft Operations

Year	Historical		Total GA and		Alternate Service Patterns Demand Scenario		
	Air Taxi Operations	General Aviation Operations	Air Taxi Operations	Air Taxi Operations	General Aviation Aircraft Operations	Aircraft Operations	Total GA and Air Taxi Operations
1990	6,206	140,345	146,551				
1991	6,044	132,024	138,068				
1992	6,328	146,645	152,973				
1993	5,807	153,075	158,882				
1994	5,774	129,270	135,044				
1995	7,694	114,617	122,311				
1996	8,450	114,422	122,872				
1997	8,562	116,480	125,042				
2005					121,500	11,300	132,800
2010					127,400	13,300	140,700
2015					133,500	15,200	148,700
2020					139,900	17,100	157,000

Sources: Airport Management Records; Federal Aviation Administration - Aviation Forecasts (FY 1998-2009)

Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.12

Alternate Service Patterns Demand Scenario - Distribution of General Aviation Operations

Calendar Year	Historical General Aviation Operations		Alternate Service Patterns Demand Scenario		Alternate Service Patterns Demand Scenario		Alternate Service Patterns Demand Scenario	
	liners as a % of Total	Local as a % of Total	Total General Aviation Operations	Total General Aviation Operations	liners as a % of Total	Total General Aviation Operations	liners as a % of Total	Total General Aviation Operations
1997 (Actual)	81.5%	18.5%	116,480					
2005	78.6%	21.4%		121,500		95,500		26,000
2010	78.6%	21.4%		127,400		100,200		27,200
2015	78.6%	21.4%		133,500		105,000		28,500
2020	78.6%	21.4%		139,900		110,000		29,900

Sources: 1998 FAA Terminal Area Forecasts; Airport Management Records; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.13

High Growth Demand Scenario - Air Taxi and General Aviation Aircraft Operations

Year	Historical			High Growth Demand Scenario		
	Air Taxi Operations	General Aviation Operations	Total GA and Air Taxi Operations	Air Taxi Operations	GA Operations	Total GA and Air Taxi Operations
1990	6,206	140,345	146,551			
1991	6,044	132,024	138,068			
1992	6,328	146,645	152,973			
1993	5,807	153,075	158,882			
1994	5,774	129,270	135,044			
1995	7,694	114,617	122,311			
1996	8,450	114,422	122,872			
1997	8,562	116,480	125,042			
2005				11,300	126,300	137,600
2010				13,300	132,800	146,100
2015				15,700	139,700	155,400
2020				18,600	146,900	165,500

Sources: Airport Management Records; 1998 FAA Terminal Area Forecasts; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.14

High Growth Demand Scenario - Distribution of General Aviation Operations

Calendar Year	Historic General Aviation Operations		High Growth Demand Scenario Total General Aviation Operations		High Growth Demand Scenario Itinerant General Aviation Operations		High Growth Demand Scenario Local General Aviation Operations	
	Itinerant as a % of Total	Local as a % of Total	Total General Aviation Operations		Aviation Operations		Aviation Operations	
1997 (Actual)	81.5%	18.5%	116,480					
2005	78.6%	21.4%	126,300		99,300		27,000	
2010	78.6%	21.4%	132,800		104,400		28,400	
2015	78.6%	21.4%	139,700		109,900		29,800	
2020	78.6%	21.4%	146,900		115,500		31,400	

Sources: 1998 FAA Terminal Area Forecasts; Airport Management Records; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-7.15

Comparisons of Total Aircraft Operations Projections

Year	Actual	Demand Scenarios			1998 FAA-TAF ¹
		Baseline	Alt. Service Patterns	High Growth	
1997	202,085				
2005		227,800	282,200	291,500	226,175
2010		244,400	300,000	317,300	239,436
2015		260,000	316,200	346,200	251,471
2020		275,100	331,800	379,000	n/a

Note: ¹ The FAA Terminal Area Forecasts shown above represent fiscal year activity projected for each given year.
The projections for each of the Demand Scenarios and the 1997 actual activity data reflect calendar year activity.

Sources: 1998 FAA Terminal Area Forecasts; Airport Management Records; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Palm Beach International Airport



Source: Airport Management Records; Federal Aviation Administration; Ricordo & Associates, Inc.
 Prepared by: Ricordo & Associates, Inc., December 1998.

Exhibit III-7.1

**Comparison of Alternate Demand Scenarios -
Total Aircraft Operations**

similar to the level of activity experienced at the Airport in 1979. Compared to the FAA's forecast, the Baseline Scenario yields projections of future activity that closely resemble those forecast by the FAA for PBIA.

3.8 Fleet Mix

The operational fleet mix under each demand scenario was defined based on the historical trends exhibited at the Airport, assumptions regarding the type and frequency of activity expected under each of the alternative scenarios, and the seats per departure ratios defined previously for commercial service.

3.8.1 Commercial Fleet Mix

Table III-8.1 summarizes the aircraft fleet mix for commercial activity at the Airport for the past five years. As shown, medium narrow body aircraft (i.e., aircraft averaging between 131 and 160 seats), such as the MD80 and the B727-200, have dominated the air carrier operational fleet at the Airport. Historically, over one third of the total scheduled commercial operations at PBIA have been performed by this category of aircraft. This category of aircraft accounts for over 55 percent of all scheduled jet activity at the Airport.

Commuter aircraft have represented approximately 30 percent of the Airport's scheduled commercial operations between 1994 and 1998. These operations have been conducted primarily with medium size commuter aircraft, ranging between 15 and 40 seats, such as the Beechcraft 1900 and the Saab Fairchild 340.

Also shown in Table III-8.1 is the average seats per aircraft for scheduled air carrier and commuter departures between 1994 and 1998. For the air carrier fleet, the average number of seats per departure decreased from 1994 to 1996, from 155 to 144 seats. Thereafter, the average number of seats per departure increased to 145 seats in 1997 and 148 seats in 1998. Commuter seats per departure, however, have decreased continually since 1994, from 29 seats to 26 seats in 1998.

Table III-8.2 presents the overall commercial fleet mix for the demand scenarios consistent with the anticipated growth in seats per departure. In the Baseline Scenario, the medium narrow body aircraft continues to dominate the fleet. While the percent of the fleet accounted for by this category of aircraft will decline in the latter years of the planning horizon, the overall number of operations is expected to experience continuous growth. Significant growth is anticipated in the large narrow body (e.g., the B757 and Airbus A320 aircraft) and wide body aircraft (i.e., B767 series and equivalent aircraft). This is based on the present and planned fleet operated by air carriers serving the Airport and the air service patterns and stage length characteristic of the service offered by these carriers. Under the Alternate Service Patterns Demand Scenario and the High Growth Demand Scenario, a similar trend is projected. However, given the addition of new service to the west coast and the New England markets (i.e., larger stage lengths) and the seasonal operating characteristics of the airlines at the Airport that also consist of a larger fleet, a different composition for the future fleet results. Specifically, the dominant fleet shown in the latter years of the planning horizon under the alternate demand scenarios is shown to be the large narrow body and wide body aircraft.

It is assumed that unscheduled commercial operations will possess the same fleet characteristics as the scheduled activity under each of the demand scenarios.

Table III-8.1

Historical Commercial Fleet Mix

Air Carrier Fleet Mix

Category	Typical Aircraft	1994		1995		1996		1997		1998	
		Departures	% of Total	Departures	% of Total	Departures	% of Total	Departures	% of Total	Departures	% of Total
110 seats & less	F100, B737-500, B717	2,502	6.4%	3,361	8.5%	3,328	8.1%	3,815	9.9%	3,149	8.3%
111-130 seats	B737-300, A319	2,997	7.7%	3,799	9.6%	3,297	8.0%	3,187	8.3%	3,431	9.0%
131-160 seats	M80, B737-800, A320	16,530	42.6%	16,145	40.9%	17,242	41.9%	15,036	39.0%	13,577	35.8%
161+ seats	B757, B767, A300	5,899	15.2%	4,110	10.4%	2,984	7.2%	3,869	10.0%	4,602	12.1%
Average Aircraft Seats - Air Carrier Fleet		155.1		147.3		144.1		145.2		147.9	

Commuter Fleet Mix

4-14 seats	Cessna (all series)	83	0.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-19 seats	Beechcraft 1900	4,413	11.4%	5,222	13.2%	7,984	19.4%	6,741	17.5%	7,444	19.6%
20-40 seats	EMB 120, SAAB 340	5,598	14.4%	5,733	14.5%	5,289	12.8%	5,168	13.4%	5,348	14.1%
41-60 seats	Dash 7, CRJ	818	2.1%	1,124	2.8%	1,038	2.5%	772	2.0%	395	1.0%
61-80 seats	ATR 72	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
TOTALS		38,840	100.0%	39,494	100.0%	41,162	100.0%	38,588	100.0%	37,946	100.0%
Average Aircraft Seats - Commuter Fleet		29.3		29.4		27.2		27.3		26.2	

Sources: Official Airline Guide

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-8.2

Projected Commercial Fleet Mix

Air Carrier Fleet Mix			1997			2005			2010			2015			2020		
			Existing	Typical Aircraft	% of Total	Baseline	Alt.	High	Baseline	Service	Growth	Baseline	Service	Growth	Baseline	Service	Growth
Category																	
110 seats & less			F100, B737-500, B717	8.3%	11.5%	11.4%	10.6%	10.0%	8.0%	7.6%	7.1%	5.0%	5.0%	5.2%	4.0%	3.5%	
111-130 seats			B737-300, A319	9.0%	7.0%	7.0%	5.5%	5.5%	3.1%	3.0%	4.0%	2.5%	2.5%	1.5%	1.0%	1.0%	
131-160 seats			M80, B737-800, A320	35.8%	38.5%	43.1%	43.8%	40.0%	41.2%	42.8%	41.1%	40.2%	37.8%	39.8%	36.5%	31.9%	
161-185 seats			B757	6.4%	9.0%	10.0%	10.0%	11.6%	15.0%	14.0%	15.0%	16.5%	16.5%	18.5%	19.0%	19.9%	
186-309 seats			B767, A300	5.7%	7.5%	8.0%	9.0%	8.4%	13.5%	12.0%	9.8%	17.4%	17.4%	13.0%	21.5%	22.0%	
310+ seats			B747, A330, B777	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Average Aircraft Seats - Air Carrier Fleet				147.9	149.2	149.8	152.4	152.8	158.7	158.4	158.0	163.5	164.4	163.9	169.5	171.4	
Commuter Fleet Mix																	
4-14 seats			Cessna (all series)	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
15-19 seats			Beechcraft 1900	19.6%	14.0%	11.5%	11.5%	10.5%	9.7%	10.3%	7.5%	7.5%	8.1%	5.0%	7.2%	7.2%	
20-40 seats			EMB 120, SAAB 340	14.1%	11.0%	8.0%	8.6%	12.0%	8.0%	8.8%	13.0%	8.5%	10.2%	14.5%	8.1%	11.5%	
41-60 seats			Dash 7, CRJ	1.0%	1.5%	1.0%	1.0%	1.5%	1.0%	1.0%	1.5%	1.4%	1.5%	1.5%	1.5%	2.0%	
61-80 seats			ATR 72	0.0%	0.0%	0.0%	0.0%	0.5%	0.5%	0.5%	1.0%	1.0%	1.0%	1.0%	1.2%	1.0%	
Average Aircraft Seats - Commuter Fleet				26.2	28.2	27.5	27.8	30.8	29.5	29.5	33.5	32.6	32.6	35.4	33.2	33.8	

Sources: Existing: Official Airline Guide; Future: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

3.8.2 All-Cargo Fleet Mix

Currently, the all-cargo fleet mix is split almost evenly between the B-757 and DC-8 aircraft. Table III-8.3 depicts the all-cargo fleet mix experienced at the Airport in 1997 and that projected under the three demand scenarios during the planning horizon. As shown, the Baseline and Alternate Service Patterns Demand Scenarios maintain a fleet mix trend that is consistent with the one experienced at the Airport since UPS began operating its own aircraft in 1994, characterized primarily by the DC-8 and B-757 aircraft, but considers the replacement of DC-8 aircraft by B767 aircraft in the long-term horizon. The High Growth Demand Scenario assumes that other freight and express carriers, such as Federal Express, DHL, Emery, and Airborne Express, will begin service at the Airport within the short-term planning horizon. Thus, the future fleet mix under these scenarios accounts for varying aircraft types consistent with the fleet operated by these other carriers.

3.8.3 General Aviation/Air Taxi Fleet Mix

General aviation/air taxi activity at the Airport is currently composed of 55 percent piston-engined aircraft, nine percent turboprop aircraft, and 36 percent jet aircraft. It is anticipated on a national level that the general aviation fleet will trend slowly towards higher percentages of jet/turboprop activity. This trend has already been observed at the Airport since 1994, due in great part to the opening of North Palm Beach County General Aviation Airport and the DOA's marketing campaign aimed at enticing private pilots to use this new airport. Considering these factors and the growing amount of corporate traffic utilizing PBIA, the future the general aviation fleet mix, shown in Table III-8.4, is expected to become increasingly more characterized by large turboprop and jet aircraft. This fleet mix projection is constant throughout the three demand scenarios.

3.8.4 Military Fleet Mix

The limited military activity at the Airport presents a varied fleet over the course of the year and includes an almost equal amount of helicopter and aircraft operations. While almost any type of military trainer or transport aircraft may utilize the Airport over the course of the year, for the purpose of the demand analysis, the military fleet mix is assumed to be exclusively small jet/turboprop activity, consistent with the primary types of military aircraft experienced at PBIA and shown in the C.A.T.E.R. data for the period beginning on October 1997 and ending in September 1998.

3.9 Peaking Characteristics

Fluctuations in passenger demands over the course of a day and year necessitate the calculation of peak period demand for facility planning purposes. Typically, the average day of the peak month (PMAD) is used as the design day for planning purposes. This factor, while not the busiest day of the year, provides for facility design capable of accommodating most busy periods with minimal delay but avoids over-designing the facilities.

Estimates of the PMAD activity levels were developed for each demand scenario based on the historical relationship between the peak month average day and annual activity. Ultimately, design day schedules of hourly activity are utilized to define PMAD peak hour activity levels in the determination of facility requirements. The following sections describe the PMAD activity under each scenario.

Table III-8.3

Projected All-Cargo Fleet Mix

Aircraft Type	1997 (Existing)		2005			2010			2015			2020		
	Total	% of Total	Baseline	Alt.	High	Baseline	Alt.	High	Baseline	Alt.	High	Baseline	Alt.	High
B727	0	0.0%	0.0%	0.0%	15.0%	0.0%	0.0%	15.0%	0.0%	0.0%	15.0%	0.0%	0.0%	20.0%
B757	1,080	61.9%	60.0%	60.0%	30.0%	60.0%	60.0%	30.0%	70.0%	70.0%	35.0%	70.0%	70.0%	35.0%
B767	0	0.0%	0.0%	0.0%	0.0%	5.0%	5.0%	20.0%	10.0%	10.0%	25.0%	30.0%	30.0%	30.0%
B747	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DC-8	665	38.1%	40.0%	40.0%	55.0%	35.0%	35.0%	35.0%	20.0%	20.0%	25.0%	0.0%	0.0%	5.0%
DC-9	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
DC-10	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.0%
A300	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
A310	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MD11	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL	1,745	100.0%	100.0%	#####	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Sources:

Existing: Airport Management Records; Future: Ricondo & Associates, Inc.

Prepared by:

Ricondo & Associates, Inc., December 1998

Table III-8.4

Projected General Aviation Fleet Mix

Category ¹	Representative Aircraft	1998 Existing % of Total	2005 % of Total	2010 % of Total	2015 % of Total	2020 % of Total
Jet Aircraft						
Small	Citation 1-SP	1.23%	1.5%	1.5%	2.0%	2.0%
Small-Plus	Citation 5, Learjet 35	24.64%	30.5%	30.5%	32.0%	34.0%
Large	Gulfstream 3, 610 Challenger	9.54%	10.0%	11.0%	12.0%	13.0%
Heavy	B727, B737, B757, B767, L1011	0.33%	0.4%	0.4%	0.4%	0.4%
Turbo-Prop Aircraft						
Small	Beech King Air	5.08%	9.5%	12.0%	14.0%	15.0%
Small-Plus	Beech 1900, Super King Air	3.71%	5.0%	6.5%	7.5%	8.5%
Large	Convair 540/580	0.20%	0.0%	0.0%	0.0%	0.0%
Piston-Prop Aircraft						
Small	Cessna 310, Aztec	54.61%	43.1%	38.1%	32.1%	27.1%
Small-Plus	DC3	0.60%	0.0%	0.0%	0.0%	0.0%
Large	Convair 240	0.06%	0.0%	0.0%	0.0%	0.0%
TOTAL		100.0%	100.0%	100.0%	100.0%	100.0%

Notes:

¹ Aircraft Categories as defined by the FAA:

Small aircraft includes all aircraft with a gross takeoff weight less than 12,500 lbs.

Small Plus aircraft includes all aircraft with a gross takeoff weight greater than 12,500 lbs and less than 41,000 lbs.

Large aircraft includes all aircraft with a gross takeoff weight greater than 41,000 lbs and less than 255,000 lbs. (excluding commercial aircraft)

Heavy aircraft includes all aircraft with a maximum gross takeoff exceeding 255,000 lbs. (including commercial aircraft)

Sources:

Existing: C.A.T.E.R Data for PBIA for the period 10/97 through 9/98; Future: Ricondo & Associates, Inc.

Prepared by:

Ricondo & Associates, Inc., December 1998

3.9.1 PMAD Commercial Enplanements

Table III-9.1 presents monthly commercial enplanements for the period January 1992 through December 1997. As shown, March represents the busiest month in terms of passenger enplanements. Individual peak month activity has ranged from 11.2 percent to 12.4 percent of annual enplanements. Based on the average percent of activity accounted for by each peak month, peak month traffic accounts for an average 11.9 percent of total annual enplanements. If historical activity is adjusted for seasonality, whereby the first four months of each year are treated as re-occurring cycles, then the peak month activity as a percent of total annual activity decreases to an average of 9.4 percent, as shown in Table III-9.2.

Table III-9.3 presents the resulting PMAD enplanements for commercial activity derived by applying the average PMAD ratio shown in Table III-9.1 (11.9 percent) to the Baseline Scenario and the average PMAD ratio shown in Table III-9.2 (9.4 percent) to the other demand scenarios. While characteristics of the various demand scenarios could influence the enplanement peaking level, the peaking factor represented by the methodology selected is a reasonable estimate under any alternative. The resulting projections of PMAD activity for the year 2020 range from 21,200 enplanements under the Baseline Scenario to 30,600 under the High Growth Scenario.

3.9.2 PMAD Commercial Operations

Table III-9.4 presents monthly commercial aircraft operations for the period January 1992 through December 1997. Individual peak months have accounted for 9.7 percent to 11.0 percent of the annual commercial aircraft operations. As shown, commercial aircraft operations usually depict the same peaking pattern historically depicted in the monthly enplanement statistics, with the exception of 1993. Peak month operation levels remain relatively constant, while fluctuations in enplanements are typically absorbed by excess seating capacity (i.e., increased Load Factors, or increased equipment size). Based on the average percent of activity accounted for by each peak month, peak month operations account for an average 10.3 percent of annual commercial operations. If historical activity is adjusted for seasonality, whereby the first four months of each year are treated as re-occurring cycles, then the peak month activity as a percent of total annual activity decreases to an average of 9.0 percent, as shown in Table III-9.5.

Table III-9.6 presents the resulting PMAD operations for commercial passenger activity derived by applying the "true historical" and "adjusted historical" PMAD ratios to the alternative demand scenarios, as appropriate. By the year 2020, PMAD commercial operations are projected to range from 410 operations under the Baseline Scenario to 590 operations under the High Growth Scenario.

3.9.3 PMAD Total Operations

PMAD operations for all-cargo service are predicated on the ratio of peak month activity to total annual activity experienced in 1997. As shown in Tables III-9.7 and III-9.8, a review of monthly general aviation and military operations for the last six years suggests peak month factors of 10.3 percent and 14.5 percent, respectively. Tables III-9.9 through III-9.12 present the PMAD operations projected under each alternative demand scenario for all activity categories.

Table III-9.1

Historic Monthly Commercial Enplanements

Month	1992		1993		1994		1995		1996		1997		Average Distr.
	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	
January	259,818	10.2%	239,293	9.4%	262,848	9.4%	284,450	10.4%	270,440	9.5%	262,294	9.0%	9.7%
February	262,671	10.4%	242,776	9.5%	262,258	9.4%	278,323	10.2%	297,035	10.4%	280,708	9.6%	9.9%
March	299,585	11.3%	285,861	10.6%	330,276	11.8%	322,831	11.3%	353,166	12.4%	353,747	12.4%	11.5%
April	249,037	9.8%	268,643	10.6%	302,224	10.8%	300,439	11.0%	324,527	11.4%	321,594	11.0%	10.8%
May	192,614	7.6%	197,873	7.8%	241,177	8.6%	214,992	7.9%	235,528	8.3%	233,766	8.0%	8.0%
June	183,828	7.3%	174,065	6.8%	189,575	6.8%	183,032	6.7%	198,250	7.0%	206,122	7.1%	6.9%
July	193,087	7.6%	175,489	6.9%	187,450	6.7%	177,489	6.5%	196,472	6.9%	210,829	7.2%	7.0%
August	184,554	7.3%	175,462	6.9%	191,664	6.8%	174,197	6.4%	197,958	6.9%	209,993	7.2%	6.9%
September	152,219	6.0%	155,090	6.1%	165,008	5.9%	151,728	5.6%	153,236	5.4%	164,322	5.6%	5.8%
October	152,579	6.0%	174,326	6.9%	186,136	6.6%	179,702	6.6%	176,233	6.2%	190,152	6.5%	6.5%
November	198,606	7.8%	225,922	8.9%	240,086	8.6%	224,715	8.2%	207,374	7.3%	230,582	7.9%	8.1%
December	206,380	8.1%	229,957	9.0%	242,913	8.7%	237,224	8.7%	241,795	8.5%	252,905	8.7%	8.6%
Total	2,534,978	100.0%	2,544,757	100.0%	2,801,615	100.0%	2,729,122	100.0%	2,852,014	100.0%	2,917,014	100.0%	100.0%

Source: Airport Management Records

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.2

Historic Monthly Commercial Enplanements Adjusted for Seasonality

Month	1992		1993		1994		1995		1996		1997		Average Distr.
	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	Enpls	% of Total	
January	259,818	8.1%	239,293	7.7%	262,848	7.6%	284,450	8.0%	270,440	7.2%	262,294	7.2%	7.6%
February	262,671	8.2%	242,776	7.8%	262,258	7.6%	278,323	7.8%	297,035	8.0%	280,708	7.7%	7.8%
March	299,585	9.3%	285,861	9.2%	330,276	9.5%	322,831	9.1%	353,166	9.5%	353,747	9.7%	9.4%
April	249,037	7.8%	268,643	8.6%	302,224	8.7%	300,439	8.4%	324,527	8.7%	321,594	8.8%	8.5%
May	259,818	8.1%	239,293	7.7%	262,848	7.6%	284,450	8.0%	270,440	7.2%	262,294	7.2%	7.6%
June	262,671	8.2%	242,776	7.8%	262,258	7.6%	278,323	7.8%	297,035	8.0%	280,708	7.7%	7.8%
July	299,585	9.3%	285,861	9.2%	330,276	9.5%	322,831	9.1%	353,166	9.5%	353,747	9.7%	9.4%
August	249,037	7.8%	268,643	8.6%	302,224	8.7%	300,439	8.4%	324,527	8.7%	321,594	8.8%	8.5%
September	259,818	8.1%	239,293	7.7%	262,848	7.6%	284,450	8.0%	270,440	7.2%	262,294	7.2%	7.6%
October	262,671	8.2%	242,776	7.8%	262,258	7.6%	278,323	7.8%	297,035	8.0%	280,708	7.7%	7.8%
November	299,585	9.3%	285,861	9.2%	330,276	9.5%	322,831	9.1%	353,166	9.5%	353,747	9.7%	9.4%
December	249,037	7.8%	268,643	8.6%	302,224	8.7%	300,439	8.4%	324,527	8.7%	321,594	8.8%	8.5%
Total	3,213,333	100.0%	3,109,719	100.0%	3,472,818	100.0%	3,558,129	100.0%	3,735,504	100.0%	3,655,029	100.0%	100.0%

Source: Airport Management Records; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.3

PMAD Commercial Enplanements

Demand Scenario/Year	Commercial Enplanements		
	Annual	Peak Month	PMAD ¹
Existing (1997)	2,917,014	353,747	11,411
Baseline			
2005	3,865,000	458,500	14,800
2010	4,416,000	523,900	16,900
2015	4,975,000	590,200	19,000
2020	5,552,000	658,600	21,200
Alternate Service Patterns			
2005	5,876,000	550,700	17,800
2010	6,703,000	628,200	20,300
2015	7,539,000	706,600	22,800
2020	8,393,000	786,600	25,400
High Growth			
2005	6,038,000	565,900	18,300
2010	7,174,000	672,300	21,700
2015	8,524,000	798,900	25,800
2020	10,128,000	949,200	30,600

¹ Peak Month Average Day

Note: Totals may not add due to rounding.

Sources: 1997, Airport Management Records; Demand Scenarios, Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.4

Historic Monthly Commercial Operations (Scheduled Activity only)

Month	1992	1993	1994	1995	1996	1997	Average
	Operations % of Total	Operations % of Total	Operations % of Total	Operations % of Total	Operations % of Total	Operations % of Total	Distribution
January	6,576	6,003	6,925	7,003	7,507	6,887	9.1%
February	6,686	5,825	6,564	6,711	7,756	6,924	9.0%
March	7,474	6,658	7,478	7,606	8,678	7,931	10.2%
April	6,896	6,558	6,932	7,453	7,869	7,391	9.6%
May	5,994	5,991	6,416	6,222	6,834	5,744	8.3%
June	5,469	5,720	5,628	5,664	5,992	5,400	7.5%
July	5,522	5,718	5,566	5,576	5,884	5,596	7.5%
August	5,312	5,818	5,480	5,478	5,481	5,570	7.4%
September	5,272	5,476	5,210	5,335	5,311	5,194	7.1%
October	5,488	5,945	5,794	5,833	5,038	5,466	7.5%
November	5,743	6,256	6,454	6,266	5,740	5,639	8.0%
December	5,964	7,063	7,085	7,226	6,552	6,356	8.9%
Total	72,396	73,031	75,532	76,373	78,642	74,098	100.0%
Average distribution for Peak Month (1992-1997):	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Airport Management Records

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.5
Historic Monthly Commercial Operations Adjusted for Seasonality (Scheduled Activity only)

Month	1992	1993	1994	1995	1996	1997	Average
	Operations% of Total	Operations% of Total	Operations% of Total	Operations% of Total	Operations% of Total	Operations% of Total	Distribution
January	6,576 7.9%	6,003 8.0%	6,925 8.3%	7,003 8.1%	7,507 7.9%	6,887 7.9%	8.0%
February	6,686 8.1%	5,825 7.8%	6,564 7.8%	6,711 7.8%	7,756 8.1%	6,924 7.9%	7.9%
March	7,474 9.0%	6,658 8.3%	7,478 8.9%	7,606 8.5%	8,678 9.1%	7,931 9.1%	9.0%
April	6,896 8.3%	6,558 8.7%	6,932 8.3%	7,453 8.6%	7,869 8.2%	7,391 8.5%	8.4%
May	6,576 7.9%	6,003 8.0%	6,925 8.3%	7,003 8.1%	7,507 7.9%	6,887 7.9%	8.0%
June	6,686 8.1%	5,825 7.8%	6,564 7.8%	6,711 7.8%	7,756 8.1%	6,924 7.9%	7.9%
July	7,474 9.0%	6,658 8.3%	7,478 8.9%	7,606 8.5%	8,678 9.1%	7,931 9.1%	9.0%
August	6,896 8.3%	6,558 8.7%	6,932 8.3%	7,453 8.6%	7,869 8.2%	7,391 8.5%	8.4%
September	6,576 7.9%	6,003 8.0%	6,925 8.3%	7,003 8.1%	7,507 7.9%	6,887 7.9%	8.0%
October	6,686 8.1%	5,825 7.8%	6,564 7.8%	6,711 7.8%	7,756 8.1%	6,924 7.9%	7.9%
November	7,474 9.0%	6,658 8.3%	7,478 8.9%	7,606 8.5%	8,678 9.1%	7,931 9.1%	9.0%
December	6,896 8.3%	6,558 8.7%	6,932 8.3%	7,453 8.6%	7,869 8.2%	7,391 8.5%	8.4%
Total	82,896 100.0%	75,132 100.0%	83,697 100.0%	86,319 100.0%	95,430 100.0%	87,399 100.0%	100.0%
Average distribution for Peak Month (1992-1997):							9.0%

Source: Airport Management Records; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.6

PMAD Commercial Operations - Year 2020

Demand Scenario	Commercial Operations		
	Annual	Peak Month	PMAD ¹
Existing (1997)	74,098	7,931	256
Baseline			
2005	99,600	10,200	330
2010	108,200	11,100	360
2015	116,100	11,900	380
2020	123,700	12,700	410
Alternate Service Patterns			
2005	145,300	13,000	420
2010	154,700	13,900	450
2015	162,400	14,600	470
2020	169,200	15,200	490
High Growth			
2005	149,300	13,400	430
2010	165,500	14,800	480
2015	183,600	16,500	530
2020	204,200	18,300	590

¹ Peak Month Average Day

Note: Totals may not add due to rounding.

Sources: 1997, Airport Management Records; Demand Scenarios, Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.7

Historic Monthly General Aviation Operations

Month	1992		1993		1994		1995		1996		1997		Average Distr.
	Ops	% of Total	Ops	% of Total	Ops	% of Total	Ops	% of Total	Ops	% of Total	Ops	% of Total	
January	12,714	8.7%	13,454	8.8%	11,440	8.8%	11,331	9.9%	10,172	8.9%	11,679	10.0%	9.2%
February	12,882	8.8%	12,743	8.3%	12,494	9.7%	12,436	10.9%	11,457	10.0%	11,342	9.7%	9.6%
March	13,385	9.1%	14,500	9.5%	13,882	10.7%	12,597	11.3%	11,064	9.7%	12,141	10.4%	10.1%
April	12,326	8.4%	15,688	10.2%	12,996	10.1%	11,186	9.8%	11,717	10.2%	10,096	8.7%	9.6%
May	13,255	9.0%	13,937	9.1%	11,160	8.6%	10,424	9.1%	9,779	8.5%	10,095	8.7%	8.8%
June	11,932	8.1%	11,486	7.5%	9,297	7.2%	8,250	7.2%	8,623	7.5%	8,556	7.3%	7.5%
July	13,202	9.0%	12,225	8.0%	9,605	7.4%	8,857	7.7%	8,595	7.5%	8,515	7.3%	7.8%
August	11,693	8.0%	13,275	8.7%	9,920	7.7%	6,766	5.9%	8,584	7.5%	8,714	7.5%	7.5%
September	10,920	7.4%	10,879	7.1%	8,277	6.4%	6,811	5.9%	7,250	6.3%	7,656	6.6%	6.6%
October	11,119	7.6%	10,680	7.0%	10,248	7.9%	7,497	6.5%	7,947	6.9%	8,808	7.6%	7.3%
November	10,700	7.3%	12,237	8.0%	10,024	7.8%	9,245	8.1%	9,008	7.9%	9,572	8.2%	7.9%
December	12,517	8.5%	11,971	7.8%	9,927	7.7%	9,217	8.0%	10,226	8.9%	9,306	8.0%	8.2%
Total	146,645	100.0%	153,075	100.0%	129,270	100.0%	114,617	100.0%	114,422	100.0%	116,480	100.0%	100.0%
Average distribution for Peak Month (1992-1997):													
					10.3%								

Note: July 1997 value was obtained from the FAA Tower Data contained in the Monthly Traffic Statistics Report. Information on aircraft operations for this period was not available from the Airport Management Records.

Source: Airport Management Records

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.8

Historic Monthly Military Operations

Month	1992		1993		1994		1995		1996		1997		Average Distr.
	Ops	% of Total	Ops	% of Total	Ops	% of Total	Ops	% of Total	Ops	% of Total	Ops	% of Total	
January	157	7.4%	124	7.5%	138	9.1%	208	10.4%	141	10.5%	184	10.5%	10.3%
February	171	8.0%	186	11.3%	179	11.3%	169	10.4%	122	9.0%	108	9.0%	9.9%
March	241	11.3%	190	11.5%	142	9.3%	185	11.3%	101	7.5%	126	10.5%	10.3%
April	114	5.4%	136	8.3%	100	6.6%	107	6.6%	221	16.4%	55	4.6%	8.0%
May	200	9.4%	204	12.4%	161	10.6%	122	7.5%	107	7.9%	143	11.9%	9.9%
June	118	5.5%	179	10.9%	84	5.5%	135	8.3%	87	6.4%	94	7.8%	7.4%
July	109	5.1%	70	4.2%	104	6.8%	82	5.0%	103	7.6%	67	5.6%	5.7%
August	153	7.2%	114	6.9%	99	6.5%	130	8.0%	96	7.1%	55	4.6%	6.7%
September	397	18.7%	74	4.5%	135	8.9%	181	11.1%	94	7.0%	76	6.3%	9.4%
October	167	7.9%	145	8.8%	141	9.3%	78	4.8%	77	5.7%	106	8.8%	7.5%
November	149	7.0%	111	6.7%	99	6.5%	142	8.7%	93	6.9%	83	6.9%	7.1%
December	151	7.1%	115	7.0%	140	9.2%	93	5.7%	107	7.9%	103	8.6%	7.6%
Total	2,127	100.0%	1,648	100.0%	1,522	100.0%	1,632	100.0%	1,349	100.0%	1,200	100.0%	100.0%

Average distribution for Peak Month (1992-1997):

14.5%

Note: July 1997 value was obtained from the FAA Tower Data contained in the Monthly Traffic Statistics Report. Information on aircraft operations for this period was not available from the Airport Management Records.

Source: Airport Management Records

Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.9

Summary of Total PMAD Operations - Year 2005

<u>Demand Scenario</u>	<u>Commercial Operations</u>	<u>All-Cargo</u>	<u>Military</u>	<u>GA/Air Taxi</u>	<u>Total</u>
Existing (1997)					
Annual Est.	74,098	1,745	1,200	125,042	202,085
Peak Month Est.	7,931	178	184	12,141	20,434
PMAD (March 1997)	256	6	6	392	659
Baseline					
Annual Est.	99,600	2,600	1,500	124,100	227,800
Peak Month Est.	10,200	270	220	12,800	23,490
PMAD	330	9	7	410	756
Alt. Service Patterns					
Annual Est.	145,300	2,600	1,500	132,800	282,200
Peak Month Est.	13,000	270	220	13,700	27,190
PMAD	420	9	7	440	876
High Growth					
Annual Est.	149,300	3,100	1,500	137,600	291,500
Peak Month Est.	13,400	320	220	14,200	28,140
PMAD	430	10	7	460	907

Sources: 1997, Airport Management Records; Demand Scenarios, Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.10

Summary of Total PMAD Operations - Year 2010

<u>Demand Scenario</u>	<u>Commercial Operations</u>	<u>All-Cargo</u>	<u>Military</u>	<u>GA/Air Taxi</u>	<u>Total</u>
Existing (1997)					
Annual Est.	74,098	1,745	1,200	125,042	202,085
Peak Month Est.	7,931	178	184	12,141	20,434
PMAD (March 1997)	256	6	6	392	659
Baseline					
Annual Est.	108,200	3,100	1,500	131,600	244,400
Peak Month Est.	11,100	320	220	13,500	25,140
PMAD	360	10	7	440	817
Alt. Service Patterns					
Annual Est.	154,700	3,100	1,500	140,700	300,000
Peak Month Est.	13,900	320	220	14,500	28,940
PMAD	450	10	7	470	937
High Growth					
Annual Est.	165,500	4,200	1,500	146,100	317,300
Peak Month Est.	14,800	430	220	15,000	30,450
PMAD	480	14	7	480	981

Sources: 1997, Airport Management Records; Demand Scenarios, Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.11

Summary of Total PMAD Operations - Year 2015

Demand Scenario	Commercial Operations	All-Cargo	Military	GA/Air Taxi	Total
Existing (1997)					
Annual Est.	74,098	1,745	1,200	125,042	202,085
Peak Month Est.	7,931	178	184	12,141	20,434
PMAD (March 1997)	256	6	6	392	659
Baseline					
Annual Est.	116,100	3,600	1,500	138,800	260,000
Peak Month Est.	11,900	370	220	14,300	26,790
PMAD	380	12	7	460	859
Alt. Service Patterns					
Annual Est.	162,400	3,600	1,500	148,700	316,200
Peak Month Est.	14,600	370	220	15,300	30,490
PMAD	470	12	7	490	979
High Growth					
Annual Est.	183,600	5,700	1,500	155,400	346,200
Peak Month Est.	16,500	580	220	16,000	33,300
PMAD	530	19	7	520	1,076

Sources: 1997, Airport Management Records; Demand Scenarios, Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

Table III-9.12

Summary of Total PMAD Operations - Year 2020

Demand Scenario	Commercial Operations	All-Cargo	Military	GA/Air Taxi	Total
Existing (1997)					
Annual Est.	74,098	1,745	1,200	125,042	202,085
Peak Month Est.	7,931	178	184	12,141	20,434
PMAD (March 1997)	256	6	6	392	659
Baseline					
Annual Est.	123,700	4,100	1,500	145,800	275,100
Peak Month Est.	12,700	420	220	15,000	28,340
PMAD	410	14	7	480	911
Alt. Service Patterns					
Annual Est.	169,200	4,100	1,500	157,000	331,800
Peak Month Est.	15,200	420	220	16,200	32,040
PMAD	490	14	7	520	1,031
High Growth					
Annual Est.	204,200	7,800	1,500	165,500	379,000
Peak Month Est.	18,300	800	220	17,000	36,320
PMAD	590	26	7	550	1,173

Sources: 1997, Airport Management Records; Demand Scenarios, Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

3.10 Planning Activity Levels

The alternate demand scenarios presented above are utilized to assess the capabilities of the various airport components to accommodate future growth and to define a range of possibilities in aviation activity that may be experienced during the planning horizon.

To facilitate the analytical process associated with the demand/capacity assessment, facility requirements definition, and alternatives definition and evaluation, the demand scenarios can be reduced to a finite number of planning levels and sensitivity levels. Planning Activity Levels (PALs) are defined to correspond to a particular demand threshold identified as part of the demand scenarios. The PALs include a more detailed analytical description of the activity parameters for that threshold. Similarly, Sensitivity Levels (SLs) are defined to assess the ability of proposed facilities to accommodate changing demands. The SLs are defined at a lower level of detail than the PALs.

For purposes of the facility analyses, two PALs have been selected. These PALs, namely PAL 1 and PAL 2, generally correspond to the activity levels and characteristics associated with the mid-point (i.e., the year 2010) and the end-point (i.e., the year 2020), of the planning horizon under the Alternate Service Demand Scenario. In addition, two SLs, SL 1 and SL 2, have been defined to correspond generally to the demand levels and characteristics projected for the year 2020 under the Baseline Demand Scenario and the High Growth Demand Scenario, respectively. Exhibits III-10.1 and III-10.2 graphically illustrate the enplanements and operations levels associated with the selected PALs and SLs as well as their relationship to the demand scenarios discussed previously.

It must be understood that Planning Activity Levels and Sensitivity Levels will be utilized to define and assess long-term development and/or operational options for the Airport. However, recommendations as to the timing of particular implementation actions will be based on the occurrence of specific "triggers" to be defined later in this study. Similarly, specific analyses, such as the financial feasibility analyses, which require a correlation of demand levels to time of occurrence, will be based on the projections developed under the Baseline Demand Scenario.

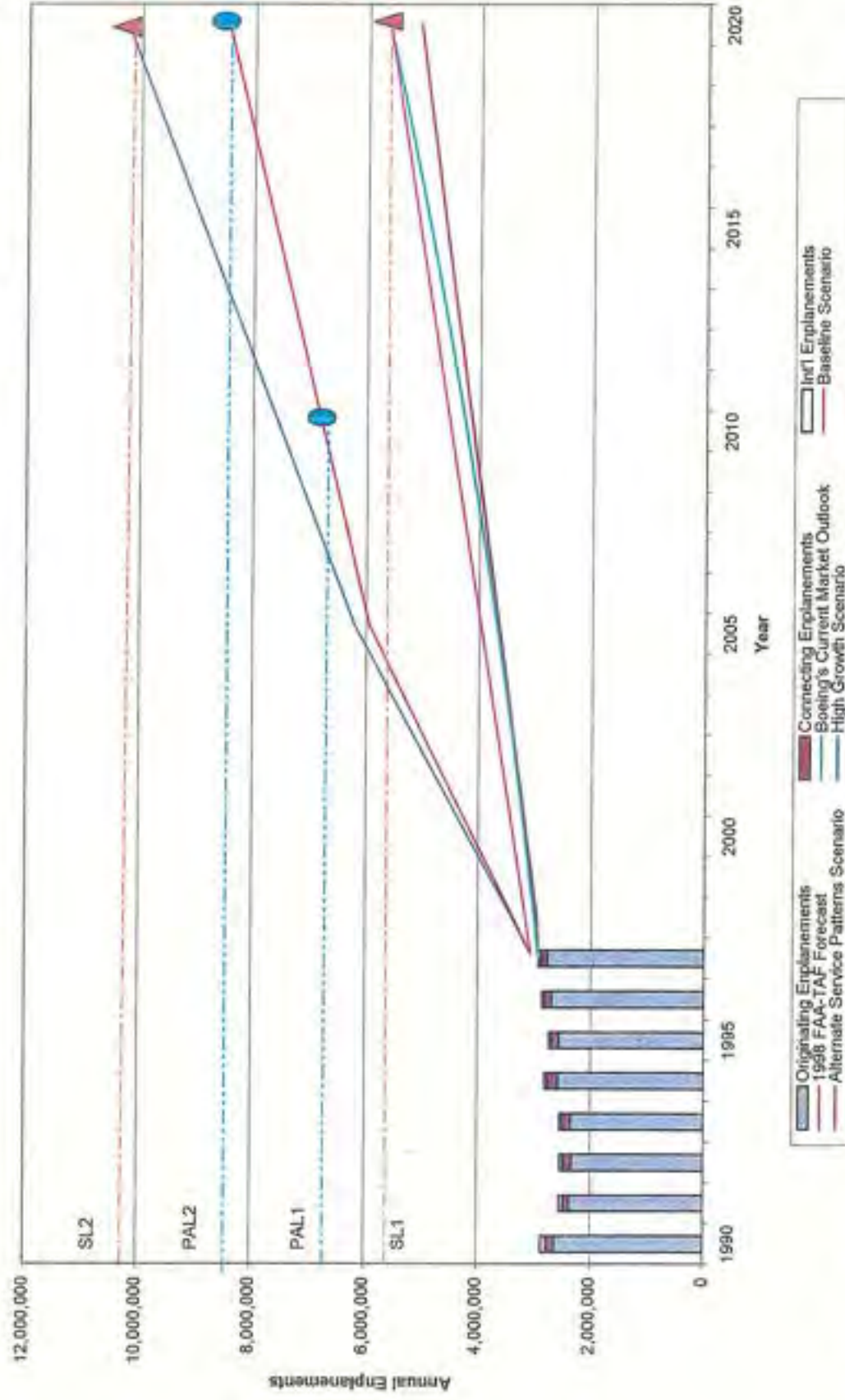
3.10.1 Design Day Schedules

For the purposes of identifying future facility requirements, a design day activity schedule was developed to represent activity distribution throughout the hours of the day. The design day schedule is indicative of the commercial flight activity anticipated at the Airport during the average day of the peak month (PMAD) and provides information on airline, arrival time, departure time, equipment type, and market for each commercial flight during the design day.

This section presents the PAL 1 and PAL 2 design day schedules and the assumptions and methodology used to derive them. It is important to recognize that the design day schedules are foremost a representation of the activity that could be experienced during the specified PMAD in terms of hourly arriving and departing passenger and aircraft levels, and secondly, an indication of future individual carrier activity levels and market service patterns.

3.10.2 Methodology

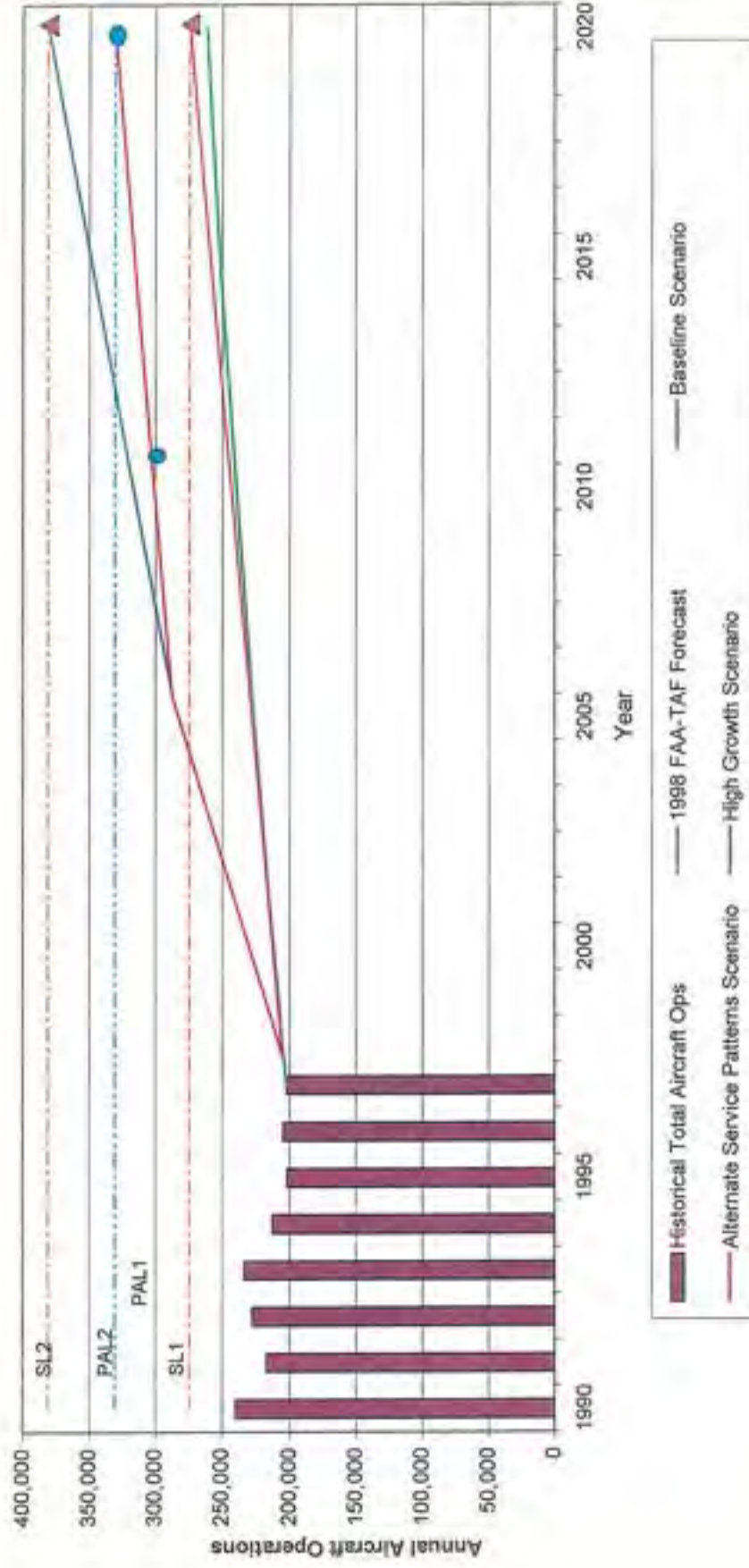
In order to provide the framework for the development of the design day schedules, the total level of activity for each design day, in terms of aircraft operations, arriving and departing seats, and arriving and departing passengers, must be defined. The design day schedules were defined to represent the



Source: Airport Management Records; Federal Aviation Administration TAF's; Ricordo & Associates, Inc.
Prepared by: Ricordo & Associates, Inc., December 1998

Exhibit III-10.1

Total Passenger Enplanements Projections



Source: Airport Management Records; Federal Aviation Administration; Ricordo & Associates, Inc.
Prepared by: Ricordo & Associates, Inc., December 1998.

Exhibit III-10.2

Total Aircraft Operations Projections

Table III-10.4
Equipment Codes

<u>Code</u>	<u>Aircraft Type</u>
BE1	Beechcraft 1900 (ALL SERIES)
DH7	De Havilland DHC-7 DASH 7
DH8	De Havilland DHC8 DASH-8
D9S	McDonnell Douglas DC9 (SERIES 30\40\50)
EM2	Embraer EMB 120 BRASILIA
L10	Lockheed L1011 (ALL SERIES)
M80	McDonnell Douglas DC9 SUPER 80
M90	McDonnell Douglas MD-90
SF3	Saab Fairchild 340
SH6	Short Bros. 360
100	Fokker 100
320	Airbus Industrie A320
72S	Boeing 727-200
73S	Boeing 737 (SERIES 200\200C\200QC)
733	Boeing 737-300
734	Boeing 737-400
735	Boeing 737-500
757	Boeing 757 (ALL SERIES)
763	Boeing 767-300\300ER
767	Boeing 767 (ALL SERIES)

Source: Official Airline Guide
Prepared by: Ricondo & Associates, Inc., April 1999

flight activity of the air carriers operating at PBIA in the years 2010 (PAL 1) and 2020 (PAL 2) based upon the Alternative Service Patterns Demand Scenario previously described. The following methodology was used to derive the design day schedules and to determine design day passenger demand levels.

- The March 10, 1998 schedule provides a reasonable baseline for the development of the future schedule in terms of the distribution of activity throughout the day.
- The future flight schedules were prepared for each airline based on the individual airline's existing level and pattern of activity.
- Each existing airline/market pair was assessed relative to arrival and departure times and frequency levels. Based on the overall flights in the market and the relative O&D traffic levels, additional flights were added to service "gaps" apparent in the airline schedule.
- Once existing market service was maximized for each airline, new markets for service from/to the Airport were identified for both carriers currently serving the Airport and those not currently providing service from PBIA. Information contained in the previously presented *Air Service Demand Analysis* for PBIA served as the primary source for new market identification. In addition, each airline's overall route structure was evaluated to identify markets that provided logical targets for service from PBIA. For most airlines, these consisted of hub airports currently not served from PBIA. Arrival and departure times from/to these markets were established based on preferred travel times in the market pair.
- New arrival and departure flights were paired on an airline by airline basis, adjusting arrival and departure time as necessary to maintain turn times consistent with the airline's operating practices. New markets that are a hub for a particular carrier were generally assigned to that carrier (e.g., Milwaukee flights were assigned to Midwest Express, Chicago Midway flights were assigned to ATA, etc.). New markets for which it isn't clear as to which carrier would be a logical choice to provide the service were assigned to carriers designated simply as New Entrant.
- An aircraft type was assigned to each new and existing flight based on the corresponding airline's existing and planned fleet, market frequency, stage length, and anticipated growth in overall seats per operation. While aircraft were assigned to each flight based primarily on the individual airline's fleet and stage length, efforts were made to maintain the overall fleet mix projected by the demand scenario. In general, existing flights were increased in aircraft size to fulfill the projected percentages of large wide body aircraft under the assumption that the existing flights represent those markets and times with the greatest demand.
- Load factors were assigned to each air carrier and commuter. The PAL 1 design day schedule assumes all air carriers have a 68 percent load factor and all commuters a 58 percent load factor for an airport wide load factor of 67.4 percent. The PAL 2 design day schedule assumes all air carriers have a 72 percent load factor and all commuters a 63 percent load factor for an airport wide load factor of 71.6 percent.

A summary of the PAL 1 and PAL 2 design day activity is shown in **Table III-10.1**.

Table III-10.1

Design Day Schedule Summary

Peak Month Average Day	Existing	PAL 1	PAL 2
Commercial Enplanements		20,308	25,396
Aircraft Departures	121	225	245
Seats Per Departure	115.2	133.9	144.9
Commercial Departing Seats	13,942	30,130	35,491
Average Load Factor		67.4%	71.6%

Sources: Existing - March 10, 1998 Schedule, Official Airline Guide; Design Day Schedule - Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., April 1999

The PAL 1 and PAL 2 design day schedules are presented in **Tables III-10.2** and **Table III-10.3**, respectively. New flights are represented in the design day schedule by flight numbers prefixed with the letter N. Changes in aircraft types were also made for existing flights. In such instances, the original aircraft type shown in the March 10, 1998 schedule was preserved in the column labeled "March 1998 Equipment." The number in parenthesis shown adjacent to the March 1998 equipment type indicates the number of seats available on that particular aircraft. **Table III-10.4** contains a legend of the equipment codes used in the design day schedules.

III.10.3 Peaking Characteristics

Exhibits III-10.3 through **III-10.6** depict the rolling hour trends exhibited in the existing March 1998 schedule and those exhibited in the PAL 1 and PAL 2 design day schedules. The future schedule generally follows the trends characterized by the March 1998 schedule. **Table III-10.5** summarizes the peak hour activity levels for the design day.

Table III-10.2

PAL 1 Design Day Schedule

Arrivals										Departures										
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.		
Overnight										5686		MIA	MIA	0745	SF3	34	66%	22		
N1004			MIA	0805	SF3	34	58%	22		N2004		MIA	MIA	0835	SF3	34	66%	22		
5679			MIA	1116	SF3	34	58%	22		5690		MIA	MIA	1140	SF3	34	66%	22		
N1008			MIA	1200	SF3	34	58%	22		N2008		MIA	MIA	1230	SF3	34	66%	22		
5681			MIA	1450	SF3	34	58%	22		5694		MIA	MIA	1520	SF3	34	66%	22		
5696			MIA	1750	AT7	68	58%	45	SF3(34)	5704		MIA	MIA	1815	AT7	68	66%	45		
5745			MIA	2040	SF3	34	58%	22		Overnight										
Overnight										2051		DFW	DFW	0745	757	188	68%	128		
Overnight										1552		LGA	LGA	0818	763	215	68%	146		
Overnight										2039		ORD	ORD	0858	763	215	68%	146		
1005			LGA	1029	763	215	68%	146	M80(139)	1050		LGA	LGA	1110	763	215	68%	146		
N1044			ORD	1100	M80	139	68%	95		N2044		ORD	ORD	1200	M80	139	68%	95		
870			DFW	1143	757	188	68%	128		521		DFW	DFW	1248	757	188	68%	128		
N1042			LGA	1220	M80	139	68%	95		N2042		LGA	LGA	1320	M80	139	68%	95		
N1009			DFW	1340	100	97	68%	66		N2009		DFW	DFW	1440	100	97	68%	66		
1076			ORD	1404	757	188	68%	128		233		ORD	ORD	1526	757	188	68%	128		
N1041			DFW	1540	M80	139	68%	95		N2041		DFW	DFW	1640	M80	139	68%	95		
411			LGA	1536	757	188	68%	128		426		LGA	LGA	1730	757	188	68%	128		
N1083			ORD	1700	M80	139	68%	95		N2083		ORD	ORD	1750	M80	139	68%	95		
1544			DFW	1807	M80	139	68%	95		1553		DFW	DFW	1847	M80	139	68%	95		
N1043			LGA	1900	M80	139	68%	95		N2043		LGA	LGA	1950	M80	139	68%	95		
427			LGA	2213	763	215	68%	146	M80(139)	Overnight										
840			ORD	2129	763	215	68%	146	M80(139)	Overnight										
1202			DFW	2352	757	188	68%	128	M80(139)	N2050		YYZ	YYZ	0845	320	132	68%	90		
N1048			YYZ	1230	320	132	68%	90		N2048		YYZ	YYZ	1345	320	132	68%	90		
N1079			YMQ	1405	320	132	68%	90		N2079		YMQ	YMQ	1520	320	132	68%	90		
N1049			YYZ	1610	320	132	68%	90		N2049		YYZ	YYZ	1735	320	132	68%	90		
N1080			YMQ	1800	320	132	68%	90		N2080		YMQ	YMQ	1915	320	132	68%	90		
N1050			YYZ	2220	320	132	68%	90		Overnight										
N1007			PID	1215	DH7	50	58%	33		601		PID	PID	0800	DH7	50	66%	33		
610			PID	2000	DH7	50	58%	33		N2007		PID	PID	1330	DH7	50	66%	33		
Overnight										Overnight										
7471			TPA	0825	BE1	19	58%	13		7384		TPA	TPA	0700	BE1	19	66%	13		
7453			TPA	0930	BE1	19	58%	13		7400		TPA	TPA	0855	BE1	19	66%	13		
7423			TPA	1220	BE1	19	58%	13		7419		TPA	TPA	1000	BE1	19	66%	13		
7469			FPO	1430	BE1	19	58%	13		7423		FPO	FPO	1245	BE1	19	66%	13		
N1001			TPA	1545	BE1	19	58%	13		7469		TPA	TPA	1455	BE1	19	66%	13		
7461			TPA	1710	BE1	19	58%	13		N2001		TPA	TPA	1615	BE1	19	66%	13		
7465			TPA	2040	BE1	19	58%	13		7385		TPA	TPA	1735	BE1	19	66%	13		
										Overnight										

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Table III-10.2

PAL 1 Design Day Schedule

Arrivals										Departures									
Carrier	Oper	A Flt#	Origin	Altme	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtme	Equip	Seats	Load%	Pass.	
Overnight										1755	IAH	0700	M80	141	68%	96			
Overnight										654	EWB	0730	757	183	68%	124			
Overnight										N2024	CLE	0745	M80	141	68%	96			
555	EWB			0955	764	280	68%	190	757(183)	730	EWB	1055	764	280	68%	190			
N1014	IAH			1030	735	105	68%	71		N2014	IAH	1120	735	105	68%	71			
469	EWB			1054	M80	141	68%	96		628	EWB	1135	M80	141	68%	96			
1131	CLE			1132	M80	141	68%	96	733(128)	1136	CLE	1225	M80	141	68%	96			
N1015	IAH			1155	735	105	68%	71		N2015	IAH	1245	735	105	68%	71			
343	EWB			1227	757	183	68%	124	M80(141)	662	EWB	1320	757	183	68%	124			
671	EWB			1344	M80	141	68%	96		560	EWB	1440	M80	141	68%	96			
649	EWB			1435	738	155	68%	105	72S(149)	642	EWB	1525	738	155	68%	105			
N1023	CLE			1450	M80	141	68%	96		N2023	CLE	1545	M80	141	68%	96			
N1045	EWB			1600	738	155	68%	105		N2045	EWB	1700	738	155	68%	105			
1930	IAH			1642	738	155	68%	105	735(105)	1931	IAH	1730	738	155	68%	105			
625	EWB			1743	764	280	68%	190	757(183)	626	EWB	1850	764	280	68%	190			
N1046	CLE			1800	M80	141	68%	96		N2046	CLE	1900	M80	141	68%	96			
667	EWB			1949	738	155	68%	105	M80(141)	664	EWB	2040	738	155	68%	105			
N1047	EWB			2110	M80	141	68%	96		N2047	EWB	2215	M80	141	68%	96			
501	EWB			2319	757	183	68%	124	M80(141)	Overnight									
1770	IAH			2223	M80	141	68%	96	733(128)	Overnight									
N1024	CLE			2245	M80	141	68%	96		2538	MCO	0800	73S	107	68%	73			
										N2010	MCO	1110	73S	107	68%	73			
N1010	MCO			1030	73S	107	68%	73		2525	MCO	1610	73S	107	68%	73			
2537	MCO			1540	73S	107	68%	73		Overnight									
2410	MCO			2130	73S	107	68%	73		1492	ATL	0530	757	180	68%	122			
										1193	TPA	0600	757	180	68%	122			
										638	ATL	0700	767	204	68%	139			
										793	DFW	0715	M90	150	68%	102			
										260	LGA	0720	757	180	68%	122			
										N2081	CVG	0720	M80	142	68%	97			
1636	TPA			0631	767	204	68%	139	757(180)	1224	BOS	0730	767	204	68%	139			
										705	ATL	0840	L10	302	68%	205			
283	ATL			0953	763	218	68%	148		1218	ATL	1050	763	218	68%	148			
N1056	DFW			1020	M80	142	68%	97		N2056	DFW	1110	M80	142	68%	97			
259	LGA			1017	763	218	68%	148		702	LGA	1120	763	218	68%	148			
1421	BDL			1050	757	180	68%	122	M80(142)	434	CVG	1140	757	180	68%	122			
337	CVG			1112	757	180	68%	122	M80(142)	676	BOS	1200	757	180	68%	122			
1104	ATL			1140	757	180	68%	122	M80(142)	772	DFW	1225	757	180	68%	122			
433	BOS			1122	L10	302	68%	205		1554	ATL	1230	L10	302	68%	205			
N1052	BDL			1215	M80	142	68%	97		N2052	BDL	1310	M80	142	68%	97			

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Table III-10.2

PAL 1 Design Day Schedule

Arrivals										Departures								
Carrier	Oper	A Flt#	Origin	Altme	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.
N1053			LGA	1245	M80	142	68%	97		N2053			LGA	1345	M80	142	68%	97
1581			ATL	1321	767	204	68%	139	757(180)	802			ATL	1425	767	204	68%	139
N1091			BOS	1400	M80	142	68%	97		N2091			BOS	1500	M80	142	68%	97
609			LGA	1435	767	204	68%	139	M80(142)	246			CVG	1525	767	204	68%	139
1103			ATL	1516	L10	302	68%	205		616			ATL	1620	L10	302	68%	205
N1054			BOS	1540	M80	142	68%	97		N2054			BOS	1630	M80	142	68%	97
N1051			ATL	1615	M80	142	68%	97		N2051			ATL	1715	M80	142	68%	97
1670			DFW	1643	M90	150	68%	102		403			DFW	1735	M90	150	68%	102
N1055			CVG	1640	M80	142	68%	97		N2055			CVG	1735	M80	142	68%	97
839			ATL	1722	763	218	68%	148	757(180)	1946			ATL	1825	763	218	68%	148
181			LGA	1759	763	218	68%	148		530			LGA	1900	763	218	68%	148
N1092			BOS	1758	M80	142	68%	97		N2092			BOS	1900	M80	142	68%	97
228			ATL	1854	763	218	68%	148		1434			BDL	1955	763	218	68%	148
1145			ATL	1939	757	180	68%	122	M80(142)	1596			ATL	2030	757	180	68%	122
247			BOS	2253	757	180	68%	122	M80(142)					Overnight				
289			DFW	2300	M90	150	68%	102						Overnight				
369			ATL	2309	L10	302	68%	205						Overnight				
461			LGA	2219	767	204	68%	139						Overnight				
657			CVG	2245	757	180	68%	122	M80(142)					Overnight				
750			ATL	2121	757	180	68%	122						Overnight				
N1081			CVG	2310	M81	142	68%	97						Overnight				
				Overnight						N2005			MCO	0700	EM2	30	66%	20
3398			MCO	0905	EM2	30	58%	20		3399			MCO	0940	EM2	30	66%	20
3440			MCO	1225	EM2	30	58%	20		3444			MCO	1245	EM2	30	66%	20
3389			MCO	1740	EM2	30	58%	20		3396			MCO	1800	EM2	30	66%	20
N1005			MCO	2030	EM2	30	58%	20						Overnight				
257			ATL	1020	D9S	106	58%	70		184			ATL	1045	D9S	106	66%	70
N1012			ATL	1200	D9S	106	58%	70		N2012			ATL	1245	D9S	106	66%	70
183			ATL	1535	D9S	106	58%	70		186			ATL	1600	D9S	106	66%	70
19			ATL	1920	D9S	106	58%	70		190			ATL	1945	D9S	106	66%	70
N1011			ATL	2230	D9S	106	58%	70						Overnight				
				Overnight						N2011			ATL	0815	D9S	106	66%	70
				Overnight						N2032			CMH	0815	733	132	68%	90
282			CMH	1112	733	132	68%	90	733(132)	1119			CMH	1155	733	132	68%	90
N1030			PHX	1555	757	190	68%	129		N2030			PHX	1640	757	190	68%	129
N1031			LAS	1720	757	190	68%	129		N2031			LAS	1810	757	190	68%	129
N1032			CMH	2205	733	132	68%	90						Overnight				
				Overnight						N2018			RDU	0700	100	98	68%	67
2			RDU	1137	320	179	68%	122	100(98)	711			RDU	1235	320	179	68%	122
304			RDU	1602	100	98	68%	67	100(98)	888			RDU	1655	100	98	68%	67
N1019			RDU	1815	100	98	68%	67		N2019			RDU	1920	100	98	68%	67

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Table III-10.2

PAL 1 Design Day Schedule

Arrivals										Departures									
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March	1998 Equip.	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.
N1018			RDU	2240	100	98	68%	67							Overnight				
				Overnight									N1036	MBJ	0740	320	150	68%	102
N1035			MBJ	1215	320	150	68%	102					N1035	MBJ	1320	320	150	68%	102
N1036			MBJ	2135	320	150	68%	102							Overnight				
				Overnight									N1039	BOS	0845	72S	150	68%	102
				Overnight									532	EWB	0930	72S	150	68%	102
N1104			BOS	0945	72S	150	68%	102					N2104	BOS	1040	72S	150	68%	102
N1040			EWB	1120	72S	150	68%	102					N1040	EWB	1200	72S	150	68%	102
545			BOS	1210	72S	150	68%	102					546	BOS	1300	72S	150	68%	102
533			EWB	1540	72S	150	68%	102					534	EWB	1630	72S	150	68%	102
N1037			BOS	1645	72S	150	68%	102					N1037	BOS	1730	72S	150	68%	102
N1038			BOS	1820	72S	150	68%	102					N1038	BOS	1920	72S	150	68%	102
535			EWB	2330	72S	150	68%	102							Overnight				
N1039			BOS	2250	72S	150	68%	102							Overnight				
34			ISP	0730	734	159	68%	108		734(159)			34	ISP	0800	734	159	68%	108
N1033			ISP	1220	734	159	68%	108					N2033	ISP	1300	734	159	68%	108
N1034			ISP	1600	734	159	68%	108					N2034	ISP	1645	734	159	68%	108
51			ISP	2130	734	159	68%	108					51	ISP	2200	734	159	68%	108
N1093			LAX	1220	763	206	68%	140					N2093	LAX	1300	763	206	68%	140
N1094			LAX	1600	757	188	68%	128					N2094	LAX	1645	757	188	68%	128
N1101			ACY	0930	D9S	127	68%	86					N2101	ACY	1020	D9S	127	68%	86
N1099			DTW	1100	D9S	127	68%	86					N2099	DTW	1150	D9S	127	68%	86
N1102			ACY	1220	D9S	127	68%	86					N2102	ACY	1310	D9S	127	68%	86
N1100			DTW	1540	D9S	127	68%	86					N2100	DTW	1630	D9S	127	68%	86
N1103			DTW	1700	D9S	127	68%	86					N2103	DTW	1815	D9S	127	68%	86
				Overnight									895	DTW	0700	757	190	68%	129
896			DTW	0912	757	190	68%	129		320(150)			893	DTW	0955	757	190	68%	129
N1013			MEM	1010	D9S	100	68%	68					N2013	MEM	1050	D9S	100	68%	68
N1058			MSP	1110	320	150	68%	102					N2058	MSP	1200	320	150	68%	102
890			DTW	1220	757	190	68%	129		72S(146)			891	DTW	1305	757	190	68%	129
N1059			MSP	1320	320	150	68%	102					N2059	MSP	1410	320	150	68%	102
N1082			MEM	1430	320	150	68%	102					N2082	MEM	1520	320	150	68%	102
892			DTW	1536	72S	146	68%	99					889	DTW	1620	72S	146	68%	99
886			DTW	1626	757	190	68%	129		320(150)			887	DTW	1725	757	190	68%	129
N1060			MSP	1820	320	150	68%	102					N2060	MSP	1910	320	150	68%	102
N1057			DTW	1935	320	150	68%	102					N2057	DTW	2030	320	150	68%	102
894			DTW	2338	757	190	68%	129		72S(146)					Overnight				
				Overnight									470	LGA	0720	767	192	68%	131
				Overnight									229	SRQ	0755	72S	146	68%	99
N1061			LGA	0850	M80	132	68%	90					N2061	LGA	0940	M80	132	68%	90
N1063			JFK	0930	72S	146	68%	99					N2063	JFK	1020	72S	146	68%	99

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Table III-10.2
PAL 1 Design Day Schedule

Arrivals										Departures								
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.
N1084		293	STL	1010	M80	132	68%	90		N2084		N2084	STL	1110	M80	132	68%	90
		461	LGA	1043	M80	132	68%	90				396	LGA	1140	M80	132	68%	90
N1085		548	LGA	1143	763	233	68%	158	72S(146)			460	LGA	1240	763	233	68%	158
		763	JFK	1200	M80	132	68%	90		N2085		N2085	JFK	1250	M80	132	68%	90
		473	STL	1338	757	180	68%	122	M80(132)			117	STL	1425	757	180	68%	122
N1062		259	JFK	1430	763	233	68%	158	M80(132)			268	LGA	1520	763	233	68%	158
		576	LGA	1527	72S	146	68%	99	M80(132)			764	JFK	1620	72S	146	68%	99
		1028	STL	1645	72S	146	68%	99		N2062		N2062	STL	1740	72S	146	68%	99
		1077	LGA	1819	757	180	68%	122	M80(132)			474	LGA	1920	M80	180	68%	122
		1027	SRQ	2159	767	192	68%	131	M80(132)					Overnight				
		1078	MDW	2306	72S	146	68%	99				N2028	MDW	Overnight				
		1752	MDW	0955	72S	173	68%	118				N2077	IND	1050	72S	173	68%	118
			IND	1115	72S	173	68%	118				N2027	MDW	1330	72S	173	68%	118
			MDW	1235	72S	173	68%	118				N2078	IND	1700	72S	173	68%	118
			IND	1610	72S	173	68%	118				N2029	MDW	1930	72S	173	68%	118
			MDW	1840	72S	173	68%	118				4114	TPA	0700	BE1	19	66%	13
				Overnight								4000	TPA	0855	BE1	19	66%	13
												4019	TPA	1000	BE1	19	66%	13
												4069	TPA	1455	BE1	19	66%	13
												N2003	TPA	1630	BE1	19	66%	13
												4115	TPA	1735	BE1	19	66%	13
													Overnight					
												1753	ORD	0745	733	134	68%	91
												N2087	DEN	0810	733	134	68%	91
												N2016	IAD	1010	735	108	68%	73
												N2066	ORD	1115	733	134	68%	91
												N2095	SFO	1220	757	188	68%	128
												499	ORD	1230	763	206	68%	140
												N2088	DEN	1340	320	144	68%	98
												N2067	IAD	1345	320	144	68%	98
												N2065	ORD	1450	733	134	68%	91
												N2064	DEN	1600	320	144	68%	98
												N2086	ORD	1710	733	134	68%	91
												N2096	SFO	1750	763	206	68%	140
												N2017	IAD	1835	735	108	68%	73
												N2068	ORD	2010	320	144	68%	98
													Overnight					
												407	MHH	1330	SH6	36	66%	24
												3031	TPA	0630	DH8	37	66%	24
												5300	JAX	0655	BE1	19	66%	13
													Overnight					
													Overnight					

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Table III-10.2

PAL 1 Design Day Schedule

Arrivals										Departures										
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.		
5330	JAX	0800	JAX	0800	BE1	19	58%	13		5284	TLH	0820	BE1	19	66%	13				
3096	TPA	0910	TPA	0910	DH8	37	58%	24		3017	TPA	0925	DH8	37	66%	24				
5300	JAX	0955	JAX	0955	BE1	19	58%	13		5568	MCO	1015	BE1	19	66%	13				
5359	MCO	1020	MCO	1020	BE1	19	58%	13		5359	MCO	1035	BE1	19	66%	13				
3180	TPA	1059	TPA	1059	DH8	37	58%	24		3069	TPA	1130	DH8	37	66%	24				
5284	TLH	1210	TLH	1210	BE1	19	58%	13		5333	MCO	1230	BE1	19	66%	13				
3029	TPA	1225	TPA	1225	DH8	37	58%	24		3052	MHH	1300	DH8	37	66%	24				
3067	TPA	1345	TPA	1345	DH8	37	58%	24		3027	TPA	1405	DH8	37	66%	24				
N1002	JAX	1420	JAX	1420	BE1	19	58%	13		N2002	JAX	1450	BE1	19	66%	13				
5360	MCO	1550	MCO	1550	BE1	19	58%	13		5288	TLH	1615	BE1	19	66%	13				
3166	MHH	1620	MHH	1620	DH8	37	58%	24		3166	TPA	1720	DH8	37	66%	24				
5304	MCO	1815	MCO	1815	BE1	19	58%	13		5304	MCO	1830	BE1	19	66%	13				
3061	TPA	1825	TPA	1825	DH8	37	58%	24		3064	TPA	1840	DH8	37	66%	24				
N1006	JAX	1850	JAX	1850	DH8	37	58%	24		N2006	JAX	1930	DH8	37	66%	24				
3041	TPA	2110	TPA	2110	DH8	37	58%	24		Overnight										
5288	TLH	2005	TLH	2005	BE1	19	58%	13		Overnight										
N1090	CLT	0910	CLT	0910	320	144	68%	98		1421	PHL	0640	757	182	68%	124				
N1020	BWI	0930	BWI	0930	73S	110	68%	75		1527	CLT	0700	757	182	68%	124				
N1073	LGA	0940	LGA	0940	734	146	68%	99		1795	DCA	0720	M80	141	68%	96				
1714	PHL	0939	PHL	0939	734	146	68%	99		1640	PIT	0831	734	146	68%	99				
N1026	DCA	0945	DCA	0945	M80	141	68%	96		1681	CLT	0930	757	182	68%	124				
N1076	CLT	1020	CLT	1020	734	146	68%	99		N2090	DCA	1000	320	144	68%	98				
2200	PHL	1053	PHL	1053	734	146	68%	99		N2020	BWI	1015	73S	110	68%	75				
N1097	PVD	1100	PVD	1100	734	146	68%	99		N2073	LGA	1030	734	146	68%	99				
N1025	PIT	1120	PIT	1120	320	144	68%	98		326	PHL	1034	734	146	68%	99				
1753	LGA	1135	LGA	1135	757	182	68%	124		N2026	PIT	1040	M80	141	68%	96				
321	BWI	1154	BWI	1154	M80	141	68%	96		N2076	CLT	1115	734	146	68%	99				
1924	DCA	1205	DCA	1205	734	146	68%	99		2285	DCA	1144	734	146	68%	99				
1930	PHL	1252	PHL	1252	734	146	68%	99		N2097	PVD	1145	734	146	68%	99				
665	CLT	1259	CLT	1259	757	182	68%	124		N2025	BWI	1215	320	144	68%	98				
N1070	BWI	1345	BWI	1345	734	146	68%	99		531	PHL	1226	757	182	68%	124				
N1098	PVD	1400	PVD	1400	734	146	68%	99		995	CLT	1240	M80	141	68%	96				
1223	PIT	1425	PIT	1425	733	128	68%	87		1440	PIT	1256	734	146	68%	99				
N1072	DCA	1500	DCA	1500	734	146	68%	99		1186	LGA	1340	734	146	68%	99				
2250	CLT	1520	CLT	1520	757	182	68%	124		888	PHL	1350	757	182	68%	124				
N1074	LGA	1540	LGA	1540	734	146	68%	99		N2070	CLT	1440	734	146	68%	99				
										N2098	PVD	1445	734	146	68%	99				
										254	BWI	1510	733	128	68%	87				
										N2072	DCA	1550	734	146	68%	99				
										1434	CLT	1610	757	182	68%	124				
										N2074	LGA	1630	734	146	68%	99				

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Table III-10.2

PAL 1 Design Day Schedule

Arrivals										Departures									
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip.	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.	
N1069			PHL	1555	734	146	68%	99		N2069			PIT	1645	734	146	68%	99	
1847			DCA	1631	757	182	68%	124	733(128)	1636			DCA	1715	757	182	68%	124	
N1075			CLT	1650	734	146	68%	99		N2075			PHL	1740	734	146	68%	99	
2257			PIT	1712	M80	141	68%	96	733(128)	2282			PIT	1804	M80	141	68%	96	
N1071			PHL	1745	734	146	68%	99		N2071			CLT	1840	734	146	68%	99	
1187			CLT	1831	757	182	68%	124	M80(141)	1478			CLT	1920	757	182	68%	124	
N1089			BWI	1900	M80	141	68%	96		N2089			BWI	1945	M80	141	68%	96	
647			LGA	1956	757	182	68%	124	M80(141)	1554			LGA	2045	757	182	68%	124	
1807			PIT	2026	757	182	68%	124	734(146)	1152			PHL	2121	734	182	68%	124	
514			CLT	2200	757	182	68%	124	M80(141)	Overnight									
1119			PHL	2141	757	182	68%	124	734(146)	Overnight									
1701			CLT	2345	734	146	68%	99	733(128)	Overnight									
1800			DCA	2253	M80	141	68%	96	733(128)	Overnight									
1817			PHL	2357	757	182	68%	124	M80(141)	Overnight									
N1021			MKE	1210	M80	116	68%	79		N2021			MKE	1315	M80	116	68%	79	
N1022			MKE	1545	M80	116	68%	79		N2022			MKE	1650	M80	116	68%	79	

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Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Table III-10.3

PAL 2 Design Day Schedule

Arrivals										Departures									
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.	
Overnight										Overnight									
N1004			MIA	0805	SF3	34	63%	21	SF3(34)	5686			MIA	0745	AT7	68	63%	43	
5679			MIA	1116	AT7	68	63%	43		N2004			MIA	0835	SF3	34	63%	21	
N1008			MIA	1200	SF3	34	63%	21		5690			MIA	1140	AT7	68	63%	43	
5681			MIA	1450	SF3	34	63%	21		N2008			MIA	1230	SF3	34	63%	21	
5696			MIA	1750	AT7	68	63%	43	SF3(34)	5694			MIA	1520	SF3	34	63%	21	
5745			MIA	2040	AT7	68	63%	43		5704			MIA	1815	AT7	68	63%	43	
Overnight										Overnight									
Overnight										2051			DFW	0745	757	188	72%	135	
Overnight										1552			LGA	0818	763	215	72%	155	
Overnight										2039			ORD	0858	763	215	72%	155	
N1116			BNA	1010	M80	139	72%	100	M80(139)	N2116			BNA	1100	M80	139	72%	100	
1005			LGA	1029	763	215	72%	155		1050			LGA	1110	763	215	72%	155	
N1044			ORD	1100	M80	139	72%	100		N2044			ORD	1200	M80	139	72%	100	
870			DFW	1143	763	215	72%	155		521			DFW	1248	763	215	72%	155	
N1042			LGA	1220	M80	139	72%	100	M80(139)	N2042			LGA	1320	M80	139	72%	100	
N1121			SJU	1230	763	215	72%	155		N2121			SJU	1340	763	215	72%	155	
N1009			DFW	1340	757	188	72%	135		N2009			DFW	1440	757	188	72%	135	
1076			ORD	1404	763	215	72%	155		233			ORD	1526	763	215	72%	155	
N1122			SJU	1500	757	188	72%	135	M80(139)	N2122			SJU	1615	757	188	72%	135	
N1041			DFW	1540	M80	139	72%	100		N2041			DFW	1640	M80	139	72%	100	
411			LGA	1536	763	215	72%	155		426			LGA	1730	763	215	72%	155	
N1083			ORD	1700	M80	139	72%	100		N2083			ORD	1750	M80	139	72%	100	
1544			DFW	1807	763	215	72%	155	M80(139)	1553			DFW	1847	763	215	72%	155	
N1043			LGA	1900	M80	139	72%	100		N2043			LGA	1950	M80	139	72%	100	
1202			DFW	2352	757	188	72%	135		Overnight									
427			LGA	2213	763	215	72%	155		Overnight									
840			ORD	2129	763	215	72%	155	M80(139)	N2050			YYZ	0845	320	132	72%	95	
N1048			YYZ	1230	763	203	72%	146		N2048			YYZ	1345	763	203	72%	146	
N1079			YMQ	1405	320	132	72%	95		N2079			YMQ	1520	320	132	72%	95	
N1049			YYZ	1610	763	203	72%	146		N2049			YYZ	1735	763	203	72%	146	
N1080			YMQ	1800	320	132	72%	95	Overnight	N2080			YMQ	1915	320	132	72%	95	
N1050			YYZ	2220	320	132	72%	95		Overnight									
Overnight										601			PID	0800	DH7	50	63%	32	
N1007			PID	1215	DH7	50	63%	32		N2007			PID	1330	DH7	50	63%	32	
610			PID	2000	DH7	50	63%	32	Overnight										
7471			TPA	0825	BE1	19	63%	12	Overnight	7384			TPA	0700	BE1	19	63%	12	
7453			TPA	0930	BE1	19	63%	12		7400			TPA	0855	BE1	19	63%	12	
7423			TPA	1220	BE1	19	63%	12		7419			TPA	1000	BE1	19	63%	12	
7469			FPO	1430	BE1	19	63%	12		7423			FPO	1245	BE1	19	63%	12	
										7469			TPA	1455	BE1	19	63%	12	

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Table III-10.3

PAL 2 Design Day Schedule

Arrivals										Departures								
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.
N1001	TPA	1545	TPA	1545	BE1	19	63%	12		N2001	TPA	1615	TPA	1615	BE1	19	63%	12
7461	TPA	1710	TPA	1710	BE1	19	63%	12		7385	TPA	1735	TPA	1735	BE1	19	63%	12
7465	TPA	2040	TPA	2040	BE1	19	63%	12		Overnight								
555	EWB	0955	EWB	0955	764	280	72%	202	757(183)	1755	IAH	0700	IAH	0700	M80	141	72%	102
N1014	IAH	1030	IAH	1030	757	183	72%	132		654	EWB	0730	EWB	0730	757	183	72%	132
469	EWB	1054	EWB	1054	763	218	72%	157	M80(141)	N2024	CLE	0745	CLE	0745	M80	141	72%	102
1131	CLE	1132	CLE	1132	757	180	72%	130	733(128)	730	EWB	1055	EWB	1055	764	280	72%	202
N1015	IAH	1155	IAH	1155	757	183	72%	132		N2014	IAH	1120	IAH	1120	757	183	72%	132
343	EWB	1227	EWB	1227	757	183	72%	132		628	EWB	1135	EWB	1135	763	218	72%	157
671	EWB	1344	EWB	1344	757	180	72%	130	M80(141)	1136	CLE	1225	CLE	1225	757	180	72%	130
649	EWB	1435	EWB	1435	757	183	72%	132		N2015	IAH	1245	IAH	1245	757	183	72%	132
N1023	CLE	1450	CLE	1450	M80	141	72%	102	M80(141)	662	EWB	1320	EWB	1320	757	183	72%	132
N1045	EWB	1600	EWB	1600	738	155	72%	112	M80(141)	560	EWB	1440	EWB	1440	757	180	72%	130
1930	IAH	1642	IAH	1642	738	155	72%	112	72S(149)	642	EWB	1525	EWB	1525	757	183	72%	132
625	EWB	1743	EWB	1743	764	280	72%	202		N2023	CLE	1545	CLE	1545	M80	141	72%	102
N1046	CLE	1800	CLE	1800	738	155	72%	112	735(105)	N2045	EWB	1700	EWB	1700	738	155	72%	112
667	EWB	1949	EWB	1949	757	183	72%	132	757(183)	1931	IAH	1730	IAH	1730	738	155	72%	112
N1047	EWB	2110	EWB	2110	738	155	72%	112		626	EWB	1850	EWB	1850	764	280	72%	202
N1024	CLE	2245	CLE	2245	M80	141	72%	102		N2046	CLE	1900	CLE	1900	738	155	72%	112
501	EWB	2319	EWB	2319	757	183	72%	132	M80(141)	664	EWB	2040	EWB	2040	757	183	72%	132
1770	IAH	2223	IAH	2223	M80	141	72%	102		N2047	EWB	2215	EWB	2215	738	155	72%	112
Overnight										Overnight								
N1010	MCO	1030	MCO	1030	M80	142	72%	102	M80(141)	2538	MCO	0800	MCO	0800	M80	142	72%	102
2537	MCO	1540	MCO	1540	M80	142	72%	102	733(128)	N2010	MCO	1110	MCO	1110	M80	142	72%	102
2410	MCO	2130	MCO	2130	M80	142	72%	102		2525	MCO	1610	MCO	1610	M80	142	72%	102
Overnight										Overnight								
1636	TPA	0631	TPA	0631	767	204	72%	147		1492	ATL	0530	ATL	0530	757	180	72%	130
283	ATL	0953	ATL	0953	763	218	72%	157	757(180)	1193	TPA	0600	TPA	0600	757	180	72%	130
N1056	DFW	1020	DFW	1020	738	155	72%	112		638	ATL	0700	ATL	0700	763	218	72%	157
259	LGA	1017	LGA	1017	763	218	72%	157		793	DFW	0715	DFW	0715	757	180	72%	130
1421	BDL	1050	BDL	1050	757	180	72%	130		N2081	CVG	0720	CVG	0720	M80	142	72%	102
337	CVG	1112	CVG	1112	757	180	72%	130	M80(142)	260	LGA	0720	LGA	0720	757	180	72%	130
Overnight										Overnight								
1636	TPA	0631	TPA	0631	767	204	72%	147		1224	BOS	0730	BOS	0730	767	204	72%	147
283	ATL	0953	ATL	0953	763	218	72%	157		705	ATL	0840	ATL	0840	L10	302	72%	217
N1056	DFW	1020	DFW	1020	738	155	72%	112		1218	ATL	1050	ATL	1050	763	218	72%	157
259	LGA	1017	LGA	1017	763	218	72%	157		N2056	DFW	1110	DFW	1110	738	155	72%	112
1421	BDL	1050	BDL	1050	757	180	72%	130	M80(142)	702	LGA	1120	LGA	1120	763	218	72%	157
337	CVG	1112	CVG	1112	757	180	72%	130	M80(142)	434	CVG	1140	CVG	1140	757	180	72%	130
Overnight										Overnight								
1636	TPA	0631	TPA	0631	767	204	72%	147		676	BOS	1200	BOS	1200	757	180	72%	130

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PAL 2 Design Day Schedule

Arrivals										Departures								
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.
		1104	ATL	1140	757	180	72%	130	M80(142)			772	DFW	1225	757	180	72%	130
		433	BOS	1122	L10	302	72%	217				1554	ATL	1230	L10	302	72%	217
		N1052	BDL	1215	738	155	72%	112				N2052	BDL	1310	738	155	72%	112
		N1053	LGA	1245	M80	142	72%	102				N2053	LGA	1345	M80	142	72%	102
		1581	ATL	1321	767	204	72%	147	757(180)			802	ATL	1425	767	204	72%	147
		N1091	BOS	1400	738	155	72%	112				N2091	BOS	1500	738	155	72%	112
		N1112	SLC	1350	763	218	72%	157				N2112	SLC	1510	763	218	72%	157
		609	LGA	1435	767	204	72%	147	M80(142)			246	CVG	1525	767	204	72%	147
		1103	ATL	1516	L10	302	72%	217				616	ATL	1620	L10	302	72%	217
		N1054	BOS	1540	738	155	72%	112				N2054	BOS	1630	738	155	72%	112
		N1051	ATL	1615	738	155	72%	112				N2051	ATL	1715	738	155	72%	112
		N1055	CVG	1640	M80	142	72%	102				N2055	CVG	1735	M80	142	72%	102
		1670	DFW	1643	763	218	72%	157	M90(150)			403	DFW	1735	763	218	72%	157
		839	ATL	1722	763	218	72%	157	757(180)			1946	ATL	1825	763	218	72%	157
		N1092	BOS	1758	M80	142	72%	102				N2092	BOS	1900	M80	142	72%	102
		181	LGA	1759	763	218	72%	157				530	LGA	1900	763	218	72%	157
		228	ATL	1854	763	218	72%	157				1434	BDL	1955	763	218	72%	157
		1145	ATL	1939	757	180	72%	130	M80(142)			1596	ATL	2030	757	180	72%	130
		N1113	SLC	1930	763	218	72%	157				N2113	SLC	2040	763	218	72%	157
		369	ATL	2309	L10	302	72%	217						Overnight				
		750	ATL	2121	757	180	72%	130						Overnight				
		247	BOS	2253	757	180	72%	130	M80(142)					Overnight				
		657	CVG	2245	757	180	72%	130	M80(142)					Overnight				
		N1081	CVG	2310	M81	142	72%	102						Overnight				
		289	DFW	2300	757	180	72%	130	M90(150)					Overnight				
		461	LGA	2219	763	218	72%	157	767(204)					Overnight				
				Overnight								N2005	MCO	0700	EM2	30	63%	19
		3398	MCO	0905	EM2	30	63%	19				3399	MCO	0940	EM2	30	63%	19
		3440	MCO	1225	EM2	30	63%	19				3444	MCO	1245	EM2	30	63%	19
		3389	MCO	1740	EM2	30	63%	19				3396	MCO	1800	EM2	30	63%	19
		N1005	MCO	2030	EM2	30	63%	19						Overnight				
				Overnight								N2011	ATL	0815	D9S	106	63%	67
		257	ATL	1020	D9S	106	63%	67				184	ATL	1045	D9S	106	63%	67
		N1012	ATL	1200	D9S	106	63%	67				N2012	ATL	1245	D9S	106	63%	67
		183	ATL	1535	D9S	106	63%	67				186	ATL	1600	D9S	106	63%	67
		19	ATL	1920	D9S	106	63%	67				190	ATL	1945	D9S	106	63%	67
		N1011	ATL	2230	D9S	106	63%	67						Overnight				
				Overnight								N2032	CMH	0815	733	132	72%	95
		282	CMH	1112	757	190	72%	137	733(132)			1119	CMH	1155	757	190	72%	137
		N1110	LAS	1215	757	190	72%	137				N2110	LAS	1310	757	190	72%	137
		N1111	CMH	1330	757	190	72%	137				N2111	CMH	1430	757	190	72%	137

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Arrivals										Departures											
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.			
N1030	PHX	1555	PHX	1555	757	190	72%	137		N2030	PHX	1640	PHX	1640	757	190	72%	137			
N1031	LAS	1720	LAS	1720	757	190	72%	137		N2031	LAS	1810	LAS	1810	757	190	72%	137			
N1032	CMH	2205	CMH	2205	733	132	72%	95		Overnight											
2	RDU	1137	RDU	1137	320	179	72%	129	100(98)	N2018	RDU	0700	RDU	0700	100	98	72%	71			
304	RDU	1602	RDU	1602	100	98	72%	71	100(98)	711	RDU	1235	RDU	1235	320	179	72%	129			
N1019	RDU	1815	RDU	1815	100	98	72%	71		888	RDU	1655	RDU	1655	100	98	72%	71			
N1018	RDU	2240	RDU	2240	100	98	72%	71		N2019	RDU	1920	RDU	1920	100	98	72%	71			
Overnight										Overnight											
N1035	MBJ	1215	MBJ	1215	320	150	72%	108		N1036	MBJ	0740	MBJ	0740	320	150	72%	108			
N1036	MBJ	2135	MBJ	2135	320	150	72%	108		N1035	MBJ	1320	MBJ	1320	320	150	72%	108			
Overnight										Overnight											
N1104	BOS	0945	BOS	0945	72S	150	72%	108		N1039	BOS	0845	BOS	0845	72S	150	72%	108			
N1040	EWB	1120	EWB	1120	72S	150	72%	108		532	EWB	0930	EWB	0930	72S	150	72%	108			
545	BOS	1210	BOS	1210	72S	150	72%	108		N2104	BOS	1040	BOS	1040	72S	150	72%	108			
533	EWB	1540	EWB	1540	72S	150	72%	108		N1040	EWB	1200	EWB	1200	72S	150	72%	108			
N1037	BOS	1645	BOS	1645	72S	150	72%	108		546	BOS	1300	BOS	1300	72S	150	72%	108			
N1038	BOS	1820	BOS	1820	72S	150	72%	108		534	EWB	1630	EWB	1630	72S	150	72%	108			
N1039	BOS	2250	BOS	2250	72S	150	72%	108		N1037	BOS	1730	BOS	1730	72S	150	72%	108			
535	EWB	2330	EWB	2330	72S	150	72%	108		N1038	BOS	1920	BOS	1920	72S	150	72%	108			
Overnight										Overnight											
N1107	DUS	1350	DUS	1350	M11	248	72%	179		N2107	DUS	1520	DUS	1520	M11	248	72%	179			
N1108	FRA	1600	FRA	1600	M11	248	72%	179		N2108	FRA	1730	FRA	1730	M11	248	72%	179			
34	ISP	0730	ISP	0730	734	159	72%	114	734(159)	34	ISP	0800	ISP	0800	734	159	72%	114			
N1033	ISP	1220	ISP	1220	734	159	72%	114		N2033	ISP	1300	ISP	1300	734	159	72%	114			
N1034	ISP	1600	ISP	1600	734	159	72%	114		N2034	ISP	1645	ISP	1645	734	159	72%	114			
51	ISP	2130	ISP	2130	734	159	72%	114		51	ISP	2200	ISP	2200	734	159	72%	114			
Overnight										Overnight											
N1093	LAX	1220	LAX	1220	763	206	72%	148		N2109	LAX	0830	LAX	0830	763	206	72%	148			
N1094	LAX	1600	LAX	1600	757	188	72%	135		N2093	LAX	1300	LAX	1300	763	206	72%	148			
N1109	LAX	2310	LAX	2310	763	206	72%	148		N2094	LAX	1645	LAX	1645	757	188	72%	135			
N1123	FPO	1305	FPO	1305	72S	175	72%	126		Overnight											
N1124	FPO	1510	FPO	1510	72S	175	72%	126		N2123	FPO	1410	FPO	1410	72S	175	72%	126			
N1114	MCI	1215	MCI	1215	73S	110	72%	79		N2124	FPO	1620	FPO	1620	72S	175	72%	126			
N1115	MCI	1800	MCI	1800	73S	110	72%	79		N2114	MCI	1315	MCI	1315	73S	110	72%	79			
N1101	ACY	0930	ACY	0930	M80	141	72%	102		N2115	MCI	1900	MCI	1900	73S	110	72%	79			
N1099	DTW	1100	DTW	1100	M80	141	72%	102		N2101	ACY	1020	ACY	1020	M80	141	72%	102			
N1102	ACY	1220	ACY	1220	M80	141	72%	102		N2099	DTW	1150	DTW	1150	M80	141	72%	102			
N1100	DTW	1540	DTW	1540	M80	141	72%	102		N2102	ACY	1310	ACY	1310	M80	141	72%	102			
N1103	DTW	1700	DTW	1700	D9S	127	72%	91		N2100	DTW	1630	DTW	1630	M80	141	72%	102			
Overnight										N2103	DTW	1815	DTW	1815	D9S	127	72%	91			
										895	DTW	0700	DTW	0700	757	194	72%	140			

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Arrivals										Departures										
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.		
896			DTW	0912	757	194	72%	140	320(150)	893			DTW	0955	757	194	72%	140		
N1013			MEM	1010	320	150	72%	108		N2013			MEM	1050	320	150	72%	108		
N1058			MSP	1110	320	150	72%	108		N2058			MSP	1200	320	150	72%	108		
890			DTW	1220	757	194	72%	140	72S(146)	891			DTW	1305	757	194	72%	140		
N1059			MSP	1320	320	150	72%	108		N2059			MSP	1410	320	150	72%	108		
N1082			MEM	1430	320	150	72%	108		N2082			MEM	1520	320	150	72%	108		
892			DTW	1536	757	194	72%	140	72S(146)	889			DTW	1620	757	194	72%	140		
886			DTW	1626	757	194	72%	140	320(150)	887			DTW	1725	757	194	72%	140		
N1060			MSP	1820	320	150	72%	108		N2060			MSP	1910	320	150	72%	108		
N1057			DTW	1935	320	150	72%	108		N2057			DTW	2030	320	150	72%	108		
894			DTW	2338	757	194	72%	140	72S(146)	Overnight										
Overnight										470			LGA	0720	767	192	72%	138		
Overnight										229			SRQ	0755	72S	146	72%	105		
N1061			LGA	0850	757	180	72%	130		N2061			LGA	0940	757	180	72%	130		
N1063			JFK	0930	72S	146	72%	105		N2063			JFK	1020	72S	146	72%	105		
N1084			STL	1010	72S	146	72%	105		N2084			STL	1110	72S	146	72%	105		
293			LGA	1043	757	180	72%	130	M80(132)	396			LGA	1140	757	180	72%	130		
461			LGA	1143	763	233	72%	168	72S(146)	460			LGA	1240	763	233	72%	168		
N1085			JFK	1200	72S	146	72%	105		N2085			JFK	1250	72S	146	72%	105		
548			STL	1338	757	180	72%	130	M80(132)	117			STL	1425	757	180	72%	130		
763			JFK	1430	763	233	72%	168	M80(132)	268			LGA	1520	763	233	72%	168		
473			LGA	1527	757	180	72%	130	M80(132)	764			JFK	1620	757	180	72%	130		
N1062			STL	1645	72S	146	72%	105		N2062			STL	1740	72S	146	72%	105		
479			LGA	1819	757	180	72%	130	M80(132)	474			LGA	1920	M80	180	72%	130		
259			LGA	2159	767	192	72%	138	M80(132)	Overnight										
576			SRQ	2306	72S	146	72%	105	M80(132)	Overnight										
N1028			MDW	0955	72S	173	72%	125		N2028			MDW	1050	72S	173	72%	125		
N1077			IND	1115	72S	173	72%	125		N2077			IND	1210	72S	173	72%	125		
N1027			MDW	1235	72S	173	72%	125		N2027			MDW	1330	72S	173	72%	125		
N1078			IND	1610	72S	173	72%	125		N2078			IND	1700	72S	173	72%	125		
N1029			MDW	1840	72S	173	72%	125		N2029			MDW	1930	72S	173	72%	125		
Overnight										4114			TPA	0700	BE1	19	63%	12		
4071			TPA	0825	BE1	19	63%	12		4000			TPA	0855	BE1	19	63%	12		
4053			TPA	0930	BE1	19	63%	12		4019			TPA	1000	BE1	19	63%	12		
4023			TPA	1220	BE1	19	63%	12		4069			TPA	1455	BE1	19	63%	12		
N1003			TPA	1550	BE1	19	63%	12		N2003			TPA	1630	BE1	19	63%	12		
4061			TPA	1710	BE1	19	63%	12		4115			TPA	1735	BE1	19	63%	12		
4065			TPA	2040	BE1	19	63%	12		Overnight										
1752			ORD	0028	767	203	72%	146	733(134)	1753			ORD	0745	767	203	72%	146		
Overnight										N2087			DEN	0810	320	144	72%	104		
N1016			IAD	0915	320	144	72%	104		N2016			IAD	1010	320	144	72%	104		

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Table III-10.3

PAL 2 Design Day Schedule

Arrivals										Departures								
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.
N1066		ORD	ORD	1025	320	144	72%	104		N2066		ORD	ORD	1115	320	144	72%	104
N1095		SFO	SFO	1100	763	206	72%	148		N2095		SFO	SFO	1220	763	206	72%	148
344		ORD	ORD	1128	763	206	72%	148	757(188)	499		ORD	ORD	1230	763	206	72%	148
N1088		DEN	DEN	1250	320	144	72%	104		N2088		DEN	DEN	1340	320	144	72%	104
N1067		IAD	IAD	1245	320	144	72%	104		N2067		IAD	IAD	1345	320	144	72%	104
N1065		ORD	ORD	1400	733	134	72%	96		N2065		ORD	ORD	1450	733	134	72%	96
N1064		DEN	DEN	1510	320	144	72%	104		N2064		DEN	DEN	1600	320	144	72%	104
N1086		ORD	ORD	1620	320	144	72%	104		N2086		ORD	ORD	1710	320	144	72%	104
N1096		SFO	SFO	1640	763	206	72%	148		N2096		SFO	SFO	1750	763	206	72%	148
N1017		IAD	IAD	1730	320	144	72%	104		N2017		IAD	IAD	1835	320	144	72%	104
N1068		ORD	ORD	1910	320	144	72%	104		N2068		ORD	ORD	2010	320	144	72%	104
N1087		DEN	DEN	2240	320	144	72%	104		Overnight								
406		MHH	MHH	1215	SH6	36	63%	23		407		MHH	MHH	1330	SH6	36	63%	23
Overnight										3031		TPA	TPA	0630	DH8	37	63%	23
5330		JAX	JAX	0800	BE1	19	63%	12		5300		JAX	JAX	0655	DH8	37	63%	23
3096		TPA	TPA	0910	DH8	37	63%	23		5284		TLH	TLH	0820	BE1	19	63%	12
5300		JAX	JAX	0955	DH8	37	63%	23	BE1(19)	3017		TPA	TPA	0925	DH8	37	63%	23
5359		MCO	MCO	1020	BE1	19	63%	12		5568		MCO	MCO	1015	DH8	37	63%	23
N1105		TLH	TLH	1035	CRJ	50	63%	32		5359		MCO	MCO	1035	BE1	19	63%	12
3180		TPA	TPA	1059	DH8	37	63%	23		N2105		TLH	TLH	1130	CRJ	50	63%	32
5284		TLH	TLH	1210	DH8	37	63%	23	BE1(19)	3069		TPA	TPA	1130	DH8	37	63%	23
3029		TPA	TPA	1225	DH8	37	63%	23		5333		MCO	MCO	1230	DH8	37	63%	23
3067		TPA	TPA	1345	DH8	37	63%	23		3052		MHH	MHH	1300	DH8	37	63%	23
N1002		JAX	JAX	1420	BE1	19	63%	12		3027		TPA	TPA	1405	DH8	37	63%	23
N1106		TLH	TLH	1500	CRJ	50	63%	32		N2002		JAX	JAX	1450	BE1	19	63%	12
5360		MCO	MCO	1550	BE1	19	63%	12		N2106		MCO	MCO	1550	CRJ	50	63%	32
3166		MHH	MHH	1620	DH8	37	63%	23		5288		TLH	TLH	1615	BE1	19	63%	12
5304		MCO	MCO	1815	BE1	19	63%	12		3166		TPA	TPA	1720	DH8	37	63%	23
3061		TPA	TPA	1825	DH8	37	63%	23		5304		MCO	MCO	1830	BE1	19	63%	12
N1006		JAX	JAX	1850	DH8	37	63%	23		3064		TPA	TPA	1840	DH8	37	63%	23
5288		TLH	TLH	2005	DH8	37	63%	23	BE1(19)	N2006		JAX	JAX	1930	DH8	37	63%	23
3041		TPA	TPA	2110	DH8	37	63%	23		Overnight								
Overnight										Overnight								
N1090		CLT	CLT	0910	320	144	72%	104		1421		PHL	PHL	0640	757	182	72%	131
N1020		BWI	BWI	0930	737	141	72%	102		1527		CLT	CLT	0700	757	182	72%	131
N1073		LGA	LGA	0940	734	146	72%	105		1795		DCA	DCA	0720	734	146	72%	105
Overnight										1640		PIT	PIT	0831	734	146	72%	105
Overnight										1681		CLT	CLT	0930	757	182	72%	131
Overnight										N2090		DCA	DCA	1000	320	144	72%	104
Overnight										N2020		BWI	BWI	1015	737	141	72%	102
Overnight										N2073		LGA	LGA	1030	734	146	72%	105

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricordo & Associates

Table III-10.3

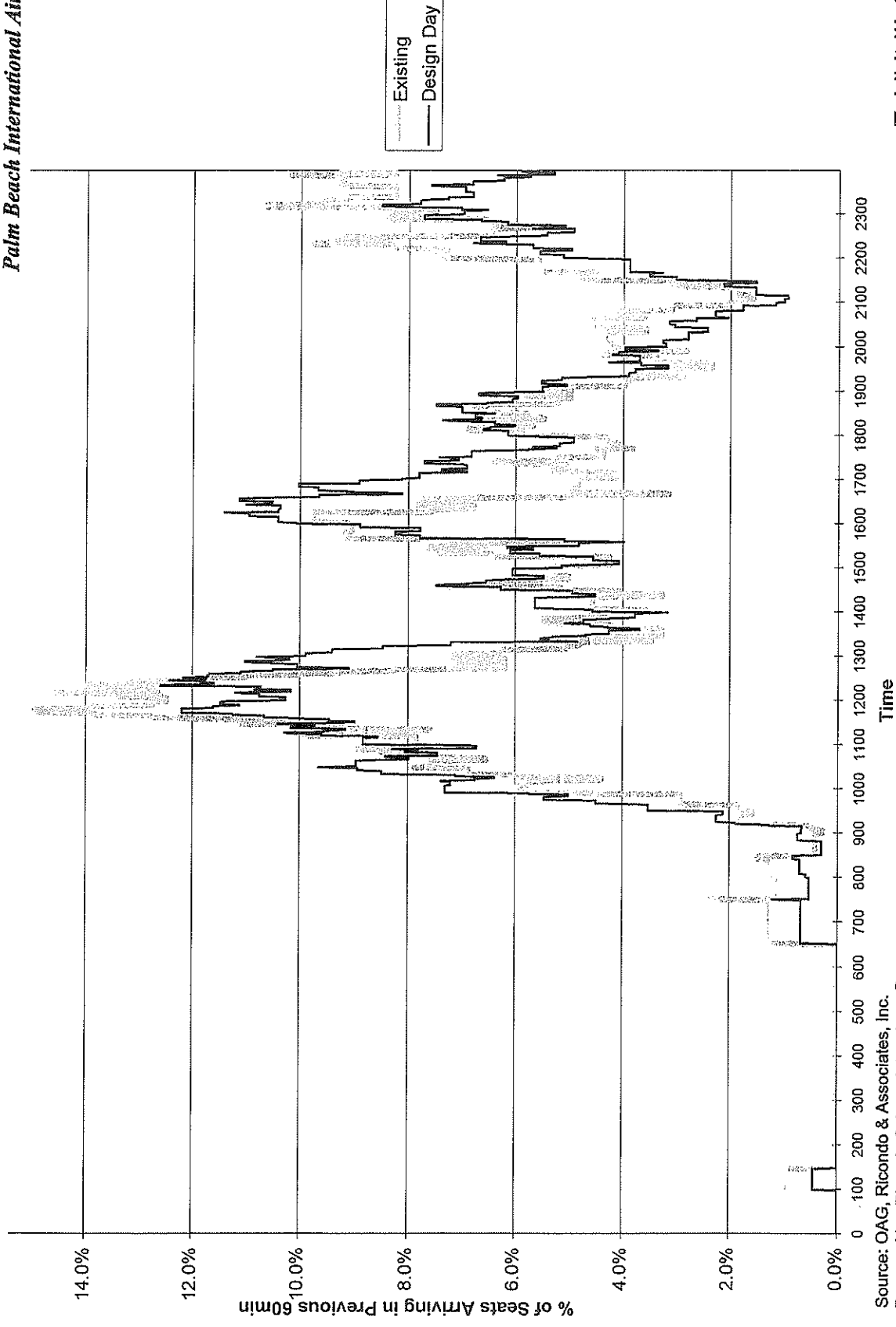
PAL 2 Design Day Schedule

Arrivals										Departures									
Carrier	Oper	A Flt#	Origin	Atime	Equip	Seats	Load%	Pass.	March 1998 Equip	Carrier	Oper	D Flt#	Dest	Dtime	Equip	Seats	Load%	Pass.	
		1714	PHL	0939	757	182	72%	131	734(146)			326	PHL	1034	757	182	72%	131	
		N1026	DCA	0945	734	146	72%	105				N2026	PIT	1040	734	146	72%	105	
		N1076	CLT	1020	734	146	72%	105				N2076	CLT	1115	734	146	72%	105	
		N1120	ORF	1040	734	146	72%	105				N2120	ORF	1125	734	146	72%	105	
		2200	PHL	1053	757	182	72%	131	734(146)			2285	DCA	1144	757	182	72%	131	
		N1097	PVD	1100	734	146	72%	105				N2097	PVD	1145	734	146	72%	105	
		N1025	PIT	1120	320	144	72%	104				N2025	BWI	1215	320	144	72%	104	
		1753	LGA	1135	757	182	72%	131	M80(141)			531	PHL	1226	757	182	72%	131	
		321	BWI	1154	734	146	72%	105	733(128)			995	CLT	1240	734	146	72%	105	
		1924	DCA	1205	757	182	72%	131	733(128)			1440	PIT	1256	757	182	72%	131	
		1930	PHL	1252	757	182	72%	131	733(128)			1186	LGA	1340	757	182	72%	131	
		665	CLT	1259	757	182	72%	131	M80(141)			888	PHL	1350	757	182	72%	131	
		N1117	BUF	1310	320	144	72%	104				N2117	BUF	1400	320	144	72%	104	
		N1070	BWI	1345	734	146	72%	105				N2070	CLT	1440	734	146	72%	105	
		N1098	PVD	1400	734	146	72%	105				N2098	PVD	1445	734	146	72%	105	
		1223	PIT	1425	757	182	72%	131	73S(110)			254	BWI	1510	757	182	72%	131	
		N1118	ALB	1430	734	146	72%	105				N2118	ALB	1525	734	146	72%	105	
		N1072	DCA	1500	734	146	72%	105				N2072	DCA	1550	734	146	72%	105	
		2250	CLT	1520	757	182	72%	131	734(146)			1434	CLT	1610	757	182	72%	131	
		N1074	LGA	1540	757	182	72%	131				N2074	LGA	1630	757	182	72%	131	
		N1069	PHL	1555	734	146	72%	105				N2069	PIT	1645	734	146	72%	105	
		1847	DCA	1631	757	182	72%	131	733(128)			1636	DCA	1715	757	182	72%	131	
		N1075	CLT	1650	734	146	72%	105				N2075	PHL	1740	734	146	72%	105	
		2257	PIT	1712	M80	141	72%	102	733(128)			2282	PIT	1804	M80	141	72%	102	
		N1071	PHL	1745	734	146	72%	105				N2071	CLT	1840	734	146	72%	105	
		N1119	PVD	1750	734	146	72%	105				N2119	PVD	1845	734	146	72%	105	
		1187	CLT	1831	757	182	72%	131	M80(141)			1478	CLT	1920	757	182	72%	131	
		N1089	BWI	1900	734	146	72%	105				N2089	BWI	1945	734	146	72%	105	
		647	LGA	1956	757	182	72%	131	M80(141)			1554	LGA	2045	757	182	72%	131	
		1807	PIT	2026	757	182	72%	131	734(146)			1152	PHL	2121	757	182	72%	131	
		514	CLT	2200	757	182	72%	131	M80(141)			Overnight							
		1701	CLT	2345	734	146	72%	105				Overnight							
		1800	DCA	2253	734	146	72%	105	733(128)			Overnight							
		1119	PHL	2141	757	182	72%	131	734(146)			Overnight							
		1817	PHL	2357	757	182	72%	131	M80(141)			Overnight							
		N1021	MKE	1210	M80	116	72%	84				N2021	MKE	1315	M80	116	72%	84	
		N1022	MKE	1545	M80	116	0.72	84				N2022	MKE	1650	M80	116	0.72	84	

Note: Flights added to March 1998 activity schedule are designated with flight numbers beginning with the letter "N", all carrier information has been removed.

Sources: OAG; Passenger Air Service Demand Analysis; Ricondo & Associates

Palm Beach International Airport

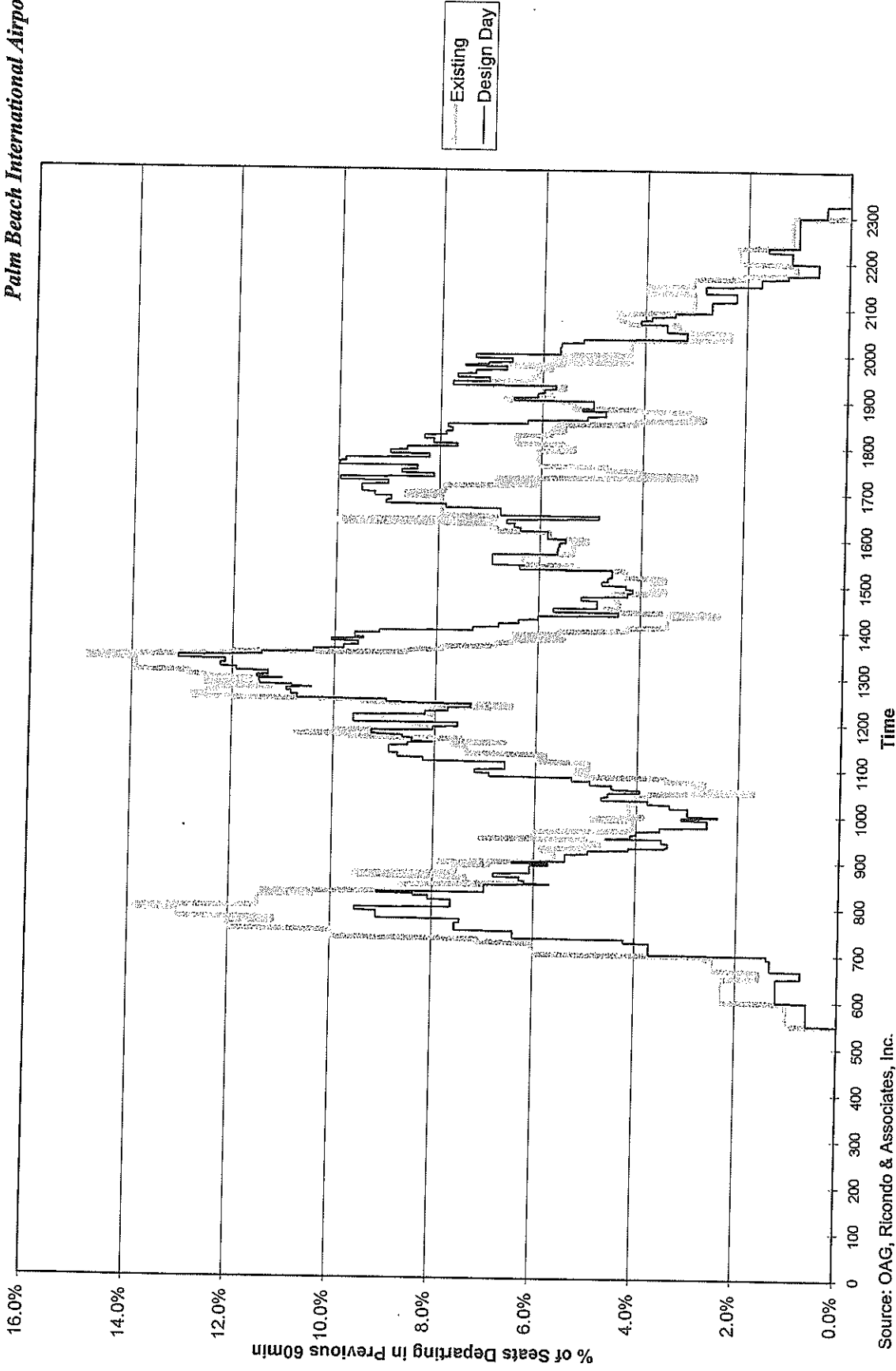


Source: OAG, Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Exhibit III-10.3

**PAL 1 -
Rolling 60min Count of Arriving Seats**

Palm Beach International Airport

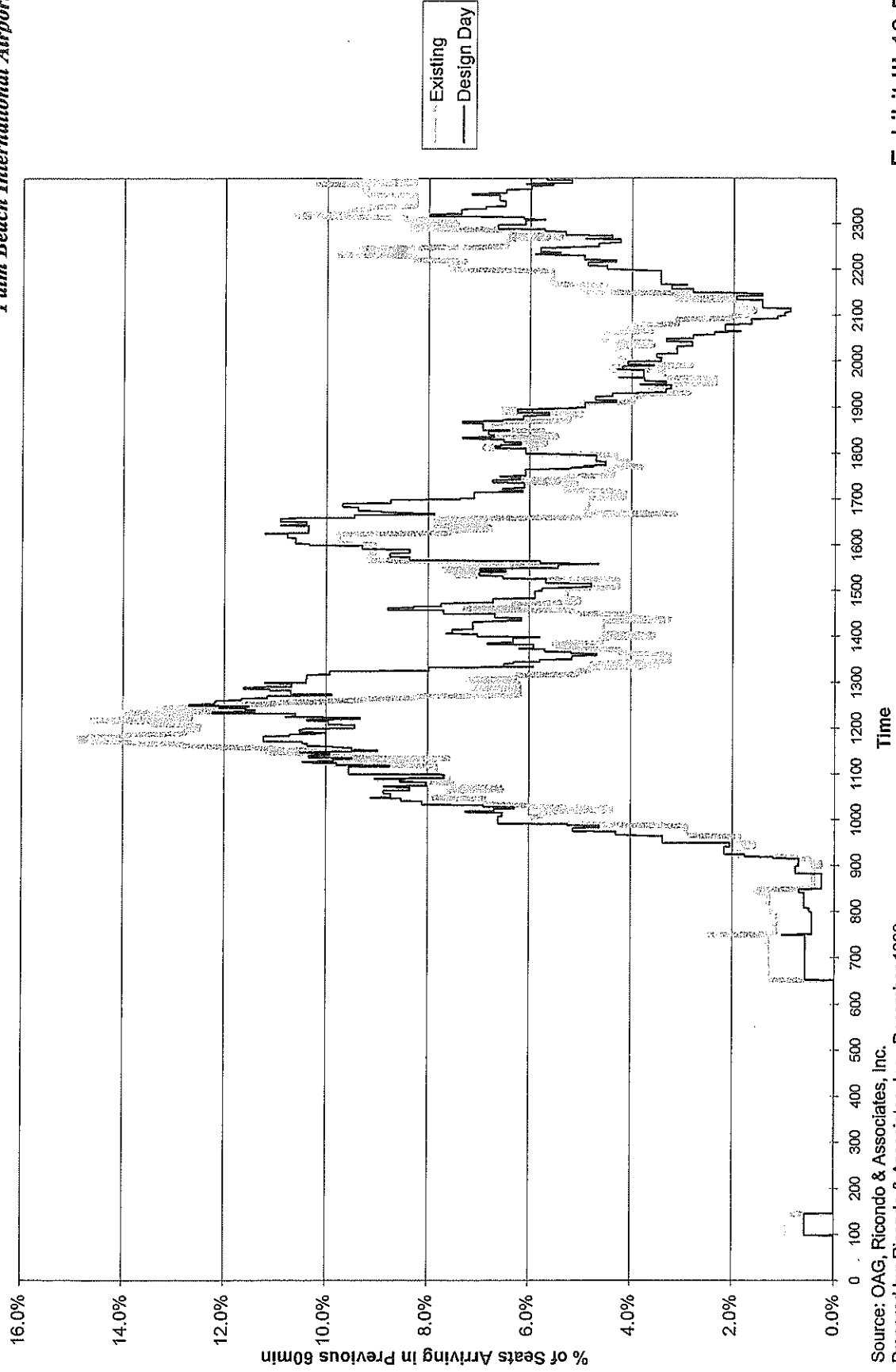


Source: OAG, Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., December 1998

Exhibit III-10.4

PAL 1 - Rolling 60min Count of Departing Seats

Palm Beach International Airport



Source: OAG, Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Exhibit III-10.5

**PAL 2 -
Rolling 60min Count of Arriving Seats**

Palm Beach International Airport

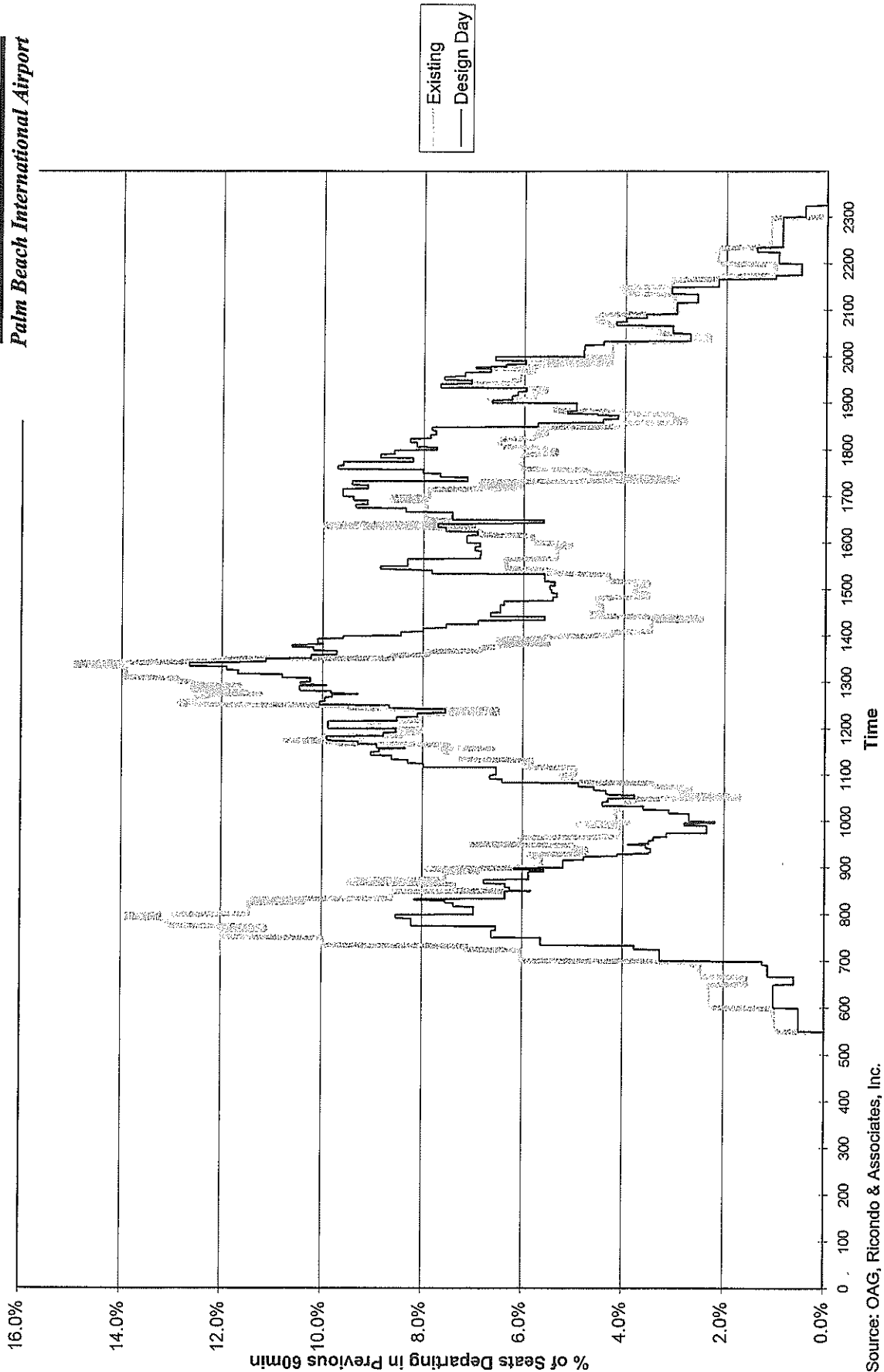


Exhibit III-10.6

**PAL 2 -
Rolling 60min Count of Departing Seats**

Source: OAG, Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., December 1998

Table III-10.5

Design Day Peak Hour Activity

	<u>PAL 1</u>	<u>PAL 2</u>
Peak Hour -- Arriving Activity		
Arriving Seats	3,797 11:22 - 12:21	4,505 11:32 - 12:31
Arriving Passengers	2,553 11:22 - 12:21	3,213 11:32 to 12:31
Peak Hour -- Departing Activity		
Departing Seats	3,942 12:25 - 13:24	4,490 12:25 - 13:24
Departing Passengers	2,654 12:25 - 13:24	3,210 12:25 - 13:24

Sources: Existing - March 10, 1998 Schedule, Official Airline Guide; Design Day Schedule - Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., April 1999

Section IV

IV. Demand/Capacity Assessment and Facility Requirements

This section documents the assessment of Airport facilities relative to their ability to accommodate existing and projected levels of activity from a capacity standpoint. The purpose of this comparison is to determine where deficiencies presently exist or are expected to develop in the future as demand growth materializes. Once existing or future deficiencies are identified, the type and timing of facility development can be determined.

The future levels of demand for both aircraft and passenger activity define future facility needs. A review of existing relationships between facilities and demand for the various Airport components was conducted to identify potential deficiencies in their capacity. Capacity, as defined for this study, represents the processing and storage capabilities of a facility or airport system. It takes into consideration the level of service or convenience that is acceptable to the DOA/County, Airport users and communities served by PBIA. As such, the definition of capacity is unique to each airport, since the level of service thresholds varies from airport to airport. For purposes of assessing future facility requirements, an acceptable operating level of service was established for each facility type, and compared to the projected demand levels.

In general, the number of passengers passing through the terminal determines the overall space requirements for the facility. Passenger characteristics (i.e. O&D versus connecting, domestic versus international, etc.) define the distribution of terminal space by function. Similarly, aircraft size, flight frequencies, aircraft operations type, (arriving or departing) and peaking (clustering of arrivals or departures) characteristics influence the need for additional runways, taxiways, and apron areas. Peaking characteristics define, in great part, the number of facilities or the sizing for various facilities required to serve the projected demand levels.

The various airport components are analyzed separately to determine their ability to serve existing and future demand levels, which in turn serve to identify gross facility requirements. These facility requirements are then combined to identify airport development alternatives. The following airport components were assessed:

- **Airfield:** Includes the runway and taxiway system. The ability of the airfield system to serve the projected demand levels and profiles in terms of runway capacity and design standards was evaluated. Aircraft apron requirements have been identified in association with the functional areas they serve.
- **Passenger Terminal:** Includes the terminal building from the curbfront to the gates. Enplaning, deplaning, and O&D connecting passenger demand levels define the need for various facilities such as ticket counters, baggage claim devices, security screening stations, and holdrooms, among other building elements. International arrivals activity defines the space requirements for the Federal Inspection Services (FIS) areas.
- **Airport Support Facilities:** These facilities include cargo facilities, General Aviation (GA)/Fixed Base Operators (FBO), Airport Rescue and Fire Fighting (ARFF), and aircraft fueling facilities. The cargo facilities serve both the all-cargo (freight) activity and belly cargo that is transported on regularly scheduled passenger aircraft. The GA/FBO facilities accommodate privately owned and corporate-owned based and transient aircraft. GA/FBO

facilities typically include aircraft storage facilities such as T-hangars, corporate hangars, conventional hangars, and/or aircraft parking/tiedown areas.

- **Roadways:** Includes on-Airport roadways including the access roads, service roads, enplaning/deplaning curbside, and vehicle parking.

4.1 Airfield Demand/Capacity Analysis

The purpose of the airfield demand/capacity analysis is to assess the capability of the airfield facilities to accommodate existing and projected aircraft demand. In evaluating the ability of the Airport to accommodate these demand levels, airfield/runway capacity and aircraft delay were identified using the methodologies outlined in FAA Advisory Circular (AC) 150/5060-5 (Change2), *Airport Capacity and Delay*.

Airfield capacity, sometimes referred to as throughput capacity, is defined as the maximum number of aircraft operations that an airfield can accommodate during a specific period of time. The capacity varies according to weather conditions, types of aircraft, and ATC airspace handling procedures. The number and location of runway exits and the share of touch and go operations also influence the airfield's capacity. Aircraft delays increase exponentially as the number of aircraft operations (aircraft demand) nears or exceeds the airfield capacity under a specific operating condition. The following airfield capacity and aircraft delay definitions, as defined by the FAA, are used in this evaluation:

- **Peak hour capacity.** Peak hour capacity is the maximum number of aircraft operations that can occur in one hour under specific operating conditions.
- **Annual service volume (ASV).** The ASV, as defined in the FAA's *Airport Capacity and Delay*, "is a reasonable estimate of an airport's annual capacity."
- **Average annual delay per operation.** This measure is an estimate of the average delay each aircraft operation in a given year would experience. Some aircraft operations, such as those in peak operating hours, would likely experience higher delays on average while other operations, such as nighttime operations, would likely experience lower delays on average.
- **Total annual hours of aircraft delay.** This measure is an estimate of the total hours of aircraft delay experienced annually at the Airport (annual aircraft operations times the average annual delay per aircraft).

4.1.1 Factors Affecting Airfield Capacity

The capacity of an airfield system, including the runways and associated exit taxiways, is not constant over time. As discussed above, there are a variety of factors that can affect the airfield capacity at an airport including:

- *the runway configuration,*
- *number and location of exit taxiways,*
- *runway use restrictions,*
- *the percentage of time the Airport experiences poor weather conditions, i.e. low cloud ceilings and/or low visibility conditions,*

- the types of aircraft operating at the Airport (aircraft mix),
- runway use as dictated by wind conditions, and
- the level of touch-and-go activity.

4.1.1.1 Runway Configuration

The number of runways, orientation, the location of runway intersections, and the lateral separation between parallel runways are primary factors affecting airfield capacity. The number of runway exits, their location, and their type (i.e. high speed, 90 degree, etc.) also affect the airfield's capacity.

Aircraft operations on intersecting runways are typically considered dependent operations. Aircraft separations must be increased to allow adequate time for aircraft operations on the intersecting runway to occur safely. The amount of in-trail separation between aircraft is dependent on the type of operation (arrival/departure) and the distance between the runway intersection and the approach end of the runways. As the distance between the end of the runway and the intersection increases, the amount of in-trail separation that is required may also increase. This is due to the greater amount of time that an aircraft requires to travel beyond the runway intersection and allow for an operation on the intersecting runway to commence. As in-trail separations are increased, airfield capacity decreases.

Airports with intersecting runways may improve airfield capacity through the utilization of Land and Hold Short Operations (LAHSO). LAHSOs allow for arrival and/or departure operations on one runway to occur independent of aircraft arrivals on the intersecting runway. These operations are only permitted on runways where sufficient landing distance exists.

Given the recent concerns expressed by the Airline Pilots Association (ALPA) and the FAA, LAHSOs are now restricted at many U.S. airports. However, FAA Order 7110.118, *Land and Hold Short Operations* establishes FAA initiatives to improve operational safety during LAHSO operations. Once fully implemented by the FAA and accepted by ALPA, LAHSO operations are expected to resume at most airports.

When an airfield configuration includes parallel runways, the lateral spacing between the runways also affects the airfield's capacity. Parallel runways with a lateral separation of 2,500 feet or greater and serving large aircraft can operate as independent runways during VFR and MVFR weather conditions. This allows for aircraft to arrive or depart on each runway simultaneously. If the lateral separation is less than 2,500 feet, as is the case at PBIA, operations during MVFR conditions become dependent. During VFR conditions, simultaneous arrivals and simultaneous departures become dependent if wake turbulence is a concern. These dependencies require an increase in the in-trail separations, thus reducing airfield capacity. The minimum lateral spacing between parallel runways during VFR and MVFR conditions is 700 feet.

During IFR conditions in a radar-controlled environment, the minimum lateral spacing between parallel runways is 2,500 feet for dependent operations. At this separation, simultaneous departures may occur independently. Dependent staggered approaches to the parallel runway are typically conducted with a minimum of 1.5 mile separation diagonally between successive aircraft on the adjacent runways. Increasing the lateral separation of the runways to 4,300 feet or more would allow for simultaneous arrival and/or simultaneous departure operations on the parallel runways during IFR conditions, provided both runways have an instrument approach procedure. If the airport is equipped

with a Precision Radar Monitor, simultaneous arrivals and/or simultaneous departures may occur during IFR conditions with a separation of 3,400 feet between parallel runways.

Another factor affecting airfield capacity is the amount of time an aircraft occupies a runway. Runway occupancy time for arriving aircraft is dependent on the number, type, and location of runway exits, as well as the aircraft's performance. Typically, lighter aircraft require less runway distance for landing, hence, less time occupying the runway. However, if a runway exit is not available once the aircraft has had an opportunity to decelerate to a speed that allows for the safe maneuvering off the runway, airfield capacity is compromised.

Runway occupancy times can also be reduced with the presence of high-speed exit taxiways. High-speed exit taxiways are aligned at an acute angle relative to the runway centerline, typically between 30 and 45 degrees relative to the runway orientation. This allows landing aircraft to exit at a higher speed than standard exit taxiways that are perpendicular to the runway. This results in a lower runway occupancy time, which increases airfield capacity.

4.1.1.2 Weather Conditions

The airfield capacity can also vary significantly due to the weather conditions experienced at the Airport. Prevailing winds (direction and speed) dictate which runways can be used for aircraft arrival and departure operations. Aircraft typically land and takeoff into the wind, and can accommodate a limited amount of crosswind and tailwind. If the maximum crosswind or tailwind is exceeded, the aircraft may not operate on that particular runway. Therefore, wind conditions may prevent use of a higher-capacity runway operating configuration, thus increasing aircraft delays.

Other meteorological conditions affecting airfield capacity include cloud ceiling height and visibility. Low cloud ceiling heights and visibility conditions result in increased spacing between aircraft in the airspace surrounding the Airport. These conditions may also cause restrictions on which runways can be used. Three operating conditions have been established based on cloud ceiling height and visibility:

- Visual Flight Rules (VFR) conditions,
- Marginal VFR (MVFR) conditions, and
- Instrument Flight Rules (IFR) conditions.

Visual Flight Rules govern the procedures used to conduct flight operations under Visual Meteorological Conditions (VMC). Similarly, Instrument Flight Rules govern the procedures used to conduct flight operations under Instrument Meteorological Conditions (IMC). The criteria for establishing the three operating conditions are summarized in **Table IV-1**.

Table IV-1

Operating Conditions for Airfield Capacity and Aircraft Delay Analysis

<u>Classification</u>	<u>Weather Conditions</u>		
	<u>Visibility</u>		<u>Cloud Ceilings</u>
VFR	Greater than or equal to 5 statute miles.	and/or	Greater than or equal to 3,000 feet AGL.
MVFR	Less than 5 statute miles but greater than or equal to 3 statute miles.	and/or	Less than 3,000' AGL but greater than or equal to 1,000' AGL.
IFR	Less than 3 statute miles.	and/or	Less than 1,000'.

Source: FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*
 Prepared by: Ricondo & Associates, Inc., October 2000

During MVFR and IFR conditions, in-trail separations for approaches and departures are increased, thus reducing the hourly capacity of the airfield. Airfield capacity is often further reduced when IFR conditions occur. This is due to the restriction of aircraft arrivals to runways with an established instrument approach procedure, (e.g. Runways 9L and 27R). During IFR conditions, procedures for aircraft arrivals and departures on parallel runway operations are also limited. From a capacity calculation standpoint, aircraft operational demand levels and the mix index may also be reduced during IFR conditions, as private pilots must have an instrument rating in order to fly during these conditions.

4.1.1.3 Aircraft Fleet Mix

The aircraft fleet mix is an important factor in determining an airport's airfield capacity. As the diversity of approach speeds and aircraft weights increase, airfield capacity decreases. This is due to a safety issue referred to as wake vortices or wake turbulence. This is a phenomenon that creates air turbulence behind an airplane as a result of its movement through the air. Heavier aircraft result in more severe wake vortices than smaller aircraft. Although it is also more prevalent during departure operations than arrivals, wake vortices are considered a significant safety hazard during any operation.

In order to alleviate the hazards of wake vortices, aircraft are spaced according to the difference in their airspeeds and weight. Lighter aircraft are more susceptible to damage from wake vortices than heavy aircraft. Therefore, light aircraft are typically required to wait up to two minutes before operating on a runway after a heavy aircraft. This delay results in a loss in airfield capacity. The greater the size and weight differential of the aircraft fleet, the greater the separation required between successive aircraft operations.

The FAA's Airport Capacity and Delay Handbook utilizes a factor referred to as the "mix index" to account for aircraft composition of the fleet mix. The mix index is a factor represented as a percentage to quantify the share of large aircraft in the fleet mix. In order to establish the mix index, aircraft are assigned to one of five categories based on the maximum certified takeoff weight of the aircraft. Based on the number of operations for each classification, a percentage is established to

quantify the share of total aircraft operations. Table IV-2 summarizes the weight classifications of the five aircraft categories considered in the fleet mix.

Table IV-2

Aircraft Classifications for Establishing Aircraft Mix Index

Aircraft Classification	Maximum Certified Takeoff Weight (pounds)	Representative Aircraft
Small	12,500 or less	Piper PA-23, Cessna C-180 Cessna C-207, and King Air
Small +	12,501 to 41,000	Lear 25, Cessna Citation, and Grumman G-1
Large	41,001 to 220,000	Gulfstream IV, F-28, Dash 8, B737 and B727
B757	220,001- to 300,000	B757
Heavy	300,001 or more	A-300, B-767, L1011, DC-10, New Large Aircraft

Source: FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*
Prepared by: Ricondo & Associates, Inc., October 2000

4.1.1.4 Touch and Go Operations

Touch-and-go operations are defined as operations by a single aircraft that lands and departs without stopping or exiting the runway. Pilots conducting touch-and-go operations are usually conducting training exercises and thus, stay in the airport traffic pattern. Analytically, airport capacity, in terms of the number of operations handled, increases with the ratio of touch-and-go operations to total operations. The reason for this is that aircraft in the pattern are continually making approaches and departures without incurring significant runway occupancy time. A touch and go operation is also counted as two operations; one arrival and one departure. However, continuous touch-and-go operations reduce the availability of the runway for other non-training operations.

4.1.2 Airfield Capacity and Delay Analyses

The existing airfield capacity is presented in terms of both hourly capacity and annual service volume for 1998, Planning Activity Level 1 (PAL 1) and Planning Activity Level 2 (PAL 2). Average aircraft delay levels and total annual aircraft delays were also estimated for each of the three demand thresholds.

A comparison of estimated hourly and annual demand is also presented for Runways 9L-27R and 13-31. This secondary assessment is due to Runway 9R-27L being restricted to light general aviation aircraft only. The purpose of assessing these two runways separately is to determine the adequacy to accommodate the demand of aircraft that are not capable of operating from Runway 9R-27L.

4.1.2.1 Overview of Airfield Capacity Assessment

For each runway use configuration, hourly capacities were established for the three operating conditions: VFR, MVFR, and IFR. Historical weather data obtained from the National Climatic Data

Center was utilized to establish the availability of each runway use configuration during the three operating conditions.

A weighted hourly capacity was then established based on the occurrence rate of each runway use configuration/weather condition and their respective hourly capacities. The weighted hourly capacity forms the basis for determining the airfield's ASV. The ASV represents an estimate of the annual number of aircraft operations the Airport can efficiently accommodate taking hourly, daily, and monthly operational patterns into consideration.

The formula for calculating ASV is comprised of three variables: C_w (weighted hourly capacity), D (the ratio of annual demand to average daily demand in the peak month), and H (the ratio of average daily demand to average peak hour demand during the peak month). These variables are multiplied together ($C_w * D * H$) to obtain the ASV for the airport.

The delays associated with the airfield are computed utilizing the FAA Annual Delay Model. This model is a computer program that calculates the hourly delays for a number of conditions that are representative of the seasonal and daily variations in demand, weather, runway use and capacity. The model assumes that the variations in demand over the year can be characterized by a number of representative daily demands. The occurrence of different weather conditions and runway uses, and hourly runway capacity parameters corresponding to these occurrences are provided as input to the model. The delay model calculates hourly delays for each hour of the year using delay curves from FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*. The average delay per aircraft operation for the year is computed by aggregating these estimated hourly delays.

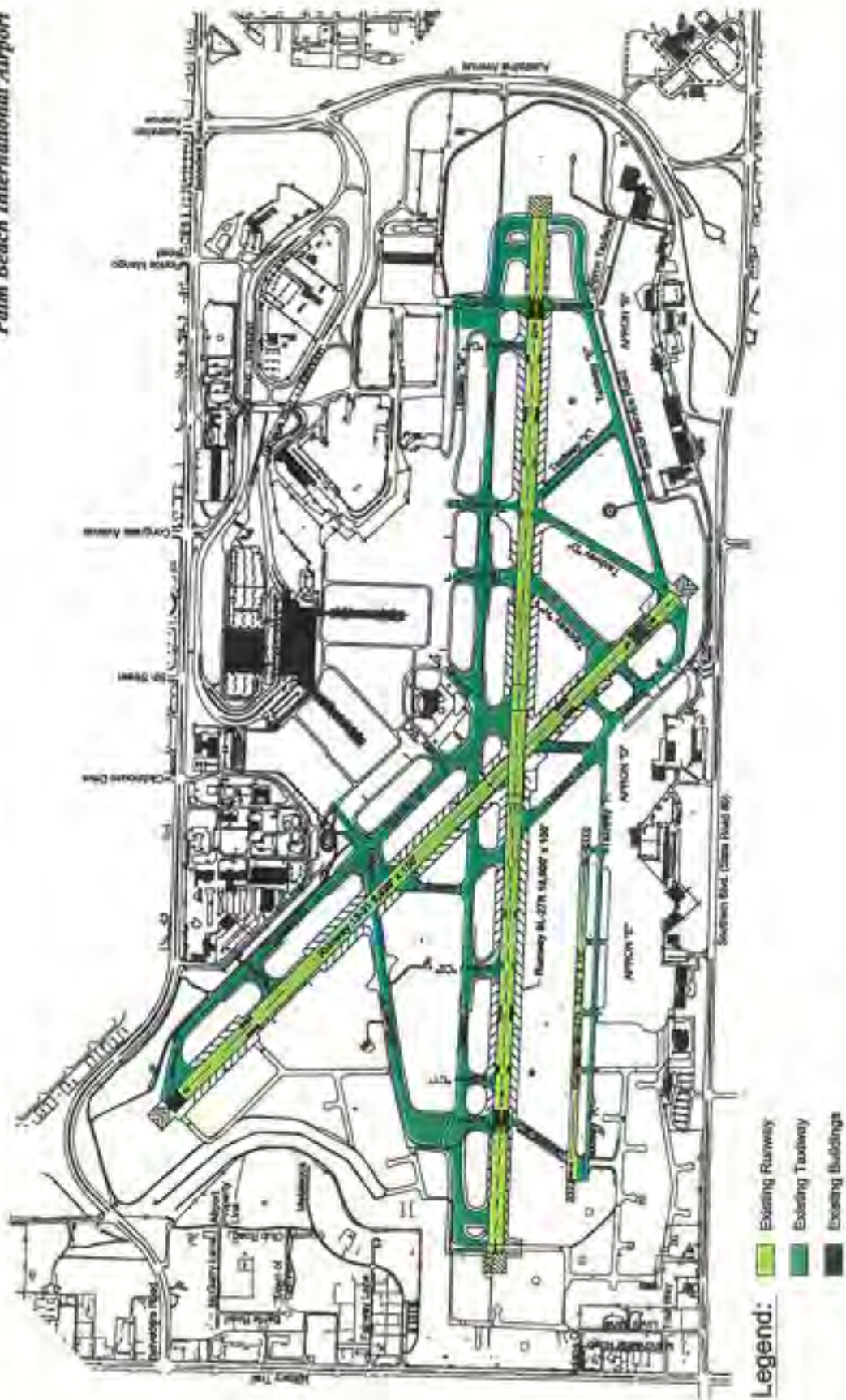
4.1.2.2 Hourly Airfield Capacity

When hourly demand begins to reach hourly capacity, aircraft delays grow at an increasing rate. These delays take the form of extended traffic patterns and departure queue delays in VFR and MVFR conditions or holding patterns and flow control delays in IFR conditions.

The following presents the hourly capacity assessment for PBIA. It documents the existing airfield, the various runway use configurations, aircraft fleet mix projections, and historical weather conditions. The hourly capacities associated with existing (1998) operational demand levels, as well as those estimated for PAL 1 and PAL 2, are also presented for VFR, MVFR and IFR conditions. These capacities are then compared to the projected peak hour demand levels to assist in the identification of potential operational delays during peak demand periods.

The existing airfield configuration is presented in **Exhibit IV-1**. The runway configuration consists of two parallel runways, Runways 9R-27L and 9L-27R, and one crosswind runway, Runway 13-31. The parallel runways have a lateral separation of 700 feet. This separation is not adequate for independent operations during IFR or MVFR conditions. Runway 9R-27L currently serves general aviation aircraft (i.e., Airplane Design Groups I and II, as defined by the FAA) exclusively. Runway 13-31 intersects Runway 9L-27R and the extended centerline of Runway 9R-27L, thus making their operations dependent.

Exhibit IV-2 illustrates the runway use configurations for PBIA during VFR, MVFR and IFR weather conditions. As depicted, the Airport's airfield has basically two operating conditions: one operating to the east, the other to the west. During VFR and MVFR conditions, Runways 9R-27L and 9L-27R serve both aircraft arrivals and departures. In west flow, Runway 31 is typically utilized



Legend:

- Existing Runway
- Existing Taxiway
- Existing Buildings



Source : Airport Management Records, November 1998
 Prepared By : Ricordo & Associates, Inc., March 1999

Exhibit IV-1

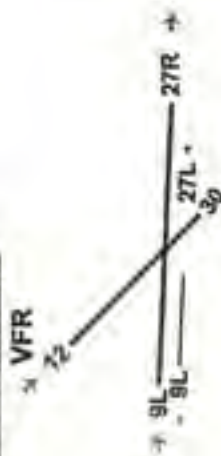
Existing Airfield

Exhibit IV-1.dwg

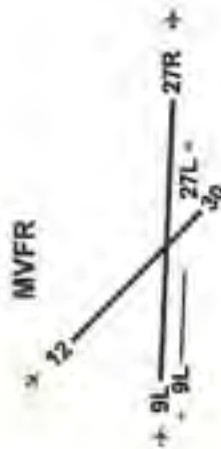
Strategic Master Plan Study

October 2000

East Configuration



(56.7% Occurrence)

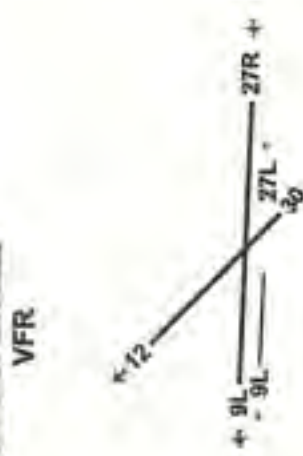


(5.0% Occurrence)



(1.34% Occurrence)

West Configuration



(33.3% Occurrence)



(3.0% Occurrence)



(0.66% Occurrence)

Source: PBIA Airport Layout Plan.
Prepared by: Ricoondo & Associates, Inc.



Legend: Depicts Arrival Runway Depicts Departure Runway

Exhibit IV-2

Airfield Operating Configurations

for departures to the north by general aviation aircraft only while Runway 13 is limited to some Land and Hold Short Operations (LAHSO) in east flow. During IFR conditions, only approaches to either Runway 9L in east flow or Runway 27R in west flow are conducted.

Exhibit IV-2 also shows the percentage of time each operating condition occurs. This information is based on historical weather data for a ten year period between January 1, 1986 and December 31, 1995. Overall, the airfield operates in east flow configuration 63% of the time, and west flow configuration 37% of the time. Additionally, VFR, MVFR, and IFR conditions occur 90%, 8%, and 2% of the time, respectively.

Table IV-3 summarizes the distribution of aircraft types, by weight classification, for each runway. The table shows fleet mix distributions experienced during 1998 and the projected fleet mix associated with PAL 1 and PAL 2 for each runway. The 1998 data was collected from the Aviation Data Systems C.A.T.E.R. and reflects actual Airport activity for the period beginning on September 1997 and ending on August 1998.

As shown in Table IV-3, the future fleet mix for PBIA reflects an increase in the proportion of air carrier activity by large (e.g. B757 or equivalent) and heavy (e.g. B767 or equivalent) aircraft throughout the planning horizon. Small aircraft activity is expected to decrease (as a percent of total activity) during the same period to reflect greater utilization of the nearby general aviation airports. The larger share of heavy aircraft in the fleet would be expected to adversely impact the capacity of the existing airfield will decrease as a result of wake turbulence separation requirements.

Table IV-4 presents the VFR hourly capacity estimates for the two operating configurations considered, i.e. existing airfield (including the extension to Runway 9L-27R), during east flow and west flow operations. The hourly capacities are shown for three conditions: (1) activity consisting of 60 percent arrivals and 40% departures, (2) activity consisting of 40% arrivals and 60% departures, and (1) activity evenly distributed between arrivals and departures.

The VFR hourly capacities presented in Table IV-4 for 1998 are 111 operations when operating to the east and 90 operations during a west flow configuration given a 50% arrival/departure split. At PAL 1, the hourly VFR capacities for the same configurations are reduced to 87 operations and 73 operations respectively. At PAL 2, they further decrease to 82 and 68 operations, respectively. The reduction in capacity at PAL 1 and PAL 2 reflects the increase in the mix index as a result of increased operations by large and heavy aircraft. In addition, the VFR capacity associated with operations to the east (Runways 9L, 9R and 13) is greater than the VFR capacity to the west. This is due to the assumption that approximately 14 land and hold short operations per hour could be performed on Runway 13 in the east configuration.

It should also be noted that the VFR hourly capacities for PBIA include consideration for Runway 9R-27L being restricted to light general aviation aircraft. Consequently, all aircraft operations on Runway 9R-27L must maintain wake turbulence separation from heavy aircraft operations on Runway 9L-27R, resulting in a slight decrease in hourly capacity. Chapter 4 of *Airport Capacity and Delay*, "Special Applications", provides the methodology for this operating condition.

Table IV-5 summarizes the hourly capacities during MVFR conditions for the two operating configurations considered. Under these conditions, the 1998 hourly capacity, assuming a 50% arrivals mix, is estimated at 78 operations during the east operating configuration and 57 operations

Table IV-3
Aircraft Fleet Mix Distribution By Runway

	Runway	Fleet Mix (%)				
		Small	Small+	Large	Heavy	ALL
1998 (Actual)	09L	13	34	49	4	100
	09R	97	3	0	0	100
	27L	96	4	0	0	100
	27R	18	35	43	4	100
	ALL	224	76	92	8	100
PAL 1	09L	1	24	42	33	100
	09R	97	3	0	0	100
	27L	96	4	0	0	100
	27R	2	22	43	33	100
	ALL	196	53	85	66	100
PAL 2	09L	2	22	52	24	100
	09R	97	3	0	0	100
	27L	96	4	0	0	100
	27R	2	21	53	24	100
	ALL	197	50	105	48	100

Notes:

- Small - Aircraft with 12,500 pounds or less maximum certificated takeoff weight.
- Small+ - Aircraft with a maximum certificated takeoff weight of more than 12,500 pounds and less than or equal to 41,000 pounds.
- Large - Aircraft with a maximum certificated takeoff weight of more than 41,000 pounds and less than or equal to 300,000 pounds.
- Heavy - Aircraft with certificated maximum takeoff weights exceeding 300,000 pounds.
(this category includes 757 activity which require increased in-trail separation)

Table IV-4

Runway Capacity Analysis - VFR Results

Configuration	Mix Index ¹	VFR Hourly Capacity		
		60% Arrivals	40% Arrivals	50% Arrivals
Existing (1998)				
09L, 09R and 13	72	101	121	111
27R, 27L and 31	72	80	100	90
PAL 1				
09L, 09R and 13	99	82	90	87
27R, 27L and 31	99	72	74	73
PAL 2				
09L, 09R and 13	113	77	85	82
27R, 27L and 31	113	67	69	68

^{1/} Mix Index = [(% of Small+ Aircraft) + (% of Large Aircraft)] + [2 * (the % of B757 Aircraft)] + [(3 * (the % of Heavy Aircraft)]

Note: Under the three activity levels, Runways 9L, 9R, 27R, and 27L serve arrival and departure operations. Runway 13 operates as an arrival runway. Runway 31 operates as a departure runway.

Sources: FAA Advisory Circular 150/5060-5; Aviation Data Systems C.A.T.E.R; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

Table IV-5

Runway Capacity Analysis - Marginal VFR Results

Configuration	Mix Index ¹	Marginal VFR Hourly Capacity		
		60% Arrivals	40% Arrivals	50% Arrivals
Existing (1998)				
09L, 09R and 13	72	67	91	78
27R, 27L and 31	72	46	70	57
PAL 1				
09L, 09R and 13	99	71	85	77
27R, 27L and 31	99	50	65	56
PAL 2				
09L, 09R and 13	113	71	81	76
27R, 27L and 31	113	50	60	55

^{1/} Mix Index = [(% of Small+ Aircraft) + (% of Large Aircraft)] + [2 * (the % of B757 Aircraft)] + [(3 * (the % of Heavy Aircraft))]

Note: Under the three activity levels, Runways 9L, 9R, 27R, and 27L serve arrival and departure operations. Runway 13 operates as an arrival runway. Runway 31 operates as a departure runway.

Sources: FAA Advisory Circular 150/5060-5; Aviation Data Systems C.A.T.E.R.; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

during the west operating configuration. At PAL 1, these hourly capacities decrease slightly to 77 operations and 56 operations, respectively. For PAL 2, the airfield capacity while operating to the east is 76 hourly operations and 55 hourly operations when operating to the west.

Table IV-6 lists the IFR hourly capacities. During IFR conditions, the Airport effectively operates as a one-runway system, i.e. using only Runway 9L-27R. This is because neither Runway 9R-27L nor Runway 13 has a published instrument approach. Thus, they do not provide any additional capacity during IFR conditions. Although Runway 31 does have a published instrument approach, Runway 9R-27L is typically preferred because it is equipped with an Instrument Landing System (ILS). The ILS allows aircraft to land with lower cloud ceiling and visibility conditions.

As shown in Table IV-6, the airfield provided an hourly capacity of 52 operations in 1998 during IFR conditions in both operating configurations. The IFR hourly capacities decline to 50 operations for both PAL 1 and PAL 2.

Exhibits IV-3 through IV-5 graphically present the VFR, MVFR, and IFR hourly capacities of the two runway-use configurations for the demand levels estimated for 1998, PAL 1 and PAL 2, respectively. The hourly capacities assume an even split between arrivals and departures. For comparative purposes, the projected peak hour demand estimates are also depicted on the graphs in red.

As shown on Exhibit IV-3, the hourly capacities associated with all six operating conditions exceeded the peak-hour demand of 48 operations during 1998. This is reflected in the fact that peak-hour operational delays were minimal during 1998. Exhibit IV-4 indicates that the projected peak-hour demand for PAL 1 will exceed the airfield's capacity in the west flow operating configuration during MVFR conditions, and both the east flow and west flow configurations during IFR conditions. Although this indicates that delay is likely to occur during these conditions, the occurrence of these delays are expected to be minimal. The reason for this is two-fold; (1) these delays will likely occur during peak demand periods only, and (2) the occurrence of MVFR and IFR conditions is less than 10%.

Exhibit IV-5 indicates that the projected peak-hour demand of 79 operations for PAL 2 will exceed the airfield's capacity during west flow operations in all weather conditions, and east flow operations during both MVFR and IFR conditions. During these conditions, higher delays are likely to occur. In addition, the hourly capacity of the airfield while in the east flow during VFR conditions exceeds the projected peak-hour demand by only three operations. However, higher delays could also occur as the aircraft operational demand levels may not be evenly distributed throughout the peak period.

4.1.2.3 Annual Service Volume

A comparison of the existing airfield's Annual Service Volume (ASV) with the annual aircraft operational demand levels experienced during 1998, and that projected for PAL 1 and PAL 2 is presented in Table IV-7. The table also presents the annual demand, expressed as a percentage of the ASV, as well as the peak hour demand estimates.

As shown, the ASV for 1998 was 296,000 annual operations. Actual demand in 1998 totaled 202,085 annual operations. As a result, with annual demand representing 68 percent of the ASV, the existing airfield was adequate to satisfy the demand level for that year. However, based on the fleet mix projections, the ASV would be reduced to 294,000 annual operations at PAL 1 and be reduced

Table IV-6

Runway Capacity Analysis - IFR Results

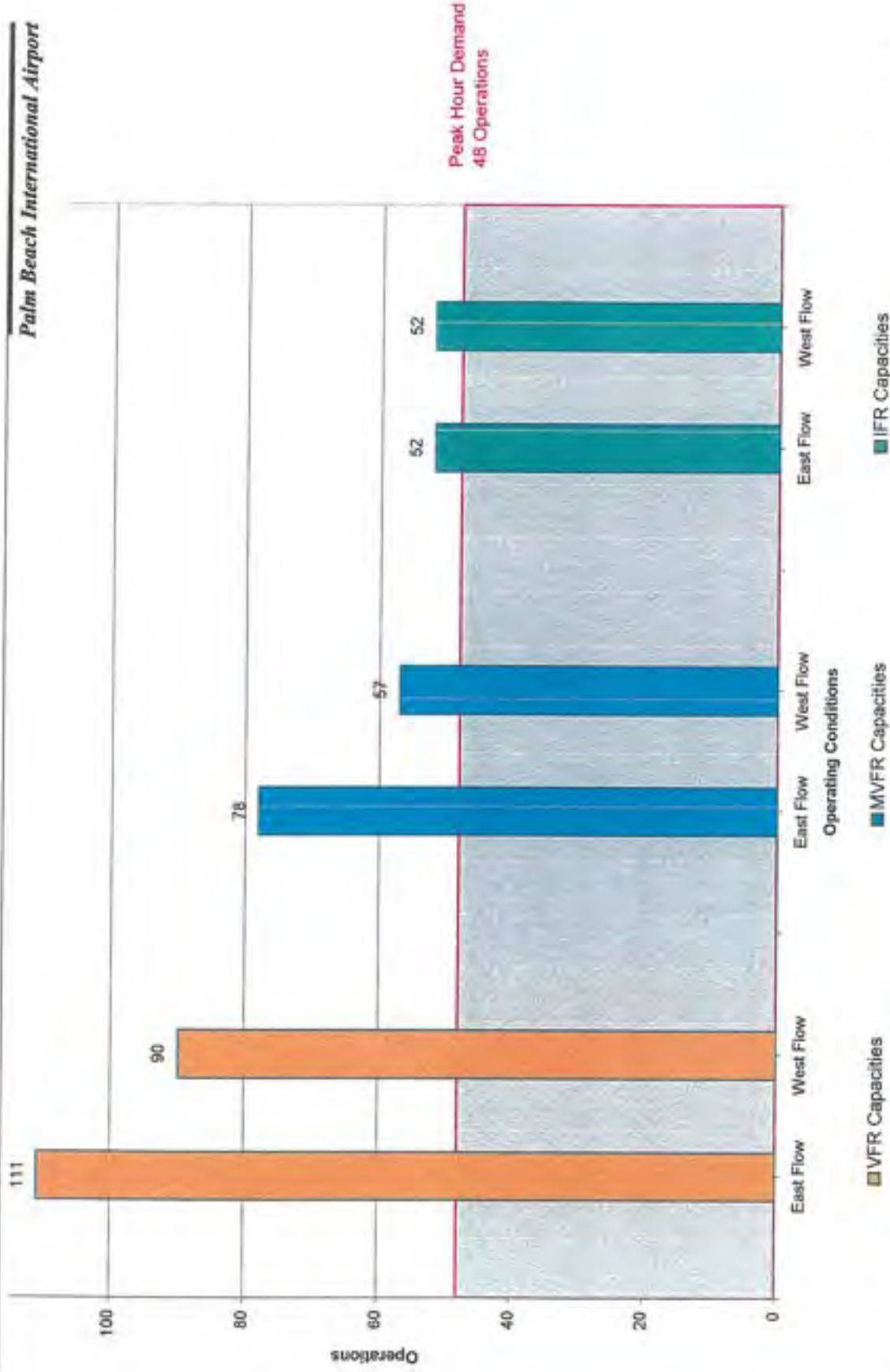
Configuration	Mix Index ¹	IFR Hourly Capacity		
		60% Arrivals	40% Arrivals	50% Arrivals
Existing (1998)				
9L	103	49	53	52
27R	103	49	53	52
PAL 1				
9L	131	49	51	50
27R	131	49	51	50
PAL 2				
9L	142	49	51	50
27R	142	49	51	50

^{1/} Mix Index = [(% of Small+ Aircraft) + (% of Large Aircraft)] + [2 * (the % of B757 Aircraft)] + [(3 * (the % of Heavy Aircraft))

Note: Under the three activity levels, Runways 9L, 9R, 27R, and 27L serve arrival and departure operations. Runway 13 operates as an arrival runway
Runway 31 operates as a departure runway.

Sources: FAA Advisory Circular 150/5060-5; Aviation Data Systems C.A.T.E.R.; Ricondo & Associates, Inc.

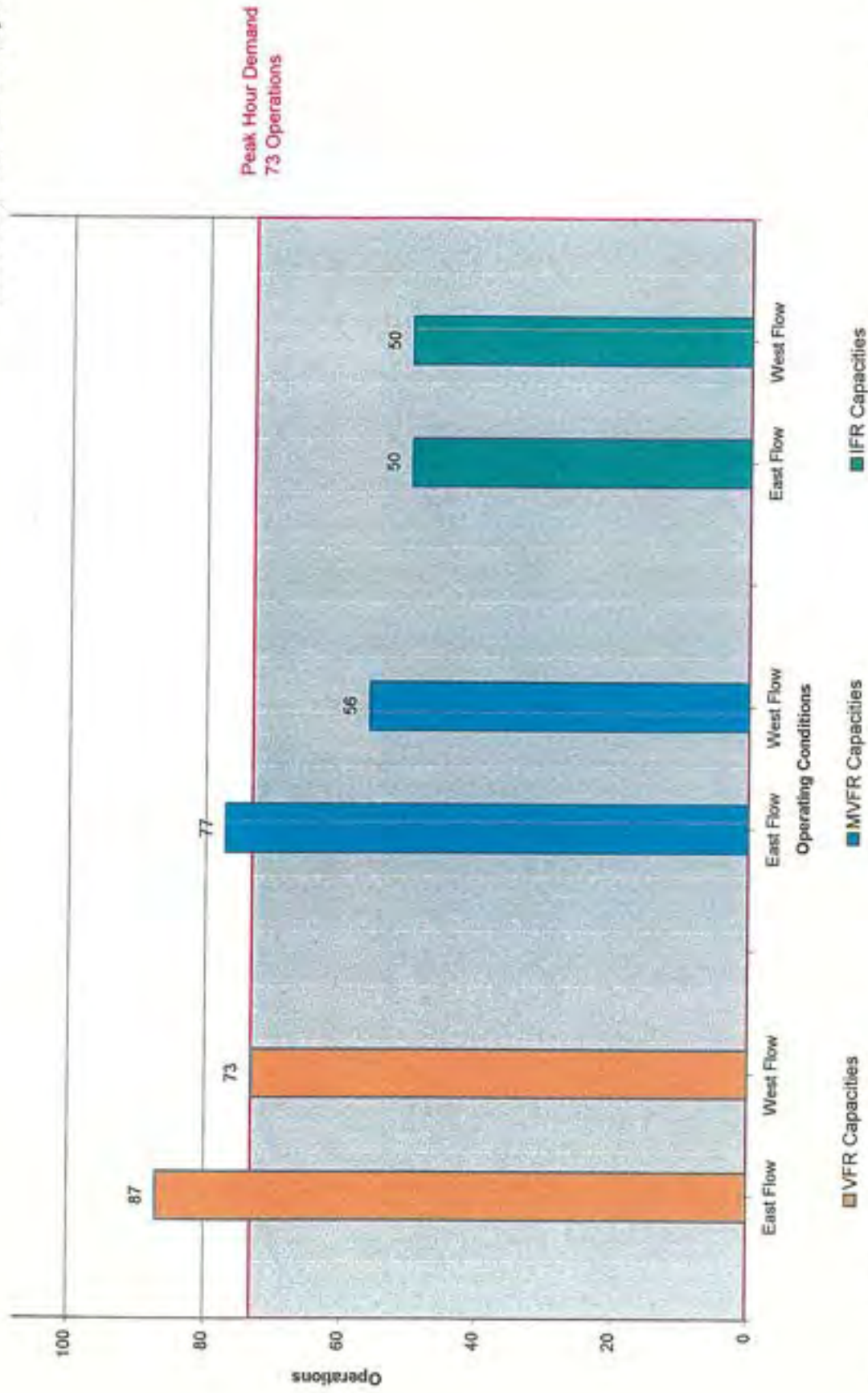
Prepared by: Ricondo & Associates, Inc., March 1999



Prepared by: Ricordo & Associates, Inc.

Exhibit IV-3

1998 Hourly Airfield Capacities



Prepared by: Rloondo & Associates, Inc.

Exhibit IV-4

PAL 1 Hourly Airfield Capacities



Prepared by: Ricordo & Associates, Inc.

Exhibit IV-5

PAL 2

Hourly Airfield Capacities

Table IV-7
Comparison of Annual Demand with Annual Service Volumes

Capacity/Demand Metric	Basis	Airfield Capacity and Demand Characteristics		
		1998	PAL 1	PAL 2
Peak Hour Demand Estimates	Ops/Hour	48	73	79
Annual Demand	Annual Operations	202,085	300,000	331,800
Annual Service Volume (ASV)	Annual Operations	296,000	294,000	282,000
Annual Demand	% of ASV	68.3%	102.0%	117.7%

Sources: FAA Advisory Circular 150/5060-5; Aviation Data Systems C.A.T.E.R; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., March 1999

further to 282,000 annual operations for PAL 2. These ASVs would be exceeded at PAL 1 and PAL 2 with annual demand levels projected to reach 300,000 and 331,800, respectively.

4.1.2.4 Airfield Delays

Airfield operational delays were computed using the FAA's Delay Model. The model uses a general demand versus capacity comparison to establish the delay associated with each runway use combination. Both the average annual delay per aircraft and the hours of annual delay were computed. Average peak hour aircraft delays for each runway combination were also estimated. These aircraft delay estimates were used to evaluate and compare the benefits of capacity improvements.

The results from using the FAA Delay Model to estimate operational delays for the existing airfield are presented in **Table IV-8**. As shown, the average delay per operation, based on an existing annual demand of 202,085 operations, was estimated to be 0.6 minute per operation or 2,021 hours of annual delay. This is well below the FAA threshold criterion for a delay-constrained airport of 20,000 hours. At the PAL 1 annual demand of 300,000 operations, delays were estimated to be 2.5 minutes per operation or 12,500 hours of annual delay. At the PAL 2 annual level demand of 331,800 operations, delays were estimated to increase to 6.8 minutes per operation or 37,604 hours of annual delay.

These results would form the baseline for evaluating benefits of proposed airfield improvements. It should also be noted that acceptable and/or tolerable levels of delay are generally defined by airport users and operators for each airport and may vary from those used by the FAA for general planning purposes.

4.1.3 Capacity of Runways Serving Commercial Aircraft Operations

Due to Runway 9R-27L being limited to light general aviation aircraft, a separate airfield capacity analysis was performed for Runways 9L-27R and 13-31. The purpose of this analysis was to determine if the capacity of these two runways would be adequate to serve the projected demand levels associated with commercial service aircraft (i.e. air carrier and commuter aircraft) operations. This analysis would assist in the identification of airfield improvements necessary to satisfy large and heavy aircraft demand throughout the planning period. This analysis was conducted in response to the increased growth in commercial service and limited growth in light general aviation activity projected in the demand scenarios and activity projections.

In this analysis, it is assumed that most light general aviation aircraft would utilize Runway 9R-27L during VFR and MVFR weather conditions. Therefore, the peak hour demand levels and aircraft mix during these conditions would include primarily large and heavy aircraft. During IFR conditions, however, light aircraft would be included in the peak hour demand levels, as well as the aircraft mix. This reflects the inability of light aircraft to utilize Runway 9R-27L due to the absence of a published instrument approach procedure.

Exhibits IV-6 through IV-8 graphically present the VFR, MVFR, and IFR hourly capacities of the two runway-use configurations for the heavy and large demand levels estimated for 1998, PAL 1 and PAL 2, respectively. The hourly capacities assume an even split between arrivals and departures. For comparative purposes, the projected peak hour demand estimates are also depicted on the graphs in red.

Table IV-8

Airfield Delay Estimates - Input Variables and Results

Configuration ¹	% Utilization			Mix Index			Hourly Capacity			Annual Demand	Average Delay Per Aircraft (min.)
	VFR	MVFR	IFR	VFR	MVFR	IFR	VFR	MVFR	IFR		
Existing (1998)											
09L, 09R and 13	56	5	1	72	72	103	111	78	52		
27R, 27L and 31	34	3	1	72	72	103	90	57	52		
Airport Total										202,085	0.6
PAL 1											
09L, 09R and 13	56	5	1	99	99	131	87	77	50		
27R, 27L and 31	34	3	1	99	99	131	73	56	50		
Airport Total										300,000	2.5
PAL 2											
09L, 09R and 13	56	5	1	113	113	142	82	76	50		
27R, 27L and 31	34	3	1	113	113	142	68	55	50		
Airport Total										331,800	6.8

Notes:

¹ Description of preferred airfield configuration:

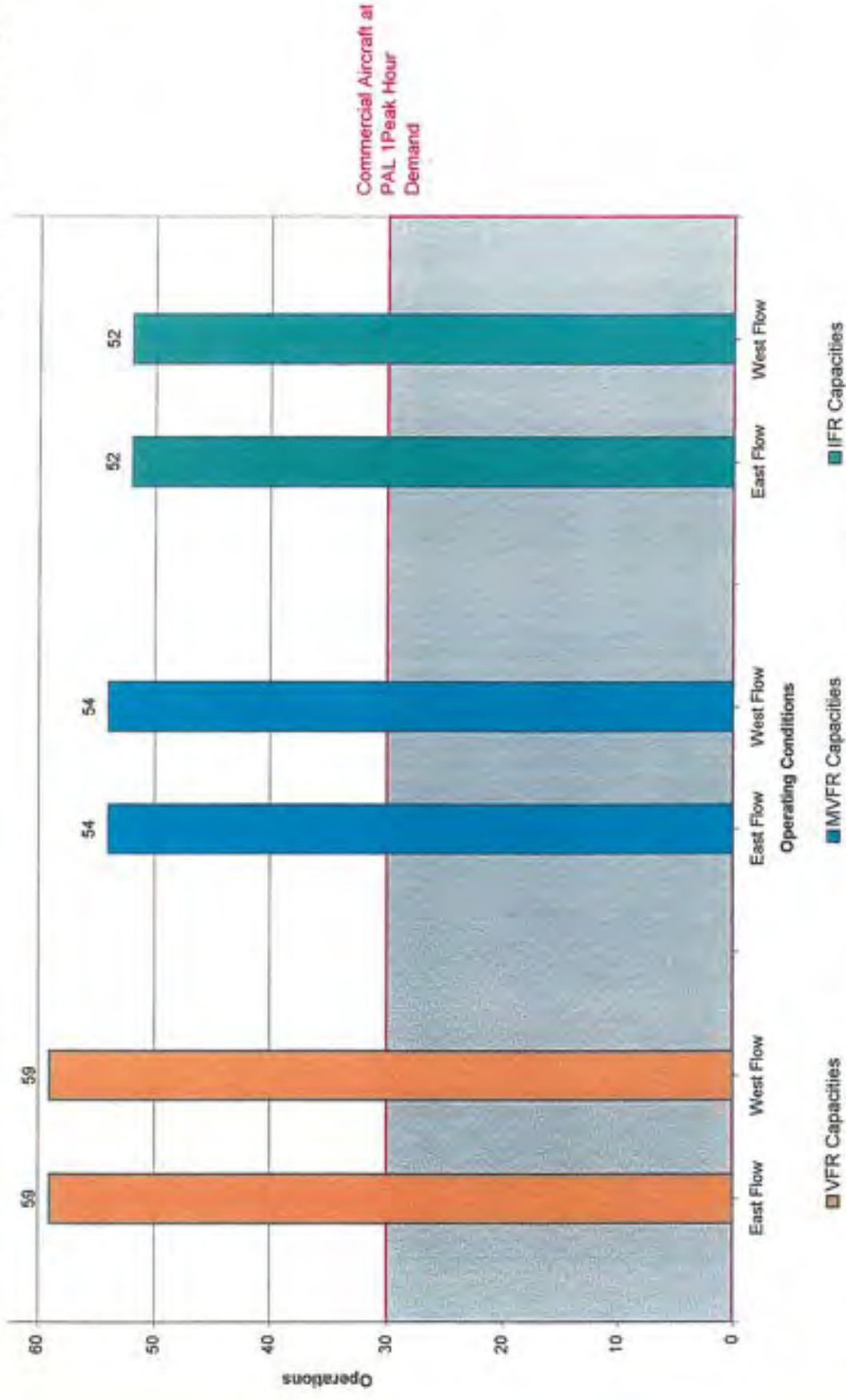
VFR = Two parallel runways with interleaved departures on both and vortex consideration for Runway 9L-27R

IFR = Single runway with interleaved departure.

Lateral separation between Runway 9R-27L and 9L-27R is 700 feet (centerline to centerline).

Sources: FAA Advisory Circular 150/5060-5; Aviation Data Systems C.A.T.E.R.; Ricondo & Associates, Inc.

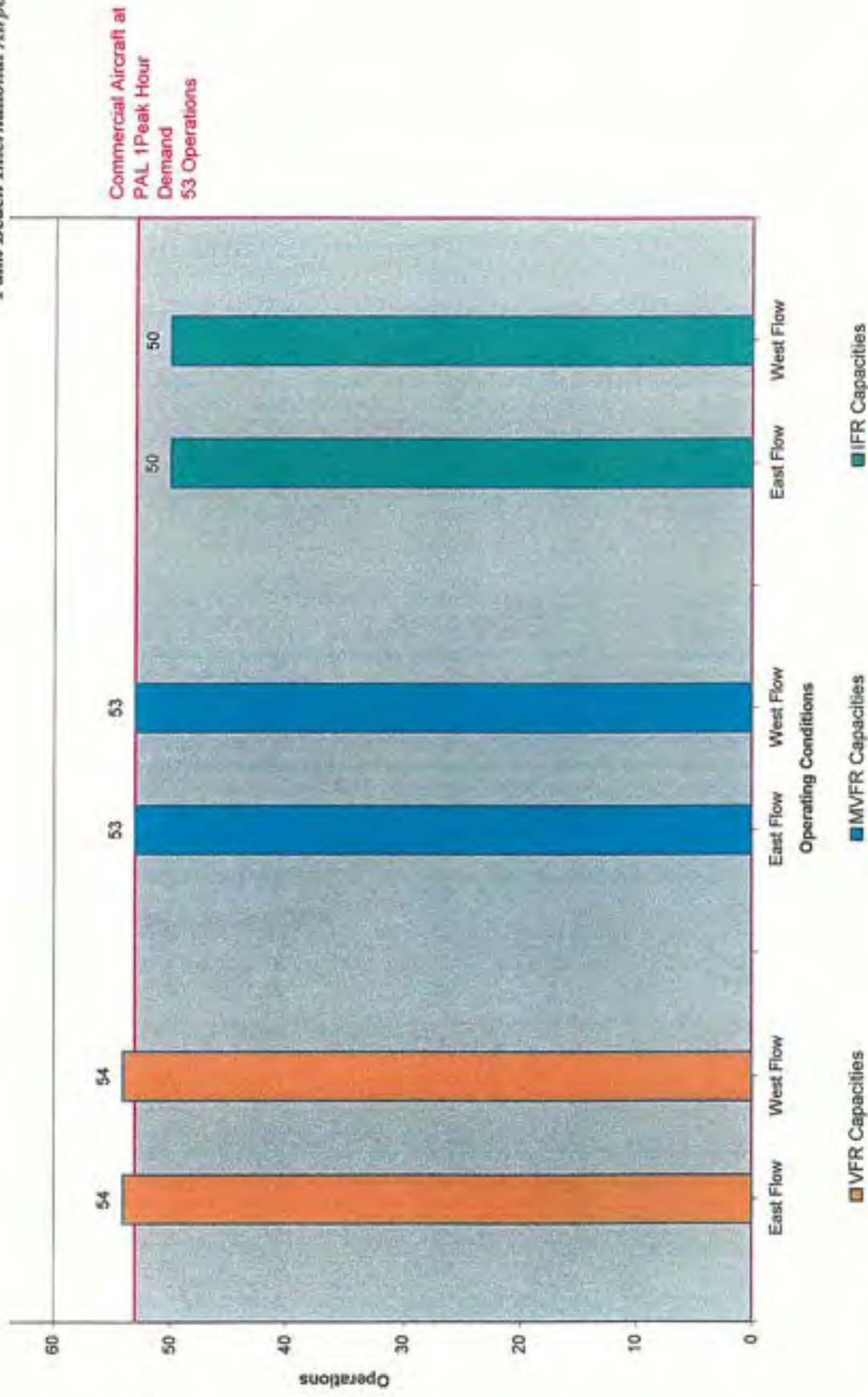
Prepared by: Ricondo & Associates, Inc., March 1999



Prepared by: Ricardo & Associates, Inc.

Exhibit IV-6

1998 Hourly Airfield Capacities Runways 9L-27R and 13-31

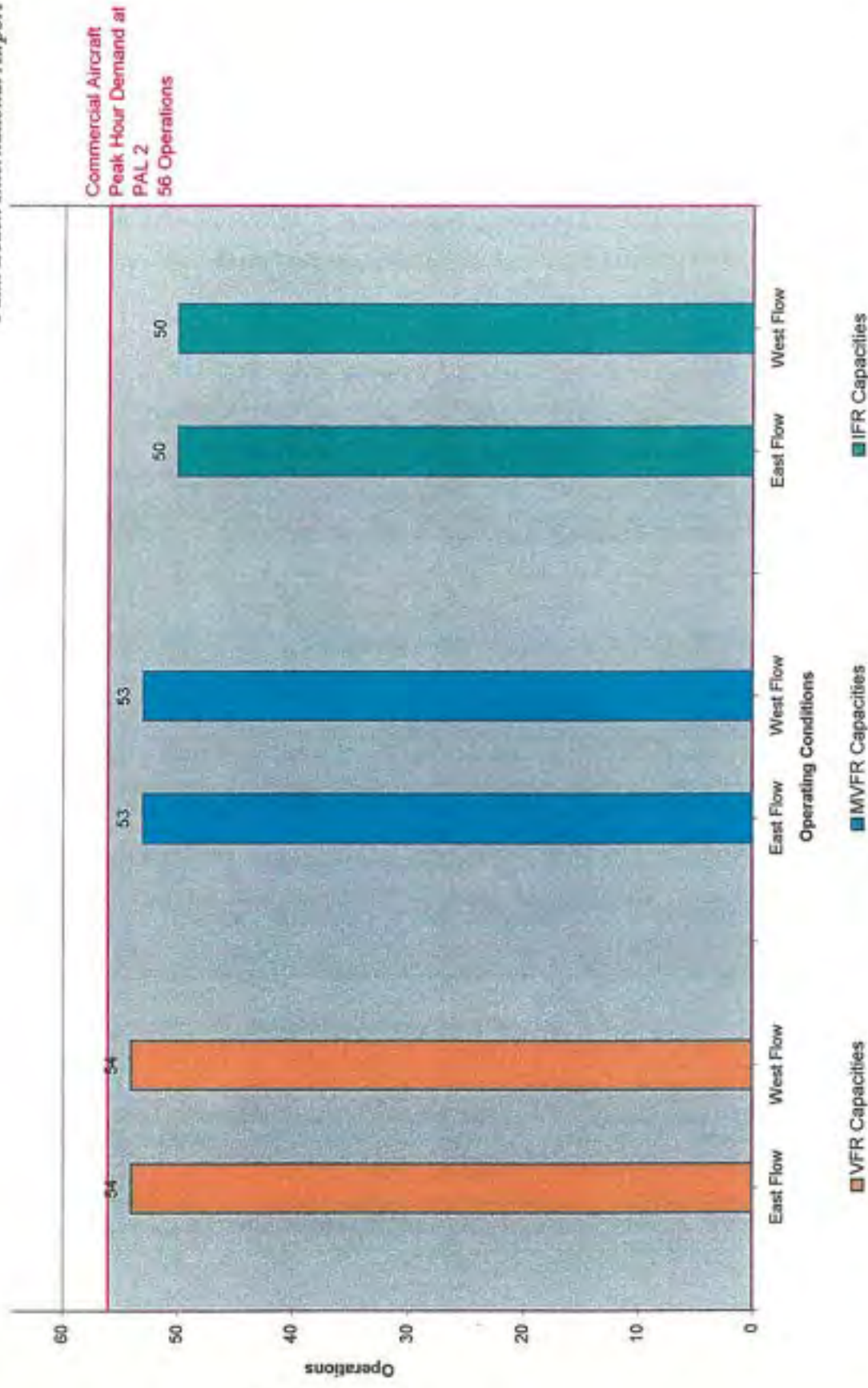


Prepared by: Riondo & Associates, Inc.

Exhibit IV-7

PAL 1 Hourly Airfield Capacities Runways 9L-27R and 13-31

Palm Beach International Airport



Prepared by: Ricondo & Associates, Inc.

Exhibit IV-8

**PAL 2 Hourly Airfield Capacities
Runways 9L-27R and 13-31**

As shown on Exhibit IV-6, the hourly capacities associated with all six operating conditions exceeded the peak-hour heavy and large aircraft demand of 30 operations during 1998. This indicates that peak-hour operational delays were minimal during 1998. Exhibit IV-7 indicates that the projected peak-hour demand for PAL 1 will exceed the airfield's capacity during IFR conditions only. However, the peak hour capacity estimates are projected to be at or slightly less than the hourly demand levels during VFR and MVFR conditions. Delays could also occur during these conditions as the aircraft operational demand levels may not be evenly distributed throughout the peak period. Exhibit IV-8 indicates that the projected peak-hour demand for PAL 2 will exceed the airfield's capacity, regardless of the weather conditions. During these conditions, delays are likely to occur.

A comparison of the Annual Service Volumes (ASV) associated with Runways 9L-27R and 13-31 with the annual aircraft operational demand levels experienced during 1998, and projected for PAL 1 and PAL 2 is presented in Table IV-9. The table also presents the annual demand as well as the peak hour demand estimates. As shown, the ASV for 1998 was 153,700 annual operations, while the annual demand was comprised of 83,295 annual operations. The ASV would increase to 163,600 annual operations at PAL 1 and increase further to 168,400 annual operations for PAL 2. Unlike the 1998 conditions, these ASVs would be exceeded at PAL 1 and PAL 2 with annual demand levels projected to reach 166,335 and 182,650, respectively.

4.1.4 Future Capacity Requirements

The future capacity requirements for the airfield would vary depending upon the anticipated growth and demand characteristics. In the past, the FAA has recommended planning for additional airfield capacity when demand exceeds 60 percent of the ASV. That recommendation was based on the need to complete a thorough investigation of the alternatives and the required environmental evaluations. However, it must be recognized that the definition of airfield capacity also includes definition of an acceptable level of delay. Airport users and operators may accept higher levels of delay based on a variety of factors, including economic, environmental, and social considerations.

Currently, the annual traffic demand at the Airport is approximately 202,085 operations, or roughly 68 percent of the ASV. This indicates that planning for additional airfield capacity is warranted. Since the ASV calculation is quite sensitive to the hourly peaking characteristics, hourly capacity and delays would be key elements for evaluating improvements to the airfield system. These improvements may include runway extensions, new runways, and/or additional runway exit taxiways.

4.1.5 Airfield Design Standards

The selection of the appropriate design standards for development of airfield facilities is based primarily upon the characteristics of the aircraft likely to use the Airport on a regular basis. The most critical characteristics are the approach speed and the physical dimensions of the design aircraft. For PBIA, the Boeing 757 represents the design narrow body aircraft. Similarly, the Boeing 767-300 represents the design widebody aircraft. Both the aircraft approach speed and wingspan have a direct effect on runway design criteria, particularly runway length.

In FAA Advisory Circular (A/C) 150/5300-13, *Airport Design*, aircraft are grouped into five categories based upon their approach speed. Table IV-10 summarizes the Aircraft Approach Categories and the corresponding approach speed for each. Aircraft Approach Categories A and B typically include small piston engine aircraft and a limited number of smaller business jets having

Table IV-9
Commercial Aircraft Demand-Capacity Profile

Activity Level	Peak Hour Activity		Annual Service Volume	Annual Demand
	VFR/MVFR/IFR Combined Capacity	Demand		
1998	55	30	153,700	83,295
PAL 1	53	53	163,600	166,335
PAL 2	53	56	168,400	182,650

Sources: FAA Advisory Circular 150/5060-5; Airport Management Records; Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., March 1999

approach speeds of 121 knots or less. Categories C, D, and E consist of the larger business jets, as well as larger jet and propeller aircraft generally associated with commercial and/or military use. Aircraft currently utilizing the PBIA generally do not exceed Approach Category D.

Table IV-10**Aircraft Approach Categories**

Approach Category	Criteria	Representative Aircraft
A	Approach speed less than 91 knots.	Piper PA-28, Cessna 172, & Cessna 207.
B	Approach speed 91 knots or greater, but less than 121 knots.	Beech King Air, Cessna 402, & Piper Cheyenne.
C	Approach speed 121 knots or greater, but less than 141 knots.	Learjet 25, B737, B767, & MD 80
D	Approach speed 141 knots or greater, but less than 166 knots.	B777, MD11, & L-1011.
E	Approach speed 166 knots or greater.	Concorde

Source: FAA Advisory Circular 150/5300-13, *Airport Design*
Prepared by: Ricondo & Associates, Inc., October 2000

A/C 150/5300-13 also categorizes aircraft by wingspan. The categories are referred to as Airplane Design Groups (ADG). The six ADGs are presented in **Table IV-11**. The table also lists representative aircraft types for each design group. As shown, ADG I and II primarily include small piston aircraft, business jets and turboprop aircraft. ADG III, IV, and V include larger business jets, turboprop, and jetliners utilized for commercial service. Currently only large military aircraft such as the Galaxy C5 are included in ADG VI. However, the New Large Aircraft (NLA), i.e. A300-XX and the new generation B747, will be categorized as ADG VI once they are introduced into commercial fleets. Based on the fleet mix projections and the design aircraft previously identified, airfield geometry for PBIA should satisfy the FAA's prescribed guidelines for ADG IV.

Table IV-11**Airplane Design Groups**

Design Group	Criteria	Representative Aircraft
I	Up to, but not including 49 feet.	Piper PA-28, Cessna 172, Beech King Air, & Lear 25.
II	49 feet up to but not including 79 feet.	Citation II, Beech 1900, & Grumman G3.
III	79 feet up to but not including 118 feet.	Dash 8, BAe 146, F28, B737, & MD 80.
IV	118 feet up to but not including 171 feet.	B757, L1011, B767, & MD11.
V	171 feet up to but not including 214 feet.	B777, & B747
VI	214 feet up to but not including 262 feet.	Lockheed C-5B Galaxy, New Large Aircraft

Source: FAA Advisory Circular 150/5300-13, *Airport Design*
Prepared by: Ricondo & Associates, Inc., October 2000

4.1.5.1 Runway Length and Width

The current length and width of the three runways at PBIA are presented in Table IV-12.

Table IV-12

Existing Runway Lengths

<u>Runway</u>	<u>Length</u>	<u>Width</u>
9L-27R	10,000 feet	150 feet
13-31	6,930 feet	150 feet
9R-27L	3,210 feet	75 feet

Source: Airport Facility Directory, February 24, 2000
Prepared by: Ricondo & Associates, Inc., October 2000

As shown in Table IV-12, Runway 9L-27R and Runway 13-31 are 150 feet wide. These dimensions meet the requirements of ADG IV aircraft, as well as the needs of ADG V aircraft. Should either runway serve ADG VI, a runway width of 200 feet would be required. Runway 9R-27L is only 75 feet wide, which is capable of serving up to ADG II aircraft only. This is satisfactory for its current role as a general aviation runway. Should this runway be upgraded to accommodate larger commercial aircraft, it would need to be widened to a minimum of 150 feet.

A runway length analysis was performed to determine the adequacy of the existing runways at PBIA. Minimum runway length requirements were established for various aircraft types representative of the projected fleet mix at the Airport. Runway length calculations for PBIA include the variables of average high temperature of 90° F (for the hottest months of the year, July/August), the Airport's elevation of 19 feet MSL, and a maximum Effective Runway Gradient of 0.1%. Representative aircraft of the commercial and general aviation fleet were selected for analysis of their runway length requirements. Most aircraft require a greater runway length for take-off than for landing. Therefore, the runway length required for take-off was calculated for each selected aircraft, using maximum take-off weight and a full passenger and cargo load.

The results of the calculations are presented in Table IV-13. As shown, none of the aircraft types assessed require a runway length exceeding that of Runway 9L-27R. However, Runway 13-31 does not provide adequate length for the B767-300, B727-200, B737-700, or B737-400 to depart under the conditions assessed. Therefore, their use is likely restricted to Runway 9L-27R during hot weather conditions.

Table IV-13
Runway Length Requirements

Aircraft Type	Engine Type	Runway Length Requirements
B767-300	G.E. CF6-80A2	9,230
B727-200	J18-15	9,800
B737-400	CFM56-3B-2	8,200
B757-200	RB211-535E4	6,500
Jetstream 31	n/a	4,500
Saab 340	n/a	4,200
Shorts 360	n/a	4,470
ATR42	n/a	3,545
ATR72	n/a	4,165
Canadair RJ50	n/a	5,800
Citation 5	n/a	2,962
Seminole	n/a	2,200
Cessna 172	n/a	1,250
Turbo Mooney 231	n/a	2,600
King Air 90	n/a	2,710

Sources: Aircraft Airport Planning Characteristics Manual; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

4.2 Terminal Facilities

In order to assess the existing terminal facility's adequacy to satisfy both passenger demand and user/tenant needs, a demand/capacity assessment was performed. The objective of the demand/capacity assessment is to determine if terminal deficiencies currently exist or will develop within the planning period. This assessment evaluates the overall terminal facility, as well as its individual functional components (i.e. ticket-counters, departure lounges, bag claim areas, etc.), to determine their adequacy for serving the existing and projected levels of demand.

Facility improvements are typically necessary if the demand/capacity assessment identifies deficiencies within the existing terminal system. The extent of these improvements is quantified by the terminal facility requirements in terms of space quantities, functional space arrangements, and the quantity of passenger processing elements, (i.e. ticket-counters, bag claim devices, security screening stations, etc.). These terminal facility requirements form the basis the definition of alternatives for terminal improvements.

4.2.1 Terminal Facilities' Demand/Capacity Assessment

This assessment evaluates the adequacy of the existing terminal facility at PBI for serving both existing and projected passenger demand levels. The overall size of the terminal facility is assessed to determine its ability to adequately serve the annual and peak hour passenger demand levels experienced during 1998, and those projected for Planning Activity Level (PAL) 1 and PAL 2.

Additionally, each of the terminal building's functional components (i.e. ticket counters, departure lounges, bag claim areas, etc.) are also assessed individually.

The demand/capacity assessment of the existing terminal facility, including its associated concourses, was determined through the analysis of airline lease agreements, the PBIA Landside Master Plan (1993), and industry planning guidelines. Planning factors contained within the Landside Master Plan were also adjusted and utilized as applicable.

4.2.1.1 Terminal Building

A demand/capacity assessment of the overall terminal building was conducted utilizing planning factors outlined in FAA Advisory Circular 150/5360-13, *Planning and Design Guidelines for Airport Terminal Buildings*. While not assessing the adequacy of individual functional components of the terminal, the Advisory Circular suggests a range of 0.08 square feet to 0.12 square feet of terminal is necessary per annual passenger enplanement. This range is representative of typical terminal building configurations (i.e. linear, pier, satellite, etc.) including the areas located in the concourse(s).

Table IV-14 presents the space distribution of the existing terminal facility at PBIA. In order to maintain consistency with the Airport's space classifications, the terminal areas are presented by terminal component. These components are based on those contained in Exhibit 4E to the "Airline-Airport Use and Lease Agreement for PBIA", dated November 17, 1997. As shown, the Airport's existing terminal has a gross area of 561,348 square feet. This would indicate that the overall size of the Airport's existing terminal is adequate to accommodate between 4.7 million and 7.0 million passenger enplanements, annually. For the purpose of this assessment, the median factor of 0.1 square feet per annual passenger enplanement is recommended. This results in a threshold of approximately 5.6 million annual passenger enplanements.

Table IV-14

Summary of Terminal Areas

<u>Terminal Component</u>	<u>Terminal Area (SF)</u>	<u>% of Total Area</u>
Airline Gate/Departure Lounges	63,517	13%
Airline Operations Areas	176,696	31%
Public Areas	191,158	31%
Concessions Areas	44,876	8%
Maintenance & Utilities	65,281	13%
Federal Inspection Services	19,820	4%
Total:	561,348	100%

Source: Airline-Airport Use and Lease Agreement for PBIA, 1997.
Prepared By: Ricondo & Associates, Inc., December 1998.

Table IV-15 presents the ratio of gross terminal area per annual enplanement for 1998, PAL 1 and PAL 2. As shown, the resulting ratio associated with the 1998 passenger demand levels is 0.19. This indicates that the size of existing terminal was adequate for processing the 1998 passenger demand level. However, at the PAL 1 and PAL 2 demand levels, the ratios decrease to 0.08 and 0.07, respectively. Although the ratio associated with the PAL 1 demand level exceeds the FAA's minimum planning factor, the recommended factor of 0.10 square feet per annual enplanement is not

satisfied. This indicates that terminal expansion should occur prior to the airport experiencing the PAL 1 demand level.

Table IV-15

Demand/Capacity Assessment of Overall Terminal Facility

	<u>Annual Passenger Enplanements</u>	<u>Ratio of Gross Terminal Area to Annual Enplanement^{1/}</u>
1998 (Actual)	2,965,253	0.19
PAL 1	6,703,000	0.08
PAL 2	8,393,000	0.07

^{1/} Ratio based on existing terminal area of 561,348 SF.

Source: Ricondo & Associates, Inc.

Prepared By: Ricondo & Associates, Inc., October 2000

The methodologies presented thus far have demonstrated that the existing terminal building, in terms of gross area, is adequate to serve the demand levels currently experienced at the Airport. Furthermore, it is likely that passenger service levels will gradually diminish throughout PAL 1 if the existing terminal facility is not expanded. It is possible, however, that the individual functional components of the terminal facility are currently inadequate, or will become inadequate sooner than the overall terminal facility. Therefore, an assessment of the individual components is also necessary.

4.2.1.1 Aircraft Gates

The overall number of gates required to satisfy air carrier demand varies based on the distribution of airline operations throughout the day and the gate occupancy times associated with these operations. The demand/capacity analysis considers these two factors in order to determine the adequacy of the existing aircraft gates to satisfy both current and projected airline operations. A comparison between PBIA and other hub airports based on annual passenger demand levels and daily utilization of gates is also included as part of this analysis.

A common method for evaluating aircraft gates is to compare peak-hour gate demand with the number of existing gates. Delays will occur when the peak-hour gate demand exceeds the number of available gates. The peak-hour gate demand can be estimated based on the number of peak-hour air carrier/commuter operations and their average gate occupancy times.

The Demand Scenarios reflect that domestic activity will continue to represent a majority of air carrier operations at the Airport. Domestic activity is generally characterized by moderate gate occupancy times, typically between 30 to 45 minutes. In comparison with domestic operators, gate occupancy times associated with Commuter operations are typically less than 30 minutes, whereas international air carriers may exceed 45 minutes at the gate. On that basis, the existing gate positions are evaluated based on an average gate occupancy time of 40 minutes. An additional 10 minutes is added to the gate occupancy time to account for gate vacancies between successive flights.

Utilizing an average gate utilization time of 50 minutes, an hourly factor of 1.2 operations per gate is established. This factor is utilized to quantify the number of aircraft that a gate can serve during the peak hour. Currently, there are 29 air carrier and commuter gate positions at PBIA. This results in the ability to serve approximately 35 aircraft during the peak-hour.

Table IV-16 presents a comparison of the estimated hourly gate capacity with the peak-hour demand levels associated with air carrier and commuter operations experienced at PBIA during 1998, and those projected for PAL 1 and PAL 2. As shown, the Airport experienced 30 operations during the peak-hour of the peak-month average day during 1998. Peak-hour air carrier and commuter operations are projected to increase to 53 operations at PAL 1 and 56 operations at PAL 2. Based on the average gate utilization time of 50 minutes, peak-hour gate demand will exceed the hourly capacity of the existing gates at PAL 1 and PAL 2, therefore indicating the need for additional aircraft gates to serve these demand levels.

Table IV-16

Peak-Hour Aircraft Gate Demand

	<u>Projected Peak Hour Operations</u>	<u>Estimated Gate Capacity (Peak Hour Operations)^{1/}</u>
1998	30	35
PAL 1	53	35
PAL 2	56	35

^{1/} The estimated gate capacity is based on an average gate utilization time of 50 minutes.

Source: Ricordo & Associates, Inc.

Prepared By: Ricordo & Associates, Inc., October 2000

The ability of the existing terminal gates to meet future demand can also be estimated using a ratio of annual enplanements per gate. This ratio approximates the terminal's aircraft gate capacity relative to the projected levels of annual enplaned passenger activity. For planning purposes, a ratio between 150,000 and 200,000 annual passenger enplanements per gate can be used to estimate gate needs at air carrier airports. Although local conditions and the gate mix greatly affect this ratio, a value of 200,000 annual enplanements per gate can be considered a maximum threshold for the purpose of this analysis. Applying this ratio to the number of existing gates (29) estimates the Airport's passenger processing capacity at approximately 5,800,000 annual enplanements. However, at this demand level, gate utilization would be high and gate availability throughout the day would likely be limited. As a result, potential delays experienced at the gate could result in an adverse effect to subsequent airline operations throughout the day.

Table IV-17 presents the gate utilization rates for PBIA and other airports within the State of Florida. These four airports were selected, as they are comparable in size and passenger profiles (O&D). In addition, these airports have similar seasonal peaking characteristics and three of the four are currently served by Southwest Airlines. The presence of Southwest Airlines is significant, as gate utilization by this airline is typically greater than most other airlines. The table presents the average daily departures per gate experienced during 1998 at PBIA and the other airports. It also presents the projected departures per gate for PBIA at PAL 1 and PAL 2 assuming no additional gates are provided at the Airport.

Table IV-17

Average Daily Departures per Gate for Select Florida Hub Airports

Airport	Average (1998) Daily Departures	Current Number of Gates ^{1/}	Daily Departures Per Gate
Southwest Florida International	72	14	5.1
Jacksonville International ^{2/}	126	23	5.5
Ft. Lauderdale-Hollywood International ^{2/}	230	39	5.9
Tampa International ^{2/}	298	48	6.2
Average	181	31	5.8
Palm Beach International			
1998	120	29	4.1
PAL 1	212	29	7.3
PAL 2	232	29	8.0

Notes:

^{1/} Number of gates includes air carrier and commuter gates.

^{2/} Served by Southwest Airlines

Sources: Official Airline Guide; Ricondo & Associates, Inc.

Prepared By: Ricondo & Associates, Inc., March 1999.

As shown by Table IV-17, the other Florida airports experienced approximately 5.8 daily departures per gate on average. In comparison, PBIA experienced 4.1 daily departures per gate during 1998. During 1998, Ft. Lauderdale/Hollywood (FLL) and Tampa International Airports (TPA) averaged 5.9 and 6.2 daily departures per gate, respectively. At the time, FLL was in the planning phase for a terminal expansion program that began earlier this year that includes a nine-gate concourse. Southwest Florida and Jacksonville International Airports averaged 5.1 and 5.5 daily departures per gate, respectively, during 1998. Both airports are in the process of completing planning studies for new terminal and/or concourse facilities. Based on these trends, it appears that the other Florida airports are implementing terminal expansion programs as the operating performance of their gates reach an average of six departures per gate.

Based on the existing number of gates at PBIA, 7.3 and 8.0 daily departures per gate would be experienced at the PAL 1 and PAL 2 demand levels. Therefore, PBI would require additional gates prior to PAL 1, in order to retain service and delay levels that are acceptable to the DOA/County and its users.

4.2.1.2 Departure Lounges

The previous demand/capacity assessment indicated that additional terminal gates will likely be required to adequately serve the PAL 1 and PAL 2 demand levels. Therefore, it is a forgone conclusion that additional departure lounges (holdrooms) will be required as well. However, the previous analysis did not determine if the size of the existing holdrooms is adequate to accommodate the fleet mix associated with those demand levels. The assessment of the departure lounges evaluates the adequacy of the existing holdrooms to serve the design aircraft through a comparison of their existing sizes with those recommended under Advisory Circular 150/5360-13 and other industry sources.

The overall size of a holdroom is governed in part by the seating capacity of the gate's design aircraft. It is recommended that the size of the holdroom be based on providing space for 80 percent of the design aircraft's seating capacity. It is assumed that holdroom seating will be provided for 80 percent of the passengers to be accommodated, at 15 square feet per passenger. The remaining 20 percent of the passengers will be standing, therefore, only 10 square feet per passenger is necessary. A factor of 10 percent is then added for circulation and the check-in counter. The average number of well-wisher per passenger for the Airport is also included in the analysis. A 1996 passenger survey conducted by Leigh Fisher Associates estimated an average of 1.1 well-wishers per enplaned passenger at PBIA.

Table IV-18 presents the establishment of the recommended size of the departure lounges for gates serving commuter, narrowbody, and widebody aircraft. As shown, the recommended holdroom sizes ranges from 500 square feet for holdrooms serving commuter aircraft to 3,400 square feet for those serving widebody aircraft. It should be noted, however, that the recommended holdroom sizes contained in Table IV-18 are based on the average seating capacity of the three representative design aircraft. Actual sizing of holdrooms should be considered on an individual basis according to the seating capacities of the design aircraft for a given gate.

Table IV-18**Recommended Departure Lounge (Holdroom) Space Requirements**

Gate Type	Design Aircraft Type	Average Seats ^{1/}	Passengers to Be Accommodated ^{2/}	Recommended Holdroom Area (SF)
Commuter	ATR 72	72	63	1,000
Narrowbody	B757-200	186	164	2,500
Widebody	B767-400	250	220	3,400

Notes:

^{1/} For the B757-200 and B767-400 Aircraft, these requirements are based on the two and three class seating configurations, respectively.

^{2/} Includes consideration for well wishers in departure lounges.

Sources: FAA Advisory Circular 5360-13, Planning and Design Guidelines for Airport Terminal Buildings.

Prepared By: Ricondo & Associates, Inc., March 1999.

At many airports, adjacent holdrooms are combined to serve multiple gates. This allows for a reduction in holdroom areas, as departing passengers may be seated in what would normally be a holdroom for another gate that may be vacant at the time. At O&D airports such as PBIA, a 20 percent reduction in holdroom seating is adequate to satisfy passenger demand levels associated with both gates. This is due to the independent peaking characteristics associated with the arrival of passengers awaiting departure on the adjacent gates. However, if multiple flights depart from the adjacent gates at the same time, or if one of the flights experiences a significant delay, passenger demands may exceed the seating capacity of the combined holdrooms.

Table IV-19 presents the demand/capacity assessment for the existing holdrooms at PBIA. The table provides a comparison of the average size of the existing holdrooms with both the minimum and recommended holdroom space requirements. The assessment indicates that the average size of the commuter holdrooms is 1,317 square feet, thus exceeding the recommended size of 1,000 square feet per gate. However, the average size of the narrowbody and widebody holdrooms are less than the minimum holdroom sizes, with an average area of 1,826 square feet 2,567 square feet, respectively.

4.2.1.3 Terminal Building Components

With the exception of the terminal gates and their associated holdrooms, the following sub-sections present the demand/capacity assessment for the individual functional components of the terminal building. The relationship between capacity and demand for each component is expressed as a ratio, representing the quantity, length, and/or area of each component necessary to process a specific demand level or support another terminal component. For those functional components that are based on passenger demand levels, Peak-Hour Originating Passengers (PHOP), Peak-Hour Terminating Passengers (PHTP), or annual enplanements form the unit of measure for its corresponding planning metric.

Functional ratios associated with the existing terminal components are based on the passenger demand levels experienced during 1998, as well as those projected for PAL 1 and PAL 2. These ratios are then compared with "target" ratios, referred to as planning factors. Both a minimum and a recommended planning factor are established for each functional component. The minimum planning factors represent the processing characteristics experienced during peak periods in 1998. The recommended planning factors represent a densely occupied facility during peak periods, but processing constant passenger flows through the facility. The terminal components that exceed the minimum and/or recommended planning factors are also identified.

In order to maintain consistency with the existing Airport-Airline Use and Lease Agreement for PBIA, this assessment utilized the following terminal space classifications:

- **Airline Operations Areas.** The Airline Operations Area includes the functional components of the terminal facility that directly serve the needs of the Airlines. These components include Airline Ticket Offices (ATO), ticket counter frontage (queue area), airline lounges/clubrooms, baggage claim, outbound baggage, inbound baggage, and curbside offices and operations. The gross area of each component is assessed, as well as the overall length of the airline ticket counters and baggage claim devices. The gross areas of the holdrooms and the number of terminal gates are not included in the Airline Operations Area assessment since they were previously assessed independently.

Table IV-19
Demand-Capacity Analysis of Existing Departure Lounges (Holdrooms)

Gate Type	Overall Holdroom Size (SF)	Terminal Gates (Quantity)	Average Holdroom Size (SF)	Holdroom Space Requirements ^{1/}	
				Minimum ^{2/}	Recommended
Commuter	5,269	4	1,317	800	1,000
Narrowbody	14,607	8	1,826	2,000	2,500
Widebody	43,641	17	2,567	2,700	3,400

Notes:

^{1/} These Requirements are based on the average seating capacity of the representative aircraft types.

Actual holdroom sizing should be based on the seating capacities of each gates design aircraft.

^{2/} Minimum holdroom sizes based on combining of adjacent holdrooms.

Sources: FAA Advisory Circular 5360-13, Planning and Design Guidelines for Airport Terminal Buildings, Ricondo & Associates, Inc.

Exhibit E-4 to the Airline-Airport Use and Lease Agreement for Palm Beach International Airport.

Prepared By: Ricondo & Associates, Inc., March 1999.

- **Concessions.** The concession areas include the non-airline, revenue-producing tenants located within the terminal. There are several types of concessions including, but not limited to, food and beverage, retail (i.e. news, gifts, sundries, etc.) and rental car services. The gross areas of each type of concession space will be evaluated.
- **Federal Inspection Services (FIS) Facility.** The FIS facility includes all terminal areas designated for the processing of arriving international passengers. These areas include sterile corridors, Immigration and Naturalization Service (INS), United States Customs Services (USCS), and Animal Plant Health Inspection Services (APHIS) processing. In addition to the gross area of each FIS component, the quantity of INS and USCS/APHIS inspection booths are assessed, as well as the FIS baggage claim frontage.
- **Public Areas.** Public areas include non-leased spaces that are accessible by the general public. These areas include security checkpoints, concourse circulation, unenclosed areas and other general public space within the terminal building. The gross area of each component is assessed, as well as the passenger processing capability of the security checkpoints.
- **Management, Utility, and Mechanical.** This classification includes the remaining terminal areas that serve as DOA office and storage space, or other mechanical, electrical and plumbing systems. Only the gross area of these components are assessed.

Table IV-20 summarizes the minimum and recommended planning factors established for the individual components of the terminal building. As appropriate, the planning factors contained within the PBIA Landside Master Plan, Terminal Area Technical Report (Terminal Area Master Plan) were utilized as the planning factors for this assessment. However, many of the factors within the Terminal Master Plan were based on different classifications of functional areas within the terminal. This warranted the need to either combine some planning factors, or establish new factors. Additionally, the Terminal Master Plan based some factors on the component's relation to annual passenger enplanements. Due to the seasonality of passenger demand at PBIA, many of these factors were revised to demonstrate a relationship with peak-hour demand levels. In addition, the planning factors for the FIS components were revised to reflect the FIS facility planning standards contained in the "*Airport Federal Inspection Facilities' Guidelines, 1994 Edition*". Due to the strict enforcement of their planning standards, minimum planning factors were not established for the FIS-related components.

Tables IV-21 through IV-23 present the ratios associated with the existing functional components of the terminal based on the passenger demand levels experienced during 1998, as well as those projected for PAL 1 and PAL 2. The tables quantify each functional component in units of quantity, linear feet (length), or square feet (area). They also present the existing demand level or unit associated with the related functional component that forms the basis for the ratio.

Table IV-24 provides a comparison of the ratios presented in Tables IV-21 through IV-23 with the minimum and recommended planning factors presented in Table IV-20. The ratios that do not satisfy the recommended planning factors are presented in yellow, while the ratios presented in red indicate that they do not satisfy the minimum planning factors.

Table IV-20

Passenger Terminal Planning Factors

Space	Planning Factors			
	Minimum		Recommended	
Airline Operations Areas ^u				
Ticket Counter Area	4	SF/PHOP	5	SF/PHOP
Ticket Counter Frontage	0.18	LF/PHOP	0.20	LF/PHOP
Airline Ticket Office	6.00	SF/PHOP	9.00	SF/PHOP
Clubs - (Quantity)	1,000	PHOP	750	PHOP
Clubs - Area	2,000	SF/Club	3,500	SF/Club
Bag Claim Area	15.00	SF/PHTP	18.00	SF/PHTP
Bag Claim Frontage	0.60	LF/PHTP	0.80	LF/PHTP
Outbound Baggage	11.00	SF/PHOP	13.00	SF/PHOP
Inbound Baggage	10.00	SF/PHTP	11.80	SF/PHTP
Curbside Offices & Operations	0.010	SF/ANNENP	0.012	SF/ANNENP
Concessions ^u				
Food/Beverage	0.004	SF/ANNENP	0.007	SF/ANNENP
News/Gift/Sundry	0.003	SF/ANNENP	0.004	SF/ANNENP
Rental Car	0.0008	SF/ANNENP	0.001	SF/ANNENP
Other Revenue	0.0008	SF/ANNENP	0.001	SF/ANNENP
Federal Inspection Services ^v				
INS Primary Inspection Booth	100	Int'l PHTP/Booth	100	Int'l PHTP/Booth
USCS/APHIS Inspection Booth ^v	40	Int'l PHTP/Booth	40	Int'l PHTP/Booth
Bag Claim Frontage	0.60	LF/PHTP	0.80	LF/PHTP
INS Counter & Queue Area	1,050	SF/INS Booth	1700	SF/INS Booth
INS Offices	6.0	SF/Int'l PHTP	6.0	SF/Int'l PHTP
Bag Claim Area	15.0	SF/Int'l PHTP	18.0	SF/Int'l PHTP
Sterile Corridor	20.0	SF/LF Bag Claim	20.0	SF/LF Bag Claim
USCS Rover Command Center	0.25	SF/Int'l PHTP	0.25	SF/Int'l PHTP
USCS/APHIS Counter & Queue Area	12.0	SF/Int'l PHTP	12.0	SF/Int'l PHTP
USCS Offices	5.0	SF/Int'l PHTP	5.0	SF/Int'l PHTP
APHIS Offices	3.0	SF/Int'l PHTP	3.0	SF/Int'l PHTP
Restrooms	3.0	SF/Int'l PHTP	3.0	SF/Int'l PHTP
Circulation	10%	Of Total FIS SF	10%	Of Total FIS SF
Public Areas ^u				
Security Checkpoints	1	Chkpt/600 PHOP	1	Chkpt/500 PHOP
Security Circulation	150	SF/Chkpt	200	SF/Chkpt
Circulation-Concourses	50.0%	Of HoldroomSF	60.0%	Of HoldroomSF
Unenclosed Area	3.80	SF/PHP	4.83	SF/PHP
General Public Areas	42	SF/PHP	52	SF/PHP
Maintenance & Utility ^u				
Administrative	2.20%	Of Total SF	2.70%	Of Total SF
Mech./Elect./Bldg. Systems	8.00%	Of Total SF	11.00%	Of Total SF

Notes:

^u Planning factor source: PBIA Landside Master Plan, HNTB Corporation, November 1993.^v Planning factor source: Airport Federal Inspection Facilities Guidelines, USCS, 1994.^v Typically, USCS and APHIS each require screening of 10% of overall arriving international passengers.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

Table IV-21

Demand/Capacity Ratios for Terminal Components Based on Existing (1998) Demand

Functional Components	Units		Existing (1998) Demand Level or Related Component	Ratio of Existing Unit to Existing Demand Level or Related Component
	Quantity	LF		
Functional Components				
Airline Operations Area				
Ticketcounter-SF			11,347	6.66 SF/PHOP
Ticketcounter-LF		516		0.30 LF/PHOP
Airline Ticket Offices			20,073	11.79 SF/PHOP
Clubs - (Quantity)	2			852 PHOP/Club
Clubs - Area	2		6,258	3,129 SF/Club
Bag Claim-SF			30,895	19 SF/PHTP
Bag Claim-LF		1,288		0.78 LF/PHTP
Outbound Baggage			29,109	17.67 SF/PHTP
Inbound Baggage			26,699	16.21 SF/PHOP
Curbside Offices & Operations,			52,315	0.018 SF/ANNENP
Subtotal Airline			176,696	
Concessions				
Food/Beverage			24,164	0.0081 SF/ANNENP
News/Gift/Sundry			10,384	0.0035 SF/ANNENP
Rental Car			2,864	0.0010 SF/ANNENP
Other			7,464	0.0025 SF/ANNENP
Subtotal Concession			44,876	
Federal Inspection Services				
INS Primary Inspection Booths	2		200	Int'l PHTP
USCS/APHIS Inspection Booths ^{a/}	3		40	Int'l PHTP
Bag Claim Frontage		150	200	PHTP
				100 Int'l PHTP/Booth
				13 Int'l PHTP/Booth
				0.75 LF/PHTP

Notes:

^{a/} Although there are currently four (4) designated commuter gates, there are actually ten (10) aircraft parking positions.^{a/} Typically, USCS and APHIS each require screening of 10% of overall arriving international passengers.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

Table IV-21

Demand/Capacity Ratios for Terminal Components Based on Existing (1998) Demand

Functional Components	Units		Existing (1998) Demand Level or Related Component	Ratio of Existing Unit to Existing Demand Level or Related Component
	Quantity	LF		
Federal Inspection Services (Continued)				
INS Counter & Queue Area			2	INS Booth
INS Offices			200	Int'l PHTP
Bag Claim Area			200	Int'l PHTP
Sterile Corridor			200	Int'l PHTP
USCS Rover Command Center			200	Int'l PHTP
USCS/APHIS Counter & Queue Area			200	Int'l PHTP
USCS Offices			200	Int'l PHTP
APHIS Offices			200	Int'l PHTP
Restrooms			200	Int'l PHTP
Circulation			19,820	SF
Subtotal FIS			19,820	
Public Areas:				
Security Checkpoints	6		1,703	PHOP
Security Circulation			6	Chkpts.
Circulation-Concourses			63,517	SF
Unenclosed Area			2,876	PHP
Public Area			2,876	PHP
Subtotal Public Areas			191,158	
Management/Utility & Mechanical				
Administration			561,344	SF
Mechanical			561,344	SF
Subtotal Mgmt/Utility & Mech. Areas			65,281	
Total All Areas			561,348	

Notes:

^{1/} Although there are currently four (4) designated commuter gates, there are actually ten (10) aircraft parking positions.

^{2/} Typically, USCS and APHIS each require screening of 10% of overall arriving international passengers.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

Table IV-22

Demand/Capacity Ratios for Terminal Components Based on PAL 1 Demand

Functional Components	Units		Existing Demand Level or Related Component	Ratio of Existing Unit to PAL 1 Demand Level or Related Component	
	Quantity	LF			
Airline Operations Area					
Ticketcounter-SF			11,347	2,654 PHOP	4.28 SF/PHOP
Ticketcounter-LF		516		2,654 PHOP	0.19 LF/PHOP
Airline Ticket Offices			20,073	2,654 PHOP	7.56 SF/PHOP
Clubs - (Quantity)	2			2,654 PHOP	1,327 PHOP/Club
Clubs - Area			6,258	2 Clubs	3,129 SF/Club
Bag Claim-SF			30,895	2,553 PHTP	12.10 SF/PHTP
Bag Claim-LF		1,288		2,553 PHTP	0.50 LF/PHTP
Outbound Baggage			29,109	2,654 PHOP	10.97 SF/PHOP
Inbound Baggage			26,699	2,553 PHTP	10.46 SF/PHOP
Curbside Offices & Operations,			52,315	6,703,000 ANNENP	0.008 SF/ANNENP
Subtotal Airline			176,696		
Concessions					
Food/Beverage			24,164	6,703,000 ANNENP	0.0036 SF/ANNENP
News/Gift/Sundry			10,384	6,703,000 ANNENP	0.0015 SF/ANNENP
Rental Car			2,864	6,703,000 ANNENP	0.0004 SF/ANNENP
Other			7,464	6,703,000 ANNENP	0.0011 SF/ANNENP
Subtotal Concession			44,876		
Federal Inspection Services					
INS Primary Inspection Booths	2			370 Int'l PHTP	185 Int'l PHTP/Booth
USCS/APHIS Inspection Booths ^v	3			74 Int'l PHTP	25 Int'l PHTP/Booth
Bag Claim Frontage		150		370 PHTP	0.41 LF/PHTP

Note:

^v Typically, USCS and APHIS each require screening of 10% of overall arriving international passengers.

Source: Ricardo & Associates, Inc.

Prepared by: Ricardo & Associates, Inc., March, 1999

Table IV-22
Demand/Capacity Ratios for Terminal Components Based on PAL 1 Demand

Functional Components Federal Inspection Services (Continued)	Quantity		Existing Demand Level or Related Component	Ratio of Existing Unit to PAL 1 Demand Level or Related Component
	Units LF	SF		
INS Counter & Queue Area		2,850	2 INS Booth	1425 SF/INS Booth
INS Offices		1,900	370 Int'l PHTP	5.14 SF/Int'l PHTP
Bag Claim Area		3,560	370 Int'l PHTP	9.59 SF/Int'l PHTP
Sterile Corridor		4,000	370 Int'l PHTP	10.81 SF/Int'l PHTP
USCS Rover Command Center		120	370 Int'l PHTP	0.32 SF/Int'l PHTP
USCS/APHIS Counter & Queue Area		2,400	370 Int'l PHTP	6 SF/Int'l PHTP
USCS Offices		1,650	370 Int'l PHTP	4.46 SF/Int'l PHTP
APHIS Offices		550	370 Int'l PHTP	1.49 SF/Int'l PHTP
Restrooms		650	370 Int'l PHTP	1.76 SF/Int'l PHTP
Circulation		2,150	19,820 SF	10.8% Of Total FIS SF
Subtotal FIS		19,820		
Public Areas:				
Security Checkpoints	6		2,654 PHOP	442 PHOP/Chkpt
Security Circulation		1,226	6 Chkpts.	204 SF/Chkpt.
Circulation-Concourses		38,518	63,517 SF	61% SF/GATE
Unenclosed Area		28,357	4,681 PHP	6.1 SF/PHP
Public Area		123,057	4,681 PHP	26.3 SF/PHP
Subtotal Public Areas		191,158		
Management/Utility & Mechanical				
Administration		19,666	561,344 SF	3.50% Of Total SF
Mechanical		45,615	561,344 SF	8.13% Of Total SF
Subtotal Mgmt/Utility & Mech. Areas		65,281		
Total All Areas		561,348		

Source: Ricardo & Associates, Inc.
Prepared by: Ricardo & Associates, Inc., March, 1999

Table IV-23
Demand/Capacity Ratios for Terminal Components Based on PAL 2 Demand

Functional Components	Units		Existing Demand Level or Related Component	Ratio of Existing Unit to PAL 2 Demand Level or Related Component
	Quantity	LF		
Airline Operations Area				
Ticketcounter-SF			11,347	3.53 SF/PHOP
Ticketcounter-LF		516	3,210	0.16 LF/PHOP
Airline Ticket Offices			3,210	6.25 SF/PHOP
Clubs - (Quantity)	2		3,210	1,605 PHOP/Club
Clubs - Area			2	3,129 SF/Club
Bag Claim-SF			3,213	9.62 SF/PHTP
Bag Claim-LF		1,288	3,213	0.40 LF/PHTP
Outbound Baggage			3,210	9.07 SF/PHTP
Inbound Baggage			3,213	8.31 SF/PHOP
Curbside Offices & Operations			8,393,000	0.006 SF/ANNENP
Subtotal Airline			176,696	
Concessions				
Food/Beverage			8,393,000	0.0029 SF/ANNENP
News/Gift/Sundry			8,393,000	0.0012 SF/ANNENP
Rental Car			8,393,000	0.0003 SF/ANNENP
Other			8,393,000	0.0009 SF/ANNENP
Subtotal Concession			44,876	
Federal Inspection Services				
INS Primary Inspection Booths	2		450	Int'l PHTP
USCS/APHIS Inspection Booths ^v	3		90	Int'l PHTP/Booth
Bag Claim Frontage		150	450	0.33 LF/PHTP

Notes:
^v Typically, USCS and APHIS each require screening of 10% of overall arriving international passengers.

Source: Ricardo & Associates, Inc.
Prepared by: Ricardo & Associates, Inc., March, 1999

Table IV-23

Demand/Capacity Ratios for Terminal Components Based on PAL 2 Demand

Functional Components	Quantity		Units	Existing Demand Level or Related Component	Ratio of Existing Unit to PAL 2 Demand Level or Related Component
	LF	SF			
Federal Inspection Services (Continued)					
INS Counter & Queue Area		2,850		2 INS Booth	1425 SF/INS Booth
INS Offices		1,900		450 Int'l PHTP	4.22 SF/Int'l PHTP
Bag Claim Area		3,550		450 Int'l PHTP	7.89 SF/Int'l PHTP
Sterile Corridor		4,000		450 Int'l PHTP	8.89 SF/Int'l PHTP
USCS Rover Command Center		120		450 Int'l PHTP	0.27 SF/Int'l PHTP
USCS/APHIS Counter & Queue Area		2,400		450 Int'l PHTP	5 SF/Int'l PHTP
USCS Offices		1,650		450 Int'l PHTP	3.67 SF/Int'l PHTP
APHIS Offices		550		450 Int'l PHTP	1.22 SF/Int'l PHTP
Restrooms		650		450 Int'l PHTP	1.44 SF/Int'l PHTP
Circulation		2,150		19,820 SF	10.8% Of Total FIS SF
Subtotal FIS		19,820			
Public Areas:					
Security Checkpoints	6		3,210	PHOP	535 PHOP/Chkpt.
Security Circulation		1,226	6	Chkpts.	204 SF/Chkpt.
Circulation-Concourses		38,518	63,517	SF	61% SF/GATE
Unenclosed Area		28,357	5,794	PHP	4.9 SF/PHP
Public Area		123,057	5,794	PHP	21.2 SF/PHP
Subtotal Public Areas		191,158			
Management/Utility & Mechanical					
Administration		19,666	561,344	SF	3.50% Of Total SF
Mechanical		45,615	561,344	SF	8.13% Of Total SF
Subtotal Mgmt./Utility & Mech. Areas		65,281			
Total All Areas		561,348			

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

Table IV-24

Comparison of Demand-Capacity Ratios for Terminal Components to Target Planning Factors

Space	Basis	Target Planning Factors		Component to Passenger Demand Level or Related Component	
		Min.	Recommended	1998	PAL 1 PAL 2
Airline Operations Areas ¹⁰					
Ticket Counter Area	SF/PHOP	3.96	5.00	4.66	4.28
Ticket Counter Frontage	LF/PHOP	0.18	0.20	0.30	0.19
Airline Ticket Office	SF/PHOP	6.00	9.00	11.78	7.46
Chairs - (Queueing)	PHOP/Chair	3,000	750	452	1,327
Chairs - Area	SF/Chair	2,000	3,500	3,125	1,129
Bag Claim Area	SF/PHTP	15.00	18.00	18.76	12.10
Bag Claim Frontage	LF/PHTP	0.60	0.80	0.76	0.50
Outboard Baggage	SF/PHOP	11.00	13.00	17.67	10.97
Inboard Baggage	SF/PHTP	10.00	11.80	16.21	10.44
Curbside Offices & Operations	SF/ANNENP	0.016	0.020	0.018	0.008
Concessions ¹¹					
Food/Beverage	SF/ANNENP	0.0040	0.0070	0.0081	0.0076
News/Gift/Sundry	SF/ANNENP	0.0010	0.0040	0.0015	0.0015
Rental Car	SF/ANNENP	0.0008	0.0010	0.0010	0.0004
Other Revenue	SF/ANNENP	0.0008	0.0010	0.0025	0.0021
Federal Inspection Services ¹²					
INS Primary Inspection Booths	Int'l PHTP/Booth	N/A	100	100	145
USCS/APHS Inspection Booths ¹³	Int'l PHTP/Booth	N/A	40	13	25
Bag Claim Frontage	LF/PHTP	N/A	0.80	0.75	0.41
Legend					
	Grey				
	White				

Indicates ratios that do not satisfy the Recommended Planning Factor.

Indicates ratios that satisfy neither the Minimum nor the Recommended Planning Factors.

Indicates ratios that do not satisfy the Recommended Planning Factor.

Indicates ratios that satisfy neither the Minimum nor the Recommended Planning Factors.

Notes:

¹⁰ Planning factor source: WBLA Landed Matter Plan, RNTB Corporation, November 1993.¹¹ Planning factor source: Riccoby & Associates, Inc.¹² Planning factor source: Airport Federal Inspection Facilities Guidelines, USCS, 1994.¹³ Typically, USCS and APHS each require screening of 10% of overall arriving international passengers.

Prepared by Riccoby & Associates, Inc., March, 1999.

Table IV-24

Comparison of Demand-Capacity Ratios for Terminal Components to Target Planning Factors

Space	Basis	Target Planning Factors		Component to Passenger Demand Level or Related Component	
		Min.	Recommended	1993	PAL 1 PAL 2
Federal Inspection Services (Continued) ^a					
INS Counter & Queue Area	SF/lan PHTP	N/A	1,700	1,425	1,425
INS Offices	SF/lan PHTP	N/A	6.0	9.5	5.14
Bag Claim Area	SF/lan PHTP	N/A	25.0	17.8	4.22
Sterile Corridor	SF/lan PHTP	N/A	20.0	20.0	9.57
USCS Rover Command Center	SF/lan PHTP	N/A	0.3	0.6	-0.81
USCS/APHIS Counter & Queue Area	SF/lan PHTP	N/A	12	6.3	0.3
USCS Offices	SF/lan PHTP	N/A	5.0	8.3	4.5
APHIS Offices	SF/lan PHTP	N/A	3.0	5.6	1.7
Restrooms	SF/lan PHTP	N/A	3.0	3.3	1.2
Circulation ^b	QF Total FIS SF	N/A	10.0%	10.8%	1.9
					10.8%
Public Areas ^b					
Security Checkpoints	PHDP/Dispatch	600	500	284	442
Security Circulation	SF/Chgt	150	200	204	204
Circulation-Concourses ^b	QF Holdroom SF	50.0%	60.0%	60.6%	60.6%
Unenclosed Area	SF/PHDP	3.90	4.81	9.36	6.06
Public Areas	SF/PHDP	42	52	43	26
					21
Maintenance & Utility ^b					
Administrative ^b	QF Total SF	2.00%	2.70%	3.5%	3.5%
Mech./Elec./Bldg. Systems	QF Total SF	8.00%	11.00%	8.1%	8.1%

Increases ratios that do not satisfy the Recommended Planning Factor

Legend: Ratio: Indicates ratios that do not satisfy the Recommended Planning Factor.

Ratio: Indicates ratios that satisfy or exceed the Minimum and the Recommended Planning Factors.

Notes:

^a Planning factor source: FDIA Landmark Master Plan, INVTB Corporation, November 1993.^b Planning factor source: Airport Federal Inspection Facilities Guidelines, USCS, 1996.^c It is likely that the administrative area and public circulation will not satisfy the Recommended and/or Minimum Terminal Planning Factors at PAL 1 and/or PAL 2.

This is due to the fact that floor area is proportional to the gross area of terminal building. As the terminal building is expanded, the sizes of these components will have to be increased as well.

Table IV-24 indicates that some of the FIS components did not meet the planning standards contained in the FIS Guidelines during 1998. These components include the FIS bag claim frontage and bag claim area, the INS counter queue area and the APHIS offices

Although the remaining terminal components had capacity-demand ratios during 1998 that exceeded the minimum planning factors, some did not satisfy the recommended factors. These facilities include airline lounges/clubs, baggage claim frontage, curbside offices and operations, news, gift and sundry concessions, rental car concessions, public areas, and mechanical, electrical and other building systems.

In summary, Table IV-24 shows that at the PAL 1 demand levels, twenty of the terminal components will not satisfy the minimum and recommended planning factors, while an additional five components will only satisfy the recommended planning factors. This confirms the earlier determination that the terminal building will need to be expanded prior to PAL 1. At PAL 2, twenty-five of the terminal components will not satisfy the minimum and recommended planning factors, while two additional components will only satisfy the recommended planning factors. It is also likely that the administrative and public circulation areas will not satisfy the recommended and/or minimum planning factors at PAL 1 and/or PAL 2. This is due to the fact that their sizes are proportional to the gross area of the terminal. As the terminal facility needs to be expanded, the sizes of these components will need to be increased as well.

4.2.2 Terminal Facility Requirements

The demand/capacity assessment for the existing terminal building determined that there are potential deficiencies in some of its functional components. These deficiencies are primarily associated with the FIS facility. The assessment also concluded that the overall size of the terminal building is adequate to serve the current demand levels experienced at the Airport, as well as some incremental demand growth. However, expansion of the terminal building would be necessary as demand levels approach PAL 1.

The following presents the facility requirements for the individual functional components of the terminal. These requirements will be necessary to ensure that facilities are adequate to serve passenger levels through PAL 1 and PAL 2.

4.2.2.1 Gate Requirements

The demand/capacity assessment determined that the existing terminal gates, in terms of quantity and type (i.e. narrowbody, widebody, and commuter), were adequate to serve the peak-hour demand levels experienced during 1998. However, at PAL 1 and PAL 2, the Peak-Hour gate demand associated with the Peak-Month Average Day (PMAD) is expected to exceed the number of existing gates. In order to quantify the number of additional gates required for PAL 1 and PAL 2, a ramp chart analysis was performed.

A detailed evaluation of gate usage based on a "design-day" schedule for the two PALs. The design-day schedules are representative of the projected PMAD activity and fleet mix projections for air carrier and commuter operations. Section III, *Demand Analyses*, presents the methodology associated with the development of the design day schedules for PAL 1 and PAL 2.

The design day schedules were converted into ramp charts utilizing a gate-scheduling model. The model assigns each air carrier aircraft to a specific gate according to logic specified by the user. The logic variables included in the development of the ramp charts are as follows:

- Minimum inter-gate times (i.e., the time the gate is not occupied between successive flights) of ten minutes for air carriers and five minutes for commuters are utilized.
- Dynamic use of gates (e.g. the use of gate frontage for either three narrow body aircraft or two wide body aircraft, etc.) is considered only for the existing gates and to the extent currently practiced at the Airport. Dynamic use of new gates necessary to accommodate the demand scenarios was not considered.
- Gates were assigned through an interactive process. Initially, the future schedules were run against the existing gate facilities with consideration of preferential use arrangements. In order to minimize the aircraft gate mix, gates were assigned according to aircraft wingspan. Aircraft with larger wingspan were given preference to use unoccupied gates since PBI has a significant number (17 out of 29) of widebody gates. Additional gates were then added, as needed, to accommodate the flights that were not scheduled to a gate under the initial run.

Exhibits IV-9 through IV-11 illustrate the ramp charts associated with the current (1998) design day schedule and those for PAL 1 and PAL 2. Each ramp chart depicts a series of bars representing the time period in which an air carrier or commuter aircraft needs to be parked, either at a gate or at a remote parking position. Each bar is assigned a color and labeled according to the aircraft operator, equipment type, scheduled arrival/departure time, and the origin/destination. Due to the scale of the ramp charts presented here, the labeling on the bars may not be legible. Therefore, Appendix D contains the same ramp charts at a larger scale so that the labeling can be read.

To the left of the bars, the associated gate or remote parking position is identified. The 1998 ramp chart, Exhibit IV-9, identifies the actual gate numbers utilized by the signatory airline(s) during March of 1998. Exhibits IV-10 and IV-11, however, do not identify specific gate numbers. Therefore, they are simply identified as air carrier (AC) gates, international gates (INT'L) or commuter (C) gates and randomly assigned a sequential number. Aircraft that will be parked temporarily at a remote parking position are still assigned a gate number/identifier, but an asterisk (*) follows the gate number/identifier to represent a remote parking position.

In some cases, the ramp charts indicate a single commuter gate serving two aircraft simultaneously. This is possible because there are currently ten commuter aircraft parking positions serving the four commuter gates. Therefore, it should not be construed that this is an indication of the need for additional commuter gates.

As depicted in Exhibit IV-9, the existing 29 gates at the Airport were adequate for serving the PMAD gate demand during 1998. However, at PAL 1 and PAL 2, the number of gates required to serve the demand levels increases to 39 and 44, respectively. **Table IV-25** summarizes the domestic air carrier, commuter, and international air carrier gate requirements for PAL 1 and PAL 2. As shown, ten additional domestic air carrier gates will be required at PAL 1 and another four at PAL 2. Additional international gates will not be needed until PAL 2, when one additional gate will be required. No additional commuter gates are anticipated throughout the planning horizon.



Source: Ricordo & Associates, Inc.
Prepared by: Ricordo & Associates, Inc.

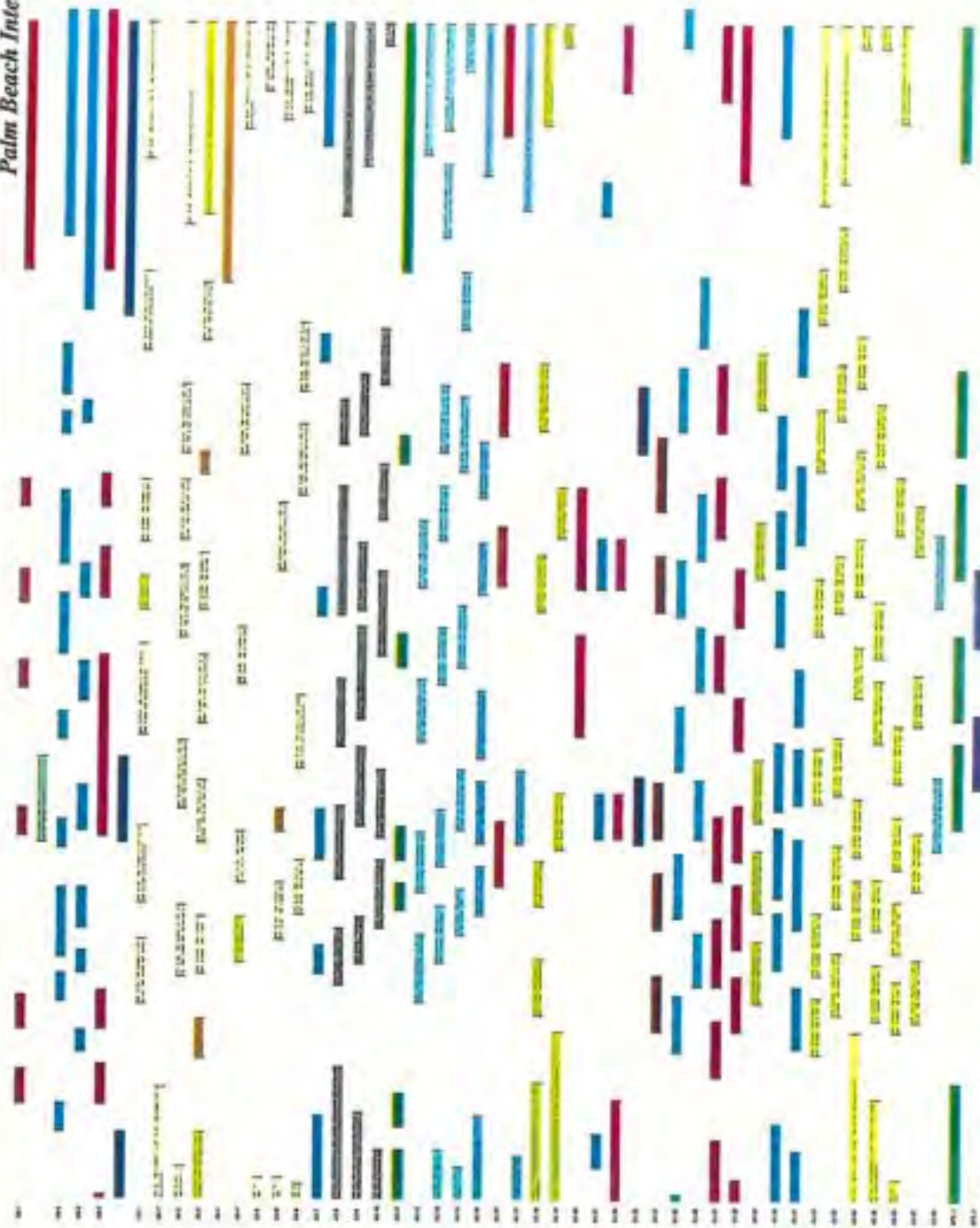
Exhibit IV-9

1998 (Actual)

Palm Beach International Airport



Palm Beach International Airport



Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

Exhibit IV-11

PAL 2 Ramp Chart

Strategic Master Plan Study

October 2000

Table IV-25

Summary of Gate Requirements

Fleet Type	1998 (Actual)	Ramp Chart Analysis	
		PAL 1	PAL 2
Domestic			
Narrow Body	8	28	31
Wide Body	16	6	7
Jumbo	0	0	0
Subtotal	24	34	38
Commuter			
Small	3	3	3
Large	1	1	1
Subtotal	4	4	4
International			
Narrow Body	0	1	1
Wide Body	1	0	1
Jumbo	0	0	0
Subtotal	1	1	2
TOTAL GATES	29	39	44

Sources: Airport Management Records, Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

In order to confirm the gate requirements that were estimated through the ramp chart analyses, two sensitivity analyses were performed. The first sensitivity analysis evaluates the gate requirements based on daily utilization factors. Under this method, future gate requirements are estimated by dividing the design year PMAD aircraft departures by a target or projected daily utilization factor. The second sensitivity analysis assessed gate requirements based on the number of annual enplanements per Narrow Body Equivalent Gate (NBEG). The NBEG statistic is used to normalize both gate and apron frontage requirements.

Under the first sensitivity analysis, daily utilization target levels were defined for each type of commercial activity: air carrier, commuter, and international. For each activity, the daily utilization target exceeded the present gate utilization rates in order to account for better gate utilization. The gate utilization targets established for air carrier gates, commuter gates, and international gates are 5 departures per gate, 10 departures per gate, and 5 departures per gate respectively. These daily utilization factors, when applied to the PMAD departures for PAL 1 (225 departures) and PAL 2 (245 departures) result in a requirement of 40 total gates and 44 total gates respectively. Of the total gates required for PAL 1, 35 are air carrier gates, four are commuter gates, and one is an international gate.

For PAL 2, 38 gates are air carrier gates, four are commuter gates, and two are international gates. With the exception of one additional air carrier gate required for PAL 1, this methodology confirms the gate requirements based on the ramp chart analysis.

For the second sensitivity analysis, utilization targets for enplanements per NBEG gate were established using the B757 aircraft to define the NBEG. **Table IV-26** presents the NBEG indexes adopted for this analysis. **Table IV-27** presents the conversion of PBIA's existing gates to NBEG gates using the indexes shown in **Table IV-26**.

The utilization targets were determined based on the actual utilization levels experienced in 1998, a comparison of enplanements per gate ratios for other airports similar to PBIA in size and operating characteristics, and consideration for potential increases in gate utilization. **Table IV-28** presents the 1998 and target utilization levels for enplanements per NBEG. Applying the target utilization levels to the projected PAL 1 and PAL 2 demand result in gate requirements of 39 total gates at PAL 1 and 44 total gates at PAL 2. This correlates to 34 air carrier gates, 4 commuter gates, and one international gate at PAL 1. At PAL 2, total gates are comprised of 38 air carrier gates, 4 commuter gates, and 2 international gates.

In addition, the apron frontage associated with the gate requirements for PAL 1 and PAL 2 identified for the ramp chart analysis are shown in **Tables IV-29** and **IV-30**. These were developed using a gate frontage multiplier for each aircraft type in the fleet. The gate frontage multiplier consists of the average wingspan of aircraft within a fleet category and the corresponding portion of wingtip clearance required between two adjacent aircraft. For purposes of this analysis, 25 feet of wingtip clearance between two adjacent aircraft is assumed. For example, a domestic narrow body requires 150 linear feet of gate frontage (125 feet wingspan plus 25 feet wingtip clearance). Currently, the Airport provides a total of 4,982 linear feet of gate frontage. At PAL 1 and PAL 2, the gate frontage required will increase to 5,976 linear feet and 6,818 linear feet, respectively.

Table IV-26

Narrow Body Equivalent Gate (NBEG) Index

Aircraft Category	Maximum Wingspan (feet)	Typical Aircraft	NBEG Index
Small Commuter	49	Beech 1900, Bae 31	0.39
Large Commuter	81	ATR 42/CRJ	0.65
Narrow Body	125	B757/MD80/B737	1.00
Wide Body	171	MD-11/B767	1.37
Jumbo	214	B747/B777/A330	1.71

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

Table IV-27

Conversion of Existing Gates to NBEG

Domestic

Aircraft Category	NBEG Index	Number of Existing Gates	NBEG
Small Commuter	0.39	3	1.17
Large Commuter	0.65	1	0.65
Narrow Body	1.00	8	8.00
Wide Body	1.37	16	21.92
Jumbo	1.71	0	0.00
Summary:			
Commuter Gates		4	1.82
Air Carrier Gates		24	29.92
Total Domestic Gates		28	31.74

International

Aircraft Category	NBEG Index	Number of Existing Gates	NBEG
Small Commuter	0.39	0	0.00
Large Commuter	0.65	0	0.00
Narrow Body	1.00	0	0.00
Wide Body	1.37	1	1.37
Jumbo	1.71	0	0.00
Summary:			
Commuter Gates		0	0.00
Air Carrier Gates		1	1.37
Total International Gates		1	1.37

Sources: Airport Management Records, Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., March 1999

Table IV-28

Gate Requirements Based On Annual Enplanements per NBEG
Actual and Recommended Gate Utilization Ratios

Utilization Ratios:

1998 (actual)	Domestic		International ¹
	Air Carrier	Commuter	
Annual Enplanements (1998)	2,786,676	167,587	10,990
Enplanements Per Gate (1998)	116,112	41,897	10,990
NBEG	29.92	1.82	1.37
Enplanements Per NBEG	93,138	107,428	8,022
Recommended PAL Utilization Factors ²			
PAL 1 - Enplanements Per NBEG	175,000	175,000	175,000
PAL 2 - Enplanements Per NBEG	190,000	190,000	175,000

Notes:

- ^{1/} International activity for this analysis includes only air carrier enplanements. International commuter enplanements currently operate from the Commuter Concourse and therefore, are included under the commuter activity.
- ^{2/} The recommended domestic utilization factors are shown to increase over time (i.e., from PAL 1 to PAL 2) to consider the anticipated increases in load factors.

Sources: Airport Management Records, Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

Table IV-29

PAL 1 Gate Frontage Requirements

Fleet Type	Gate Frontage Multiplier (Lin. Ft.)	Required Gates ¹	Gate Frontage Requirement (Linear Feet)
Domestic			
Narrow Body	150	28	4,200
Wide Body	196	6	1,176
Jumbo	239	0	0
Total - Domestic		34	5,376
Commuter			
Small	100	3	300
Large	150	1	150
Total - Commuter		4	450
International			
Narrow Body	150	1	150
Wide Body	196	0	0
Jumbo	239	0	0
Total - International		1	150
Total Gate Frontage Required			5,976

Notes:

^{1/} Required Gates represent the number of required gates as determined through the Ramp Chart Analysis.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

Table IV-30

PAL 2 Gate Frontage Requirements

Fleet Type	Gate Frontage Multiplier (Lin. Ft.)	Required Gates ¹	Gate Frontage Requirement (Linear Feet)
Domestic			
Narrow Body	150	31	4,650
Wide Body	196	7	1,372
Jumbo	239	0	0
Total - Domestic		38	6,022
Commuter			
Small	100	3	300
Large	150	1	150
Total - Commuter		4	450
International			
Narrow Body	150	1	150
Wide Body	196	1	196
Jumbo	239	0	0
Total - International		2	346
Total Gate Frontage Required			6,818

Notes:

^{1/} Required Gates represent the number of required gates as determined through the Ramp Chart Analysis.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999

4.2.2.2 Individual Functional Component Requirements

Facility requirements for the individual functional components in the terminal building are based on the passenger demand levels experienced during 1998, and those projected for PAL 1, PAL 2, SL 1, and SL 2. Both the minimum and recommended planning factors established during the demand/capacity assessment also form the basis for establishing these facility requirements. These factors are simply multiplied by either the associated passenger demand levels and/or the related terminal facility that dictates the quantity or size of the individual components.

Future terminal area space requirements are based on projected demand affecting the different functional areas, in terms of aircraft operations or peak passenger flows. These space requirements serve only as an initial assessment of the future needs for the terminal facilities. The gross area ultimately provided for each functional area may vary from that derived through the planning factors, depending on the terminal development concept implemented and its ultimate configuration.

The minimum and recommended terminal facility requirements for PAL 1, PAL 2, SL 1 and SL 2 are presented in Tables IV-31 and IV-32, respectively. The minimum terminal facility requirements range from 694,850 square feet to 1,069,390 square feet for SL 1 and SL 2, respectively. Based on the recommended terminal planning factors, the terminal facility requirements range from 813,140 square feet at SL 1 to 1,451,620 square feet at SL 2.

4.3 Terminal Curbfront

This section presents the demand/capacity assessment and the establishment of facility requirements for the terminal curbfront. Both the enplaning and deplaning curb frontage are evaluated based on passenger and vehicular demand characteristics from the "Concurrent Survey of Departing Passengers for Ft. Lauderdale/Hollywood International (FLL), Miami International (MIA), and Palm Beach International Airports (PBI)" performed by Leigh Fisher Associates (LFA). In addition, average vehicle dwell times are considered based on field observations conducted as part of this Strategic Plan.

4.3.1 Terminal Curbfront Demand/Capacity Assessment

The purpose of the demand/capacity assessment for the terminal's curbfront is to determine its ability to support both the existing and projected vehicular traffic levels. This assessment establishes a peak hour capacity, in terms of the number of vehicles that each of the existing curbfronts can accommodate. Based on the average passengers per vehicle contained in the Concurrent Survey of Departing Passengers, the peak hour vehicular capacities are converted into a peak hour passenger threshold. The maximum demand levels are then compared with the existing passenger demand levels, as well as the demand levels associated with PAL 1 and PAL 2.

Demand/capacity assessments are presented separately for the existing enplaning (upper) and deplaning (lower) level curbfront facilities. Currently, both the enplaning (departure) and deplaning (arrival) level roadways have two separate curbfront facilities, commonly referred to as the inner and outer curbfronts. As previously presented in the Inventory Section, both the inner and outer curbfronts on the enplaning level, as well as the inner curbfront of the deplaning level, have an overall length of 650 linear feet. The outer curb of the deplaning level is slightly shorter, with only

Table IV-31
Minimum Terminal Requirements

Existing Area		SL 1	PAL 1	PAL 2	SL 2
Airline Gates					
Quantity:					
Commuter Holdroom-Quantity	4	4	4	4	5
Narrowbody Holdroom-Quantity	8	26	29	32	40
Widebody Holdroom-Quantity	17	5	6	8	10
Area:					
Commuter Holdroom-SF	5,269	3,200	3,200	3,200	4,000
Narrowbody Holdroom-SF	14,607	5,200		64,000	80,000
Widebody Holdroom-SF	43,641	13,500	16,200	21,600	22,000
Subtotal Gate Areas	63,517	66,700	77,400	88,800	111,000
Airline Operations Area					
Ticketcounter-SF	11,347	13,400	13,300	16,100	19,400
Ticketcounter-LF	516	540	530	640	770
Airline Ticket Offices	20,073	16,100	15,900	19,300	23,200
Club - Quantity	2	3	3	3	4
Club-SF	6,258	9,400	9,300	11,200	13,600
Bag Claim-SF	30,895	40,400	38,300	48,200	58,200
Bag Claim-LF	1,288	1,600	1,500	1,900	2,300
Outbound Baggage	29,109	29,600	29,200	35,300	42,600
Inbound Baggage	26,699	26,900	25,500	32,100	38,800
Curbside Offices & Operations	52,315	55,500	67,000	83,900	101,300
Subtotal Airline Operations Area	176,696	191,300	198,500	246,100	297,100
Concessions					
Food/Beverage	24,164	22,200	26,800	33,600	40,500
News/Gift/Sundry	10,384	16,700	20,100	25,200	30,400
Rental Car	2,864	4,400	5,400	6,700	8,100
Other	7,464	4,400	5,400	6,700	8,100
Subtotal Concessions Area	44,876	47,700	57,700	72,200	87,100

Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

Table IV-31

Minimum Terminal Requirements

	Existing Area	SL 1	PAL 1	PAL 2	SL 2
Federal Inspection Services					
INS Primary Inspection Booths	2	4	4	5	6
USCS/APHIS Inspection Booths ^v	3	2	2	3	3
Bag Claim Frontage	150	230	220	270	330
INS Counter & Queue Area					
INS Offices	2,850	6,800	6,800	8,500	10,200
Bag Claim Area	1,900	2,260	2,220	2,700	3,260
Sterile Corridor	3,550	5,660	5,550	6,750	8,150
USCS Rover Command Center	4,000	7,540	7,400	9,000	10,860
USCS/APHIS Counter & Queue Area	120	120	120	120	120
USCS Offices	2,400	4,520	4,440	5,400	6,520
APHIS Offices	1,650	1,890	1,850	2,250	2,720
Restrooms	550	1,130	1,110	1,350	1,630
Circulation	650	1,130	1,110	1,350	1,630
	2,150	3,400	3,400	4,200	5,000
Subtotal FIS Areas	19,820	34,450	34,000	41,620	50,090
Public Areas:					
Security Checkpoints	5	5	5	5	6
Security Circulation	1,226	800	800	800	900
Circulation-Concourses	38,518	41,200	46,400	53,300	66,600
Unenclosed Area	28,357	18,400	17,800	22,000	26,600
Public Area	123,057	203,800	196,600	243,300	293,700
Subtotal Public Areas	191,158	264,200	261,600	319,400	387,800
Management/Utility & Mechanical					
Administration	19,666	13,600	14,200	17,300	21,000
Mechanical	45,615	74,900	77,800	94,900	115,300
Subtotal Mgmt/Utility & Mech. Areas	65,281	88,500	92,000	112,200	136,300
Total All Areas:	561,348	694,850	721,200	880,320	1,069,390

Note:

^v Typically, USCS and APHIS each require screening of 10% of overall arriving international passengers.

Source: Ricardo & Associates, Inc.

Prepared by: Ricardo & Associates, Inc.

Table IV-32

Recommended Terminal Requirements

Airline Gates		Existing Area		SL 1		PAL 1		PAL 2		SL 2	
Quantity:											
Commuter Holdroom-Quantity 1/		4		4		4		4		5	
Narrowbody Holdroom-Quantity		8		26		29		32		40	
Widebody Holdroom-Quantity		17		5		6		8		10	
Area:											
Commuter Holdroom-SF		5,269		4,000		4,000		4,000		5,000	
Narrowbody Holdroom-SF		14,607		65,000		72,500		80,000		100,000	
Widebody Holdroom-SF		43,841		17,000		20,400		27,200		34,000	
Subtotal Gate Areas		63,517		86,000		96,900		111,200		139,000	
Airline Operations Area											
Ticketcounter-SF		11,347		12,700		15,900		19,300		23,200	
Ticketcounter-LF		516		530		660		800		970	
Airline Ticket Offices		20,073		22,900		28,700		34,700		41,800	
Club - Quantity		2		3		4		4		5,16	
Club-SF		6,258		9,900		12,400		15,000		18,100	
Bag Claim-SF		30,895		38,300		46,000		57,800		69,800	
Bag Claim-LF		1,288		1,700		2,000		2,600		3,100	
Outbound Baggage		29,109		27,600		34,500		41,700		50,400	
Inbound Baggage		26,699		25,100		30,100		37,900		45,800	
Curbside Offices & Operations		52,315		111,000		134,100		167,900		202,600	
Subtotal Airline Operations Area		176,696		247,500		301,700		374,300		451,700	
Concessions											
Food/Beverage		24,164		38,900		46,900		58,800		70,900	
News/Gift/Sundry		10,384		22,200		26,800		33,600		40,500	
Rental Car		2,864		5,600		6,700		8,400		10,100	
Other		7,464		5,600		6,700		8,400		10,100	
Subtotal Concessions Area		44,876		72,300		87,100		109,200		131,600	

Source: Ricordo & Associates, Inc.
Prepared by: Ricordo & Associates, Inc.

Table IV-32

Recommended Terminal Requirements

	Existing Area		SL 1		PAL 1		PAL 2		SL 2	
Federal Inspection Services										
INS Primary Inspection Booths	2		3		4		5		6	
USCS/APHIS Inspection Booths ^v	3		2		2		3		3	
Bag Claim Frontage	150		240		300		360		430	
INS Counter & Queue Area	2,850		5,100		6,800		8,500		10,200	
INS Offices	1,900		1,790		2,220		2,700		3,260	
Bag Claim Area	3,550		7,440		9,250		11,250		13,580	
Sterile Corridor	4,000		5,950		7,400		9,000		10,860	
USCS Rover Command Center	120		120		120		120		120	
USCS/APHIS Counter & Queue Area	2,400		3,570		4,440		5,400		6,520	
USCS Offices	1,650		1,490		1,850		2,250		2,720	
APHIS Offices	550		890		1,110		1,350		1,630	
Restrooms	650		890		1,110		1,350		1,630	
Circulation	2,150		3,000		3,800		4,700		5,600	
Subtotal FIS	19,820		30,240		38,100		46,620		56,120	
Public Areas:										
Security Checkpoints	5		4		5		6		8	
Security Circulation	1,226		800		1,000		1,200		1,600	
Circulation-Concourses	38,518		51,600		58,100		66,700		83,400	
Unenclosed Area	28,357		18,500		22,600		28,000		33,800	
Public Area	123,057		199,300		243,400		301,300		363,600	
Subtotal Public Areas	191,158		270,200		325,100		397,200		482,400	
Management/Utility & Mechanical										
Administration	19,666		19,600		23,600		28,800		35,000	
Mechanical	45,615		87,300		104,900		128,400		155,800	
Subtotal Mgmt/Utility & Mech. Areas	65,281		106,900		128,500		157,200		190,800	
Total All Areas:	561,348		813,140		977,400		1,195,720		1,451,620	

Notes:

^v Typically, USCS and APHIS each require screening of 10% of overall arriving international passengers.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc.

600 linear feet of curb frontage. In addition, the terminal roadway provides four vehicle lanes with each curbfront: two for passenger loading/unloading, and two for vehicle circulation.

At PBIA, the enplaning and the deplaning level curbfronts are not operated on a common use basis for all transportation modes. Instead, the outer and inner curbfronts are allocated to specific transportation modes. Recently, curbside check-in facilities for select airlines were installed on the outer curbfront of the enplaning level. Enplaning level vehicle distribution among the inner and outer curbfront has changed as a result of this project. Both the inner and outer enplaning level curbfronts now accommodate private autos, taxis, limousines and courtesy vehicles. Commercial vehicles, such as buses, rental car shuttles, and Park-and-Ride shuttles continue to utilize the outer curbfront only. On the deplaning level, the inner curbfront serves private automobiles exclusively. Taxis and limousines utilize two stands located at both ends of the inner curbfront. The outer curbfront is used exclusively by commercial vehicles.

This analysis utilizes the concept of foot-minutes to quantify curbfront demand. When using foot-minutes, curbfront demand is defined in terms of the number of vehicles accessing each terminal curb, the operational length of each vehicle type, and the time each vehicle spends at the curbfront. **Tables IV-33 and IV-34** present the methodology used to establish demand limits for both the enplaning and deplaning level's existing curbfront, respectively. The methodology utilized to calculate the demand limits contained in these two tables is summarized below.

- (a) **Average Vehicle Length** - The typical overall vehicle length for each mode of transportation was established and increased approximately five feet (5 feet) to allow for maneuvering space between stopped vehicles.
 - (b) **Average Dwell Time** - The average time that each vehicle type is stopped at the curbfront was established through field observations conducted on February 24, 1999.
 - (c) **Demand Per Vehicle** - The average vehicle demand is obtained by multiplying the average vehicle length (a) by the average dwell time (b). Demand is expressed in terms of foot-minutes.
 - (d) **Mode Split** - The mode split indicates the percent of overall vehicles utilizing the curb that are of a particular vehicular type. Statistics from the Concurrent Survey of Departing Passengers for PBIA, MIA and FLL performed by Leigh Fisher Associates (LFA) were the basis of the mode split. The survey indicated the percent of passengers arriving at PBIA via each transportation mode. These percentages were then weighed based on the average passengers per vehicle to obtain the distribution of vehicles (expressed as a percentage).
 - (e) **Weighted Curbfront Demand** - This is a presentation of the calculation used to establish the weighted curbfront demand by vehicle type. It results in the apportioning of the available curbfront to each vehicle mode based on the average foot-minutes and the share (percent) of overall demand for each vehicle mode type.
- (1) **Foot-Minutes:** The demand per vehicle (c), expressed as foot-minutes, was multiplied by the vehicle mode split (d) to obtain a weighted curbfront demand in foot-minutes.

Table IV-33
Existing Enplaning Level Curbside Demand Limits

	(a) Average Vehicle Length (ft.)	(b) Average Dwell Time ^v	(c) Demand Per Vehicle (Fl.-Min.)	(d) Mode Split by Vehicle Type ^w	(e-1) Weighted Curbside Demand by Mode		(e-3) Linear Ft.	(f-1) Foot- Minutes ^x	(f-2) 20 Minute Demand Limit		(f-3) Pax/ Veh. ^y	(f-4) Pax.	(g) PHOP Per Mode
					Fl.-Min.	Percent			Vehicles	Pax.			
Inner Curbside:													
Private Autos ^z	25	2.64	66.00	81.63%	53.88	89.13%	579.35	17,380.52	263.34		1.6	421	843
Taxi	25	0.84	21.00	11.80%	2.48	4.10%	26.65	799.44	38.07		1.5	57	114
Limousine	35	1.91	66.85	5.23%	3.50	5.79%	37.60	1,128.15	16.88		2.3	39	78
Courtesy Vehicles	35	1.27	44.45	1.34%	0.59	0.98%	6.40	191.89	4.32		3.0	13	28
				100.00%	60.45	100.00%	650.00	19,500.00	322.60			530	1,060
Outer Curbside:													
Private Autos ^z	25	2.64	66.00	56.96%	37.59	70.09%	455.61	13,668.43	207.10		1.6	331	663
Taxi	25	0.84	21.00	8.23%	1.73	3.22%	20.96	628.70	29.94		1.5	45	90
Limousine	35	1.91	66.85	3.65%	2.44	4.55%	29.57	887.20	13.27		2.3	31	61
Rental Car Shuttle	35	1.19	41.65	22.58%	9.40	17.54%	113.98	3,419.39	82.10		4.0	328	657
Park-and-Ride Shuttle	25	0.98	24.50	4.75%	1.16	2.17%	14.12	423.45	17.28		3.0	52	104
Bus	50	1.19	59.50	0.51%	0.30	0.57%	3.67	110.18	1.85		4.0	7	15
Courtesy Vehicles	35	1.27	44.45	0.93%	0.42	0.77%	5.03	150.91	3.40		3.0	10	20
Hotel Shuttle	25	0.98	24.50	2.38%	0.58	1.09%	7.06	211.73	8.64		3.0	26	52
				100.00%	53.63	100.00%	650.00	19,500.00	363.58			831	1,661

Total PHOP Utilizing Enplaning Curb: 2,722

Notes:
^v All modes from R & A observations on February 24, 1999.
^w Derived from Concurrent Survey of Departing Passengers, FLL, MIA and PBI/A Airports, Leigh Fisher Associates, January 1996.
^x A ratio of 1.3 is applied to actual curbside length to account for dual curbside lanes.
^y Private auto from Leigh Fisher Survey. All other modes estimated.
^z Includes automobiles checking in at curbside prior to parking in public garage.
 Totals may not add due to rounding.
 Source: Concurrent Survey of Departing Passengers for FLL, MIA, and PBI; Ricardo & Associates, Inc.
 Prepared by: Ricardo & Associates, Inc., March, 1999

Table IV-34
Existing Deplaning Level Curbfront Demand Limits

Existing Deplaning Level Curbfront Demand Limits																		
	(a)	(b)	(c)	(d)	(e-1)	(e-2)	(e-3)					(f-3)	(f-4)	(g)				
								Weighted Curbfront Demand by Mode		20 Minute Demand Limit								
								Fl.-Min.	Percent	Linear Ft.	Foot-Minutes ^z				Vehicles	Pax/Veh. ⁴	Pax.	
Average Vehicle Length (ft.)	Average Dwell Time ^v	Average Foot-Minutes	Mode Split by Vehicle Type ^z											PHTP Per Mode				
Inner Curbfront:																		
Private Autos ^z	25	3.5	87.50	100.00%	87.50	100.00%	650.00	19,500.00	222.86	1.6	357	713						
				100.00%	87.50	100.00%	650.00	19,500.00	222.86		357	713						
Outer Curbfront:																		
Rental Car Shuttle	35	2.06	72.10	78.59%	56.67	88.10%	528.60	15,858.11	219.95	4.0	880	1,760						
Park-and-Ride Shuttle	25	1.27	31.75	14.37%	4.56	7.09%	42.56	1,276.80	40.21	3.0	121	241						
Bus	50	1.27	63.50	1.17%	0.74	1.16%	6.95	208.46	3.28	4.0	13	26						
Hotel Shuttle	25	1.27	31.75	2.05%	0.65	1.01%	6.08	182.40	5.74	3.0	17	34						
Courtesy Vehicles	35	1.27	44.45	3.81%	1.69	2.63%	15.81	474.24	10.67	3.0	32	64						
				100.00%	64.32	100.00%	600.00	18,000.00	279.86		1063	2,126						
Total PHTP Utilizing Deplaning Curb:													2,839					

Notes:
^v All modes from R&A observations on February 24, 1999.
^z Derived from Concurrent Survey of Departing Passengers, FLL, MIA and PHA Airports. Leigh Fisher Associates, January 1996.
^z A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.
^z Private auto from Leigh Fisher Survey. All other modes estimated.
^z Includes automobiles checking in at curbside prior to parking in public garage.
 Totals may not add due to rounding
 Sources: Concurrent Survey of Departing Passengers for FLL, MIA, and PHA; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., March, 1999

- (2) **Percent:** This figure expresses the weighted curbside demand by vehicle type as a share (percentage) of overall demand at the associated curbside. It is obtained by dividing the weighted demand of each mode in foot-minutes (e-1) by the total weighted demand associated with all modes utilizing the curb (e-1 total).
- (3) **Linear Feet:** Based on each mode's share of weighted curbside demand, the overall curbside length is apportioned to each vehicle mode. This is obtained by multiplying each mode's share of weighted curbside demand (e-2) by the length of available curbside.
- (f) **20-Minute Demand Limit** – This is a summary of the peak 20-minute curbside demand limits in terms of foot-minutes, vehicles and passengers.
 - (1) **Foot-Minutes** - The foot-minutes column presents the peak 20-minute capacity of the curbside based on the linear feet of curb frontage apportioned to each vehicle mode. Due to the availability of dual curbside lanes, a factor of 1.5 is applied to the available curbside and then multiplied by 20, for the number of minutes.
 - (2) **Vehicles** – The peak 20-minute demand limit is expressed in the number of vehicles. This is obtained by dividing the peak 20-minute foot-minutes (f-1) by the average demand per vehicle (c).
 - (3) **Passengers per Vehicle** – For private automobiles, this statistic was obtained from the LFA Concurrent Survey of Departing Passengers. The remaining modes were based on curbside observations made on February 24, 1999.
 - (4) **Passengers (Pax.)** – This statistic was obtained by multiplying number of vehicles in the peak 20-minute period (f-2) by the average passengers per vehicle (f-3).
- (g) **Peak Hour Originating/Terminating Passengers** – For planning purposes, the peak 20-minute passengers is typically representative of half of the peak hour passengers. Therefore, the quantity of peak 20-minute passengers for each vehicle mode was doubled to obtain the peak hour passengers.

Table IV-35 provides a comparison of the curbside demand limits with the existing demand levels, as well as the demand levels associated with PAL 1 and PAL 2. According to the table, the inner curbside of the deplaning level is currently operating close to the maximum demand level established by this assessment and will exceed it at PAL 1. The table also indicates that the outer curbside of the enplaning level roadway will exceed its maximum demand level shortly after PAL 1. The demand for the other two curbsides, (inner curb-enplaning level, and outer curb-deplaning level) are not expected to exceed their demand limits through PAL 2.

4.3.2 Terminal Curbside Facility Requirements

This section presents the curbside requirements associated with the enplaning and deplaning levels of the terminal roadway. These requirements are based on the passenger demand levels projected for PAL 1, PAL 2, SL 1, and SL 2. In order to represent the current curbside utilization by vehicle mode at PBLA, these requirements were determined for the individual vehicle modes and then

Table IV-35

Terminal Curbfront Demand-Capacity Results

	Demand Limits	Peak Hour Originating/Terminating Passenger Levels	
		1998	PAL 2
Enplaning Level:			
Inner Curbfront	1060 PHOP ^{1/}	531	1002
Outer Curbfront	1661 PHOP ^{1/}	1058	1994
Deplaning Level:			
Inner Curbfront	713 PHTP ^{2/}	701	1346
Outer Curbfront	2126 PHTP ^{2/}	588	1128

Notes:

- ^{1/} Peak Hour Originating Passengers (PHOP) includes only the portion of overall PHOP utilizing the associated curbfront.
^{2/} Peak Hour Terminating Passengers (PHTP) includes only the portion of overall PHTP utilizing the associated curbfront.

Sources: Concurrent Survey of Departing Passengers for FLL, MIA, and PBI; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., March, 1999

combined according to their allocation to each curbfront, i.e. outer enplaning level curb, inner enplaning level curb, etc.

Similar to the demand/capacity assessment, the terminal curbfront facility requirements presented here utilize the concept of foot-minutes. The passenger and vehicular demand characteristics from the *Concurrent Survey of Departing Passengers for FLL, MIA, and PBI* and the average vehicle dwell times observed on February 24, 1999 also form the basis of these facility requirements.

Terminal curbfront requirements are defined utilizing a peak 20-minute vehicular demand derived from the peak hour activity levels under the various planning and sensitivity levels, the transportation mode splits and average passengers-per-vehicle obtained from the passenger surveys. By distributing the peak hour passengers by the vehicle types, and dividing them by the passenger-per-vehicle ratios, estimates of peak hour vehicles by mode are derived. The peak 20-minute vehicular demand is then established by dividing the peak hour vehicular demand in half.

Based on the typical vehicle length established for each vehicle type and the average vehicle dwell times, peak 20-minute vehicular demand can be quantified in terms of foot-minutes. By dividing the resulting foot-minutes by twenty (to represent the peak 20-minutes), the length of curbfront required by each vehicle type is established. The overall length of required curbfront is then obtained by simply adding the length required by each of the individual vehicle types.

The enplaning and deplaning curbfront requirements for the existing passenger demand levels and those associated with PAL 1, PAL 2, SL 1 and SL 2 are presented in Table IV-36 through IV-40. The resulting curbfront requirements are summarized in Table IV-41.

As shown in Table IV-40, the existing curbfront for the enplaning level roadway should be adequate through PAL 1. At PAL 2, the outer curb of the enplaning level would need to be increased by 130 linear feet to an overall length of 780 linear feet. At SL 2, additional curbfront on the enplaning level would be required for both the inner and outer curbfronts.

In comparison, the inner curb of the deplaning level would need to be increased by 160 linear feet to an overall length of 810 linear feet at SL 1 while the existing length of its outer curb will not need to be expanded throughout the planning period. However, it is possible that expansion of the deplaning level's inner curb could be delayed, if vehicular demand is balanced between the inner and outer curb of the deplaning level. Based on the total deplaning level curbfront requirement of 1,210 linear feet for PAL 1, it appears that expansion could be delayed beyond PAL 1 if a complete balance of vehicular demand is achieved.

4.4 Terminal Area Parking

Terminal area parking consists of employee and public parking for the terminal facility. Employee parking serves the DOA, airlines, and other tenants operating within the terminal building. Public parking includes the short and long-term parking, as well as the Park and Ride (overflow) parking lots. The following sections present the demand/capacity assessment and facility requirements for the public parking areas for PBIA. The facility requirements for employee parking areas are also presented.

Table IV-36
Current (1998) Terminal Curbfront Requirements

	Enplaning Level					
	Passenger Mode Split ^{1/}	Peak Hour Passenger Originations	Passengers Per Vehicle ^{2/}	Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle
						Length
Inner Curb:						Vehicle Dwell Time ^{3/}
Private Auto (Curbfront) ^{3/}	24.8%	422	1.6	263.8	131.9	(foot-minutes)
Taxi	3.3%	57	1.5	38.0	19.0	25
Limousine	2.3%	39	2.3	17.0	8.5	25
Courtesy	0.8%	14	3	4.7	2.3	35
	31.2%	532		323.4	161.7	35
						9,773
Outer Curb:						
Private Auto (Curbfront) ^{3/}	24.8%	422	1.6	263.8	131.9	25
Taxi	3.3%	57	1.5	38.0	19.0	25
Limousine	2.3%	39	2.3	17.0	8.5	35
Courtesy	0.8%	14	3	4.7	2.3	35
Rental Car/Shuttle	24.5%	418	4	104.5	52.3	35
Park-and-Ride Shuttle	3.9%	67	3	22.3	11.2	35
Bus	0.5%	9	4	2.3	1.1	25
	1.9%	32	3	10.7	5.3	50
Hotel Van	62.1%	1,058		463.1	231.6	25
						12,409
						410
Enplaning Level Totals:	93.3% ^{4/}	1,590		786.5	393.2	22,182

Notes:
 From Concurrent Survey of Departing Passengers, FLT, MIA and PBIA Airports. Leigh Fisher Associates, January 1996.
 Private auto from Leigh Fisher Survey. All other modes estimated.
 All modes from R&A observations on February 24, 1999.
 A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.
 Includes automobiles checking in at curbfront prior to parking in public garage.
 The remaining 6.7% of enplaning passengers travel directly to the public parking facilities without utilizing the curbfront.
Totals may not add due to rounding.

Table IV-36
Current (1998) Terminal Curbfront Requirements

	Passenger Mode Split, %	Peak Hour Passenger Terminations	Passengers Per Vehicle ²	Deplaning Level			Vehicle Dwell Time ³ (foot-minutes)	Peak 20-minute Curbfront Required by Mode Frontage (ft.) ⁴
				Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length		
Inner Curb:								
Private Auto (Curbfront)	41.9%	701	1.6	438.1	219.1	25	3.50	639
	41.9%	701		438.1	219.1			640
Outer Curb:								
Rental Car/Shuttle	29.0%	485	4	121.3	60.6	35	2.06	146
Park-and-Ride Shuttle	3.9%	65	3	21.7	10.8	25	0.40	4
Bus	0.5%	8	4	2.0	1.0	50	1.27	2
Courtesy	1.1%	18	3	6.0	3.0	35	1.27	4
Hotel Van	0.6%	10	3	3.3	1.7	25	1.27	2
	35.1%	586		154.3	77.1		4,729	150
Deplaning Level Totals:	77.0% ⁵	1,287		592.4	296.2		23,897	800

Notes:

Private autos and limousines from Concurrent Survey of Departing Passengers, FLL, MIA and PBIA Airports. Leigh Fisher Associates, January 1996.
All other modes from Frederick R. Harris, 1999.

Private auto from Leigh Fisher Survey. All other modes estimated.

A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.

Includes automobiles in public parking garage returning to curbside to pick up passengers/baggage.

The remaining 23% of deplaning passengers travel directly to the public parking facilities without utilizing the curbfront.

Totals may not add due to rounding.

Sources: Concurrent Survey of Departing Passengers for FLL, MIA, and PBIA; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

Table IV-37

SL 1 Terminal Curbfront Requirements

SL 1 Terminal Curbfront Requirements										
	Passenger Mode Split ^u	Peak Hour Passenger Originations	Passengers Per Vehicle ^v	Enplaning Level				Vehicle Dwell Time ^w	Peak 20-minute Curbfront Required by Mode (foot-minutes)	Peak 20-minute Curbfront Frontage (ft.) ^x
				Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length				
Inner Curb:										
Private Auto (Curbfront) ^y	24.8%	526	1.6	328.8	164.4	25	2.64	10,849	362	
Taxi	3.3%	71	1.5	47.3	23.7	25	0.84	497	17	
Limousine	2.3%	49	2.3	21.3	10.7	35	1.91	712	24	
Courtesy	0.8%	17	3	5.7	2.8	35	1.27	126	4	
	31.2%	663		403.1	201.5			12,184		410
Outer Curb:										
Private Auto (Curbfront) ^y	24.8%	526	1.6	328.8	164.4	25	2.64	10,849	362	
Taxi	3.3%	71	1.5	47.3	23.7	25	0.84	497	17	
Limousine	2.3%	49	2.3	21.3	10.7	35	1.91	712	24	
Courtesy	0.8%	17	3	5.7	2.8	35	1.27	126	4	
Rental Car/Shuttle	24.5%	521	4	130.3	65.1	35	1.19	2,712	90	
Park-and-Ride Shuttle	3.9%	83	3	27.7	13.8	25	0.98	339	11	
Bus	0.6%	12	4	3.0	1.5	50	0.98	74	2	
Hotel Van	1.9%	40	3	13.3	6.7	25	0.98	163	5	
	62.1%	1,319		577.3	288.7			15,472		520
Enplaning Level Totals:										930

Notes:

- ^u From Concurrent Survey of Departing Passengers, FLL, MIA and PBI Airports. Leigh Fisher Associates, January 1996.
- ^v Private auto from Leigh Fisher Survey. All other modes estimated.
- ^u All modes from R&A observations on February 24, 1999.
- ^u A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.
- ^u Includes automobiles checking in at curbside prior to parking in public garage.
- ^u The remaining 6.7% of enplaning passengers travel directly to the public parking facilities without utilizing the curbfront.
- Totals may not add due to rounding.

Table IV-37
SL 1 Terminal Curbfront Requirements

	Deplaning Level						
	Passenger Mode Split ^v	Peak Hour Passenger Terminations	Passengers Per Vehicle ^z	Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length	Vehicle Dwell Time ^y
Inner Curb:							
Private Auto (Curbfront)	41.9%	890	1.6	556.3	278.1	25	3.50
	41.9%	890		556.3	278.1		
Outer Curb:							
Rental Car/Shuttle	29.0%	616	4	154.0	77.0	35	2.06
Park-and-Ride Shuttle	3.9%	83	3	27.7	13.8	25	0.40
Bus	0.5%	11	4	2.8	1.4	50	1.27
Courtesy	1.1%	23	3	7.7	3.8	35	1.27
Hotel Van	0.6%	13	3	4.3	2.2	25	1.27
	35.1%	746		196.4	98.2		
Deplaning Level Totals:	77.0% ^y	1,636		752.7	376.3		
							30,352
							1,010

Notes:

^v Private autos and limousines from Concurrent Survey of Departing Passengers, FL, MIA and PBI Airports. Leigh Fisher Associates, January 1996.

^z All other modes from Frederick R. Harris, 1999.

^y Private auto from Leigh Fisher Survey. All other modes estimated.

^x A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.

^u Includes automobiles in public parking garage returning to curbside to pick up passengers/baggage.

^w The remaining 23% of deplaning passengers travel directly to the public parking facilities without utilizing the curbfront.

Totals may not add due to rounding.

Source: Concurrent Survey of Departing Passengers for FL, MIA, and PBI; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1989

Table IV-38
PAL 1 Terminal Curbfront Requirements

Enplaning Level									
	Passenger Mode Split ^u	Peak Hour Passenger Originations	Passengers Per Vehicle ^{2v}	Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length	Vehicle Dwell Time ^{3v}	Peak 20-minute Required by Mode (foot-minutes)	Peak 20-minute Curbfront Frontage (ft.) ^{4v}
Inner Curb:									
Private Auto (Curbfront) ^{5v}	24.8%	658	1.6	411.3	205.6	25	2.64	13,571	452
Taxi	3.4%	89	1.5	59.3	29.7	25	0.84	623	21
Limousine	2.3%	61	2.3	26.5	13.3	35	1.91	886	30
Courtesy	0.8%	21	3	7.0	3.5	35	1.27	156	5
	31.2%	829		504.1	252.1		1.27	15,236	510
Outer Curb:									
Private Auto (Curbfront) ^{5v}	24.8%	658	1.6	411.3	205.6	25	2.64	13,571	452
Taxi	3.4%	89	1.5	59.3	29.7	25	0.84	623	21
Limousine	2.3%	61	2.3	26.5	13.3	35	1.91	886	30
Courtesy	0.8%	21	3	7.0	3.5	35	1.27	156	5
Rental Car/Shuttle	24.6%	652	4	163.0	81.5	35	1.19	3,394	113
Park-and-Ride Shuttle	3.9%	104	3	34.7	17.3	25	0.98	425	14
Bus	0.5%	14	4	3.5	1.8	50	0.98	86	3
Hotel Van	1.9%	50	3	16.7	8.3	25	0.98	204	7
	62.1%	1,649		721.9	361.0			19,345	640
Enplaning Level Totals:		2,478		1,226.0	613.0			34,582	1,150

Notes:

From Concurrent Survey of Departing Passengers, FLL, MIA and FPI Airports. Leigh Fisher Associates, January 1996.
Private auto from Leigh Fisher Survey. All other modes estimated.

All modes from R&A observations on February 24, 1999.

A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.

Includes automobiles checking in at curbside prior to parking in public garage.

The remaining 6.7% of enplaning passengers travel directly to the public parking facilities without utilizing the curbfront.

Totals may not add due to rounding.

Table IV-39

PAL 2 Terminal Curbfront Requirements

	Passenger Mode Split ^u	Peak Hour Passenger Originations	Passengers Per Vehicle ²⁾	Enplaning Level				Peak 20-minute Curbfront Required by Mode (foot-minutes)	Peak 20-minute Curbfront Required by Mode Frontage (ft.) ⁴⁾
				Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length	Vehicle Dwell Time ³⁾		
Inner Curb:									
Private Auto (Curbfront) ⁵⁾	24.8%	796	1.6	497.5	248.8	25	2.64	16,418	547
Taxi	3.3%	107	1.5	71.3	35.7	25	0.84	749	25
Limousine	2.3%	73	2.3	31.7	15.9	35	1.91	1,061	35
Courtesy	0.8%	26	3	8.7	4.3	35	1.27	193	6
	31.2%	1,002		609.2	304.6			18,420	610
Outer Curb:									
Private Auto (Curbfront) ⁵⁾	24.8%	796	1.6	497.5	248.8	25	2.64	16,418	547
Taxi	3.3%	107	1.5	71.3	35.7	25	0.84	749	25
Limousine	2.3%	73	2.3	31.7	15.9	35	1.91	1,061	35
Courtesy	0.8%	26	3	8.7	4.3	35	1.27	193	6
Rental Car/Shuttle	24.5%	788	4	197.0	98.5	35	1.19	4,103	137
Park-and-Ride Shuttle	3.9%	125	3	41.7	20.8	25	0.98	510	17
Bus	0.5%	17	4	4.3	2.1	50	0.98	104	3
Hotel Van	1.9%	61	3	20.3	10.2	25	0.98	249	8
	62.1%	1,993		872.5	436.2			23,386	780
Enplaning Level Totals:		2,995		1,481.7	740.9			41,806	1,390

Notes:

From Concurrent Survey of Departing Passengers, FLL, MIA and FBT Airports. Leigh Fisher Associates, January 1996.

Private auto from Leigh Fisher Survey. All other modes estimated.

All modes from R&A observations on February 24, 1999.

A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.

Includes automobiles checking in at curbside prior to parking in public garage.

The remaining 6.7% of enplaning passengers travel directly to the public parking facilities without utilizing the curbfront.

Totals may not add due to rounding.

Table IV-39

PAL 2 Terminal Curbfront Requirements

	Deplaning Level								
	Passenger Mode Split ^u	Peak Hour Passenger Terminations	Passengers Per Vehicle ^{2v}	Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length	Vehicle Dwell Time ^{3v}	Peak 20-minute Curbfront Required by Mode (foot-minutes)	Peak 20-minute Curbfront Frontage (ft.) ^{4v}
Inner Curb:									
Private Auto (Curbfront)	41.9%	1,346	1.6	841.3	420.6	25	3.50	36,805	1,227
	41.9%	1,346		841.3	420.6			36,805	1,230
Outer Curb:									
Rental Car/Shuttle	29.0%	932	4	233.0	116.5	35	2.06	8,400	280
Park-and-Ride Shuttle	3.9%	125	3	41.7	20.8	25	0.40	208	7
Bus	0.5%	16	4	4.0	2.0	50	1.27	127	4
Courtesy	1.1%	35	3	11.7	5.8	35	1.27	259	9
Hotel Van	0.6%	19	3	6.3	3.2	25	1.27	101	3
	35.1%	1,127		296.7	148.3			9,095	300
Deplaning Level Totals:	77.0% ^u	2,473		1,137.9	569.0			45,900	1,530

Notes:

Private autos and limousines from Concurrent Survey of Departing Passengers, FLL, MIA and PBI Airports. Leigh Fisher Associates, January 1996.

All other modes from Frederick R. Harris, 1999.

Private auto from Leigh Fisher Survey. All other modes estimated.

A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.

Includes automobiles in public parking garage returning to curbside to pick up passengers/baggage.

The remaining 23% of deplaning passengers travel directly to the public parking facilities without utilizing the curbfront.

Totals may not add due to rounding.

Source: Concurrent Survey of Departing Passengers for FLL, MIA, and PBI; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

Table IV-40

SL 2 Terminal Curbfront Requirements

Enplaning Level										
	Passenger Mode Split ^u	Peak Hour Passenger Originations	Passengers Per Vehicle ^{2/}	Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length	Vehicle Dwell Time ^{3/}	Peak 20-minute Required by Mode (foot-minutes)	Peak 20-minute Curbfront Frontage (ft.) ^{4/}	
Inner Curb:										
Private Auto (Curbfront) ^{5/}	24.8%	960	1.6	600.0	300.0	25	2.64	19,800	660	
Taxi	3.4%	130	1.5	86.7	43.3	25	0.84	910	30	
Limousine	2.3%	89	2.3	38.7	19.3	35	1.91	1,293	43	
Courtesy	0.8%	31	3	10.3	5.2	35	1.27	230	8	
	31.2%	1,210		735.7	367.8			22,233	740	
Outer Curb:										
Private Auto (Curbfront) ^{5/}	24.8%	960	1.6	600.0	300.0	25	2.64	19,800	660	
Taxi	3.4%	130	1.5	86.7	43.3	25	0.84	910	30	
Limousine	2.3%	89	2.3	38.7	19.3	35	1.91	1,293	43	
Courtesy	0.8%	31	3	10.3	5.2	35	1.27	230	8	
Rental Car/Shuttle	24.5%	951	4	237.8	118.9	35	1.19	4,951	165	
Park-and-Ride Shuttle	3.9%	151	3	50.3	25.2	25	0.98	617	21	
Bus	0.5%	21	4	5.3	2.6	50	0.98	129	4	
Hotel Van	1.9%	73	3	24.3	12.2	25	0.98	298	10	
	62.1%	2,406		1,053.4	526.7			28,227	940	
Enplaning Level Totals:		3,616		1,789.1	894.5			50,461	1,680	

Notes:

From Concurrent Survey of Departing Passengers, FLA, MIA and PBI Airports. Leigh Fisher Associates, January 1996.

Private auto from Leigh Fisher Survey. All other modes estimated.

All modes from R&A observations on February 24, 1999.

A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.

Includes automobiles checking in at curbside prior to parking in public garage.

The remaining 6.7% of enplaning passengers travel directly to the public parking facilities without utilizing the curbfront.

Totals may not add due to rounding.

Table IV-40

SL 2 Terminal Curbfront Requirements

Deplaning Level									
	Passenger Mode Split ^u	Peak Hour Passenger Terminations	Passengers Per Vehicle ^{2/}	Estimated Peak Hour Vehicles	Estimated Peak 20-minute Vehicles	Vehicle Length	Vehicle Dwell Time ^{3/}	Peak 20-minute Curbfront Required by Mode (foot-minutes)	Frontage (ft.) ^{4/}
Inner Curb:									
Private Auto (Curbfront)	41.9%	1,624	1.6	1,015.0	507.5	25	3.50	44,406	1,480
	41.9%	1,624		1,015.0	507.5			44,406	1,480
Outer Curb:									
Rental Car/Shuttle	29.0%	1,124	4	281.0	140.5	35	2.06	10,130	338
Park-and-Ride Shuttle	3.9%	151	3	50.3	25.2	25	0.40	252	8
Bus	0.5%	19	4	4.8	2.4	50	1.27	151	5
Courtesy	1.1%	43	3	14.3	7.2	35	1.27	319	11
Hotel Van	0.6%	23	3	7.7	3.8	25	1.27	122	4
	35.1%	1,360		358.1	179.0			10,973	370
Deplaning Level Totals:		2,984		1,373.1	686.5			55,379	1,850
		77.0% ^{5/}							

Notes:

Private autos and limousines from Concurrent Survey of Departing Passengers, FLL, MIA and PBI Airports. Leigh Fisher Associates, January 1996.

All other modes from Frederick R. Harris, 1999.

Private auto from Leigh Fisher Survey. All other modes estimated.

A ratio of 1.5 is applied to actual curbfront length to account for dual curbfront lanes.

Includes automobiles in public parking garage returning to curbside to pick up passengers/baggage.

The remaining 23% of deplaning passengers travel directly to the public parking facilities without utilizing the curbfront.

Totals may not add due to rounding.

Source: Concurrent Survey of Departing Passengers for FLL, MIA, and PBI; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

Table IV-41

Terminal Curbfront Requirements Summary

Activity Level	Enplaning Level (Linear Feet)			Deplaning Level (Linear Feet)		
	Inner Curb	Outer Curb	Total	Inner Curb	Outer Curb	Total
Existing	650	650	1,300	650	600	1,250
1998	330	410	740	640	160	800
SL 1	410	520	930	810	200	1,010
PAL 1	510	640	1,150	970	240	1,210
PAL 2	610	780	1,390	1,230	300	1,530
SL 2	740	940	1,680	1,480	370	1,850

Source: Concurrent Survey of Departing Passengers for FLL, MIA, and PBI; Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March, 1999

4.4.1 Public Parking Demand/Capacity Assessment

The demand/capacity assessment for the public parking areas evaluated the ability of the existing public parking facilities to serve the existing (1998) parking demand levels, as well as those projected for PAL 1 and PAL 2. This assessment is based on a ratio of public parking spaces per O&D passenger enplanements for the PMAD. These ratios are established for the existing (1998) passenger demand levels, as well as those projected for PAL 1 and PAL 2 and then compared to the target ratio established by the Parking Demand and Capacity Analysis, performed for PBIA by Reynolds, Smith and Hills, Inc. in 1995. The target ratio of 0.61 public parking spaces per PMAD O&D enplanement is nominally higher than the 0.60 ratio experienced in 1994, where the parking facilities operated within 17 spaces of capacity. The recommended ratio (0.61) would have resulted in a surplus of 115 parking spaces during the peak day of 1994, approximately a two percent reserve.

Table IV-42 presents the demand/capacity assessment for the public parking facilities at PBIA. As shown, the resulting ratios of public parking spaces to PMAD O&D enplanements decrease from 0.74 during 1998 to 0.51 at PAL 1. By comparing these ratios to the recommended ratio of 0.61 parking spaces per PMAD O&D enplanement, it can be concluded that there was adequate public parking supply to satisfy peak demand periods during 1998. However, demand for public parking will likely exceed the number of available parking spaces prior to PAL 1.

4.4.2 Public Parking Facility Requirements

Table IV-43 summarizes the public parking requirements for PAL 1, PAL 2, SL 1, and SL 2 based on the target ratio established in the demand/capacity assessment. The table identifies the recommended number of short-term, long-term, and Park and Ride (overflow) parking spaces. The quantities of each are based on their share as of 1998. As indicated, the requirements for public parking facilities will range from approximately 12,140 parking spaces at PAL 1 to 18,360 parking spaces at SL 2.

4.4.3 Employee Parking Facility Requirements

Table IV-44 presents the employee parking facility requirements for PAL 1, PAL 2, SL 1, and SL 2. Currently, there are 550 parking spaces in the employee parking lot. Future employee parking requirements were established based on the current (1998) relationship of employee parking spaces to the peak month enplaned passengers. On this basis, PBIA will require from approximately 980 parking spaces at PAL 1 and 1,480 parking spaces at SL 2.

It is significant to note that the level of employee parking required at the Airport will vary depending on a number of factors related to individual leasehold practices, employee shift patterns, etc. The requirements presented here will be used as an allowance for planning purposes; however, further adjustments may be needed in the future.

4.5 Airport Support Facilities

Ancillary facilities at the Airport include cargo, Aircraft Rescue and Fire Fighting (ARFF), General Aviation/Fixed Base Operator (GA/FBO), and aircraft fueling facilities. The objective of the demand/capacity assessments is to evaluate each facility type to determine if deficiencies currently exist or will develop within the planning horizon. The methodology for assessing each facility type varies. The demand/capacity assessment for the existing cargo and GA/FBO facilities evaluates the ability to serve existing and future demand based on the overall size (gross area) of the facilities.

Table IV-42

Public Parking Demand/Capacity Assessment

	1998	PAL 1	PAL 2
Annual Enplanements (O&D)	2,816,990	6,367,850	7,973,350
Peak-Month Share of Annual O&D Enplanements	11.8%	9.4%	9.4%
Peak-Month Enplanements (O&D)	333,202	596,790	747,270
Peak-Month Average Day O&D Enplanements	11,107	19,900	24,900
Available Parking Spaces	8,233	10,147	10,147
Parking Spaces per PMAD O&D Enplanement	0.74	0.51	0.41
Recommended Parking Spaces per PMAD O&D Enplanement ^{1/}	0.61	0.61	0.61

Notes:

^{1/} PBIA Parking Demand & Capacity Analysis, Reynolds, Smith & Hills, November 1995.

Source: PBIA Parking Demand & Capacity Analysis, Reynolds, Smith & Hills, November 1995.; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., March 1999.

Table IV-43

Public Parking Requirements

Activity Level	Peak-Month Enplanements (O&D)	Peak-Month Average Day Enplanements ^{1/}	Short Term ^{2/}	Public Parking Spaces		
				Long Term ^{3/}	Overflow	Total ^{4/}
1998	333,202	11,107	1,238	2,814	3,924	7,976
PAL 1	596,790	19,900	1,880	4,280	5,970	12,140
SL-1	625,670	20,900	1,980	4,500	6,270	12,750
PAL 2	747,270	24,900	2,360	5,360	7,470	15,190
SL-2	901,740	30,100	2,850	6,480	9,030	18,360

Notes:

^{1/} Represents O&D passenger enplanements only.^{2/} Includes premium parking spaces.^{3/} Includes garage and long term surface parking.^{4/} Based on target ratio of .61 parking spaces per peak-month average day (O&D) passenger enplanement.

Source: FBIAP Parking Demand & Capacity Analysis, Reynolds, Smith & Hills, November 1995.; Ricondo & Associates, Inc.
 Prepared by: Ricondo & Associates, Inc., March 1999.

Table IV-44

Activity Level	Annual		Peak-Month's		Overall Employee Parking (Spaces) ^{1/}
	Enplaned Passengers	Share of Enplaned Passengers	Enplaned Passengers	Peak-Month Enplaned Passengers	
1998	2,965,253	11.9%	350,739		550
PAL 1	6,703,000	9.4%	628,200		980
SL 1	5,552,000	11.9%	658,600		1,030
PAL 2	8,393,000	9.4%	788,942		1,230
SL 2	10,128,000	9.4%	949,200		1,480

^{1/} Based on 1998 utilization ratio of 1 employee parking space per 640 peak-month enplanements.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 1999.

Table IV-44
Employee Parking Requirements

Activity Level	Annual Enplaned Passengers	Peak-Month's Share of Enplaned Passengers	Peak-Month Enplaned Passengers	Overall Employee Parking (Spaces) ^{1/}
1998	2,965,253	11.9%	350,739	550
PAL 1	6,703,000	9.4%	628,200	980
SL 1	5,552,000	11.9%	658,600	1,030
PAL 2	8,393,000	9.4%	788,942	1,230
SL 2	10,128,000	9.4%	949,200	1,480

^{1/} Based on 1998 utilization ratio of 1 employee parking space per 640 peak-month enplanements.

Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., March 1999.

In comparison, the assessment of the ARFF facility evaluates both the existing facility size and location for compliance with the requirements of Federal Aviation Regulation (FAR) Part 139. The aircraft fuel farm facilities are assessed based on the capacity (in gallons) of the fuel storage tanks.

4.5.1 Cargo Facilities

Currently, there are two buildings dedicated to the processing of cargo at PBI: Building 1475 and Building 1301-1311. Cargo Building 1475 is occupied by the United Parcel Service (UPS) and the United States Postal Service (USPS). Several belly cargo operators (airlines) and freight forwarders occupy Building 1301-1311. UPS is the only all-cargo operator at PBI. Belly cargo operators handled the remaining cargo.

Due to the difference in facility needs, separate demand/capacity assessments are performed for belly cargo and all-cargo facilities. Tables IV-45 and IV-46 present the results of these two assessments. Each table summarizes the existing area designated to each of the primary elements of the associated cargo facility. Cargo facilities designated as belly cargo include all of Building 1301-1311 and the portion of Building 1475 currently leased to the USPS. The all-cargo facilities include the portions of Building 1475 currently vacant or leased to UPS.

The tables also present resulting ratios of square feet per annual ton for each functional component. Target ratios are also presented to help identify the activity levels at which the associated facility could become operationally constrained. As shown, the existing cargo facilities were adequate to serve both the belly and all-cargo demand levels during 1998. However, the existing belly cargo facilities will become deficient prior to PAL 1. Although the all-cargo facilities will likely require additional automobile parking prior to PAL 1, the remaining all-cargo facilities should be adequate through PAL 2 (assuming that all-cargo activity continues to occur exclusively by UPS).

Table IV-47 summarizes the individual facility requirements for all-cargo, belly-cargo, and total cargo facilities. With the exception of auto parking, the remaining vacant areas of Building 1475 should be adequate to satisfy the all-cargo demand levels through PAL 2. However, the facilities for belly cargo operators and freight forwarders will need to be expanded to satisfy both PAL 1 and PAL 2 demand levels.

It should be noted that due to the age and condition of Building 1301-1311, it is likely that a replacement belly cargo warehouse facility will be needed within the planning horizon. The facility requirements presented in Table IV-47 do not include the additional 29,349 square feet of cargo warehouse that would be needed for replacement-in-kind of Building 1301-1311.

4.5.2 Airport Rescue and Fire Fighting (ARFF)

Each airport with daily scheduled air carrier service is required to provide Airport Rescue and Fire Fighting (ARFF) services. The ARFF facility must be located so that ARFF personnel can demonstrate a response time of three (3) minutes to the midpoint of all air carrier runways under normal conditions. Under the current airfield configuration at PBI, three-minute response times to both air carrier runways are provided by the existing ARFF facility.

The level of service and equipment requirements for the ARFF facility are based on the length of air carrier aircraft (expressed in groups), and the number of average daily departures by the most demanding group. Air carrier aircraft lengths are grouped as follows:

Table IV-45

Belly Cargo Facility Demand-Capacity Assessment

	Annual Enplaned Belly Cargo Tonnage	Ratio of Belly-Cargo Facilities' Functional Area to Annual Belly-Cargo Tonnage (SF/Annual Ton)					
		Warehouse	Ramp ^{1/}	Loading Dock	Truck Dock Area	Auto Parking	Total
Existing Functional Area - S.F. ^{2/}		43,349	10,500	9,655	72,300	78,400	214,204
1998	10,968	3.95	0.96	0.88	6.59	7.15	19.53
PAL 1	33,600	1.29	0.31	0.29	2.15	2.33	6.38
PAL 2	47,000	0.92	0.22	0.21	1.54	1.67	4.56
Target Ratio: ^{3/}		3.00	0.75	0.75	6.75	1.50	12.75

Notes:

^{1/} Only the United States Postal Service utilizes airside apron for mail processing.^{2/} Includes all areas associated with Building 1301-1311 and the US Postal Service leasehold of Building 1475.^{3/} Warehouse facilities based on current utilization ratio of 3 s.f. per annual enplaned ton of belly cargo.

Other cargo facilities based on cargo facility configuration prescribed within PBIA Landside Master Plan, Cargo Area Technical Report. HNTB Corporation, 1993.

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc.

Table IV-46

All-Cargo Cargo Facility Demand-Capacity Assessment

	Annual Enplaned All-Cargo Tonnage	Ratio of All-Cargo Facilities' Functional Area to Annual All-Cargo Tonnage (SF/Annual Ton)				
		Warehouse	Ramp	Loading Dock	Truck Dock Area	Auto Parking
Existing Functional Area S.F.:		26,000	79,950	6,500	53,500	56,375
1998	3,182	8.17	25.13	2.04	16.81	17.72
PAL 1	7,000	3.71	11.42	0.93	7.64	8.05
PAL 2	9,200	2.83	8.69	0.71	5.82	6.13
Target Ratio:		2.00	6.00	0.50	4.50	10.00
						23.00

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc.

Table IV-47
Cargo Facility Requirements Summary

	Annual Enplaned Cargo (Tons)	Loading					Truck		Auto		Surplus/ (Deficit)	
		Building	Ramp ^{1/}	Dock	Dock Area	Parking	Total					
Belly Cargo Facilities ^{2/}												
Existing Functional Areas:												
1998 Requirements	10,968	43,349	10,500	9,655	72,300	78,400	214,204					
PAL 1 Requirements	33,600	32,900	8,200	8,200	74,000	16,500	139,800				74,000	
PAL 2 Requirements	47,000	100,800	25,200	25,200	226,800	50,400	428,400				(214,000)	
SL-1 Requirements	34,300	141,000	35,300	35,300	317,300	70,500	599,400				(385,000)	
SL-2 Requirements	56,700	170,100	42,500	42,500	382,700	85,100	722,900				(509,000)	
All-Cargo Facilities:												
Existing Functional Areas:												
1998 Requirements	3,182	26,000	90,450	6,500	53,500	56,375	232,825					
PAL 1 Requirements	7,000	6,400	19,100	1,600	14,300	31,800	73,200				160,000	
PAL 2 Requirements	9,200	14,000	42,000	3,500	31,500	70,000	161,000				72,000	
SL-1 Requirements	9,200	18,400	55,200	4,600	41,400	92,000	211,600				21,000	
SL-2 Requirements	17,500	35,000	105,000	8,800	78,800	175,000	402,600				(170,000)	

Table IV-47
Cargo Facility Requirements Summary

	Annual Enplaned Cargo (Tons)	Ramp ^{1/}		Loading Dock	Truck Dock Area	Auto Parking	Total	Surplus/ (Deficit)
		Building						
Total Cargo Facilities:								
Existing Functional Areas:								
1998 Requirements	14,150	69,349	100,950	16,155	125,800	134,775	447,029	
PAL 1 Requirements	40,600	39,300	27,300	9,800	88,300	48,300	213,000	234,000
PAL 2 Requirements	56,200	114,800	67,200	28,700	258,300	120,400	589,400	(142,000)
SL-1 Requirements		159,400	90,500	39,900	358,700	162,500	811,000	(364,000)
SL-2 Requirements		121,300	80,900	30,300	272,900	143,500	648,900	(436,000)
		205,100	147,500	51,300	461,500	260,100	1,125,500	(1,126,000)

Notes:

^{1/} Currently, belly cargo operators do not require designated airside apron at the cargo facility.

^{2/} Includes freight forwarders.

Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

Index A:	Aircraft less than 90 feet in length
Index B:	Aircraft at least 90 feet in length, but less than 126 feet in length
Index C:	Aircraft at least 126 feet in length, but less than 159 feet in length
Index D:	Aircraft at least 159 feet in length, but less than 200 feet in length
Index E:	Aircraft at least 200 feet in length

The largest Index group with an average of five or more daily departures is the Index required for the airport. At PBIA, the largest Index group with five or more daily scheduled departures is Index D. The Airport is currently rated and meets the requirements of this ARFF Index. Widebody aircraft like the B-767, A-300, and the MD-11 are included in this group. The next largest group, Index E, includes "jumbo" wide body aircraft like the B-747, and A-330 aircraft. Currently, there are no regularly scheduled "jumbo" wide body aircraft that serve the Airport. The fleet mix projected for PAL 1 and PAL 2 indicate that growth in the operating fleet at PBIA will not warrant the need to increase the ARFF rating beyond Index D. Therefore, the Airport would not need to add any additional equipment or manpower under these criteria, since the facilities, equipment and manpower are currently in place to provide Index D level of ARFF services.

4.5.3 General Aviation (GA) And Fixed Base Operator (FBO) Facilities

Currently, there are three Fixed Base Operators (FBOs) at PBIA: Signature Flight Support, Galaxy Aviation, and Jet Aviation. The FBOs are located on the south side of the airfield, which provides direct access to Runway 9R-27L, the primary general aviation runway. All three FBOs provide aircraft storage and fuel services to a wide variety of general aviation activities. Signature Flight Support and Jet Aviation also provide aircraft maintenance services.

The demand/capacity assessment evaluates the FBO facilities dedicated to the two primary services offered by the existing FBOs: aircraft storage (apron and hangars), and aircraft maintenance (hangars). The fueling services of the FBO facilities are assessed separately and are presented in the following section.

This assessment establishes a direct relation between GA activity at the Airport and the size of the FBO facilities. The current utilization of FBO facilities was compared with current (1998) GA demand levels. The existing ratio of aircraft storage and maintenance facilities to GA activity at the Airport formed the basis for future FBO facility needs.

Historically, nearly 80 percent of all general aviation (GA) aircraft operations at PBIA are transient, most of which require FBO services. This high proportion of transient aircraft makes it very difficult to establish an overall FBO capacity for transient aircraft storage in terms of the number of aircraft the facility can accommodate. This is due to the diverse type and size of transient aircraft utilizing the FBO facilities on a day-to-day basis. As a result, this assessment relates GA activity at PBIA and the size of the FBO facilities in order to assess demand/capacity and project facility requirements.

In order to determine the current utilization of FBO facilities, each of the three FBO operators were interviewed. All three FBO's indicated that during the peak month of recent years, their overall aircraft storage capacities were barely adequate to satisfy the experienced demand levels. Although Jet Aviation and Signature Flight Support are currently constructing and/or planning new hangars,

both FBOs indicated that their overall aircraft storage capacity (i.e. hangars and apron) would not increase. Based on this input, it was determined that the existing ratio of aircraft storage facilities to GA activity at PBIA could be utilized to assess future FBO facility needs.

Table IV-48 summarizes the demand/capacity assessment for the existing FBO aircraft parking apron, aircraft storage hangars, maintenance hangars, auto parking areas, office buildings, and 'other' areas at PBIA. The assessment compares the utilization ratios of the existing FBO facilities based on existing GA demand levels, as well as those associated with PAL 1 and PAL 2. The assessment utilized peak-month GA operations for the assessment of FBO apron, auto parking areas, office buildings and areas designated as 'other'. Aircraft storage and maintenance hangar facilities were related to the number of GA aircraft based at PBIA. The assessment also considered the hangar facilities currently under design/construction for Jet Aviation and Signature Flight Support as existing facilities.

At the time that this assessment was performed, historical data pertaining to GA operations for 1998 was incomplete. Therefore, 1997 historical data was utilized in lieu of the 1998 data. Based on this data, the existing FBO facilities provided an average of 230 square feet of aircraft parking apron for each peak month GA operation. This ratio is utilized as a target ratio for future GA demand levels. Additionally, there were 123 based aircraft at PBIA, resulting in an average of 2,100 square feet of aircraft storage and 1,025 square feet of maintenance hangar space per based aircraft. Based on these ratios, additional FBO facilities would be required prior to PAL 1.

Table IV-49 presents the facility requirements for GA/FBO facilities at PBIA. These requirements are based on the recommended utilization ratios presented in Table IV-48 and the projected demand levels. Currently, the Airport leases 3,812,520 square feet of airport property to the FBO operators. In order to satisfy the GA demand levels associated with PAL 1, approximately 4.5 million square feet would be required. At SL 2, the FBO facility requirements increase to approximately 5.3 million square feet.

4.5.4 Aircraft Fueling Facilities

Currently, there are four separate fuel farm facilities at PBIA, each operated independently. ASII operates the primary fuel farm at the Airport, supplying Jet A fuel exclusively to air carrier, commuter and all-cargo aircraft. ASII's total Jet A fuel storage tank capacity is 1 million gallons. The remaining fuel farm facilities at PBIA are operated by each of the Fixed Base Operators (FBOs); Signature Flight Support, Jet Aviation, and Galaxy Aviation. All three FBOs provide both Jet A and AvGas (100 LL) to general aviation aircraft. The FBOs have a combined storage tank capacity of 290,000 gallons of Jet A and 47,000 gallons of AvGas.

Table IV-50 compares the annual fuel flowage based on the 1997 demand levels, as well as those for PAL 1 and PAL 2. By dividing total demand by existing storage, a turnover rate was established, along with the number of days of capacity that the system would have under each scenario. Jet A Capacity for PAL 2 ranges from four days for ASII to eight days for the FBOs. AvGas capacity for the FBOs is approximately fourteen days. Typically, three days' capacity is the recommended capacity for this analysis. Since all fuel farm facilities meet this minimum throughout the planning period, existing facilities appear adequate to meet future demand.

Table IV-48

General Aviation/FBO Facility Demand-Capacity Assessment

	1997 ^{1/}	PAL 1	PAL 2
<u>Aircraft Parking Apron:</u>			
General Aviation Operations			
Annual	116,480	127,400	139,900
Peak Month (10.3% of Annual)	11,997	13,122	14,410
Total Existing FBO Apron Area S.F.	2,774,723	2,774,723	2,774,723
Average FBO Apron Area (S.F.) per Peak-Month GA Operation	230	210	190
Target Apron Area (S.F.) per Peak-Month GA Operation:	230	230	230
<u>Aircraft Storage Hangars:</u>			
Based Aircraft			
Total Existing Aircraft Storage Hangar Area S.F. ^{2/}	258,726	258,726	258,726
Average FBO Aircraft Storage Hangar Area (S.F.) per Based Aircraft	2,100	1,920	1,750
Target Storage Hangar Area (S.F.) per Based Aircraft:	2,100	2,100	2,100
<u>Aircraft Maintenance Hangars:</u>			
Based Aircraft			
Total Existing Aircraft Maintenance Hangar Area S.F. ^{2/}	126,076	126,076	126,076
Average FBO Aircraft Maintenance Hangar Area (SF) per Based Aircraft	1,025	937	853
Target Maintenance Hangar Area (S.F.) per Based Aircraft:	1,025	1,025	1,025
<u>Office Building</u>			
Peak Month GA Operation	11,997	13,122	14,410
Total Existing Office Building Area S.F.	43,115	43,115	43,115

Table IV-48

General Aviation/FBO Facility Demand-Capacity Assessment

	1997 ^{1/}	PAL 1	PAL 2
Average FBO Office Building Area (SF) per Peak-Month GA Operation	3.6	3.3	3.0
Target Office Building (S.F.) per Peak-Month GA Operation:	3.6	3.6	3.6
Auto Parking			
Peak Month GA Operation	11,997	13,122	14,410
Total Existing Auto Parking Area S.F.	99,653	99,653	99,653
Average FBO Auto Parking Area (SF) per Peak-Month GA Operation	8.3	7.6	6.9
Target Auto Parking Area (S.F.) per Peak-Month GA Operation:	8.5	8.5	8.5
Other Grounds			
Peak Month GA Operation	11,997	13,122	14,410
Total Existing "Other Grounds" S.F.	510,227	510,227	510,227
Average FBO "Other Grounds" Area (SF) per Peak-Month GA Operation	43	39	35
Target "Other Grounds" Area (S.F.) per Peak-Month GA Operation:	40	40	40

^{1/} Due to unavailability of 1998 GA annual operations at the time of this assessment, 1997 data was utilized.

^{2/} Includes hangars currently under design and/or construction for Signature Flight Support and Jet Aviation.

Sources: Airport Management Records and FBO survey results.

Prepared by: Ricondo & Associates, Inc.

Table IV-49
General Aviation/FBO Facility Requirements Summary

Year	Based Aircraft	Peak-Month GA Operations	Facility Requirements (Square Feet)						Total GA Facility
			Storage Hangar ^{2/}	Maintenance Hangar ^{3/}	Apron ^{4/}	Office Building ^{5/}	Auto Parking ^{6/}	Other Grounds ^{7/}	
Existing (1998)	123	12,879	258,726	126,076	2,774,723	43,115	99,653	510,227	3,812,520
PAL 1	138	14,492	290,645	141,900	3,333,200	52,200	123,200	579,700	4,520,845
SL 1	143	15,017	301,180	147,000	3,454,000	54,100	127,600	600,700	4,684,580
PAL 2	154	16,171	324,316	158,297	3,719,300	58,200	137,500	646,800	5,044,413
SL 2	163	17,047	341,874	166,867	3,920,700	61,400	144,900	681,900	5,317,642

Notes:

- ^{2/} Based on 1998 utilization ratio of 2100 s.f. of aircraft storage hangar per based aircraft.
- ^{3/} Based on 1998 utilization ratio of 1025 s.f. of aircraft maintenance hangar per based aircraft.
- ^{4/} Based on 1998 utilization ratio of 230 s.f. of aircraft apron per peak-month GA operation.
- ^{5/} Based on 1998 utilization ratio of 3.6 s.f. of FBO office space per peak-month GA operation.
- ^{6/} Based on 1998 utilization ratio of 8.5 s.f. of auto parking per peak-month GA operation.
- ^{7/} Based on 1998 utilization ratio of 40 s.f. of other grounds per peak-month GA operation.
- ^{8/} Due to unavailability of 1998 GA annual operations at the time of this assessment, 1997 data was utilized.

Source: Airport Management Records, Ricordo & Associates, Inc.
Prepared by: Ricordo & Associates, Inc.

Table IV-50

Fuel Facility Demand-Capacity Assessment

	JET A		AVGAS	
	ASII ^{1/}	FBO ^{2/}	ASII ^{1/}	FBO ^{2/}
1997 Annual Operations ^{3/}				
1997 Annual Fuel Demand (gals)	72,842	56,019	-	69,023
1997 Average Fuel Demand Per Operation (gals.)	51,000,000	10,422,000	-	933,200
	700	186	-	14
PAL 1 Annual Operations	157,800	63,000	-	77,700
PAL 1 Projected Fuel Demand (gals.)	110,482,963	11,720,812	-	1,050,511
PAL 2 Annual Operations	173,300	70,300	-	86,700
PAL 2 Projected Fuel Demand (gals.)	121,335,219	13,078,938	-	1,172,192
Existing Fuel Capacity (gals.)	1,000,000	290,000	-	47,000
Existing Fuel Supply (1998-days)	7	10	-	18
PAL 1 Fuel Supply (days)	3	9	-	16
PAL 2 Fuel Supply (days)	3	8	-	15
Recommended Fuel Supply (days)	3	3	-	3

Notes:

^{1/} ASII currently provides JetA fuel exclusively for air carrier, commuter and all-cargo operators.^{2/} FBO includes Signature Flight Support, Jet Aviation, and Galaxy Aviation.^{3/} Due to unavailability of 1998 annual GA operations, actual 1997 data was used.

Source: Airport Management Records.

Prepared by: Ricoondo & Associates, Inc.

4.6 Airport Roadway Systems

This section presents the demand/capacity assessment and facility requirements for the Airport's primary access roads located both on and off the Airport. The assessment of on-Airport roadways focused on the terminal area roadways. The off-Airport roadways evaluated during this assessment included portions of Australian Boulevard, Belvedere Road, Military Trail, and Southern Boulevard that are within the Airport's vicinity.

4.6.1 Off Airport Roadway Demand/Capacity Assessment

The assessment of the off-Airport Roadways includes arterial capacity analyses for defined segments of the four primary off-Airport roadways. In addition, Level of Service (LOS) analyses of 15 intersections within the four roadway segments were also performed. The four roadway segments are defined as follows:

- *Belvedere Road from Military Trail to I-95 North - This East/West segment spans 3.0 miles in length and has posted speed limit of 45 mph. The roadway segment includes eight signalized intersections with the following roads:*
 - Military Trail
 - 5th Street
 - Congress Avenue
 - Florida Mango
 - Australian Avenue
 - Mercer Road
 - I-95 - south bound entrance/exit ramps
 - I-95 - north bound entrance/exit ramps
- *Southern Boulevard from Military Trail to I-95 North - This East/West segment spans 2.8 miles in length and has posted speed limit of 45 mph. The roadway segment includes six signalized intersections with the following roads:*
 - Military Trail
 - Kirk Road
 - Congress Avenue
 - Australian Avenue
 - I-95 - south bound entrance/exit ramps
 - I-95 - north bound entrance/exit ramps
- *Military Trail from Southern Boulevard to Belvedere Road - This North/South segment is located between two signalized intersections, one at Southern Boulevard and the other at Belvedere Road. This roadway segment spans 1.0 miles with no other signalized intersections. The posted speed limit along this segment is 45 mph.*
- *Australian Avenue from Southern Boulevard to Belvedere Road - This North/South segment is located between two signalized intersections, one at Southern Boulevard and the other at Belvedere Road. This roadway segment spans 1.1 miles with a third signalized intersections at Turnage Boulevard. The posted speed limit along this segment is 45 mph.*

4.6.1.1 Traffic Projections

The initial step of the demand/capacity assessment of off-Airport Roadways involves the development of traffic projections for PAL 1 and PAL 2. These traffic projections are based on model results provided by the Palm Beach Metropolitan Planning Organization (MPO). The MPO utilizes the Florida Standard Urban Transportation Model System (FSUTMS) in forecasting traffic for the transportation network within Palm Beach County. The FSUTMS model was used as a starting point in "windowing in" within the PBIA Study Area in developing more detail for the study area network.

A series of regression analyses were performed by comparing Florida Department of Transportation (FDOT) and Palm Beach County historic traffic with the model output. Compound Growth Rates (CGR) for all intersections within the study area were determined based on the results obtained from the regression analyses and considering various factors. Such factors include historic growth, future road improvements, future traffic diversion/attraction due to road improvements, future project traffic, future developments within the study area, engineering judgment, etc. The computed CGRs are summarized in **Table IV-51**.

Table IV-51

Annual Compound Growth Rates (CGR) per Intersection - Palm Beach International Airport

Road	Location	CGR(%)
<i>Belvedere Road @</i>	Military Trail	1.1
	5 th Street	1.1
	Congress Avenue	0.4
	Florida Mango	0.4
	Australian Avenue	1.4
	Mercer Road	-2.3
	I-95 Southbound	-0.3
	Entrance/Exit Ramps	
	I-95 Northbound	1.8
	Entrance/Exit Ramps	
<i>Australian Avenue @</i>	PBIA Entrance	3.0
<i>Southern Boulevard @</i>	Military Trail	1.4
	Kirk Road	2.0
	Congress Avenue	1.5
	Australian Avenue	1.4
	I-95 Southbound	0.5
	Entrance/Exit Ramps	
	I-95 Northbound	0.5
	Entrance/Exit Ramps	

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc., October 2000

Based on the CGRs contained in Table IV-51, Average Annual Daily Traffic (AADT) levels for PAL 1 and PAL 2 were established. The resulting AADT levels are shown in Table IV-52.

Table IV-52

Projected Average Annual Daily Traffic (AADT) - Palm Beach International Airport

Road	Location	AADT	
		PAL 1	PAL 2
Belvedere Road @	Military Trail	29,822	33,270
	5th Street	30,575	34,109
	Congress Avenue	31,516	32,799
	Florida Mango	37,918	39,463
	Australian Avenue	41,414	N/A
	Australian Avenue East	N/A	38,514
	Australian Avenue West	N/A	38,514
	Mercer Road	24,900	19,731
	I-95 Southbound Entrance/Exit Ramps	29,064	28,204
	I-95 Northbound Entrance/Exit Ramps	26,366	31,516
Australian Avenue @	PBIA entrance	11,403	16,293
Southern Boulevard @	Military Trail	21,620	24,845
	Kirk Road	35,775	40,985
	Congress Avenue	49,524	57,474
	Australian Avenue	40,465	46,570
	I-95 Southbound Entrance/Exit Ramps	34,207	35,777
	I-95 Northbound Entrance/Exit Ramps	28,959	30,289

N/A: Not Applicable

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc., October 2000

4.6.1.2 Existing Intersection LOS Analyses

Level of Service (LOS) analyses were performed at 15 signalized intersections using the latest version of the Highway Capacity Software (i.e., Version 2.1g). According to the HCM, LOS for signalized intersections is defined in terms of delay, which is a measure of discomfort and frustration, fuel consumption, and driver discomfort. Specifically, LOS criteria are stated in terms of average stopped delay per vehicle for a 15-min analysis period. The criteria are given below

- LOS A - stopped delay per vehicle (sec): up to 5 seconds per vehicle.
- LOS B - stopped delay per vehicle (sec): greater than 5 and up to 15 seconds per vehicle.
- LOS C - stopped delay per vehicle (sec): greater than 15 and up to 25 seconds per vehicle.
- LOS D - stopped delay per vehicle (sec): greater than 25 and up to 40 seconds per vehicle.
- LOS E - stopped delay per vehicle (sec): greater than 40 and up to 60 seconds per vehicle.
- LOS F - stopped delay per vehicle (sec): greater than 60 seconds per vehicle.

The relationship between delay and capacity is very complex and the above LOS thresholds were established on the basis of the acceptability of various delays to drivers. It is important to note that this concept is not related to capacity in a one-to-one fashion. While using these procedures, it is possible, for example, to have delays in the range of LOS F with volume to capacity ratios (v/c) below 1.0. The reverse is also possible: a saturated lane group may have low delays. Thus, the designation LOS F does not automatically imply that the intersection, approach, or lane group is overloaded, nor does a LOS better than E automatically imply that there is unused capacity available.

Recent traffic counts (Year 1999), Turning Movement Counts (TMCs) and signal timing data were provided by the Palm Beach County Traffic Engineering Division. Existing lane configurations of the studied intersections are summarized in **Table IV-53**.

Table IV-53

Existing Lane Configuration of Main Signalized Intersections at PBI

Road	Location	NB			SB			EB			WB		
		L	T	R	L	T	R	L	T	R	L	T	R
<i>Belvedere Rd. @</i>	Military Trail	1	3	S	1	3	1	2	2	1	2	2	1
	5 th Street	-	-	-	1	-	1	1	3	-	1	3	S
	Congress Avenue	1	1	F	3	SL	1	1	3	1	1	2	F
	Florida Mango	1	1	S	1	1	1	1	3	S	1	3	S
	Australian Avenue	2	3	F	1	3	2	2	3	1	2	3	1
	Mercer Road	-	-	-	1	-	1	1	3	-	S	3	-
	I-95 West	2	-	1	-	-	-	-	4	-	2	2	-
	I-95 East	2	-	1	-	-	-	2	2	-	-	4	-
<i>Australian Ave @</i>	PBIA Entrance	2	3	1	1	3	F	2	-	F	-	-	-
<i>Southern Blvd. @</i>	Military Trail	1	3	S	1	3	S	2	2	S	2	2	S
	Kirk Road	S	1	1	S	1	1	1	2	S	1	2	1
	Congress Avenue	1	-	2F	-	-	-	-	2	F	2	2F	-
	Australian Avenue	S	2	S	1	1	S	2	2	-	1	2	-
	I-95 West	-	-	-	2	-	-	-	3	-	1	2	-
	I-95 East	2	-	-	-	-	-	1	2	-	-	3	-

Legend:

L - Left Turn Lane
 T - Thru Lane
 R - Right Turn Lane
 S - shared w/thru lane
 F - free right turn

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc. March 1999

As shown in **Table IV-54**, of the total 15 intersections analyzed, six are currently operating deficiently. The remaining nine intersections are operating at an acceptable LOS. The failing intersections are listed below:

- Belvedere Road / Military Trail
- Belvedere Road / Australian Avenue
- Belvedere Road / I-95 West
- Southern Boulevard / Military Trail
- Southern Boulevard / Kirk Road
- Southern Boulevard / Australian Avenue

Table IV-54

Intersection Capacity Analysis - PM Peak Period

Intersection	Current Level of Service				Intersection
	NB	SB	EB	WB	
Belvedere Road @					
Military Trail	F	D	D	F	F
5 th Streets	-	D	B	B	B
Congress Avenue	D	C	C	D	D
Florida Mango	D	E	B	C	C
Australian Avenue	F	D	D	C	F
Mercer Road	-	D	B	B	B
I-95 West	D	-	C	F	F
I-95 East	D	-	C	D	D
Southern Boulevard @					
Military Trail	D	F	D	D	F
Kirk Road	C	D	C	-	F
Congress Avenue	E	-	F	C	D
Australian Avenue	D	F	F	E	F
I-95 West	-	D	D	E	D
I-95 East	D	-	D	C	D
Australian Ave @					
Turnage Boulevard	B	B	D	-	C

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc. March 1999

4.6.1.3 Existing Arterial Capacity Analysis

The arterial capacity analysis was calculated using the ART-PLAN software. ART-PLAN is a spreadsheet template that replicates the procedures from the Highway Capacity Manual (1994 Highway Capacity Manual, Chapter 11). The model is accepted by Palm Beach County for transportation planning studies. Data used in ART-PLAN include traffic volumes, traffic flow characteristics, roadway characteristics (e.g., number of lanes, free flow speeds, and arterial and area classification) and signalization characteristics (e.g., arrival types and signal timing data). A summary of the ART-PLAN level of service results for existing conditions is depicted in Exhibit IV-12.

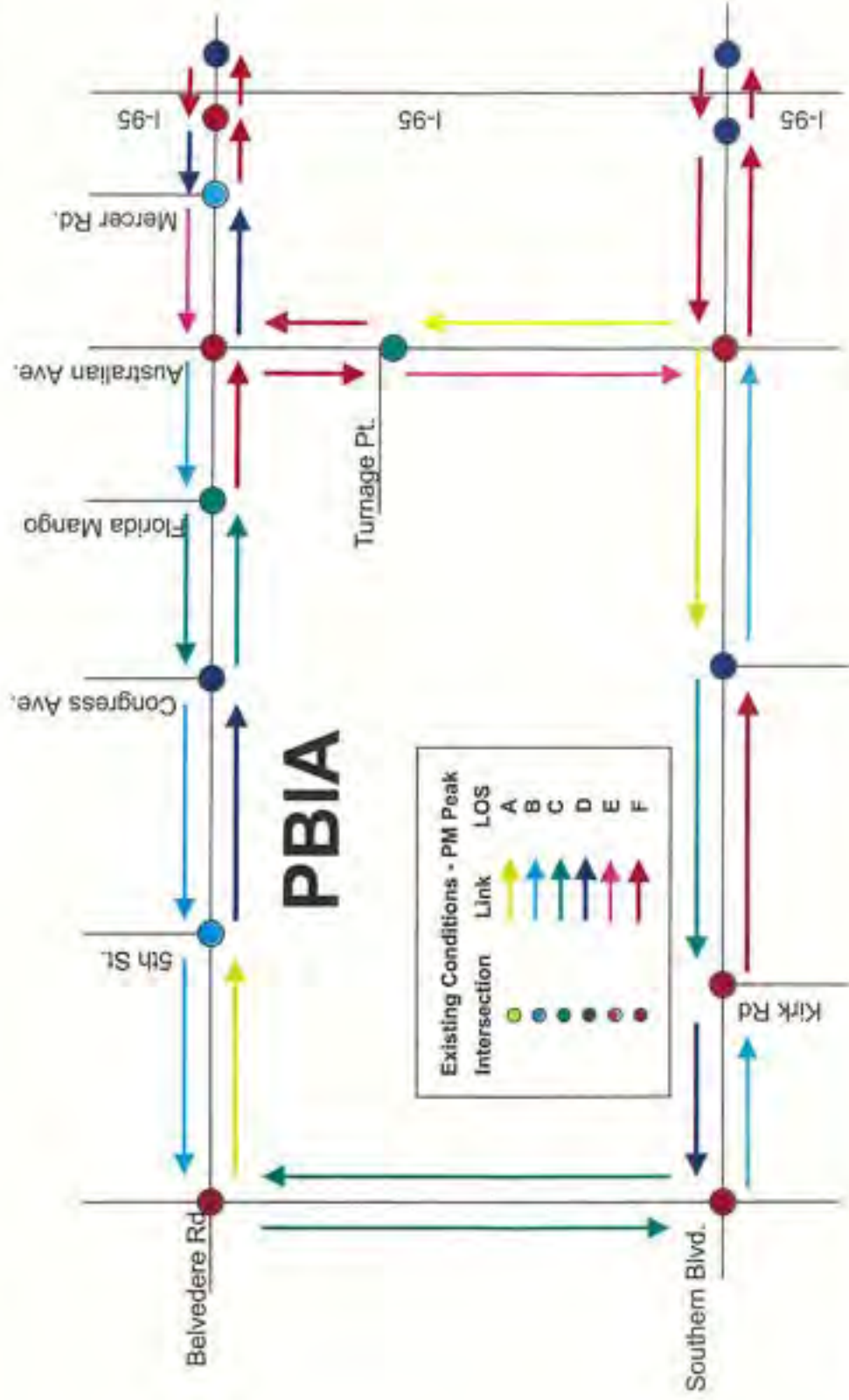
The arterial capacity analysis indicates that two links along Belvedere Road are currently operating deficiently (i.e., LOS "E" or worse) in the peak period direction (westbound):

- From I-95 West to I-95 East, and
- From Mercer Road to Australian Avenue

The analysis also indicates that three links are currently operating deficiently in the off-peak direction (eastbound):

- From Florida Mango to Australian Avenue,
- From Mercer Road to I-95 East, and
- From I-95 East to I-95 West.

The arterial capacity analysis indicates that two links along Southern Boulevard are operating deficiently in the peak period direction (westbound):



Source: Frederic P. Harris, Inc.
Prepared by: Ricondo & Associates, Inc.

Exhibit IV-12



Intersection Arterial LOS Existing (1999)

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- From I-95 West to I-95 East, and
- From I-95 East signal to Australian Avenue

The analysis shows that during the PM peak period, the roadway segment along Southern Boulevard between the I-95 West traffic signal and Australian Avenue is operating deficiently in both directions. The analysis also indicates that the roadway segment along Southern Boulevard between Kirk Road and Congress Avenue is operating deficiently and needs improvement.

The links studied along Military Trail are currently operating within an acceptable level of service during the PM peak period.

The analysis also indicates that Australian Avenue (southbound) is operating over capacity. The Turnage Boulevard - Belvedere Road northbound link is very congested as compared to the Turnage Boulevard - Southern Boulevard southbound link which is operating at an acceptable level of service. This may be attributed to the following reasons:

- *The Turnage Boulevard / Australian Avenue signal provides a considerable amount of green time (green time/cycle length = 0.69) to the northbound movement allowing queues to dissipate very efficiently.*
- *The Southern Boulevard / Australian Avenue signal, on the other hand, provides insufficient time (green time/cycle length = 0.20) to the southbound movement. This amount of green time is insufficient to clear the traffic volume that accumulates along this link during the PM peak period.*

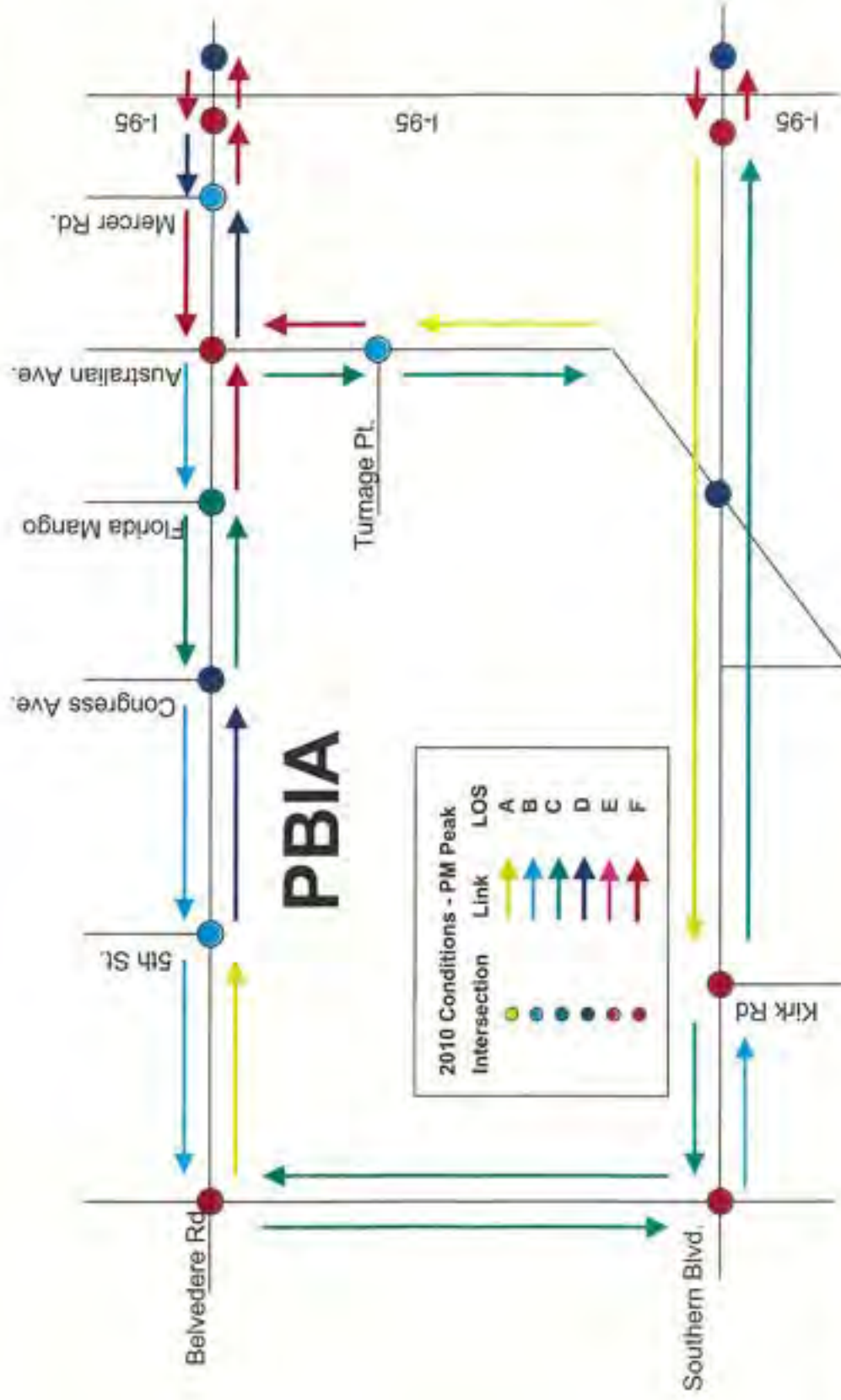
4.6.1.3 PAL 1 and PAL 2 Intersection Capacity Analysis

Exhibits IV-13 and IV-14 provide a graphical illustration of the capacity analysis results for PAL 1 and PAL 2. The following improvements were assumed to be complete prior to PAL 1 and were included in the capacity analyses:

- *Southern Boulevard – Improvements include widening the road from a 6-lane divided arterial to an 8-lane divided arterial.*
- *Australian Avenue/Congress Avenue Connector - Implementation of the proposed connector will eliminate the at-grade intersections at Australian Avenue/Southern Boulevard and at Congress Avenue/Southern Boulevard.*
- *Palm Beach International Airport/I-95 Direct Connector - This grade-separated link will considerably reduce airport inbound/outbound traffic at the Turnage Boulevard/Australian Avenue intersection.*
- *Australian Avenue (Southern Boulevard to Turnage Boulevard) – This roadway segment will be upgraded to a 6-lane divided arterial.*

In addition to the improvements assumed to be in-place by Year 2010, the following additional improvements were included in the Year 2020 analysis:

- *Australian Avenue/Belvedere Road Overpass - This “diamond interchange” project consists of constructing a north-south overpass at the Australian Avenue/Belvedere Road intersection with a direct exit ramp to Palm Beach International Airport.*

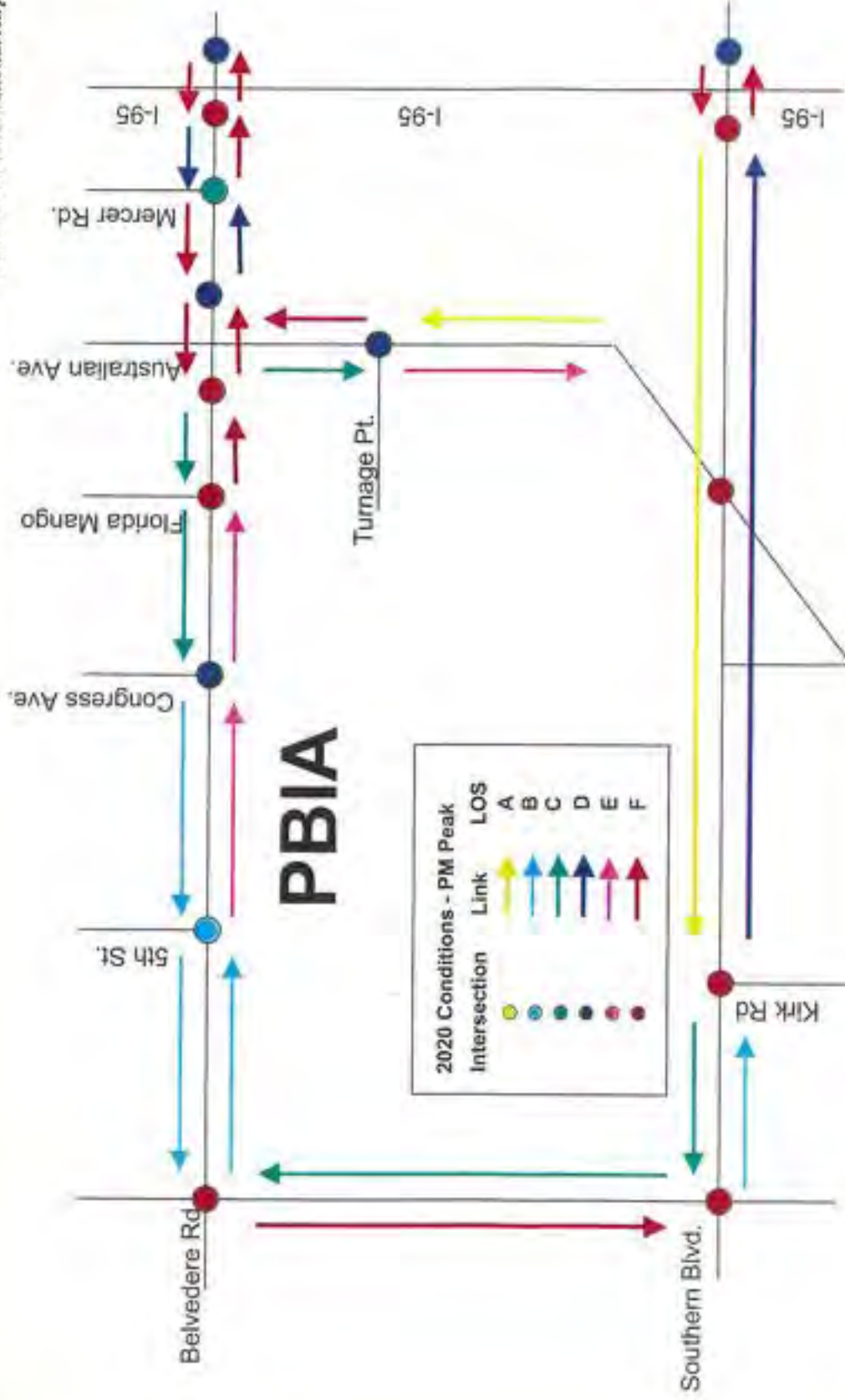


Sources: Frederic P. Harris, Inc.
Prepared by: Ricordo & Associates, Inc.

Exhibit IV-13

Intersection Arterial LOS PAL 1

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Source: Frederic P. Harris, Inc.
Prepared by: Ricardo & Associates, Inc.



Exhibit IV-14

Intersection Arterial LOS PAL 2

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- *Mercer Road Extension* - This phase of the "Australian Avenue/Belvedere Road Overpass" project consists of connecting Turnage Boulevard and Mercer Road with a 4-lane divided road. Thus, Turnage Boulevard/Australian Avenue and Mercer Road/Belvedere Road will operate as 4-leg intersections instead of T-intersections.

Of the 14 intersections analyzed, six (43%) will operate deficiently (i.e., congestion is present) at PAL 1:

- Belvedere Road/Military Trail
- Belvedere Road/Florida Mango
- Belvedere Road/I-95 West
- Southern Boulevard/Military Trail
- Southern Boulevard/Kirk Road
- Southern Boulevard/I-95 West

Of the 15 intersections analyzed, eight (53%) will operate deficiently (i.e., congestion is present) at PAL 2:

- Belvedere Road/Military Trail
- Belvedere Road/Florida Mango
- Belvedere Road/Australian Avenue Interchange (West Traffic Signal)
- Belvedere Road/I-95 West
- Southern Boulevard/Military Trail
- Southern Boulevard/Kirk Road
- Southern Boulevard/Australian Avenue
- Southern Boulevard/I-95 West

4.6.1.4 PAL 1 and PAL 2 Arterial Capacity Analysis

Table IV-55 summarizes the results of the future arterial capacity analysis listing the links that will operate deficiently at PAL 1 and PAL 2.

4.6.2 Off Airport Roadway Requirements

The Florida Department of Transportation (FDOT) and Palm Beach County have five key roadway improvement projects in various phases of development and implementation. The description of each project is summarized below. They are also shown graphically in Exhibit IV-15.

4.6.2.1 Interstate 95/Palm Beach International Airport Direct Connector

The purpose of the I-95/PBIA Direct Connector is to provide connectivity between I-95 and PBIA which would otherwise continue to strain the local traffic network via the Belvedere Road and Southern Boulevard interchanges.

This project involves construction of a new interchange directly connecting PBIA and I-95. Two single-lane elevated inbound ramps will be constructed to carry traffic from I-95 to PBIA, one each from the northbound and southbound directions. These structures combine to form a single ramp into PBIA. Similarly, outbound PBIA traffic to I-95 will use a combined elevated ramp that will separate into single-lane northbound and southbound ramps. The Direct Connector movements will be located on structure parallel and immediately south of Belvedere Road. The estimated

Table IV-55

Summary of ART-PLAN Analysis - Deficient Links

Road	Number of Links	Peak Direction	Off-Peak Direction
<i>Belvedere Road</i>			
PAL 1	7	I-95 West to I-95 East Mercer Rd to Australian Avenue	Florida Mango to Australian Avenue Mercer Road to I-95 East I-95 East to I-95 West
PAL 2	8	I-95 West to I-95 East Mercer Rd to Australian Avenue E Australian Ave. E to Australian Ave. W.	5 th St. to Congress Avenue Congress Avenue to Florida Mango Florida Mango to Australian Avenue W Australian Ave. W to Australian Ave. E Mercer Road to I-95 East I-95 East to I-95 West
<i>Southern Boulevard</i>			
PAL 1	3	I-95 West to I-95 East	I-95 East to I-95 West
PAL 2	3	I-95 West to I-95 East	I-95 East to I-95 West
<i>Military Trail</i>			
PAL 1	1	None	Belvedere Road to Southern Boulevard
PAL 2	1	None	None
<i>Australian Avenue</i>			
PAL 1	2	None	Turnage Boulevard to Southern Boulevard
PAL 2	2	Turnage Boulevard to Belvedere Road	Turnage Boulevard to Belvedere Road

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc. March 1999



LEGEND:
 Roadway Widening
 Future Roadway
 Intersection Improvement

Source: Frederic P. Harris, Inc.
 Prepared by: Ricordo & Associates, Inc.

Exhibit IV-15



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Strategic Master Plan Study

Off-Airport Roadways - Planned Roadway Improvements

October 2000

construction cost is \$85 million. Construction was let Spring, 1999 with construction completion programmed for the Year 2003.

Results of the traffic analysis indicate that the Turnage Boulevard - Belvedere Road link on Australian Avenue as well as the Mercer Road - I-95 link on Southern Boulevard will be operating deficiently through at PAL 2. It is expected that construction of the I-95/PBIA connector will aid in decongesting these links by absorbing a great part of the traffic exiting and entering PBIA to/from I-95.

4.6.2.2 State Road 80 Interchange with Australian Avenue

SR 80 (Southern Boulevard) is a major 4-lane east-west thoroughfare within Palm Beach County connecting the Town of Palm Beach on the east coast of Florida with Fort Myers on the west coast of Florida. Australian Avenue and SR 807 (Congress Avenue) form a north-south county thoroughfare that connects Southern Boulevard to Blue Heron Boulevard in Riviera Beach and Yamato Road in Boca Raton. Australian Avenue and Congress Avenue, together with Southern Boulevard, provide major access to Downtown West Palm Beach with Southern Boulevard providing access for commuters from the western communities of Palm Beach County. Presently, both Australian Avenue and SR 807 (Congress Avenue) terminate at Southern Boulevard and are separated by 0.75 miles. Both northbound and southbound traffic must utilize Southern Boulevard to continue either north on Australian Avenue or south on Congress Avenue. This additional traffic, coupled with the east/west traffic along Southern Boulevard, results in traffic operating level of service "F" for this section of roadway.

Proposed improvements include an interchange to connect SR 807 (Congress Avenue), Australian Avenue, and SR 80 (Southern Boulevard) with a grade separation within the vicinity of PBIA. Specifically, the project will include the following:

- *A direct connection between Australian Avenue and Congress Avenues. A new alignment will eliminate utilizing Southern Boulevard for Australian Avenue and Congress Avenue traffic. This Australian Avenue/Congress Avenue Connector will be a 6-lane divided (urban section) roadway with 12 feet wide travel lanes, 22 feet wide median with curb and gutter. In addition, the connector will have 4 feet wide bike lanes on both sides between the outermost lane and the outside curb and gutter, and 6 feet wide sidewalks.*
- *Directional ramps will serve the following traffic movements: (1) SR 80 eastbound-to-Congress Avenue southbound; (2) Australian Avenue southbound-to-SR 80 eastbound; (3) Australian Avenue northbound-to-SR 80 westbound; and (4) SR 80 westbound-to-Australian Avenue northbound. The ramp typical sections will have a design speed of 25-35 mph and will consist of single-lane ramps (15-16 feet wide) and shoulders. Sidewalks and curb and gutter will be provided on one side of the ramps located within the northwest and southeast quadrants.*
- *Southern Boulevard will be constructed as an 8-lane divided urban section with 12-foot wide travel lanes, 22-foot wide median with curb and gutter, 4-foot wide bike lanes on both sides between the outermost lane and outside curb and gutter, and 7-foot wide sidewalks.*

The contract letting for this project was Spring, 1999.

4.6.2.3 State Road 80 from West of Forest Hill Boulevard to East of I-95

The SR 80 (Southern Boulevard) improvement project was initiated in response to the rapidly growing development within western Palm Beach County. The purpose of SR 80 improvements is to provide a high capacity corridor to accommodate both current as well as future traffic demands within the east/west directions. This project will also include grade-separated interchanges at major intersections (i.e., Jog Road, Haverhill Road, SR 7, Turnpike, Military Trail, and SR 80 Overpass at I-95).

This project involves the widening and reconstruction of an 11.5 mile section of SR 80 (Southern Boulevard). As proposed, the highway is to be widened to an 8-lane divided roadway between Forest Hill Boulevard and I-95.

SR 80 improvements along the west end of the corridor (i.e., Forest Hill Boulevard to SR 7) are programmed for a Year 2002 contract letting. However, the balance of the SR 80 improvements is beyond the 5-Year Work Plan (see Table IV-58 for timetable improvements), as these improvements will require significant right-of-way acquisition.

The traffic analysis indicates that SR 80 from Military Trail to I-95 will operate at acceptable levels of service (at or above "D") through PAL 2, with the exception of the segment of road on SR 80 between the I-95 access ramps.

4.6.2.4 Australian Avenue Improvements

This project provides for the upgrading of Australian Avenue from the Hilton Hotel Complex to south of the PBIA Entrance. The project consists of a 0.5 mile reconstruction to a 6-lane divided section. The design speed for this roadway segment will be 45 mph. FDOT will enter into a Joint Participation Agreement with Palm Beach County to implement this project.

The results of the traffic analysis show that the northbound movement along Australian Avenue between Turnage Boulevard and Belvedere Road will operate deficiently throughout 2010 and beyond. To maintain acceptable operating levels of service, it is recommended that extending the proposed upgrading of Australian Avenue to Belvedere Road be considered. This improvement coupled with the I-95/PBIA direct connector will greatly alleviate congestion in this location and will ensure satisfactorily traffic operations throughout the year 2020.

4.6.2.5 Summary

In summary, there is considerable major construction planned for "Off-Airport Roadways" within the vicinity of PBIA. The aforementioned projects are considered to be committed improvements that will enhance the background traffic network. Proposed roadway improvements to support PBIA Strategic Plan/Business Plan recommendations will need to be integrated with these improvements to provide for an efficient transportation system.

Transportation improvements, that are either programmed or planned within Palm Beach County, are included in the Transportation Improvement Program and Long-Range Transportation Plan, respectively.

4.6.2.6 Short-Term and Long-Term Adopted Improvements

4.6.2.6.1 Transportation Improvement Program

The FY 1999-2003 Transportation Improvement Program (TIP) is a staged program encompassing a five-year period consisting of all regionally significant transportation improvements to all modes of travel within Palm Beach County. The TIP contains all transportation projects funded by federal, state, and local sources. The TIP is developed by the Metropolitan Planning Organization (MPO) of Palm Beach County through a continuing, comprehensive and coordinated effort involving the Florida Department of Transportation (FDOT), the Palm Beach Board of County Commissioners, the Port of Palm Beach, and municipalities within the County. The TIP is based on and reflects FDOT's FY 99-03 Five-Year Work Program for Palm Beach County and generally moves forward the projects in the time frame from previous work programs. The County Five-Year Road Program is also included.

In order to be included in the TIP, a major improvement project must be consistent with the policies and priorities of the MPO's adopted Long-Range Transportation Plan (LRTP). The intent of the TIP is not only to address current problems but also to construct the needed facilities for the LRTP. TIP projects are funded using existing revenue sources. The projects are funded using the various funding sources and are appropriate for the available funds in each category. Modifications to the Plan have been made to reflect changes in anticipated development levels and proposals for specific roadway links. These modifications are reviewed and approved by the MPO. The Airport Master Plan is used for consistency in selection of aviation projects in the TIP.

The MPO sets priorities for major projects, those adding capacity to the transportation system (i.e., additional lanes, additional buses, significant reconstruction, etc.). Projects contained in the TIP generally reflect the continuation of priorities established in previous years during the TIP process.

Transportation projects identified in the TIP that relate to the PBIA Strategic Plan/Business Plan are presented in **Table IV-56**.

4.6.2.6.2 Long-Range Transportation Plan

The West Palm Beach Urban Study Area Year 2015 Plan Update represents the MPO's current Long-Range Transportation Plan (LRTP). The current LRTP is the 2015 Cost Feasible Transportation System Plan. The LRTP is a 20-year plan based on regional needs identified through the process of forecasting future travel demands, evaluating system alternatives, and selecting those options that best achieve the mobility needs of the region. The LRTP contains elements for roadways, mass transit, bicycles, and pedestrians. The 2015 Plan was prepared using estimates of available revenues from local option gas taxes and impact fees. The Needs Plan contains all the road, highway, rail, pedestrian and pathway facilities, bicycle facilities, and transit system improvements that would be needed to maintain the County's adopted level of service "D" standard on all roadways. Revenues available to implement the Needs Plan are insufficient to cover all projects in the Plan. Financial revenue sources available for funding highway and transit projects within Palm Beach County include fuel taxes, transportation impact fees, ad-valorem taxes, fare box and other transit revenues, and motor vehicle tag fees. The 2015 Plan is included in the County Comprehensive Plan and in local municipal comprehensive plans. This inclusion ensures consistency with local comprehensive plans to the maximum extent feasible. As a result, the Year 2015 Cost Feasible Plan was selected as representing the best combination of multi-modal improvements in meeting the long-range transportation needs of Palm Beach County. The LRTP also provides the framework for the development of the TIP.

Table IV-56

TIP Projects within the PBIA Study Area

Project	Description	Dist. (miles)	Type of Work	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03
I-95/PBIA Direct Connect #4147515	Southern Blvd to Belvedere Rd	1.4	New Interchange & Direct Connect to PBIA	CST 85381				CST 2000
Southern Blvd #4118841	Haverhill Rd to west of Congress	2.0	Add Lanes & Reconstruction		ROW 8932	ROW 9111	ROW 9000	ROW 9000
Military Trail #4118631	Okeechobee Bl. to north of Blue Heron Bl.	5.3	Add Lanes & Reconstruction	ROW 1000	RRU 150	CST 18323		CST 1600
Southern Blvd #4118757	Interchange at Australian Ave & Congress Ave	0.0	New Construction	CST 9192				
Southern Blvd Interchange #41157574	Southern Blvd	0.3	Interchange (Major)	CST 18446		MSC 8365		
Southern Blvd #4118031	Congress Ave to west of I-95	2.2	Add Lanes & Reconstruction	CST 5317		MSC 4366		
I-95 HOV #4147526	Belvedere Rd to Okeechobee Rd	1.8	Interchange (Major)			CST 600		
I-95 HOV #4147556	Forest Hill to Congress Avenue	3.7	Add Lanes & Reconstruction					PE 3900

CST: construction

MSC: miscellaneous

PE: preliminary engineering

ROW: right-of-way

RRY: reconstruction

Source: Frederic R. Harris

Prepared by: Frederic R. Harris

The Year 2015 Cost Feasible Plan includes the following roadway improvement projects within the PBLA Study Area:

- *Southern Boulevard – Proposed interchanges located at the following intersections: SR 7, Turnpike, Jog Road, Haverhill Road, Military Trail, and Congress Avenue. In addition, an upgrade to an 8-lane section is proposed along Southern Boulevard between Forest Hill Boulevard and I-95. These interchange improvement projects will enable Southern Boulevard to operate as a high capacity corridor in providing increased throughput capacity while still providing local access within the corridor.*
- *Okeechobee Road – Proposed interchange at SR 7 combined with an upgrade to 8 lanes between SR 7 and I-95.*
- *I-95 – Upgrade of I-95 between Linton Boulevard and Okeechobee Boulevard to a 10-lane section including 8 through lanes and 2 HOV lanes and upgrade of I-95 between Okeechobee Boulevard and PGA Boulevard to a 8-lane section including 6 through lanes and 2 HOV lanes.*
- *Ronald Reagan Turnpike – Upgrade of the Turnpike to a 6-lane section with new interchanges located at the following intersections: Clint Moore Road, Southern Boulevard, Hypoluxo Road, and the Beeline Highway (or 45th Street).*
- *Urban Interchanges – The following urban interchanges are included in the Year 2015 Cost Feasible Plan: Belvedere Road & Australian Avenue, Southern Boulevard & Australian Avenue, Southern Boulevard & Jog Road, SR 7 & Lake Worth Road, SR 7 & Southern Boulevard, PGA Boulevard & Old Dixie Highway, Southern Boulevard & Haverhill Road, Southern Boulevard & Military Trail, and SR 7 & Okeechobee Boulevard.*
- *Palm Tran – Increased frequency in bus service in reducing headways to 30 minutes.*
- *Tri-Rail – Tri-Rail services are expected to be extended to Jupiter north of Indiantown Road with improved headways to 30 minutes. With the extension of Tri-Rail, approximately five new Tri-Rail stations are anticipated.*

Intermodal Facilities – The Tri-Rail station, located in Downtown West Palm Beach, includes connections for buses, bikes, pedestrians, taxis, paratransit, intercity rail, and Greyhound. The facility will be designed to accommodate a future transit linkage to PBLA.

The Year 2020 Future Directions Plan serves to forecast the additional transportation improvements that are expected to be financially feasible for the additional five-year period between 2016 and 2020, in an effort to define the overall Year 2020 Cost Feasible Transportation System. For the highway component, all improvements needed by the Year 2015 were found to be financially feasible by the Year 2020. For the transit component, four express bus routes were identified for the Future Directions Plan, in addition to the Year 2015 Cost Feasible Plan.

Each step of the approval process features public involvement. Projects that require Project Development & Environmental Studies will be subject to the preparation and implementation of a formalized public involvement program for the specific project.

4.6.3 On Airport Roadway Demand/Capacity Assessment

The LOS analysis of PBIA's internal roads was based on the 3-day 24-hour traffic counts performed through November 17 to 19, 1998. **Table IV-57** presents the Average Weekday Daily Traffic (AWDT) for every roadway section identified in **Exhibits IV-16A** through **IV-16C**. It also presents Annual Average Daily Traffic (AADT) for existing and interim years. Future AADT was obtained using a 3.0 percent compound annual growth rate. This growth rate was computed based on off-airport roadway system historic traffic information. However, future passenger activity at PBIA was also considered.

Demand scenarios developed as part of this study were used to project roadway traffic based on PBIA's passenger activity. The Baseline Scenario and a High Growth Scenario define the boundaries of passenger growth projected for PBIA. The Baseline Scenario represented an average annual growth for the period 1997 through 2020 of 2.84 percent per year while the High Growth demand scenario represented 3.5 percent per year. Since the historic traffic growth rate falls between these two demand scenario growth rates, using a 3.0 percent growth rate is appropriate.

Table IV-57

Existing and Future AWDT and AADT on PBIA Internal Roads

Section	1998 AWDT	# Lanes	SF	AADT	PAL 1	PAL 2
1	6,689	2	0.99	6,622	9,442	12,689
2	9,358	2	0.99	9,264	13,209	17,752
3	10,718	3	0.99	10,611	15,128	20,331
4	10,178	4	0.99	10,076	14,366	19,307
5	10,957	4	0.99	10,847	15,466	20,785
6	13,717	4	0.99	13,580	19,362	26,020
7	6,822	4	0.99	6,754	9,629	12,941
8	5,073	2	0.99	5,022	7,161	9,623
9	11,895	2	0.99	11,776	16,790	22,564
10	8,606	4	0.99	8,520	12,147	16,325
11	8,155	4	0.99	8,073	11,511	15,470
12	10,623	3	0.99	10,517	14,994	20,151
13	2,669	3	0.99	2,642	3,767	5,063
14	7,954	1	0.99	7,874	11,227	15,088
15	2,490	2	0.99	2,465	3,515	4,723
16	1,085	2	0.99	1,074	1,531	2,058

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc. March 1999

LEGEND:

5 Road Section Identification Number



Source: Frederic P. Harris, Inc.
Prepared by: Ricondo & Associates, Inc.

Exhibit IV-16A



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Strategic Master Plan Study

On-Airport Roadway - Traffic Counts

October 2000



Source: Frederic P. Harris, Inc.
Prepared by: Ricordo & Associates, Inc.

Exhibit IV-16B

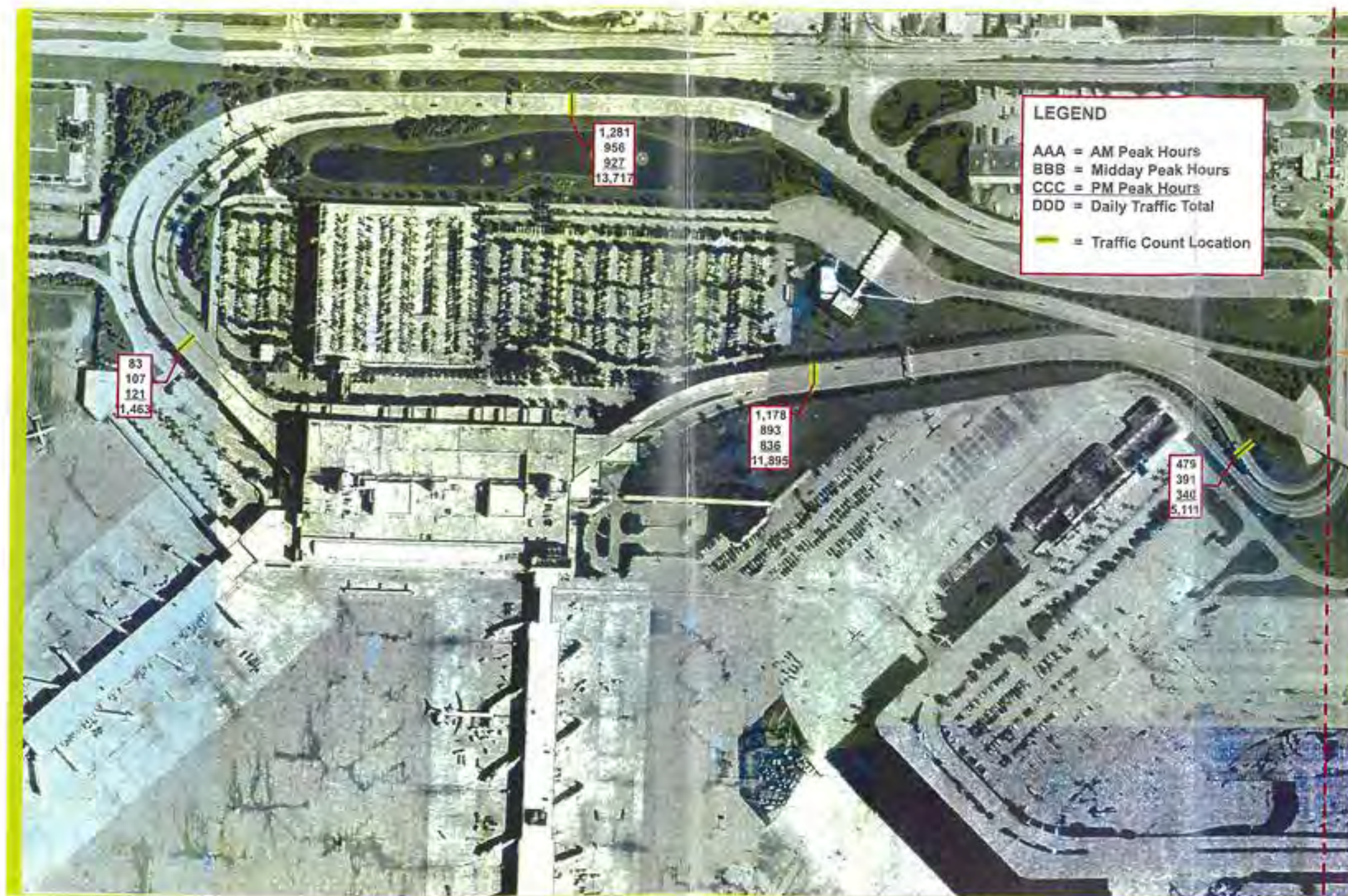


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Strategic Master Plan Study

On-Airport Roadway - Traffic Counts

October 2000



Source: Frederic P. Harris, Inc.
Prepared by: Ricondo & Associates, Inc.

Exhibit IV-16C

The Level of Service analysis results were based on the Florida Department of Transportation Generalized Annual Average Daily Volumes LOS Tables. Since most of the roads within PBIA are one-way roads, the LOS thresholds presented in these tables were adjusted with the procedure provided in these tables to reflect one-way streets. **Table IV-58** presents the one-way LOS volumes.

Table IV-58

One-Way Roads LOS Volumes

Lanes	Level of Service (LOS)				
	A	B	C	D	E
2	NA	NA	6,540	8,520	9,300
4	NA	NA	14,640	18,600	19,920
6	NA	NA	22,680	28,500	30,120

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc. March 1999

Table IV-59 shows the sections of roads that will operate below and above LOS "D" in PAL 1 and PAL 2. This table indicates that the existing roadway configuration is able to handle efficiently existing and future traffic volumes.

Table IV-59

Existing and Future LOS on PBIA's Internal Roads

Section	1998			PAL 1		PAL 2	
	AADT	# Lanes	LOS	AADT	LOS	AADT	LOS
1	6,622	2	C	9,442	C	12,689	C
2	9,264	2	C	13,209	C	17,752	D
3	10,611	3	C	15,128	C	20,331	C
4	10,076	4	C	14,366	C	19,307	C
5	10,847	4	C	15,466	C	20,785	C
6	13,580	4	C	19,362	C	26,020	C
7	6,754	2	C	9,629	C	12,941	C
8	5,022	2	C	7,161	C	9,623	C
9	11,776	4	C	16,790	C	22,564	C
10	8,520	4	C	12,147	C	16,325	C
11	8,073	3	C	11,511	C	15,470	C
12	10,517	3	C	14,994	C	20,151	C
13	2,642	1	C	3,767	C	5,063	C
14	7,874	2	C	11,227	C	15,088	D
15	2,465	2	A	3,515	A	4,723	A
16	1,074	1	C	1,531	C	2,058	C

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc. March 1999

4.6.4 Traffic Signage Deficiencies



Traffic sign placement and quantity appear to be sufficient. Based on visual inspection, the existing signs meet the Manual of Uniform Traffic Control Devices (MUTCD) standards with few exceptions. There is a regulatory sign in the southbound direction on the south side at the intersection of Belvedere Road and Congress Avenue. The sign restricts trucks and commercial vehicles over 13 feet from entering the airport. The sign has white letters on a green background that is typically reserved for roadway guide signs. Regulatory signs should have a color scheme of black letters on a white background.

Several of the guide signs have small letters making them difficult to read. For example, the first exit from the circulation roadway exiting the terminal is the ramp to Belvedere Road/Congress Avenue. The sign for this movement has the following information:



- Terminal Return
- Short Term Parking
- Long Term Parking
- Congress Avenue North

The letters for this sign should be at least 8 inches high. There are other signs with small lettering along the circulation roadway and the access roads. All signs should be checked for legibility according to MUTCD standards.

There is an overhead sign truss informing motorists of the Congress Avenue North exit, but the signs are conflicting as shown in the picture. It is recommended to designate the inside lane as the return-to-terminal and parking access. The outside lane should be designated as the exit to Congress Avenue North and access to Hertz. The vehicles leaving the parking payment gate merge with the traffic from the Congress Avenue North exit.

The approach to the terminal has overhead signs directing traffic to parking, flight arrivals, and flight



departures. As the airport continues to expand, these signs should be color-coded and have airline access designation. There are three concourses (A, B, and C) at the terminal. Concourses B and C appear to be the busiest of the three concourses. Color coded signs would direct vehicles to proper drop off/pick up points

for departing and arriving flights.

Palm Tran Route # 44 accesses the Airport at Congress Avenue North. There does not appear to be sufficient signing directing potential riders to the bus system. There is a bus shelter on the south side of Belvedere Road at Congress Avenue.

4.6.5 Potential Roadway Problems

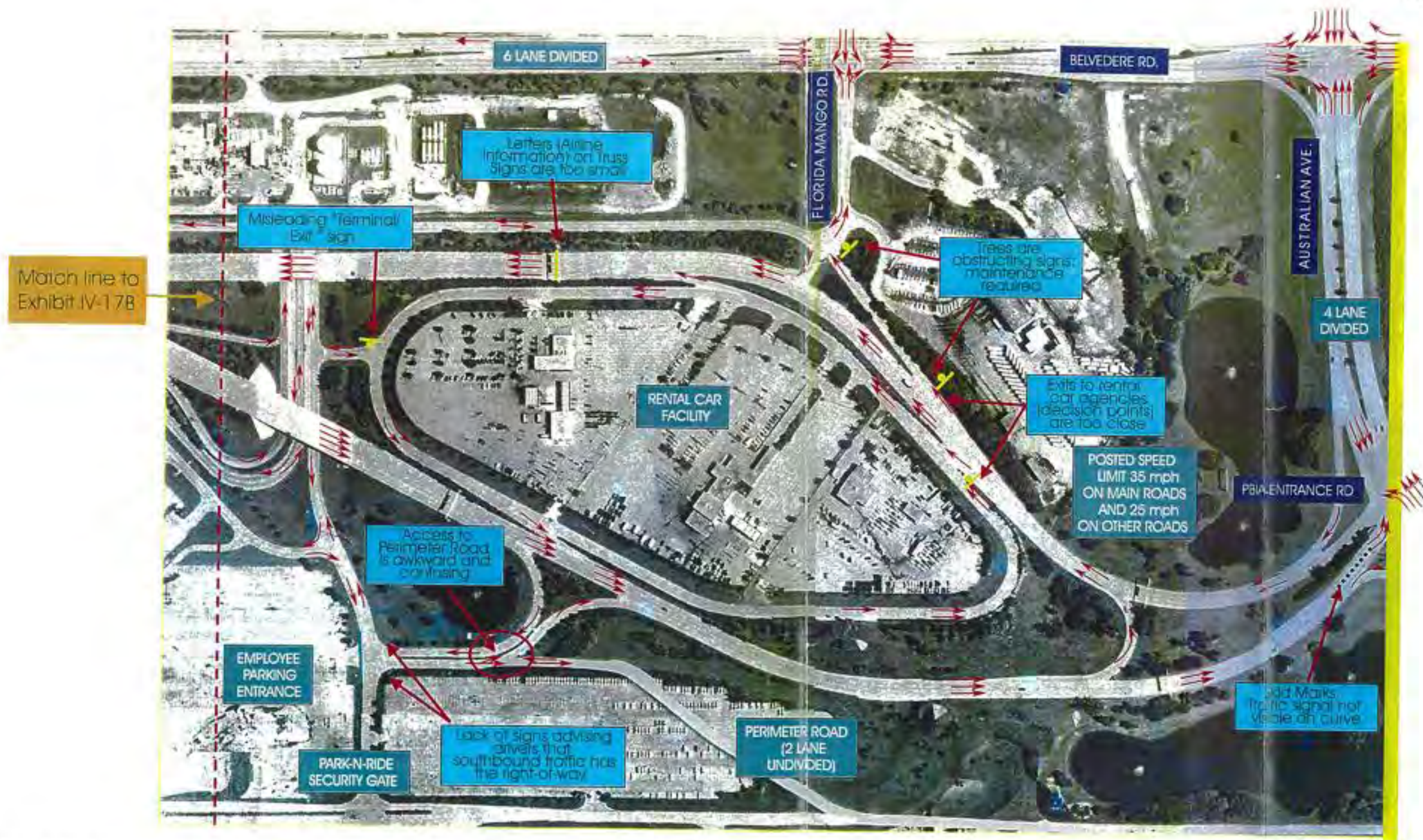
The main Airport circulation roadway provides good access to the terminal as well as short-term parking, long-term parking, rental car areas, and secondary roadways. However, there are a few areas that may become potential problems as the Airport expands and traffic increases. These issues are described below and are illustrated in Exhibit IV-17A and IV-17B.

4.6.5.1 Potential Geometric Problems

The Airport entry at the intersection of Belvedere Road and Congress Avenue could become a potential problem. The receiving lane into the Airport immediately curves to the west leading to a merge with the Airport circulation roadway. The radius of the curve is 50 feet. The length of the section between Belvedere Road and the merge point on the main circulation roadway is 300 feet. Field observations did not indicate a problem; however as traffic increases and more vehicles utilize this entrance in the future, a potential geometric problem is imminent.



Congress Avenue looking north toward Belvedere Road



Source: Frederic P. Harris, Inc.
Prepared by: Ricordo & Associates, Inc.



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Strategic Master Plan Study

Exhibit IV-17A

**On-Airport Roadway -
Proposed Roadway Improvements**

October 2000



Source: Frederic P. Harris, Inc.
Prepared by: Ricondo & Associates, Inc.



CHProjectPbair10-06-00Corel ExhibitIV-17BNEW.cdr

Strategic Master Plan Study

Exhibit IV-17B

**On-Airport Roadway -
Proposed Roadway Improvements**

October 2000



Congress Avenue looking south toward the main Airport roadway

The air cargo access drive south of Belvedere Road has a short receiving lane that leads to a "T"-intersection. The storage area before the "T" is 50 feet and the turning radius is 35 feet. Field observations did not indicate a problem; however the short storage area could become a potential problem as traffic increases. The turning radius is adequate for passenger vehicles, but heavy vehicles may have a problem negotiating a right turn.

4.6.5.2 Potential Operational Problems

The exit of the lower drive of the terminal has three separate lanes merging together. These lanes come from the parking area, shuttle drive, and arrival passenger pick-up drive. Field observations indicate that the merge from the arrival passenger pick-up drive appears short and may conflict with the shuttle drive.

There are several left inside lane merges along the circulation roadway. Upon entering the main terminal roadway, the central rental car area has an inside lane entrance and an exit that merges into the inside lane. The central rental car area has another exit that merges with the inside lane upon leaving the terminal.



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STRATEGIC MASTER PLAN STUDY

PBI



Palm Beach International Airport

Prepared for:

**VOLUME III
SECTIONS 5-7**

JANUARY 2001

Prepared by:

Ricondo & Associates, Inc.

in association with

Unison-Maximus Consulting Solutions
GKMG Consulting Services

PALM BEACH COUNTY DEPARTMENT OF AIRPORTS



Section V

V. Strategic Options

A primary focus of the Strategic Master Plan Study ("Strategic Plan") for PBIA is to identify and evaluate airport development alternatives that satisfy future aviation-related demand, are responsive to the needs of the communities served by the Airport, and maximize revenue-generating opportunities while effectively managing land-uses. To satisfy these needs, several alternatives capable of serving future demand were developed for each distinct airport component (i.e., airfield, terminal, cargo, and general aviation), and their merits and impacts were evaluated. A Composite Development Plan was created by integrating and refining the preferred development alternatives to provide the basis for the Airport Layout Plan.

Other alternatives for each of the various airport components that, based upon the existence or occurrence of certain conditions, were determined to be viable development schemes have been integrated into a decision tree, along with the preferred alternatives, comprising the Composite Development Plan. The decision tree, which represents a key product of the Strategic Plan, is intended to assist the County in identifying key decisions or milestones to be addressed as they relate to future development actions. The alternate development patterns or "strategic options" (i.e., the preferred alternatives and the other viable development schemes) form the framework of the decision tree.

Through this process, the Strategic Plan helps define a long-term development plan that can adapt to the needs of any of the modeled demand scenarios in an incremental manner. While it is possible that the plan ultimately selected may not be the "best" alternative under each of the demand scenarios, it will provide the greatest flexibility to adjust to the occurrence of any of the demand profiles. As such, the development plan will not be linked to any single demand projection. Instead, it will be a valid development plan for a wide range of demand profiles that may ultimately materialize at the Airport.

The identification and evaluation of development alternatives was based upon the facility requirements derived for the Alternate Service Patterns Demand Scenario, represented by PAL 1 (Year 2010 Facility Requirements) and PAL 2 (Year 2020 Facility Requirements). A risk or sensitivity analysis was also performed on each of the development alternatives using the year 2020 facility requirements derived for the Baseline Demand Scenario (SL1) and the High Growth Demand Scenario (SL2). The Baseline Demand Scenario is considered the best representation of future aviation demand growth assuming historical activity trends and operating conditions at the Airport continue through the 20-year planning horizon. It also represents the most conservative (i.e., low) estimate of future aviation activity developed in this Strategic Plan. However, the Alternate Service Patterns Demand Scenario provides a more aggressive set of facility requirements resulting from enhanced air service patterns at the Airport and increased activity in some of the aviation-related segments of PBIA's current activity, such as air cargo and corporate activity.

The remainder of this section discusses, in greater detail, the methodology utilized in the identification of development alternatives and the process that led to the selection of the preferred Composite Development Plan. This discussion is provided in the following sub-sections:

- Strategic Planning Approach
- Methodology
- DOA Workshop

- Identification of Development Alternatives
- Screening of Development Alternatives
- Refinement of Short Listed Alternatives
- Evaluation of Short Listed Alternatives
- Preferred Composite Development Plan

5.1 Strategic Planning Approach

The strategic planning process can be discussed within the context of the following four major areas:

The Vision - Strategic airport planning is a significantly improved approach to airport master planning, which realistically accounts for rapid changes in the economy, airline business strategies and operating practices, technology, and needs of the local communities served by the Airport.

The Context – The traditional approach to airport master planning, as outlined by the FAA, involves defining a forecast and examining development options (or facility layouts) that are responsive to the forecast growth. A single sequence for development that responds primarily to changes in demand levels is then identified.

The Problem – One weakness of the traditional master planning approach is that it does not adequately anticipate the risk of possible changes in the market conditions forming the basis for the forecast. It does not provide any means for ensuring against those risks and it is inflexible and inherently unresponsive to those risks. Airport management typically becomes committed to the “plan,” which leads to the resistance to change if and when such change is needed. The consequences are potential economic losses and opportunity losses.

The Solution – the solution to the problem identified above is dynamic strategic planning, which is accomplished in three phases:

- Recognizing risk and complexity as a reality of planning
- Analyzing the solution
- Developing diverse development plans that serve to track actual developments in the aviation industry and changes in the needs of the community

5.1.1 Recognizing Risk and Complexity

Dynamic strategic planning recognizes risk by looking ahead several time periods to foresee the opportunities and threats that may emerge in the future. It also accepts that future demand levels and characteristics cannot be known and will most often not reflect that which is projected. Therefore, dynamic strategic planning should assume the likelihood for the occurrence of the unexpected.

In recognizing complexity, it is important to realize the wide range of choices that may be realized. The process of dynamic strategic planning examines potential complex development patterns, simple plans, and hybrid solutions. It supports the need for flexibility by being responsive to market and industry conditions while committing to only one period at a time. Like a chess game, dynamic strategic planning looks ahead many moves but commits to only one decision at a time.

5.1.2 Analyzing the Situation

Analysis of the situation involves identifying strengths, weaknesses, opportunities, and threats. It further involves identifying risks and analyzing the impact of decisions.

The current strengths at PBIA include a consistent signatory airline base, a passenger-friendly and convenient airport complex, low debt requirements, competitive operating costs relative to the other South Florida airports, and the availability of land for facility expansion (growth) opportunities. Weaknesses include stagnant (flat) growth in air service activity and the inability to stimulate aviation-related demand.

The Air Service Analysis presented in Section III identified promising opportunities for enhancing air service at PBIA. The demand for year-round service for markets historically served on a seasonal basis by PBIA's signatory and non-signatory airlines offer the potential for increased air service activity by existing tenants. In addition, the demand for air service to markets currently served with one stop or multi-stop flights provide opportunities for new entrant carriers or new service by existing airlines. Similarly, the recent acquisition of the Town of Golfview provides growth opportunities in some of the other aviation components at the Airport such as general aviation activity currently handled by three fixed base operators. In recent years, general aviation activity at PBIA has been more characterized by corporate-related traffic than by private general aviation (single-engine and twin-engine) aircraft owners. This newly acquired property also offers opportunities for new aviation-related activities such as aircraft manufacturing and/or avionics services. The Collateral Development Analysis, also completed under the Business Plan, identified some limited opportunities for non-aviation related facility development at the Airport.

Future threats to PBIA include competition from other airports, particularly Miami International Airport (MIA) and Ft. Lauderdale-Hollywood International Airport (FLL) to the south and Orlando International Airport (MCO) to the north. Air service commitments from some of its signatory airlines, most of which also maintain a significant operation at FLL, are another major threat to future growth at PBIA and the ability to maximize the air service opportunities previously identified.

In identifying risks, it is important to periodically evaluate factors such as competition, airline fleet commitments, and changes in the airline industry. Competition will likely continue from the three major commercial airports mentioned above: MIA, FLL, and MCO. However, other Florida airports, such as Sarasota-Bradenton International Airport and Southwest Florida International Airport, have aggressive air service marketing plans underway, which may compete with PBIA's plans for attracting new air service. Other airports near the center of the state, such as Melbourne International, Daytona International, and Sanford International Airports, have made significant investments in airfield infrastructure and/or terminal facilities in recent years in order to enhance or attract air service activity. With these improvements now in place, each of these airports will have greater pressures to attract and secure the air service profiles that served as the catalysts for these investments.

A dynamic strategic plan includes a decision tree, which defines the first step and then outlines various options for subsequent steps. The demand levels and types that actually materialize, among other factors, will influence the choice for each subsequent step.

5.1.3 Dynamic Strategic Planning

Dynamic strategic planning views choices as portfolios of risk. Choices differ in their likely benefits as well as in their performance over a range of future demand profiles. The strategic plan, however, is somewhat of an insurance policy in that it builds in flexibility. The plan balances the level of insurance with the extent of the risk. It also commits only to the immediate first-term stage of development. The plan maintains an understanding of the need for flexibility and recognizes that the

best choices, identified with the consideration for long-term flexibility, may sacrifice maximum performance under some circumstances.

5.2 Methodology

Development alternatives for each of the various Airport component, (i.e., airfield, terminal, cargo, and general aviation/FBO) were defined based on the facility requirements established for PAL 2. Specifically, these alternatives were derived for purposes of providing the facility requirements necessary to accommodate the demand levels and types modeled under the Alternate Service Patterns Demand Scenario for the year 2020. A summary of the PAL 2 facility requirements for each of the airport components is presented in **Table V-1**.

Table V-1

PAL 2 Facility Requirements

<u>Airport Component</u>	<u>Existing Capacity</u>	<u>PAL 2 Facility Requirements</u>
Air Carrier Gates	25	40
Commuter Gates	4	4
Gate Frontage	4,982 linear feet	7,232 linear feet
Terminal Facilities	561,348 square feet	1,162,370 square feet
Terminal Curbfront	2,550 linear feet	2,920 linear feet
Belly Cargo Facilities	214,204 square feet	599,400 square feet
All-Cargo Facilities	232,825 square feet	211,600 square feet
General Aviation/FBO Facilities	3,812,520 square feet	4,937,400 square feet
Public Parking Spaces		
Short-Term	1,239 spaces	2,250 spaces
Long-Term	2,814 spaces	5,120 spaces
Park and Ride/Overflow	3,924 spaces	7,410 spaces

Source: Airport Management Records; Ricondo & Associates, Inc.

Development alternatives for each airport component were defined independently. The integration of the various development alternatives into a composite development plan did not occur until the refinement phase, after the preferred alternative for each airport component was identified through a two-step screening and evaluation process.

Some of the alternatives build upon existing facilities and attempt to minimize social, environmental, and financial impacts. However, other alternatives are more radical in their approach in an attempt to maximize the efficient use of the on-airport property. Since the Airport currently possesses vacant developable land parcels, particularly given the recent acquisition of the Town of Golfview, the initial identification of development alternatives focused on future facility schemes within the on-airport property bounded by the current property line. The potential use of adjacent off-airport land parcels that are Airport property were also considered for aviation-support functions (e.g., public parking, employee parking, rental car facilities, etc.) or other non-aviation related uses.

The development alternatives defined for each of the airport components were subjected to a two-step screening and evaluation process. The two-step process sought to confirm each alternative's capability for satisfying the PAL 2 facility requirements and define the impacts caused by the development. The first step, the screening of alternatives, sought to reduce the number of viable and/or desirable alternatives using four factors: operational efficiency/effectiveness;

constructability/physical characteristics; development costs; and environmental and community impacts considerations.

Through the screening process, a set of "short-listed alternatives" emerged. The short-listed alternatives were then rated using a group of evaluation criteria that assessed the strengths and weaknesses of each alternative. The evaluation parameters were quantified to provide a more detailed and objective review of each alternative with greater emphasis on the incremental implementation characteristics, financial feasibility, long-term flexibility, and indirect facility impacts.

The evaluation process served to identify the preferred development alternative for each airport component. These preferred development alternatives were integrated into a Composite Development Plan and refined to maintain the integrity of the varying land uses and maximize the long-term growth opportunities. The other short-listed alternatives represent a portfolio of optional development patterns that provide viable development scenarios given certain conditions. The preferred and short-listed alternatives, and the conditions under which they provide the best development solution for the Airport, are integrated and presented in the decision tree (contained in Section VII of this document).

5.3 DOA Workshop

A workshop was held at PBIA on May 5 and 6, 1999, with staff from various DOA divisions. The workshop was intended to provide a vehicle for the consulting team and airport staff to identify and discuss potential options for long-range airport development in the context of the Strategic Plan. The workshop also served to identify issues associated with certain development actions.

One of the primary goals of the workshop was to ensure that a comprehensive identification of all possible development patterns was accomplished. Concepts or ideas were not judged or evaluated during the workshop. Therefore, the workshop was an open and unencumbered exchange of ideas. The product of the workshop was an assemblage of concepts indicating various ways to develop PBIA's airfield, terminal complex, cargo facilities, and general aviation facilities during the planning horizon.

Throughout the workshop, participants were encouraged to adopt an unconstrained approach for the identification of future development patterns. In other words, land parcels currently designated for specific aviation uses were not excluded from accommodating other functions in the future. Facility requirements identified for PAL 2 provided the basis for identifying gross "footprints" of facilities. The general philosophy of this approach is that if facility development is planned for the higher, less-constrained demand levels, it would be feasible to accommodate lower demand levels within the footprint defined for the overall concept.

5.4 Identification of Development Alternatives

Following the DOA workshop, the facility concepts identified during the two-day workshop were converted into development alternatives. The planning team also developed additional alternatives following the workshop. As previously discussed, unconstrained development patterns were identified for each of PBIA's aviation-related components: airfield, terminal, cargo, and general aviation. Each alternative was subjected to a screening process. During the screening process, alternatives were either eliminated from further consideration or recommended for further evaluation. The integration of the preferred development alternatives (i.e., one for each airport component),

identified through the evaluation process, into a composite plan occurred during the refinement phase.

The following sub-sections describe and present the various development alternatives identified for PBIA.

5.4.1 Airfield Alternatives

The capacity estimates for the existing airfield at PBIA presented in the prior section define the highest number of aircraft operations that the runway system can accommodate during the peak hour of the design day. However, inherent to this definition is the understanding that there is an acceptable level of delay per operation.

An assessment of future airfield development alternatives was performed in order to identify airport property that would either be protected for new runway systems in the mid-to-long term future or facilities that would have to be relocated during this same period in order to vacate land for airfield development.

A total of sixteen airfield development alternatives were identified. Some of the alternatives are conservative in nature and only consider augmenting the existing airfield. Other alternatives are more aggressive and consider the partial or total replacement of the existing airfield. The sixteen airfield alternatives range from the closure of one or more existing runways to the replacement of all three runways with a new airfield layout and configuration.

In general, the airfield alternatives identified can be grouped into five runway configurations or development patterns:

- Runway Extensions/Upgrades
- Parallel Runway Development
- Converging Runway Development
- Primary Runway Orientation
- Hybrids

Runway extension/upgrade alternatives attempt to provide additional capacity solely through the extension and/or upgrade of existing runway systems. In the case of PBIA, this type of airfield improvement results in a significant enhancement to the throughput capacity and operating efficiency of the airfield. Runway 9R-27L is a general aviation runway, and Runway 13-31 is length limited for many commercial aircraft, particularly because of its intersecting configuration with Runway 9L-27R. However, the demand profiles comprising PAL 1 and PAL 2 represent increasing commercial service activity and decreasing general aviation activity by piston and turbine engine aircraft. Therefore, increasing the operating length of the crosswind runway (Runway 13-31) and the general aviation runway to allow for commercial service operations provides a substantial airfield improvement for the Airport.

Parallel runway development alternatives provide additional runway capacity through the development of new runways parallel to either Runway 9L-27R or Runway 13-31. Generally, these alternatives utilize the various rules governing separation requirements between parallel independent and dependent runways to define the alternative and provide additional aircraft processing capacity.

Converging runway alternatives attempt to provide additional capacity through the development of a new runway that is not parallel to any of PBIA's existing runways. The airfield alternatives derived with a converging runway concept often involve the closure of two or more runways and the development of more than one new runway.

Primary runway orientation alternatives include concepts that develop a new set of parallel runways in a direction different from the existing runways. Alternatives in this category developed for PBIA typically improve runway capacity through the development of a new parallel runway system.

Hybrid alternatives are those that consider a combination of two or more of the airfield configuration concepts described above. The airfield alternatives identified for PBIA are shown and described in **Exhibits V-1 through V-16**. Although many of the alternatives were discarded during the screening process, the collection of the sixteen airfield alternatives represent the wide spectrum of airfield development patterns that exist given an unrestricted and unconstrained environment. The various alternatives include options to increase airfield capacity and/or processing efficiency, options to enhance the terminal development area, and options to maximize overall airport development opportunities.

The runway development alternatives are relevant for facility planning since the airfield systems determine, in part, the number of aircraft operations that must be supported by the terminal complex and other airport facilities. Ultimately, the airfield configuration and its capacity will also determine the maximum level of aviation activity that can be processed at PBIA and the associated financial capability to support capital projects.

5.4.2 Terminal Building Alternatives

Seventeen terminal building alternatives were identified to satisfy the demand associated with PAL 2. Some of these alternatives included multiple configuration schemes. Similar to the approach utilized to identify PBIA's airfield alternatives, an unconstrained and unrestricted methodology was adopted for the identification of terminal building development opportunities. While some of the alternatives considered an expansion of the existing terminal complex, other alternatives assume the construction of future satellite terminals to supplement the existing terminal building. Some alternatives also considered the replacement of the existing terminal facilities with a new terminal building and concourses.

The more conservative terminal building expansion alternatives consider the replacement of Concourse A, the commuter concourse, with a new pier concourse having loading bridge-equipped gates similar to Concourses B and C. Others consider the expansion of the terminal building to the east, with a new air carrier concourse parallel to Concourse C. Most of these alternatives include the expansion of the Concourse B and Concourse C ends in order to provide an incremental gate capacity gain in the short-term future horizon. Depending on the design aircraft selected for these concourse expansions, an incremental gain of two to four gates is projected. As an alternate consideration to the expansion of Concourses B and C, the linear extension of both of these concourses was also depicted under some of the development alternatives.

More aggressive terminal building development alternatives include unit terminal facilities in the newly acquired Town of Golfview property or at other locations within the Airport's property boundaries. These unit terminals would link with the existing terminal building through an automated people mover/transport system.

Description of Alternative A-1:

1. Runways 9L-27R, 9R-27L, & 13-31 to remain operational



Legend: Existing runway to remain
 Existing buildings

Sources : PBIA Airport Layout Plan
 Prepared By : Ricordo & Associates, Inc.



PBIA STRATEGIC PLAN EXHIBIT V-1.dwg
 Strategic Master Plan Study

Exhibit V-1

No Changes to Existing Facility Alternative A-1

October 2000

Description of Alternative A-2:-

1. Close Runway 9R-27L
2. Runways 8L-22R & 13-31 to remain operational.



Source : PBIA Airport Layout Plan
Prepared By : Ricordia & Associates, Inc.

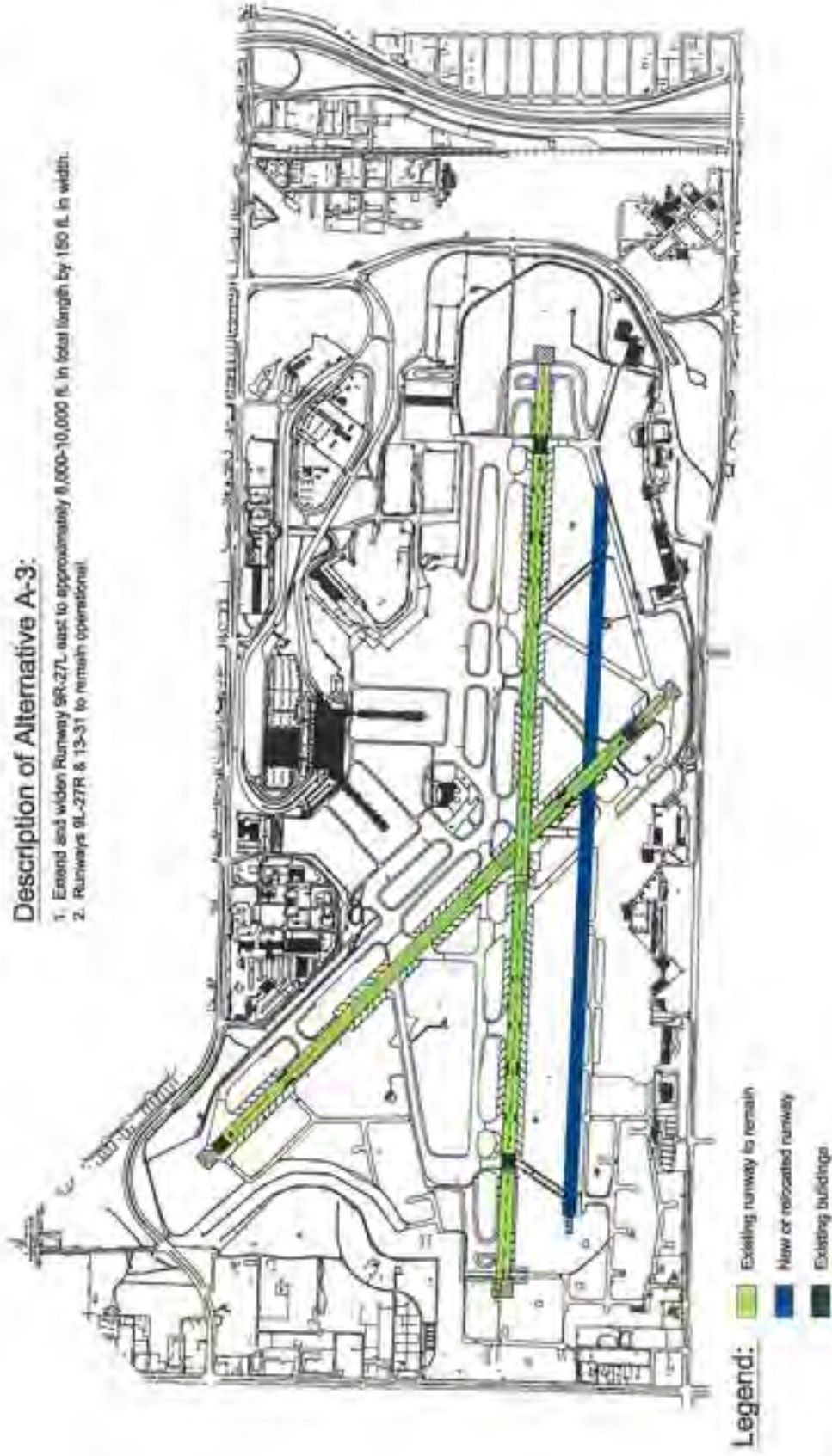
Exhibit V-2

**Airfield Development
Alternative A-2**

October 2000

Description of Alternative A-3:

1. Extend and widen Runway 9R-27L east to approximately 8,000-10,000 ft. in total length by 150 ft. in width.
2. Runways 8L-27R & 13-31 to remain operational.



Legend:

- █ Existing runway to remain
- █ New or relocated runway
- █ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1,000 ft. north

PBIA STRATEGIC PLAN Exhibit V-3.0wg
Strategic Master Plan Study

Exhibit V-3

Airfield Development Alternative A-3

October 2000

Description of Alternative A-4:

1. Close Runway 9L-27R
2. Extend Runway 13-31 north to approximately 8,400 ft. in total length for a threshold to intersection distance of 6,200 ft.
3. Runways 9L-27R & 13-31 to remain operational.



Legend:

- Existing runway to remain
- New or relocated runway
- Existing runway to be abandoned
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricondo & Associates, Inc.

0 1800 ft. ↑ north

PBIA/STRATEGIC PLAN/EXHIBIT V-4.dwg
Strategic Master Plan Study

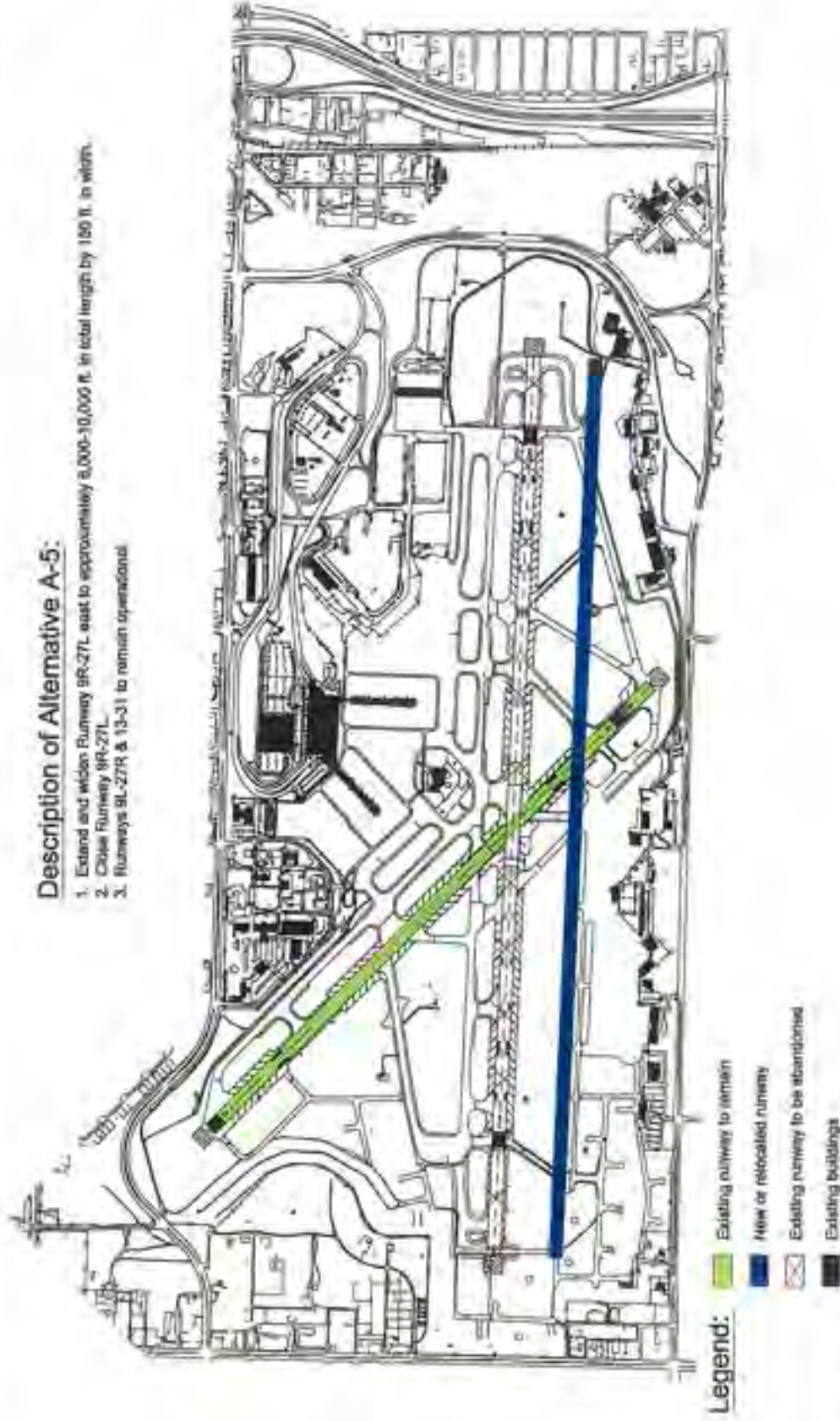
Exhibit V-4

**Airfield Development
Alternative A-4**

October 2000

Description of Alternative A-5:

1. Extend and widen Runway 9R-27L east to approximately 9,000-10,000 ft. in total length by 150 ft. in width.
2. Close Runway 9R-27L.
3. Runways 9L-27R & 13-31 to remain operational.



Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

1500 ft. north

PBIA/STRATEGIC PLAN/EXHIBIT V-5.dwg
Strategic Master Plan Study

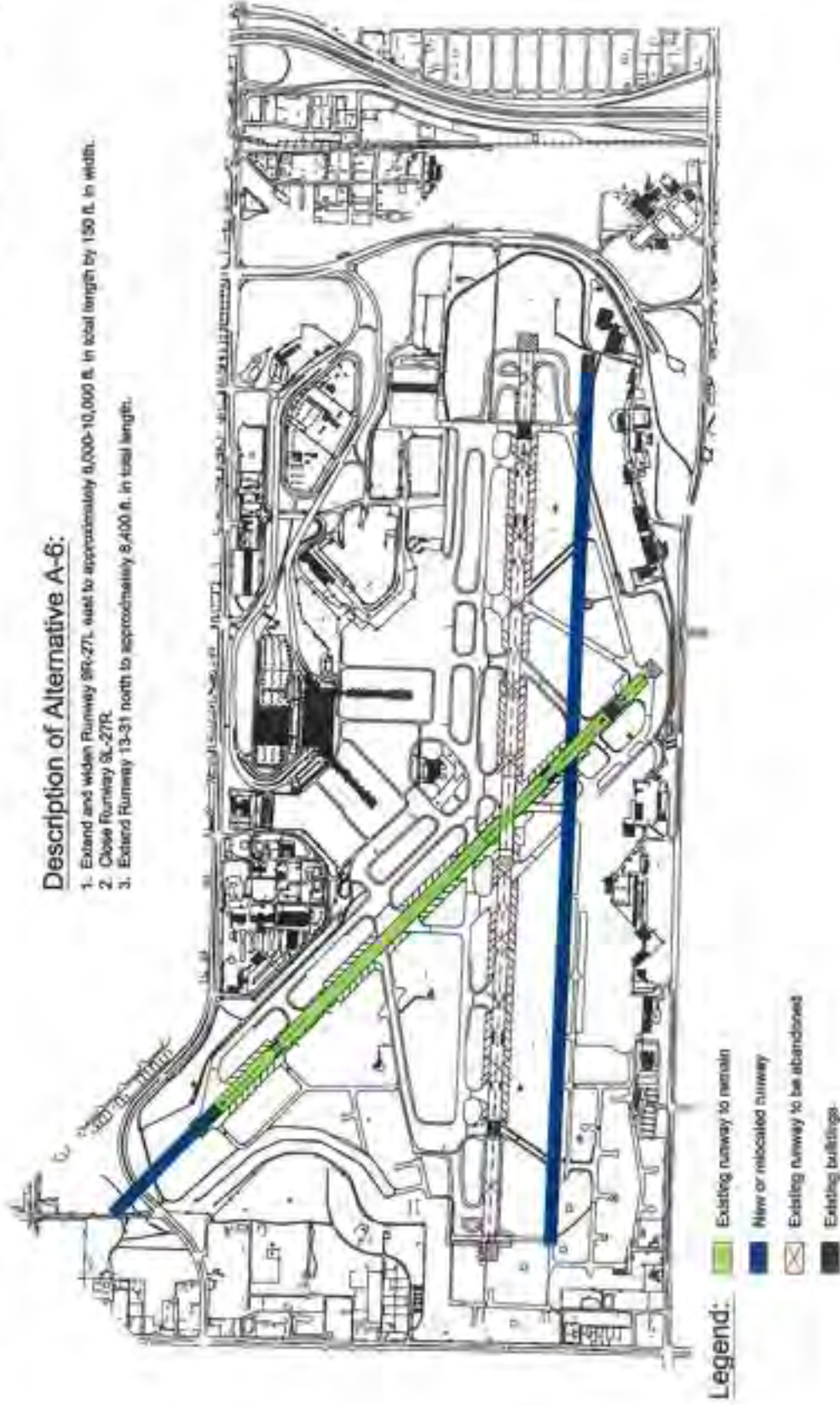
Exhibit V-5

**Airfield Development
Alternative A-5**

October 2000

Description of Alternative A-6:

1. Extend and widen Runway 9R-27L east to approximately 8,000-10,000 ft. in total length by 150 ft. in width.
2. Close Runway 8L-27R.
3. Extend Runway 13-31 north to approximately 8,400 ft. in total length.



Legend:

- Existing runway to remain
- New or relocated runway
- Existing runway to be abandoned
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricondo & Associates, Inc.

0 1800 ft. ↑ north

PBIASTRATEGIC PLANExhibit V-8.dwg
Strategic Master Plan Study

Exhibit V-6

Airfield Development Alternative A-6

October 2000

Description of Alternative A-7:

1. Close Runway 8R-27L
2. Relocate Runway 8L-27R south approximately 1,000 ft. and maintain length of 10,000 ft.
3. Runway 13-31 to remain operational.



- Legend:**
- Existing runway to remain
 - New or relocated runway
 - Existing runway to be abandoned
 - Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



P-BIA STRATEGIC PLAN/EXHIBIT V-7.dwg

Strategic Master Plan Study

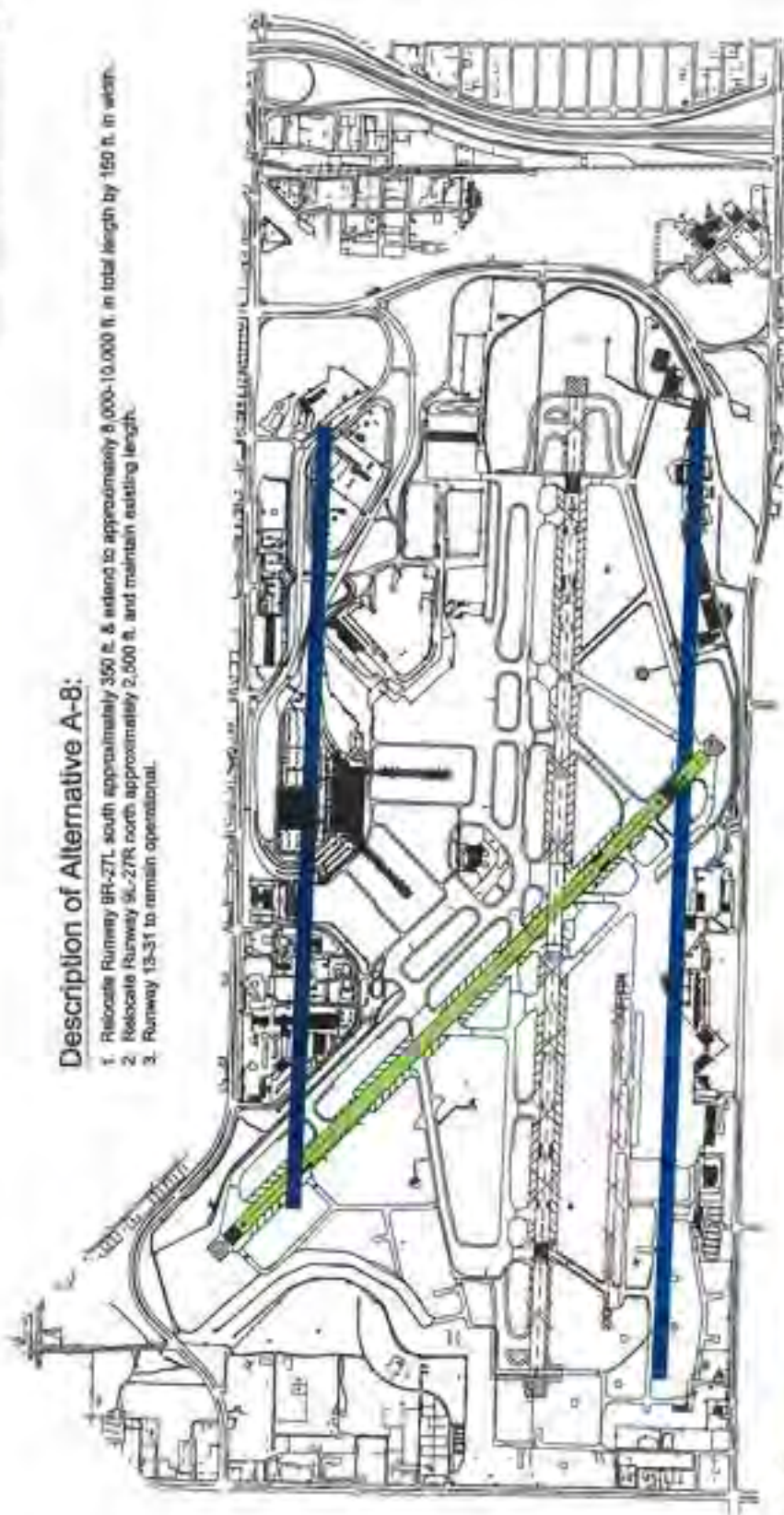
Exhibit V-7

**Airfield Development Concept
Alternative A-7**

October 2000

Description of Alternative A-8:

1. Relocate Runway 9R-27L south approximately 350 ft. & extend to approximately 8,000-10,000 ft. in total length by 150 ft. in width.
2. Relocate Runway 9L-27R north approximately 2,500 ft. and maintain existing length.
3. Runway 13-31 to remain operational.



Legend:

- █ Existing runway to remain
- █ New or relocated runway
- Existing runway to be abandoned
- █ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBIA\Strategic Plan\Exhibit V-8.dwg
Strategic Master Plan Study

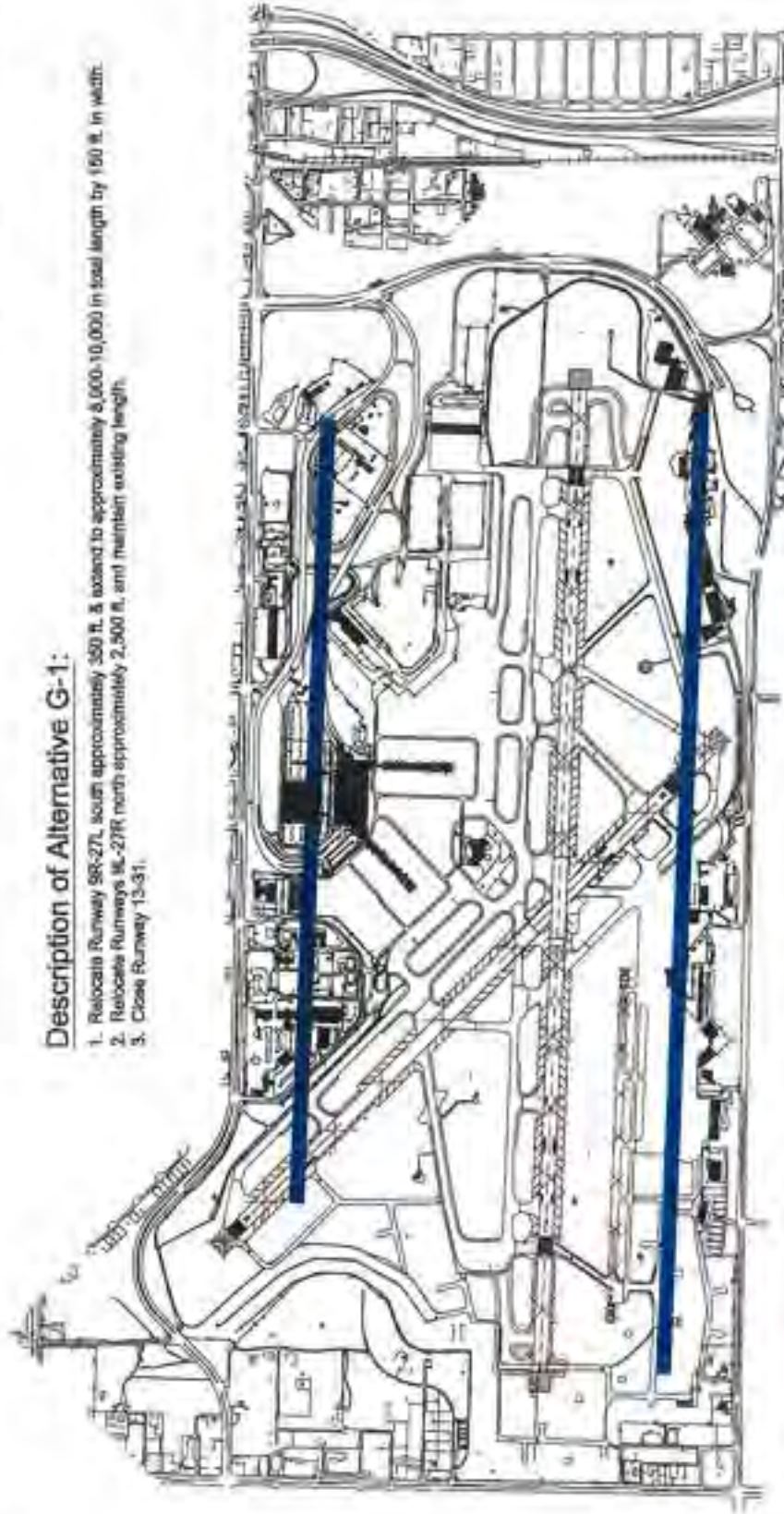
Exhibit V-8

Airfield Development Alternative A-8

October 2000

Description of Alternative G-1:

1. Relocate Runway 9R-27L, south approximately 350 ft. & extend to approximately 8,000-10,000 ft. in total length by 150 ft. in width.
2. Relocate Runways 18L-27R north approximately 2,500 ft. and maintain existing length.
3. Close Runway 13-31.



Legend:

- New or relocated runway
- Existing runway to be abandoned
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricardo & Associates, Inc.



PBIA Strategic Plan Exhibit V-9.dwg
Strategic Master Plan Study

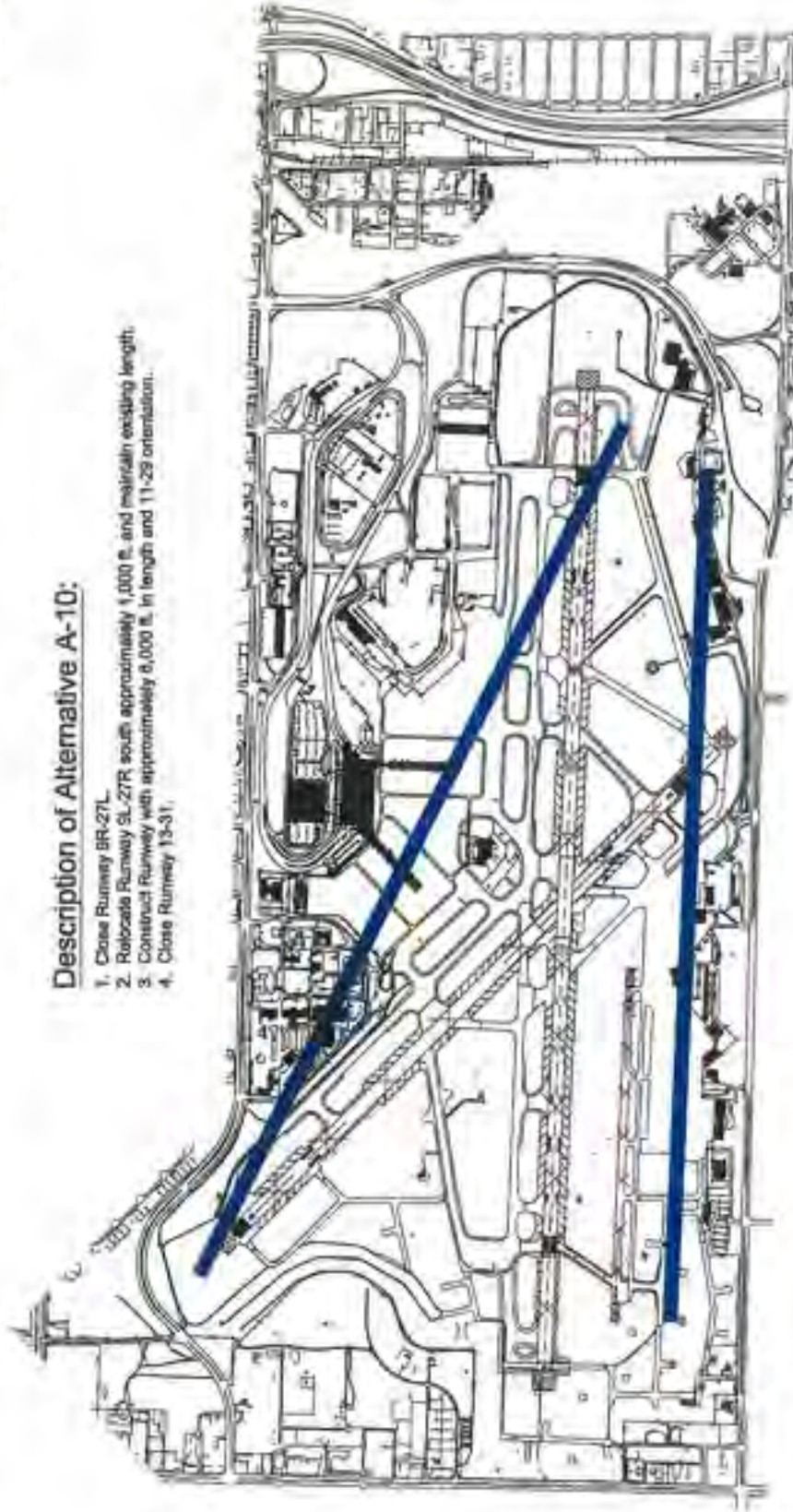
Exhibit V-9

Airfield Development Alternative A-9

October 2000

Description of Alternative A-10:

1. Close Runway BR-27L
2. Relocate Runway SL-27R south approximately 1,000 ft. and maintain existing length.
3. Construct Runway with approximately 8,000 ft. in length and 11-29 orientation.
4. Close Runway 13-31.



- Legend:**
- New or relocated runway
 - Existing runway to be abandoned
 - Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBIASTRATEGIC PLAN-0801_V-10.dwg
Strategic Master Plan Study

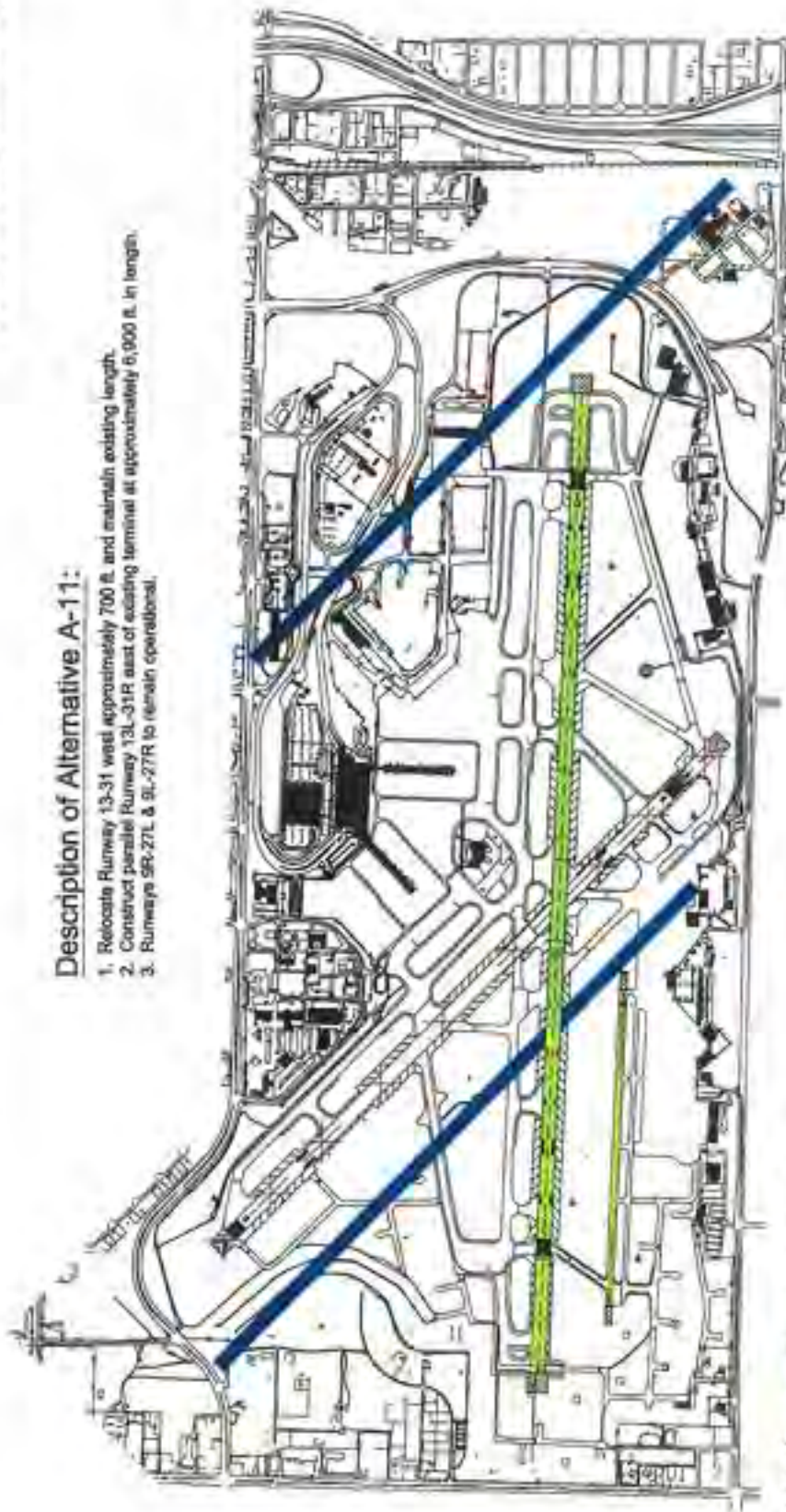
Exhibit V-10

Airfield Development Alternative A-10

October 2000

Description of Alternative A-11:

1. Relocate Runway 13-31 west approximately 700 ft. and maintain existing length.
2. Construct parallel Runway 13L-31R east of existing terminal at approximately 6,900 ft. in length.
3. Runways 5R-27L & 9L-27R to remain operational.



Legend:

- Existing runway to remain
- New or relocated runway
- Existing runway to be abandoned
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricardo & Associates, Inc.



PBIA STRATEGIC PLANNING V-11.dwg
Strategic Master Plan Study

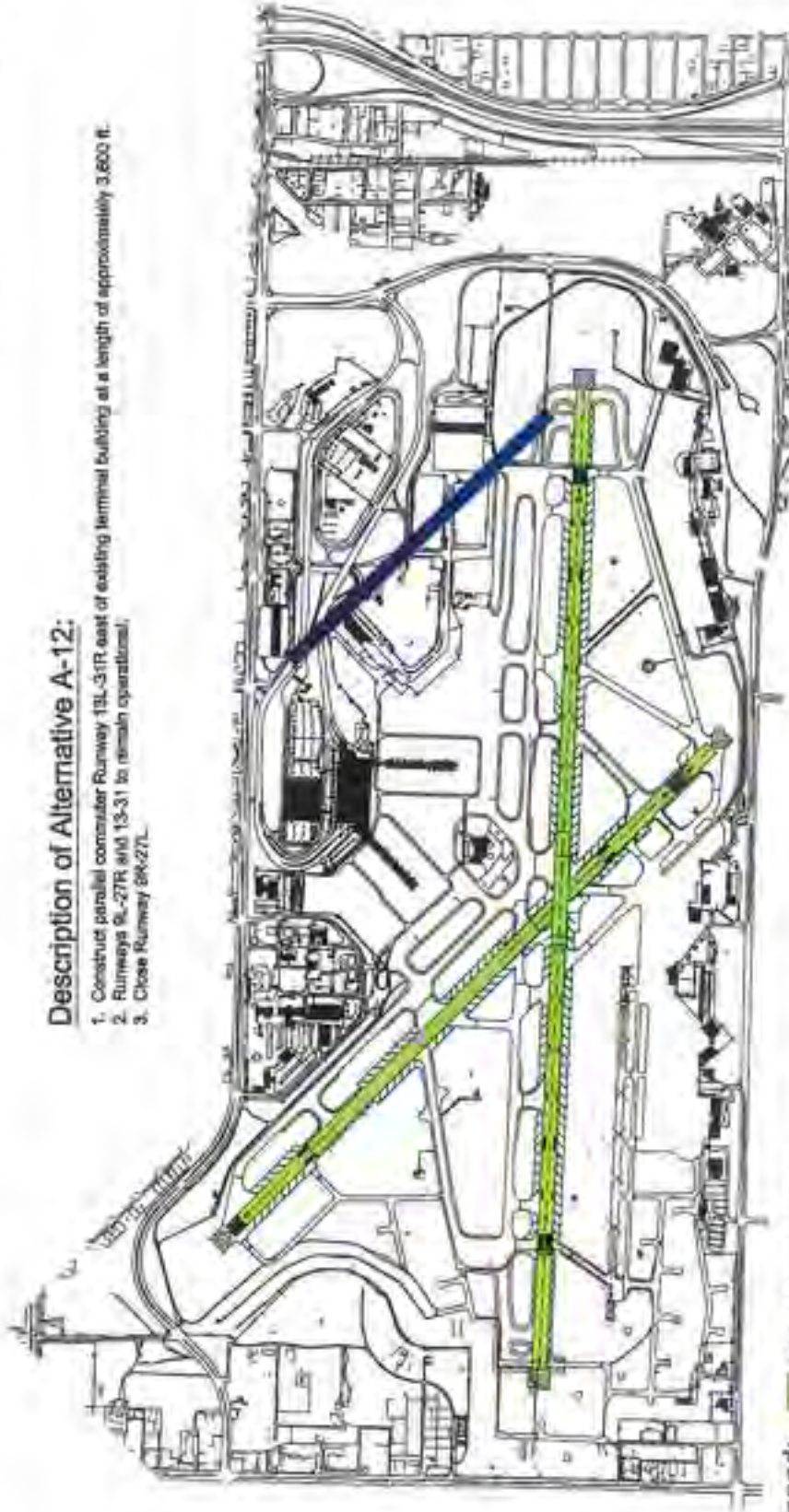
Exhibit V-11

Airfield Development Alternative A-11

October 2000

Description of Alternative A-12:

1. Construct parallel connector Runway 13L-31R east of existing terminal building at a length of approximately 3,600 ft.
2. Runways 9L-27R and 13-31 to remain operational.
3. Close Runway 8R-27L.



Legend:

- Existing runway to remain
- New or relocated runway
- Existing runway to be abandoned
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBIA/Strategic Plan/Concepts/Exhibit_V-12.dwg
Strategic Master Plan Study

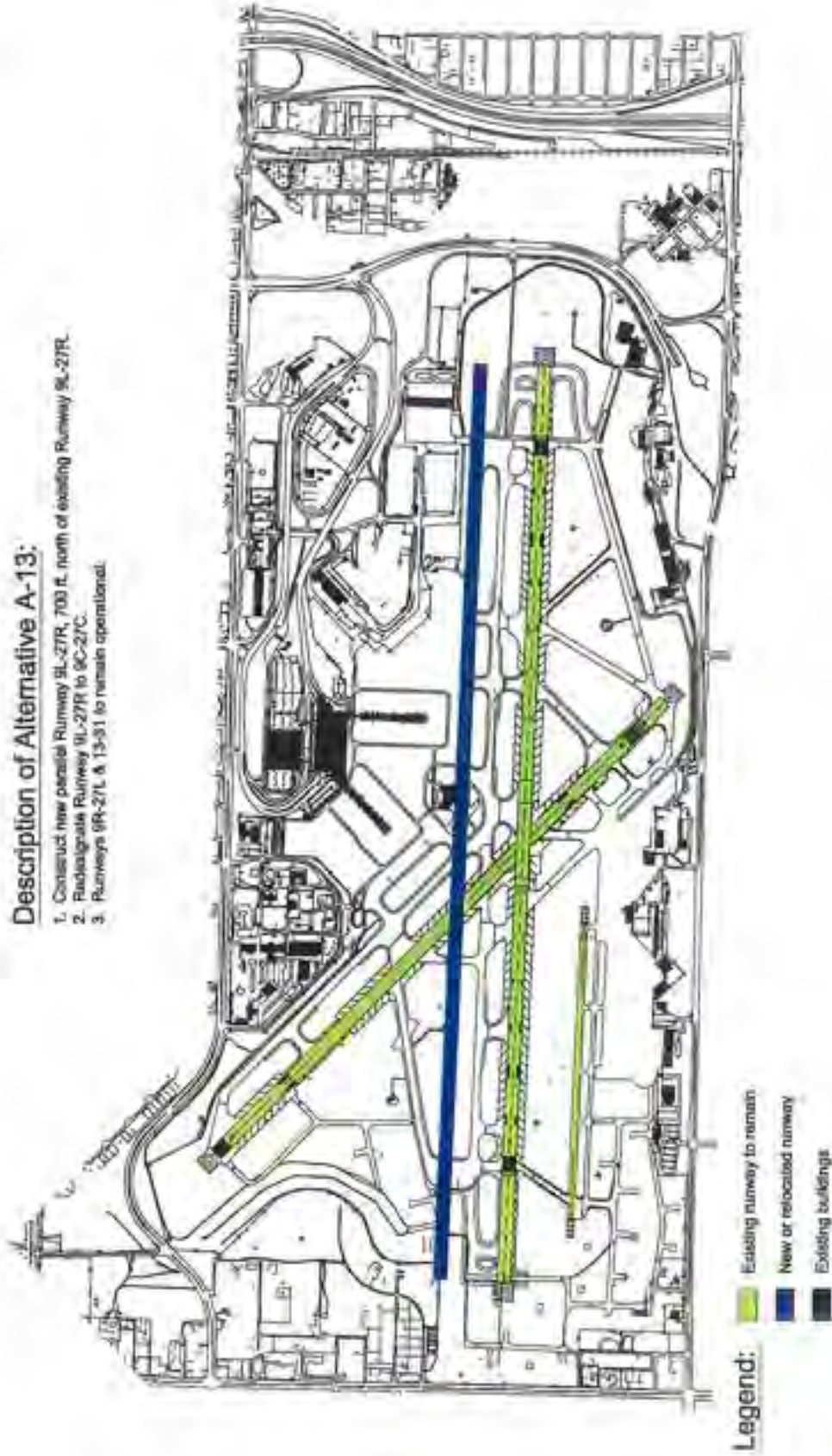
Exhibit V-12

Airfield Development Alternative A-12

October 2000

Description of Alternative A-13:

1. Construct new parallel Runway 9L-27R, 700 ft. north of existing Runway 9L-27R.
2. Realign Runway 9L-27R to 9C-27C.
3. Runways 9R-27L & 13-31 to remain operational.



Legend:

Existing runway to remain

New or relocated runway

Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1500 ft north

PBIA Strategic Plan Exhibit V-13.dwg
Strategic Master Plan Study

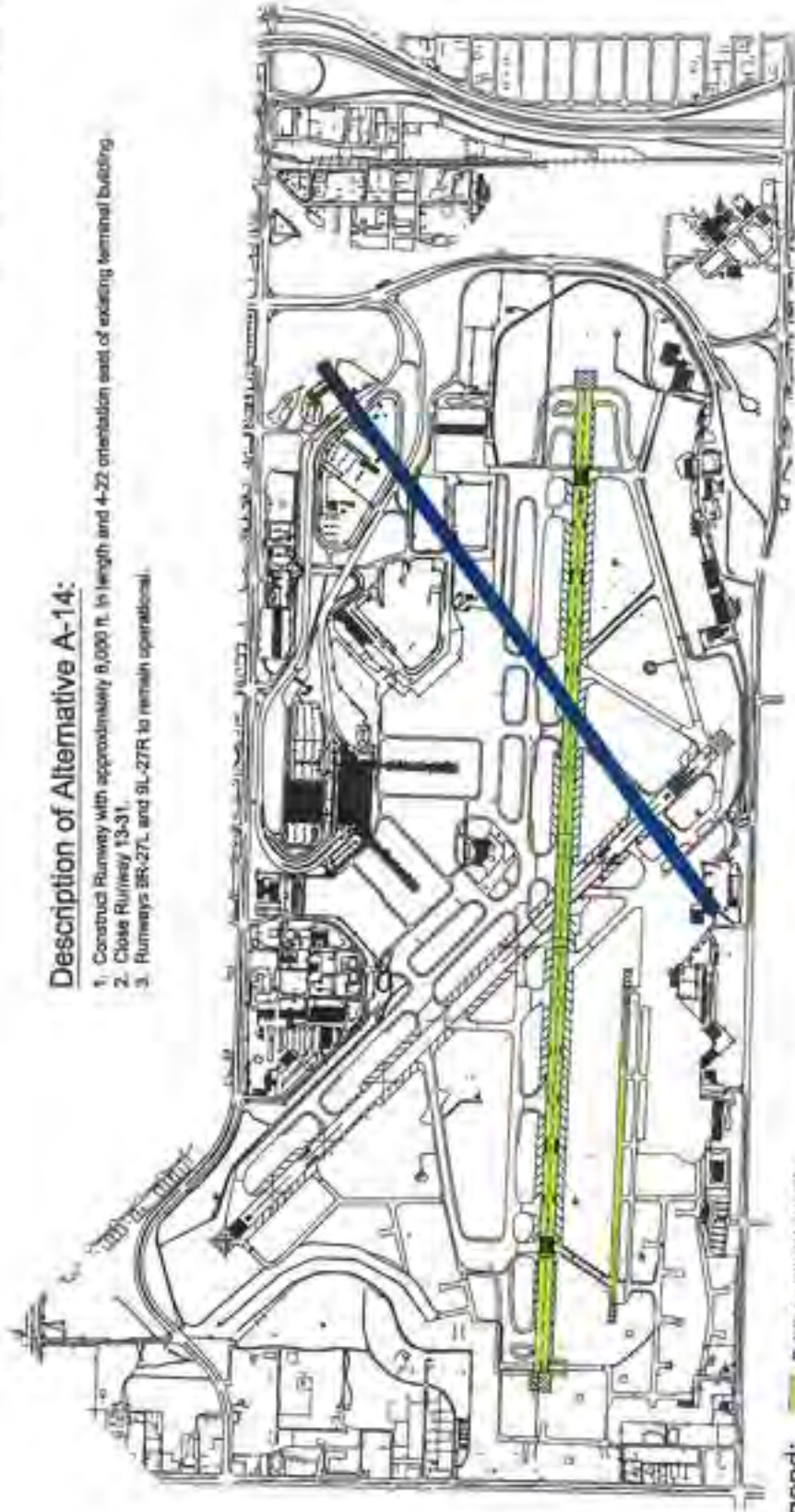
Exhibit V-13

**Airfield Development
Alternative A-13**

October 2000

Description of Alternative A-14:

1. Construct Runway with approximately 8,000 ft. in length and 4-22 orientation east of existing terminal building.
2. Close Runways 13-31.
3. Runways 5R-27L and 9L-27R to remain operational.



Source : PBIA Airport Layout Plan
 Prepared By : Rbondo & Associates, Inc.



PRIMA STRATEGIC PLAN Exhibit V-14.dwg
 Strategic Master Plan Study

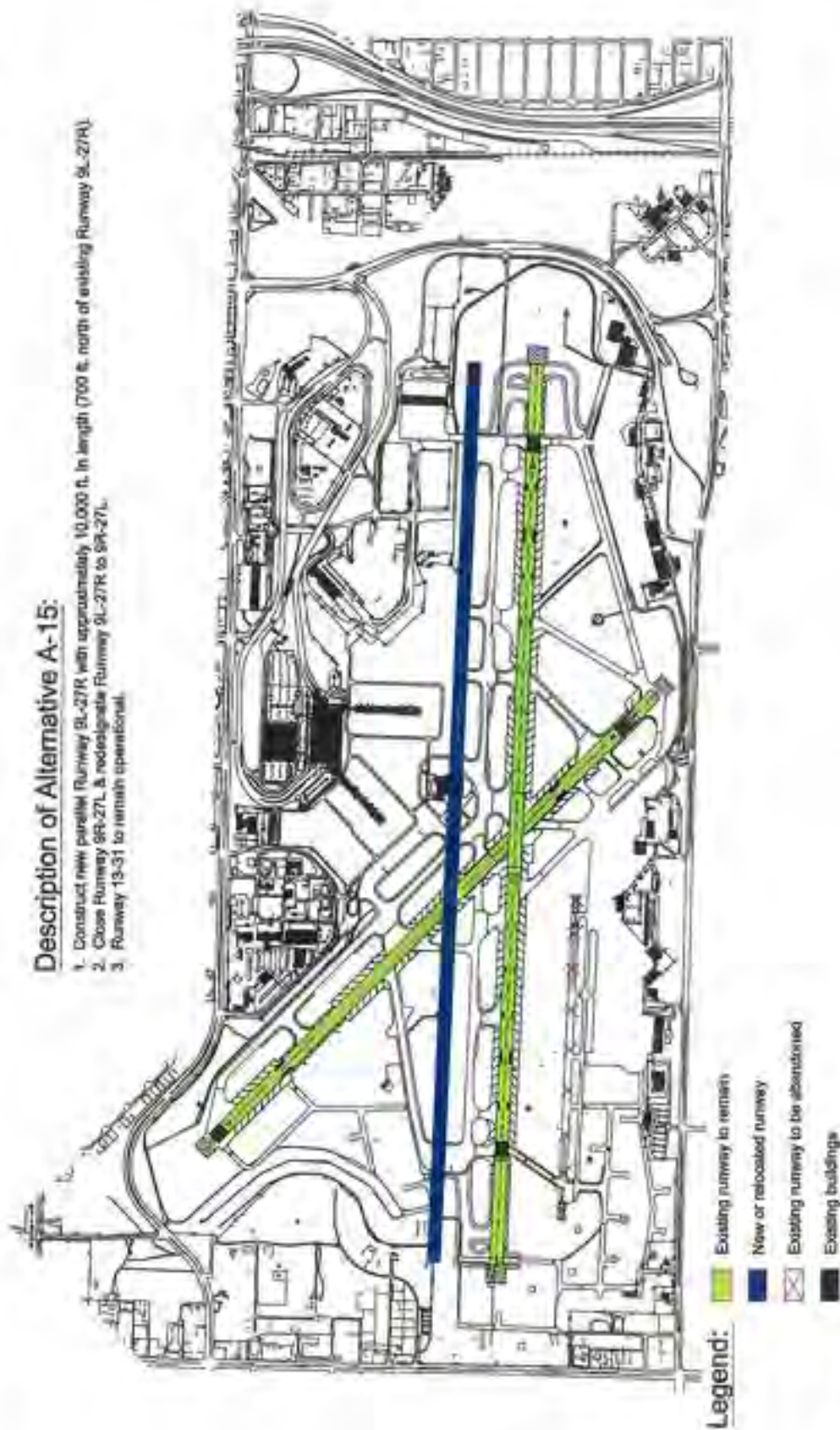
Exhibit V-14

Airfield Development Alternative A-14

October 2000

Description of Alternative A-15:

1. Construct new parallel Runway 9L-27R with approximately 10,000 ft. in length (700 ft. north of existing Runway 9L-27R).
2. Close Runway 9R-27L & redesignate Runway 9L-27R to 9R-27L.
3. Runway 13-31 to remain operational.



Legend:

- █ Existing runway to remain
- █ New or relocated runway
- X Existing runway to be abandoned
- █ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1600 ft. north

PBIA/Strategic Plan/Exhibit V-15.dwg
Strategic Master Plan Study

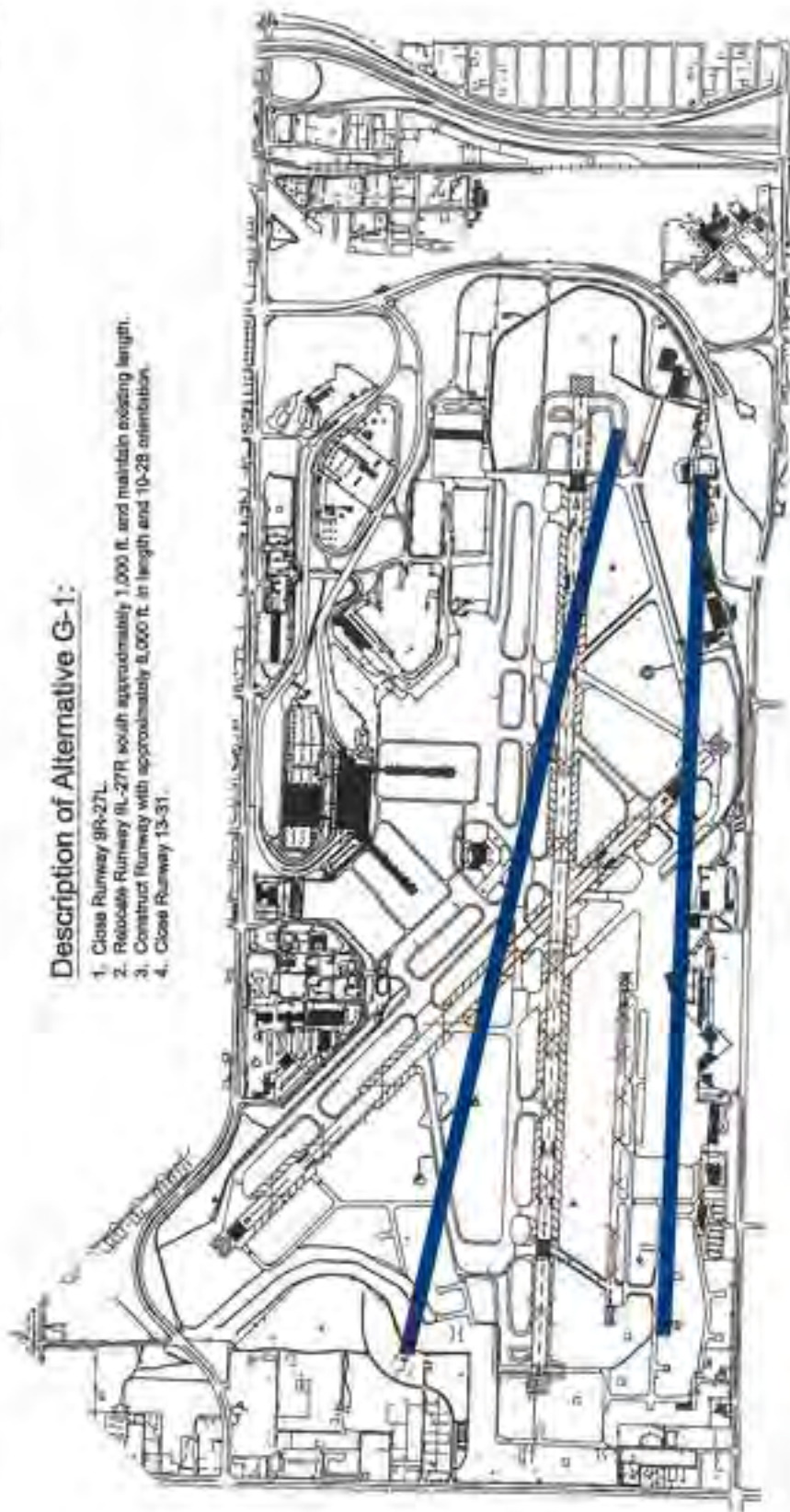
Exhibit V-15

**Airfield Development
Alternative A-15**

October 2000

Description of Alternative G-1:

1. Close Runway 9R-27L.
2. Relocate Runway 9L-27R south approximately 1,000 ft. and maintain existing length.
3. Construct Runway with approximately 8,000 ft. in length and 10-28 orientation.
4. Close Runway 13-31.



Legend:

- New or relocated runway
- Existing runway to be abandoned
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Riconda & Associates, Inc.



PBIA Strategic Plan/Exhibit V-15.dwg
Strategic Master Plan Study

Exhibit V-16

**Airfield Development
Alternative A-16**

October 2000

Other alternatives consider a new replacement terminal at or near the locations proposed for the unit terminals. In addition, one alternative depicts the construction of a new replacement terminal building north of Belvedere Road, on the property presently occupied by the Kennel Club, with pier concourses located south of Belvedere Road in the area that currently comprises the terminal area. Overhead pedestrian bridges and/or underground tunnels would link the proposed terminal with the concourses.

Like the airfield development alternatives previously presented, the terminal schemes identified for PBIA represent diverse development patterns for the terminal facilities that can be conceptualized given an unconstrained planning approach. Each terminal building alternative possesses greater compatibility to one or more of the airfield development alternatives identified for the Airport. During the screening process, several of the terminal building alternatives were discarded, since they were not compatible with any of the short-listed airfield development alternatives.

Exhibits V-17 through V-41 depict and describe the terminal building alternatives identified for PBIA. A no-action alternative was not considered for the Airport, since the capacity offered by the existing terminal building is not sufficient for satisfying the demand levels associated with PAL 2.

5.4.3 Cargo Facility Alternatives

PBIA's cargo activity is presently accommodated in one of two facilities at the Airport. Building 1301, the Air Freight Building, is a landside facility located on the north side of the Airport, off of Belvedere Road. Many of the airlines transporting belly cargo into PBIA, such as Delta Airlines, American Airlines, and US Airways, are located within this building. A few freight forwarding companies are also located within Building 1301. The age of this facility supports the needed refurbishment to various building components including the roof system and truck dock facilities.

The all-cargo (freight) tonnage is handled in Building 1475, a new facility constructed in 1996, which offers airside and landside access. The building also possesses an adjacent aircraft parking apron capable of accommodating up to three Boeing 757 aircraft simultaneously. Presently, the United Parcel Service (UPS) and the United States Postal Service (USPS) lease space within this new facility. Although much of the building remains vacant for new entrant cargo handlers/operators, UPS occupies and operates most of the aircraft parking apron.

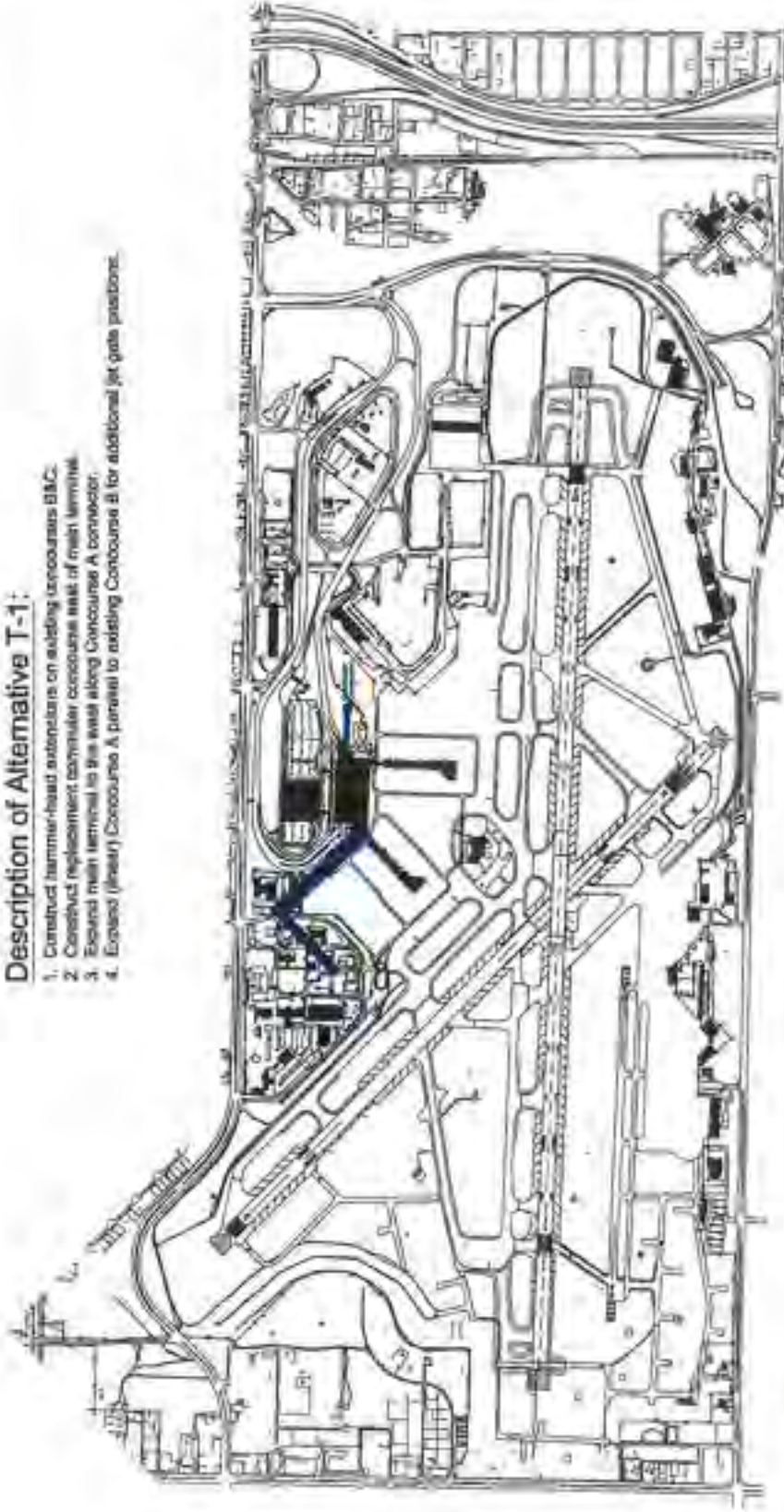
Since it is anticipated that the replacement of Building 1301 will be required during the planning horizon, the identification of cargo facility alternatives includes satisfying the space requirements necessary for accommodating future cargo demand and the cargo activities presently served in the Air Freight building. As such, the cargo facility alternatives identified provide for a consolidation of air cargo, belly cargo, and freight forwarding functions into one primary area in the Airport.

A total of eight development alternatives were identified for PBIA's cargo facilities. The more conservative development alternatives consider the continuation of cargo facility development east of Building 1475 or west of the new air cargo building, as proposed under the Cargo Technical Report completed as part of the Landside Master Plan in 1993. Other alternatives include future cargo facility development in the following sites:

- along the south side of the Airport, adjacent to, and directly west of, the 391st Bomb Squadron Restaurant

Description of Alternative T-1:

1. Construct hammer-head extensions on existing concourses B&C;
2. Construct replacement terminal concourse west of main terminal;
3. Expand main terminal to the east along Concourse A connector;
4. Expand (linear) Concourse A parallel to existing Concourse B for additional jet gate positions.



Legend:

- New or relocated terminal building / concourses
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1000 ft. north

PBIA STRATEGIC PLAN/Exhibit V-17.dwg
Strategic Master Planning Study

Exhibit V-17

**Terminal Development
Alternative T-1**

October 2000

Description of Alternative T-2A:

1. Construct hammer-head extensions on existing concourses (B&C).
2. Expand main terminal to the east.
3. Construct (linear) Concourse D parallel to and east of existing Concourse C.



Legend: ■ New or relocated terminal building / concourses

■ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1000 ft. north

PBIA/Strategic Plan/Eval. V-18.dwg
Strategic Master Planning Study

Exhibit V-18

Terminal Development Alternative T-2A

October 2000

Description of Alternative T-2B:

1. Construct hammer-head extensions on existing concourses B.
2. Extend Concourse C approximately 1000 ft. to the south.
3. Expand main terminal to the east.
4. Construct (near) Concourse D parallel to and east of existing Concourse C.



Legend: ■ New or relocated terminal building / concourses

■ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1000 ft. north

PBIA/Strategic-Plan/Exhibit_V-13.dwg
Strategic Master Planning Study

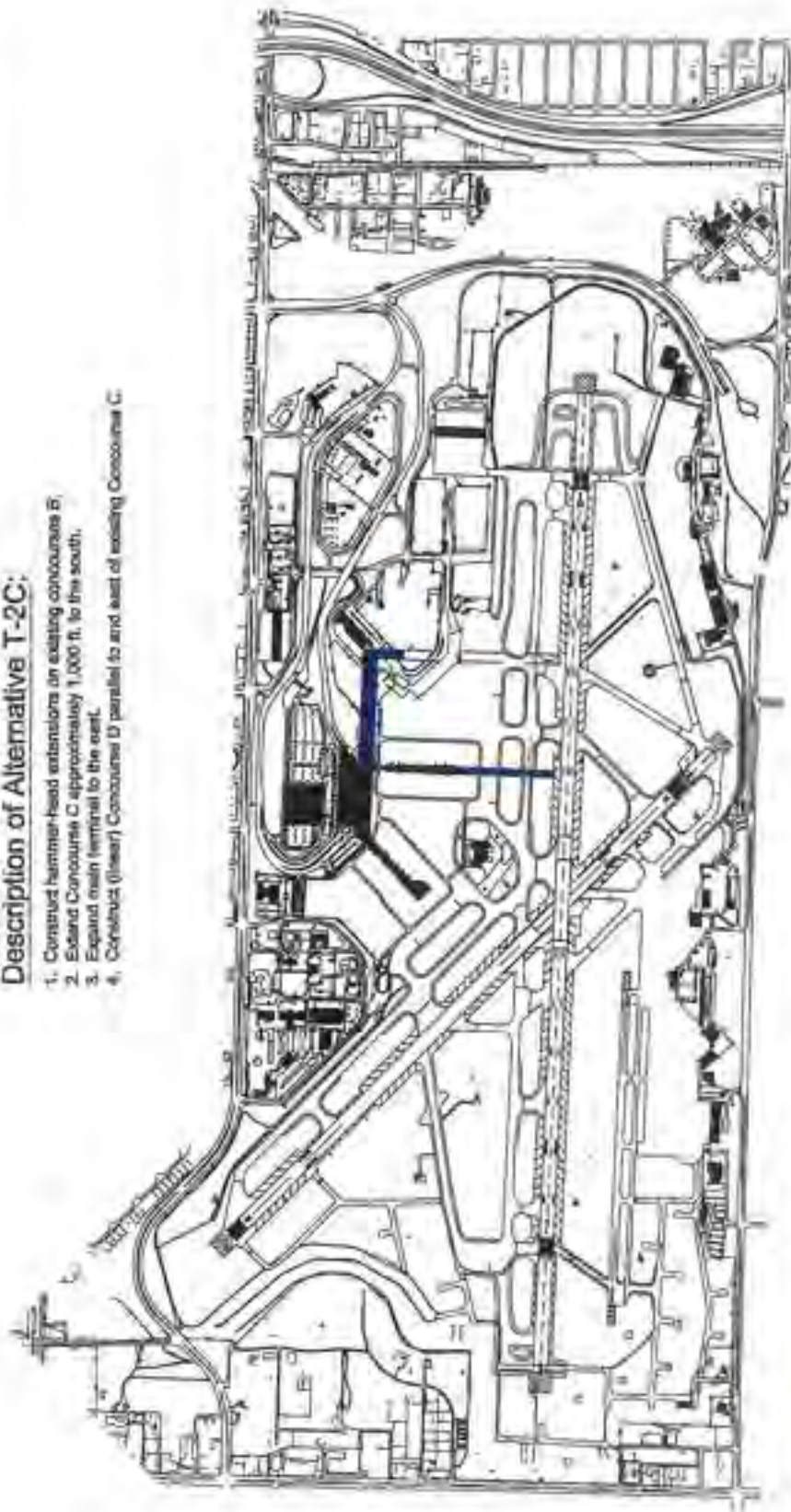
Exhibit V-19

Terminal Development Alternative T-2B

October 2000

Description of Alternative T-2C:

1. Construct hammer-head extensions on existing concourses B,
2. Extend Concourse C approximately 1,000 ft. to the south,
3. Expand main terminal to the east,
4. Construct (linear) Concourse D parallel to and east of existing Concourse C.



Legend: ■ New or relocated terminal building / concourses
 ■ Existing buildings

Source : PBIA Airport Layout Plan
 Prepared By : Ricardo & Associates, Inc.

0 1,500 ft. north

PBIA/Strategic Plan Exhibit V-30.dwg
 Strategic Master Planning Study

Exhibit V-20

Terminal Development Alternative T-2C

October 2000

Description of Alternative T-3A:

1. Construct hammer-head extension on existing concourse C.
2. Extend Concourse C approximately 1,000 ft. to the south.
3. Expand main terminal to the east.
4. Construct (linear) Concourse D parallel to existing Concourse C.



Legend: New or relocated terminal building / concourses

Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Riccardo & Associates, Inc.



PBIA STRATEGIC PLANNING V-21.dwg
Strategic Master Planning Study

Exhibit V-21

Terminal Development Alternative T-3A

October 2000

Description of Alternative T-3B:

1. Construct hammer-head extensions on existing concourse C.
2. Extend Concourse B approximately 500 ft. to the southwest with enlarged hammer-head.
3. Expand main terminal to the east.
4. Construct (linear) Concourse D parallel to and east of existing Concourse C.



Legend: ■ New or relocated terminal building / concourse

■ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ribondo & Associates, Inc.



PBIASTRATEGIC_PLANS-Exhibit V-22.dwg
Strategic Master Planning Study

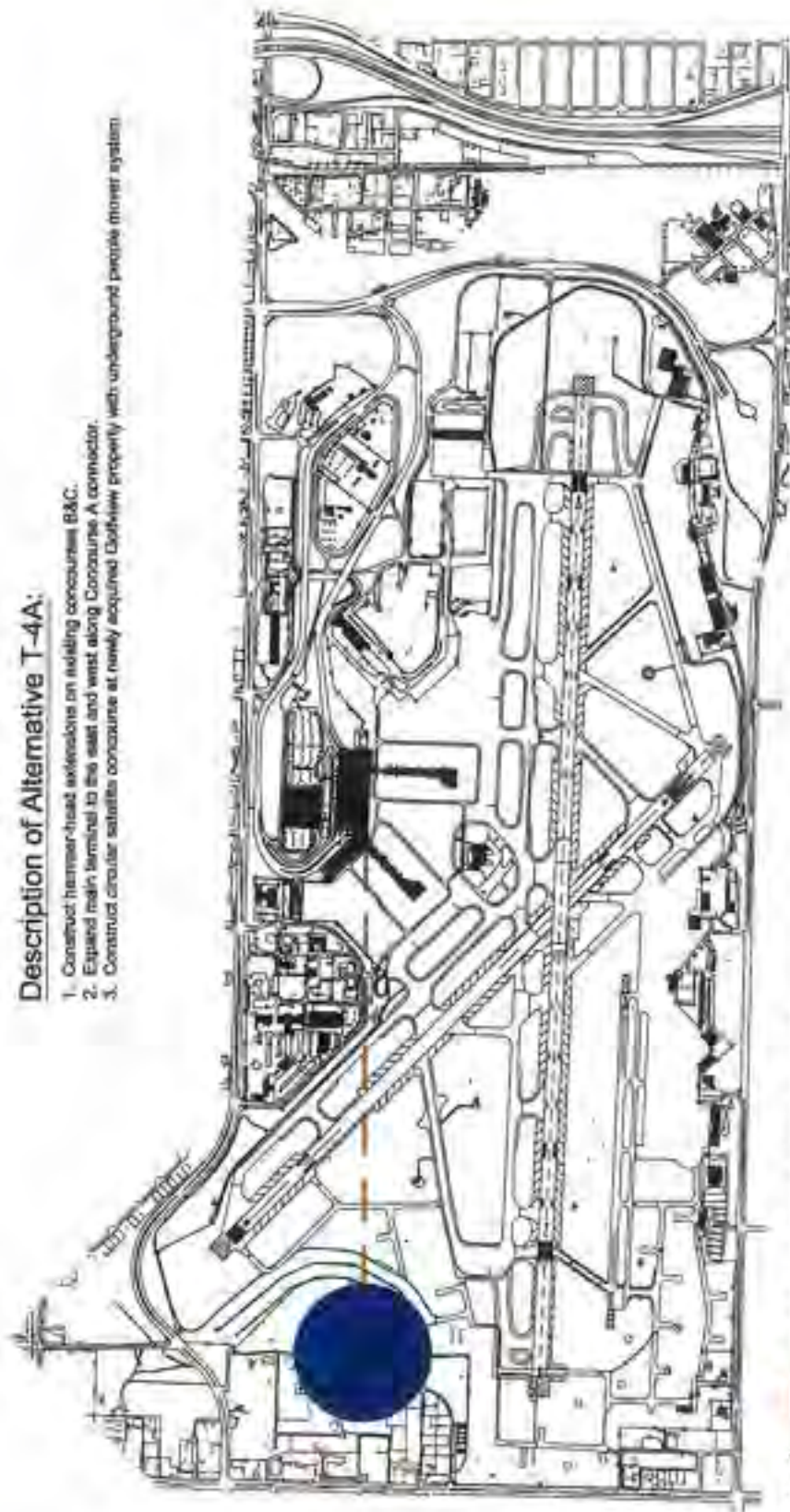
Exhibit V-22

Terminal Development Alternative T-3B

October 2000

Description of Alternative T-4A:

1. Construct hemispherical extensions on existing concourses B&C.
2. Expand main terminal to the east and west along Concourse A connector.
3. Construct circular satellite concourse at newly acquired Doleway property with underground people mover system.



Legend:

- New or relocated terminal building / concourse
- Existing buildings
- People mover

Source : PSIA Airport Layout Plan
Prepared By : Ricondo & Associates, Inc.

0 1000 ft. north

PSIA Strategic Plan/Concepts/Exhibit V-23.dwg
Strategic Master Planning Study

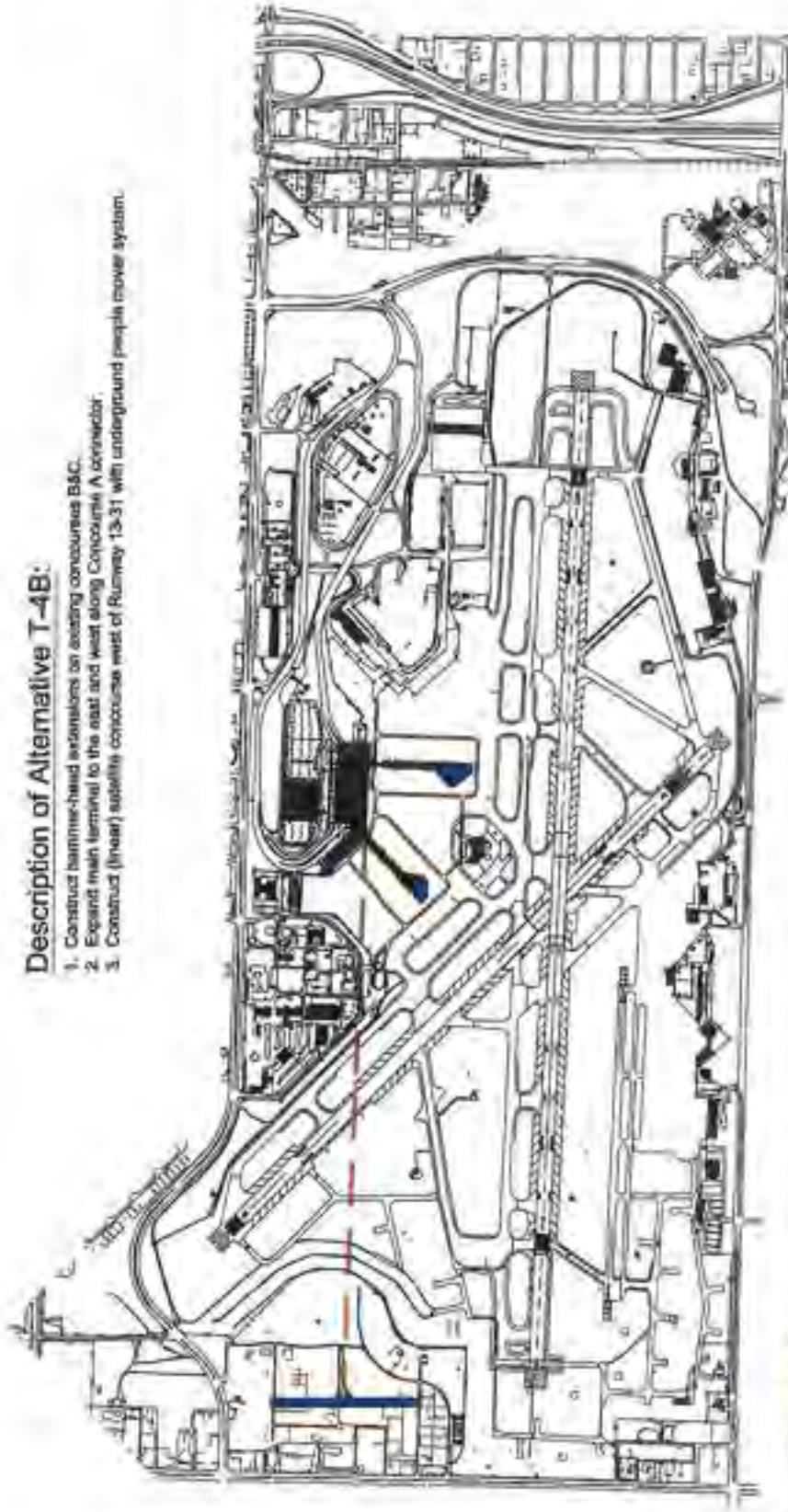
Exhibit V-23

Terminal Development Alternative T-4A

October 2000

Description of Alternative T-4B:

1. Construct hairpin-head extensions on existing concourses B&C.
2. Expand main terminal to the east and west along Concourse A connector.
3. Construct (linear) satellite concourse west of Runway 13-31 with underground people mover system.



Legend:

- New or relocated terminal building / concourse
- Existing buildings
- People mover

Source: PBIA Airport Layout Plan
Prepared By: Ricordo & Associates, Inc.



PBIASTRATEGIC_PLANNING_V-24.dwg
Strategic Master Planning Study

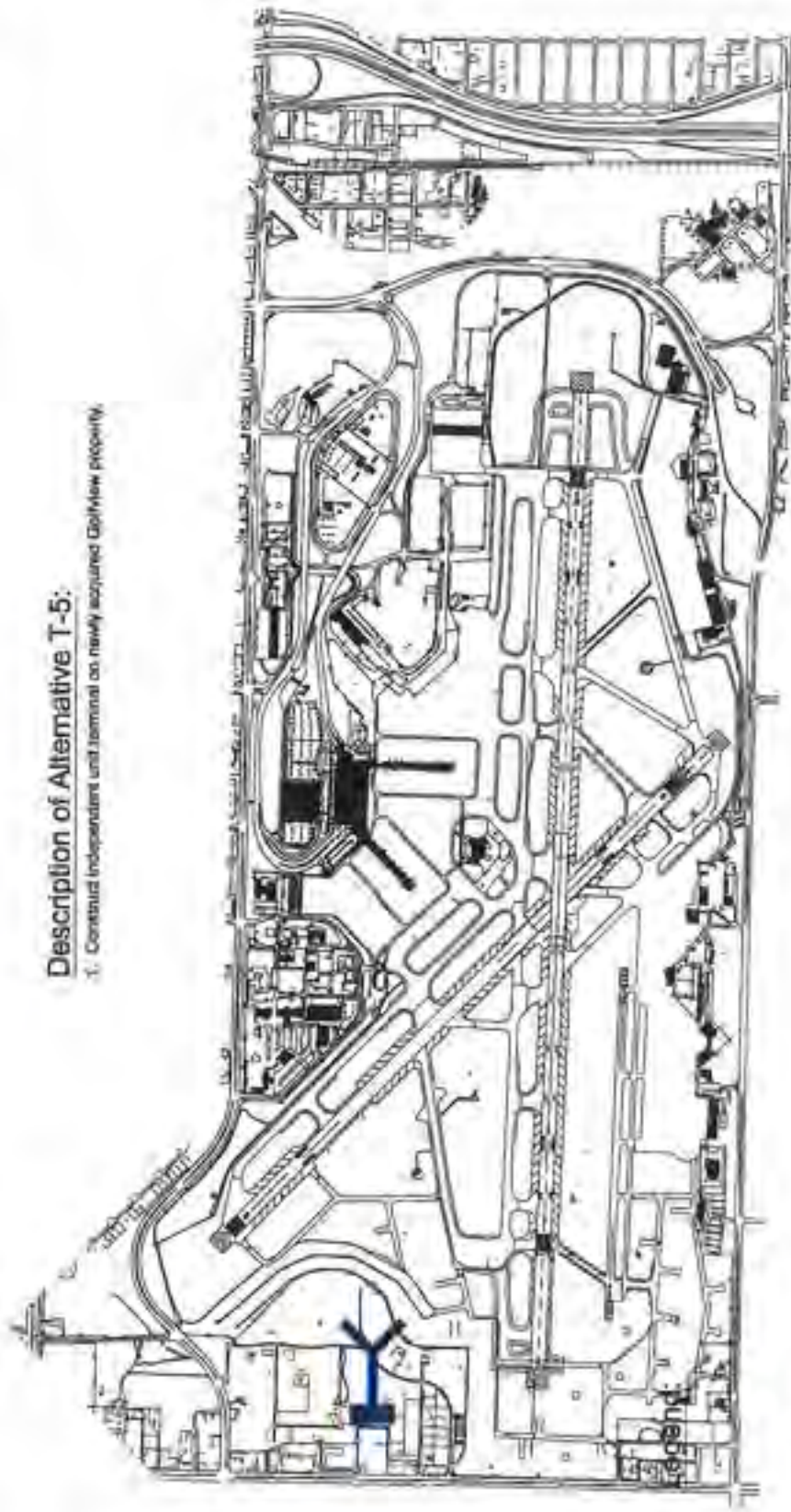
Exhibit V-24

Terminal Development Alternative T-4B

October 2000

Description of Alternative T-5:

1. Construct independent unit terminal on newly acquired Golfview property.



Legend:

- New or relocated terminal building / concourse
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBIA STRATEGIC PLAN/Exhibit V-25.dwg
Strategic Master Planning Study

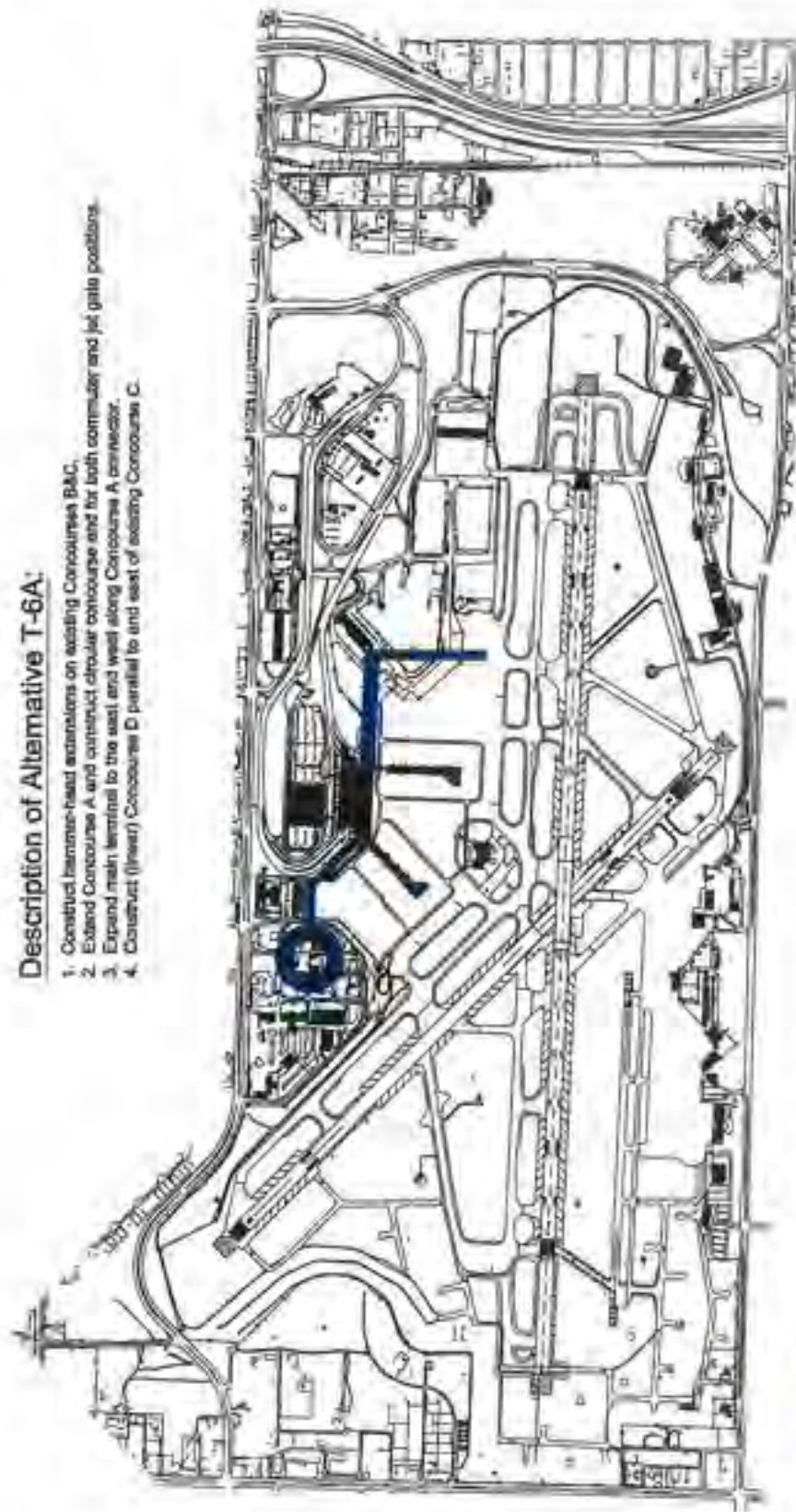
Exhibit V-25

Terminal Development Alternative T-5

October 2000

Description of Alternative T-6A:

1. Construct hammer-head extensions on existing Concourse B&C.
2. Extend Concourse A and construct circular concourse and jet bridge positions.
3. Expand main terminal to the east and west along Concourse A connector.
4. Construct (linear) Concourse D parallel to and east of existing Concourse C.



Legend:

- New or relocated terminal building / concourses
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared by : Ricomato & Associates, Inc.



PBIA STRATEGIC PLAN Exhibit V-28.dwg
Strategic Master Planning Study

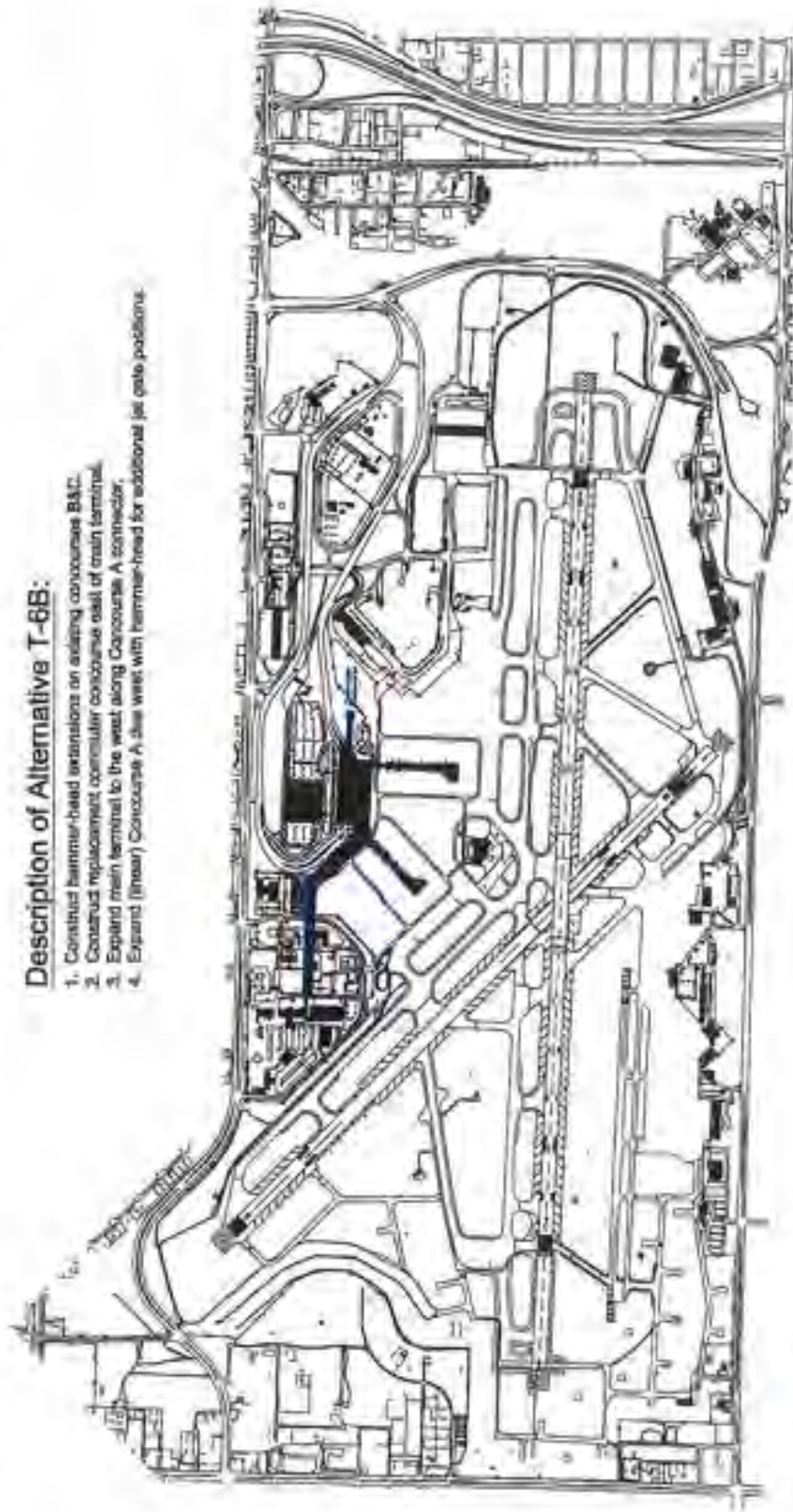
Exhibit V-26

Terminal Development Alternative T-6A

October 2000

Description of Alternative T-6B:

1. Construct hammer-head extensions on existing concourse B&C.
2. Construct replacement concourse east of main terminal.
3. Expand main terminal to the west along Concourse A connector.
4. Expand (linear) Concourse A also west with hammer-head for additional jet gate positions.



Legend:

- New or reconfigured terminal building / concourse
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordin & Associates, Inc.

0 1500 ft. north

PBIASTRATEGIC_PLAN\Exhibit V-27.aeg
Strategic Master Planning Study

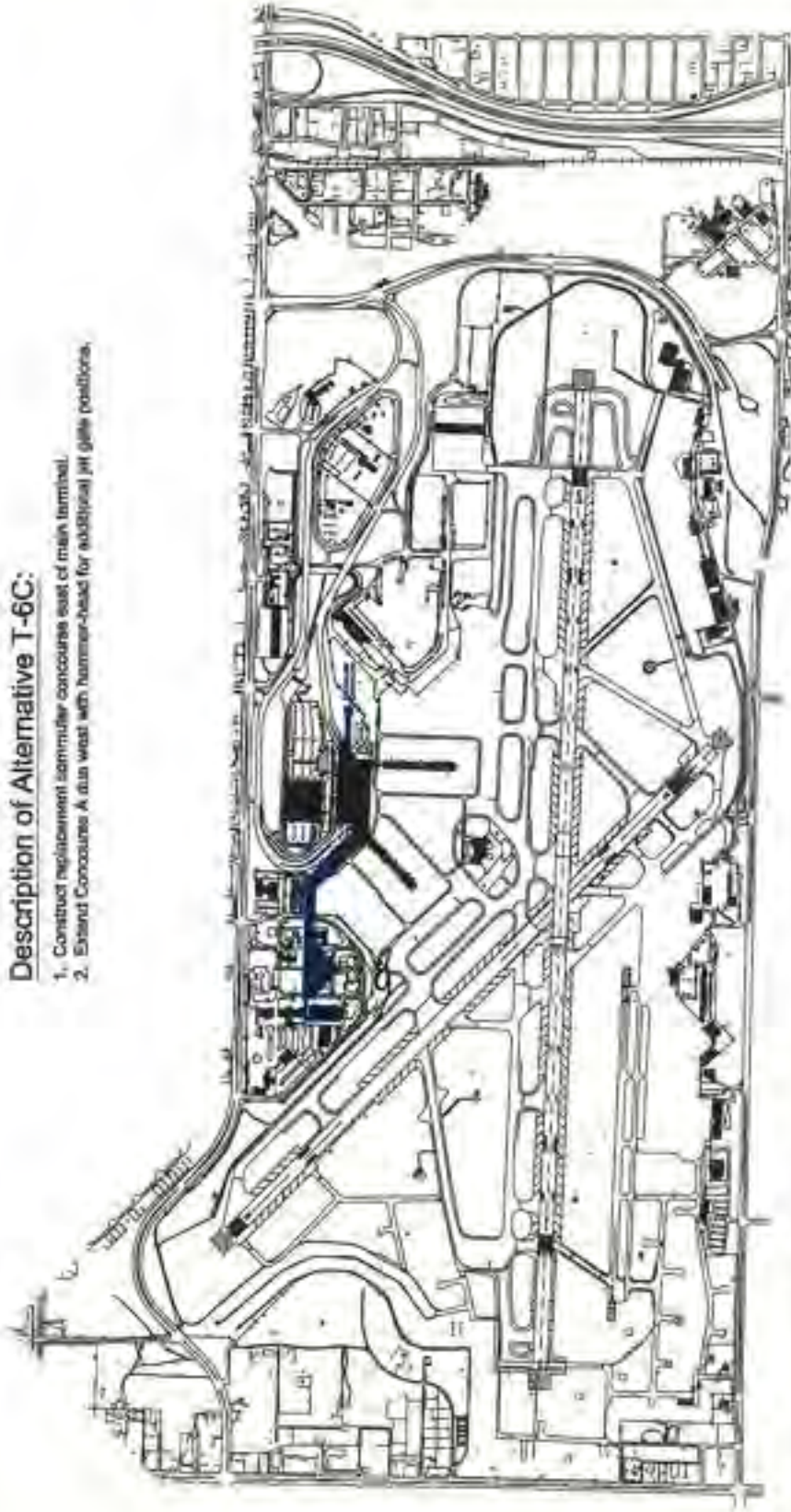
Exhibit V-27

Terminal Development Alternative T-6B

October 2000

Description of Alternative T-6C:

1. Construct replacement terminal concourse east of main terminal.
2. Extend Concourse A area west with hammer-head for additional jet gate positions.



Legend: ■ New or relocated terminal building / concourse
■ Existing buildings

Source : PBSA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1800 ft. north

PBSA\STRATEGIC PLAN\Exhibit V-35.dwg
Strategic Master Planning Study

Exhibit V-28

**Terminal Development
Alternative T-6C**

October 2000

Description of Alternative T-7:

1. Construct replacement terminal north of Belvedere Road.
2. Construct replacement (linear) Concourses A, B, and C, immediately south of Belvedere Road with underground connector to Main Terminal.
3. Demolish existing terminal building and associated concourses.



Legend:

-  New or relocated terminal building / concourse
-  Existing terminal building and / or concourse to be removed
-  Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ribando & Associates, Inc.

1800 ft.  north

PBIASTRATEGIC_PLAN/Exhibit_V-29.dwg
Strategic Master Planning Study

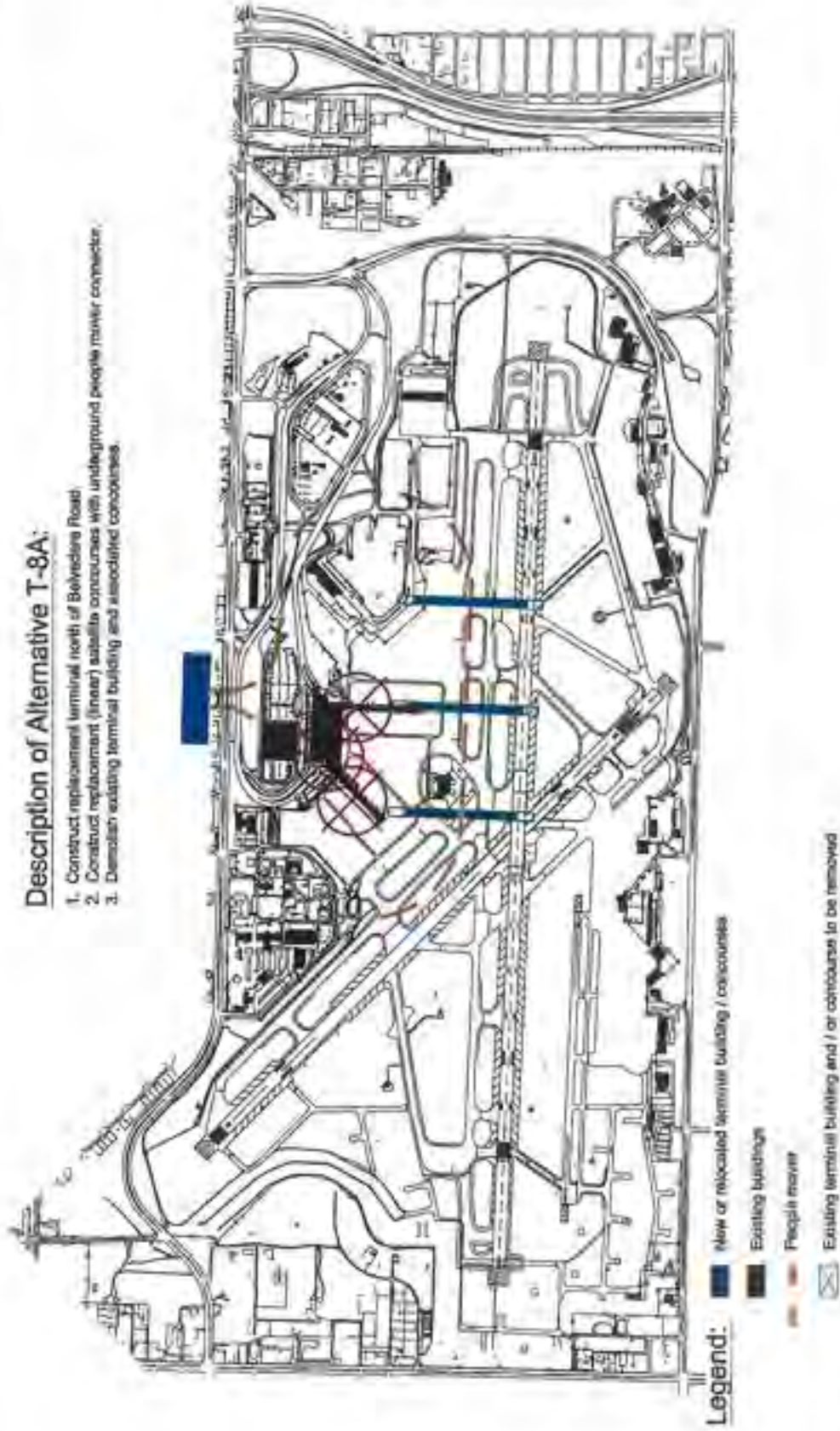
Exhibit V-29

Terminal Development Alternative T-7

October 2000

Description of Alternative T-8A:

1. Construct replacement terminal north of Belvedere Road
2. Construct replacement (linear) satellite concourses with underground people mover connector.
3. Demolish existing terminal building and associated concourses.



Source : PBIA Airport Layout Plan
Prepared By : Ricardo & Associates, Inc.

0 1800 ft. north

PBIA STRATEGIC PLAN Exhibit V-30.dwg
Strategic Master Planning Study

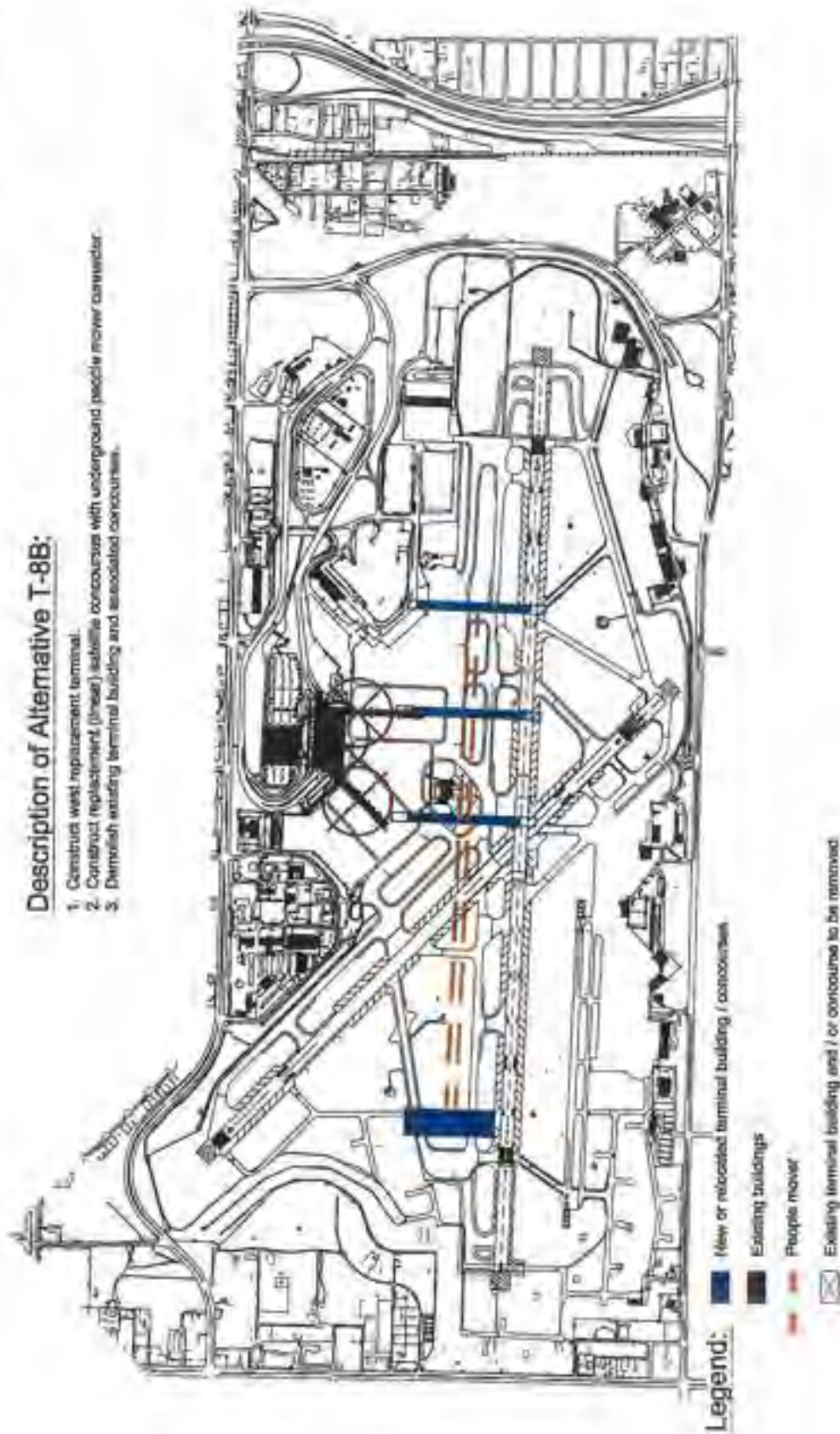
Exhibit V-30

Terminal Development Alternative T-8A

October 2000

Description of Alternative T-8B:

1. Construct west replacement terminal.
2. Construct replacement (linear) satellite concourse with underground people mover connector.
3. Demolish existing terminal building and associated concourse.



Source : PBIA Airport Layout Plan
Prepared By : Riccardi & Associates, Inc.



PBIA/STRATEGIC_PLAN/Exhibit V-31.dwg
Strategic Master Planning Study

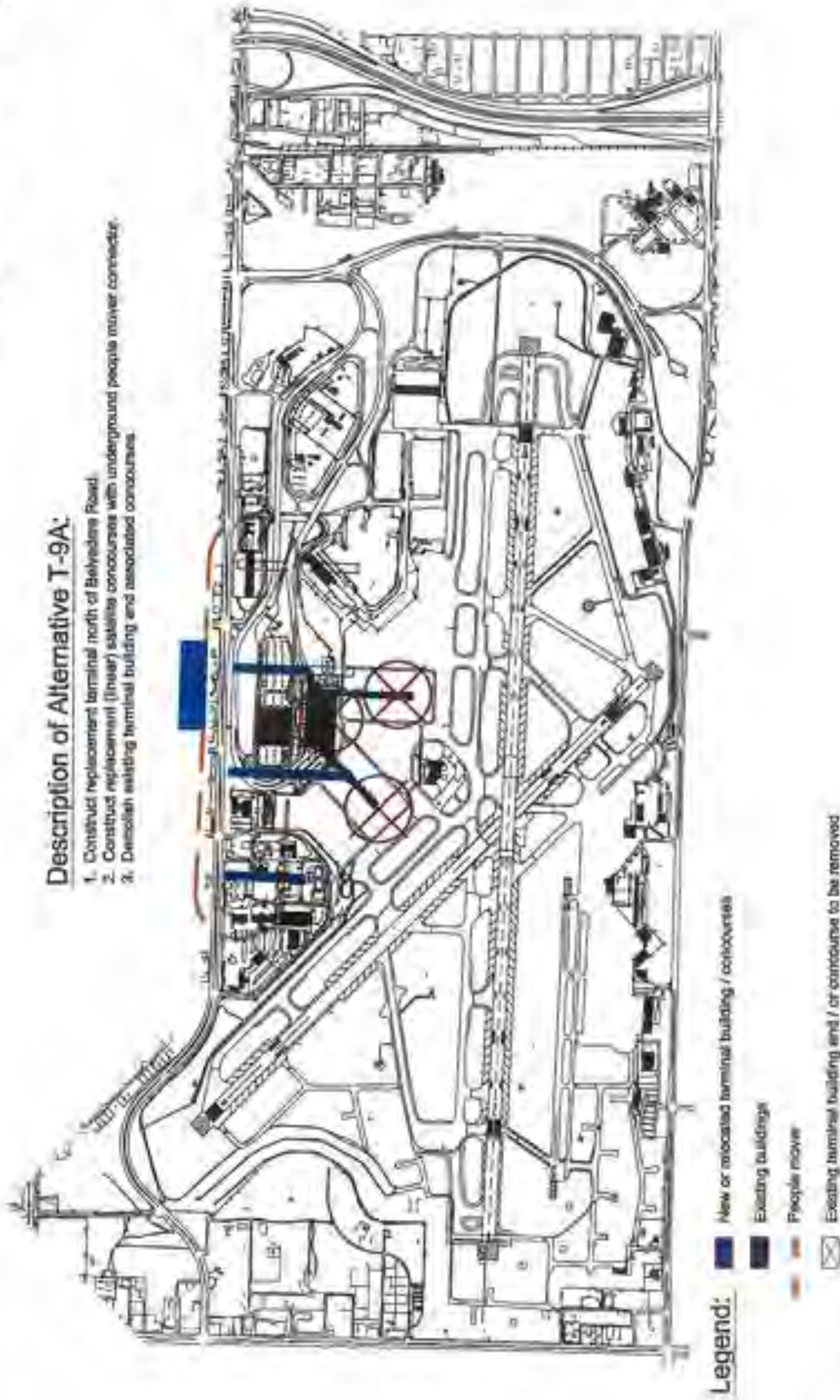
Exhibit V-31

Terminal Development Alternative T-8B

October 2000

Description of Alternative T-9A:

1. Construct replacement terminal north of Belyden Road.
2. Construct replacement (linear) satellite concourses with underground people mover connector.
3. Demolish existing terminal building and associated concourses.



Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBIA\STRATEGIC_PLANS\Exhibit V-32.dwg
Strategic Master Planning Study

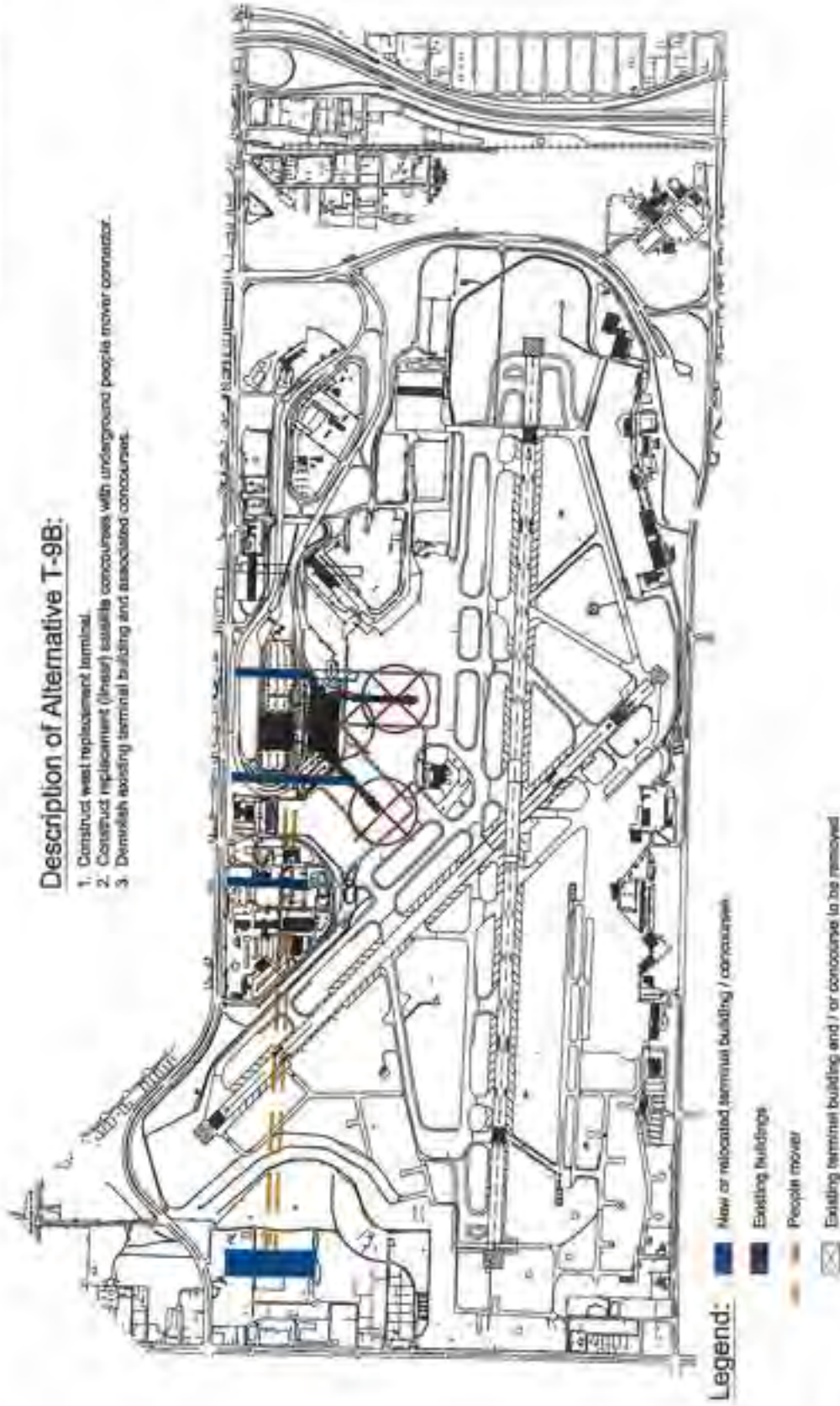
Exhibit V-32

Terminal Development Alternative T-9A

October 2000

Description of Alternative T-9B:

1. Construct west replacement terminal.
2. Construct replacement (linear) satellite concourses with underground people mover connector.
3. Demolish existing terminal building and associated concourses.



Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBIA Strategic Plan Exhibit V-33.dwg
Strategic Master Planning Study

Exhibit V-33

Terminal Development Alternative T-9B

October 2000

Description of Alternative T-10:

1. Extend terminal building to the east with frontal gates to the south.



Legend:

- New or proposed terminal building / concourses
- Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricardo & Associates, Inc.

0 1500 ft. north

PBIA/Strategic Plan/Exhibit V-34.dwg
Strategic Master Planning Study

Exhibit V-34

Terminal Development Alternative T-10

October 2000

Description of Alternative T-11:

1. Construct west replacement terminal and (linear) concourses.
2. Demolish existing terminal and concourses.



Legend:

- New or relocated terminal building / concourses
- Existing buildings
- X Existing terminal building and / or concourse to be removed

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1500 ft. ↑ north

PBIA/Strategic Plan/Exhibit V-35.dwg
Strategic Master Planning Study

Exhibit V-35

**Terminal Development
Alternative T-11**

October 2000

Description of Alternative T-12:

1. Construct east replacement terminal with (new) concourses.
2. Demolish existing terminal facility.



Legend:

■ New or relocated terminal building / concourses

■ Existing buildings

⊗ Existing terminal building and / or concourses to be removed

Source : PBIA Airport Layout Plan
Prepared By : Riboards & Associates, Inc.



PBIA Strategic Plan/Exhibit V-36.dwg
Strategic Master Planning Study

Exhibit V-36

**Terminal Development
Alternative T-12**

October 2000

Description of Alternative T-13:

1. Construct runner-head extensions on existing Concourses B & C.
2. Construct unit terminal and (linear) Concourse D east of existing terminal facility.



Legend: ■ New or relocated terminal building / concourses

■ Existing buildings

Source: PBIA Airport Layout Plan
Prepared By: Ricardo & Associates, Inc.

0 1000 ft.  north

PBIA Strategic Plan Exhibit V-37 (HW)
Strategic Master Planning Study

Exhibit V-37

**Terminal Development
Alternative T-13**

October 2000

Description of Alternative T-14:

1. Expand existing terminal building to the east.
2. Construct (linear/loop) Concourse D east of existing Concourse C.



Legend: ■ New or relocated terminal building / concourses

■ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1000 ft.  north

PBIA-Strategic Plan/Exhibit V-38.dwg
Strategic Master Planning Study

Exhibit V-38

**Terminal Development
Alternative T-14**

October 2000

Description of Alternative T-15:

1. Expand existing terminal building to the east.
2. Construct (linear) satellite concourses south of Runway 9L-27R.



Legend: ■ New or relocated terminal building / concourses

■ Existing buildings

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1000 ft.  north

PBIA Strategic Plan/Exhibit V-35.dwg
Strategic Master Planning Study

Exhibit V-39

Terminal Development Alternative T-15

October 2000

Description of Alternative T-16:

1. Expand existing terminal building to the east.
2. Construct (linear) satellite concourse south of Runway 16-27R.



Legend:

- New or relocated terminal building / concourses
- Existing buildings
- People mover

Source : PBI/A Airport Layout Plan
Prepared By : Rizzardo & Associates, Inc.



PBI/A Strategic Plan/Exhibit V-40.dwg
Strategic Master Planning Study

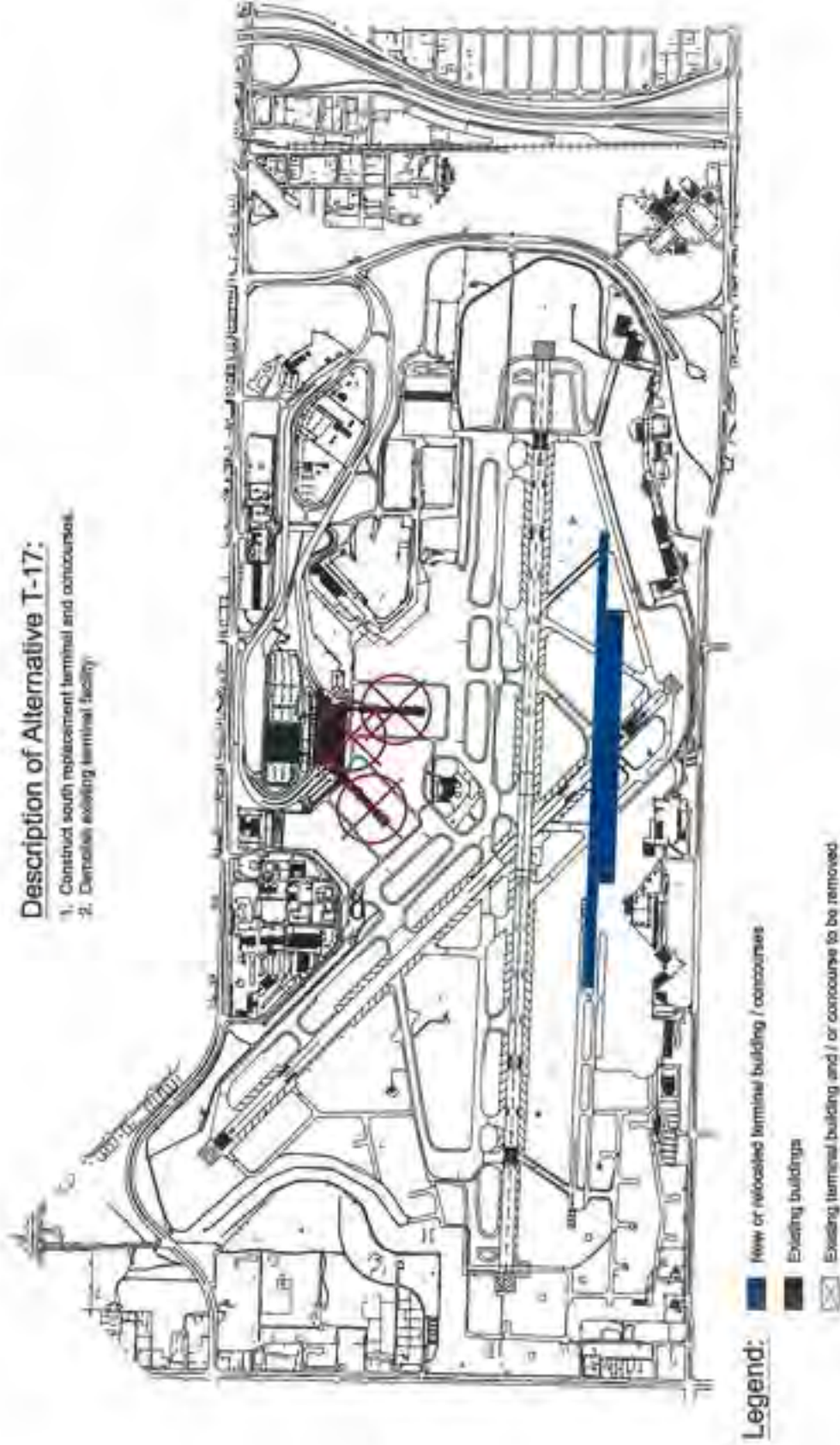
Exhibit V-40

Terminal Development Alternative T-16

October 2000

Description of Alternative T-17:

1. Construct south replacement terminal and concourses.
2. Demolish existing terminal facility.



Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

Exhibit V-41

PBIA/Strategic Plan/Exhibit V-41.dwg
Strategic Master Planning Study

**Terminal Development
Alternative T17**

October 2000

- in the airside and landside properties presently leased and occupied by Jet Aviation and Signature Flight Support, east of Runway 31 and south of Runway 27R
- within the newly acquired Town of Golfview property
- adjacent to, and west of Building 846, in the land parcels proposed for the New Maintenance Compound
- also within the 8th Street loop area, but northwest of the proposed site for the New Maintenance Compound

The cargo development alternatives identified for PBIA are shown and briefly described in Exhibits V-42 through V-49.

5.4.4 General Aviation Development Alternatives

Even though North Palm Beach County General Aviation Airport, opened in 1995, has effectively served as a general aviation reliever airport for PBIA, the demand for general aviation facilities has persisted at PBIA. PBIA's demand for general aviation facilities has been evidenced by the development of new hangars and the expansion of aircraft aprons undertaken by Jet Aviation and Signature Flight Support, two Fixed Base Operators (FBOs) operating at the Airport. Additional facility development by these two tenants was possible due to the availability of new land parcels that resulted from the relocation of outer perimeter road to the south. The third FBO at PBIA, Galaxy Aviation, is also currently planning the expansion of its facilities along the south side of the Airport, west of Runway 31.

While much of the piston-engine private and leisure aircraft have relocated to North Palm Beach County General Aviation Airport and other reliever airports in the region, corporate-related traffic has steadily grown at PBIA. This steady growth pattern is expected to continue throughout the planning horizon. However, available land along the south side of the Airport, contiguous to the leaseholds of the three FBOs, is scarce. Therefore, many of the development alternatives identified for PBIA's general aviation facilities consider the partial or total relocation of one or more of the FBOs to other sites on the Airport.

These alternate sites include properties owned by the Airport west of Military Trail. Two such parcels were considered for these functions. One of these parcels is north of Runway 9L, opposite to the southern half of the Town of Golfview property. The other parcel is located south of Runway 9L, opposite of the property occupied by the Palm Beach County Sheriff's office.

Other alternatives consider the Town of Golfview property or the property currently bounded by the 8th Street Loop and Belvedere Road (including the proposed New Maintenance Compound site). The most conservative alternatives propose additional general aviation development in the property located both east or west of the 391 Bomb Squadron Restaurant and south of Runway 9R.

A total of seven general aviation development alternatives were identified. Each of these alternatives is presented and briefly described in Exhibits V-50 through V-56.

5.5 Screening of Development Alternatives

A preliminary screening of the development alternatives identified for each airport component was conducted in order to establish those alternatives that should be refined and evaluated in greater detail. While specific future events and demand types will dictate the most appropriate

Description of Alternative C-1:

1. Construct new cargo building immediately west of existing Cargo Building #1475.



Legend:

- New cargo truck docking area
- New belly freight facility

Source : PBIA Airport Layout Plan
Prepared By: Rizzardo & Associates, Inc.

0 1500 ft.  north

PBIA STRATEGIC PLAN/EXHIBIT V-42 (REV)
Strategic Master Plan Study

Exhibit V-42

Cargo Facilities Development Alternative C-1

October 2000

Description of Alternative C-2:

1. Construct new cargo building immediately west of existing Cargo Building #1475.



Legend: ■ New cargo truck docking area ■ New daily freight facility

Source: PBIA Airport Layout Plan
Prepared By: Filion & Associates, Inc.

0 1500 ft.  north

PBIASTRATEGIC PLAN Exhibit V-43.dwg
Strategic Master Plan Study

Exhibit V-43

Cargo Facilities Development Alternative C-2

October 2000

Description of Alternative C-3:

1. Construct new cargo building and apron immediately west of existing Cargo Building #1475.

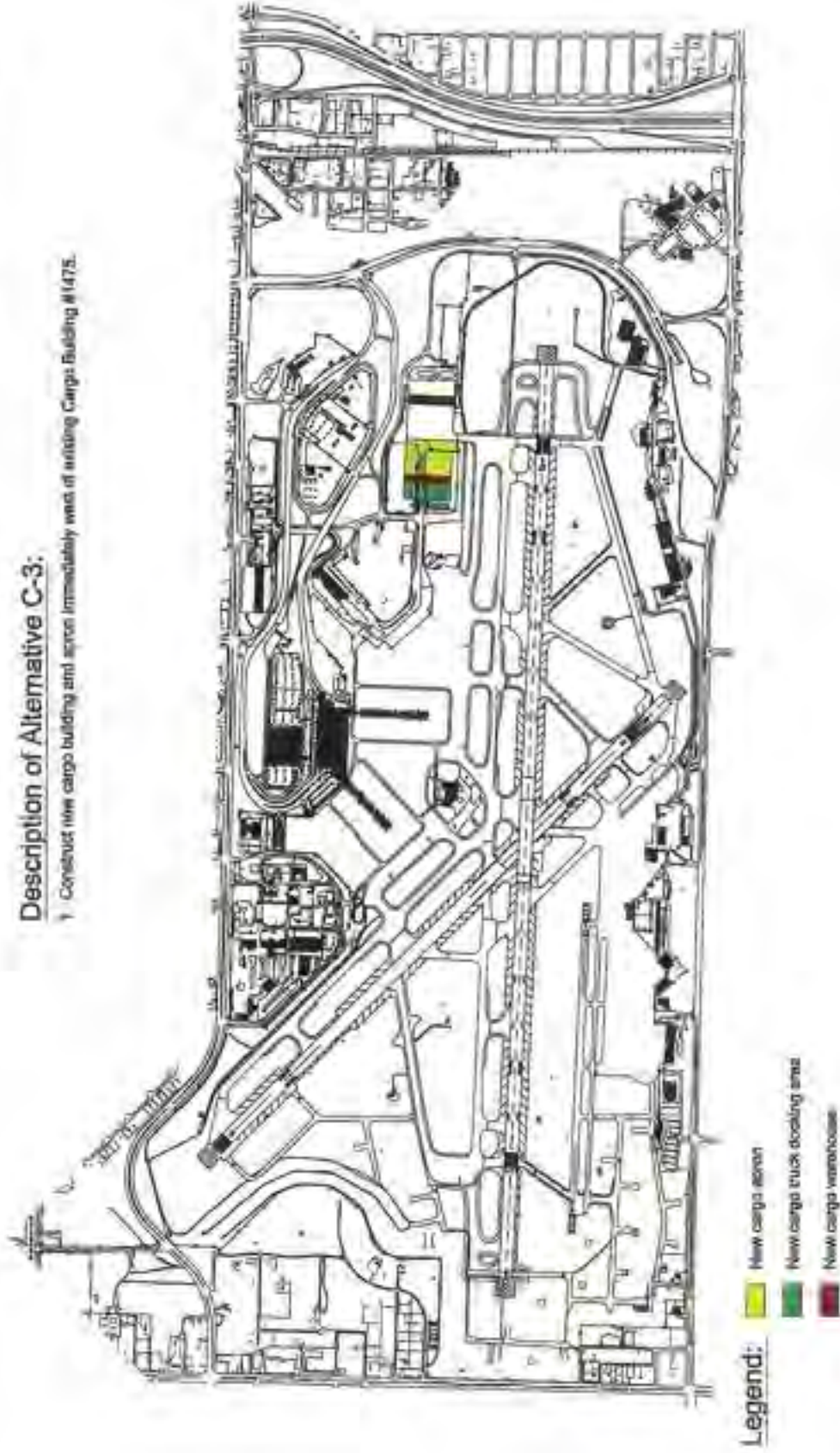


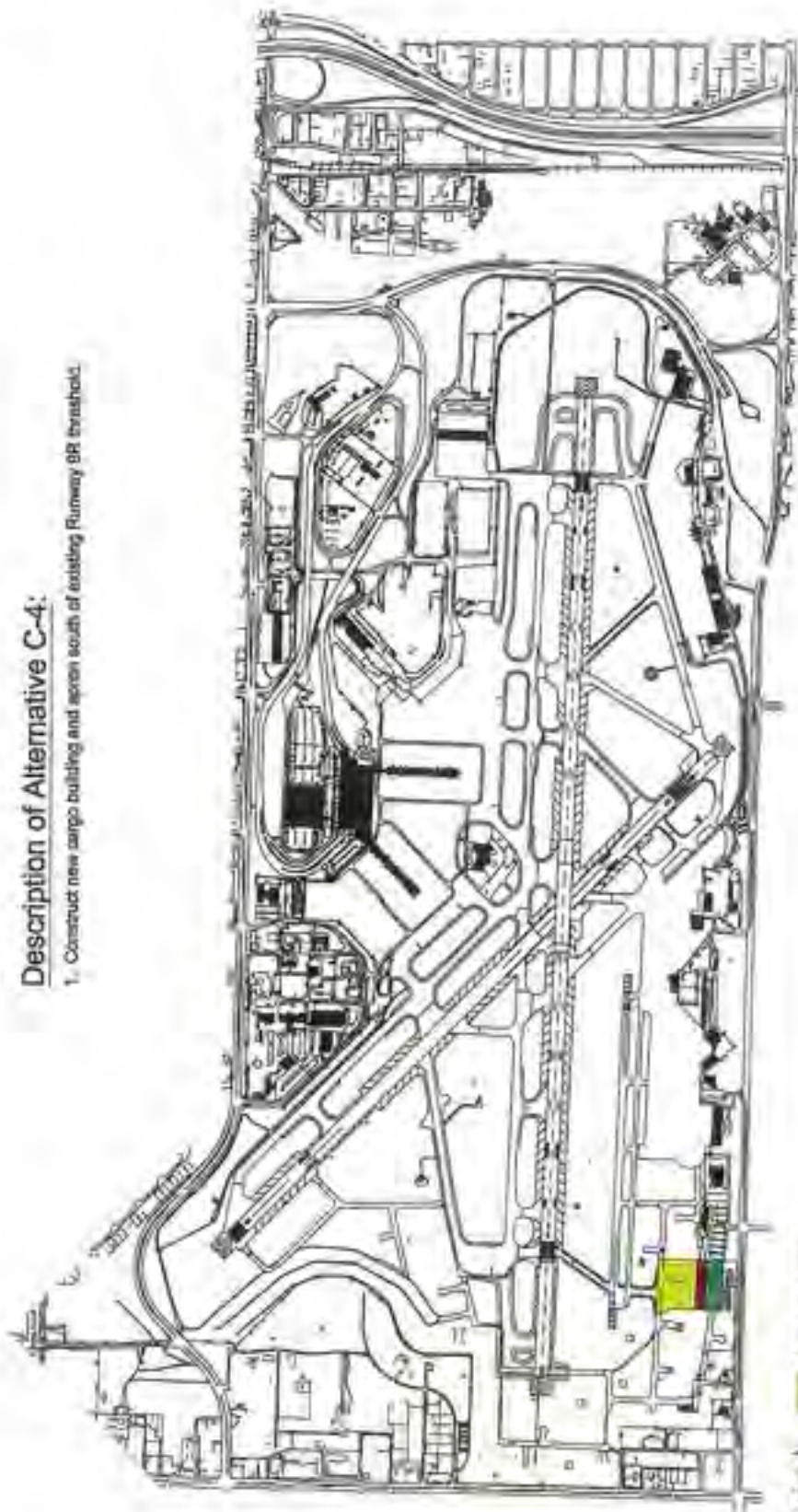
Exhibit V-44

Cargo Facilities Development Alternative C-3

October 2000

Description of Alternative C-4:

1. Construct new cargo building and apron south of existing Runway 8R threshold.



Legend:

- New cargo apron
- New cargo truck docking area
- New cargo warehouse

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

1800 ft. north

PBIA/STRATEGIC PLAN/EXHIBIT V-45.dwg
Strategic Master Plan Study

Exhibit V-45

**Cargo Facilities Development
Alternative C-4**

October 2000

Description of Alternative C-5:

1. Construct new cargo building and apron south of existing Runway 21R threshold.



Legend:

- New cargo apron
- New cargo truck docking area
- New cargo warehouse

Sources : PBI/A Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBI/STRATEGIC PLAN/Exhibit V-4a.dwg
Strategic Master Plan Study

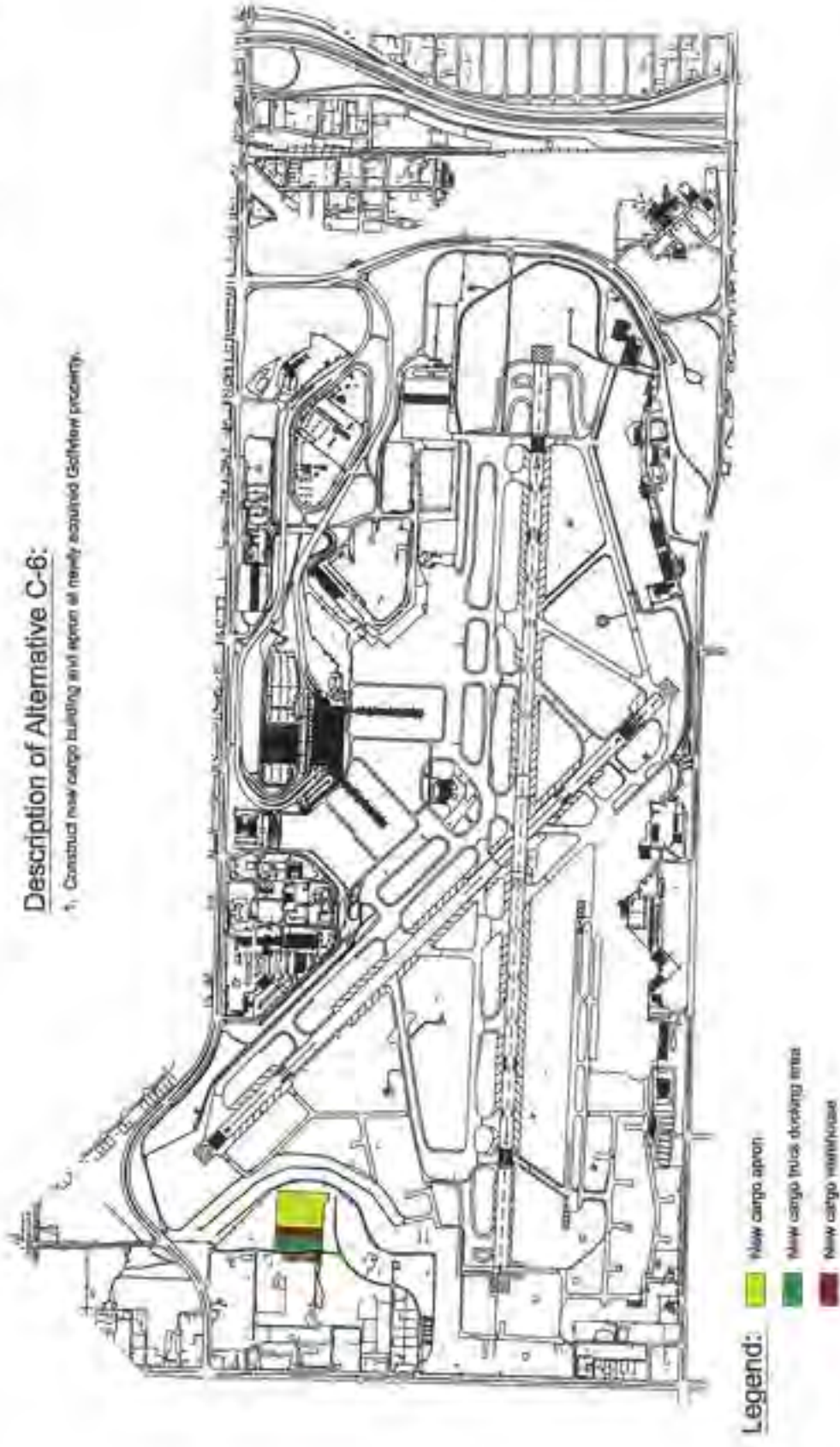
Exhibit V-46

**Cargo Facilities Development
Alternative C-5**

October 2000

Description of Alternative C-6:

1. Construct new cargo building and apron at newly acquired Goldview property.



Source : PBIA Airport Layout Plan
 Prepared By : Ricordo & Associates, Inc.

PRIMA STRATEGIC PLANNING, V-47.dwg
 Strategic Master Plan Study

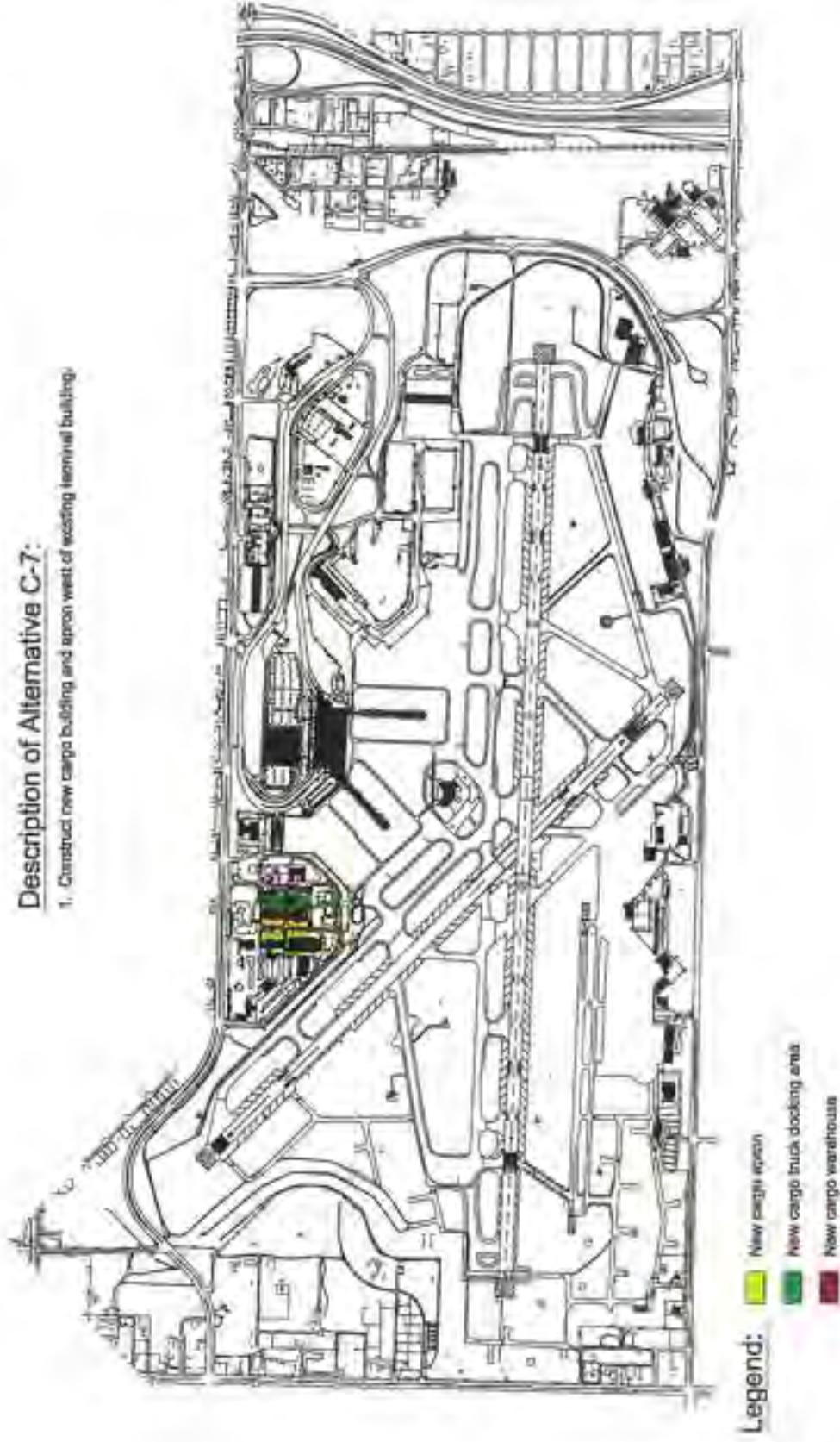
Exhibit V-47

**Cargo Facilities Development
 Alternative C-6**

October 2000

Description of Alternative C-7:

1. Construct new cargo building and apron west of existing terminal building.



Legend:

New cargo apron

New cargo truck docking area

New cargo warehouse

Source : PBI/A Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



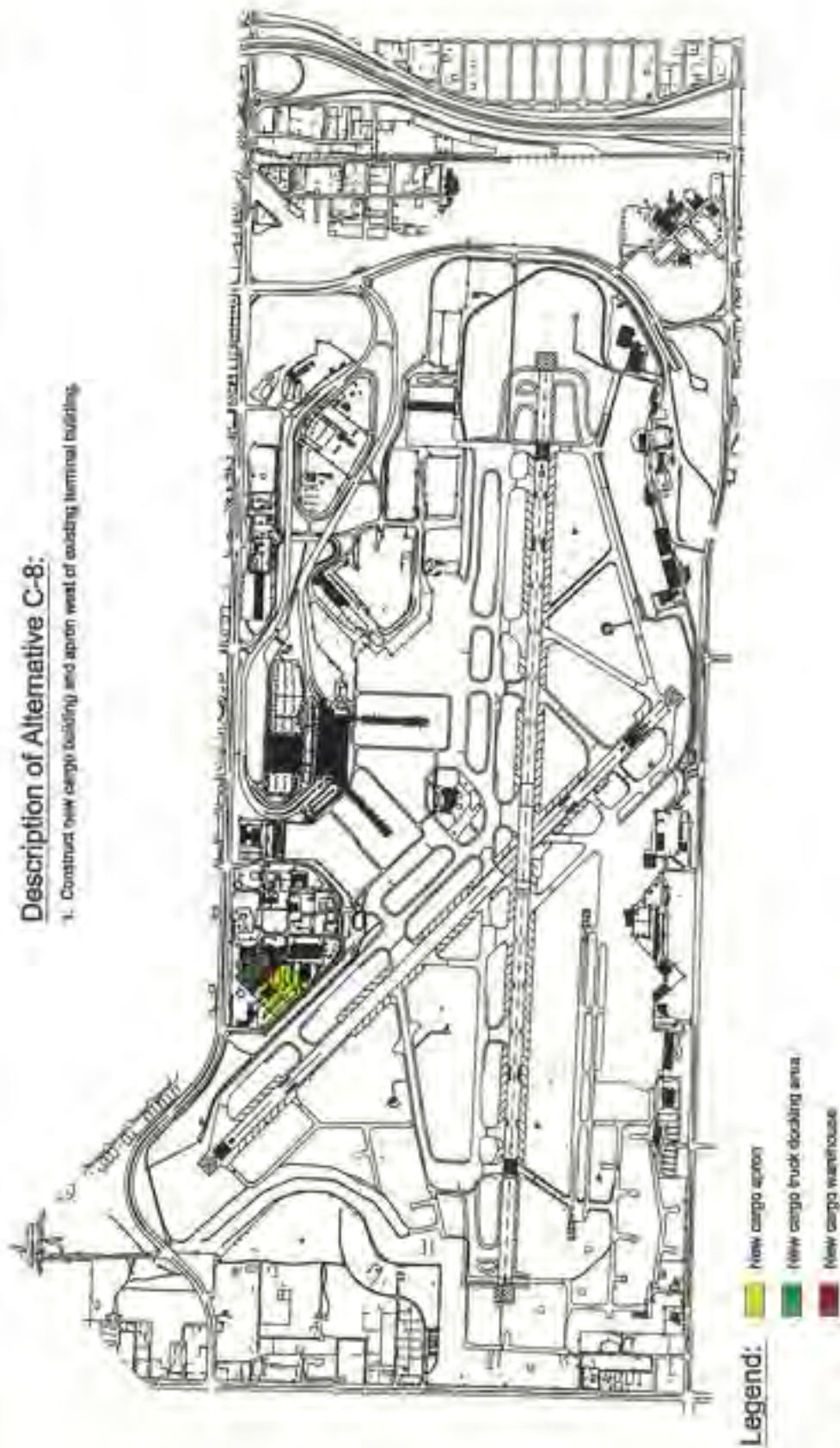
Cargo Facilities Development Alternative C-7

Exhibit V-48

October 2000

Description of Alternative C-8:

1. Construct new cargo building and apron west of existing terminal building.



Legend:

- New cargo apron
- New cargo truck docking area
- New cargo warehouse

Sources : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.



PBIA/STRATEGIC PLANNING V-49.dwg
Strategic Master Plan Study

Exhibit V-49

Cargo Facilities Development Alternative C-8

October 2000

Description of Alternative G-1:

1. Expand southwest FBO ramp to the north.
2. Construct new hangars and offices along west perimeter of southwest apron.

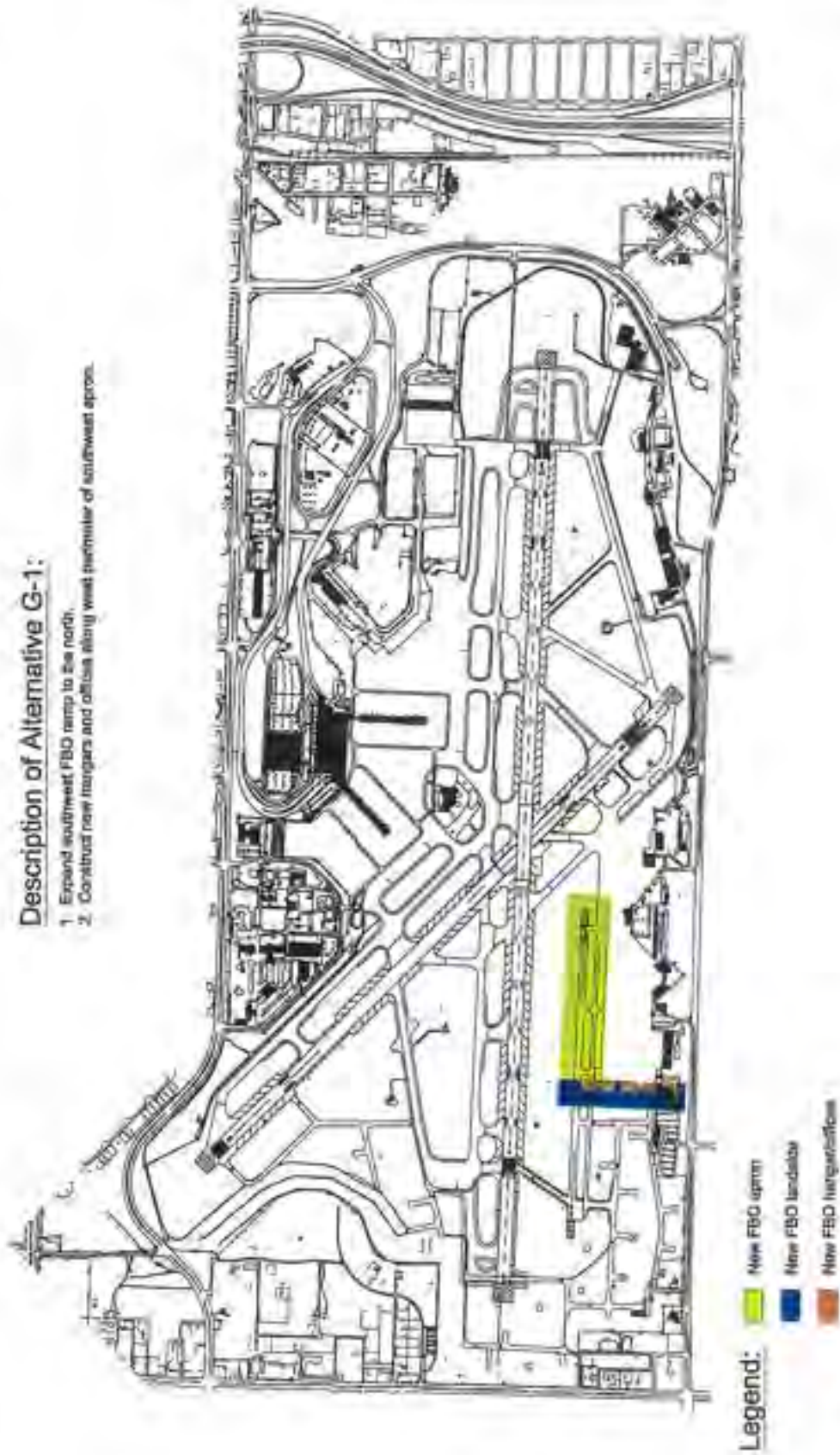


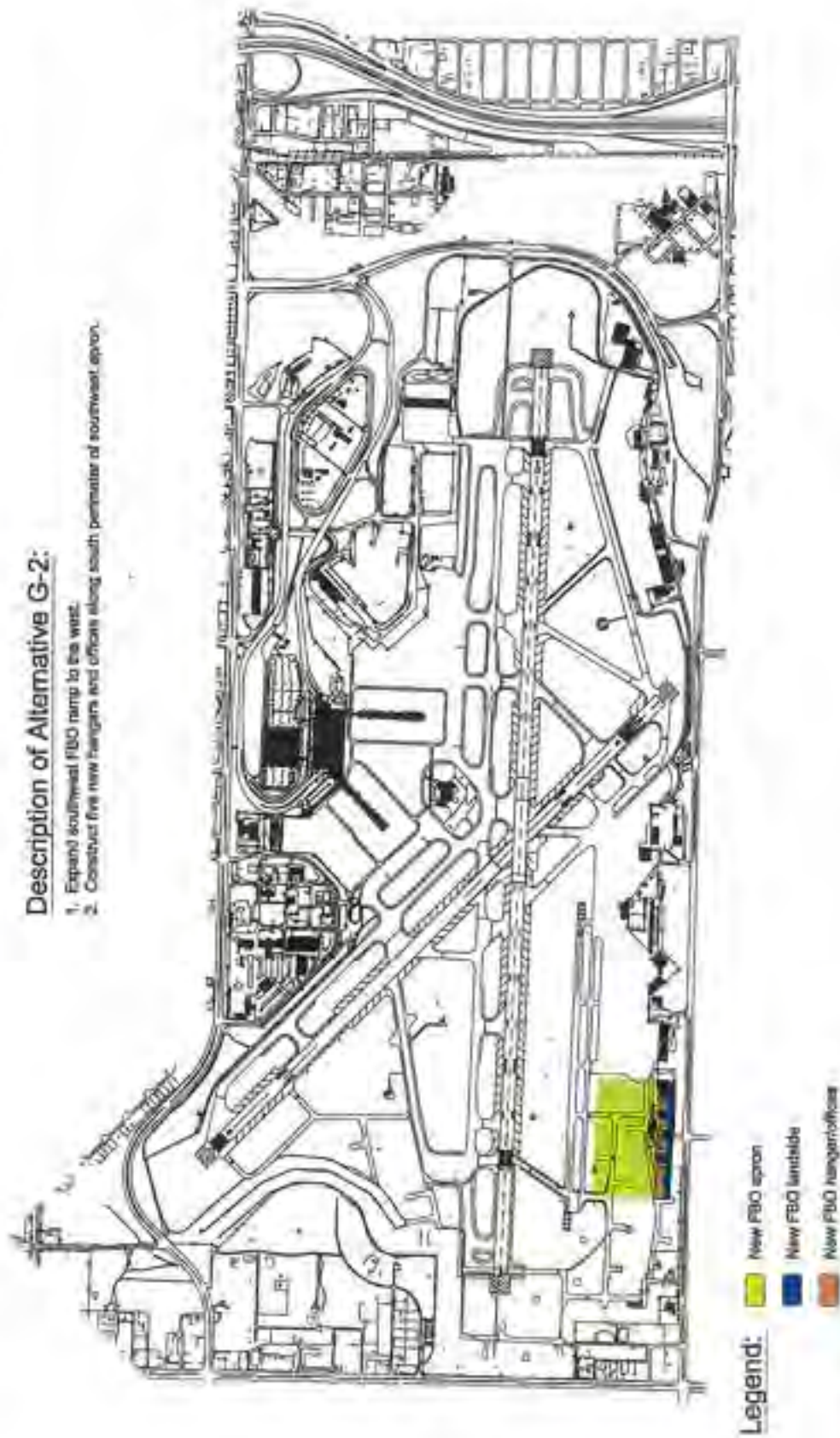
Exhibit V-50

General Aviation / FBO Facilities Development Alternative G-1

October 2000

Description of Alternative G-2:

1. Expand southwest FBO ramp to the west.
2. Construct five new hangars and offices along south perimeter of southwest apron.



Legend:

New FBO apron

New FBO landside

New FBO hangar/offices

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1500 ft north

PBIASTRATEGIC PLAN/Exhibit V-51.dwg
Strategic Master Plan Study

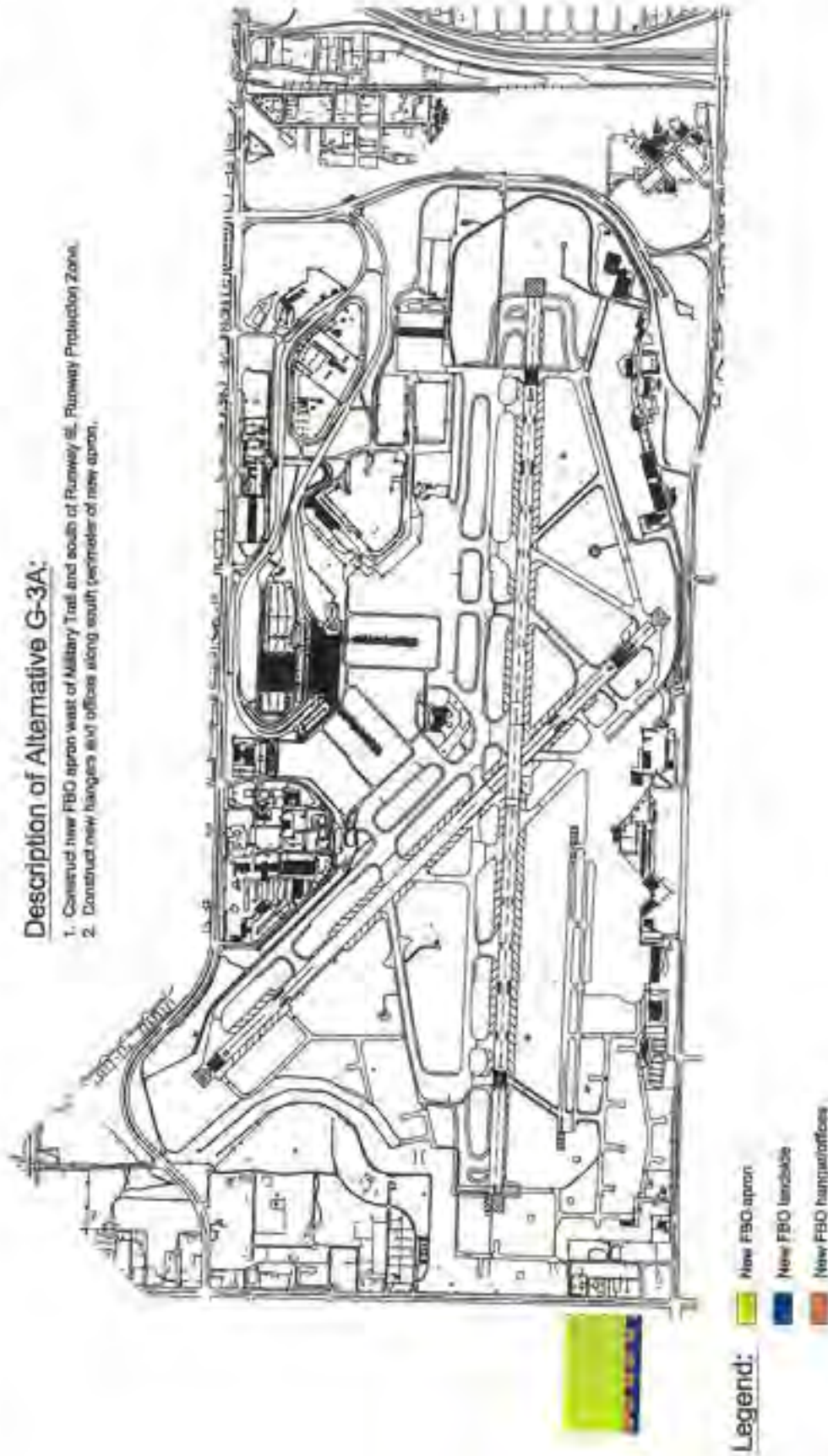
Exhibit V-51

General Aviation / FBO Facilities Development Alternative G-2

October 2000

Description of Alternative G-3A:

1. Convert new FBO apron west of Military Trail and south of Runway 8L Runway Protection Zone.
2. Construct new hangars and offices along south perimeter of new apron.



Legend:

New FBO apron

New FBO terminal

New FBO hangar/offices

Source : PBIA Airport Layout Plan
Prepared By : Riboondo & Associates, Inc.



PBIA/STRATEGIC PLAN/Exhibit V-52.dwg
Strategic Master Plan Study

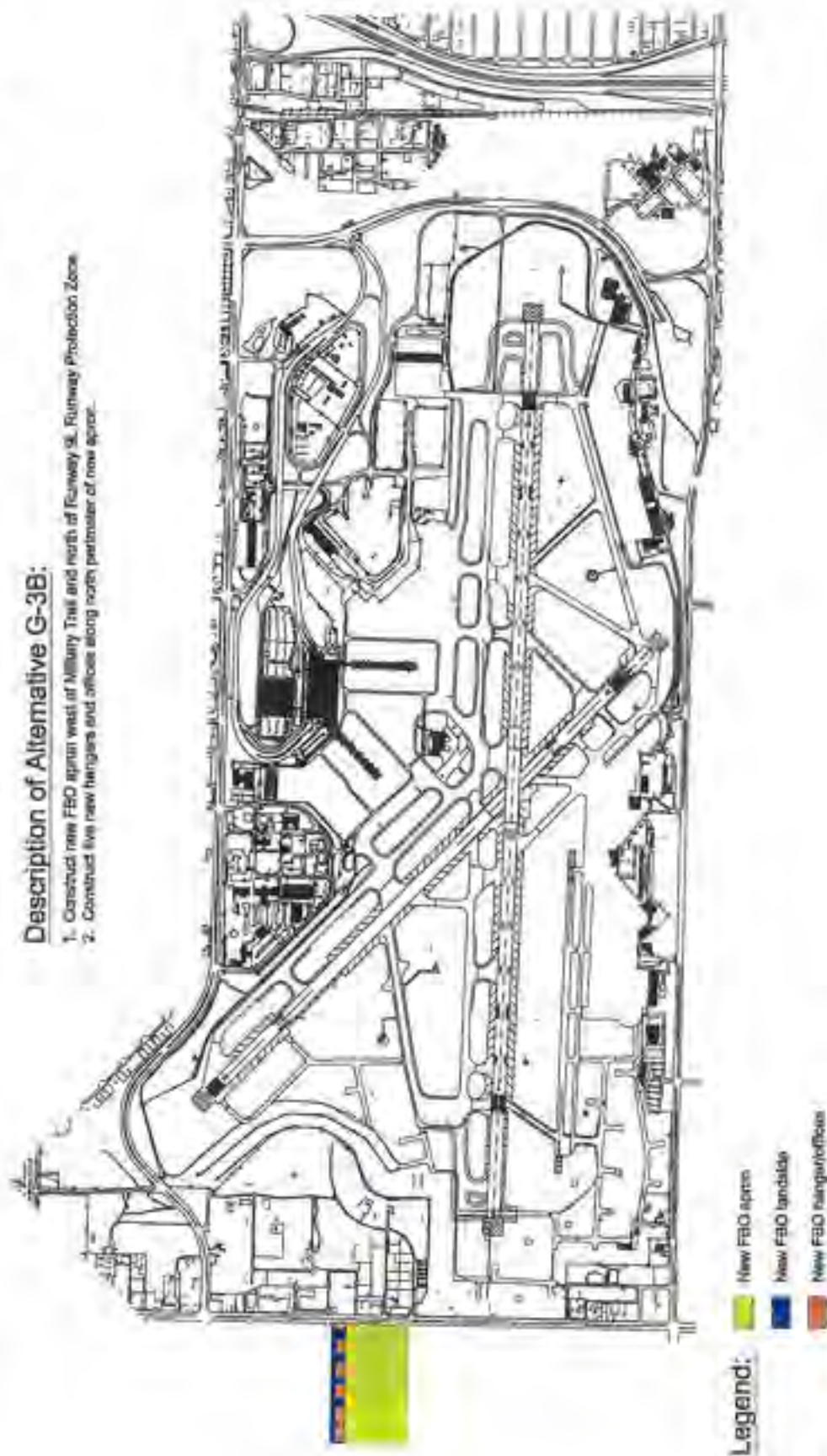
Exhibit V-52

General Aviation / FBO Facilities Development Alternative G-3A

October 2000

Description of Alternative G-3B:

1. Construct new FBO apron west of Military Trail and north of Runway 9L, Runway Protection Zone
2. Construct five new hangars and offices along north perimeter of new apron.



Legend:

New FEO system

How FEO handles

New F&O ratings/officials

Source : PBIA Airport Layout Plan
Prepared By : Ricordo & Associates, Inc.

0 1500 ft

↑ north

Strategic Master Plan Study

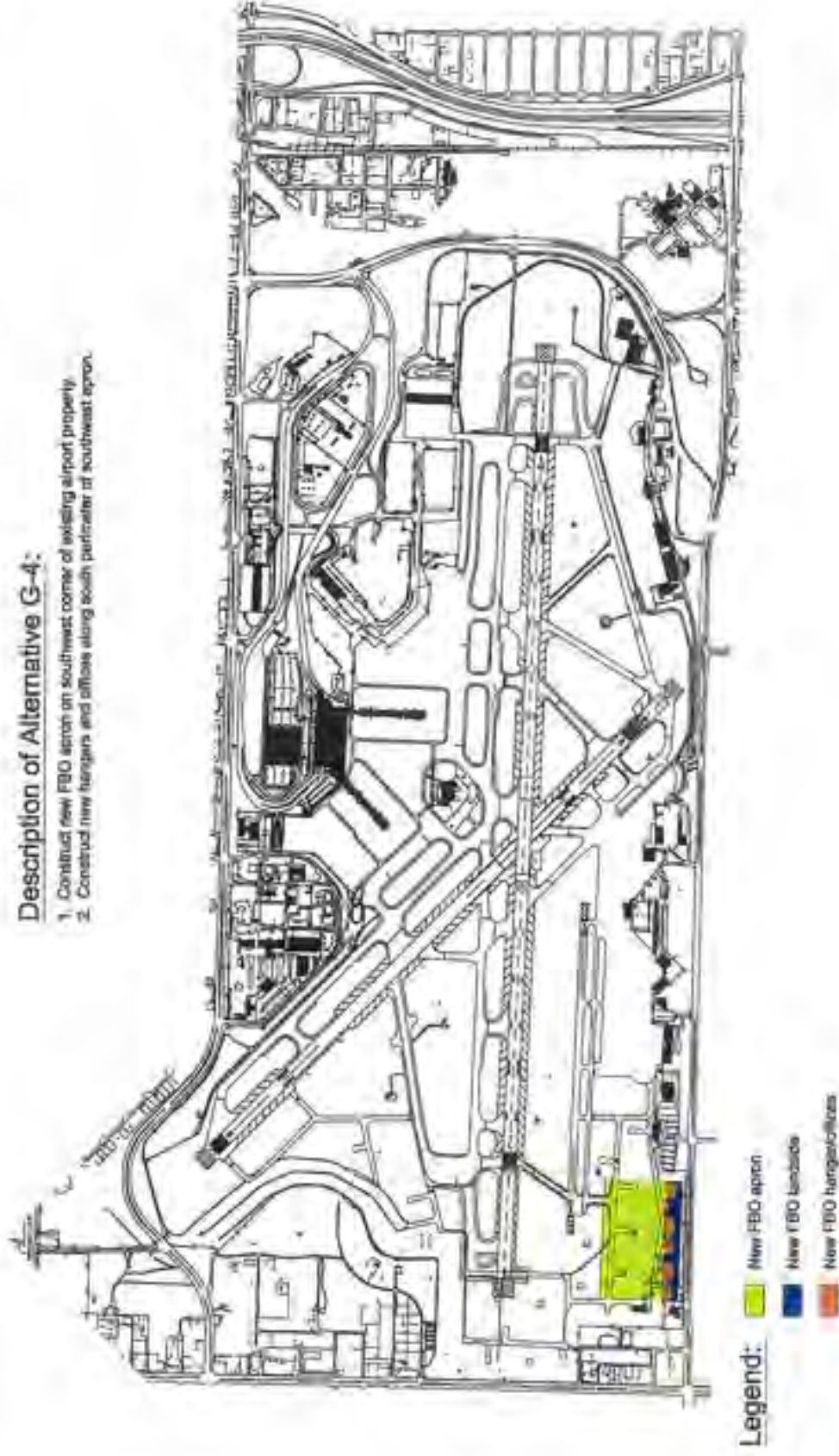
Exhibit V-53

**General Aviation / FBO Facilities Development
Alternative G-3B**

October 2000

Description of Alternative G-4:

1. Construct new FBO apron on southwest corner of existing airport property
2. Construct new hangars and offices along south perimeter of southwest apron.



Source: PBIA Airport Layout Plan
 Prepared by: Hoonits & Associates, Inc.

PBIA STRATEGIC PLAN Exhibit V-54.dwg
 Strategic Master Plan Study

Exhibit V-54

General Aviation / FBO Facilities Development Alternative G-4

October 2000

Description of Alternative G-5:

1. Construct new FBO apron west of existing terminal building.
2. Construct new hangars and offices along north perimeter of new apron.



Legend:

- New FBO apron
- New FBO hangars/offices
- New FBO hangars/offices

Source : PBIA Airport Layout Plan
Prepared By : Ricardo & Associates, Inc.

0 1000 ft. north

PBIA STRATEGIC PLAN Exhibit V-55.dwg
Strategic Master Plan Study

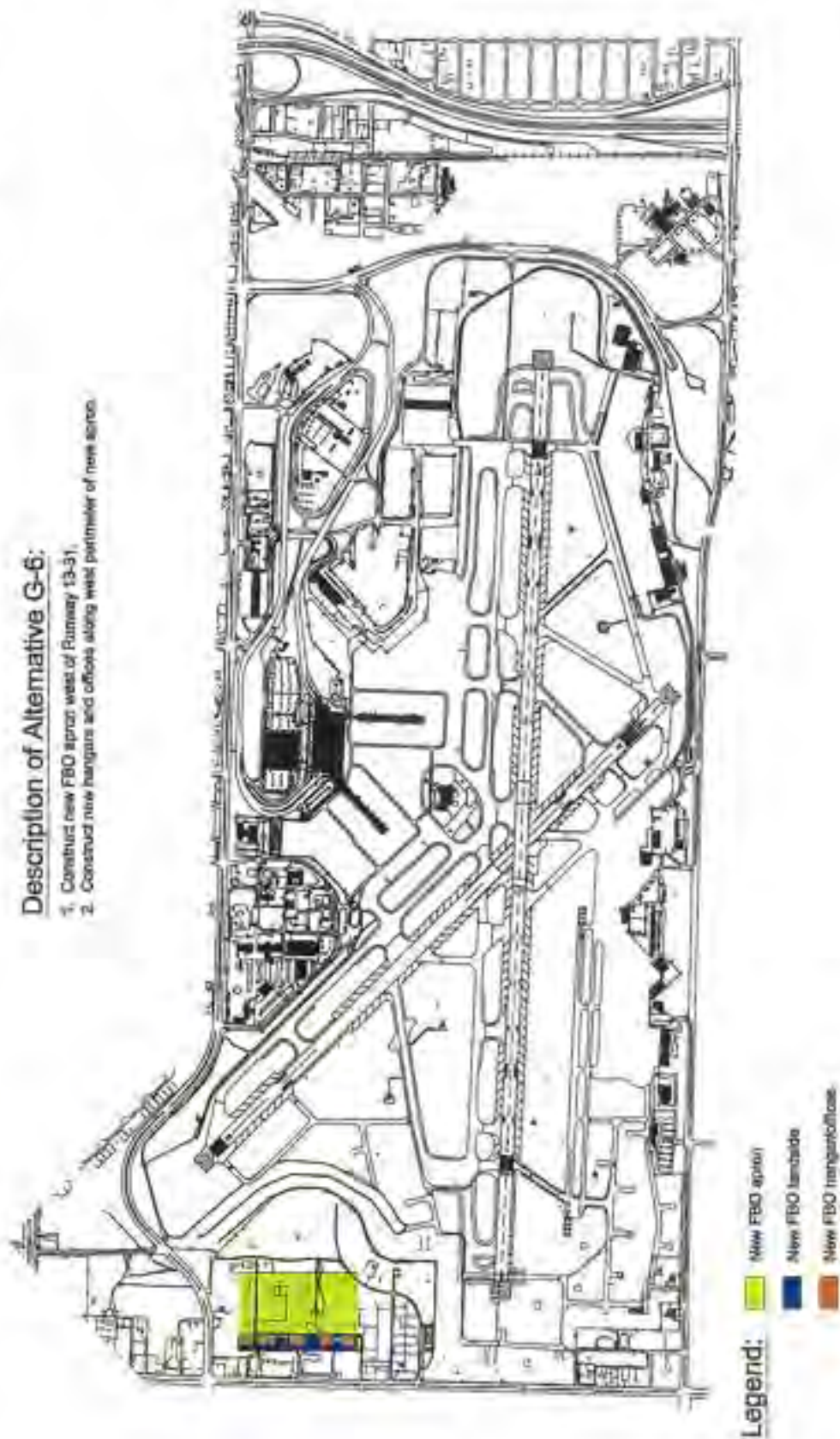
Exhibit V-55

General Aviation / FBO Facilities Development Alternative G-5

October 2000

Description of Alternative G-6:

1. Construct new FBO apron west of Runway 13-31.
2. Construct new hangars and offices along west perimeter of new apron.



Source: PBIA Airport Layout Plan
 Prepared by: Ricordo & Associates, Inc.

Exhibit V-56

General Aviation / FBO Facilities Development Alternative G-6

PBIA STRATEGIC PLAN/Exhibit V-56.dwg
 Strategic Master Plan Study

October 2000

alternative(s) to implement, as well as its time of implementation, a set of preliminary screening criteria was developed to provide a preliminary assessment of the overall merits of each alternative.

The set of preliminary screening criteria utilized for this analysis included the following:

- Operational Efficiency/Effectiveness
- Constructability/Physical Characteristics
- Development Costs
- Environmental and Community Impact Considerations

A key indicator of an alternative's desirability is its ability to serve the projected growth. For most facilities, this can be assessed in terms of the facility's capacity and/or operational efficiency relative to the projected demand levels. Other elements, such as airfield circulation, facility interrelationships, and overall system integration (i.e., airside-landside-terminal-support facilities) can be assessed qualitatively to further define an alternative's merits.

The physical characteristics of each alternative and their relationship to the existing operating facilities and surrounding man-made and natural environment can help determine the constructability of the proposed development. The magnitude of development associated with an alternative can impact its viability either as a result of the physical requirements of the plan or the impact of the alternative's implementation on airport operations. The general drainage and water management requirements prescribed by the South Florida Water Management District were also considered, since the amount of land typically dedicated to satisfy these requirements can be significant.

The displacement of existing airport facilities was assessed based on the magnitude and the generalized effects of these impacts. The magnitude of these impacts are largely affected by the type of facilities requiring displacement, the functions served by these facilities, the facility's age, and the Airport's/tenant's capital investment.

Relative order of magnitude costs were developed for the various alternatives. During this initial screening of alternatives, the level of investment anticipated (i.e., low, moderate, or high) for each alternative relative to the other development options identified were measured in terms of the direct and indirect costs that would be incurred in the implementation of each alternative.

Finally, potential environmental impacts associated with each alternative qualitatively identified included noise and compatible land use and hazardous waste impacts. Once again, this general overview served as a relative measure of the environmental impacts of the various development alternatives.

As previously noted, the screening process was the initial step in a two step process identified for the selection of the preferred development alternative for each of the four primary airport components. The other step included the refinement and evaluation of the short-listed alternatives. As such, the screening process is fundamentally a qualitative assessment of the various alternatives in relation to each other. The evaluation of the refined short-listed alternatives involves a quantitative approach for measuring the benefits and impacts of each alternative.

5.5.1 Screening of Airfield Alternatives

The 16 airfield development alternatives were analyzed using the screening criteria described above. The results of the screening of the airfield alternatives are discussed below.

Operational Efficiency: The proposed airfield configuration's ability to serve the peak hour and annual demand levels projected for PAL 2 was analyzed for each development alternative. Airfield alternatives A1, A3, A7, A8, A9, A10, A11, A13, A15, and A16 were adequate for the peak hour (79 operations) and annual demand (331,800 operations) derived for PAL 2. Airfield alternatives A2, A4, A5, A6, A12, and A14 did not provide sufficient capacity to serve the PAL 2 demand.

Constructability/Physical Characteristics: An assessment of the impacts to existing facilities was conducted in order to identify the magnitude of facility relocation or restoration that would be associated with the implementation of each airfield development scheme. Alternatives A1 and A2 result in the fewest impacts to existing airport facilities. Alternatives A3 and A5 impact the south side general aviation/FBO facilities, particularly those located east of Runway 31 (i.e., currently operated by Signature Flight Support and Jet Aviation) and the VORTAC. Several crossover taxiways, linking Runways 13-31 and 9L-27R, would also need to be reconfigured.

Alternative A4 would require the relocation of Belvedere Road and the acquisition of land and avigation easements in order to expand the Airport's boundaries to encompass the extended crosswind runway and to preserve the approach to Runway 13. Alternative A6 has the collective impacts of Alternatives A3 and A4.

Alternatives A7, A8 and A9, which propose the construction of a 10,000-foot parallel runway further south of Runway 9R-27L, would impact all of the tenants located along the south side of the Airport. These tenants include Signature Flight Support, Jet Aviation, the FAA Air Traffic Control Tower and administrative offices, Autec Range Services, the 391st Bomb Squadron Restaurant, and the General Aviation-Federal Inspection Service facility. In addition, the construction of the north parallel runway included in Alternatives A8 and A9 would impact the existing terminal facilities, the adjacent long term parking garage and surface lots, the terminal roadway, the on-airport rental car facilities, and all facilities located within the 8th Street loop as well as restrict development on the north half of the Town of Golfview property.

Alternative A10 includes the facility impacts associated with Alternative A7. Additionally, it includes the relocation of the existing terminal facilities and concourses and all facilities located within the 8th Street loop. The approach to the relocated crosswind runway during a west operating configuration would be restricted by the Hilton Hotel and the Palm Beach County buildings located on the northeast corner of the Southern Boulevard/Australian Avenue intersection.

Under Alternatives A11 and A12, impacts to the overflow parking areas, rental car facilities, and Building 1475 would result from the east parallel crosswind runway. This proposed runway would also impact the Hilton Hotel and Palm Beach County buildings located southeast of the Airport. The west parallel crosswind runway, shown only in Alternative A11, would impact the Town of Golfview property and the leaseholds presently held by Autec Range Services and Galaxy Aviation as well as the General Aviation-Federal Inspection Service facility.

A closely spaced parallel runway north of Runway 9L-27R, as proposed under Alternatives A13 and A15, would impact the ARFF facilities and the outboard gates on Concourses B and C, and the

overnight aircraft parking positions and the air cargo facilities associated with Building 1475 would also have to be relocated.

The 4-22 orientation shown for the new runway under Alternative A14 would impact the on-airport rental car facilities, the Park and Ride/overflow public parking lots, the General Aviation-Federal Inspection Service facility, and the leaseholds of Autec Range Services and Galaxy Aviation. The protection of the approaches to both ends of this new runway would likely result in additional impacts to off-airport facilities.

Alternative A16 impacts all of the facilities located south of Runway 9R-27L similar to Alternative A10. The realigned crosswind runway would also affect the ARFF building and restrict development on the Town of Golfview property. The approach to the two new runways would likely require the relocation of the Hilton Hotel and the Palm Beach County Building located southeast of PBIA.

Relative Development Costs: Both the direct and indirect development costs associated with the implementation of each airfield alternative were assessed in relative terms. Alternatives 1 and 2 have low direct and indirect costs relative to the sixteen airfield alternatives identified. Alternatives A3, A4, A5, A6, A7, A13, A14, and A15 have moderate indirect development costs. Alternatives A8, A9, A10, A11, A12, and A16 have high direct implementation costs.

The indirect costs associated with Alternatives A3, A4, A12, A14, and A15 were moderate relative to the other airfield alternatives. Alternative A13, like Alternatives A1 and A2, had low indirect development costs. The indirect development costs for all other alternatives were high.

Environmental and Community Impact Considerations: The effect on land uses was also qualitatively assessed during the screening process. Specifically, it was analyzed whether the proposed airfield reconfiguration resulted in new land uses and/or increases or decreases in non-compatible land uses based on existing conditions. As expected, Alternative A1 resulted in no change to the existing land uses. Only Alternative A2 provided a decrease in non-compatible land uses. Alternatives A3, A4, A5, and A6 appear to result in an increase in non-compatible land uses. Alternatives A7 through A16 create new or alternate land uses.

In addition, the identification of potential environmental remediation was noted during this initial screening of alternatives. Except for Alternatives A11, A12, A13, A14, and A15, there is no known or anticipated environmental remediation required within the areas proposed for the development of new or extended runway systems.

Table V-2 summarizes the screening of the sixteen airfield alternatives identified for PBIA. Based on this initial screening, Airfield Alternatives A1 and A3 were recommended for further refinement and evaluation.

5.5.2 Screening of Terminal Alternatives

The 17 terminal alternatives, including the derivative schemes, were also subjected to the screening criteria previously presented. While the same set of screening criteria was utilized, the basis for the assessment of terminal development layouts considered facility characteristics in lieu of the aircraft processing capabilities analyzed under the screening of airfield alternatives. A summary of the screening of terminal alternatives is provided below.

Table V-2
Screening of Airfield Alternatives

	AIRFIELD ALTERNATIVES															
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16
Operational Efficiency																
Adequate for PAL 2																
Inadequate for PAL 2																
Constructability/Physical Characteristics																
Facilities Required to be Relocated																
None																
Terminal/Concourses																
Cargo Facilities																
GA/FBO Facilities																
FAA/NavAids																
Other																
Operational Changes Required During Construction																
Yes (Y)/No (N)	N	Y	Y	N	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N
Relative Development Costs																
Direct																
Low (L)/Moderate (M)/High (H)	L	L	M	M	M	M	M	H	H	H	H	H	M	M	M	H
Indirect																
Low (L)/Moderate (M)/High (H)	L	L	M	M	H	H	H	H	H	H	H	M	L	M	M	H
Environmental & Community Impact Considerations																
Land-uses Relative to Existing																
No Change																
New																
Increase																
Decrease																
Potential Environmental Remediation																
Yes (Y)/No (N)	N	N	N	N	N	N	N	N	N	N	Y	Y	Y	Y	Y	N
Conclusions																
Eliminated from Further Consideration																
Refine and Evaluate																

Source: Ricondo & Associates, Inc.

Operational Efficiency: the assessment of operational efficiency for each of the terminal alternatives was performed using two principal parameters: average walking distance and curbside capacity. The average walking distance associated with each terminal alternative was defined as the distance (in linear feet) from the midpoint of the terminal curbside to the furthest aircraft gate. The assessment of curbside capacity was limited to the verification of the adequacy or inadequacy of the proposed terminal facility's ability to provide the necessary curbside for satisfying PAL 2 demand. Except for Alternative T10, all of the proposed terminal layouts have the ability to provide sufficient capacity for serving the curbside requirements associated with PAL 2.

The average walking distance for the various terminal alternatives ranged from approximately 435 feet to 2,033 feet. The lower boundary, 435 feet, was provided by Alternative T9A. The 2,033-foot average walking distance was associated with Alternative T7. In comparison, the existing terminal building possesses an average walking distance of 970 feet. A summary of the average walking distance for each terminal alternative is presented in **Table V-3**.

Table V-3

Average Walking Distance – Midpoint of Inner Curb to Furthest Gate

<u>Terminal Alternative</u>	<u>Average Walking Distance (Feet)*</u>
T1	1,033
T2A	1,000
T2B	1,000
T2C	1,000
T3A	1,025
T3B	1,050
T4A	1,375
T4B	850
T5	875
T6A	1,200
T6B	935
T7	2,033
T8A	500
T8B	500
T9A	435
T9B	600
T10	700
T11	1,770
T12	1,200
T13	925
T14	975
T15	900
T16	800
T17	1,300

* Estimated from Autocadd exhibits

Source: Ricondo & Associates, Inc.

Walking distances have become one of the more important level of service parameters guiding terminal planning and programming in airports throughout the country. Walking distances in some airport terminals, particularly those having a significant share of connecting traffic, have become quite long, exceeding 1,500 feet. This has been considered unacceptable and has prompted the introduction of terminal layout schemes that either minimize and/or reduce the discomfort of long walking distances by introducing mechanical people-mover systems (e.g., moving walkways, above ground train systems, etc.). Unassisted passenger walking distances of 800 feet to 1,000 feet,

excluding distances associated with mechanical people-mover systems, have become an acceptable planning metric in the aviation industry.

In addition to assessing the average walking distance and curbside capacity for each terminal alternative, the proposed terminal facility layout represented by each alternative was judged in terms of its compatibility with the two short-listed airfield alternatives. While many of the terminal alternatives offer acceptable average walking distances and adequate curbside capacity, several of the terminal layouts identified offer development patterns that are more compatible with the airfield alternatives that were not short-listed. Since the two short-listed airfield alternatives represent the more conservative airfield configuration schemes relative to the total group of airfield alternatives identified, the terminal alternatives that appear most feasible and compatible with the two short-listed airfield alternatives and those that expand upon the existing terminal building and concourses. As such, Alternatives T1, T2A, T4B, T5, T6A, T6B, T6C, T7, T9A, T9B, T10, T11, T13, and T14 represent the terminal alternatives that are compatible with the short-listed airfield alternatives. Alternatives T1, T6B, and T6C assume future terminal development would occur to the west. Under these alternatives, Concourse A is replaced with an air carrier (all loading bridge equipped gates) concourse. A replacement commuter terminal (optional) could be constructed east of Concourse C, in the area presently occupied by the east commercial loop. Conversely, Alternatives T2A, T10, T13, and T14 assume future terminal development would occur east of Concourse C.

Alternative T6A provides terminal development in both directions (west of Concourse B and east of Concourse C). Terminal Alternatives T4B, T5, T7, T9A, T9B, and T11 suggest more aggressive development patterns with either unit terminals or replacement concourses and terminal facilities north of Belvedere Road or in the Town of Golfview property.

Constructability/Physical Characteristics: A qualitative assessment of the required facility relocation associated with each terminal alternative was also performed in order to identify the direct impacts related to each alternative and the resulting indirect development costs. Of the 25 terminal alternatives (i.e., 17 terminal layouts plus eight derivative schemes), Alternatives T4A and T4B have the fewest impacts to existing facilities. However, the proposed people mover system providing a linkage between the remote concourse and existing terminal building will affect Runway 13-31 during construction (if an underground system is implemented) or on a permanent basis (if an above ground system is constructed). Alternatives T5 and T11, which propose a unit terminal in the Town of Golfview property, offer minimal disruption, as well, without the effects associated with the people mover system proposed with the prior alternatives. However, as will be discussed later, the additional investment in ancillary terminal facilities (e.g., access roadway, parking, passenger processing functions, etc.) which are necessary to support operations in the unit terminal, largely offset the benefits gained from reduced facility impacts.

Alternatives T1, T6B, and T6C require the relocation of facilities currently located within the 8th Street loop. The optional commuter concourse affects the east commercial loop and requires the relocation of the employee parking lot. Alternatives T2A, T2B, T2C, T3A, T3B, T10, T13, and T14 impact the employee parking lot and the Park and Ride/overflow parking lots. These alternatives also require the realignment of the terminal roadway and the restoration of the overnight aircraft parking positions that exist east of Concourse C. In addition, Alternatives T2B and T2C impact Runway 9L-27R and its north parallel taxiways. Similarly, Alternatives 3A and 3B impact Runway 13-31 and its north parallel taxiways.

Alternative 6A, which expands the terminal facilities in both directions, east and west of the terminal building, have the same facility impacts as Alternatives T1 and T2A.

Alternatives that consider the replacement of the existing terminal facilities, such as Alternatives T7, T8A, T9A, and T9B, impact the existing terminal roadway, short-term and long-term public parking facilities, and the facilities located within the 8th Street loop. Alternative T8A also impacts Runways 13-31 and 9L-27R. Similarly, Alternative T8B impacts the existing airfield.

Alternative T12, representing a replacement terminal and concourses on the east side of the Airport, impacts the cargo facilities, on-airport rental car facilities, Park and Ride/overflow parking lots, the existing terminal roadway, and Runway 9L-27R.

Terminal Alternatives T15, T16, and T17, proposing either a remote concourse, unit terminal, or replacement terminal on the south side of the Airport, impact PBIA's two primary runways, Runway 13-31 and Runway 9L-27R. Other facility impacts resulting from these alternatives include the General Aviation-Federal Inspection Service facility and most, if not all, of the fixed base operator leaseholds.

Relative Development Costs: As expected, many of these terminal alternatives have significant direct and indirect development costs. When evaluated in relative terms, Alternatives T4A, T4B, T5, T7, T8A, T8B, T9A, T9B, T11, T12, T16, and T17 have higher direct costs due in great part to the ancillary facility development needed to support the new terminal or remote terminal operations. Alternatives T6A, T10, and T15 represent moderate direct development costs. All other alternatives have relatively low direct development costs.

Indirect development costs were lower for Alternatives T5 and T14 than any of the other alternatives. Alternatives T1, T2A, T4A, T4B, T6A, T6B, T6C, T10, and T13 have moderate indirect development costs. The remaining alternatives have high indirect costs relative to the other alternatives due in large part to the off-airport land that would have to be acquired and/or the relocation costs and facility impacts previously discussed.

Environmental and Community Impact Considerations: Only a few of the terminal alternatives identified require the acquisition of property not currently owned by the County. Alternatives T7, T8A, T9A, and T10 represent those alternatives requiring land acquisition.

As with some of the airfield alternatives previously presented, a few terminal alternatives propose facility development on land parcels that could potentially require environmental treatment and/or remediation. These include Alternatives T4A, T5, T9A, T9B, and T12. Additional environmental analysis and field testing is required in order to confirm the need and quantify the extent of any environmental actions necessary prior to or conjunction with the implementation of any of these alternatives.

Table V-4 summarizes the screening of the terminal development alternatives identified for PBIA. Based on this initial screening, Alternatives T1, T2A, T6A, T6B, T6C, T13 and T14 were recommended for further refinement and evaluation.

Table V-4
Screening of Terminal Alternatives

Compatible With Viable Airfield Alternative Yes (Y)/No (N)	T1	T2A	T2B	T2C	T3A	T3B	T4A	T4B	T5	T6A	T6B	T6C	T7
	Y	Y	N	N	N	N	Y	Y	Y	Y	Y	Y	Y
Operational Efficiency													
Curbfront Capacity	●	●	●	●	●	●	●	●	●	●	●	●	●
Adequate													
Inadequate													
Other													
Existing Airfield Access (Y/N)	Y	Y	Y	Y	Y	Y	N	N	N	Y	Y	Y	Y
Constructability/Physical Characteristics													
Facilities Required to be Relocated													
None								●					●
Terminal/Concourses													
Cargo Facilities			●	●	●	●							
Runways/Taxiways			●										
GA/FBO Facilities													
FAA/Navajds													
Other	●	●	●	●	●	●	●		●	●	●	●	●
Operational Changes Required During Construction Yes (Y)/No (N)	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Relative Development Costs													
Direct													
Low (L)/Moderate (M)/High (H)	L	L	L	L	L	L	H	H	H	M	L	L	H
Indirect													
Low (L)/Moderate (M)/High (H)	M	M	H	H	H	H	M	M	L	M	M	M	H
Environmental & Community Impact Considerations													
Potential Environmental Remediation Yes (Y)/No (N)/Not Determined(ND)	N	N	N	N	N	N	ND	N	ND	N	N	N	N
Land Acquisition Required Yes (Y)/No (N)	N	N	N	N	N	N	N	N	N	N	N	N	Y
Conclusions													
Eliminated from Further Consideration	●	●	●	●	●	●	●	●	●	●	●	●	●
Refine and Evaluate													

Source: Ricordo & Associates, Inc.

Table V-4 (continued)
Screening of Terminal Alternatives

	TERMINAL DEVELOPMENT ALTERNATIVES											
	T8A	T8B	T9A	T9B	T10	T11	T12	T13	T14	T15	T16	T17
Compatible With Viable Airfield Alternative												
Yes (Y)/No (N)	N	N	Y	Y	Y	Y	N	Y	Y	N	N	N
Operational Efficiency												
Curbfront Capacity												
Adequate	●	●	●	●		●	●	●	●	●	●	●
Inadequate					●							
Other												
Existing Airfield Access (Y/N)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y
Constructability/Physical Characteristics												
Facilities Required to be Relocated												
None												
Terminal/Concourses	●	●	●	●								
Cargo Facilities							●					
Runways/Taxiways	●	●					●					
GA/FBO Facilities												
FAA/NavAids		●										
Other	●	●	●	●	●	●	●	●	●	●	●	●
Operational Changes Required During Construction												
Yes (Y)/No (N)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y
Relative Development Costs												
Direct												
Low (L)/Moderate (M)/High (H)	H	H	H	H	M	H	H	L	L	M	H	H
Indirect												
Low (L)/Moderate (M)/High (H)	H	H	H	H	M	H	H	M	L	H	H	H
Environmental & Community Impact Considerations												
Potential Environmental Remediation												
Yes (Y)/No (N)/Not Determined(ND)	N	N	ND	ND	Y	ND	Y	N	N	N	N	N
Land Acquisition Required												
Yes (Y)/No (N)	Y	N	Y	N	N	Y	N	N	N	N	N	N
Conclusions												
Eliminated from Further Consideration	●	●	●	●	●	●	●	●	●	●	●	●
Refine and Evaluate												

Source: Ricardo & Associates, Inc.

5.5.3 Cargo Development Alternatives

The eight cargo alternatives identified for PBIA were similarly assessed qualitatively in order to obtain an initial evaluation of each alternative in relation to each other. In general, the magnitude of facility impacts and development costs are significantly lower than those associated with the airfield and terminal alternatives. This was expected since the extent of cargo facility development is much lower than that proposed under the various airfield and terminal alternatives, particularly when the ancillary facilities (e.g., taxiways, auto parking, access roadways, etc.) are included. Nonetheless, by analyzing the merits of each cargo development alternative in relation to each other using the screening criteria adopted under this study, the selection of a preferred development pattern for future cargo handling and processing capacity is facilitated.

The results of the screening of the cargo development alternatives using the pre-defined criteria are summarized below.

Operational Efficiency: Like the terminal alternatives, each of the cargo development alternatives was assessed to evaluate their compatibility with the two short-listed airfield alternatives. All of the cargo alternatives, except for Alternatives C4 and C5, provide a facility development scheme that is compatible with the short-listed airfield alternatives. Even though compatibility with the short-listed terminal alternatives was not performed as part of the initial screening, it is evident that some of the cargo alternatives would overlap land parcels proposed for terminal facility development under some of the terminal alternatives.

The operational efficiency of each alternative was also assessed from an airfield access perspective. Specifically, the potential for direct airfield access was analyzed. If direct airfield access did not appear feasible, then the ability to access the airfield via a roadway crossing/bridge structure was assessed. The results of this analysis indicated that seven of the eight cargo alternatives possess the potential for having direct access to the airfield, since the proposed location for each alternative is adjacent to existing taxiway systems. Alternative C1, which represents a landside belly cargo facility east of Building 1475, does not have the potential for directly accessing the airfield, unless a portion of the detention pond located to the south can be re-established to allow for the extension of Taxiway M. Alternative C4 is viable with the existing airfield, however, access to the Runway 9L would require crossing the approach for the Runway 9R-27L that could potentially restrict the capacity of this general aviation runway. Development, as shown under Alternative C4, would be limited with the Airfield Alternative A3.

Alternative C6, which proposes cargo development within the Town of Golfview property, offers the potential for direct airfield access. However, as with any aviation-related development proposed within the Town of Golfview property, accessibility to the airfield will require, as a minimum, a bridge structure over the Airport West Canal at one or multiple locations.

Constructability/Physical Characteristics: In comparison to many of the other development alternatives identified for the airfield and terminal facilities, the cargo development alternatives provide much less significant impacts to existing airport facilities. This is due, for the most part, to two primary reasons. First, the footprint for development is much smaller for the cargo component than that associated with the airfield and terminal facilities. Second, many of the sites identified for future cargo expansion and/or development do not presently accommodate any airport facilities (e.g., the Town of Golfview) as proposed under Alternative C6. Other examples of relatively vacant sites include the areas adjacent to Building 1475, as proposed under Alternatives C1, C2, and C3, which

currently functions as either public or tenant surface parking lots, and that adjacent to the 391st Bomb Squadron Restaurant, as proposed under Alternative C4. However, as previously discussed, although the facility impacts associated with these alternatives is minimal, they do require the construction of access systems (i.e., taxiways, roadways, etc.), which may result in indirect impacts to other airport facilities.

Nonetheless, there are some alternatives that do have direct impacts on existing facilities. For example, Alternative C5 impacts the Jet Aviation leasehold, thus requiring the relocation of that tenant. This impact may be significant given the recent investment made by Jet Aviation in the development of new aircraft hangars and the expansion of its apron areas. Alternatives C7 and C8 result in extensive impacts to facilities located within the 8th Street loop. However, since many of these facilities are relatively old structures (i.e. more than 15 years), some of which are even vacant at the present time, the replacement of these structures with new demand-driven cargo structures may be acceptable. In addition, Alternative C7 will require the identification of an alternate site for the New Maintenance Compound.

Relative Development Costs: Based on the facility impacts described above, most of the development costs for these cargo development alternatives are low or moderate relative to the airfield and terminal alternatives. Except for Alternatives C6 and C7, the cargo development alternatives have low direct implementation costs. However, although most of the alternatives have low direct development costs, the indirect costs for all alternatives, except Alternative C6, are moderate. This is due to the ancillary facilities that are required to support the proposed cargo development (e.g., taxiways, roadways, etc.).

Environmental and Community Impact Considerations: None of the proposed cargo alternatives appear to cause any additional community effects to those presently associated with the Airport. Environmental impact considerations were identified for Alternative C3, since the subsurface conditions of the gravel surface lot may require treatment based on the activities conducted on the site (e.g., aircraft maintenance) several years ago when more conscious environmental considerations were not as prevalent. In addition, Alternative C6 requires further analysis in order to assess whether any environmental treatment will be required prior to the construction of any facilities in the Town of Golfview property.

Table V-5 summarizes the screening of the cargo development alternatives. Based on this initial screening, Alternatives C2, C3, and C6 were recommended for further refinement and evaluation.

5.5.4 General Aviation/Fixed Base Operator Facility Alternatives

The screening of the seven general aviation/FBO facility development alternatives provided similar results to those obtained from the screening of cargo alternatives in terms of the extent of facility impacts and the magnitude of implementation costs. The additional general aviation facilities necessary for accommodating the PAL 2 demand levels represent modest footprints of development in comparison to those associated with the future airfield and terminal facility requirements. The results of the screening of general aviation/FBO facility development alternatives are described below.

Operational Efficiency: With the existing airfield, which represents one of the short-listed airfield alternatives, six of the seven general aviation/FBO facility alternatives provide compatible development patterns. Alternative G1 is not compatible with the existing airfield since, it impacts

Table V-5

Screening of Cargo Alternatives

	Cargo							
	<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>C4</u>	<u>C5</u>	<u>C6</u>	<u>C7</u>	<u>C8</u>
Compatible With Viable Airfield Alternative								
Yes (Y)/No (N)	Y	Y	Y	Y	Y	Y	Y	Y
Operational Efficiency								
Airfield Access								
Direct Airfield Access	●	●	●		●	●	●	●
Roadway Crossings								
Runway Crossings				●				
Constructability/Physical Characteristics								
Facilities Required to be Relocated								
None						●		
Terminal/Concourses								
Cargo Facilities								
Runways/Taxiways								
GA/FBO Facilities					●			
FAA/NavAids				●				
Other	●	●	●	●			●	●
Operational Changes Required During Construction								
Yes (Y)/No (N)	N	N	N	N	Y	N	N	N
Relative Development Costs								
Direct								
Low (L)/Moderate (M)/High (H)	L	L	L	L	L	M	M	L
Indirect								
Low (L)/Moderate (M)/High (H)	M	M	M	M	M	L	M	M
Environmental & Community Impact Considerations								
Potential Environmental Remediation								
Yes (Y)/No (N)/Not Determined (ND)	Y	N	Y	N	N	ND	N	N
Land Acquisition Required								
Yes (Y)/No (N)	N	N	N	N	N	N	N	N
Conclusions								
Eliminated from Further Consideration	●			●	●		●	●
Refine and Evaluate		●	●			●		

Source: Ricondo & Associates, Inc.

Runway 9R-27L. When the other short-listed airfield alternative is considered, Alternative A3, general aviation/FBO facility alternatives G1, G3, and G4 do not offer development opportunities that are compatible.

Airfield access characteristics were also assessed in the same manner as the cargo alternatives. Alternatives G1, G2, G4, and G5 provide future facility layouts on sites that are currently located adjacent to the airfield, thus confirming the availability of, or opportunity for, direct airfield access. Alternatives G3A and G3B, which represent development opportunities on adjacent land located off airport property, would require an elevated crossover bridge for either vehicular traffic or taxiing aircraft or the relocation of a portion of Military Trail to the west. In addition, development on these sites would be impaired by the proposed widening of Southern Boulevard and the associated elevated interchange proposed at the intersection of Southern Boulevard and Military Trail.

Alternative G6 also offers the potential for direct airfield access. However, as previously mentioned during the screening of cargo alternatives, accessibility to the airfield will require, as a minimum, a bridge structure over the Airport West Canal at one or multiple locations.

Constructability/Physical Characteristics: Many of the general aviation/FBO alternatives have minimal impacts on existing facilities, since they present development opportunities on vacant land or sites that have been historically preserved for the expansion of general aviation/FBO facilities. Alternatives G2, G4, and G6 are development alternatives that do not displace any existing facilities.

Conversely, Alternatives G3A and G3B have significant impacts on the commercial businesses presently located on these off-airport land parcels. In addition, the acquisition of this property and integration with the other Airport facilities would be required in order to implement either of these alternatives.

Alternative G1, as previously mentioned, displaces the general aviation runway. This is a significant impact, since this general aviation runway serves most of the small single engine and twin engine aircraft operating to and from PBIA, thus freeing up the two commercial runways for the air carrier and cargo operations. This runway is also effective in consolidating all of PBIA's general aviation activities on the south side of the Airport, thus minimizing the interaction between the smaller aircraft and the larger commercial jets. The consolidation of general aviation activity to the south side of the Airport helps avoid general aviation aircraft crossing Runway 9L-27R, which in turn would have an adverse effect on the processing capabilities of PBIA's airfield.

Alternative G5 has the largest effect on existing facility displacement, since it requires the relocation or demolition of the older facilities located within the 8th Street loop. In addition, an alternate site for the New Maintenance Compound would be required for the implementation of this alternative.

Relative Development Costs: Most of the alternatives identified for future general aviation/FBO facility growth are characterized by moderate level direct development costs. Alternative G1's moderate direct costs are primarily associated with the displacement of Runway 9R-27L. Alternatives G3A and G3B will require land acquisition, thus making its direct implementation costs high. Similarly, the direct costs for the implementation of Alternative G5 are assessed as moderate due to the significant displacement of facilities.

The indirect costs associated with ancillary facilities supporting the proposed development site are predominantly moderate for the seven alternatives. Only Alternatives G1, G2, and G4 have low

indirect implementation costs due primarily to the adjacency of the proposed development to the airfield.

Environmental and Community Impact Considerations: Similar to the cargo development alternatives previously discussed, most of the alternatives for future general aviation/FBO development, except for Alternatives G3A and G3B, do not appear to cause any additional community effects from those presently associated with the Airport. As mentioned above, Alternatives G3A and G3B will require additional land acquisition to the west of Military Trail, which will result in some community impacts (e.g., new land uses).

In addition, none of the sites proposed for future general aviation/FBO facilities that are presently located within the Airport's boundaries are anticipated to require any environmental mitigation. Potential environmental considerations for Alternatives G6 (located within the Town of Golfview), G3A, and G3B were not determined as part of the screening process, since further analysis on this recently acquired property and off-airport sites is necessary in order to assess whether any environmental treatment or remediation will be required. The DOA has already initiated an environmental assessment for the Town of Golfview property, which will further evaluate the environmental and community impacts, if any, that must be mitigated prior to the construction of any facilities.

Table V-6 summarizes the screening of the general aviation/FBO development alternatives. Based on this initial screening, Alternatives G2 and G6 were recommended for further refinement and evaluation.

5.5 Refinement of Short-Listed Alternatives

The refinement of the short-listed alternatives identified through the initial screening process was performed to better define the physical characteristics of each alternative and facilitate the quantitative evaluation process that will serve to select the preferred development alternative for each airport component (i.e., airfield, terminal, cargo, general aviation/FBO). The refinement included the integration of the short-listed alternatives and detailing the facility layout schemes identified for satisfying the PAL 2 facility requirements to reflect geometric standards and recommended clearances prescribed by the FAA under Advisory Circular 150/5300-13 (Change 5). The detailing of these development alternatives also serves to assess the compatibility among the proposed (future) development and existing facilities.

The following sub-sections further describe the refinement process applied to the short-listed alternatives for each airport component.

5.6.2 Airfield Refinements

The refinement of Airfield Alternatives A1 and A3 include the definition of geometric characteristics for the proposed airfield. These geometric characteristics comprise runway length requirements; runway and taxiway geometry; and vertical, horizontal, and approach clearances for Group V aircraft. It further includes the identification of airfield construction impacts.

For Alternatives A1 and A3, Group V taxiways and taxilanes were delineated for access to and from the Terminal area. As such, the clearances shown in the refined airfield alternatives reflect the following dimensions:

Table V-6**Screening of General Aviation/FBO Alternatives**

	General Aviation/Fixed Base Operator						
	G1	G2	G3A	G3B	G4	G5	G6
Compatible With Viable Airfield Alternative							
Yes (Y)/No (N)	N	Y	Y	Y	Y	Y	Y
Operational Efficiency							
Airfield Access							
Direct Airfield Access	●	●		●	●	●	●
Roadway Crossings			●	●			
Runway Crossings							
Constructability/Physical Characteristics							
Facilities Required to be Relocated							
None			●	●			●
Terminal/Concourses							
Cargo Facilities							
Runways/Taxiways	●						
GA/FBO Facilities							
FAA/Nav aids		●					
Other		●			●	●	
Operational Changes Required During Construction							
Yes (Y)/No (N)	N	N	N	N	N	N	N
Relative Development Costs							
Direct							
Low (L)/Moderate (M)/High (H)	M	L	H	H	L	M	L
Indirect							
Low (L)/Moderate (M)/High (H)	L	L	M	M	L	M	M
Environmental & Community Impact Considerations							
Potential Environmental Remediation							
Yes (Y)/No (N)/Not Determined (ND)	N	N	ND	ND	N	N	ND
Land Acquisition Required							
Yes (Y)/No (N)	N	N	Y	Y	N	N	N
Conclusions							
Eliminated from Further Consideration	●		●	●	●	●	
Refine and Evaluate		●					●

Source: Ricondo & Associates, Inc.

• Taxiway Object Free Area Width	=	160 feet
• Taxiway Centerline to Parallel Taxiway/Taxilane Centerline	=	267 feet
• Taxilane Object Free Area Width	=	138 feet
• Taxilane Centerline to Taxilane Centerline	=	245 feet

In addition, the proposed location for the future parallel runway depicted in Alternative A3 was analyzed to identify the location that optimizes operational benefit with minimal impacts to existing tenant leaseholds. Three locations for the future runway relative to existing Runway 9L-27R were evaluated. All three locations (measured in terms of runway centerline to runway centerline separation) reflect the location of the future runway south of Runway 9L-27R as further described below.

- Location 1 (Alternative a-3A) represents the location of the future parallel runway 700 feet south of Runway 9L-27R. This separation is also the centerline to centerline separation that exists between Runway 9L-27R and the existing general aviation runway, Runway 9R-27L. Therefore, the future parallel runway would reflect upgrading (in terms of runway lengthening and widening in addition to pavement strengthening/reconstruction to handle increased loads) the existing general aviation runway to an air carrier runway.
- Location 2 (Alternative A-3B) considers the location of the future runway 800 feet south of Runway 9L-27R. The 100-foot increase relative to Location 1 allows for the construction of a full-length parallel taxiway centered between the two parallel runways. The 400-foot runway centerline-to-taxiway centerline separation is required for airfield systems designed to accommodate operations by Group V aircraft and smaller.
- Location 3 (Alternative A-3C) provides for a runway to runway separation of 1,000 feet. The additional 200-foot separation allows for an increase in the hold and queue capacity between the two runways to help reduce runway occupancy times and possibly provide additional throughput capacity for the future parallel runway.

Advisory Circular 150/5300-13 prescribes a minimum separation of 700 feet for simultaneous landings and takeoffs using visual flight rules. However, at a 700-foot separation, an aircraft with an overall length in excess of 200 feet that is holding/queuing between the two parallel runways (either for departure clearance or to cross Runway 9L-27R following an arrival on the south parallel runway) would penetrate at least one of the runway safety areas. Representative aircraft having an overall length exceeding 200 feet include the Boeing 747 and 767-300, McDonnell Douglas MD11, and the Airbus A330 and A340. The inability to queue these larger aircraft between the two runways results in an operational disadvantage for a parallel runway layout having a 700-foot separation.

The 800-foot separation, which as previously described, allows for the placement of a full-length parallel taxiway located at a 400-foot separation from either runway, would allow for Group V operations on the future south parallel runway. The Advisory Circular recommends a runway centerline to runway centerline of 1,200 feet for Group V aircraft, however, the 800-foot separation would provide adequate separation requirements for the conditions being modeled for PBIA. An aircraft aligned with the parallel taxiway centerline can have a maximum tail height of 82.5 feet and remain clear of the obstacle free zone's inner transitional surface associated with the parallel runways.

The Advisory Circular also recommends a 600-foot separation between a runway and its parallel taxiway for acute-angled or high-speed runway exits. However, if the traffic flow is in the same direction as the landing, the 400-foot runway centerline to taxiway centerline separation is sufficient.

The 1,000-foot separation allows for a parallel taxiway between the two parallel runways while protecting the long-term potential for Group VI aircraft operations. However, the increased separation also creates a larger impact on the facilities presently located on the south side of the Airport without significantly increasing airfield capacity or operational efficiency given the conditions and aviation activity modeled for PBIA.

The assessment of the three possible locations concluded that the preferred location for the future parallel runway is 800 feet south of existing Runway 9L-27R. The location of the future parallel runway and the parallel taxiway was shifted to the west as much as possible, while maintaining the runway safety area within the existing airport boundaries. The purpose for this westerly shift is to minimize the effects on the Hilton complex and Palm Beach County offices (southeast of the Airport) caused by the approach clearances that must be protected for the future runway.

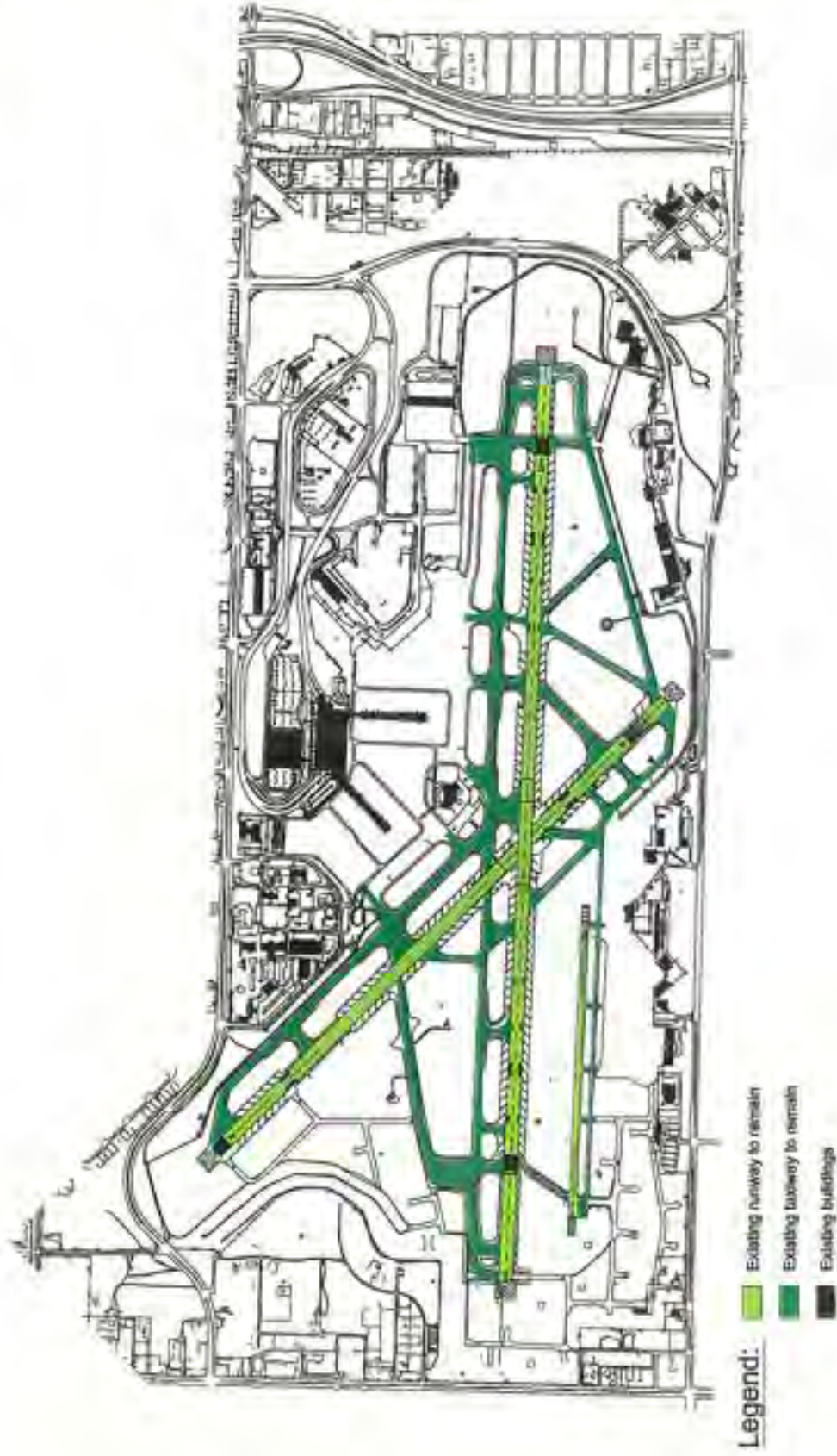
The refined airfield alternatives that were further evaluated are shown in **Exhibits V-57 and V-58**.

5.6.2 Terminal Refinements

The short-listed terminal development alternatives depict growth of the terminal facilities occurring to the northwest of Concourse B and/or east of Concourse C. With these layouts, the existing and future airfield configurations depicted on the refined airfield alternatives will not be impacted by the proposed terminal facility expansion. The short-listed terminal alternatives will only require the expansion of the terminal apron and the realignment of the terminal roadways that will in turn result in impacts to some of the landside ancillary facilities, remote public parking facilities, and employee parking areas.

As part of the refinement process, preliminary aircraft parking schemes were prepared for each short-listed terminal alternative. These aircraft parking schemes were developed using the gate frontage requirements identified for PAL 2 and the ramp chart analysis developed in conjunction with the design day schedule for this planning activity level. To enhance future flexibility in gate utilization and establish uniform facilities that are not user-specific, the Boeing 757-200 was used as the design narrow body aircraft. Similarly, the Boeing 767-300 represented the design wide-body aircraft. In addition, by maintaining the 250-foot apron depth that presently exists around Concourses B and C, the ability to substitute some narrow body or wide body parking positions for larger aircraft remains feasible if the parking angle is adjusted.

The various facilities represented in the refined terminal alternatives reflect the facility requirements previously established for PAL 2. These are summarized below in **Table V-7**.



Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.

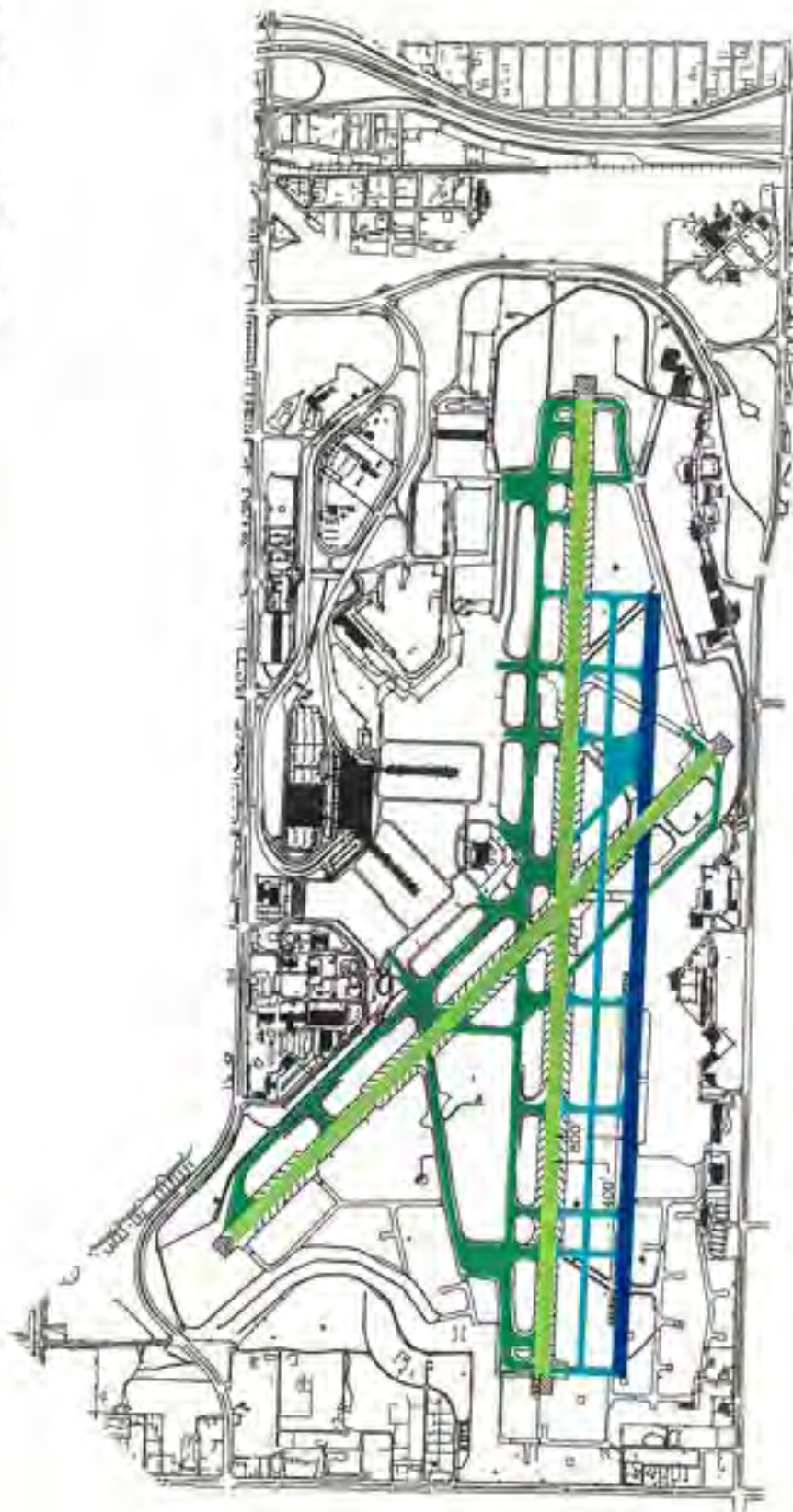
Exhibit V-57.dwg

Strategic Master Planning Study

Exhibit V-57

Short-Term Airfield Alternative
Refined Alternative 1 (PAL 2)

October 2000



Legend:

- ▬ Existing runway to remain
- Existing taxiway to remain
- ▬ New or relocated runway
- New or relocated taxiway
- ▬ Existing buildings
- New or relocated buildings

Source: PBIA Airport Layout Plan
Prepared by: Ricondo & Associates, Inc.



Exhibit V-58.dwg

Exhibit V-58

Long-Term Airfield Refined Alternative 3B (PAL 2)

Strategic Master Planning Study

October 2000

Table V-7**Summary of PAL 2 Terminal Facility Requirements**

<u>Terminal Component</u>	<u>PAL 2 Facility Requirements</u>
Air Carrier Gates	39
Commuter Gates	4
Gate Frontage	7,232 linear feet
Terminal Building	1,162,370 square feet
Terminal Curbfront	2,920 linear feet
Public Parking (Short-Term)	2,250 spaces
Public Parking (Long-Term)	5,120 spaces

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., October 2000

The refined terminal development alternatives are shown in **Exhibits V-59 through V-65**.

5.6.3 Cargo Development Refinements

The refinement of the three short-listed cargo development alternatives included the delineation between the space requirements related to building space, aircraft ramp, truck docks, and automobile parking. The refinement of each alternative using the space requirements of each functional area served to illustrate the site's adequacy for the proposed use. However, it is important to recognize that building and ramp configuration may be influenced by unique tenant needs, as evidenced by the use patterns associated with the existing air cargo facilities (i.e., Building 1475). Therefore, actual development may differ substantially from the facility layouts developed under this study.

Like the refinement of the general aviation/FBO development alternatives, the short-listed cargo alternatives have been detailed to show a delineation between aircraft taxi and parking areas, integration with roadway access and circulation systems, and functional dependencies that exist among the various cargo facility functional areas described above. **Exhibits V-66 through V-68** depict the refined cargo development alternatives that were short-listed through the initial screening process.

5.6.4 General Aviation/FBO Facility Refinements

The general aviation/FBO development alternatives comprise two facility components: (1) new FBO facilities to accommodate the demand associated with PAL 2, and (2) the replacement of existing facilities that may be impacted should the construction of a new air carrier runway, as depicted under Airfield Alternative A3, be implemented. Facility needs were assessed in terms of square footage of hangar space (inclusive of office, storage, and maintenance areas), ramp space, and automobile parking. The refinement of the short-listed general aviation/FBO alternatives included the delineation between taxiing and aircraft parking areas and a facility layout that optimizes land-use, preserves properties adjacent to the airfield for other aviation-related uses, and maintains flexibility for the future utilization of general aviation/FBO facilities.

The refined general aviation/FBO development alternatives short-listed through the initial screening process are presented in **Exhibits V-69 and V-70**.

Palm Beach International Airport



Legend:

- Proposed terminal expansion
- Roadway Realignment
- Taxiway / Taxilane Centerline
- Service Road
- Narrowbody aircraft positions
- Widebody aircraft positions

Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.



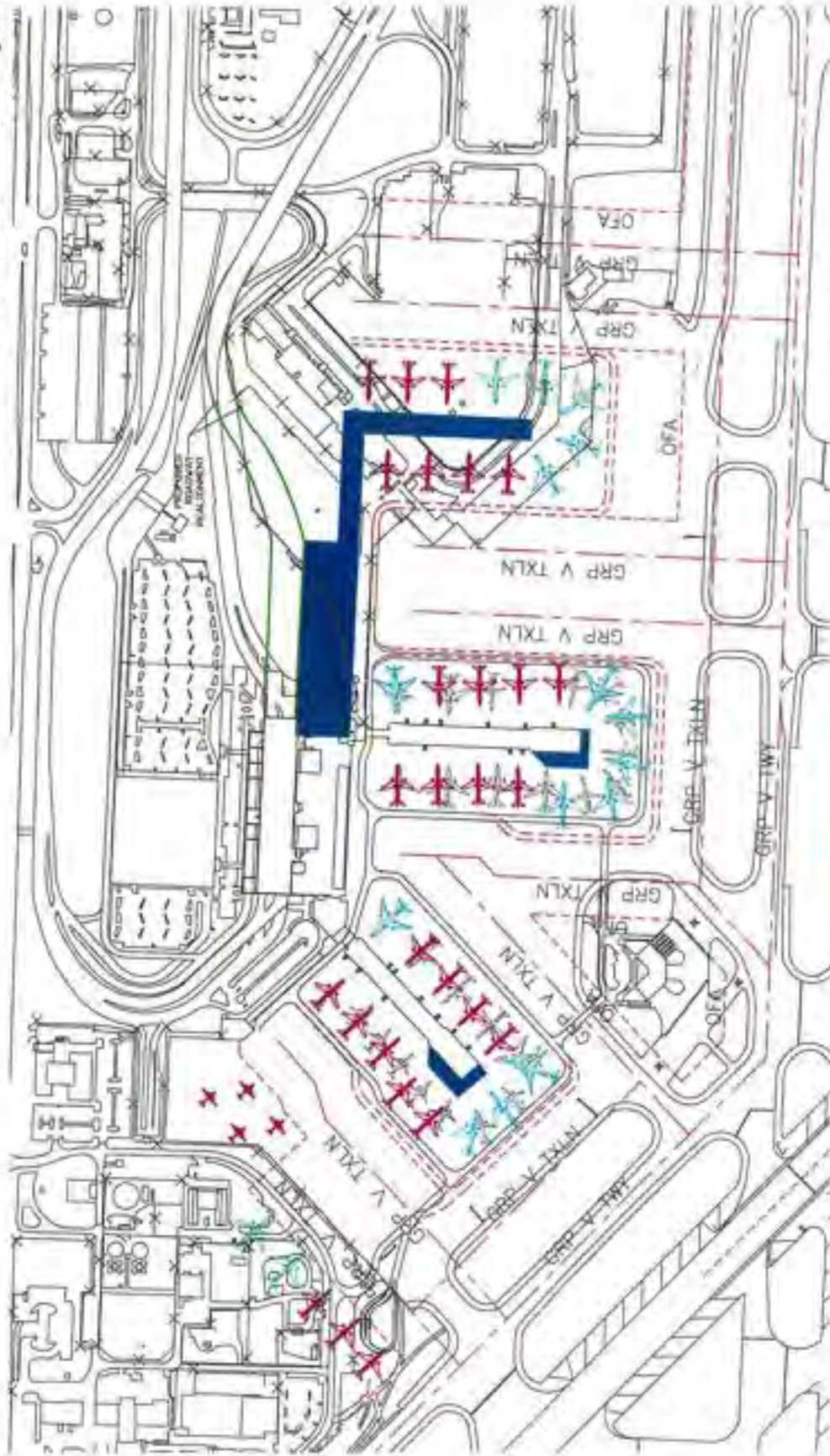
Exhibit V-59

Strategic Master Planning Study

Exhibit V-59

Terminal Development Refined Alternative 1 (PAL 2)

October 2000



Legend:

- Proposed terminal expansion
- Roadway Realignment
- Taxiway / Taxiway Centerline
- Service Road
- ✈ Narrowbody/twin-engine aircraft positions
- ✈ Widebody aircraft positions

Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.



Exhibit_V-60.dwg

Exhibit V-60

**Terminal Development
Refined Alternative 2A (PAL 2)**

Palm Beach International Airport



Exhibit V-61

Terminal Development Refined Alternative 6A (PAL 2)

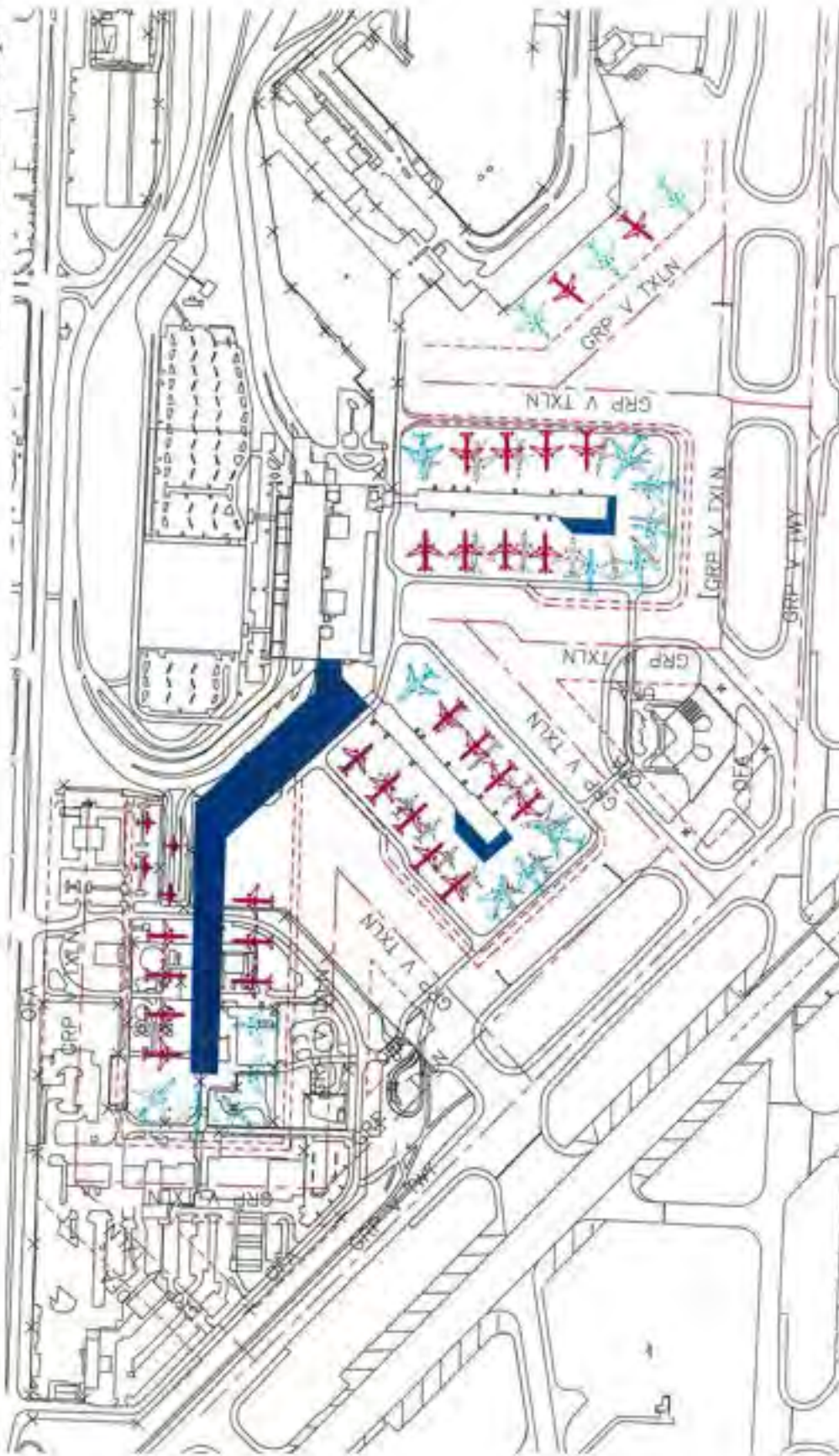


Exhibit V-61.dwg

Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.

Strategic Master Planning Study

October 2000



Legend:

- Proposed terminal expansion
- ✈ Narrowbody aircraft positions
- ✈ Widebody aircraft positions
- Taxiway / Taxiway Centerline
- Service Road

Exhibit V-62



Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.

Exhibit V-62.dwg

Terminal Development Refined Alternative 6B (PAL 2)



Legend:

- Proposed terminal expansion
- Taxiway / Taxiway Centerline
- Service Road

- Narrowbody/commuter aircraft positions
- Widebody aircraft positions

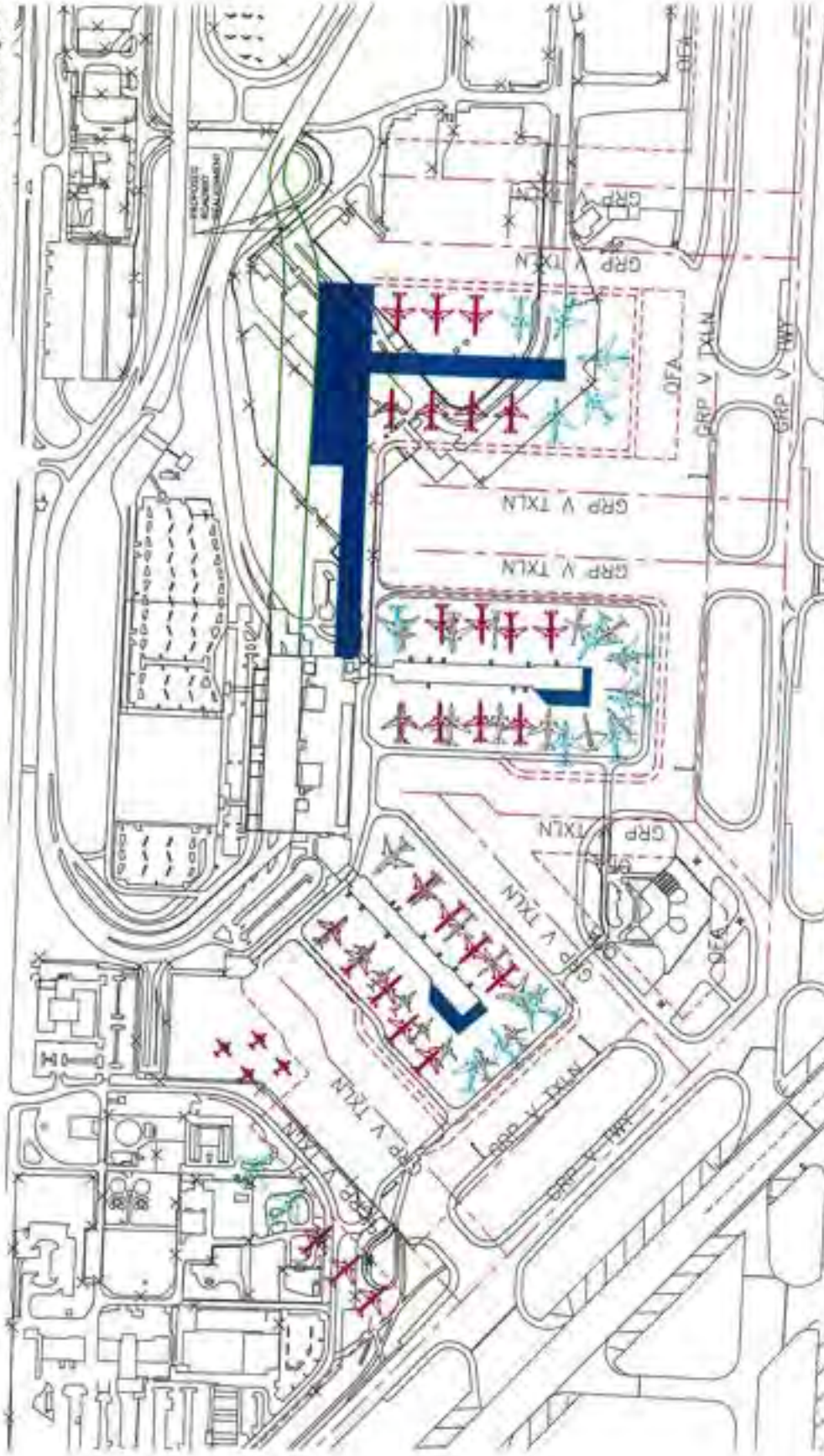
Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.



Exhibit V-63.dwg

Exhibit V-63

**Terminal Development
Refined Alternative 6C (PAL 2)**



Legend:

- Proposed terminal expansion
- Roadway Realignment
- Taxiway / Taxiway Centerline
- Service Road

- Narrowbody/twin-engine aircraft positions
- Widebody aircraft positions

Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.



Exhibit_V-64.dwg

Exhibit V-64

**Terminal Development
Refined Alternative 13 (PAL 2)**



Legend:

- Proposed terminal expansion
- Roadway Realignment
- Taxiway / Taxiway Centerline
- Service Road

- Narrowbody/commuter aircraft positions
- Widebody aircraft positions

Exhibit V-65



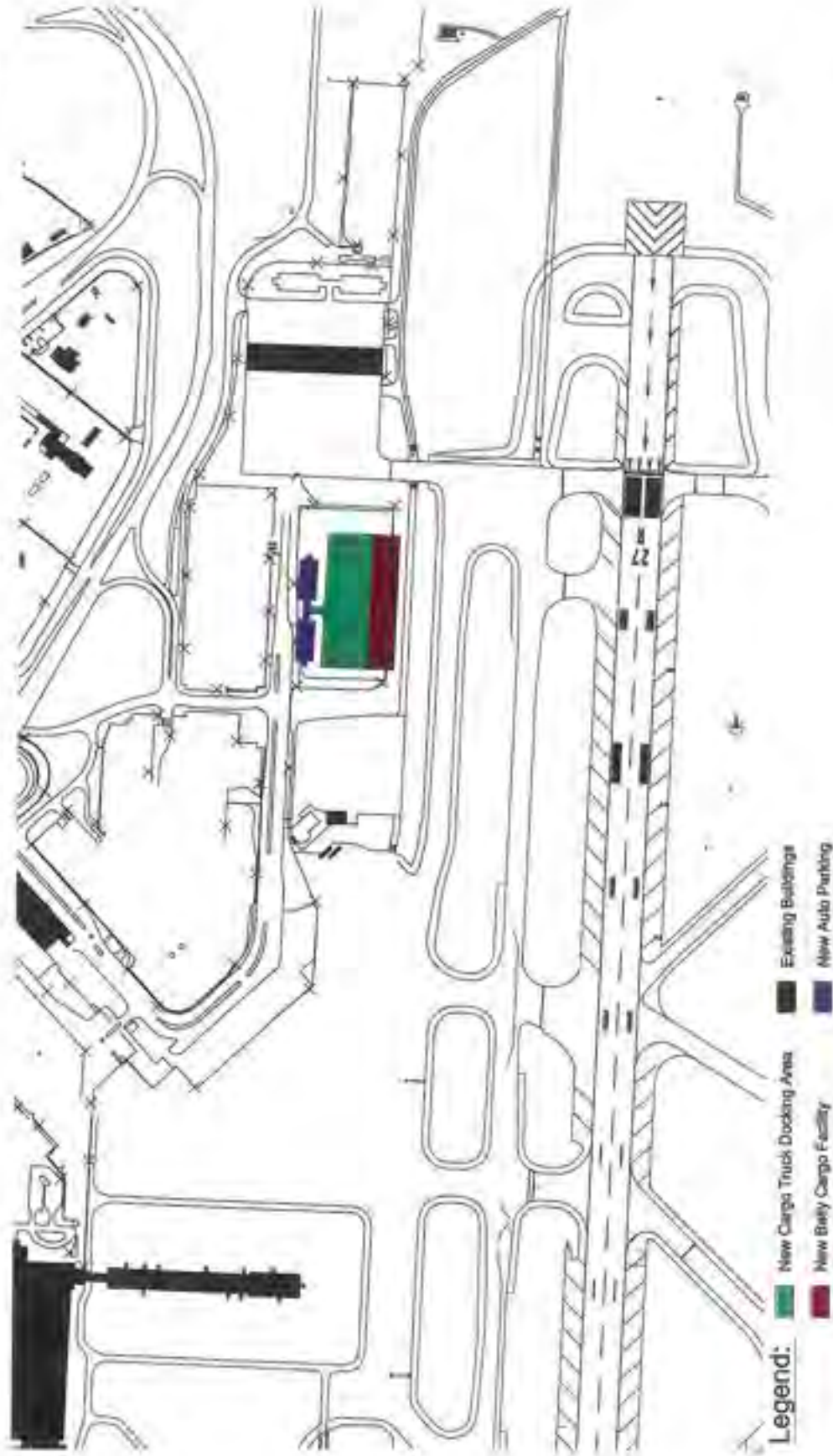
Source: PBIA Airport Layout Plan
Prepared by: Ricomdo & Associates, Inc.

Exhibit V-65.dwg

Strategic Master Planning Study

**Terminal Development
Refined Alternative 14 (PAL 2)**

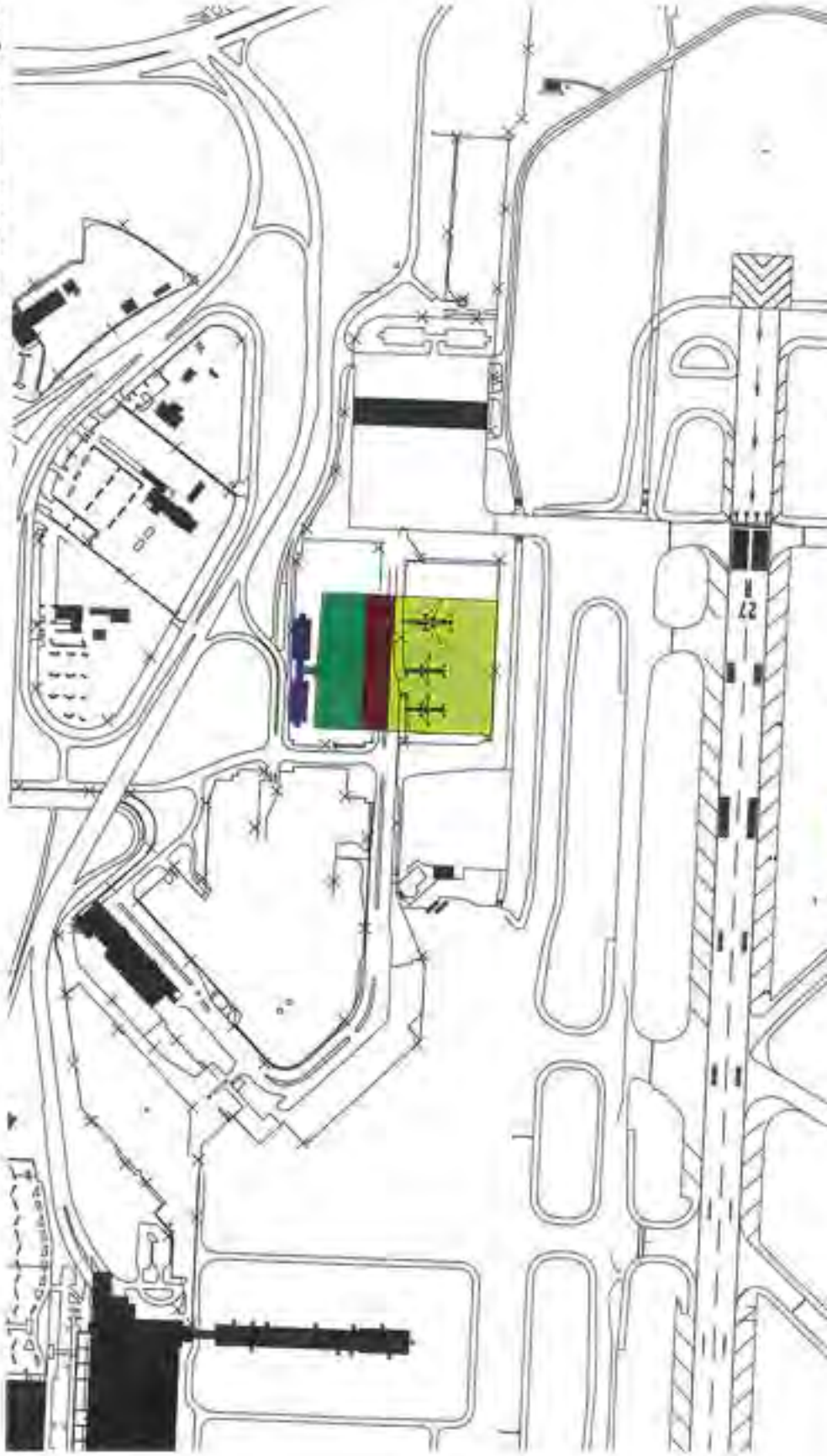
October 2000



Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.

Exhibit V-66

Cargo Facility Development Refined Alternative S8



Legend:

- New Cargo Apron
- New Cargo Truck Docking Area
- New Cargo Warehouse
- Existing Buildings
- New Auto Parking

Sources: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.



Exhibit V-67.dwg

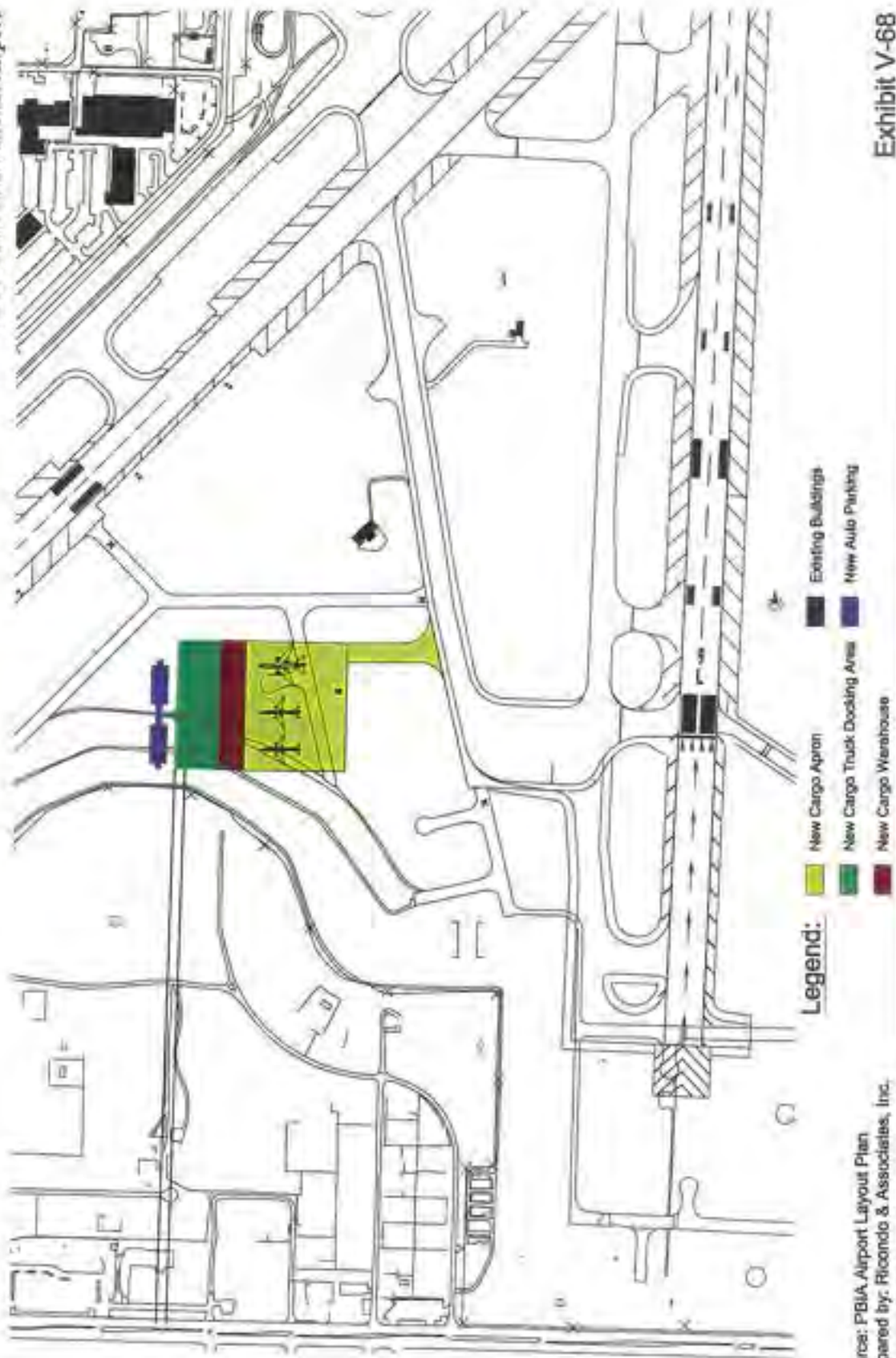
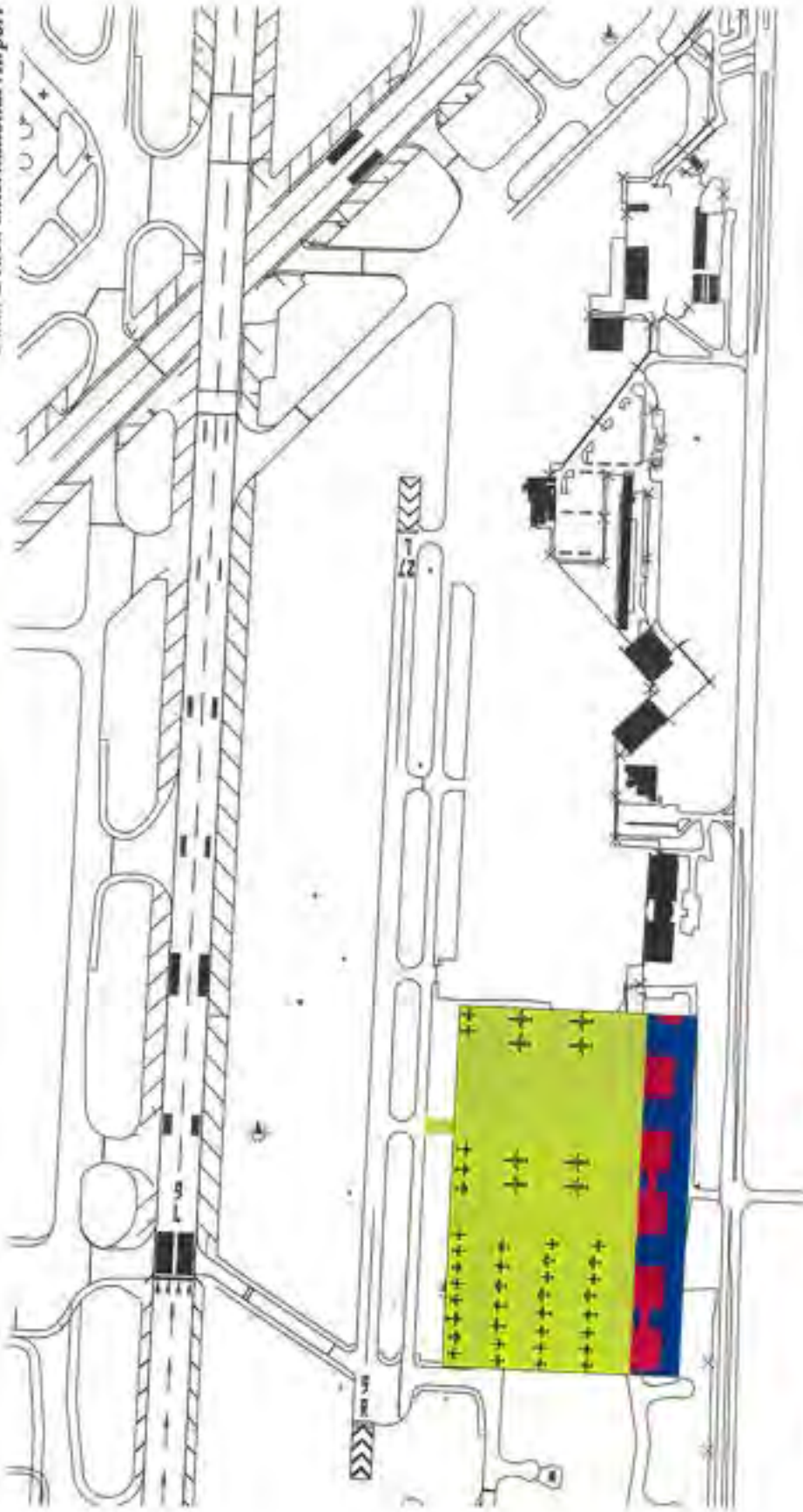


Exhibit V-68

Cargo Facility Development Refined Alternative S12

October 2000

Palm Beach International Airport



Legend:

- New FBO Apron
- New FBO Hangar / Offices
- New FBO Landside
- Existing Buildings

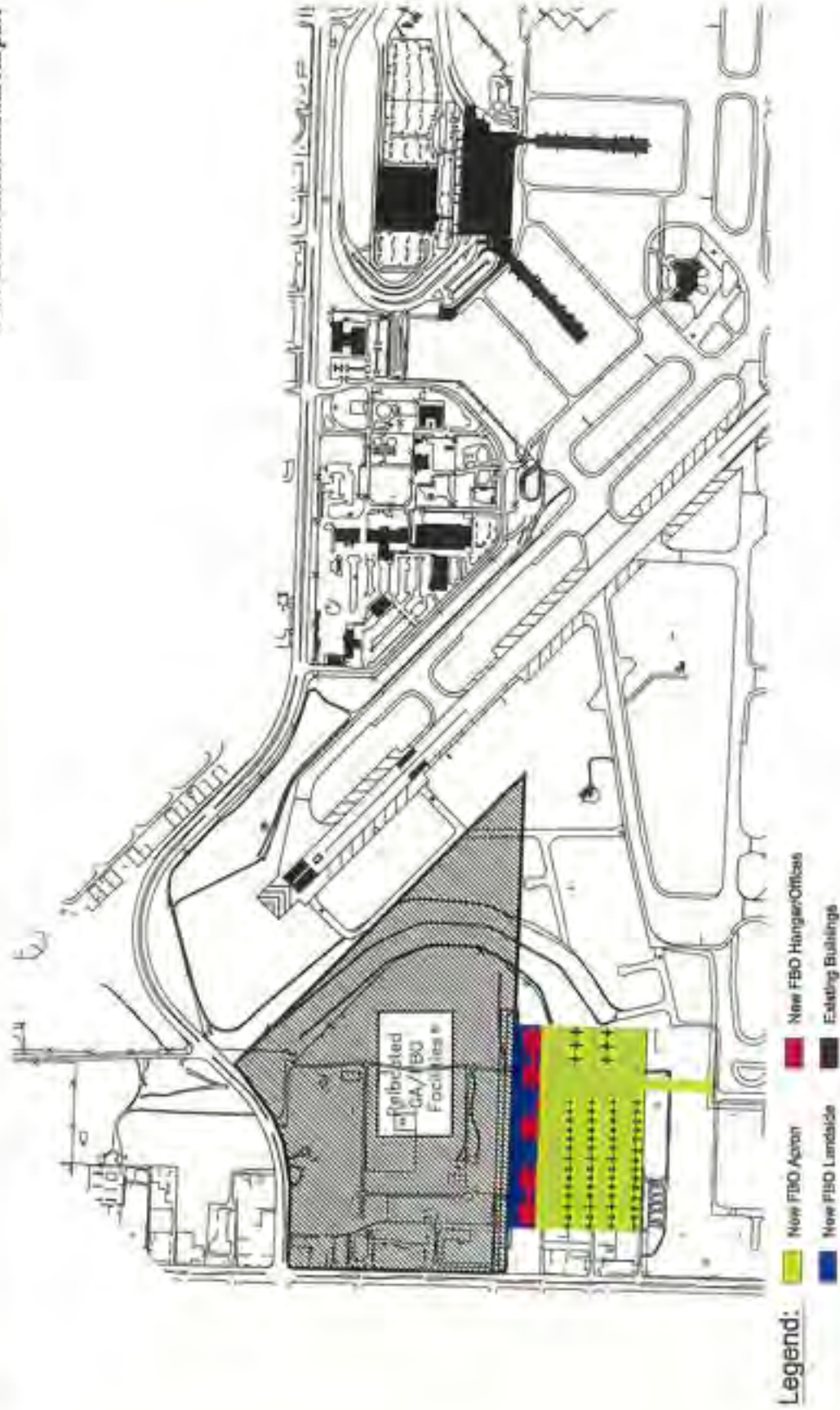
Source: PBIA Airport Layout Plan
Prepared by: Ricordo & Associates, Inc.



Exhibit V-69.dwg

Exhibit V-69

**General Aviation\FBO Facility Development
Refined Alternative S2**



Source: PBIA Airport Layout Plan
Prepared by: Riccarda & Associates, Inc.

Exhibit V-70

General Aviation\FBO Facility Development Refined Alternative S6

5.7 Evaluation of Short-listed Alternatives

The evaluation of short-listed alternatives provided a secondary assessment of the future airfield and facility development patterns identified for PBIA. However, unlike the initial assessment (i.e., the screening of alternatives), which evaluated the various development alternatives using a qualitative approach, the evaluation process assessed the strengths and weaknesses of the short-listed alternatives with a complimentary set of criteria under a quantitative method for measuring such strengths and weaknesses.

The evaluation criteria utilized for this assessment included the following:

- Incremental Demand Compatibility
- Capital Investment
- Long-Term Flexibility and Expandability
- Indirect Facility Impacts

While the initial screening process assessed each alternative's ability to serve the projected demand levels and types, the evaluation process analyzed the ability to incrementally implement each refined short-listed alternative. This was accomplished using the demand profiles and facility requirements previously presented for SL 1, PAL 1, PAL 2, and SL 2 to develop a four-phase implementation plan. The most desirable alternative based on this criteria possessed four implementation phases that accommodate the demand characteristics defined by these four demand thresholds.

The capital investment required to implement the facilities necessary for serving the PAL 2 demand profiles was estimated using current (1998) dollars. This estimate included the direct development costs for each of the short-listed alternatives as well as any indirect costs (e.g., land acquisition, replacement or temporary facilities, relocation costs, etc.) necessary to implement the proposed facilities.

The evaluation of each alternative's ability to meet future facility development beyond the 20-year planning horizon as projected under PAL 2 or varying demand types was conducted on each short-listed alternative. The evaluation also included an assessment of the level of disruption to landside or airside facilities resulting from increased demand for specific facilities (e.g., air cargo) or new demand for other facilities (e.g., aircraft maintenance).

Similarly, the displacement of existing airport facilities was evaluated based on the magnitude and generalized effects of these impacts. While the screening process provided the identification of impacted facilities, the evaluation process included a quantification of such indirect impacts in order to ascertain the desirability of each development alternative. For instance, an alternative that requires a significant amount of capital in order to re-establish/relocate existing facilities impacted by the new facilities is less attractive than one that allows for the construction of the new facilities with minimum impacts to existing facilities.

5.7.1 Airfield Alternatives Evaluation

The evaluation of airfield alternatives included the existing airfield, Alternative A1, and the three derivative schemes for Alternative A3. The three derivative schemes for Alternative A3 discussed previously include the following:

- Alternative A3A: a new air carrier runway located 700 feet south of, and parallel to, Runway 9L-27R
- Alternative A3B: a new air carrier runway located 800 feet south of, and parallel to, Runway 9L-27R
- Alternative A3C: a new air carrier runway located 1,000 feet south of, and parallel to, Runway 9L-27R

A summary of the results of the evaluation of these four airfield alternatives is provided below.

Incremental Demand Compatibility: As noted in the demand/capacity assessment for the existing airfield, Alternative A1 provides an hourly capacity that is slightly less than the hourly demand projected for PAL 2. The three Alternative A3 derivatives provide an hourly capacity for the airfield that exceeds the demand associated with PAL 2. Therefore, based on this criterion, Alternatives A3A, A3B, and A3C are preferred over Alternative A1. Of the three derivative alternatives, Alternative A3C provides the greatest capacity for holding/queuing/maneuvering aircraft between the two parallel runways.

Capital Costs: There were no capital costs estimated for Alternative A1, since it is assumed that the recently completed extension and rehabilitation of Runway 9L-27R represent the final airfield improvements to be completed within the planning horizon. Although additional rehabilitation projects (e.g., pavement overlays) may be implemented for either the crosswind runway or the general aviation runway, these costs are assumed to be operation and maintenance (O&M) expenses rather than capital investments for capacity enhancement projects.

The estimated capital costs for Alternatives A3A and A3B are approximately \$51.4 million and \$58.3 million, respectively. Alternative A3C has a higher cost for implementation, approximately \$105.8 million, which is largely attributable to the indirect costs associated with the relocation of most of the general aviation/FBO facilities located on the south side of the Airport. Based on this criterion, Alternative A1 and A3A, are the two preferred airfield alternatives.

Long-Term Flexibility and Expandability: Alternative A1 offers the least long-term flexibility in terms of satisfying demand levels beyond PAL 2. As previously noted, Alternative A1 offers the most conservative development plan at the expense of increased airfield capacity. Alternative A3A, A3B, and A3C provide sufficient airfield capacity to accommodate demand levels exceeding those projected for PAL 2. Of the three derivative schemes, Alternative A3C offers the greatest long-term flexibility and expandability by providing a runway-to-runway separation that is capable of serving Group VI operations in the long-term future while providing increased aircraft holding/queuing capacity between the two parallel runways in the near-term. Based on this criterion, Alternative A3C, followed by Alternative A3B, provides the best airfield development alternative for the Airport.

Indirect Facility Impacts: The existing airfield, Alternative A1, provides the least indirect impact to other facilities presently located on the Airport, since the expansion of the airfield beyond the recent extension of Runway 9L-27R is not anticipated. Alternatives A3A, A3B, and A3C, however, result in some significant impacts to many existing facilities located on the south side of the Airport. For example, the Obstacle Free Areas (OFAs) associated with the new runway and taxiways will require the partial relocation of the general aviation/FBO facilities and the VOR. The relocation of one or both of the Instrument Landing Systems (ILS) presently located on Runway 9L-27R to the new

parallel runway may also be required if an outboard arrival runway and an inboard arrival/departure runway operating configuration is adopted for the airfield.

In addition, the west end of the new runway's RPZ, as proposed, would extend beyond Military Trail. The area beneath the RPZ must be cleared of obstructions and protected by an aviation easement. Alternately, the County could acquire the property. Similarly, FAA approval would be required for Australian Avenue and Perimeter Road, since portions of these road segments will also be located within the east end of the new runway's RPZ.

Height limitations that are more restrictive than those currently in place would also be imposed on facilities located within the approach paths for the new runway. Specifically, facilities located near the intersections of Australian Avenue/Southern Boulevard and Military Trail/Southern Boulevard would be affected by these more stringent height restrictions. Facilities located parallel to Southern Boulevard and adjacent to the Airport would also be subjected to more stringent height restrictions due to the transitional surfaces associated with the new runway.

The construction of any of these Alternative 3 derivative schemes would require the partial or full closure of Taxiways E, G, K, and S. Based on this criterion, of the four short-listed alternatives evaluated, Alternative A1, followed by Alternative A3A, provides development opportunities with the least indirect impacts to existing facilities.

Conclusions: Based on the evaluation of the short-listed alternatives summarized above, Alternative A1 provides the best short-term airfield alternative until hourly demand levels reach the processing capacity of the airfield. Prior to that time, airfield improvements should be planned, designed, and implemented in a manner that allows the timing of an increase in the airfield's capacity to occur as hourly demand levels and delays reach these thresholds. When such improvements are necessary, Alternative A3B provides a viable solution for increasing the capacity of the airfield. Of the short-listed alternatives, Alternative A3B provides the best balance between airfield capacity benefits, aircraft ground maneuvering efficiency, and long-term flexibility while minimizing direct and indirect impacts to other facilities on the Airport.

Table V-8 provides a summary of the evaluation of the short-listed airfield alternatives and presents the strengths and weaknesses identified for each alternative.

Table V-8

Evaluation of Short-listed Airfield Alternatives

EVALUATION CRITERION	AIRFIELD ALTERNATIVES			
	A1	A3A	A3B	A3C
INCREMENTAL DEMAND COMPATIBILITY	1. PAL 2 demand levels slightly exceed the existing airfield's hourly capacity.	1. With full development, the airfield capacity exceeds the PAL 2 hourly demand.	1. With full development, the airfield capacity exceeds the PAL 2 hourly demand. 2. Allows for a center parallel taxiway for aircraft circulation, queuing, and holding.	1. With full development, the airfield capacity exceeds the PAL 2 hourly demand. 2. Provides the greatest capacity for queuing and holding aircraft between the two parallel runways in comparison to the other alternatives.
CAPITAL INVESTMENT (ESTIMATED)	\$0	\$51,443,000	\$58,263,000	\$105,823,000
LONG-TERM FLEXIBILITY AND EXPANDABILITY	1. Restricted to demand levels that are less than those associated with PAL 2.	1. Additional runway extension is possible, but unlikely to improve capacity. 2. In the proposed configuration, Runway 9R-27L will be used primarily for arrivals.	1. Additional runway extension is possible, but unlikely to improve capacity. 2. In the proposed configuration, Runway 9R-27L will be used primarily for arrivals. 3. Provides for future Group VI aircraft operations.	1. Additional runway extension is possible, but unlikely to improve capacity. 2. In the proposed configuration, Runway 9R-27L will be used primarily for arrivals.
INDIRECT FACILITY IMPACTS	1. None	1. Runway and taxiway OFAs will require relocation of the south side GA/FBO facilities (partial), the VOR, and the relocation of the Runway 9L-27R ILS to the new runway. 2. Runway 9R RPZ extends west of Military Trail. This area must either be cleared or obtain FAA nonstandard approval. 3. Australian Ave. and Perimeter Road are located within the Runway 27L RPZ, therefore requiring FAA approval.	1. Runway and taxiway OFAs will require relocation of the south side GA/FBO facilities (more than under Alternative A3A), the VOR, and the relocation of the Runway 9L-27R ILS to the new runway. 2. Runway 9R RPZ extends west of Military Trail. This area must either be cleared or obtain FAA nonstandard approval. 3. Australian Ave. and Perimeter Road are located within the Runway 27L RPZ, therefore requiring FAA approval.	1. Runway and taxiway OFAs will require relocation of the south side GA/FBO facilities, the VOR, and the relocation of the Runway 9L-27R ILS to the new runway. 2. Runway 9R RPZ extends west of Military Trail. This area must either be cleared or obtain FAA nonstandard approval. 3. Australian Ave. and Perimeter Road are located within the Runway 27L RPZ, therefore requiring FAA approval.

Table V-8
Evaluation of Short-listed Airfield Alternatives

EVALUATION CRITERION	AIRFIELD ALTERNATIVES			
	A1	A3A	A3B	A3C
INDIRECT FACILITY IMPACTS (Continued)		4. Potential airspace impact: FAR Part 77 and TERPS height limitations on building between Australian Ave. and Southern Blvd. are 60' AGL and 138' AGL, respectively. 5. Requires closure of Taxiways S, G (partial), K and E. 6. The TERPS surface associated with the Runway 27L ILS has a minimum elevation of approximately 75 ft. AGL over the centerline of Runway 9L-27R. The proposed tailheight of the A3XX is 79 ft.	4. Potential airspace impact: FAR Part 77 and TERPS height limitations on building between Australian Ave. and Southern Blvd. are 60' AGL and 138' AGL, respectively. 5. Requires closure of Taxiways S, G (partial), K and E. 6. The TERPS surface associated with the Runway 27L ILS has a minimum elevation of approximately 75 ft. AGL over the centerline of Runway 9L-27R. The proposed tailheight of the A3XX is 79 ft.	4. Potential airspace impact: FAR Part 77 and TERPS height limitations on building between Australian Ave. and Southern Blvd. are 60' AGL and 138' AGL, respectively. 5. Requires closure of Taxiways S, G (partial), K and E. 6. The TERPS surface associated with the Runway 27L ILS has a minimum elevation of approximately 75 ft. AGL over the centerline of Runway 9L-27R. The proposed tailheight of the A3XX is 79 ft. 7. Requires further displacement of Runway 31 threshold to meet pavement marking precedence requirements.
STRENGTHS	1. No development costs. 2. No impacts to existing airport facilities.	1. Maintains (but requires the reconfiguration of the south side GA/FBO facilities. 2. Can reconfigure Taxiways H and D to high speed exits for Runway 9R. 3. Configuration satisfies the projected demand levels.	1. Maintains (but requires the reconfiguration of the south side GA/FBO facilities. 2. Can reconfigure Taxiways H and D to high speed exits for Runway 9R. 3. Configuration satisfies the projected demand levels. 4. Allows parallel taxiway between runways for aircraft queuing, holding, and circulation.	1. Can reconfigure Taxiways H and D to high speed exits for Runway 9R. 2. Configuration satisfies the projected demand levels. 3. Allows parallel taxiway between runways for aircraft queuing and protecting for ADG VI on
WEAKNESSES	1. PAL 2 demand levels will slightly exceed hourly airfield capacity.	1. Provides minimum holding area between parallel runways. 2. Requires reconfiguration of southwest GA/FBO facilities. 3. Cannot hold ADG V aircraft between parallel	1. Requires reconfiguration of southwest GA/FBO facilities. 2. Parallel taxiway impacts ADG VI on Runways 9R-27L and 9L-27R. 3. Does not meet high-speed exit reverse-turn	1. Requires further threshold displacement of Runway 31. 2. Requires demolition and/or relocation of GA/FBO facilities.
CONCLUSIONS	Concept is viable for the short-term future (through PAL 1)	Concept is NOT recommended due to the inability to aircraft between parallel runways, thus reducing the operational benefit provided by the new	Concept is desirable because of the capability to hold aircraft on the parallel taxiway while minimizing impacts on the GA/FBO facilities	Concept is NOT recommended because of high costs associated with relocation of GA/FBO facilities and other facility impacts.

5.7.2 Terminal Development Alternatives Evaluation

The evaluation of the short-listed alternatives also sought to identify either a short-term and a long-term development alternative or a single alternative that could be incrementally implemented to satisfy future growth. Based on the demand/capacity assessment, the need for additional terminal facilities will likely precede the demand for airfield capacity improvements if the activity levels and profiles modeled under the three demand scenarios materialize.

Incremental Demand Compatibility: The ability to incrementally add facilities to the existing terminal complex in an efficient and non-disruptive manner is an essential characteristic for the preferred terminal development alternative. This includes the ability to expand the existing facilities to accommodate the PAL 2 demand levels as well as the ability to expand the terminal for growth beyond PAL 2.

Except for Alternatives T6C and T14, all of the terminal development alternatives include construction of the Concourse B and C hammerheads as an incremental capacity improvement in addition to construction of a new air carrier concourse. All of the alternatives will require expansion of the terminal building functions to support the additional gates. Regardless of whether the next concourse is built west of the terminal building (Alternatives T1, T6A, T6B, and T6C) or east of the terminal building (Alternatives T2A, T13, and T14), subsequent terminal development that is contiguous to the existing facilities would occur to the east of Concourse C.

In addition, in terms of incremental capacity gains, Alternatives T2A, T13, and T14 allow for construction of new facilities with minimal impacts to existing operations. Construction of Alternatives T1, T6A, T6B, or T6C would displace or require the relocation of the four commuter gates and ten commuter aircraft parking positions presently served from Concourse A. This would result in either increased capital costs or decreased capacity benefits relative to the alternatives proposing development of additional terminal facilities east of Concourse C. Therefore, Alternatives T2A, T13, and T14 are preferred based on their incremental demand compatibility.

Capital Costs: Due in part to the required displacement or relocation of the commuter facilities located in Concourse A, the capital costs for the short-listed alternatives proposing the expansion of the terminal facilities west of Concourse B are greater than the expansion alternatives to the east of Concourse C. The estimated capital costs for Alternative T1 are approximately \$195.0 million. Alternatives T6A, T6B, and T6C possess capital costs estimated at approximately \$186.9 million, \$181.9 million, and \$175.0 million, respectively.

Alternatives T2A, T13, and T14 have estimated capital costs of approximately \$154.6 million, \$164.0 million, and \$141.0 million, respectively. As previously noted, all capital cost estimates are in 1998 U.S. dollars. Based on this criterion, Alternative T14, followed by Alternatives T2A and T13, is preferred.

Long-Term Flexibility and Expandability: Construction of future facilities contiguous to the existing terminal is limited to sites east of Concourse C, except for the potential for one air carrier concourse and supporting terminal components west of Concourse B. However, future facilities west of Concourse B could be limited for future expansion should user profiles and demand types change, thus requiring an increase in the physical characteristics of the airfield systems and/or terminal

facilities. In addition, development of landside facilities supportive of the expanded terminal and new concourse is constrained by Belvedere Road to the north and Runway 13-31 to the west.

Moreover, except for Alternative T1, all of the short-listed terminal development alternatives allow for extension of the proposed concourse to provide a small increment of gates (i.e., two to four gates).

Based on this criterion, Alternatives T2A, T13, and T14 are preferred over the other short-listed alternatives.

Indirect Facility Impacts: All of the short-listed terminal alternatives impact relatively old facilities (i.e., 20 years or older), which presently accommodate support and administrative functions for the Airport or employees, and public parking surface lots serving overflow parking demand during peak travel season and holidays. In addition, regardless of the direction in which the terminal facilities are expanded, the existing terminal roadway will have to be extended and realigned to provide vehicular access to the new facilities and allow for additional curbfront capacity. Realignment of the terminal roadway downstream (i.e., east of the terminal facilities) would likely be less disruptive to airport operations during construction, thus favoring Alternatives T2A, T13, and T14.

Construction of Alternatives T1, T6A, T6B, and T6C would require relocation of the west commercial loop and demolition/relocation of most of the facilities located within the 8th Street Loop (e.g., DOA administrative offices, the in-flight kitchen, other County facilities, the taxi staging lot, and the triturator). Similarly, construction of Alternatives T2A, T13, and T14 would require demolition of the former Delta terminal and relocation of the Park and Ride surface lots located east of Concourse C.

Based on this criterion, Alternative T2A, followed by Alternatives T14 and T13, is the preferred short-listed alternative.

Conclusions: The evaluation of the seven short-listed terminal development alternatives concluded that future terminal expansion is preferred to the east of Concourse C rather than to the west of Concourse B. The lower magnitude of impacts provided by Alternatives T2A, T13, and T14 relative to the other alternatives, coupled with better long-term flexibility and the ability to expand the terminal facilities with minimal disruption to airport operations, led to this conclusion.

Of these three alternatives, Alternative T13 was selected as the overall preferred alternative. Alternative T13 provided a more desirable layout for future terminal development to satisfy growth beyond PAL 2 compared to Alternative T14. In addition, aircraft maneuvering between Concourse C and the future concourse is preferred with the parallel concourse layout included under Alternative T13. In relation to Alternative T2A, Alternative T13 provides better adjacency between the new concourse and the supporting terminal facilities. As the terminal building expands further to the east beyond PAL 2, the terminal facilities become better balanced relative to the aircraft gates under Alternative T13.

Table V-9 presents the evaluation of the short-listed terminal development alternatives and summarizes the strengths and weaknesses of each alternative.

Table V-9

Evaluation of Short-listed Terminal Alternatives

EVALUATION CRITERION	TERMINAL ALTERNATIVES						
	T1	T2A	T6A	T6B	T6C	T13	T14
INCREMENTAL DEMAND COMPATIBILITY	1. Construction of hammerheads on Concourses B and C will provide adequate gate frontage for the baseline and alternate service demand scenarios. 2. Incremental construction of additional gates will likely require the expansion of terminal related facilities (i.e. ticket counters, curbside, bag claim, etc.) 3. Would displace the commuter facilities.	1. Construction of hammerheads on Concourses B and C will provide adequate gate frontage for the baseline and alternate service demand scenarios. 2. Incremental construction of additional gates will likely require the expansion of terminal related facilities (i.e. ticket counters, curbside, bag claim, etc.)	1. Construction of hammerheads on Concourses B and C will provide adequate gate frontage for the baseline and alternate service demand scenarios. 2. Incremental construction of additional gates will likely require the expansion of terminal related facilities (i.e. ticket counters, curbside, bag claim, etc.) 3. Would displace the commuter facilities.	1. Construction of hammerheads on Concourses B and C will provide adequate gate frontage for the baseline and alternate service demand scenarios. 2. Incremental construction of additional gates will likely require the expansion of terminal related facilities (i.e. ticket counters, curbside, bag claim, etc.) 3. Would displace the commuter facilities.	1. Incremental construction of additional gates will likely require the expansion of terminal related facilities (i.e. ticket counters, curbside, bag claim, etc.) 2. Would displace the commuter facilities.	1. Construction of hammerheads on Concourses B and C will provide adequate gate frontage and holdroom space for both baseline and alternate service CIP. 2. Incremental construction of additional gates will likely require the expansion of terminal related facilities (i.e. ticket counters, curbside, bag claim, etc.)	1. Incremental construction of additional gates will likely require the expansion of terminal related facilities (i.e. ticket counters, curbside, bag claim, etc.)
CAPITAL INVESTMENT (ESTIMATED)	\$195,000,000	\$154,600,000	\$186,900,000	\$181,900,000	\$175,000,000	\$164,000,000	\$141,000,000
LONG-TERM FLEXIBILITY AND EXPANDABILITY	1. Subsequent expansion of the existing terminal facility and concourses will be limited to the east. 2. Limited in its capacity to satisfy the demand for a small increment (2 to 4) gates beyond PAL 2.	1. Subsequent expansion of the existing terminal facility and concourses will be limited to the east.	1. Subsequent expansion of the existing terminal facility and concourses will be limited to the east.	1. Subsequent expansion of the existing terminal facility and concourses will be limited to the east.	1. Subsequent expansion of the existing terminal facility and concourses will be limited to the east.	1. Subsequent expansion of the existing terminal facility and concourses will be available to the east and west.	1. Subsequent expansion of the existing terminal facility and concourses will be available to the east and west.
INDIRECT FACILITY IMPACTS	1. Expansion will require the modification of the terminal roadway (Turnage Road) for curbside facilities. 2. Expansion will require the demolition/relocation of the DOA offices (846), the tributor (928), and the abandoned water plant. 3. Expansion will also require the relocation of the commercial vehicle staging area.	1. Expansion will require the modification of the terminal roadway (Turnage Road) for curbside facilities. 2. Expansion will require the demolition of the former Delta Terminal (Building 106). 3. Expansion will require the partial relocation of Park and Ride Lots 1 and 2.	1. Expansion will require the modification of the terminal roadway (Turnage Road) for curbside facilities. 2. Expansion will require the demolition/relocation of the DOA offices (846), the in-flight kitchen (1169), DOA facilities (944 & G), PBC Engineering (D & E), the taxi-stand restrooms (893), the tributor (928), and the abandoned water plant. 3. Expansion will also	1. Expansion will require the modification of the terminal roadway (Turnage Road) for curbside facilities. 2. Expansion will require the demolition/relocation of the DOA offices (846), the in-flight kitchen (1169), DOA facilities (944 & G), PBC Engineering (D & E), the taxi-stand restrooms (893), the tributor (928), and the abandoned water plant. 3. Expansion will also	1. Expansion will require the modification of the terminal roadway (Turnage Road) for curbside facilities. 2. Expansion will require the demolition/relocation of the DOA offices (846), the in-flight kitchen (1169), DOA facilities (944 & G), PBC Engineering (D & E), the taxi-stand restrooms (893), the tributor (928), and the abandoned water plant. 3. Expansion will also	1. Expansion will require the modification of the terminal roadway (Turnage Road) for curbside facilities. 2. Expansion will require the demolition of the former Delta Terminal (Building 106). 3. Expansion will require the partial relocation of Park and Ride Lots 1 and 2.	1. Expansion will require the modification of the terminal roadway (Turnage Road) for curbside facilities. 2. Expansion will require the demolition of the former Delta Terminal (Building 106). 3. Expansion will require the partial relocation of Park and Ride Lots 1 and 2.

Table V-9
Evaluation of Short-listed Terminal Alternatives

EVALUATION CRITERION	TERMINAL ALTERNATIVES						
	T1 Build west of the existing terminal building.	T2A	T6A require the relocation of the commercial vehicle staging areas west of the existing terminal building.	T6B require the relocation of the commercial vehicle staging areas west of the existing terminal building.	T6C require the relocation of the commercial vehicle staging areas west of the existing terminal building.	T13	T14
STRENGTHS	1. Expansion is contiguous to the existing terminal building. 2. Dual taxi lanes around concourse provide efficient aircraft movements.	1. Expansion is contiguous to the existing terminal building. 2. Dual taxi lanes around concourse provide efficient aircraft movements. 3. Relatively low indirect development costs. 4. Preserves planned location of Maintenance Compound. 5. Concourse may be expanded longitudinally. 6. Concourse is in close proximity to the primary air carrier runway.	1. Expansion is contiguous to the existing terminal building. 2. Concourse is adjacent to terminal building reducing passenger travel distances to gates. 3. Provides adequate space for a concessions mall at the end of the concourse.	1. Expansion is contiguous to the existing terminal building. 2. Concourse is adjacent to terminal building reducing passenger travel distances to gates.	1. Expansion is contiguous to the existing terminal building. 2. Concourse is adjacent to terminal building reducing passenger travel distances to gates. 3. Provides adequate space for a concessions mall at the end of the concourse.	1. Dual taxi lanes around concourse provide efficient aircraft movements. 2. Relatively low indirect development costs. 3. Preserves planned location of Maintenance Compound. 4. Concourse may be expanded longitudinally. 5. Concourse is adjacent to the center of the terminal building, resulting in minimal passenger travel distances to the gates. 6. Concourse is in close proximity to the primary air carrier runway.	1. Partial dual taxi lanes around concourse provide efficient aircraft movements. 2. Relatively low indirect development costs. 3. Preserves planned location of Maintenance Compound. 4. Concourse may be expanded longitudinally. 5. Concourse is in close proximity to the primary air carrier runway.
WEAKNESSES	1. Concourse is not adjacent to the center of the terminal building resulting in greater passenger travel distances to gates. 2. Requires the demolition/relocation of many facilities. 3. Requires realignment of terminal roadway. 4. Expansion impacts the planned location of the Airport's Maintenance Compound.	1. Concourse is not adjacent to the center of the terminal building resulting in greater passenger travel distances to gates.	1. Concourse is not adjacent to the center of the terminal building resulting in greater passenger travel distances to gates. 2. Requires the demolition/relocation of many facilities. 3. Requires realignment of terminal roadway. 4. Single taxi lanes around concourse produce inefficient aircraft movements.	1. Concourse is not adjacent to the center of the terminal building resulting in greater passenger travel distances to gates. 2. Requires the demolition/relocation of many facilities. 3. Requires realignment of terminal roadway. 4. Single taxi lanes around concourse produce inefficient aircraft movements.	1. Requires the demolition/relocation of many facilities. 2. Requires realignment of terminal roadway. 3. Single taxi lanes around concourse produce inefficient aircraft movements.	1. Requires the realignment of the terminal roadway. 2. May require additional parking structure. 3. Terminal functions are decentralized.	1. Concourse is not adjacent to terminal building resulting in greater passenger travel distances to gates. 2. Requires realignment of terminal roadway. 3. Subsequent terminal expansion to the east becomes limited. 4. Aircraft pushback operations from inboard gates may become obstructed, resulting in delays.

Table V-9
Evaluation of Short-listed Terminal Alternatives

EVALUATION CRITERION	TERMINAL ALTERNATIVES						
	T1	T2A	T6A	T6B	T6C	T13	T14
CONCLUSIONS	Concept not recommended due to high costs relative to indirect facility impacts.	Concept not recommended due to the long passenger walking distances.	Concept not recommended due to high costs relative to indirect facility impacts.	Concept not recommended due to high costs relative to indirect facility impacts.	Concept not recommended due to high costs relative to indirect facility impacts.	Concept recommended due to minimal costs associated with indirect facility impacts, minimal passenger travel distances to gates, and minimal taxi distances to/from Runway 9L-27R.	Concept not recommended due to the limited long term expandability.

5.7.3 Cargo Alternatives Evaluation

The short-listed cargo development alternatives offer future development opportunities that can be regarded as either complimentary alternatives or mutually exclusive options for satisfying demand growth in cargo. Therefore, the evaluation of these short-listed alternatives served a twofold purpose. First, it was an assessment process to help recognize the preference of one alternative over the others. Second, it served to provide the justification for whether or not all three alternatives should be maintained as viable solutions for addressing future demand.

For purposes of this analysis, Alternatives C2 and C3 were evaluated as one alternative, since they represent derivations of the same alternative. Alternative C2 depicts the proposed cargo facilities being developed for belly cargo activity. Alternative C3 represents a similar facility that also includes an aircraft apron to allow for either belly cargo or all-cargo (freight) handling and processing. In those instances in which a differentiation between the two alternatives is warranted, the advantages or disadvantage of Alternatives C2 and C3 have been identified. An overview of the evaluation of the cargo development alternatives is provided below.

Incremental Demand Compatibility: For all three alternatives, incremental development of the facilities can be undertaken to address gradual cargo tonnage growth. However, the initial increment of development would require a lower investment in support facilities (e.g., access roads and utilities), with Alternatives C2/C3 compared to Alternative C6. In addition, Alternatives C2/C3 provide closer and more direct access to both the existing cargo facilities (i.e., Buildings 1301-1311 and 1475) and to the airline facilities/gates transporting belly cargo tonnage. Based on this criterion, Alternatives C2/C3 are preferred over Alternative C6.

Capital Costs: The estimated capital costs for Alternative C2 are approximately \$7.5 million. The estimated costs for Alternative C3 are approximately \$9.5 million. The costs for these two alternatives include an allowance of \$2.5 million for the re-establishment of the lost Park and Ride surface parking spaces at another site. However, the capital cost estimates for Alternatives C2 and C3 exclude any potential environmental cleanup/remediation that may be required for the proposed site. Such costs were not included in the cost estimates for these two alternatives since the extent of the environmental-related work, if any, requires further investigation and quantification.

The capital costs for Alternative C6 were estimated at \$13.0 million. The costs associated with this alternative include the facility development costs estimated for Alternative C3 in addition to roadway-related and utilities-related capital expenditures. Alternative C6 also includes an allowance for an aircraft-supporting box culvert across the Airport West canal to provide airfield access for the new cargo facilities.

Based on this criterion, Alternative C2, followed by Alternative C3, provides the preferred cargo development alternative.

Long-Term Flexibility and Expandability: Cargo facility expansion to serve demand levels beyond PAL 2 is not probable under Alternatives C2 and C3, particularly as the demand for terminal facilities beyond those illustrated under Terminal Alternative T13 materializes. Of these two alternatives, Alternative C3 is preferred over Alternative C2, since it offers the flexibility to serve belly cargo activity as well as all-cargo (freight) activity.

Alternative C6 provides the same flexible utilization benefits as Alternative C3. In addition, Alternative C6 provides greater growth/expansion opportunities than the two other short-listed cargo alternatives. The ultimate cargo development opportunities in the Town of Golfview property may be limited by other proposed uses (e.g., general aviation/FBO facility development). However, the opportunities for cargo facility development beyond those identified for serving the PAL 2 demand levels would likely be greater adjacent to the Alternative C6 site than adjacent to the Alternative C2/C3 site.

Based on this criterion, Alternative C6 is referred over Alternatives C8/C9 for future cargo expansion.

Indirect Facility Impacts: Alternatives C2/C3 will require relocation of approximately 900 Park and Ride surface parking spaces and may potentially require underground environmental cleanup or treatment. Alternative C6 would require crossing of the Airport West canal with an aircraft-rated supporting structure/bridge to allow for airfield access. Overall, either site provides an undeveloped site for future cargo development. Based on this criterion, Alternative C6 is preferred over Alternatives C2/C3, since it precludes the need to relocate facilities that are currently in operation.

Conclusions: Based on the evaluation of the three cargo development alternatives and the projected growth in cargo activity over the planning horizon, Alternative C3 is the preferred cargo expansion plan for serving demand through PAL 2. Should cargo activity grow at more aggressive rates than those projected by the three demand scenarios, thus requiring a more extensive cargo development program, then the relocation of cargo functions to the Town of Golfview property may be further justified. Ultimately, as the growth in terminal facilities continues and the existing terminal complex is expanded to the east, relocation of the cargo facilities to the Town of Golfview property or other sites on the Airport will be required.

Table V-10 summarizes the evaluation of the three short-listed cargo development alternatives.

5.7.4 General Aviation/FBO Alternatives Evaluation

An initial review of the two short-listed general aviation/FBO development alternatives illustrates the potential for either alternative serving the future demand represented by PAL 2. If additional general/FBO facilities are needed in the near-term, prior to the construction of the new parallel runway, then Alternative G2 appears to offer an acceptable short-term solution. This assumes that the anticipated length of time for the operation of the new facilities, prior to being displaced by the new runway, is sufficient to allow for a positive return on investment. However, if the demand for the new runway precedes the need for additional general aviation/FBO facilities, then Alternative G2 would be less desirable and Alternative G6 would be the preferred development alternative. Alternative G6 would also be preferred over Alternative G2 if the economic life for the new facilities were not anticipated to be long enough to provide a positive return on investment.

The evaluation of these two general aviation/FBO development alternatives is further discussed below.

Incremental Demand Compatibility: Alternative G2 provides incremental growth for general aviation/FBO facilities contiguous to some of the existing FBO leaseholds located on the south side. Sufficient property exists to accommodate the facilities necessary to serve demand growth projected

Table V-10
Evaluation of Short-listed Cargo Alternatives

EVALUATION CRITERION	CARGO ALTERNATIVES	
	C2/C3	C6
INCREMENTAL DEMAND COMPATIBILITY	1. Each cargo building could be developed as demand levels warrant their need. 2. Initial increments of development are less capital demanding under this alternative.	1. Each cargo building could be developed as demand levels warrant their need.
CAPITAL INVESTMENT (ESTIMATED)	C2: \$7,500,000 C3: \$9,500,000	\$13,000,000
LONG-TERM FLEXIBILITY AND EXPANDABILITY	1. Cargo buildings can be configured so that they are initially utilized for belly cargo, and later configured for all-cargo with construction of an airside apron. 2. Cargo facility expansion beyond PAL-2 adjacent to the site is not probable.	1. Cargo buildings can be configured so that they are initially utilized for belly cargo, and later configured for all-cargo with construction of an airside apron. 2. Cargo facility expansion beyond PAL-2 adjacent to the site is possible.
INDIRECT FACILITY IMPACTS	1. Minimal impact on overflow surface parking facilities. 2. Potential environmental remediation associated with contaminated soil may be required.	1. Would require a bridge structure over the Airport West Canal.
STRENGTHS	1. Impact on existing facilities is minimal. 2. Belly cargo facilities would be located in close proximity to the terminal facility.	1. Cargo building expansion capability beyond SL-2.
WEAKNESSES	1. May require environmental remediation. 2. Cargo facility expansion beyond PAL-2 adjacent to the site is not probable.	2. Belly cargo facilities would not be located in close proximity to the terminal facility.
CONCLUSIONS	Concept is viable for cargo growth through PAL 2.	Concept is viable for long-term cargo growth (beyond PAL 2)..

under PAL 2. However, the opportunity for expansion is not equal among the three FBOs. Therefore, aggressive growth by one tenant could potentially require subleasing from another tenant or conducting remote operations in order to obtain the additional facilities necessary for accommodating its growth in demand.

Alternative G6 provides sufficient growth capabilities to serve demand levels projected under SL2 and/or the relocation of one or more of the south side tenants that would be necessary for construction of the new parallel runway (i.e., Airfield Alternative A3B). Based on this criterion, Alternative G6 is preferred over Alternative G2.

Capital Costs: The costs for constructing the additional facilities needed to satisfy PAL 2 demand are similar for both short-listed alternatives. The estimated capital costs for Alternative G2 are approximately \$7.4 million. The estimated costs for Alternative G6 are approximately \$8.5 million. The higher costs for Alternative G6 are attributed to investments in roadway access system and utilities infrastructure necessary to support this new development in the recently acquired Town of Golfview property.

Based on this criterion, Alternative G2 is preferred over Alternative G6.

Long-Term Flexibility and Expandability: As discussed above, long-term flexibility and expandability under Alternative G2 is restricted to the extent of development shown for this alternative. Future roadway improvements planned for Southern Boulevard and the intersection of Southern Boulevard/Military Trail limit further expansion to the south and west. The preferred long-term airfield alternative restricts expansion to the north. Expansion to the east is already constrained by existing leaseholds, most of them serving general aviation demand. As a result, Alternative G6 is the preferred general aviation/FBO development alternative based on this criterion.

Indirect Facility Impacts: The areas proposed for future general aviation/FBO facility development would require demolition and relocation of the 391st Bomb Squadron Restaurant and facilities presently occupied by Flight Safety International. In addition, the four parcels identified for private hangar development by the DOA would be consumed by the proposed general aviation/FBO expansion. Alternative G6, on the other hand, would have no indirect impacts on existing airport facilities. This property was recently cleared and leveled to allow for future airport-related facility development.

Based on this criterion, Alternative G6 is preferred over Alternative G2.

Conclusions: Based on the evaluation of these short-listed alternatives, and the observations presented in the introduction to the evaluation of these alternatives, the two short-listed alternatives are recommended for future consideration.

Development of additional general aviation/FBO facilities along the south side of the Airport is the preferred short-term alternative for satisfying future general aviation demand and corporate activity. As the planning phase for implementation of Airfield Alternative A3B begins, continued expansion of general aviation facilities and relocation of existing general aviation/FBO facilities is most preferred in the Golfview property, as illustrated in Alternative G6. Relocation of existing general aviation and FBO facilities located east of Runway 13-31 will be required in order to construct the new parallel runway. The Golfview property provides the preferred site for the ultimate relocation and development of general aviation facilities. The adjacency of the Golfview property to Runways

13-31 and 9L-27R is advantageous, since most of the general aviation operations will be shifted to one of these two runways once the new parallel air carrier runway is constructed as proposed under Airfield Alternative A3B.

Table V-11 summarizes the evaluation of the two short-listed general aviation/FBO alternatives.

5.8 Preferred Composite Development Plan

The Composite Development Plan ("Composite Plan") developed for PBIA is built upon the integration of the preferred development alternatives selected for the Airport's airfield, terminal, general aviation/FBO, and cargo facilities. In addition to integrating these preferred development alternatives, further refinements to each of these facilities were provided to support the ancillary facilities associated with each functional component, maximize land-use, and preserve flexible growth patterns for each component.

Some of the ancillary facilities shown in the Composite Plan include overnight aircraft parking positions, taxiway improvements, navigation aids, public and employee parking facilities, aircraft maintenance and Airport maintenance facilities, landside access and circulation roadways, and on-airport collateral development. The Composite Plan also delineates off-airport property that may be utilized in the future to support airport operations.

The Composite Plan is shown in **Exhibit V-71**. The various airport components included in the Composite Plan are further described below.

5.8.1 Future Airfield Improvements

The most significant airfield improvement depicted in the Composite Plan is the ultimate conversion of existing GA Runway 9R/27L to an air carrier runway at PBIA. The future runway, as proposed under Airfield Alternative A-3B, would be located 800 feet south of Runway 9L-27R (centerline to centerline distance). This runway would have a length of 8,000 feet and a width of 150 feet. Full-length runway shoulders, 35-foot wide, would also be provided on both sides of the runway. This new runway would physically replace existing Runway 9R/27L.

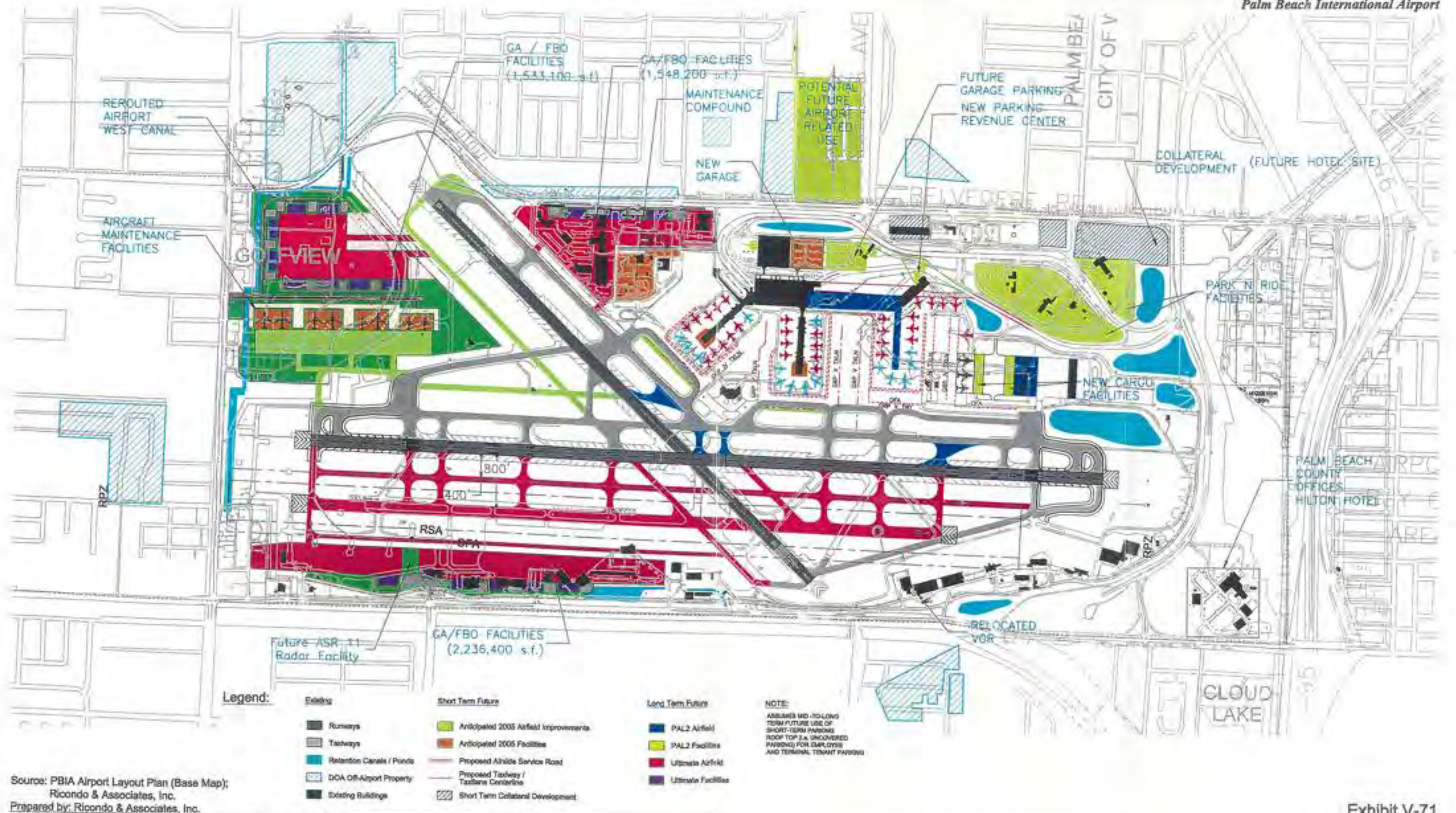
The future runway would be complimented by a new parallel taxiway, located 400 feet from the future runway and Runway 9L-27R. The parallel taxiway would be 75 feet wide and would extend eastward up to Taxiway E. Eight taxiway connectors would link the new taxiway with the future runway. These are presently shown as 90-degree connector taxiways. However, it is anticipated that some of these would be high-speed angled taxiways rather than 90-degree connectors. As the implementation of the future runway approaches and the user (i.e., aircraft) characteristics are better defined, an analysis of the number of high-speed angled taxiways and their corresponding location, based on aircraft operating performance, should be included as part of the programming for the runway.

In addition to the future runway and its associated taxiway systems, several other short-term taxiway improvements were identified to improve aircraft circulation on the existing airfield. These improvements were identified by members from the consulting team, Airport staff, and/or representatives from PBIA's Air Traffic Control Tower and are further discussed under the Implementation Plan.

Table V-11

Evaluation of Short-listed General Aviation/FBO Alternatives

EVALUATION CRITERION	GENERAL AVIATION/FBO ALTERNATIVES	
	G2	G6
INCREMENTAL DEMAND COMPATIBILITY	1. Incremental growth can be accommodated with expansion west of the existing general aviation area. 2. Limited apron expansion can be accommodated in the east general aviation area.	1. Initial development would likely require substantial investments in infrastructure that may be viewed negatively by an existing or new FBO to develop in the Golfview area. 2. The area can accommodate incremental growth through SL2 demand level.
CAPITAL INVESTMENT (ESTIMATED)	\$7,425,000	\$8,500,000
LONG-TERM FLEXIBILITY AND	1. Expansion to the west of the existing general aviation/FBO area could provide growth through the PAL-2 demand levels. 2. Provides limited expansion contiguous to the existing general aviation/FBO area beyond PAL-2.	1. The area available for development exceeds the SL-2 requirements. 2. FBO facilities could be relocated to this area if an airfield alternative impacts the existing general aviation facilities. 3. There would be some limited areas available for other aviation related development.
INDIRECT FACILITY IMPACTS	1. Would require demolition and/or relocation of the 391st Bomb Squadron Restaurant. 2. Would require demolition and/or relocation of Flight Safety International. 3. Would impact four parcels planned for private hangar development by the DOA.	1. None
STRENGTHS	1. Expansion is contiguous to existing general aviation/FBO area. 2. General aviation/FBO facilities are adjacent to general aviation Runway 9R-27L. 3. Infrastructure is present.	1. Development has no impact on existing or planned facilities. 2. General aviation/FBO expansion capability beyond SL-2. 3. Site geometry allows for flexible planning.
WEAKNESSES	1. Limited expansion capability in east General Aviation/FBO area and beyond PAL 2. 2. Potential impact on existing facilities.	1. Access to Runway 9R-27L will require crossing of Runway 9L-27R. 2. Increased cost due to lack of existing infrastructure.
CONCLUSIONS	Concept is viable for expansion through PAL 1.	Concept is viable for demand levels beyond PAL 1 and PAL 2 or if airfield development requires relocation of general aviation/FBO facilities.



Source: PBIA Airport Layout Plan (Base Map);
Ricardo & Associates, Inc.
Prepared by: Ricardo & Associates, Inc.

0 1200 ft
north

Exhibit V-71.dwg

Strategic Master Plan Study

Exhibit V-71

**Composite
Development Plan**

October 2000

5.8.2 Terminal Facilities

The expansion of the terminal facilities includes short-term and long-term development initiatives aimed to serve incremental increases in demand. The short-term improvements identified for PBIA's terminal facilities include expansion of the Concourse B and C ends by converting the pier-ends to a wider concourse "hammerhead." The configuration for these hammerheads has been revised relative to layouts shown in the preferred terminal development alternative, Alternative T13. In the Composite Plan, the concourse end expansion for Concourses B and C is shown for both sides of each concourse. Under Alternative T13, only the west side of the concourse ends were expanded. The concourse expansion depicted in the Composite Plan provides additional building capacity without impacting the existing ARFF building. This is achieved by converting the Group IV taxiways between Concourses B and C to Group IV taxilanes.

Depending on the design aircraft identified for the concourse extensions, the incremental gain in gates may range between two gates (if wide-body aircraft are chosen as the design fleet) and four gates (using a narrow body design aircraft). In programming and designing these concourse extensions, the operating characteristics of the other gates in each concourse must be considered. There are two reasons that make this consideration critical:

- The design aircraft for the existing gates in Concourses B and C are the Boeing 727 for the narrow body gates and the L1011 for the wide-body gates. However, modern aircraft fleets commonly used at medium-hub airports like PBIA include the B-737-700 or B-757-200 as the narrow body design aircraft and the B-767-300 as the wide-body design airplane. Re-sizing the existing holdrooms to accommodate these modern aircraft may have an effect on the gate increment yielded by the construction of the hammerheads.
- The circulation corridor for Concourses B and C is approximately 25 feet wide. This corridor width is typically not sufficient to allow for the implementation of mechanical walking systems (e.g., moving walkways) in compliance with the requirements imposed by the American with Disabilities Act (ADA). The narrower circulation corridor relative to modern-day standards may exasperate any shortfalls in holdroom capacity within the existing gates. This will be particularly true during peak activity periods as passenger traffic grows and increases in gate utilization materialize.

In addition to construction of the hammerheads, construction of a new concourse, Concourse D, is depicted in the Composite Plan. Construction of this new concourse and its associated terminal facilities will require the demolition of the former Delta Terminal and result in the displacement of the employee parking lot and the Park and Ride facilities. The four overnight aircraft parking positions located southwest of the Park and Ride facilities would also be displaced, but would be relocated east of Concourse D.

Dual Group V taxilanes are shown to provide aircraft access to the east gates on Concourse C and all gates in Concourse D. The aircraft parking layout shown for Concourse D is represented by the B-757-200 as the narrow body design airplane and the Boeing 767-300 as the wide-body design airplane.

The configuration of Concourse D, and the associated terminal facilities, reflects the layout shown under Terminal Alternative T13. However, rather than extending the terminal facilities beyond the

east side of Concourse D, the terminal area between Concourses C and D, previously limited to a circulation corridor between the existing terminal building and the new terminal facilities, has been expanded to encompass additional terminal functions. In addition, the terminal area between the two concourses will also provide space for some of the Airport's Administration offices and the FAA facilities presently located on the south side of PBIA.

A space allocation plan, shown in **Exhibits V-72 through V-74**, was prepared to identify an initial increment of terminal building development. This initial expansion could be implemented to provide space for the Airport's administrative offices and FAA facilities in addition to some terminal support functions projected to operate at unacceptable levels of service before the demand for Concourse D materializes. Specifically, the space allocation plan schemes provide for the following uses:

- A new Air Traffic Control Tower, TRACON, and approximately 20,000 square feet of administrative office space for the FAA
- Approximately 20,000 square feet of administrative office space for the DOA to replace Building 846
- Additional airline ticket counters and adjacent offices
- Rental car counters to be relocated from the lower level of the existing terminal building, the relocation of which will provide additional space for future growth by the rental car agencies and alleviate congestion in the bag claim area currently experienced during peak arrival periods
- Space for the relocation of the Federal Inspection Service (facilities) which will allow for an increase in the processing capacity (from 250 passengers per hour to 400 passengers per hour) and provide additional space for the expansion of the baggage make up facilities for Concourse B. The baggage claim devices associated with the FIS facilities are positioned to allow their use for domestic service when international flights are not being processed

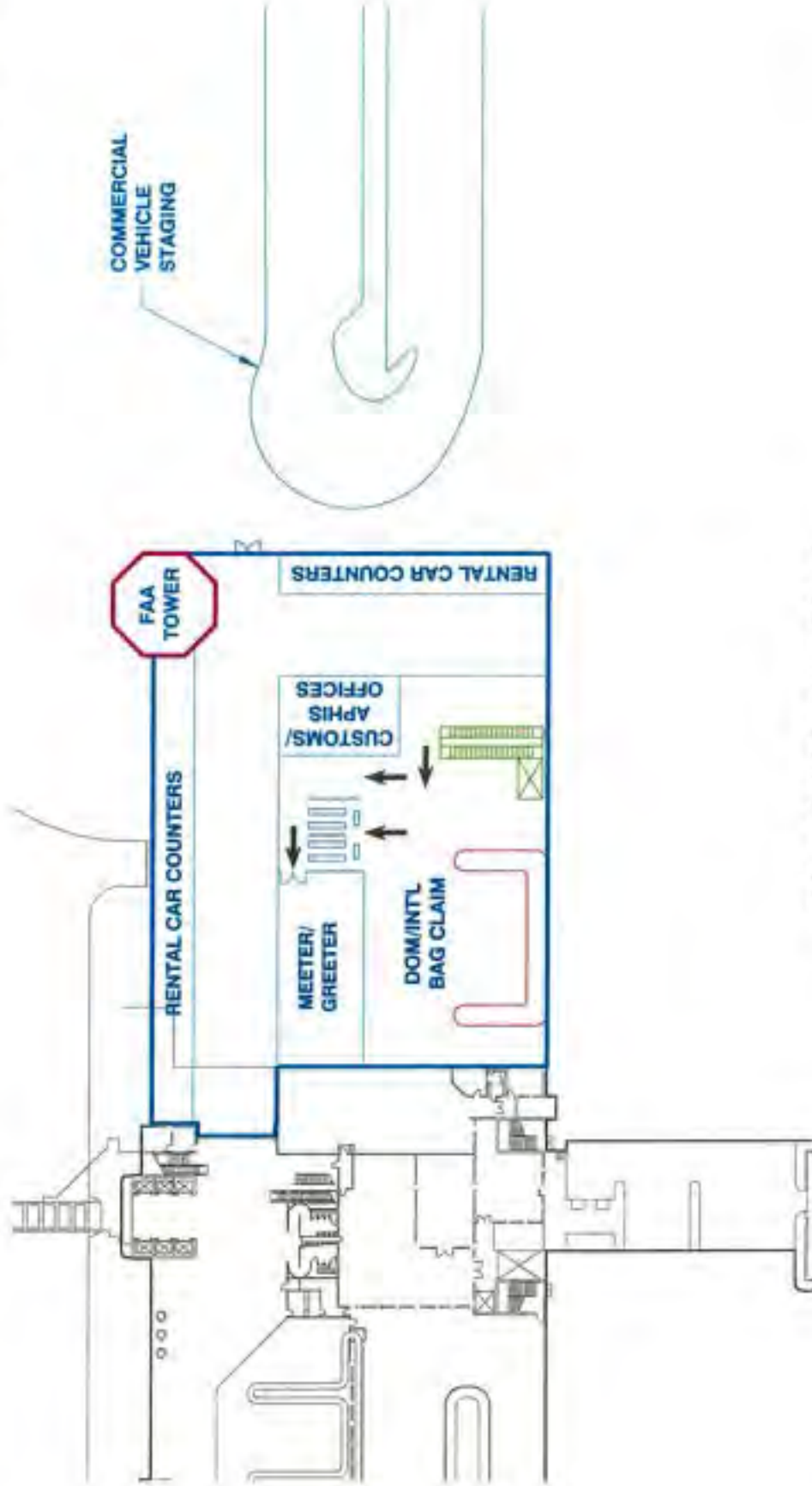
The east commercial loop, which would be displaced by this initial terminal expansion, would be restored to the east of the expanded terminal building. Relocation of the rental car counters to the east end of the terminal building could result in the increased use of the east commercial loop by some or all of the rental car shuttles.

5.8.3 Terminal Roadway

The outbound terminal roadway, east of the existing terminal building, will have to be realigned as a result of the eastward expansion of the terminal facilities. The realignment is required to provide access to Concourse D and the terminal facilities constructed in association with this new concourse.

The realignment of this terminal roadway segment will serve to provide additional property for the expansion of the terminal's landside components. With the expansion of the terminal facilities, additional public parking spaces will be required to supplement the parking capacity being provided by the existing parking garages and the new 3,600 parking stall garage (currently under design). The additional parking spaces are represented in the Composite Plan by the construction of a future garage(s). Along with the increased public parking capacity, an increase in the number of stations and queuing capacity of the Airport's parking revenue collection system will be needed.

The existing curbfront will follow the horizontal alignment of the terminal roadway. **Exhibit V-75** depicts the roadway improvements proposed for PBIA.



DOA / FAA Parking on Fourth Level.

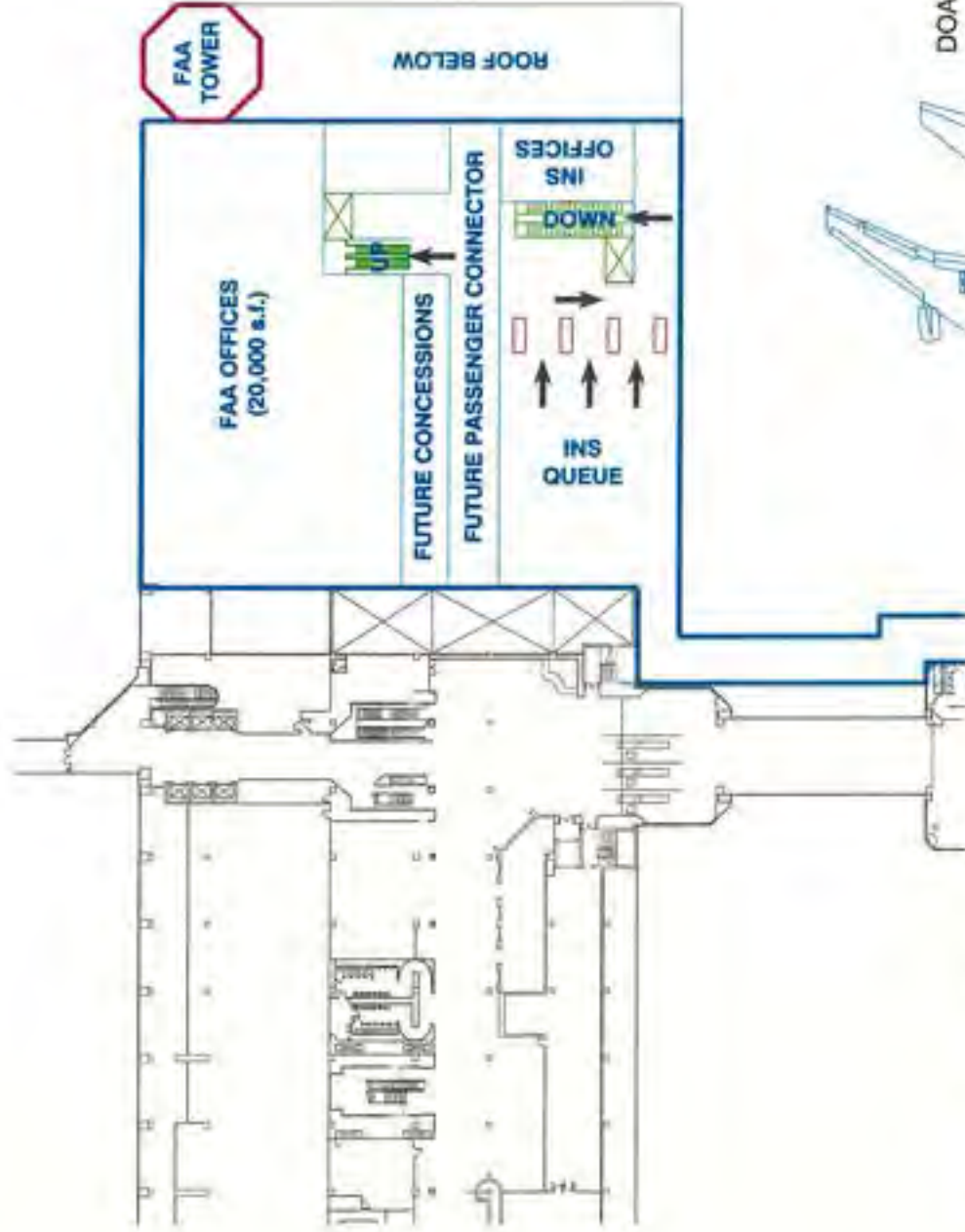
Source: Terminal Lease Drawings (Base Map); Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.



Exhibit_V-72.dwg

Exhibit V-72

Short Term Terminal Expansion Option 3 - Level 1



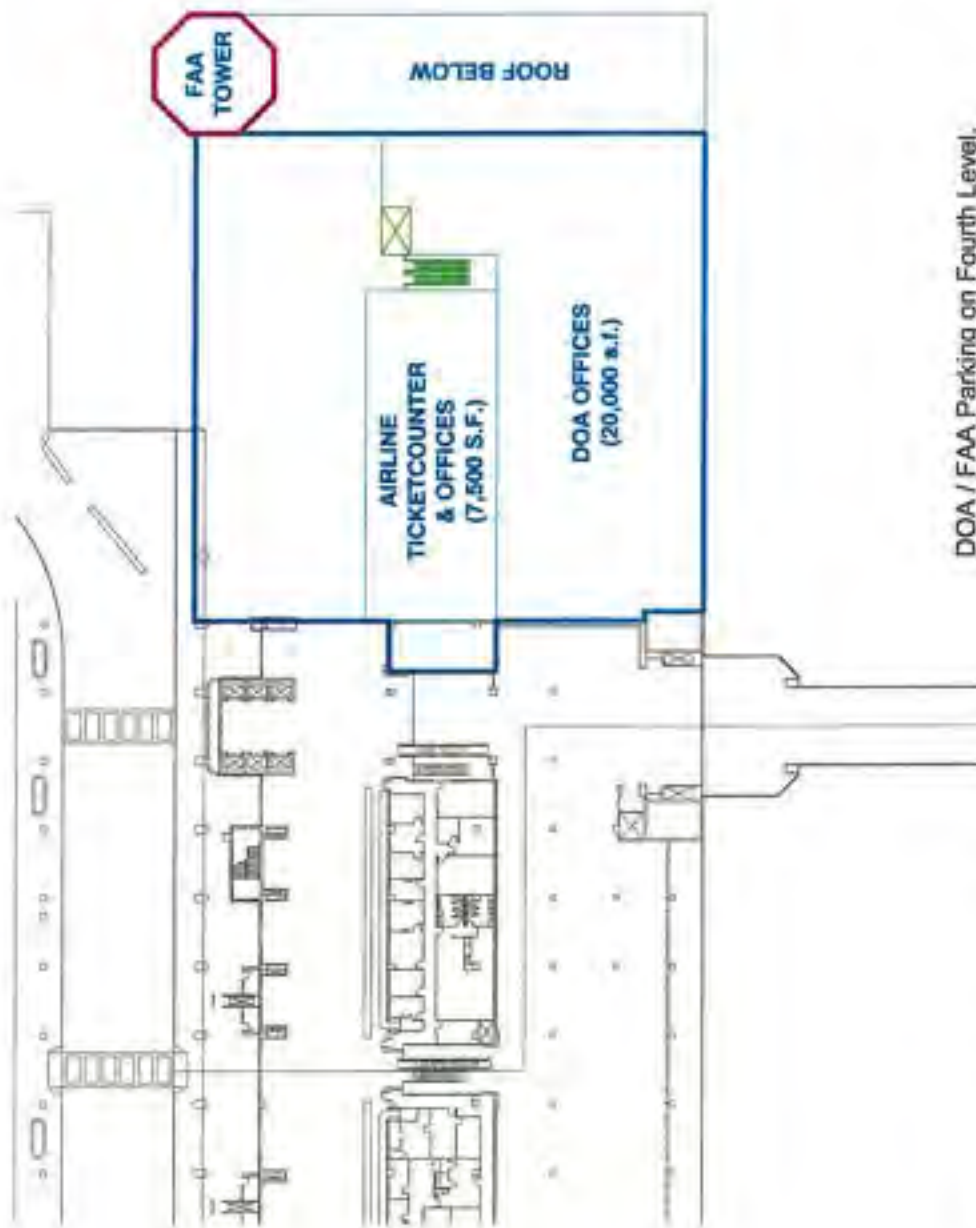
Source: Terminal Lease Drawings (Base Map); Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

0 80 ft north

Exhibit_V-73.dwg

Exhibit V-73

Short Term Terminal Expansion Option 3 - Level 2



DOA / FAA Parking on Fourth Level.

Source: Terminal Lease Drawings (Base Map); Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc.

Exhibit V-74

Short Term Terminal Expansion Option 3 - Level 3

0 80 ft. north

Exhibit V-74.dwg

5.8.4 Short-Term and Long-Term Public Parking Facilities

This study assumes that short-term and long-term public parking demand will continue to be served in a manner similar to present conditions. This includes the availability of short-term public parking spaces in the four-level parking decks located above the terminal building. Future terminal expansion(s) assumes that the four decks of parking would also be extended across the expanded terminal building.

Long-term public parking spaces would continue to be provided by structure parking systems (i.e., parking garages) supplemented by adjacent surface parking areas. The new parking garage shown in the Composite Plan is representative of a six-level structure with a slightly larger footprint than the existing long-term parking garage.

5.8.5 Employee Parking Facilities

With the displacement of the employee parking lot by the expansion of the terminal facilities and construction of Concourse D, it is assumed that a portion of the upper (uncovered) deck of the short-term parking garage would provide close-in parking facilities for Airport employees and tenants of the terminal building.

Since the upper deck is typically the least desirable parking option for patrons utilizing the covered parking facilities and paying the garage rates, the use of the upper parking deck for employee and tenant parking provides a viable solution for these parking needs. This is further supported by the apparent surplus capacity of short-term parking that may be available at PAL 2 following the complete buildout of the terminal facilities as shown in the Composite Plan.

5.8.6 Park and Ride/Rental Car Facilities

The terminal facilities expansion and construction of Concourse D will require relocation of the Park and Ride surface lots. Two possible scenarios were identified for the re-establishment and future expansion (needed to serve increasing demand levels) of the Park and Ride facilities. The two scenarios similarly addressed the future growth needs of the on-airport rental car agencies.

Both scenarios consider the acquisition of the Kennel Club property, north of Belvedere Road, and use of the adjacent County owned property for either overflow (Park and Ride) public parking surface lots or development of a Ground Transportation hub that would accommodate the rental car agencies currently located on-airport. The Ground Transportation Hub could be linked to the terminal building by an above ground people-mover system. Under this scenario, the Park and Ride facilities would be re-established in the property currently occupied by the on-airport rental car agencies, as shown in the Composite Plan. Future capacity for the Park and Ride facilities could be provided northeast of the proposed site, complimented by roadway access and circulation improvements.

The second scenario maintains the on-airport rental car facilities in their present location, expanding them to the southeast to serve future demand in the manner described above for the Park and Ride facilities. The Park and Ride facilities would then be re-established in the Kennel Club property and adjacent parcels.

5.8.7 Cargo Facilities

Future belly-cargo and all-cargo (freight) facilities have been consolidated to the sites east of the proposed terminal facilities and west of Cargo Building 1475. The integration of these cargo-related facilities and the location proposed for the facilities reflect the identification and evaluation of cargo development patterns for PBIA previously presented that support prior recommendations provided under the 1993 Cargo Technical Report prepared as part of the Landside Master Plan.

Development of cargo facilities shown in the Composite Plan reflects an incremental, demand-driven buildout of facilities that would first occur on the sites furthest to the east, closest to Building 1475. The buildings that are closest to the terminal apron and access taxilanes should be developed as flex-use cargo facilities to allow for their utilization for either belly-cargo/freight forwarding functions or all-cargo (freight) processing and handling. An aircraft apron should also be constructed west of the flex-use building, adjacent to the terminal access taxilanes, to support the all-cargo (freight) operations. Alternately, the aircraft apron could provide overnight aircraft parking positions for airlines if the building is serving predominantly freight forwarding operations.

5.8.8 General Aviation/FBO Facilities

As the services offered by the existing FBOs continue to expand and general aviation demand, particularly in the area of corporate aviation, continues to grow the ability to provide additional capacity to support this growth with acceptable levels of service will be required. In addition, with the displacement of most of the general aviation/FBO facilities east of Runway 13-31 caused by the development of the new air carrier runway south of Runway 9L-27R, alternate locations for these facilities have to be defined for implementation during the mid-term to long-term future horizon. The new locations require sufficient land to accommodate the existing facilities and the future growth anticipated for these functions.

To satisfy the long-term general aviation/FBO needs of PBIA, three sites have been identified for general aviation/FBO facility-related development. It is anticipated that the relocation of tenants and facilities to these sites would occur in a phased-manner, transitioning from the existing site(s) to the new location(s) based on demand growth, the need for additional facilities, and the timing for the conversion of Runway 9R/27L to air carrier use.

It is envisioned that the FBO tenants located east of Runway 13-31 would be the first to experience site development constraints and the need for additional facilities. To accommodate these growth needs, the northern areas of the recently acquired Town of Golfview property, comprising approximately 1.5 million square feet, have been designated for future general aviation/FBO development. The relocation of one of the existing FBOs to this area would also provide additional growth opportunities for the two FBOs remaining on the south side of the Airport.

As additional growth in general aviation/corporate aviation demand materializes and/or the construction of the new runway enters the design and development phase, the relocation of another south side FBO tenant would be required. To serve this continued growth, a second site was identified for future general aviation/FBO facilities. This site is located east of Runway 13, opposite to the general aviation/FBO parcels proposed within the northern half of the Town of Golfview. The proposed site is currently bounded by the 8th Street loop and comprises approximately 1.5 million square feet.

With the relocation of the east-side tenants to the north Airport properties described above, it is assumed that the areas presently serving general aviation/FBO functions on the south side, west of Runway 13-31, would continue serving these uses. Even with the conversion of Runway 9R/27L to air carrier use, it is estimated that approximately 2.2 million square feet of land would be available for general aviation/corporate aviation uses and growth by the remaining FBO not relocated to the north sites.

5.8.9 Aircraft Maintenance Facilities

Within the Composite Plan, opportunities for aircraft maintenance activities have been considered and made available in the southern areas of the Town of Golfview property. Aircraft maintenance activities are presently limited to those performed by some of the FBO tenants. Although future projections of aircraft maintenance facility requirements were not included in the scope for this study, it is recognized that the location of the Airport within the South Florida market and its relative proximity to the Caribbean and South and Central America could result in the entry of new tenants into PBIA desiring to provide aircraft manufacturing/avionics services.

As a result, the designation of parcels for aircraft maintenance functions was included in the development of PBIA's land-use options reflected in the Composite Plan. The facility layout depicted in the Composite Plan recognizes the potential for aircraft maintenance facility demand by one or more prospective tenants. These parcels could be available immediately to prospective tenants, however, facility development would be contingent on the demand for such facilities and lease commitments executed by these prospective tenants.

5.8.10 Airport Maintenance Facilities

The location for future airport maintenance facilities is shown west of the terminal complex, within the 8th Street Loop, adjoining the future general aviation/FBO facilities. This site reflects the siting analysis, master planning, and facility programming completed for the New Maintenance Compound in 1996. The design of the new airport maintenance facilities is currently underway and continues to reflect the development of these facilities within the proposed site.

The New Maintenance Compound provides for the integration of terminal maintenance and airside/landside grounds maintenance within one site. Facilities included within the Compound include administrative offices, conference rooms, employee locker rooms and break rooms, trade-shops, storage areas, equipment staging areas and material stockpiling yards, warehouses, and delivery loading zones and truck docks.

5.8.11 Navigation Aids

- Some of the existing navigation aids would also be displaced by the construction of new facilities and require the identification of alternate sites for their relocation. The primary navigation aids that would have to be relocated prior to, or concurrent with, the conversion of Runway 9R/27L include the Instrument Landing Systems (ILS's) for Runway 9L-27R and the VOR located south Runway 27R and east of Runway 31.

The runway utilization assumed for the future airfield is characterized by departure and arrival air carrier operations on the inboard runway (Runway 9L-27R) and arrival operations on the outboard runway (the new runway). Therefore, the location of the existing ILS's should be south of the new runway. Similarly, the new location of the VOR is shown to be within the leasehold presently held by Signature Flight Support.

The programming for the new runway should include a more detailed siting analysis for these navigation aids taking into consideration the FAA and manufacturer prescribed clearances to preserve the integrity of these facilities and the signal(s) transmitted by these devices.

5.8.12 Collateral Development

Various parcels have also been preserved within the perimeter of the Airport for potential collateral development. Such development may include office buildings, retail and wholesale facilities, hotel and tourism-related facilities, and other community compatible and supported development. The collateral development analysis completed under the Business Plan assessed the opportunities available within PBIA serve those market opportunities using lands not needed for aeronautical purposes. Based on this analysis, the airport parcels abutting Belvedere Road and located closest to Australian Boulevard were identified for this use. As such, three parcels have been designated for collateral development within the northeast options of the Airport.

One of these parcels, which is located on the southwest corner of the intersection between Belvedere Road and Australian Avenue, has been preserved by the DOA for future hotel development. Since the approach paths for the new runway will impact the Hilton complex located southeast of the Airport, off Southern Boulevard, it is possible that this airport parcel could serve as the future site for the Hilton Hotel. The other two sites are also located adjacent to Belvedere Road, on either side of the Airport's fuel farm and supporting facilities. The site shown to the west of the fuel farm is presently occupied by Buildings 1301-1311, the Air Freight facilities, and would be available after the relocation of the cargo operations to the sites shown in the Composite Plan is completed.

An implementation plan for the development of PBIA's future facilities is presented and described in the following section. The implementation plan includes a sequencing of development over the short-term future as reflected by the Airport's five-year Capital Improvement Program (CIP). It also provides an incremental development plan for facilities that would likely be constructed following the CIP and through PAL 2 if the activity projections and demand profiles materialize in accordance with the demand scenarios modeled under this study.

5.8.13 Other On-Airport Roadway Improvements

In order to support the long-term airport development shown under the Composite Plan, several internal roadway improvements are necessary. These roadway improvements are required in order to re-establish on-airport circulation patterns that will be disrupted or impacted due to the development of the proposed facilities and to accommodate future demand levels. The proposed roadway improvements are further discussed in the following sub-sections.

5.8.13.1 Town of Golfview Property

As a result of the airport improvements and facility expansion previously described, the relocation of one or more FBOs to the Golfview property is proposed. The new FBO facilities would be located north of the proposed Aircraft Maintenance facilities as shown in the Composite Plan. These changes in land use will require the following improvements:

- Relocate the existing Airport West Canal - It is proposed that the existing canal be relocated to the west of its current location, parallel to Military Trail and Belvedere Road.
- Provide access roads to the various FBOs facilities (i.e., hangars, offices, etc.) - It is proposed that this access/circulation road be a two-lane road with a center turning lane.

Access to these facilities would be available through two primary locations: one from Military Trail and another one from Belvedere Road. Currently, the Golfview Property has two access points off Belvedere Road. With the proposed circulation improvements, the western entrance to the property would be closed. The eastern entrance would remain open.

The eastern entrance is a four-legged intersection composed of Belvedere Road (east and west approaches, Golf Club Road (the north approach), and Golfview property exit road (south approach). Two intersection layouts were developed and are shown in **Exhibits V-76 and V-77**. Exhibit V-76 shows this intersection as a two-way stop sign intersection in which the northbound to westbound movement is prohibited. Exhibit V-77 shows this junction as a signalized intersection with all movements allowed.

5.8.13.2 8th Street Loop

As previously described, the new Maintenance Compound's proposed location is west of the commuter apron adjacent to Concourse A. This site, which is bounded by the 8th Street loop, is currently used by the Airside/Landside Site Maintenance Division.

The consolidation of the maintenance buildings allows for relocation of another GA / FBO facility west and north of the new maintenance compound. The FBO facilities that could be accommodated within this site include aircraft maintenance and storage, apron space, and automobile parking areas. These facilities require roadway circulation improvements, which are detailed in **Exhibit V-78** and described below.

- Provide direct access (two access points) from Belvedere Road to the general aviation/FBO facilities by constructing a two-lane undivided frontage road parallel to Belvedere Road, which will minimize impacts to the existing configuration of Belvedere Road
- Provide access to the new Maintenance Compound, which will also consist of a two-lane undivided road that intersects Belvedere Road

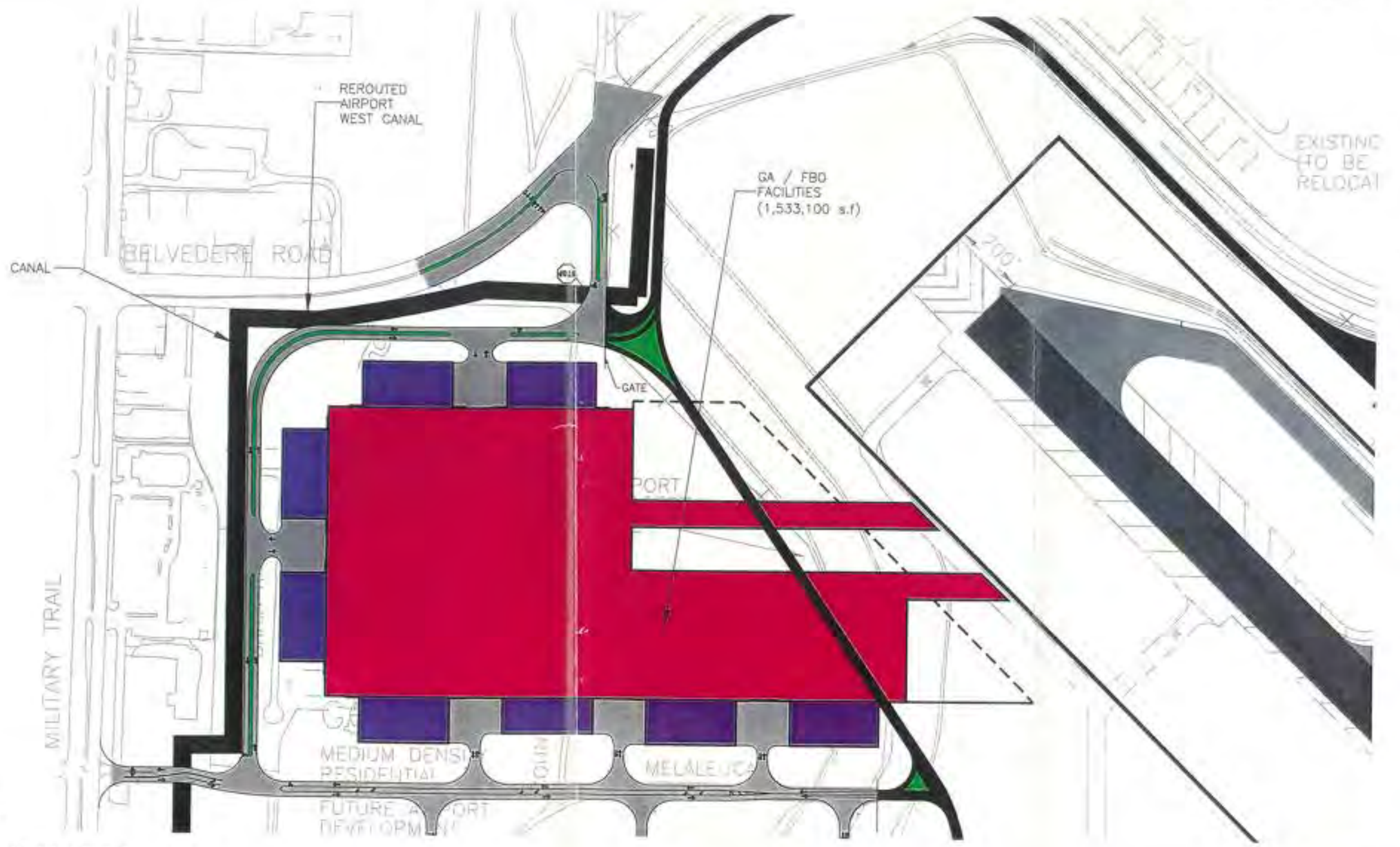
5.8.13.3 Southside General Aviation/FBO Facilities

Access to the southside general aviation/FBO facilities that would remain west of Runway 13-31 would be provided by the recent construction of the Airport's south outer perimeter road. This new on-airport access road has been constructed to allow for its future integration with the widened SR80. For the most part, the only enhancements that would be required for these south side facilities will be connector roads to link the Airport's south outer perimeter road with the new or expanded facilities. These proposed enhancements are shown in **Exhibit V-79**.

5.8.13.4 Existing and Proposed Air Cargo Facilities Site

Vehicular access to the consolidated cargo facilities, shown in the parcels west of Building 1475 and its associated aircraft apron, would occur through the east perimeter road segment intersecting Australian Boulevard. In an effort to divert the circulation of heavy vehicles around PBI's terminal roadway, it is proposed that these two facilities be accessed from Australian Avenue only. This vehicle circulation pattern would provide direct access to the cargo facilities. In addition, the larger commercial vehicles (i.e., trucks) that typically transport goods to and from these cargo facilities would be segregated from the private vehicle traffic traveling on the terminal roadway.

V125



Legend:
■ Airside Service Road
■ Landside Service Road

Source: PBIA Airport Layout Plan (Base Map); Frederic R. Harris, Inc.
 Prepared by: Frederic R. Harris



Exhibit_V-76.dwg



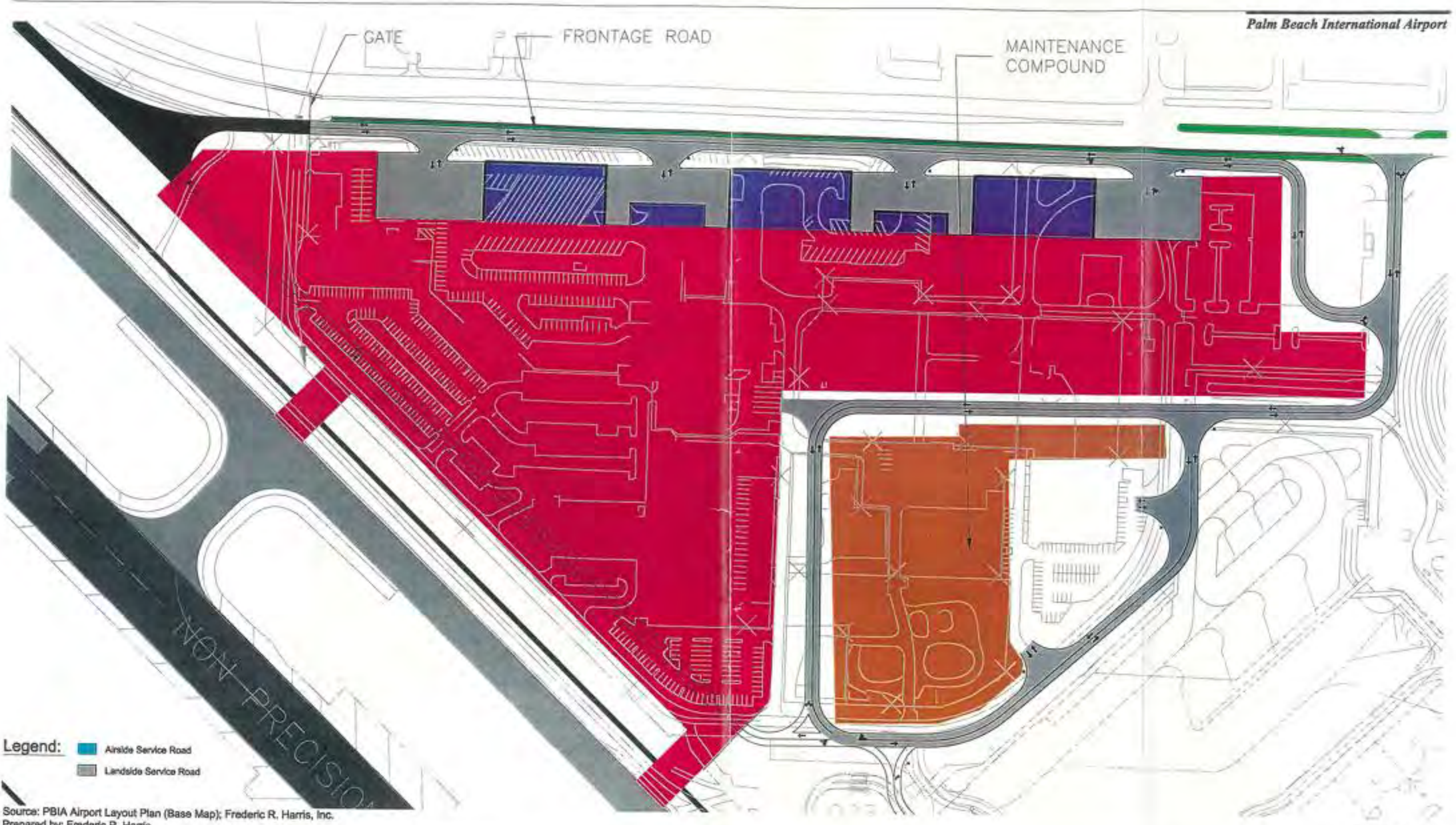
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Strategic Master Plan Study

**Golfview Property Access Improvements
Alternative B**

October 2000

V-78



Palm Beach International Airport

Legend: ■ Airside Service Road
■ Landside Service Road

Source: PBIA Airport Layout Plan (Base Map); Frederic R. Harris, Inc.
Prepared by: Frederic R. Harris

0 100 ft. 
north

Exhibit_V-78.dwg

Strategic Master Plan Study

Exhibit V-78

**8th Street Loop
Access Improvements**

October 2000

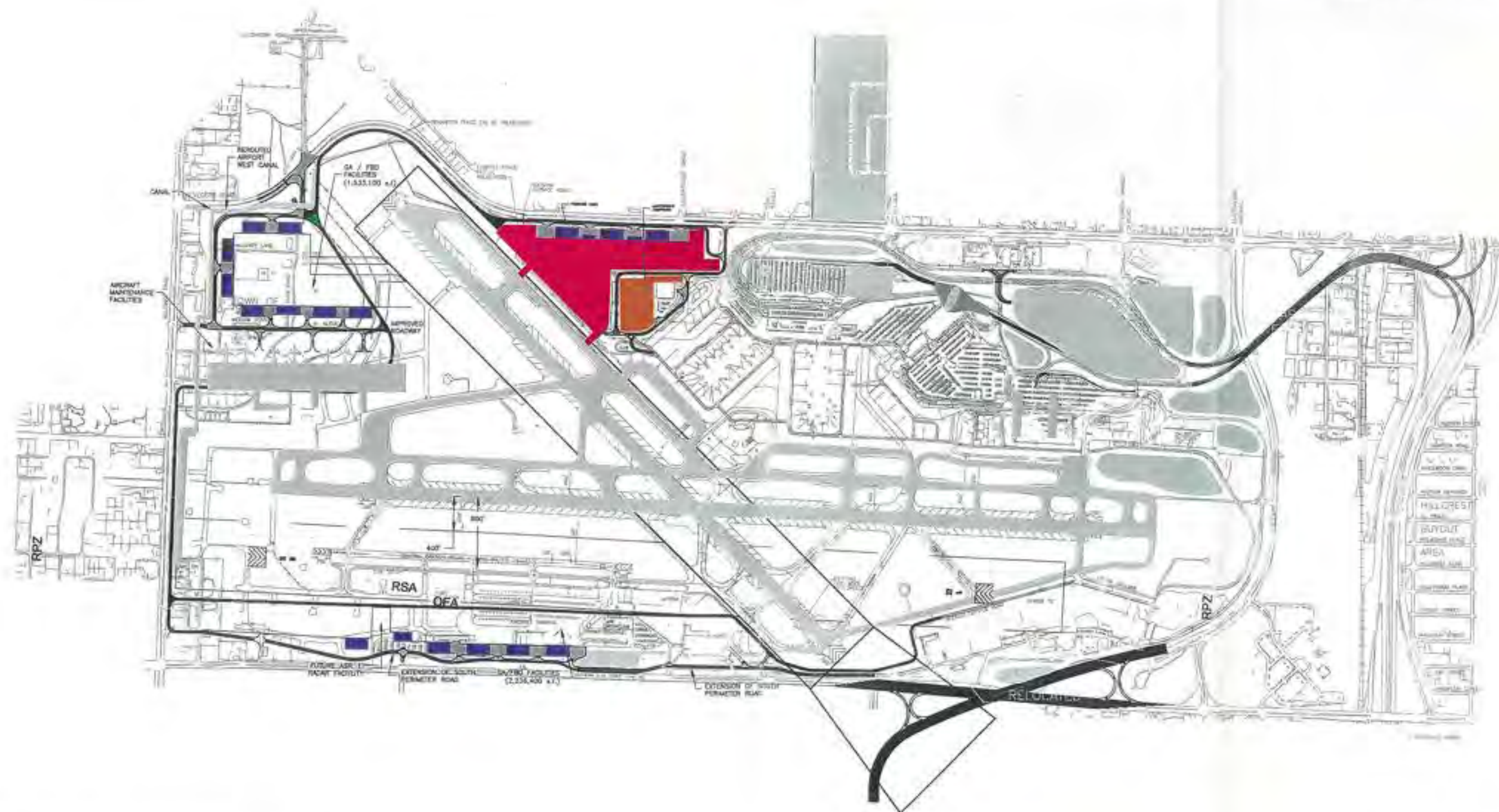


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Strategic Master Plan Study

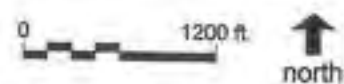
South FBO Access Improvements

October 2000



Source: PBIA Airport Layout Plan (Base Map); Frederic R. Harris, Inc.
Prepared by: Frederic R. Harris

Exhibit V-75



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Strategic Master Plan Study

Roadway Improvements Within PBIA

October 2000

Section VI

VI. Transit and Intermodal Analysis

A transit and intermodal analysis was performed as part of PBIA's Strategic Plan to study the near-term and long-term transit enhancements that could be provided for the Airport. This analysis also serves to assess the opportunities for providing a linkage between PBIA and the Downtown Multimodal Center.

As the Airport continues to expand in order to serve aviation demand growth, access improvements to the Airport via ground transportation and transit modes need to be identified to support the long-term facility development plan proposed for PBIA. More importantly, efficient and direct ground circulation patterns need to be identified to serve existing and future traffic volumes.

Local and state planned rail improvements will provide an efficient and less congested transportation mode within the County and throughout the South Florida area. As the County's rail and multimodal improvement plans mature, PBIA needs to have a plan that compliments the County's multimodal system with a compatible intra-airport intermodal network.

This intra-airport intermodal network will be beneficial as activity at PBIA grows, thus increasing ground circulation and traffic levels within the Airport's roadway system and requiring alternate means for accessing the Airport and its terminal facilities.

6.1 Intermodal Passenger Transportation Services

PBIA is served by the following intermodal passenger transportation services:

- **PalmTran Bus Service** – PalmTran presently operates bus routes directly to PBIA's terminal building.
- **Tri-Rail Passenger Service** - Tri-Rail presently serves the Airport through the Mercer Avenue station. This station has been closed indefinitely while planned improvements by Tri-Rail proceed through the implementation phase. One of these planned improvements includes expansion of a single track to a dual track rail system. The double-track rail system will greatly improve Tri-Rail service and increase ridership as headways are reduced from 30 minutes to 20 minutes during peak periods.
- **For Hire Transportation Services** - Taxicabs, limousines, and courtesy shuttle vehicles also serve the terminal building directly. Staging spaces and curbside areas are provided for these services.

6.1.1 Assessment of the Palm Beach County Transit System

The Palm Beach County Transit System (PalmTran) operates a total of 39 routes throughout Palm Beach County, of which two routes, 44 and 53, serve PBIA. **Table VI-1** summarizes the performance indicators associated with the PalmTran service. The table shows performance/indicators for both fixed (schedule service) routes and demand-driven trips/routes.

Table VI-1

Palm Tran Performance Indicators (FY 1996)

Performance Indicators	Fixed-Route	Demand-Response
Service Area Population (000)	869.63	869.63
Passenger Trips (000)	2,746.24	125.94
Revenue Miles (000)	4,857.43	948.87
Revenue Hours (000)	286.47	59.04
Total Operating Expense (000) \$	17,394.92	2,131.68
Total Maintenance Expense (000) \$	3,143.30	7.63
Total Capital Expense (000) \$	7,379.96	122.40
Total Operating & Local Revenue (000) \$	16,624.46	N/A
Total Employees	260.70	5.30
Vehicles Available for Max. Service	145.00	52.00
Vehicles Operated in Max. Service	122.00	34.00
Number of Incidents	35.00	N/A
Total Revenue Service Interruptions	1,450.00	N/A
Passenger Trips per Revenue Mile	0.57	0.13
Operating Expense per Passenger Trip, \$	6.33	16.93
Operating Expense per Passenger Hour, \$	60.72	36.11
Farebox Recovery (%)	0.11	0.00
Average Fare (\$)	0.70	0.06

Source: Center for Urban Transportation Research, 1998 Florida Transportation Almanac
 Prepared by: Ricondo & Associates, Inc.

PalmTran Route 44 is an east/west route operating seven days per week and serving nine destinations:

- Downtown West Palm Beach
- West Palm Beach Tri-Rail Station
- PBIA Tri-Rail Station
- PBIA
- Kennel Club
- Drexel Road
- Lake Point Center
- Summer Creek / Lake Crystal
- Western Plaza

PalmTran Route 53 is an east/west route operating only on weekdays. This route provides transit service to the following destinations:

- Downtown West Palm Beach
- Tri-Rail Station at West Palm Beach
- Tri-Rail Station at Mercer Road
- Palm Beach County Building 502 (Belvedere Road and 5th Street)
- PBIA

The "Peak Load Factor" is a common performance measure used to assess the utilization of a fixed bus route. It is a ratio that compares the number of riders on the bus versus the number of available seats during a specific time period. Load factors range between 0.0 and 1.0, however, a load factor greater than 1.0 does not mean the route is over capacity, since standing riders are an accepted

element of capacity. In this case, the load factor should be compared to the bus space available for standing riders in order to determine whether the route is operating in excess of its theoretical capacity.

PalmTran provided the morning (6:00 – 9:00) and evening (3:00 – 7:00) peak ridership and bus fleet capacity information necessary to determine the peak load factors for the bus routes serving PBIA. The results of this analysis are presented below in **Table VI-2**. As shown, the average load factors are below 0.5, indicating that the utilization of these routes is very low during the peak hours.

Table VI-2

Fixed Route Bus Peak Load Factor - PBIA

Route	Date	# Seats	Standing Riders	AM Peak		PM Peak	
				Avg. Riders	Peak Load Factor	Avg. Riders	Peak Load Factor
44	Jan. 25-30, 1999	46	23	8	0.18	10	0.22
53	Jan. 25-30, 1999	22	11	2	0.09	NA	NA

NA: Not available

Source: Frederic R. Harris, Inc.
Prepared by: Frederic R. Harris, Inc.

6.1.2 Assessment of the Tri-Rail System

The Tri-Rail system is evaluated based on the level of connectivity that is provided between Tri-Rail, the Palm Tran buses, and PBIA. The Tri-Rail station closest to PBIA is located north of Belvedere Road along Mercer Road. As previously shown, this station is served by PalmTran Routes 44 and 53 and taxicabs. A second Tri-Rail/Amtrak station, the West Palm Beach Station, is located in the West Palm Beach business district, due north of the Mercer Road Station. Park & Ride service is provided at the downtown station.

Tri-Rail provided passenger counts collected for the month of January 1999 related to activity at the Mercer Road Tri-Rail Station. This information indicated the following:

Northbound Direction

- A total of 2,570 passengers per day were reported to de-board the train at this station.
- A total of 995 (approximately 39 percent of the daily total) passengers de-boarded Tri-Rail at this station during the peak period (5:02 p.m. to 7:26 p.m.).

Southbound Direction

- A total of 248 passengers per day were reported to de-board the train at this station
- A total of 193 passengers (approximately 78 percent of the daily total) de-boarded Tri-Rail at this station during the peak period (2:06 p.m. to 5:43 p.m.).

Tri-Rail operates seven days per week with approximately one-hour headways between 4:00 a.m. and 10:00 p.m. depending on the station location.

6.1.3 PalmTran/Tri-Rail Connectivity Analysis

In general, northbound Tri-Rail passengers experience an average wait time of 11.5 minutes when transferring to PalmTran Routes 44 and 53 during weekdays. Eastbound PalmTran passengers experience an average wait time of 41 minutes when transferring to Tri-Rail.

Northbound Tri-Rail passengers experience an average wait time of 35 minutes when transferring to Palm Tran Route 44 during weekends and an average wait time of 10.4 minutes when transferring to Palm Tran Routes 44 and 53 on weekdays.

Eastbound Palm Tran passengers experience an average wait time of 39 minutes when transferring to Tri-Rail during weekdays, which is 3.5 times more than the southbound to westbound transfer wait time. On Saturdays and Sundays, eastbound passengers experience an average wait time of 69 and 88 minutes respectively, when transferring to Tri-Rail heading northbound.

Southbound Tri-Rail passengers experience an average wait time of 73.0 and 85.3 minutes on Saturdays and Sundays, respectively, when transferring to Palm Tran Route 44. Southbound Tri-Rail passengers experience an average wait time of 35 and 58 minutes on Saturdays and Sundays, respectively, when transferring to Palm Tran Route 44.

Four geographic areas within Palm Beach County were selected to illustrate the connectivity between Tri-Rail and Palm Tran in providing access to PBIA:

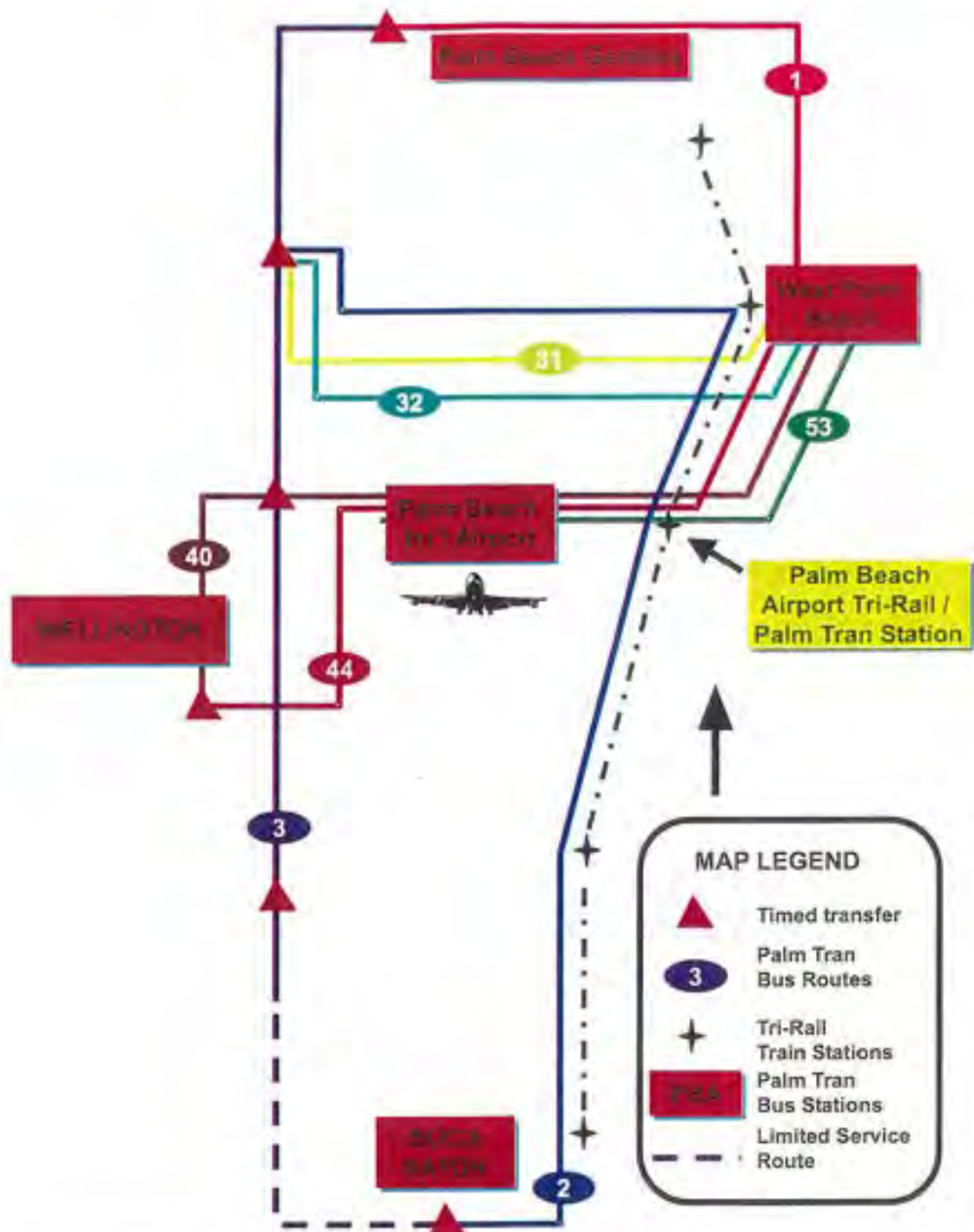
- Palm Beach Gardens (PBG) – PBIA
- Downtown West Palm Beach (WPB) – PBIA
- Wellington – PBIA
- Boca Raton – PBIA

Exhibit VI-1 depicts the four geographic areas and the available transit system routes that connect these areas to PBIA. In many cases, transit travel from these geographic areas to PBIA entails circuitous routes and the need to transfer between modes.

6.2 PBIA Intermodal Hub

The objective of an “intermodal transportation hub” is to integrate the intermodal transportation services described above to provide Airport users efficient transfers and services characterized by the highest degree of comfort, convenience, and security possible.

A PBIA Intermodal Hub has been identified to serve as a centralized transfer hub for the various transit and intermodal modes currently serving the Airport. As growth continues at PBIA, the presence of a centralized hub for the transit and intermodal services would facilitate the efficient transfer of passengers between PBIA’s terminal building and its ground transportation providers. The Intermodal Hub would provide a base of operations for rail services, PalmTran and other bus services, and for-hire transportation services. The Intermodal Hub would



Source: Frederic P. Harris, Inc.
Prepared by: Frederic P. Harris, Inc.

Exhibit VI-1



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Palm Tran/Tri-Rail Connectivity Analysis

compliment the Ground Transportation Center that will be identified to centralize the on-airport rental car operations.

The proposed site for PBIA's Intermodal Hub is directly east of the Airport, within the area bounded by Belvedere Road to the north, I-95 to the east, and the West Palm Beach Stub Canal to the west and south. This site is shown in **Exhibit VI-2**.

The area is currently occupied by a mixture of land-uses and is located within the center of the new above ground ramps that will be constructed as part of the I-95/PBIA Direct Connector project. Australian Avenue would provide access to the site for PBIA Shuttle Buses as well as private vehicles. The site is bisected by the South Florida Rail Corridor, which accommodates Tri-Rail trains. It has the potential for serving as the replacement for the Mercer Road Tri-Rail Station after the completion of the I-95/PBIA Direct Connector project. Other advantages of this site include the following:

- There would be full utilization of land east and west of the South Florida Rail Corridor.
- There is sufficient land to accommodate at-grade or garage parking for both Tri-Rail and Airport users.

Some of the disadvantages include the following:

- The rail corridor divides available land
- The entire site is significantly developed and occupied by primarily industrial uses.
- PBIA Shuttle Buses will need to cross Australian Avenue. However, this can occur at a signalized intersection.

This Intermodal hub will accommodate the following modes of transportation:

- Rail (Tri-Rail, Amtrak)
- Private Vehicles
- PBIA Shuttle Buses
- PBIA – Intermodal Hub People Mover connection (long-term)
- PalmTran buses
- Taxicabs
- Bicycles
- Pedestrians

6.3 Connectivity Between PBIA and Proposed Intermodal Hub

6.3.1 People Mover System

People movers are a type of automated fixed guideway transportation system. Generally, these systems are provided to transport people within a restricted major activity center such as an airport, an entertainment complex, a large retail or employment center, or a central business district. People movers are relatively small systems of short length (maximum of two to three miles) with a small number of stations and vehicles. A people mover may be configured as a shuttle or a loop system.



Source: Frederic R. Harris, February 4, 1999
 Prepared By: Ricordo & Associates, Inc. April 1994.



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Exhibit VI-2

I-95 / PBIA Direct Connector

October 2000

The type of people mover proposed for PBIA is a shuttle people mover system. Typically, this type of system has a single vehicle or train operating back and forth over a single-lane of guideway at 15 to 30 mph between on line stations. Shuttles are found to be practical applications for point-to-point service.

Exhibit VI-3 presents two possible corridors for a people mover system connecting PBIA with the proposed Intermodal Hub and the Ground Transportation Center (discussed in a subsequent subsection). The proposed system would connect Airport users to the various transportation modes available at the Intermodal Hub (transit, rail, auto, etc.) and to the ready-return rental car facility (i.e., the Ground Transportation Center). This system could ultimately be complimented with a luggage conveyor system to allow baggage check-in at this remote location.

Descriptions of the two possible people mover system corridors are presented below.

- *People Mover Option 1:* This alternative proposes the people mover system on an elevated structure connecting PBIA and the Intermodal Transportation Hub with an intermediate stop at the Ground Transportation Center. In this alternative, the people mover would traverse over Belvedere Road twice. The alignment of this route is located in the northern portion of the Airport's inbound terminal roadway, parallel to and south of Belvedere Road, as shown in Exhibit VI-3. At Congress Avenue, it traverses north to the Ground Transportation Center, circulating it and then heading south toward PBIA's future parking garage and PBIA's terminal building.
- *People Mover Option 2:* Under this scenario, the people mover system is also on an elevated structure and connects the Intermodal Hub and the Ground Transportation Center with an intermediate stop at PBIA's terminal building. The alignment of this route is located between the inbound and outbound terminal roadways as shown in Exhibit VI-3. This route traverses through the future Park and Ride facilities and continues to PBIA's terminal building, the parking garage, and finally to the Ground Transportation Center. This route is shorter in distance than Option 1.

6.3.2 Preliminary Screening of People Mover Conceptual Route Alternatives

A preliminary screening of the proposed people mover routes was performed based on various evaluation criteria. An evaluation matrix is presented in **Table VI-3**.



Source: Frederic P. Harris, Inc.
Prepared by: Ricordo & Associates, Inc.



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Strategic Master Plan Study

Exhibit VI-3

Connecting Between PBIA Terminal Building,
Intermodal Hub and Ground Transportation Center

October 2000

Table VI-3

Preliminary Screening of People Mover Route Alternatives for PBIA

Criteria	Corridor Option 1	Corridor Option 2
Physical Impacts to the Environment		
Trees	1	3
Water	2	2
Wetland	1	1
Accessibility to Airport Terminal		
Direct Access	1	1
Access Via People Mover	1	1
Platform-Airport Walking Distance	1	1
Length of Route	2	1
Cost	To Be Determined	To Be Determined
Impact to PBIA Existing Terminal Infrastructure	2	2
Impact to PBIA Roadway Infrastructure	2	3
Type of Operation		
Unidirectional	1	1
Bi-directional	Not Applicable	Not Applicable
Type of Grade		
At-grade	Not Applicable	Not Applicable
Elevated	1	1
Impact to Utilities	To Be Determined	To Be Determined
1	Most Acceptable	
2	Acceptable	
3	Least Acceptable	

Source: Frederic R. Harris, Inc.
Prepared by: Frederic R. Harris, Inc.

Some of the guidelines and constraints that were considered in the evaluation of the two routes include the following:

- Minimizing of roadway and utility poles relocation - An assessment of the roadway conditions and the utilities in the area should be conducted prior to the selection of the preferred corridor in order to minimize impacts to these infrastructure systems.
- Minimizing environmental impacts - An environmental evaluation of the proposed corridors is necessary to assure that the route selected is one that offers the least impact to the environment.

Based on the preliminary screening of these people mover corridors, Option 1 provides the desired connectivity between PBIA and the two transit/intermodal centers proposed for the Airport with the least disruption to existing facilities, infrastructure systems, and other surface access systems.

6.4 Downtown Multimodal Center

As shown in **Exhibit VI-4**, the site for the Downtown Multimodal Center identified by Palm Beach County is located along the west side of Tamarind Avenue, between Fern Street and Banyan Boulevard, where the downtown Palm Beach Tri-Rail station currently operates. This facility will integrate the following existing transportation services:

- Tri-Rail
- Amtrak
- Greyhound buses
- PalmTran buses
- Taxicabs
- Bicycles
- Pedestrians

6.5 Alternatives for Connectivity Between PBIA and Downtown Multimodal Center

Potential transit corridors between PBIA and the Downtown Multimodal Center were initially addressed in the Intermodal Transportation Master Plan and Transit Facility Schematic Design Study prepared for Palm Beach County by Frederic R. Harris, Inc. in June 1995. The transit corridors analyzed in this prior study were revisited as part of this Strategic Plan. Three preliminary conceptual corridors were studied. These corridors are presented in **Exhibit VI-5**. It is important to recognize that these corridors represent a preliminary group of possible alternatives for connecting PBIA to the Downtown Multimodal Center and will require further analysis prior to their implementation. In addition, it is recognized that the ultimate selection and implementation of a particular alternative will be effected by agencies other than PBIA.

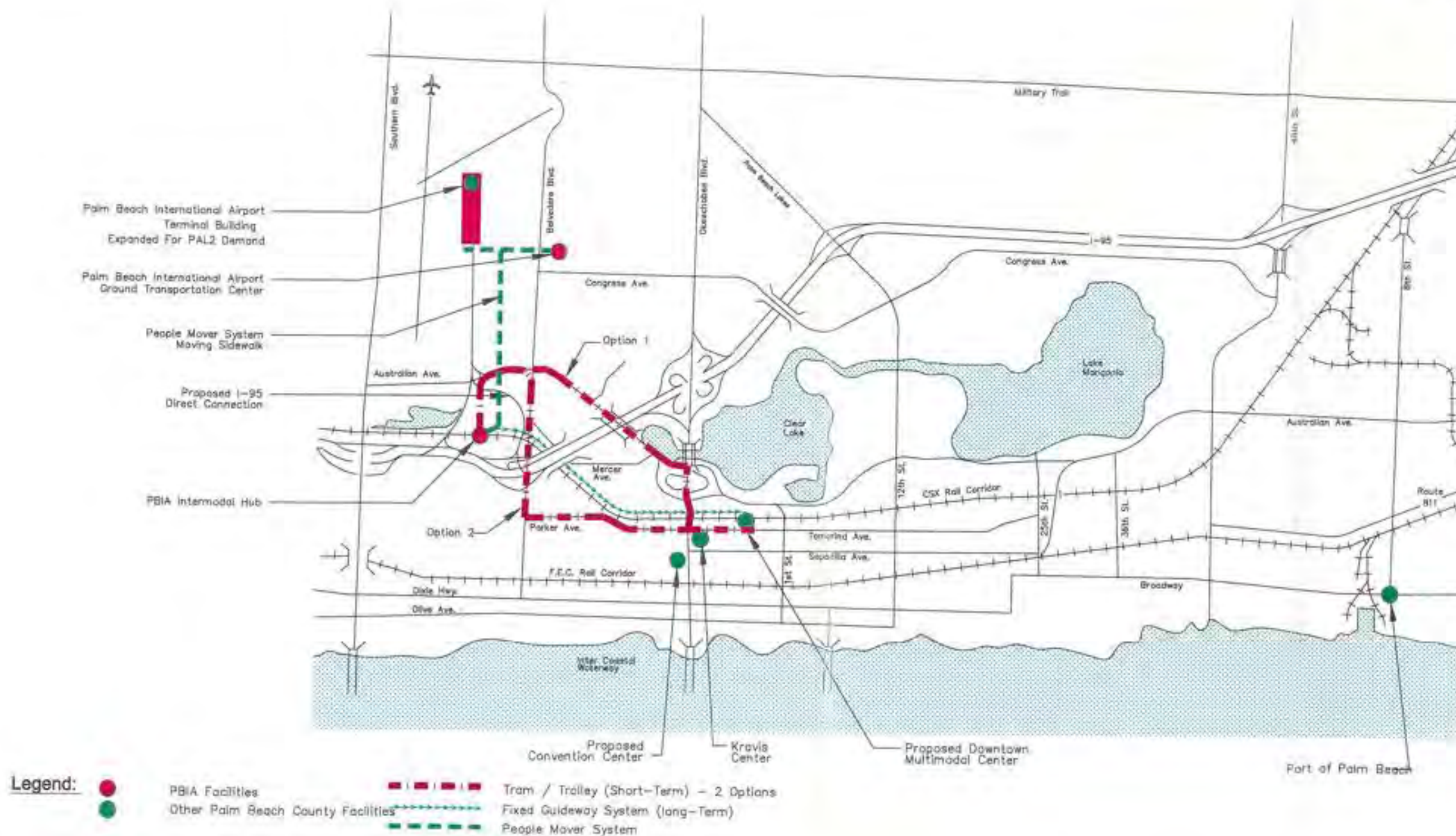
It is assumed that, initially, the transit mode between PBIA and the Downtown Multimodal Center would be a tram/trolley system that could eventually evolve into a fixed-guideway system if patronage demands warrant this magnitude of investment. This fixed guideway system may consist of a Light Rail Transit (LRT) System. The general operating system characteristics of a tram trolley system and the LRT are described below.

6.5.1 Tram/Trolley – Short Term Rail Alternative

Exhibit VI-5 shows two preliminary (conceptual) corridors for the tram/trolley system, that link PBIA's Intermodal Hub with the Downtown Multimodal Center. A brief description of each of these corridors is provided below.

Tram/Trolley Corridor Option 1 originates from the PBIA Intermodal Hub and heads north along Australian Avenue. At Okeechobee Boulevard, it turns east toward the Kravis Center and then traverses to its final destination, the proposed Downtown Multimodal Center.

Tram/Trolley Corridor Option 2 also originates at the PBIA Intermodal Hub and heads north along Australian Avenue. At Belvedere Road it runs east until Park Avenue where it turns north again, stopping at the Kravis Center and traversing to the Downtown Multimodal Center as its final destination.



Source: Frederic R. Harris

Exhibit VI-5

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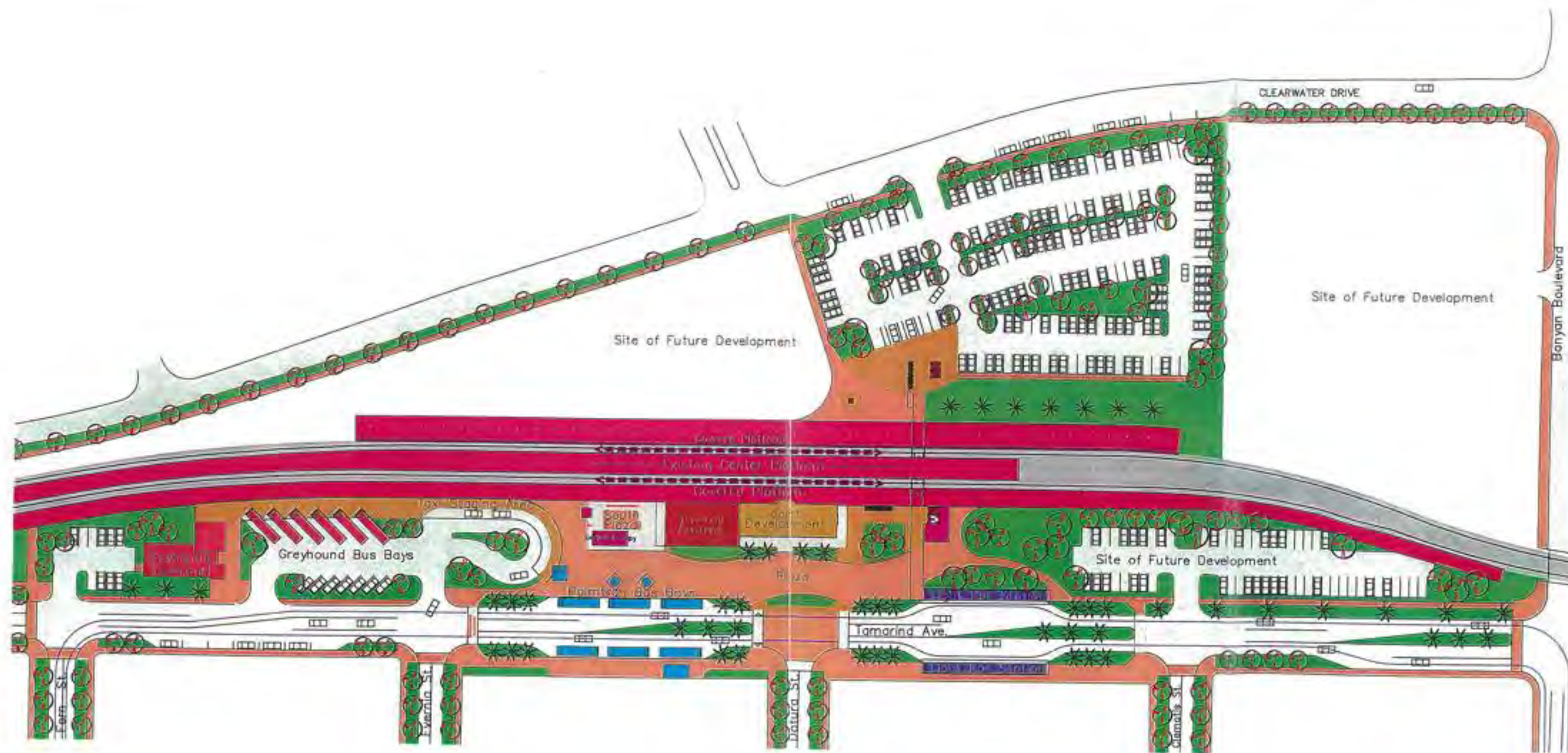


Exhibit VI-5.dwg

Strategic Master Plan Study

PBIA - Downtown Multimodal Center Connectivity Preliminary Conceptual Transit Corridors

October 2000



Source: PBIA Airport Layout Plan.
Prepared by: Frederic R. Harris

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north

Exhibit_VI-4.dwg

Strategic Master Plan Study

Exhibit VI-4

Downtown Multimodal Center Preliminary Conceptual Plan

October 2000

As previously mentioned, these corridors represent viable opportunities for connecting PBIA and its proposed Intermodal Hub with the Downtown Multimodal Center. They do not represent corridors that have reached the final conceptual phase or paths that have been mutually agreed upon by the DOA, other County agencies, state and federal transportation agencies, and the governing bodies of the municipalities that exist within the PBIA market area. Further planning and programming among these parties will be necessary to further define a mutually accepted and agreed upon corridor that can then be carried forward into the implementation phases.

6.5.1.1 System Characteristics

Tramways or trolleys, also known as streetcars, are electrically powered rail vehicles operating in one-to-three car tramway units, mostly on streets. Their tracks and distinct vehicles give streetcar service a strong identity. Spacious vehicles and comfortable rides make them popular with passengers.

The operation of these streetcars on local streets is typically considered a disadvantage. The interaction of these streetcars with congested vehicle traffic causes considerable friction with other vehicles, impeding both the streetcars and the vehicle traffic. These problems can be alleviated, and even provide a better flow for streetcars than buses, by implementing street design and regulatory traffic engineering techniques. Without such measures, buses usually offer superior speed and reliability in street operation. For this and several other reasons, streetcars have been replaced by buses or gradually upgraded into higher-performance rail modes in most cities. A comparison between streetcars and buses shows that streetcars provide:

- A more comfortable ride
- Quieter, pollution-free operation
- Better vehicle performance
- Higher labor productivity (larger vehicles)
- Higher line capacity
- Higher investment cost
- Less reliable street operation unless transit enjoys priority treatment
- Higher maintenance of way and power supply system costs
- Greater impedance of other traffic

6.5.2 Light Rail System – Long Term Rail Alternative

Exhibit VI-5 also shows a conceptual Light Rail corridor connecting PBIA's Intermodal Hub with the Downtown Multimodal Center. This preliminary corridor is shown to be located parallel to the existing CSX rail alignment. A description of the system requirements to operate a Light Rail Train (LRT) system is provided below.

LRT System Characteristics: LRTs typically serve moderate trip lengths of five to 20 miles. Overall speeds are between 20 and 30 mph. LRT service headways typically range from five minutes (minimum for peak hours) to 30 minutes (maximum off-peak). Station spacing is between one and one and a half miles. Station stops are located at major activity centers, major intersecting local bus routes, and park and ride facilities.

LRT Conceptual Design Assumptions: the following characteristics can be assumed for the conceptual design of the LRT proposed for PBIA:

- The LRT system would be in-street running and would be comprised of either Overhead Contact System (OCS) or Diesel Multiple Units (DMU).
- Peak period headways may be from five to 10 minutes.
- A LRT may consist of four cars, each being 55 feet long, for a total length of 220 feet.
- Stops would be at curbside.
- Passenger walking distances should be minimized and should be covered or otherwise sheltered where possible.
- Low floor cars are advisable.
- Pre-emption of traffic signals on streets may be necessary.

Track Configuration: The minimum radius for a turn on a structure should be 500 feet. The desirable minimum radius for a turn not on a structure should be 100 feet. The absolute minimum radius for a turn not on a structure is 82 feet. Track-crossing-track and catenary crossings should be avoided.

Passenger Platform: LRT passenger platforms should be 300 feet long. This will accommodate a 220-foot long train with 80 feet of run room. The maximum grade for the passenger platform should be zero percent (desirable), ½ percent, or one percent (maximum). If the platform grade is excessive, passenger safety could be in jeopardy. The curbing around the platform should be six inches to 12 inches above the top of rail. Ramping to the sidewalk should be provided as needed. The platform should be 12 feet wide and should be equipped with a canopy. The LRT track should not be curved in the station. Therefore, the platform should be on a tangent alignment.

Grades: The maximum grade should be six percent.

Vertical Clearance: A vertical clearance of 17 to 20 feet must be maintained depending on the type of LRT equipment chosen.

Horizontal Clearance: a minimum horizontal clearance of 25 feet must be maintained between an LRT line and an obstruction. Otherwise, crash walls must be used. A minimum separation of 20 to 25 feet must be maintained between an LRT line and a heavy rail line. The minimum right-of-way for an LRT should be 30 feet.

6.6 Ground Transportation Services at PBIA

PBIA is served by four types of ground transportation services:

- Rental Cars
- Public Transportation (operated by Tri-Rail and PalmTran)
- For-Hire Transportation (e.g., taxicabs, limousines, courtesy shuttle vehicles, etc.)

In addition to these ground transportation services, roadway traffic at the Airport includes private vehicles, employee vehicles, official airport administrative and security vehicles, and service and delivery vehicles.

Given the preferred long-term development patterns identified for PBIA's terminal and cargo facilities and the need for additional space to serve the growth in the on-airport rental car operations,

the need to identify a long-term site for these ground transportation functions became evident. The analysis of potential sites for the on-airport rental car operations is discussed below.

6.7 Analysis of Future Rental Car Facilities

There are six rental car companies serving the Airport. Avis, National, and Dollar are located on Airport property in a large area just west of Australian Avenue, between the inbound and outbound terminal roadways. Hertz, Budget, and Alamo are located off airport property near the intersection of Belvedere Road and Congress Avenue. Each operator has its own ready/return, maintenance, and storage facilities.

Rental counters for the on-airport companies are located within the lower level of PBIA's terminal building. Each operator provides its own shuttle to and from the terminal building.

The various locations of these facilities result in several surface access and road circulation conflicts:

- Drivers entering the Airport are confronted with multiple choices. They can either turn right to go to Hertz, Budget, and Alamo; turn left to go to Avis, National, and Dollar; or continue straight to go to the short-term or long-term parking garages and the terminal building. This decision is made immediately upon entering the Airport and results in driver indecision on the terminal roadway. It would be beneficial to direct all rental car returns to a secondary roadway and then guide them to specific destinations.
- Traffic going to Hertz, Budget, and Alamo enter the Airport and are then directed to exit the Airport to get to their destination. This may be confusing and may lead to unnecessary traffic on the terminal roadway plus extra vehicle turning movements, increased congestion, and potential accidents at the intersection of Belvedere Road and Congress Avenue.

Finding a new location(s) for the rental car facilities depends on the following factors:

- Providing convenient and efficient service to time-sensitive airport travelers
- Having an efficient and economical system for the rental car companies
- Minimizing traffic impacts to the terminal roadways and to the surrounding streets

The ready/return lots represent the rental car facilities most often used by customers. As such, these areas should be highly visible and conveniently located. The maintenance and storage facilities are internal to the rental car operations and need not be readily accessible to the customers. However, they should contribute to an economical operation.

The shuttle trip from the rental car return lot to the terminal building is the most crucial for time-sensitive travelers arriving at the Airport via a rental car. The shuttle trip from the terminal to the rental car ready lot for passengers arriving via aircraft is typically less time-sensitive.

It is assumed that each rental car company will find it more desirable to have its own self-contained, freestanding operation rather than consolidated operations with other rental car companies. The exception is the ready/return lanes, which could be conveniently co-located in a common parking garage. Some internal functions (e.g., fueling, cleaning, washing, minor maintenance, etc.) could also be economically combined. The advantage of combining operations would be reduced duplication of facilities and services and savings in land area devoted to several self-contained rental car operations.

**LEGEND:**

- Proposed Roadway Improvements
- Proposed Facility Improvements

Notes:

- ① Shuttle to Rental Car facility is too long.
May increase congestion at the intersection of Belvedere Rd. and Congress Avenue.
Good to consolidate both rental facilities in one area, however, Off-airport location not desirable.
- ② Shuttle route to/from Terminal is very long.
Short ingress/egress to Belvedere Road.
Traffic between off- and on-Airport Rental Car Facility may cause traffic congestion at this intersection.

Notes:

- ③ Close access to 2 PBIA Entrances.
Easy access toward inbound Terminal road.
Relatively easy access from outbound Terminal road.
- ④ Direct and easy access to/from Terminal.
Locate too far from the Rental Car Storage facility.
- ⑤ Direct and easy access to/from Terminal.
Good to consolidate both rental facilities in one area.
- ⑥ Good and direct access to Terminal (walking distance).
Shuttle to Rental Car facility is too long.

Source: Frederic R. Harris, Inc.
Prepared by: Ricardo & Associates, Inc.



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Strategic Master Plan Study

Exhibit VI-6

Candidate Sites for Rental Car Facilities

October 2000

Exhibit VI-6 shows six alternative sites for the rental car ready/return facilities. Each of these sites is further described below.

6.7.1 Ready/Return Alternative 1-A: Short-Term Improvement

In Alternative 1-A, the facilities are located on the northwest quadrant of the intersection of Belvedere Road and Congress Avenue. This location provides the most direct shuttle route from the rental car return lot to the terminal building. In addition, all rental car operations could be centralized at this location. The internal decision to share facilities could be made on the basis of efficiency, cost and customer service. It could even be possible, with proper facility design, to have a single shuttle service serving all the rental car companies.

The disadvantage of Alternative 1-A is that the return shuttle bus trip from the terminal building to the rental car pick-up lot has to travel via the terminal return loop and cross the inbound roadway. This alternative concentrates all rental car and shuttle bus traffic at the intersection of Belvedere Road and Congress Avenue and may contribute to congestion and accidents at this intersection. In addition, the ramp from Congress Avenue to the terminal roadway is sharply curved and very short and, therefore, has low capacity.

This alternative would benefit greatly from advance signage on Belvedere Road and Australian Avenue directing all rental car traffic to continue west on Belvedere Road rather than entering the terminal roadway system.

6.7.2 Ready/Return Alternative 1-B: Long-Term Improvement

In Alternative 1-B, a people mover or elevated pedestrian bridge will connect the rental car facilities and the terminal building. In addition to the advantages Alternative 1-A offers, this alternative will improve internal traffic circulation and reduce traffic congestion by eliminating the need to use shuttle buses.

The disadvantage of Alternative 1-B is that it is a costly, long-term improvement project.

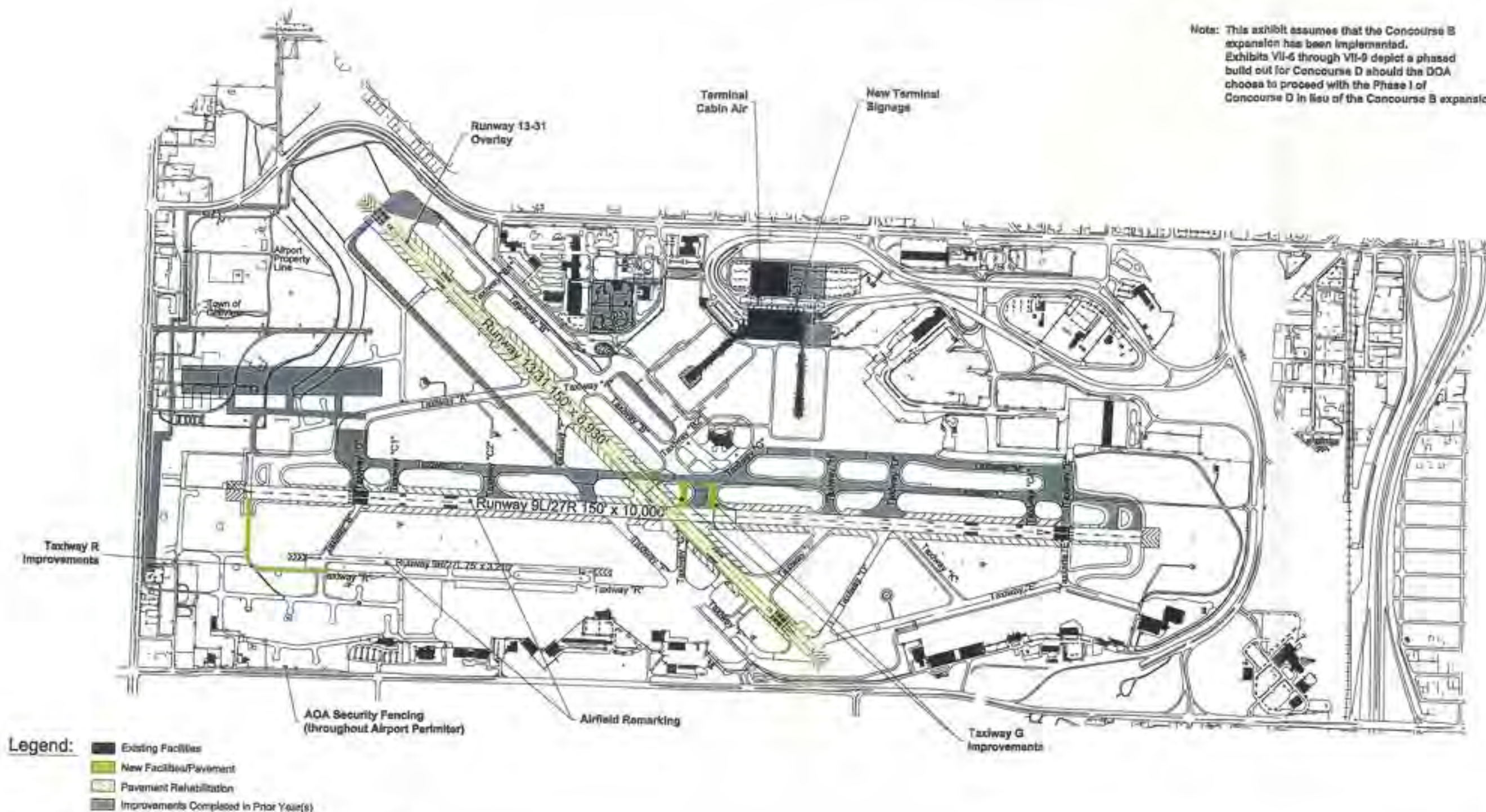
6.7.3 Ready/Return Alternative 2

In Alternative 2, the ready/return lots are located on Airport property, south of Belvedere road and east of Congress Avenue, in the area presently occupied by the air freight facilities (Building 1301-1310). This alternative has two design options. Option 2a is to relocate all six ready/return facilities to the Alternative 2 location, Option 2b is to leave Hertz, Alamo, and Budget where they are and relocate only Avis, National, and Dollar to the new facility.

The advantage of this alternative is that it does not presently possess direct the rental car operations are better identified and integrated into the Airport. The disadvantage is that the site does not appear to be large enough to contain all the rental car functions, particularly storage of inventory. If the ancillary functions cannot be located on the upper levels of a garage structure, it will be necessary to ferry cars back and forth across Belvedere Road.

Another disadvantage of Alternative 2 is that access to and from the terminal roadway. This would significantly lengthen shuttle bus routes.

Note: This exhibit assumes that the Concourse B expansion has been implemented. Exhibits VII-5 through VII-9 depict a phased build out for Concourse D should the DOA choose to proceed with the Phase I of Concourse D in lieu of the Concourse B expansion.



Source: PBIA Joint Automated Capital Improvement Program (2001-2005)
Prepared by: Ricordo & Associates, Inc.

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north

Exhibit VII-4.dwg

Strategic Master Plan Study

Exhibit VII-4

**Capital Improvement Program
Fiscal Year 2004**

October 2000

6.7.4 Ready/Return Alternative 3

In Alternative 3, the ready/return lots are located off Florida Mango Road, south of Belvedere Road, on Airport property. Florida Mango Road currently provides secondary access to the Airport and would become a major access road to the rental car operations under this alternative. This location could serve the non-airport customers of the rental car companies.

As with Alternative 2, Alternative 3 better identifies the rental car facilities and integrates them into the Airport. The shuttle trip from the rental car return lot to the terminal building is relatively direct. However, a disadvantage is that the return shuttle trip from the terminal building to the ready car lot is required to use the terminal return loop and change lanes across the terminal roadway.

In addition, the Alternative 3 site does not appear to be large enough to contain all the rental car functions, particularly storage of inventory.

6.7.5 Ready/Return Alternatives 4 and 5

In Alternative 4, the rental car ready/return lot would be located on the east side of Australian Avenue, south of Belvedere Road. Rental car functions other than ready/return lots would be located elsewhere. This would require ferrying rental cars back and forth to the maintenance and storage location.

In Alternative 5, all rental car operations would be located to the east of Australian Avenue and would be integrated with the Tri-Rail intermodal station that is proposed to replace the existing Mercer Avenue station.

Alternative 4 and 5 have many of the same advantages and disadvantages. The advantages offered by these alternatives are discussed below.

- All rental car facilities would be located adjacent to the Airport entrance, achieving a degree of integration and identification, but they would not be located within the Airport boundaries.
- Alternative 5 would leave land within the Airport footprint available to be developed for aviation-related purposes such as public parking.
- The rental car companies would be accessible from I-95.
- Tri-Rail could become a major access mode to the Airport.
- A decision could be made whether PalmTran buses would continue to serve the terminal building directly or could be rerouted to PBIA's Intermodal Hub.
- Shuttle bus routes to and from the terminal building, although longer than the other alternatives, would be relatively direct.
- The Alternative 5 site offers an opportunity to serve all rental car companies, plus Tri-Rail and PalmTran, with a single shuttle bus. A separate shuttle bus would serve the Park and Ride lots.

These alternatives also have several of the following disadvantages:

- Alternatives 4 and 5 would require acquiring numerous parcels of land that are presently occupied by industrial land uses.

- These alternatives would concentrate rental car traffic on Australian Avenue, which is an existing congestion concern. Moving the Airport intersection further to the south along Australian Avenue and aligning it with the eastern access road could alleviate this concern.
- All shuttle bus traffic to and from the Airport terminal roadway would be required to cross Australian Avenue. However, this would occur at a signalized intersection.
- It would be necessary to cross the West Palm Beach Stub Canal.

6.7.6 Ready/Return Alternative 6

Alternative 6 proposes locating the rental car ready/return lots in the ground level of the parking garage adjacent to the expanded terminal building. This alternative has several advantages. It would enable rental car customers to walk directly to and from the terminal, thus eliminating the need for rental car shuttles. This could be a great convenience for time-sensitive travelers.

However, there are also disadvantages. All rental car traffic would utilize the terminal roadway. Furthermore, it would be necessary to ferry rental cars back and forth to off-site maintenance and storage facilities using the terminal roadway. It would also be necessary to reconfigure ingress and egress from the parking garage to segregate rental car and public parking operations. Non-airport rental car customers would be required to enter the terminal roadway to access these facilities.

6.7.7 Evaluation of Ready/Return Rental Car Alternatives

Table VI-4 summarizes the evaluation of alternative locations for rental car facilities.

Table VI-4

Summary of Evaluation of Rental Car Ready/Return Alternatives

Criterion	Alternative Locations						
	1-A	1-B	2	3	4	5	6
Convenient Trip - Rental Car Return to Terminal	1	1	3	2	2	2	1
Convenient Trip - Terminal to Rental Car Return	3	1	3	3	2	2	1
Integrate All Rental Car Functions	1	1	3	3	3	1	3
Minimize Traffic Impacts to Australian Avenue	1	1	2	2	3	3	2
Minimize Traffic Impacts to Terminal Roadways	3	1	3	3	2	1	3
Minimize Traffic at Congress Avenue Entrance	3	1	3	1	1	1	2
Minimize Circuitous Routes	3	1	3	3	2	2	2
Minimize Airport Land Used for Rental Cars	1	1	3	2	1	1	3
Maximize Use of Shuttles on Airport Terminal Roadways	2	1	2	2	2	2	3
Efficient, Economical System for Rental Car Companies	1	1	3	3	2	1	3
Short-Term Improvement	3	2	3	3	2	2	1
Cost Effective	3	1	3	3	3	1	3

1 = Most acceptable

2 = Acceptable

3 = Least Acceptable

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc.

The evaluation of these rental car facility alternatives shows that the most appropriate location for a Ground Transportation Center housing the on-airport rental car ready/return functions and, ultimately, other ground transportation services is the site shown for Alternatives 1-A and 1-B.

6.8 Initial Agency Coordination

The Palm Beach County Metropolitan Planning Organization (MPO) was consulted to coordinate policies and procedures regarding the approval process and funding options for proposed airport improvement projects.

The MPO approval process, regarding policies and procedures concerning airport improvement projects, is similar to the traditional approval process for all other transportation projects:

- *PBIA Initiates Airport Improvement Project* – PBIA develops the project scope, budget and schedule, and identifies funding sources.
- *Airport Improvement Project is presented to the Palm Beach County Technical Advisory Committee (TAC) and Citizens Advisory Committee (CAC)* – The proposed project is presented to the TAC and CAC for review and approval. The TAC is composed of planning and engineering staff from municipal, county, and state agencies and organizations to provide input on the technical aspects of the program. The CAC is composed of representatives from the community with interests in transportation and planning to provide citizen perspectives on transportation projects and impacts.
- *Airport Improvement Project is presented to the MPO* – The proposed project is presented to the MPO, who upon review and approval, incorporates the project in the TIP and/or LRTP.
- *FDOT Notification* – The proposed project is presented to FDOT for inclusion in the State Transportation Improvement Program.
- *Federal Agencies Notification* – The proposed project is presented to the appropriate federal agency(s) for review and approval.

Each step of the approval process features public involvement. Projects that require Project Development & Environmental Studies will require the preparation and implementation of a formalized public involvement program for the specific project.

6.9 Funding

Funding of transportation improvements related to PBIA has historically been segregated into two basic components: (1) Airport Improvement Projects within PBIA boundaries that are funded by the County, FAA, FDOT, and other sources; and (2) PBIA transportation access improvements outside Airport boundaries that are funded by a combination of other sources of federal, state, and County dollars. Although the Transportation Equity Act for the 21st Century (TEA-21) provides an opportunity to fund intermodal projects by combining “airport” and “non-airport” funds, there are no projects identified in the TIP or LRTP that utilize these non-traditional funding techniques.

The TIP provides a summary of MPO priorities by major federal funding source as shown in **Table VI-5**.

Table VI-5

Summary of MPO Priorities By Major Federal Funding Source (Thousands of Dollars)

Description	Funding Code	Total Program Cost	FY 98/99	FY 99/00	FY 00/01
National Highway	NH	92,983	1,600	56,533	34,850
Bridge Replacement	BRT	1,650	1,650	0	0
Interstate Maintenance	IM	17,709	4,366	6,459	6,884
Surface Transp Program	STP	115,096	101,090	8,663	10,219
Congestion Mitigation	CMAQ	10,102	5,217	559	4,326
Federal Aviation Admin	FAA	2,161	527	815	819
Federal Transit Admin	FTA	60,224	19,488	21,248	19,488
Other Federal Funds	--	17,072	6,956	2,771	7,345
Grand Total	--	316,997	140,894	96,489	79,614

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc.

In addition, Palm Beach County's Five Year Road Program will be funded by the resources shown in Table VI-6.

Table VI-6

Palm Beach County Five Year Road Program (Thousands of Dollars)

Road Program Revenues	FY 97/98	FY 98/99	FY 99/00	FY 00/01	FY 01/02	FY 02/03
Local Option Gas Taxes	27,486	28,173	28,878	29,600	30,340	144,477
Impact Fees	13,069	13,069	13,069	13,069	13,069	65,345

Source: Frederic R. Harris, Inc.

Prepared by: Frederic R. Harris, Inc.

FDOT District 4 is currently developing the revised Five-Year Work Program based on the anticipated funding increases as a result of TEA-21. TEA-21 authorizes a total of \$217 billion for highway and mass transit programs for FY 1998-2003 including \$42 billion for mass transit programs and \$175 billion for highways. By contrast, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) authorized \$121 billion for highways and \$34 billion for mass transit for FY 1992-1997. Due to changes in the state apportionment formulas, as well as increased funding levels, the State of Florida will receive a 55.7 percent increase in average annual funding.

Preliminary indications estimate that Palm Beach County will receive an additional \$100 million over the next five years. This additional revenue is anticipated to be used to accelerate the upgrading of Southern Boulevard as a quasi-expressway to accommodate the high growth in traffic generated in West Palm Beach County.

Section VII

VII. Implementation Plan

The Implementation Plan, as described here, documents the factors and characteristics to be monitored and evaluated in order to determine the timing and need for specific improvements. The Implementation Plan also outlines a possible development sequence and schedule based on the character and rates of growth anticipated under the Alternate Service Patterns Demand Scenario through the planning horizon, year 2020, which corresponds to the Planning Activity Level (PAL) 2.

Since actual growth may vary from that which has been projected, the Implementation Plan includes a discussion of factors that are expected to trigger a development action. This approach offers the DOA the ability to assess actual demand and the flexibility to respond effectively. Through regular monitoring and analysis of statistics and an understanding of the impacts of various trends, the DOA can respond in a strategic manner to meet tenant and user needs by developing demand-driven facilities in a timely manner.

The Section is subdivided into four discussion topics:

- **Factors that determine timing and need for implementation** – discusses general criteria upon which decisions for facility development should be based and identifies specific implementation indicators
- **Five Year Capital Improvement Program**
- **Phased implementation plan** – includes phasing of development, that illustrates the logical progression of development projects to take PBIA from its existing conditions towards the Composite Plan, as anticipated demand dictates
- **Monitoring and assessing timing indicators** – presents data that can be monitored by the DOA and analyzed to give an early indication of development needs
- **Adjusting development patterns** – presents the decision tree containing all the short-listed alternatives and the conditions and demand profiles that are associated or best suited for each alternative

7.1 Factors Impacting Implementation and Development Phasing

In general, implementation of the recommended development plan should be based on demand and the need to provide additional capacity. Ideally, projects should be implemented in adequate time to serve the needs of growing demand, but not so early that facilities are underutilized. The ability to time implementation correctly requires an understanding of the factors that trigger facility development, ongoing data monitoring and analysis to identify when action should be taken, and an organizational structure to implement project planning and construction when demand dictates. While it is anticipated that facilities recommended as part of PBIA's Strategic Plan will be built as demand growth materializes, it must be recognized that depending on the rate of growth actually experienced at the Airport, the need to replace or modernize older facilities may also arise.

7.1.1 Volume and Character of Growth

The volume and character of activity determine how development should occur. For instance, a significant increase in the number of connecting passengers may not require the same improvements as an increase in O&D passengers, although the increase in the *total* number of passengers may

appear to be the same. Likewise, an increase in commuter aircraft activity will have a different impact than a similar increase in the number of operations by large jet aircraft. Therefore, it is essential that overall activity monitoring be accompanied by a regular assessment of the elements of that activity. The types of demand placed on various elements will indicate much more about the utilization patterns for a facility than an overall activity statistic. Such analysis allows the DOA to understand the functionality and deficiencies of facilities, as well as to anticipate tenant needs for additional capacity.

Several metrics may be used to assess the rate and character of growth in a single area of the Airport. For example, overall performance of the airfield may be measured by aircraft delay. However, to understand why particular delay levels are being experienced and to respond with the appropriate actions, statistics such as annual operations growth, daily and peak hour operations, operations by aircraft type (fleet mix), weather characteristics, and other non-facility factors should be assessed.

Growth seldom occurs at the steady rate assumed by the demand projections. It typically exhibits high and low activity periods. Therefore, statistics must be monitored and assessed over a period of time to differentiate long-term or sustained trends from short-term fluctuations.

7.1.2 Relocation and Replacement of Displaced Facilities

The expansion of terminal and airfield facilities to meet growing demand will likely impact existing tenants or other airport facilities. The replacement of facilities and the need to minimize disruption of tenant activities will influence project phasing. This means that detailed planning, design, financing, and construction of replacement facilities must occur prior to the expansion project that impacts existing facilities.

7.1.3 Replacement of Facilities

If growth occurs slowly, older facilities could become functionally or structurally obsolete before demand dictates expansion. The replacement, then, rather than expansion, would drive development. Obsolescence could occur due to age, changes in operating requirements, or changes in regulations that make the configuration or size of the facility inefficient or ineffective. Remodeling, refurbishing, or renovating the facility may extend its useful life. However, if preliminary design or maintenance history identifies that renovation costs for a major facility will be substantial, replacement of the facility may be more cost effective. Replacement generally creates a more substantial cost burden and more difficult construction phasing than expansion.

7.1.4 General Criteria for Implementation

The primary criteria used to phase the recommended development plan for implementation include:

- **Promoting detailed project planning and design so that improvements can be in place when needed** - For runways and terminal expansion, environmental studies and preliminary design should precede design and construction. These steps may take several years before the improvement can be in place and functional.
- **Minimizing operational impacts** - This includes minimizing gate loss during terminal construction, minimizing closures of runways and taxiways to reduce interim capacity reductions in the airfield, maintaining roadways and parking facilities accessible to vehicles, and minimizing passenger inconvenience and confusion.

- **Maintaining a logical sequence of development, building with individual projects toward the long-term goals** - Near term development projects should be configured to further long-term development, protecting future options. Project sequence must also consider access and utility. For instance, taxiways must be in place to allow the development of adjacent tenant facilities requiring airfield access.

7.1.5 Implementation Indicators

Specific levels of activity will trigger implementation of various development elements contained in the Composite Development Plan. These activity levels are referred to in this discussion as "indicators." Two types of indicators have been identified for activity monitoring and implementation: primary and secondary indicators. Primary indicators are those that can be considered "triggers" for implementation when a specific level of activity or threshold is reached. Secondary indicators are not intended to trigger implementation actions, but provide more insight into the type of demand that is occurring. They may provide another way to measure activity or guide some details of how the element is implemented once the trigger is reached. For example, parking lot occupancy is a primary indicator, or trigger, for parking expansion. A secondary indicator, such as occupancy by type of lot, may guide the DOA to implement alternate operational procedures or to provide additional short term parking rather than long-term parking.

Indicators for each general area of airport development are discussed briefly here and will be described more fully in the section on monitoring and assessing timing indicators. It must be recognized that these indicators are intended to identify the impending need for additional facilities given present demand/capacity relationships. Once these triggers are reached, contemporaneous studies should be undertaken to confirm the continued validity of the triggers, the demand/capacity relationships, and the resulting facility concepts.

Airfield Indicators

This Strategic Plan defines four minutes of delay per aircraft operation as the point at which planning for additional airfield capacity should begin. As such, average annual aircraft delay is the primary indicator for implementation of airfield projects. By initiating planning at this point, additional capacity would be expected to come on-line approximately at the time in which delays reach six to 10 minutes. While acceptability of a given delay level is a function of the costs associated with providing additional capacity, typically, that threshold is encountered when six to 10 minutes of average delay materialize at high volume airports. Under this range, it is likely that delay during IFR periods is significantly disruptive to airline schedules and passenger service. Secondary indicators that provide insight into the character of demand are annual aircraft operations, in total and by aircraft category and daily and peak hour demand.

Terminal/Gate Indicators

The timing for terminal/gate expansion or development will be based on airline demand for additional facilities or DOA's need to replace facilities or enhance passenger service. Some of these latter needs may or may not be specifically linked to demand. Primary indicators related to terminal capacity development relate to area measures per annual enplaned passenger or gate utilization (i.e., daily operations per gate). Phasing of development will be based upon the facilities occupied, facilities required, the airline(s) needing the facilities, and the DOA's ability to reallocate facilities to accommodate airline needs. Secondary indicators have been identified to assess and track passenger and aircraft gate utilization.

Parking Indicators

A primary indicator for parking development is parking lot occupancy in the peak month. Planning should be initiated when average peak month occupancy reaches 85 percent to 88 percent of total capacity so that improvements can be in place when occupancy reaches approximately 90 percent to 95 percent. Secondary indicators that provide insight into the rate of growth, character of growth, and allocation of parking among facilities include the total number of parkers per originating enplanement and the total parkers by month and type of lot.

General Aviation Indicators

The number of private and corporate-based aircraft provides the primary indicators for facility development. Since itinerant operations have a significant influence on apron requirements, the growth and character of itinerant operations has been identified as a secondary indicator. While general aviation development is typically driven by tenant needs rather than by DOA's initiatives, secondary indicators may be assessed to provide insight into overall general aviation demand. Based aircraft fleet and the annual number of general aviation operations indicate the health and overall demand for general aviation facilities and services at the Airport. Growth of the based fleet by the tenant (corporate or private) can indicate the need for hangar, terminal, or apron expansion.

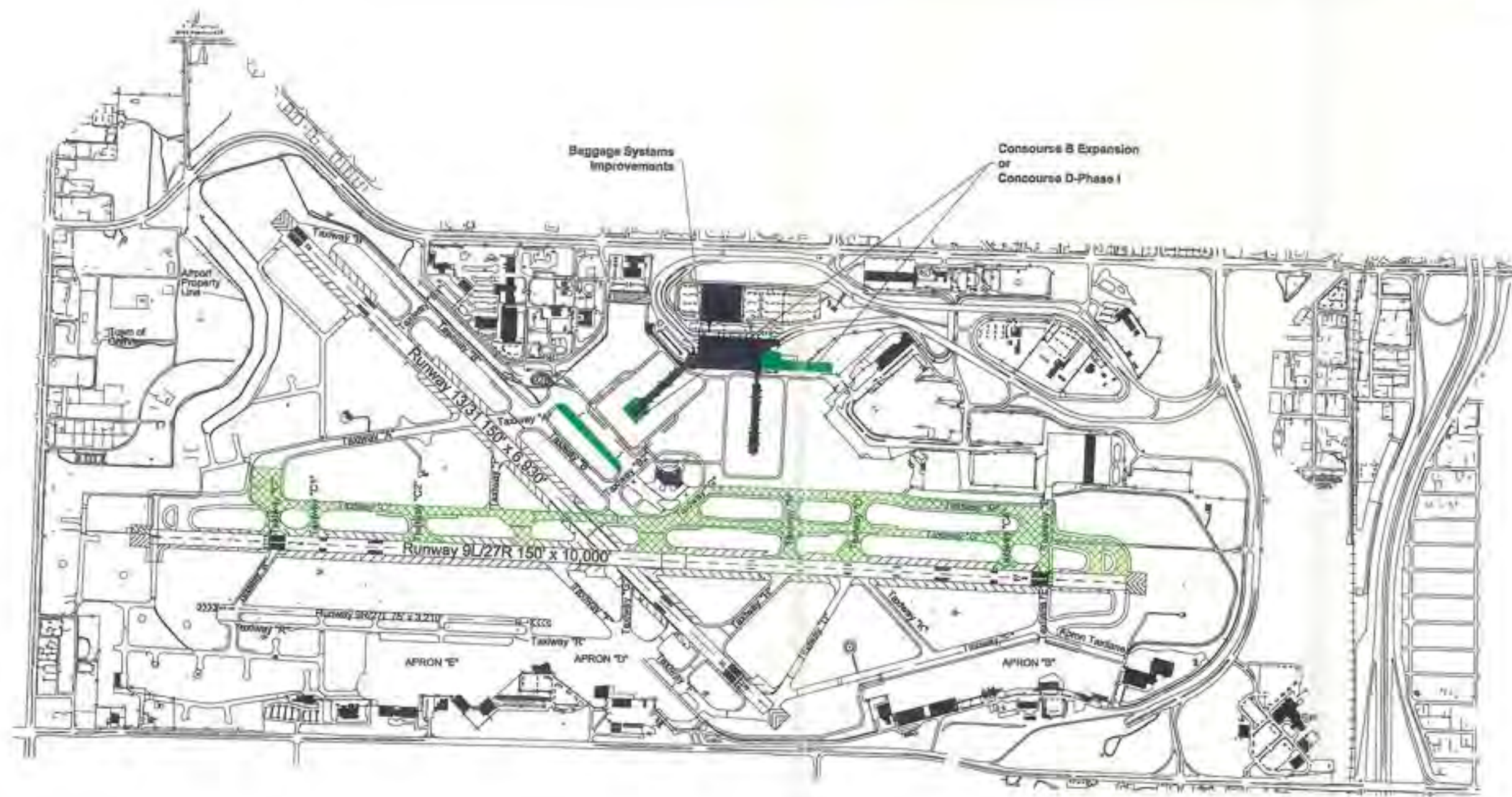
Cargo Indicators

Like general aviation, cargo facility development is driven largely by tenant demand. However, by assessing growth of primary indicators, such as cargo tonnage, cargo aircraft operations, and fleet mix, the DOA can anticipate demand and plan for cargo tenant expansion.

7.2 Five Year Airport Improvement Program

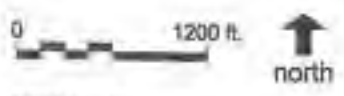
Several capacity and level of service improvements for PBIA were identified as part of the Demand-Capacity Analyses. Other facility enhancements were identified by members of the DOA during a planning workshop or identified by the consulting team during field observations. Many of these enhancements and improvements are driven, in large part, by the demand growth represented under the planning activity levels and sensitivity levels previously identified. However, there were some facility enhancements and capacity improvements that were determined to be necessary in the near term (i.e., within the next five years) under two or more of the demand scenarios. **Table VII-1** summarizes the near term facility requirements associated with the three demand scenarios. The airport components that need to be expanded to provide additional capacity to meet the near term demand are delineated in blue text. As shown, the airport components that will require increased capacity in the near future include airline gates, baggage systems, curbside facilities, concourse concessions, the FIS facility, belly cargo facilities, and the south side general aviation aircraft aprons.

In order to establish a five-year implementation plan that addresses these near term airport improvements or enhancements, two Airport Improvement Programs have been identified, the Capital Improvement Program (CIP) and the Facilities Enhancement Program (FEP). The purpose for establishing two distinct programs is to differentiate demand-driven projects from projects that are targeted at enhancing operational efficiency and level of service.



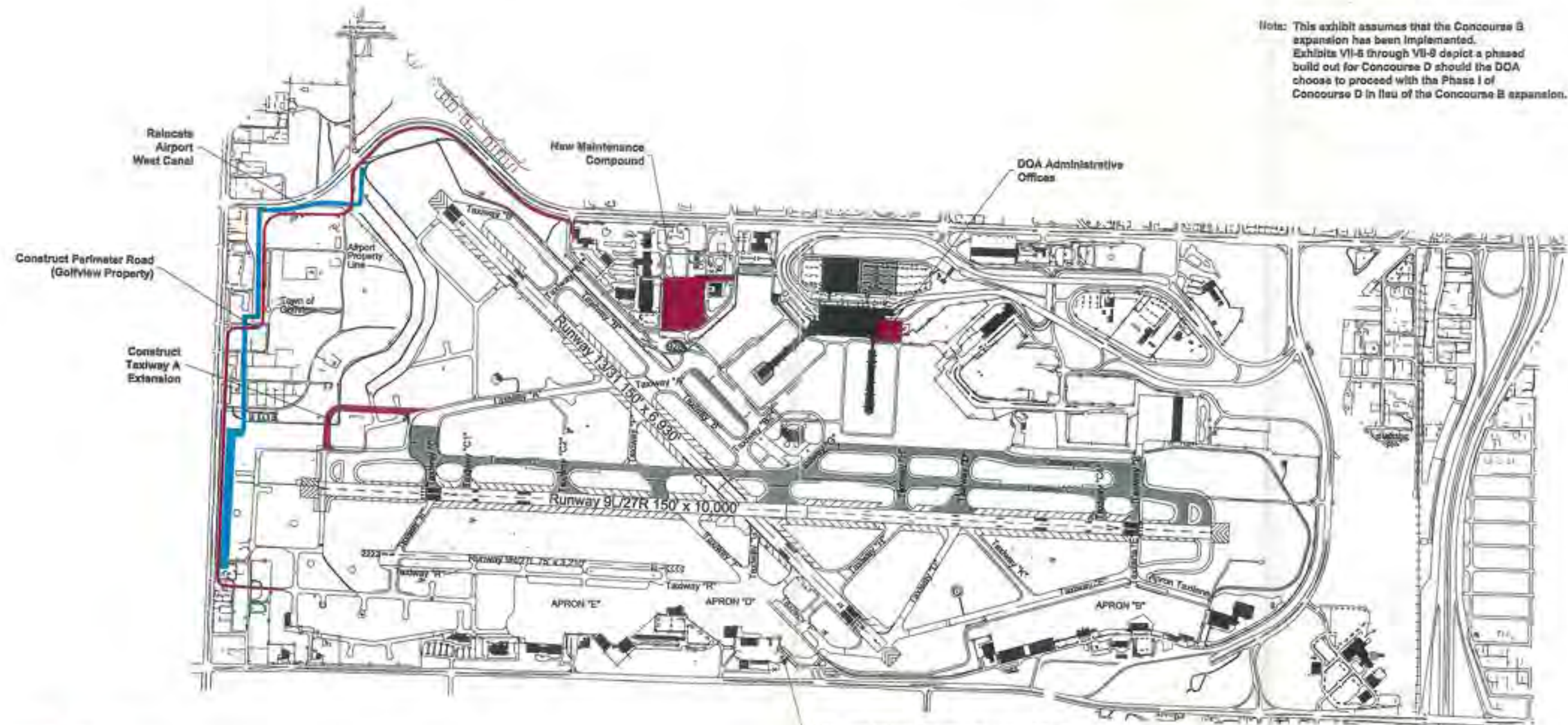
- Legend:**
- Existing Facilities
 - New Facilities
 - Pavement Rehabilitation

Source: PBIA Joint Automated Capital Improvement Program (2001-2005)
Prepared by: Ricordo & Associates, Inc.



Exhibit_VII-1.dwg

Note: This exhibit assumes that the Concourse B expansion has been implemented. Exhibits VII-6 through VII-9 depict a phased build out for Concourse D should the DOA choose to proceed with the Phase I of Concourse D in lieu of the Concourse B expansion.



Legend:

- Existing Facilities
- New Facilities/Pavement
- Improvements Completed in Prior Year(s)
- Canal Relocation

Source: PBIA Joint Automated Capital Improvement Program (2001-2005)
Prepared by: Ricondo & Associates, Inc.

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Exhibit VII-2.dwg

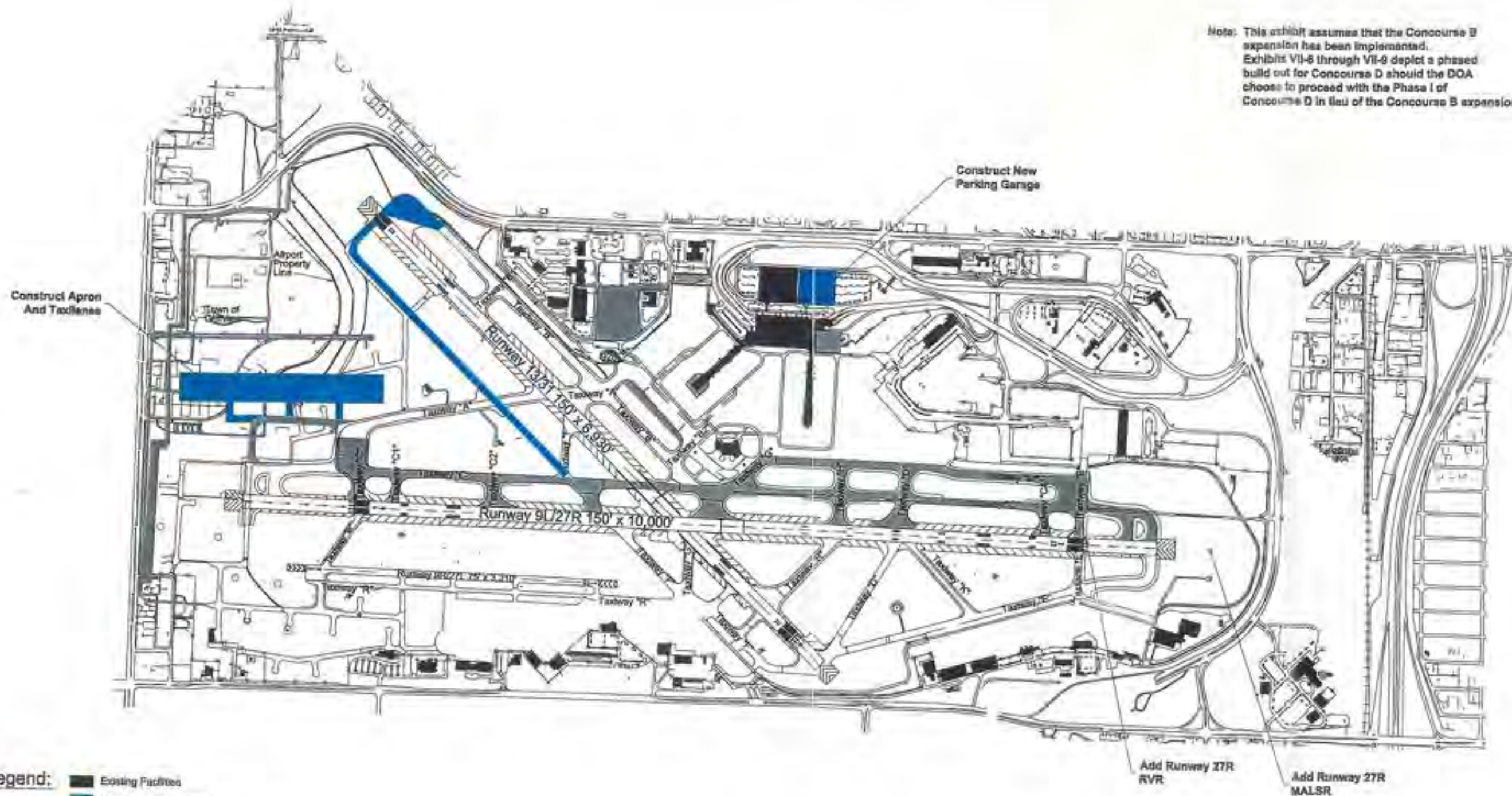
Strategic Master Plan Study

Exhibit VII-2

**Capital Improvement Program
Fiscal Year 2002**

October 2000

Note: This exhibit assumes that the Concourse B expansion has been implemented. Exhibits VII-6 through VII-9 depict a phased build out for Concourse D should the DOA choose to proceed with the Phase I of Concourse D in lieu of the Concourse B expansion.



Legend:
 Existing Facilities
 New Facilities/Pavement
 Improvements Completed in Prior Year(s)

Source: PBIA Joint Automated Capital Improvement Program (2001-2005)
 Prepared by: Ricordo & Associates, Inc.

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Exhibit VII-3.dwg

Strategic Master Plan Study

Exhibit VII-3

Capital Improvement Program
 Fiscal Year 2003

October 2000

Table VII-1					
Near Term Facility Requirements					
Airport Component	Unit	Existing	Baseline	Demand Scenario	
				Alternate Service	High Growth 3/
TERMINAL BUILDING:					
Airline Gates					
Commuter Gates 1/	Quantity	4	4	4	4
Narrowbody Gates	Quantity	8	21	24	24
Widebody Gates	Quantity	17	4	6	6
TOTAL GATES		29	29	34	34
Apron Frontage (Jet Gates Only)	Linear Feet	4,200	3,670	4,390	4,390
Commuter Holdrooms	Square Feet	5,269	2,400	2,400	2,400
Narrowbody Holdrooms	Square Feet	14,607	37,800	43,200	43,200
Widebody Holdrooms	Square Feet	43,641	12,800	19,200	19,200
Subtotal Gate Areas:		63,517	53,000	64,800	64,800
Airline Operations Area					
Ticketcounter Queue Area	Square Feet	11,347	11,544	13,900	14,300
Ticketcounter	Linear Feet	516	481	580	590
Airline Ticket Offices	Square Feet	20,073	20,779	25,000	25,700
Club	Quantity	2	3	3	3
Club	Square Feet	6,258	8,979	10,800	11,100
Baggage Claim Area	Square Feet	30,895	33,300	40,100	41,200
Bag Claim Carousels	Linear Feet	1,288	1,480	1,800	1,800
Outbound Baggage	Square Feet	29,109	25,012	30,100	30,900
Inbound Baggage	Square Feet	26,699	21,830	26,300	27,000
Curbside Offices & Ramp Operations	Square Feet	52,315	46,380	70,500	72,500
Subtotal Airline Operations Area:		176,696	167,824	216,700	222,700

Table VII-1

Near Term Facility Requirements

Airport Component	Unit	Existing	Baseline	Demand Scenario	
				Alternate Service	High Growth 3/
Concessions					
Food/Beverage	Square Feet	24,164	27,055	41,100	42,300
News/Gift/Sundry	Square Feet	10,384	15,460	23,500	24,200
Rental Car	Square Feet	2,864	3,865	5,900	6,000
Other	Square Feet	7,464	3,865	5,900	6,000
Subtotal Concessions Area:			50,245	76,400	78,500
Federal Inspection Services					
INS Primary Inspection Booths	Quantity	2	3	3	3
USCS/APHIS Inspection Booths	Quantity	3	2	2	2
Bag Claim Frontage	Quantity	150	172	210	210
INS Counter & Queue Area	Square Feet	2,850	5,100	5,100	5,100
INS Offices	Square Feet	1,900	1,900	1,900	1,900
Bag Claim Area	Square Feet	3,550	5,375	6,500	6,625
Sterile Corridor	Square Feet	4,000	4,300	5,200	5,300
USCS Rover Command Center	Square Feet	120	120	120	120
USCS/APHIS Counter & Queue Area	Square Feet	2,400	2,580	3,120	3,180
USCS Offices	Square Feet	1,650	1,600	1,600	1,600
APHIS Offices	Square Feet	550	650	780	800
Restrooms	Square Feet	650	650	780	800
Circulation	Square Feet	2,150	2,475	2,800	2,800
Subtotal FIS Area:			24,750	27,900	28,225
Public Areas:					
Security Checkpoints	Quantity	5	4	5	5
Security Circulation	Square Feet	1,226	900	1,000	1,000
Circulation-Concourses	Square Feet	38,518	31,800	38,900	38,900
Unenclosed Area	Square Feet	28,357	13,041	15,600	16,100
Public Area	Square Feet	123,057	140,400	168,500	173,200
Subtotal Public Areas:			186,145	224,000	229,200

Table VII-1

Near Term Facility Requirements

Airport Component	Unit	Existing	Baseline	Demand Scenario	
				Alternate Service	High Growth 3/
Management/Utility & Mechanical					
Administration	Square Feet	19,666	13,374	16,900	17,300
Mechanical	Square Feet	45,615	59,569	75,400	77,100
Subtotal Mgmt./Utility & Mech. Areas:		65,281	72,943	92,300	94,400
Subtotal All Terminal Areas:		561,348	554,907	702,100	717,825
CARGO FACILITIES:					
Belly Cargo					
Warehouse 1/	Square Feet	43,349	55,800	81,300	83,700
Ramp	Square Feet	10,500	14,000	20,300	20,900
Loading Dock	Square Feet	9,655	14,000	20,300	20,900
Truck Dock	Square Feet	72,300	125,600	182,900	188,300
Auto Parking	Square Feet	78,400	27,900	40,700	41,900
Subtotal Belly Cargo Facilities:		214,204	237,300	345,500	355,700
GA/FBO FACILITIES:					
Aircraft Storage Hangar	Square Feet	258,726	256,354	274,326	284,241
Aircraft Maintenance Hangar	Square Feet	126,076	125,100	133,897	138,700
Aircraft Parking Apron	Square Feet	2,774,723	2,939,900	3,146,000	3,259,700
Office Building	Square Feet	43,115	46,000	49,200	51,000
Auto Parking	Square Feet	99,653	108,600	116,300	120,500
Other Grounds	Square Feet	510,227	511,300	547,100	566,900
Subtotal GA/FBO Facilities:		3,812,520	3,987,254	4,266,823	4,421,041

1/ Although there are currently four (4) designated commuter gates, there are actually ten (10) aircraft parking positions.

2/ Typically, USCS and APHS each require screening of 10% of overall arriving international passengers.

3/ Terminal Gate requirements for high growth are consistent with Alternate Service due to identical aircraft operational demand levels through the 5-year period.

The Capital Improvement Program (CIP) represents a collection of projects that increase or improve the capacity of the Airport and that are necessary to accommodate future demand levels and types. Typically, these projects are identified by the Strategic Plan and represent airport components that require augmentation or expansion in order to satisfy the aviation activity projected for the next five years. **Table VII-2** presents the five-year CIP for PBIA.

The Facilities Enhancement Program (FEP) represents a collection of projects that are intended to improve existing airport deficiencies and passenger/product processing and circulation. It also includes those projects that are intended to improve the level of service offered by the Airport in one or more specific areas. The five-year FEP for the Airport is shown in **Table VII-3**.

The projects included under PBIA's CIP are further discussed in the following sub-section.

7.2.1 Capital Improvement Program

Fiscal Year 2001:

Exhibit VII-1 depicts the planned improvement projects included under Fiscal Year (FY) 2001 of the CIP. A brief description of each project is provided below.

Concourse B Expansion: Construction of a hammerhead extension to Concourse B is proposed to provide an incremental gain of two to four air carrier gates. The exact number of gates provided by this concourse expansion will be dependent upon the design aircraft selected for the new gates. The available apron frontage suggests that up to two widebody gates or four narrow body gates could be added to the end of the concourse. However, further analysis of the processing capabilities of the terminal components is necessary to ensure that the terminal building can support the additional gates. As an alternate to the Concourse B expansion, an initial phase of Concourse D could be developed.

Rehabilitation of Taxiways C, M, and D: Even though rehabilitation of these airfield pavements is identified into three distinct projects for funding purposes, the design and construction of these improvements have been integrated into one project. The design of these pavement improvements has been completed by the Airport. The scope of the project comprises pavement repairs and an asphalt overlay for the three taxiway systems.

Baggage Systems Improvements: Improvements to the Airport's bag claim and baggage makeup systems will be provided in conjunction with the Concourse B Expansion. The scope of this project will be to increase the capacity of these baggage systems to support the new gates and to adjust the existing system configuration, as necessary, in order to enhance the operating efficiency of these systems.

Fiscal Year 2002:

The CIP projects for FY 2002 are shown in **Exhibit VII-2** and described below.

New Maintenance Compound: This facility will serve to integrate the Terminal Maintenance and Airside/Landside Ground Maintenance divisions into a centralized on-airport facility. The Compound will be located west of the existing commuter apron and Building 846. Administrative offices, storage spaces, warehouse facilities, trade shops, and stockpiling zones will be located within the Compound. A program book was prepared for these new facilities in 1996, and a design team has been selected to begin the implementation process for the New Maintenance Compound.

Table VII-2

Five Year Capital Improvement Program - Fiscal Years 2001 through 2005

<u>Fiscal Year</u>	<u>Project Description</u>	<u>Estimated Project Cost (in 1999 Dollars)</u>
2001	Concourse B Expansion	\$11,200,000
2001	Rehabilitate Taxiway C	\$1,627,000
2001	Rehabilitate Taxiway M	\$547,000
2001	Rehabilitate Taxiway D	\$326,000
2001	Baggage Systems Improvements	\$2,240,000
	Subtotal - FY 2001	\$15,940,000
2002	New Maintenance Compound	\$1,000,000
2002	DOA Administrative Offices	\$5,600,000
2002	Construct Drainage Facilities	\$3,000,000
2002	Construct Taxiway A Extension/Canal Relocation	\$7,921,500
2002	Construct Perimeter Road (Golfview)	\$1,200,000
	Subtotal - FY 2002	\$18,721,500
2003	Construct Apron (Golfview) and Taxilanes	\$8,500,000
2003	Add Runway 27R RVR	\$152,000
2003	Add Runway 27R MALSR	\$728,000
2003	Construct New Parking Garage	\$43,680,000
	Subtotal - FY 2003	\$53,060,000
2004	New Terminal Signage	\$3,000,000
2004	Replace Terminal Cabin Air System	\$1,000,000
2004	Upgrade AOA Security Fencing	\$2,000,000
2004	Runway 13/31 Overlay	\$3,360,000
2004	Airfield Remarking	\$300,000
2004	Taxiways R and G Improvements	\$2,800,000
	Subtotal - FY 2004	\$12,460,000
2005	Concourse C Expansion	\$11,200,000
2005	General Aviation/FBO Apron Expansion	\$4,758,000
	Subtotal - FY 2005	\$15,958,000
	TOTAL (FY 2001 THROUGH 2005)	\$116,139,500

Source: PBIA Joint Automated Capital Improvement Program, Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., March 2000

Table VII-3

Facility Enhancement Program - Fiscal Years 2001 through 2005

Fiscal Year	Project Description/Scope	Project Identified By		Cost Estimate (1999 Dollars)
		1996 Eckrose Green Pavement Inspection	1999 Annual Airport Facilities Inspection	
2001	Overnight Parking Apron and Adjacent Taxilane - Reseal and/or Overlay			\$375,000
2001	Terminal Building : East and West Canopy Replace Canopy Fabric		1999 Annual Airport Facilities Inspection	\$15,000
2001	Terminal Building : East and West Side Entrances - Repair Cracked Tiles		1999 Annual Airport Facilities Inspection	\$2,000
2001	Short Term Parking Garage : Top Level - Repair/Repaint Doors and Frames		1999 Annual Airport Facilities Inspection	\$1,200
2001	Short Term Parking Garage - Repaint Sprinkler System		1999 Annual Airport Facilities Inspection	\$6,000
2001	Concourse B : Roof Material Delaminating at Supply Fan - Repair		1999 Annual Airport Facilities Inspection	\$1,000
2001	Terminal Building : Ceiling Tiles - Replace tiles and Clean A/C Vents		1999 Annual Airport Facilities Inspection	\$4,000
2001	Concourse A : Ceiling Cover Ceiling Opening		1999 Annual Airport Facilities Inspection	\$500
2001	Terminal Building : Fire Hose Cabinet Repair Cabinet and Hose		1999 Annual Airport Facilities Inspection	\$500
2001	Terminal Building : Second Level - Repair Cracks at Expansion Joint		1999 Annual Airport Facilities Inspection	\$6,000
2001	Terminal Building : West Mechanical Facility - Louver/Screen; Rest Louver/Weather Strip		1999 Annual Airport Facilities Inspection	\$500
2001	Terminal Building : Condensate Sump Pumps in Main Chiller Rooms - Replace Pumps		1999 Annual Airport Facilities Inspection	\$48,000

Source: Ricondo & Associates, Inc.

Prepared by: Ricondo & Associates, Inc., February 2000

Table VII-3

Facility Enhancement Program - Fiscal Years 2001 through 2005

Fiscal Year	Project Description/Scope	Project Identified By	Cost Estimate (1999 Dollars)
2001	Terminal Building : Baggage Conveyor Electric Control Panel - Relocate	1999 Annual Airport Facilities Inspection	\$5,000
2001	Main Electrical Vault - Install Roll-up Doors	1999 Annual Airport Facilities Inspection	\$10,000
	SUBTOTAL - FY2001		\$474,700
2002	Fuel Farm - Refurbish Pavement (Seal Coating and Misc. Patching)	1999 Annual Airport Facilities Inspection	\$7,500
2002	Terminal Building : Steel Downspout Elbows Replace with PVC or Equivalent Material	1999 Annual Airport Facilities Inspection	\$2,500
2002	Terminal Building : Building Exterior at Deplane Level - Clean and Repair Exterior Fascia	1999 Annual Airport Facilities Inspection	\$18,000
2002	Terminal Building : Building Exterior at Deplane Level - Repair Ceiling Stucco and Paint	1999 Annual Airport Facilities Inspection	\$12,000
2002	Terminal Building : Barrel Vault Skylight - Replace Fiberglass and Joints	1999 Annual Airport Facilities Inspection	\$320,000
2002	Short Term Parking Garage - Double T-beams have Cracked and Spalled	1999 Annual Airport Facilities Inspection	\$10,000
2002	Terminal Building : East/West Mechanical Facility - Air Handling Units (Recondition)	1999 Annual Airport Facilities Inspection	\$3,500
2002	Terminal Building : 500 Ton Chillers - Interior Corroding and Refrigerant Conversion	1999 Annual Airport Facilities Inspection	\$17,500
2002	Short Term Parking Garage : 7th Level - Replace Light Base/Bollards	1999 Annual Airport Facilities Inspection	\$6,000

Source: Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., February 2000

Table VII-3

Facility Enhancement Program - Fiscal Years 2001 through 2005

Fiscal Year	Project Description/Scope	Project Identified By		Cost Estimate (1999 Dollars)
		DOA Maintenance Division	1999 Annual Airport Facilities Inspection	
2002	Installation of Dehumidification Units			\$450,000
2002	Terminal Building : Cooling Towers #1, #2, and #3 - Interior Wood Frame Needs Repair			\$10,500
2002	Airfield Lighting Control System w/ Fiber Optic Data Line	DOA Maintenance Division		\$125,000
	SUBTOTAL - FY2002			\$982,500
2003	Relocation of 8th Street AOA Access Gate	DOA Maintenance Division		\$100,000
2003	ITS Communication	1999 Strategic Master Plan		\$500,000
2003	Closed Circuit Television Surveillance	1999 Strategic Master Plan		\$300,000
2003	Traveler Advisory System	1999 Strategic Master Plan		\$750,000
	SUBTOTAL - FY2003			\$1,650,000
2004	Dynamic Message Signs	1999 Strategic Master Plan		\$1,000,000
	SUBTOTAL - FY2004			\$1,000,000
	No Projects Identified			
	SUBTOTAL - FY2005			\$0

Runway 9L is currently served by an RVR installation, but Runway 27R does not have a RVR. Runway 9L RVR readings apply only to Runway 9L and no other runway. Consequently, landing minimums for Runway 9L are RVR 2400, while landing minimums for Runway 27R are visibility $\frac{3}{4}$ mile. Adding an RVR to Runway 27R would change the landing minimums to RVR 4000.

Runway 24R Medium Intensity Approach Light System with Runway Alignment Indicator Lights: The approach visibility minimum for Runway 27R is currently $\frac{3}{4}$ mile. This is in contrast to Runway 9L, which has an approach visibility minimum of $\frac{1}{2}$ mile. Consequently, Runway 9L is the preferred runway during periods of low Instrument Meteorological Condition (IMC). Should wind conditions not favor the use Runway 9L during low IMC conditions, the airfield could be left with no arrival capacity.

The installation of a MALSR (Medium Intensity Approach Light System with Runway Alignment Indicator Lights) for Runway 27R would allow approach visibility minimums to be reduced from the Category I standard $\frac{3}{4}$ mile to $\frac{1}{2}$ mile. This would give the airfield all runway wind coverage when visibility is less than $\frac{3}{4}$ mile. The addition of an RVR installation in conjunction with MALSR could give Runway 27R landing minimums of RVR 2400, which is the current visibility minimum on Runway 9L.

New Parking Garage: A new 3,600 space (net gain of 3,000 spaces) parking garage is currently being designed by Walker Parking Consultants, Inc. The new garage will be located east of, and adjacent to, the existing long-term parking garage. The new structure will serve the near-term and mid-term public parking needs of the Airport.

Fiscal Year 2004:

The CIP projects for FY 2004 are shown in Exhibit VII-4 and described below.

New Terminal Signage: Improvements to the terminal building's interior signage system are proposed to improve wayfinding for passengers and intra-terminal passenger circulation.

Replacement of Terminal Cabin Air System: The replacement of this system was identified by the Airport's Terminal Maintenance division. The replacement of this system is necessary due to the fact that the current unit is severely corroded and has a poor design for the system's present location and application. In addition, the operating characteristics of the current system are inefficient for modern standards.

AOA Security Fencing Upgrades: The age and condition of the existing perimeter fencing warrants replacement. These aging conditions are widespread and extend beyond the scope of random maintenance repairs. The integrity of the existing perimeter fencing remains adequate to provide a secured perimeter for the Airport.

Runway 13/31 Overlay: The rehabilitation of these runway pavements is required to preserve the integrity and safe operating condition of the runway. A program book detailing the scope of this rehabilitation work, which includes an asphalt overlay, was prepared by the DOA in 1995.

Airfield Remarking: this project involves the remarking/re-designation of PBIA's runway systems to coincide with the magnetic heading of each runway. For example, the current magnetic heading of Runway 13-31 is approximately 139/319 degrees, which results in a runway identification number of

DOA Administrative Offices: The existing administrative offices are located within Building 846, west of the commuter apron. The DOA will likely relocate its offices to the terminal building when the demand for additional terminal facilities warrants an incremental expansion of the building to the east, as shown in Exhibit VII-2.

Drainage Facilities: As part of the stormwater improvements recommended by the 1994 Stormwater Master Plan, the renovation of the south and east pump stations will be renovated. In addition, the underground airfield drainage infrastructure located east of Runway 13-31, most of which was constructed between the 1950s and 1960s, will be replaced. The airfield stormwater systems west of Runway 13-31 were replaced under a similar project in 1996.

Taxiway A Extension and Canal Relocation: Extension of Taxiway A to the west will enable the holding of Boeing 757-sized aircraft awaiting departure clearance for Runway 9L-27R with the aircraft tails pointing north and clear of the Runway 9L Runway Protection Zone (RPZ). This extended taxiway section would be used during weather conditions characterized by visibility less than two statute miles and ceiling heights less than 700 feet above ground. This will maximize the length of runway available for departing aircraft while positioning the aircraft in such a way as to minimize the time it takes for the departing aircraft to access the runway during the above specified weather conditions. Air Traffic Control (ATC) estimates this improvement will allow in-trail separation to be reduced from 13 miles to approximately eight miles.

The relocation of the Airport West Canal will serve to integrate the Town of Golfview property with the existing airfield by placing the canal along the Airport's westerly property line. Crossover of the canal via a bridge structure will still be required by vehicles accessing the Town of Golfview property.

Perimeter Road (Golfview): This new road segment will provide the initial infrastructure for the Town of Golfview property and will furnish ground access to the future general aviation/FBO and aircraft manufacturing facilities proposed for this site. It will also provide an access route from the south side of the Airport to the north side facilities east of Runway 13.

Fiscal Year 2003:

Exhibit VII-3 depicts the CIP projects planned for FY 2003. Each of these projects is described below.

Apron (Golfview) and Taxilanes/Taxiways: New aircraft apron pavements and access taxiways will be provided for the southern half of the Town of Golfview property to support and allow for the development of facilities requiring airfield access. Among the proposed taxiway improvements is the extension of Taxiway F to the northwest, up to Runway 13.

Runway 27R Runway Visual Range Equipment: Visibility minimums for approach and departure procedures are determined by either prevailing visibility measurements made by a qualified weather observer or by the Runway Visual Range (RVR) equipment associated with the runway. Prevailing visibility measurements are generally less accurate than RVR readings. RVR readings are specific measurements for the runway environment while prevailing visibility measurements utilize identifiable landmarks for the general area of the airfield. When both RVR and prevailing visibility measurements are available, RVR visibility readings govern.

14 for the southeast direction and 32 for the northwest direction. The re-numbering of the runway systems will include the following:

- File FAA Form 7460-1, *Notice of Proposed Construction of Alteration*, with the FAA Airports District Office or Regional Office
- Revise the current Airport Layout Plan (ALP) to reflect the new runway identification numbers
- Upon approval of the revised ALP, existing runway numbers and replaced with new runway identification numbers
- Replace of all runway identification signage panels with panels depicting the new corrected runway designations

Taxiways R and G Improvements: An extension of Taxiway R to the west will improve airfield circulation to Runway 9L. This would provide a more direct taxi routing for general aviation aircraft requiring access to Runway 9L. Currently, general aviation aircraft requiring access to Runway 9L are routed either via Taxiways E, F, R, and S or via Taxiways K or E and C. These routings are circuitous and, in some instances, require the crossing of the primary runway, Runway 9L. In addition, the extension of Taxiway R for use by general aviation aircraft would minimize crossings of the main air carrier runway. It is recognized that the western portion of the extended taxiway penetrates the Runway 9R RPZ and runway safety area, thus prohibiting aircraft from holding on Taxiway R while aircraft are arriving on Runway 9R. A safety enhancement would be to re-designate the north-south portion of the extended taxiway with a different taxiway designation. This would allow ATC to issue a standard hold short taxi clearance, thus having aircraft remain clear of the Runway 9L RPZ.

In addition to the extension of Taxiway R, improvements to Taxiway G are proposed to enhance taxi patterns at the intersection of Runway 13/31 and Runway 9L-27R. This intersection is confusing to airfield users due, in large part, to the misalignment of Taxiway G from south of Runway 13/31 to north of Runway 9L/27R. The realignment of Taxiway G is proposed in order to minimize crossing distance across the two runways and enhance taxi flows at this intersection. An existing taxiway stub east of Taxiway G will remain so that the current runway exiting capabilities are maintained.

Fiscal Year 2005:

The CIP projects planned for FY 2005 are illustrated in **Exhibit VII-5** and further described below.

Concourse C Expansion: Similar to Concourse B, the construction of a hammerhead extension to Concourse C is proposed to provide a second incremental gain of two to four air carrier gates. Once again, the exact number of gates provided by this concourse expansion will be dependent upon the design aircraft selected for the new gates. The available apron frontage suggests that up to two widebody gates or four narrow body gates could be added to the end of the concourse. However, further analysis of the processing capabilities of the terminal components is necessary to ensure that the terminal building can support the additional gates.

Should the Airport experience aggressive growth in passenger activity that results in the need for the concurrent development of the additional gates provided by the two concourse expansion projects, the DOA may find it preferable to implement an initial development phase of Concourse D in lieu of the two concourse expansion projects. However, the financial investment required for an initial development of Concourse D will be greatly influenced by the costs of ancillary facilities needed to

support the new concourse. Examples of these ancillary facilities include terminal support functions that should, and in some cases must, be located adjacent to the concourse facilities and the realignment of the terminal roadway necessary to provide access to the new gates. Exhibit VII-6 presents an interim four-gate concourse development concept that provides the additional facilities while minimizing the need to develop a significant amount of ancillary facilities. In addition, the interim concept shown in Exhibit VII-6 allows for the incremental and ultimate development of the preferred Terminal Alternative depicted in the Composite Plan without disrupting the operations provided by the four interim gates, as shown in Exhibits VII-7 through VII-9.

General Aviation/FBO Apron Expansion: The expansion of the general aviation aprons on the south side of the Airport will provide additional capacity in the near term to fulfill general aviation demand growth. Opportunities for expanding the east and west general aviation aprons have been provided. The expansion of the general aviation apron located east of Runway 13/31 provides an additional 208,000 square feet of aircraft apron area while preserving the VOR and the Runway 27R glide slope critical areas. However, this expansion requires the rerouting of Taxiway E as shown in Exhibit VII-5.

Similarly, the expansion of the aircraft aprons west of Runway 13/31 provides additional uncovered aircraft storage capacity as well as opportunities for further hangar and office space development. Approximately 50 percent of the expanded apron area encompasses property currently leased by Signature Flight Support and utilized for aircraft parking. In addition, the expansion of these aprons will require the relocation of the 391st Bomb Squadron Restaurant.

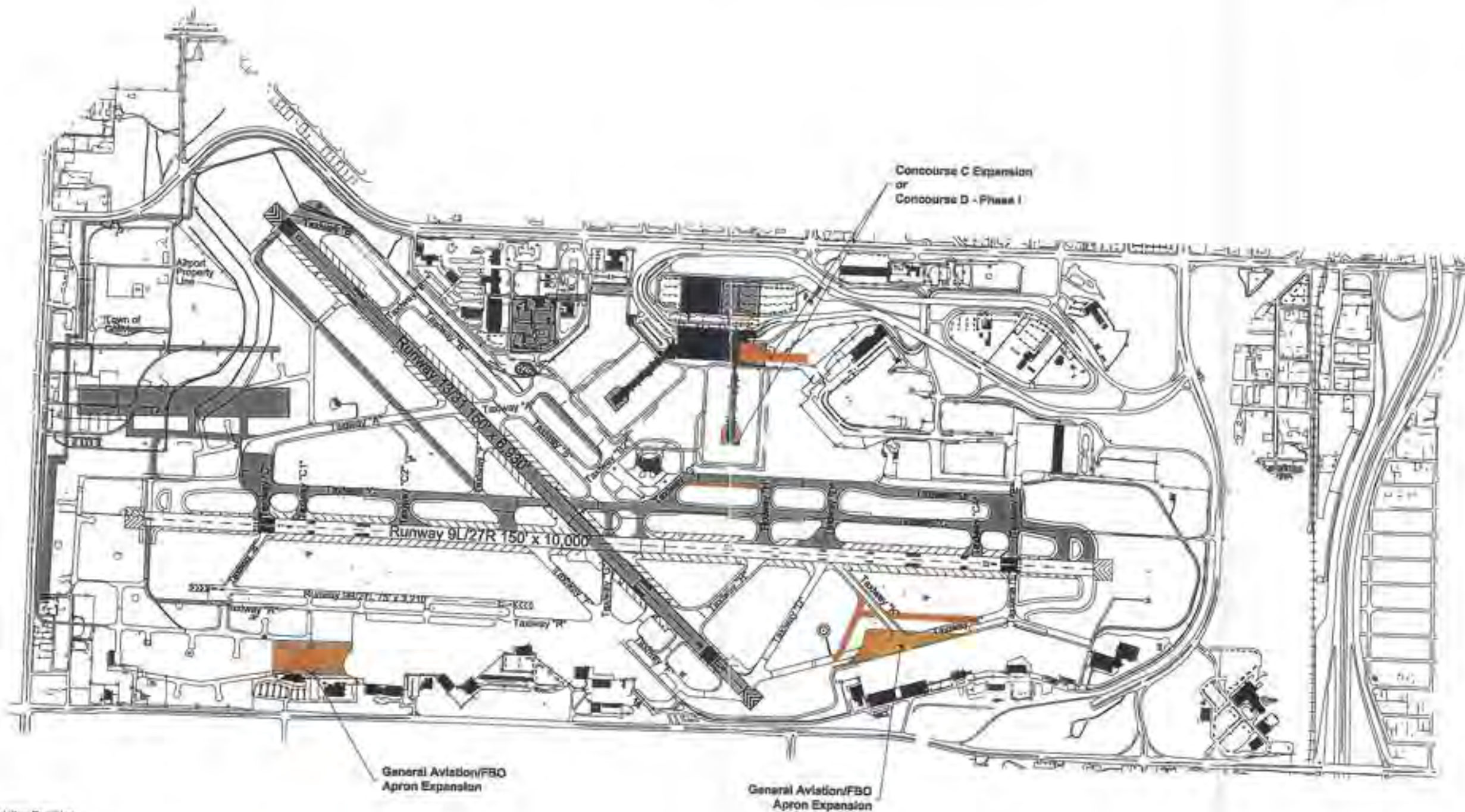
The expansion of the two general aviation apron areas described above will satisfy the PAL 1 demand levels associated with these facilities. The following sub-section provides a phased implementation plan for the development of facilities depicted on the Composite Development Plan following the completion of the CIP.

7.3 Phased Implementation Plan

The projects that make up the Composite Development Plan, as described in the Strategic Options section, have been phased and scheduled based on demand growth projected under the Alternate Service Patterns Demand Scenario and facility condition considerations. However, this implementation phasing plan is intended to illustrate the feasibility of implementing the future facilities shown in the Plan. The actual implementation schedule should be dictated by demand growth as it materializes.

Under the Alternate Service Patterns Demand Scenario, it is projected that activity at the Airport will reach PAL 1 around the year 2010 and PAL 2 around the year 2020. Based upon the facility requirements previously defined for these levels in Section IV, the growth in facility requirements has been linearly interpolated through the planning horizon (PAL 2). Development projects that make up the Composite Development Plan have been timed accordingly to meet the projected facility requirements as they are projected to occur.

For illustrative purposes, the projects have been grouped into six phases with each phase presenting the facilities that are to be developed to meet the projected facility requirements anticipated for a specific demand level. Each phase defines the facilities that are to be developed as well as which ones should be in place and operational by the time the associated demand level is reached. The specific demand levels for each phase have been defined in Table VII-4. As each demand level



Legend:

- Existing Facilities
- New Facilities
- Improvements Completed in Prior Year(s)

Source: PBIA Joint Automated Capital Improvement Program (2001-2005)
 Prepared by: Ricordo & Associates, Inc.

0 1200 ft. ↑
 north

Exhibit_VII-5.dwg

Strategic Master Plan Study

Exhibit VII-5

**Capital Improvement Program
 Fiscal Year 2005**

October 2000



Proposed AOA Fence Expanded Terminal Building
New Concourse Taxiway Centerline

Source: PBIA Airport Layout Plan.
Prepared by: Ricordo & Associates, Inc.

Exhibit VII-6



Concourse D (Stage 1) - Concept B Initial 4 Gate Concept

Project/PBIA/Strategic Plan/Final Documentation/Exhibit_VII-6.dwg



Source: PBIA Airport Layout Plan.
Prepared by: Ricordo & Associates, Inc.

0 500' north
PBIA Strategic Plan/Final Documentation/Exhibit VII-7.dwg

Legend: Proposed ADA Fence
Construction Completed
Under Construction - Building
Taxiway Centerline
Under Construction - Apron

Exhibit VII-7

Ultimate Concourse D Buildout - Concept B Construction Phasing - Plate No. 1



Source: PBIA Airport Layout Plan.
Prepared by: Ricordo & Associates, Inc.



PBIA Strategic Plan/Final Documentation/Exhibit VII-8.dwg

Legend:

- Proposed AOA Fence
- Construction Completed
- Construction Completed - Apron
- Taxiway Centerline

Exhibit VII-8

Ultimate Concourse D Buildout - Concept B Construction Phasing - Plate No. 2



Sources: PBIA Airport Layout Plan.
Prepared by: Ricordo & Associates, Inc.



Legend:
 Proposed AOA Fence
 Taxiway Centerline
 Under Construction - Building

Exhibit VII-9

Ultimate Concourse D Buildout - Concept B **Construction Phasing - Plate No. 3**

PBIA\Strategic Plan\Final Documentation\Exhibit_VII-9.dwg

Strategic Airport Master Planning Study

September 8, 2000

Table VII-4

Demand Level Thresholds
Airfield Facilities Implementation Plan

	Phase I	Phase II	Phase III	Phase IV	Phase V	PAL 2 Phase VI
Passengers						
Annual Passenger Enplanements	5,876,000	6,372,200	6,872,000	7,379,000	7,886,000	8,393,000
Peak Hour Passengers	3,240	4,105	4,792	5,126	5,460	5,794
Peak Hour Originating Passengers	2,314	2,518	2,710	2,876	3,043	3,210
Peak Hour Terminating Passengers	2,225	2,422	2,619	2,817	3,015	3,213
International Peak Hour Terminating Passengers	260	326	378	402	426	450
GA Operations						
Annual General Aviation/Air Taxi Operations	132,800	137,540	142,330	147,220	152,110	157,000
Cargo Tonnage						
Annual Belly Cargo Tonnage	27,100	31,000	34,940	38,960	42,980	47,000
Annual All-Cargo Tonnage	5,800	6,520	7,220	7,880	8,540	9,200
Anticipated Year	2005	2008	2011	2014	2017	2020

Source: Ricondo & Associates, Inc.

threshold is reached, the planning and implementation of the facilities in the following phase should be initiated so that the facilities required to meet the next demand threshold are in place and operational in sufficient time.

The following sections describe each phase of the implementation plan.

Phase I:

Phase I depicts the facilities to be developed following the completion of the five-year Capital Improvement Plan. **Table VII-5** summarizes Phase I of the Implementation Plan and **Exhibit VII-10** depicts the location of facilities needed to meet the anticipated facility needs for this demand level. The development items identified for completion during Phase I include the following.

- **Exit Taxiways from Runways 13, 9L, 27R.** Construction of new exits will provide a small incremental capacity increase to the existing airfield by reducing runway occupancy times.
- **Belly Cargo Building and Facilities.** Additional Belly Cargo facilities are required to meet the facility demand during Phase I. The construction of the facilities, as depicted in Exhibit VII-7, displaces approximately 300 Park and Ride (overflow) parking spaces.
- **Expand All-Cargo Auto Parking.** The auto parking requirements associated with the All-Cargo/Air Freight facilities are projected to exceed the existing amount during this period. The expansion of the All-Cargo Parking facilities, as depicted, displaces approximately 30 parking spaces in Overflow Lot #3.
- **Aircraft Maintenance Facilities.** Adequate space has been protected in the northwest area of the airfield (within the Town of Golfview property) for the construction of aircraft maintenance facilities. Facilities in the location, as shown on Exhibit VII-10, would be developed as demand warrants.
- **Collateral Development.** Adequate space has also been protected for collateral development uses (e.g. hotels, retail, office space development, etc.) in the northeast area of the Airport's property. Collateral development facilities would be developed as demand dictates.

As is shown in Table VII-5, the existing and proposed development provide the Airport with the capacity required, except for some minor deficiencies (primary in the landside support components) in general aviation (GA)/FBO facilities. Due to the minimal amount of these deficiencies, additional GA/FBO development is not depicted. Should the DOA desire to develop facilities to satisfy the need for these additional support components, sufficient vacant property exists adjacent to the general aviation/FBO leaseholds to allow for the implementation of such development.

Phase II:

The facilities to be developed during Phase II are depicted on **Exhibit VII-11** and summarized in **Table VII-6**. The development identified for implementation during Phase II includes:

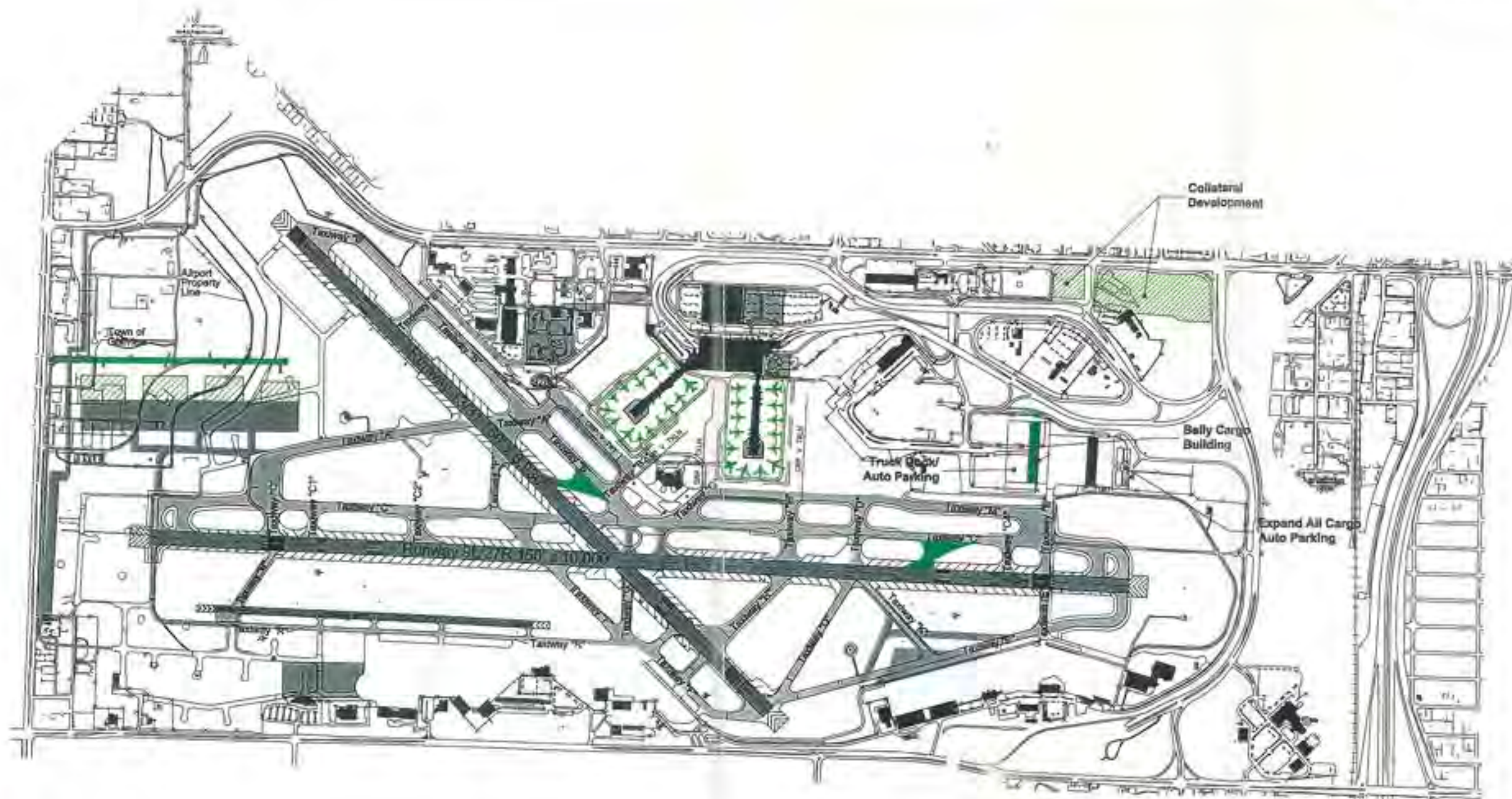
- **Extension of Taxiway M to the West End of Runway 9L-27R.** The extension of Taxiway M will improve aircraft circulation on the airfield by providing dual taxi streams between the terminal area and Runway 9L.

Table VII-5

Phase I
Airport Facilities Implementation Plan

Facility	Initial Facilities	Facilities Required	Phase I		Facilities Available Upon Completion of Phase I	Surplus(+)/ Deficit(-)
			Facilities Constructed During Phase I	Facilities Impacted/ Demolished		
Terminal						
Level 1	195,476	235,459	61,150	-	256,626	21,167
Level 2	68,406	98,572	61,150	-	129,556	30,984
Level 3	124,754	156,474	61,150	-	185,904	29,429
	388,636	490,505	183,450	-	572,086	81,581
Concourse						
Level 1	44,438	61,920	49,145	-	93,583	31,663
Level 2	128,274	156,275	49,145	-	177,419	21,144
	172,712	218,195	98,290	-	271,002	52,807
Total	561,348	708,700	281,740	-	843,088	134,388
Belly Cargo						
Warehouse	43,349	81,300	73,300	-	116,649	35,349
Ramp	10,500	20,300	48,800	-	59,300	39,000
Loading Dock	9,655	20,300	18,000	-	27,655	7,355
Truck Dock	72,300	182,900	160,000	-	232,300	49,400
Auto Parking	78,400	40,700	35,500	-	113,900	73,200
Total	214,204	345,500	335,600	-	549,804	204,304
All-Cargo						
Warehouse	26,000	11,600	-	-	26,000	14,400
Ramp	90,450	34,800	-	-	90,450	55,650
Loading Dock	6,500	2,900	-	-	6,500	3,600
Truck Dock	53,500	26,100	-	-	53,500	27,400
Auto Parking	56,375	58,000	24,500	-	80,875	22,875
Total	232,825	133,400	24,500	-	257,325	123,925
GA/FBO						
Acraft Hangar	384,802	408,223	-	-	384,802	(23,421)
Acraft Apron	2,774,723	3,146,000	484,155	-	3,258,878	112,878
Office Bldg	43,115	49,200	-	-	43,115	(6,085)
Auto Parking	99,653	116,300	-	-	99,653	(16,647)
Total	3,302,293	3,719,723	484,155	-	3,786,448	66,725
Parking Facilities						
Public Park						
Short Term	1,238	1,590	415	-	1,653	63
Long Term	2,814	3,610	3,500	600	5,714	2,104
Overflow Lts	3,924	5,220	-	330	3,594	(1,626)
Total	7,976	10,420	3,915	930	10,961	541
Employee Parking						
General	550	720	200	-	750	30
Total Parking	8,526	11,140	4,115	930	11,711	571

Source: Ricondo & Associates, Inc.



Legend:

-  Existing Facilities
 New Facilities
 Improvements Completed in Prior Year(s)
 Facilities to be Developed Based on New/Existing Tenant Demand

Source: FBIA Airport Layout Plan.
Prepared by: Ricondo & Associates, Inc.

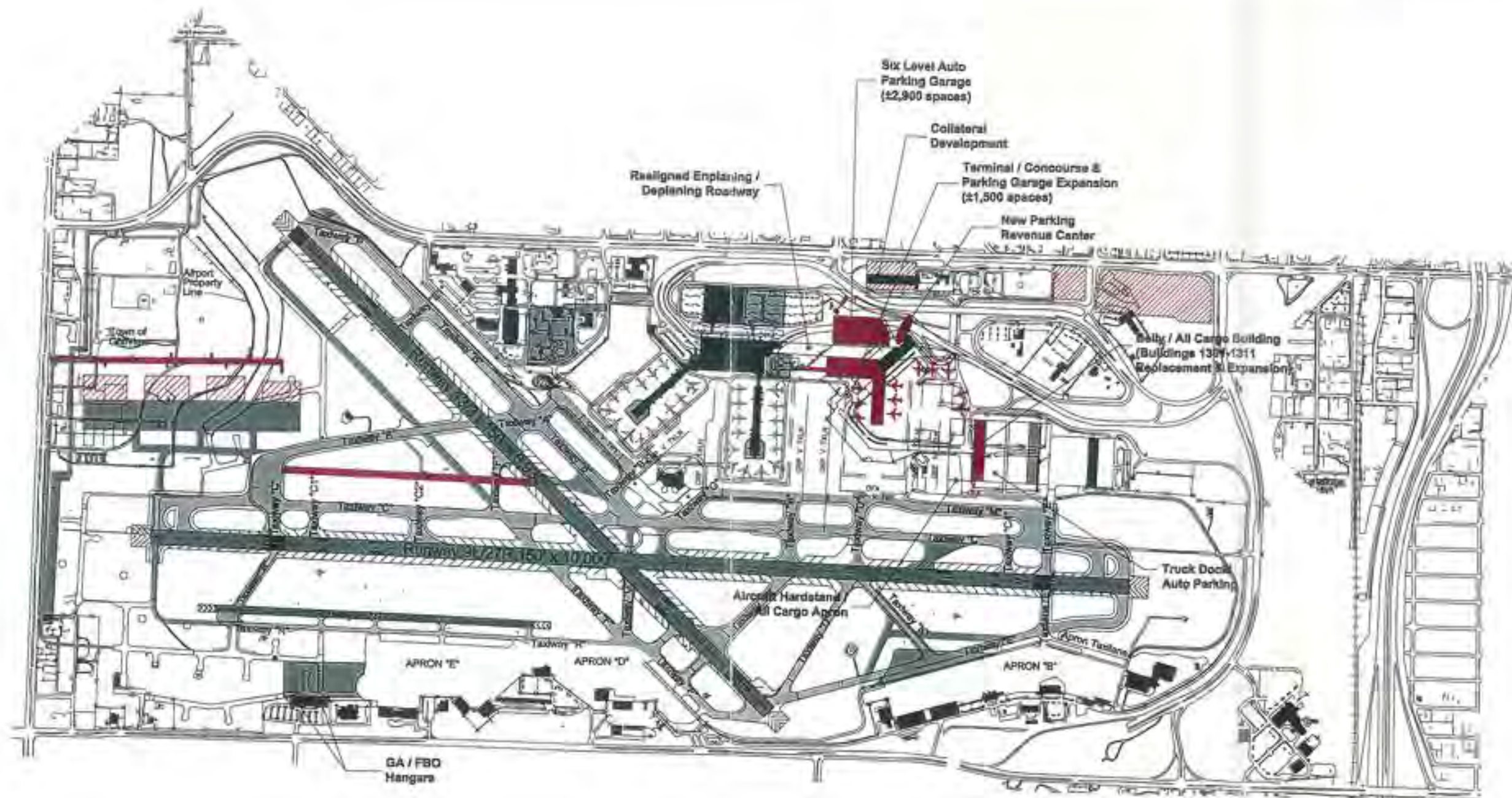
Exhibit_V5-10.dwg

Strategic Airport Master Planning Study

Exhibit VII-10

Phase I Proposed Development Plan

October 2000



Legend:

- Existing Facilities
- New Facilities
- Improvements Completed in Prior Year(s)
- Facilities to be Developed Based on New/Existing Tenant Demand

Source: PBIA Airport Layout Plan,
Prepared by: Ricondo & Associates, Inc.

0 1200' 
north

Exhibit VII-11.dwg

Strategic Airport Master Planning Study

Exhibit VII-11

**Phase II
Proposed Development Plan**

October 2000

Table VII-6

Phase II
Airport Facilities Implementation Plan

Facility	Initial Facilities	Facilities Required	Phase II		Facilities Available Upon Completion of Phase II	Surplus(+)/ Deficit(-)
			Facilities Constructed During Phase II	Facilities Impacted/ Demolished		
Terminal						
Level 1	256,626	294,521	122,480	-	379,106	84,585
Level 2	129,556	118,727	122,480	-	252,036	133,309
Level 3	185,904	193,954	122,480	-	308,384	114,429
	572,086	607,202	367,440	-	939,526	332,324
Concourse						
Level 1	93,583	73,428	58,263	-	151,846	78,418
Level 2	177,419	189,290	58,263	-	235,682	46,392
	271,002	262,718	116,526	-	387,528	124,810
Total	843,088	869,920	483,966	-	1,327,054	457,134
Belly Cargo						
Warehouse	116,649	93,000	73,300	43,349 ¹	146,600	53,600
Ramp	59,300	23,240	156,570	10,500 ¹	205,370	182,130
Loading Dock	27,655	23,240	18,000	9,655 ¹	36,000	12,760
Truck Dock	232,300	209,240	160,000	72,300 ¹	320,000	110,760
Auto Parking	113,900	46,520	35,500	78,400 ¹	71,000	24,480
Total	549,804	395,240	443,370	214,204	778,970	383,730
All-Cargo						
Warehouse	26,000	13,040	-	-	26,000	12,960
Ramp	90,450	39,120	-	-	90,450	51,330
Loading Dock	6,500	3,260	-	-	6,500	3,240
Truck Dock	53,500	29,340	-	-	53,500	24,160
Auto Parking	80,875	65,200	-	-	80,875	15,675
Total	257,325	149,960	-	-	257,325	107,365
GA/FBO						
Acft Hangar	384,802	422,817	30,634	-	415,436	(7,381)
Acft Apron	3,258,878	3,258,320	-	-	3,258,878	558
Office Bldg	43,115	51,000	8,000	-	51,115	115
Auto Parking	99,653	120,440	-	-	99,653	(20,787)
Total	3,786,448	3,852,577	38,634	-	3,825,082	(27,495)
Parking Facilities						
Public Park						
Short Term	1,653	1,728	750	-	2,403	675
Long Term	5,714	3,922	2,900	-	8,614	4,692
Overflow Lts	3,594	5,676	-	3,376	218	(5,458)
Total	10,961	11,326	3,650	3,376	11,235	(91)
Employee Parking						
General	750	780	750	550	950	170
Total Parking	11,711	12,106	4,400	3,926	12,185	79

Note:

¹ Assumes that a replacement building for Building 1301-1311 would be required due to the aging condition of this existing facility.

- **Concourse D, Terminal Building, and Short-Term Parking Garage Expansion.** The addition of Concourse D increases the number of gate positions and the amount of concourse space to meet the projected facility requirements. To provide adequate terminal facilities to support the Concourse D gates, the expansion of all levels of the terminal building is required. The outbound terminal roadway should also be realigned to provide enplaning and deplaning curbside for the expanded terminal building. The four-level, short-term parking garage located above the terminal should also be expanded accordingly to provide approximately 1,500 additional short-term public parking spaces. The new concourse and terminal displaces Park and Ride lots #1 and #2 and the employee parking lot east of the terminal building. To provide adequate employee parking capacity, portions of the rooftop short term parking garage should be designated for employee parking. In Phase II, it is anticipated that approximately 750 spaces will need to be designated as employee parking from the short-term garage, thereby meeting the demands for both public short-term parking and employee parking.
- **New Long-Term Parking Garage.** A new long-term parking garage is to be constructed with the terminal expansion to provide adequate parking for the new Concourse D. The new six-level parking garage would provide approximately 4,100 additional spaces.
- **Expand Parking Structure Two Additional Levels.** If feasible, the existing parking structure should be expanded with two additional levels. However, it is anticipated that expanding the existing structure may not be feasible. If so, the new garage constructed during Phase I should be expanded to provide additional long-term parking spaces.
- **New Parking Revenue Center.** It is anticipated that a new larger parking revenue center will be required during this phase to accommodate the traffic volumes associated with the amount of parking spaces that will be located in the terminal at the end of Phase II.
- **Belly Cargo Building and Facilities.** A new belly cargo facility is required to meet the projected demand as well as to replace the existing belly cargo/freight forwarders building (Building 1301-1310) that is nearing the end of its useful life. The location of the new facilities would also allow their use as an all-cargo/freight facility if demand dictates, as there is adequate ramp available for aircraft parking.
- **Collateral Development.** Upon the replacement of belly cargo building 1301-1311, the area now occupied by this facility will be re-designated for airport related collateral development as demand warrants.
- **GA/FBO Hangars and Office.** Additional GA hangars, office space, and auto parking should be developed as demand dictates.

As is shown in Table VII-6, the existing and proposed development provides the Airport with the capacity required, except for some minor deficiencies (primarily in the landside support components) in GA/FBO facilities. Due to the minimal amount of these deficiencies, additional GA/FBO development is not depicted. However, as described under Phase I, sufficient land is available adjacent to the GA/FBO facilities to allow for the development of the additional support facilities.

Phase III:

The facilities to be developed during Phase III are depicted on **Exhibit VII-12** and summarized in **Table VII-7**. The development identified for implementation during Phase III includes:

- **Overflow Parking/Park-n-Ride Facilities.** An overflow parking area of approximately 1,175 spaces is to be constructed as shown on Exhibit VII-12.
- **GA/FBO Apron Expansions.** To meet the projected GA/FBO aircraft parking apron requirements, the expansion of the west side GA/FBO aircraft aprons shown in Exhibit VII-12 is required.

As with the previous Phases, the existing and proposed development provides the Airport with the capacity required, except for some minor deficiencies (primary in the landside support components) in GA/FBO facilities. Due to the minimal amount of these deficiencies, additional GA/FBO development is not depicted. However, as described under Phase I, sufficient land is available adjacent to the GA/FBO facilities to allow for the development of the additional support facilities.

Phase IV:

The facilities to be developed during Phase IV are depicted on **Exhibit VII-13** and summarized in **Table VII-8**. The development identified for implementation during Phase IV includes the following:

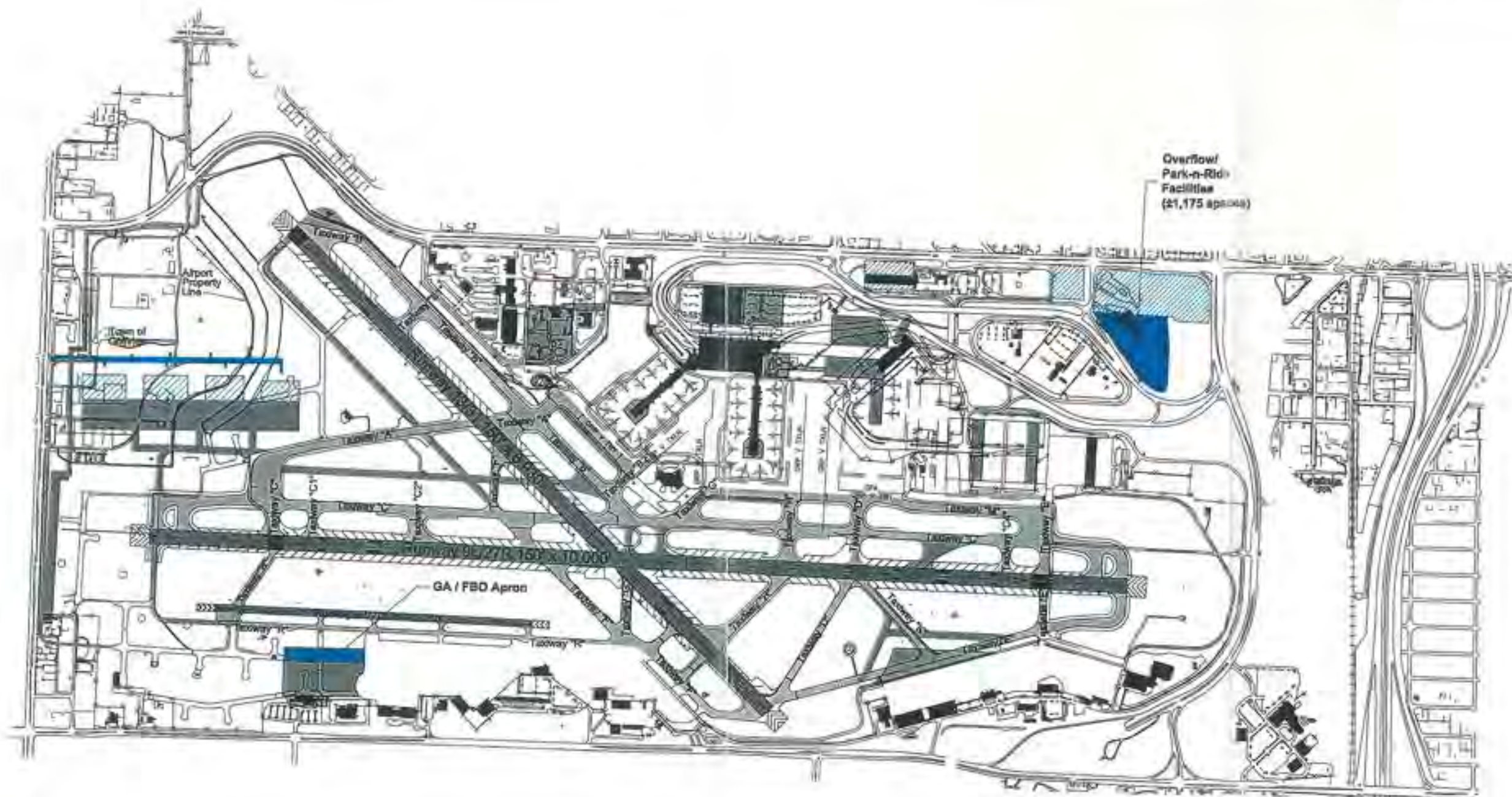
- **GA/FBO Facilities -** In preparation for the construction of the new air carrier runway, GA/FBO facilities are to be constructed in the northwest section of the airfield as is shown on Exhibit VII-13. These facilities will accommodate growth in GA activity and allow for the relocation of some existing GA/FBO facilities that is necessary for the construction of the new parallel runway.

As is shown in Table VII-8, at the end of Phase IV, the projected airfield facility requirements have been provided through the combination of the existing and proposed facilities.

Phase V:

The facilities to be developed during Phase V are depicted on **Exhibit VII-14** and summarized in **Table VII-9**. The development identified for implementation completion during Phase V includes:

- **Concourse Expansion.** The expansion of Concourse D increases the number of gate positions provided and the amount of holdroom space needed to meet the projected facility requirements.
- **Terminal & Short-Term Parking Garage Expansion.** To provide adequate terminal facilities to meet the projected requirements associated with the additional gates, the expansion of the terminal building on all levels is required. The four-level, short-term parking garage located above the terminal should also be expanded, accordingly, to provide additional short-term parking spaces. It is also anticipated that the demand for employee and tenant parking in the terminal area will exceed that which is available. To provide adequate employee parking capacity, portions of the rooftop short term parking garage should be allocated for employee parking. In Phase V, it is anticipated that approximately 100 additional spaces will be re-designated for employee parking, thereby meeting the demands for both short-term public and employee parking.



Legend:

- Existing Facilities
- New Facilities
- Improvements Completed in Prior Year(s)
- Facilities to be Developed Based on New/Existing Tenant Demand

Source: PBIA Airport Layout Plan.
Prepared by: Ricordo & Associates, Inc.

0 1200' 
north

Exhibit_VII-12.dwg

Strategic Airport Master Planning Study

Exhibit VII-12

**Phase III
Proposed Development Plan**

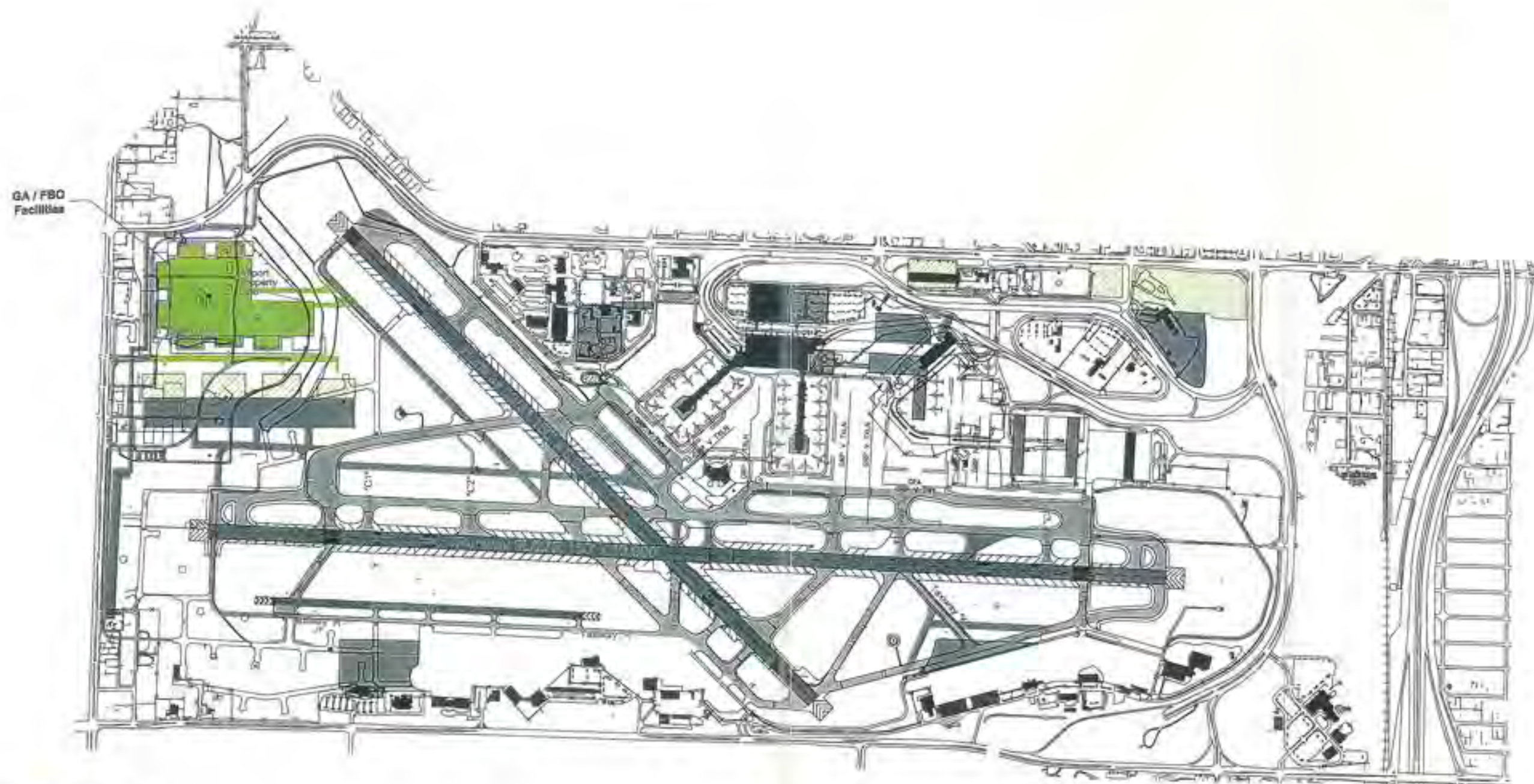
October 2000

Table VII-7

Phase III
Airport Facilities Implementation Plan

Facility	Initial Facilities	Facilities Required	Phase III		Facilities Available Upon Completion of Phase III	Surplus(+) Deficit(-)
			Facilities Constructed During Phase III	Facilities Impacted/ Demolished		
Terminal						
Level 1	379,106	342,504	-	-	379,106	36,602
Level 2	252,036	135,285	-	-	252,036	116,751
Level 3	308,384	223,501	-	-	308,384	84,883
	939,526	701,290	-	-	939,526	238,236
Concourse						
Level 1	151,846	82,822	-	-	151,846	69,024
Level 2	235,682	215,120	-	-	235,682	20,562
	387,528	297,942	-	-	387,528	89,586
Total	1,327,054	999,232	-	-	1,327,054	327,822
Belly Cargo						
Warehouse	146,600	104,820	-	-	146,600	41,780
Ramp	205,370	26,210	-	-	205,370	179,160
Loading Dock	36,000	26,210	-	-	36,000	9,790
Truck Dock	320,000	235,850	-	-	320,000	84,150
Auto Parking	71,000	52,410	-	-	71,000	18,590
Total	778,970	445,500	-	-	778,970	333,470
All-Cargo						
Warehouse	26,000	14,440	-	-	26,000	11,560
Ramp	90,450	43,320	-	-	90,450	47,130
Loading Dock	6,500	3,610	-	-	6,500	2,890
Truck Dock	53,500	32,490	-	-	53,500	21,010
Auto Parking	80,875	72,200	-	-	80,875	8,675
Total	257,325	166,060	-	-	257,325	91,265
GA/FBO						
Acraft Hangar	415,436	437,552	-	-	415,436	(22,116)
Acraft Apron	3,258,878	3,371,810	114,330	-	3,373,208	1,398
Office Bldg	51,115	52,800	-	-	51,115	(1,685)
Auto Parking	99,653	124,630	-	-	99,653	(24,977)
Total	3,825,082	3,986,792	114,330	-	3,939,412	(47,380)
Parking Facilities						
Public Park						
Short Term	2,403	1,863	-	-	2,403	540
Long Term	8,614	4,229	-	-	8,614	4,385
Overflow Lts	218	6,123	1,175	-	1,393	(4,730)
Total	11,235	12,215	1,175	-	12,410	195
Employee Parking						
General	950	840	-	-	950	110
Total Parking	12,185	13,055	1,175	-	13,360	305

Source: Ricondo & Associates, Inc.



Legend:

- Existing Facilities
- New Facilities
- Improvements Completed in Prior Year(s)
- Facilities to be Developed Based on New/Existing Tenant Demand

Source: PBIA Airport Layout Plan.
Prepared by: Ricondo & Associates, Inc.

0 1200' 
north

Exhibit VII-13.dwg

Strategic Airport Master Planning Study

Exhibit VII-13

Phase IV
Proposed Development Plan

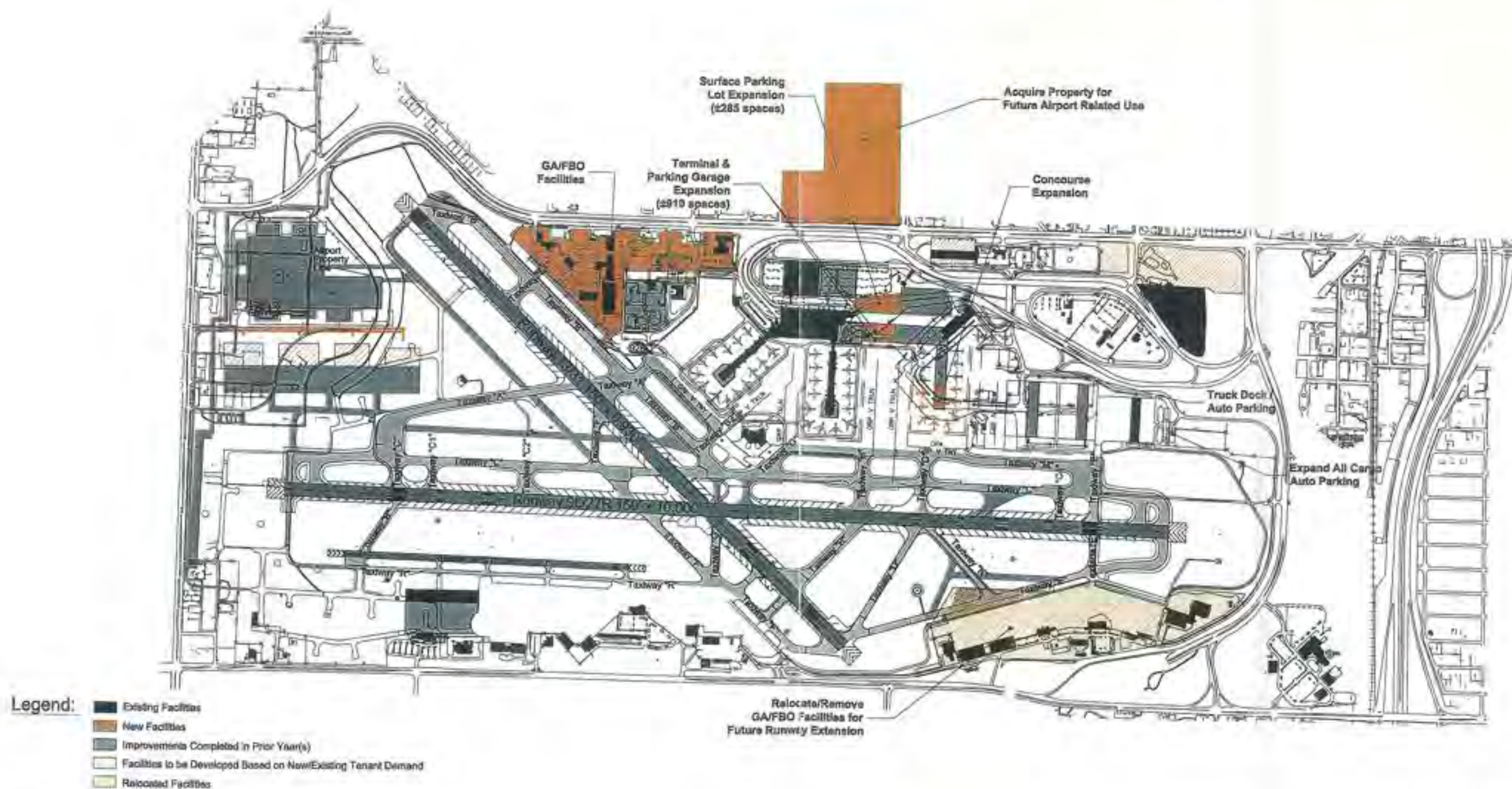
October 2000

Table VII-8

Phase IV
Airport Facilities Implementation Plan

Facility	Initial Facilities	Facilities Required	Phase IV		Facilities Available Upon Completion of Phase IV	Surplus(+)/ Deficit(-)
			Facilities Constructed During Phase IV	Facilities Impacted/ Demolished		
Terminal						
Level 1	379,106	368,328	-	-	379,106	10,778
Level 2	252,036	144,651	-	-	252,036	107,385
Level 3	308,384	237,181	-	-	308,384	71,203
	939,526	750,160	-	-	939,526	189,366
Concourse						
Level 1	151,846	87,988	-	-	151,846	63,858
Level 2	235,682	226,580	-	-	235,682	9,102
	387,528	314,568	-	-	387,528	72,960
Total	1,327,054	1,064,728	-	-	1,327,054	262,326
Belly Cargo						
Warehouse	146,600	116,880	-	-	146,600	29,720
Ramp	205,370	29,240	-	-	205,370	176,130
Loading Dock	36,000	29,240	-	-	36,000	6,760
Truck Dock	320,000	263,000	-	-	320,000	57,000
Auto Parking	71,000	58,440	-	-	71,000	12,560
Total	778,970	496,800	-	-	778,970	282,170
All-Cargo						
Warehouse	26,000	15,760	-	-	26,000	10,240
Ramp	90,450	47,280	-	-	90,450	43,170
Loading Dock	6,500	3,940	-	-	6,500	2,560
Truck Dock	53,500	35,460	-	-	53,500	18,040
Auto Parking	80,875	78,800	-	-	80,875	2,075
Total	257,325	181,240	-	-	257,325	76,085
GA/FBO						
Acraft Hangar	415,436	452,572	218,250	-	633,686	181,114
Acraft Apron	3,373,208	3,487,640	984,100	-	4,357,308	869,668
Office Bldg	51,115	54,600	25,600	-	76,715	22,115
Auto Parking	99,653	128,920	147,875	-	247,528	118,608
Total	3,939,412	4,123,732	1,375,825	-	5,315,237	1,191,505
Parking Facilities						
Public Park						
Short Term	2,403	1,992	-	-	2,403	411
Long Term	8,614	4,526	-	-	8,614	4,088
Overflow Lts	1,393	6,552	-	-	1,393	(5,159)
Total	12,410	13,070	-	-	12,410	(660)
Employee Parking						
General	950	900	-	-	950	50
Total Parking	13,360	13,970	-	-	13,360	(610)

Source: Ricondo & Associates, Inc.



Source: PBIA Airport Layout Plan.
Prepared by: Ricondo & Associates, Inc.



Exhibit VII-14.dwg

Table VII-9

Phase V
Airport Facilities Implementation Plan

Facility	Initial Facilities	Facilities Required	Phase V			Surplus(+)/ Deficit(-)
			Facilities Constructed During Phase V	Facilities Impacted/ Demolished	Facilities Available Upon Completion of Phase V	
Terminal						
Level 1	379,106	394,152	74,240	-	453,346	59,194
Level 2	252,036	154,017	74,240	-	326,276	172,259
Level 3	308,384	250,861	74,240	-	382,624	131,763
	939,526	799,030	222,720	-	1,162,246	363,216
Concourse						
Level 1	151,846	93,154	32,560	-	184,406	91,252
Level 2	235,682	238,040	32,560	-	268,242	30,202
	387,528	331,194	65,120	-	452,648	121,454
Total	1,327,054	1,130,224	287,840	-	1,614,894	484,670
Belly Cargo						
Warehouse	146,600	128,940	-	-	146,600	17,660
Ramp	205,370	32,270	-	-	205,370	173,100
Loading Dock	36,000	32,270	-	-	36,000	3,730
Truck Dock	320,000	290,150	-	-	320,000	29,850
Auto Parking	71,000	64,470	-	-	71,000	6,530
Total	778,970	548,100	-	-	778,970	230,870
All-Cargo						
Warehouse	26,000	17,080	-	-	26,000	8,920
Ramp	90,450	51,240	-	-	90,450	39,210
Loading Dock	6,500	4,270	-	-	6,500	2,230
Truck Dock	53,500	38,430	-	-	53,500	15,070
Auto Parking	80,875	85,400	14,750	-	95,625	10,225
Total	257,325	196,420	14,750	-	272,075	75,655
GA/FBO						
Acft Hangar	633,686	467,593	91,575	234,466	490,795	23,202
Acft Apron	4,357,308	3,603,470	1,242,850	1,251,600	4,348,558	745,088
Office Bldg	76,715	56,400	14,300	28,025	62,990	6,590
Auto Parking	247,528	133,210	63,325	92,868	217,985	84,775
Total	5,315,237	4,260,673	1,412,050	1,606,959	5,120,328	859,655
Parking Facilities						
Public Park						
Short Term	2,403	2,121	810	-	3,213	1,092
Long Term	8,614	4,823	285	-	8,899	4,076
Overflow Lts	1,393	6,981	-	45	1,348	(5,633)
Total	12,410	13,925	1,095	45	13,460	(465)
Employee Parking						
General	950	960	100	-	1,050	90
Total Parking	13,360	14,885	1,195	45	14,510	(375)

Source: Ricondo & Associates, Inc.

- **Expand Long-Term Surface Parking Lot.** Expansion of the existing long-term surface parking lot has been planned to provide parking directly across from the expanded terminal building. The amount of parking provided with the proposed and existing facilities should be adequate to meet the anticipated demand as shown in Table VII-9.
- **Expand All-Cargo Auto Parking.** The auto parking requirements associated with the All-Cargo/Air Freight facilities is projected to exceed the amount provided during this period. The expansion of the All-Cargo Parking facilities, as depicted on Exhibit VII-14, displaces approximately 45 parking spaces in Overflow Lot #3.
- **GA/FBO Facilities.** In preparation for the construction of the new air carrier runway, GA/FBO facilities are to be constructed northeast of Runway 13-31 as shown on Exhibit VII-14. These facilities will accommodate growth in GA activity and complete the relocation of the entire existing east side GA/FBO facilities that is necessary for the implementation of the new runway.
- **Acquire Property for Future Airport Related Use.** The property north of the existing terminal area has been marked for acquisition by the Airport for future airport related use. It has been depicted for acquisition in Phase V to serve as a Ground Transportation center for the on-airport rental car facilities, remote-parking facilities, or other Airport uses.

Phase VI:

The facilities to be developed during Phase VI are depicted on Exhibit VII-15 and summarized in Table VII-10. The development items identified for completion during Phase VI include:

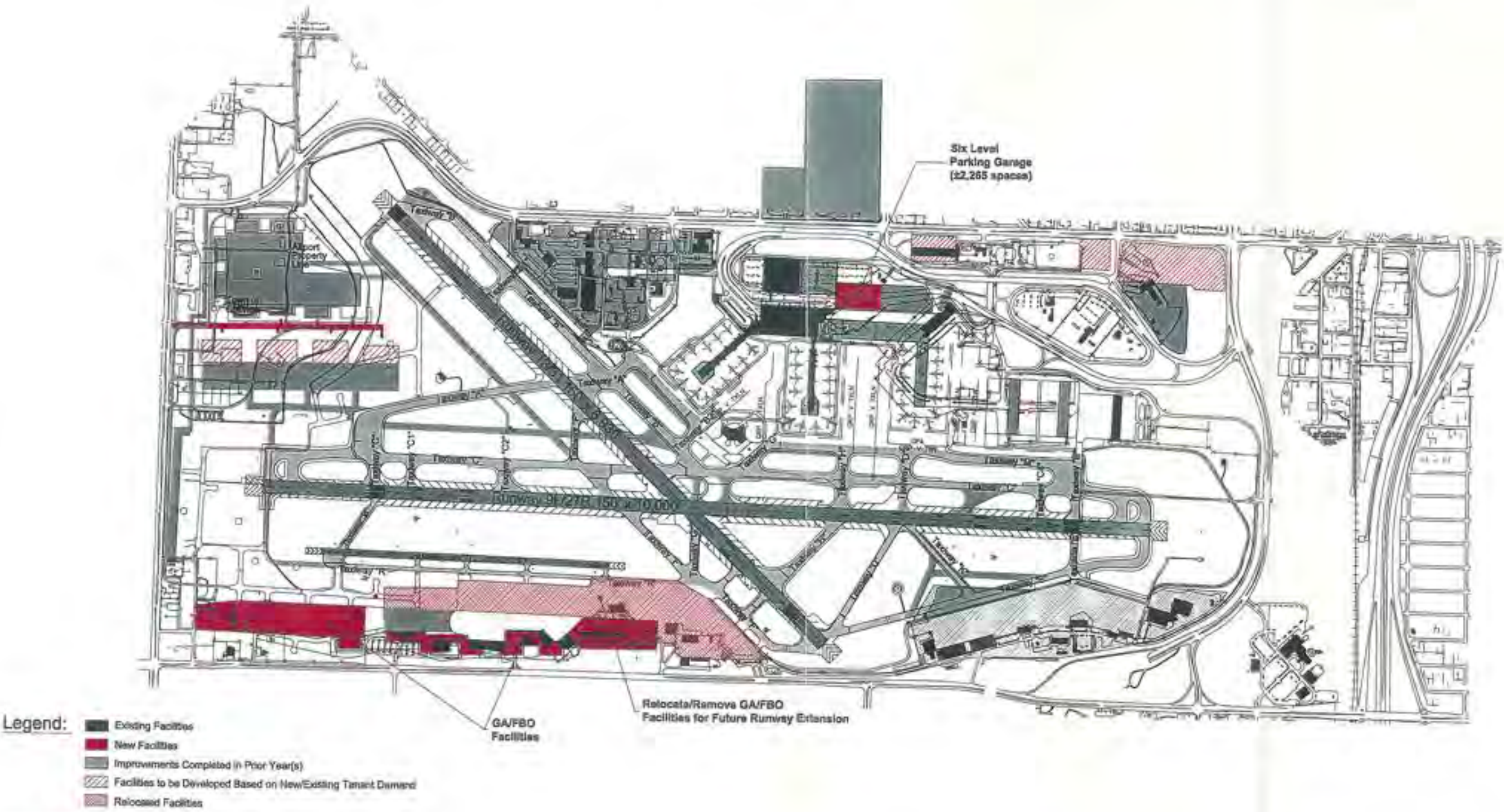
- **New Long-Term Parking Garage.** A new long-term parking garage is to be constructed across from the expanded terminal building implemented during Phase V to provide adequate parking within the terminal area. A new six-level parking garage of approximately 2,265 spaces is estimated to be required to serve this public parking demand.
- **GA/FBO Facilities.** The west side GA/FBO facilities are to be reconfigured as is shown on Exhibit VII-15 in order to vacate the land proposed for the new air carrier runway. The reconfigured facilities will accommodate growth in GA activity through the planning period and allows for the construction of the new parallel runway.

7.3 Monitoring and Assessing Timing Indicators

The DOA currently monitors passenger, aircraft operations, and cargo data to assess growth patterns at PBI. However, adding several key sources of data to the monitoring program can produce a more thorough understanding of the character of growth. Analyzing data to assess utilization of facilities, and comparing those figures to planning factors or demand thresholds outlined in the Strategic Plan, can provide the DOA early indications of the timing for the implementation of facilities.

7.3.1 Data Monitoring and Analysis

The DOA should regularly collect and analyze data to determine how actual activity compares to demand projections and implementation triggers. A summary of the data that should be collected and monitored by the DOA is summarized in Table VII-11. In general, the data to be collected includes the following:



Source: PBIA Airport Layout Plan.
Prepared by: Ricordo & Associates, Inc.

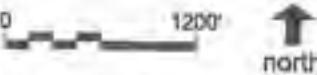


Exhibit VII-15.dwg

Table VII-10

Phase VI
Airport Facilities Implementation Plan

Facility	Initial Facilities	Facilities Required	Phase VI		Facilities Available Upon Completion of Phase VI	Surplus(+)/ Deficit(-)
			Facilities Constructed During Phase VI	Facilities Impacted/ Demolished		
Terminal						
Level 1	453,346	419,976	-	-	453,346	33,370
Level 2	326,276	163,383	-	-	326,276	162,893
Level 3	382,624	264,541	-	-	382,624	118,083
	1,162,246	847,900	-	-	1,162,246	314,346
Concourse						
Level 1	184,406	98,320	-	-	184,406	86,086
Level 2	268,242	249,500	-	-	268,242	18,742
	452,648	347,820	-	-	452,648	104,828
Total	1,614,894	1,195,720	-	-	1,614,894	419,174
Belly Cargo						
Warehouse	146,600	141,000	-	-	146,600	5,600
Ramp	205,370	35,300	-	-	205,370	170,070
Loading Dock	36,000	35,300	-	-	36,000	700
Truck Dock	320,000	317,300	-	-	320,000	2,700
Auto Parking	71,000	70,500	-	-	71,000	500
Total	778,970	599,400	-	-	778,970	179,570
All-Cargo						
Warehouse	26,000	18,400	-	-	26,000	7,600
Ramp	90,450	55,200	-	-	90,450	35,250
Loading Dock	6,500	4,600	-	-	6,500	1,900
Truck Dock	53,500	41,400	-	-	53,500	12,100
Auto Parking	95,625	92,000	-	-	95,625	3,625
Total	272,075	211,600	-	-	272,075	60,475
GA/FBO						
Acraft Hangar	490,795	482,613	198,900	150,336	539,359	56,746
Acraft Apron	4,348,558	3,719,300	1,164,050	1,519,900	3,992,708	273,408
Office Bldg	62,990	58,200	21,490	15,090	69,390	11,190
Auto Parking	217,985	137,500	126,750	6,785	337,950	200,450
Total	5,120,328	4,397,613	1,511,190	1,692,111	4,939,407	541,794
Parking Facilities						
Public Park						
Short Term	3,213	2,250	-	-	3,213	963
Long Term	8,899	5,120	2,265	-	11,164	6,044
Overflow Lts	1,348	7,410	-	-	1,348	(6,062)
Total	13,460	14,780	2,265	-	15,725	945
Employee Parking						
General	1,050	1,020	-	-	1,050	30
Total Parking	14,510	15,800	2,265	-	16,775	975

Source: Ricondo & Associates, Inc.

Table VII-11

Statistics to be Collected for Aviation Activity Monitoring

Data	Sources	Frequency
Commercial enplanements: total, domestic, international, commuter, totals by airline	Air carriers' monthly reports to the Department of Airports	Monthly and annually
Origin/Destination passengers	Origin/Destination Survey of Airline Passenger Traffic, USDOT	Annual
Number of departing seats	Official Airline Guide (OAG)	Quarterly
Aircraft Operations: total, air carrier, cargo, military, GA/air taxi, peak hour operations	FAA ATCT Reports (Contact Tower Chief), OAG, and air carrier data from landing fee reports	Monthly and annually
Commercial aircraft fleet mix	Air carrier's monthly landing fee reports and OAG	Quarterly
Cargo: total domestic freight enplaned & deplaned, total international freight enplaned & deplaned, total mail enplaned and deplaned	Carrier's monthly reports to the Department of Airports	Monthly
Hourly distribution of activity in peak month	FAA ATCT Reports (Contact Tower Chief) and OAG	Collect for two weeks during peak month
Aircraft delay	FAA Consolidated Operations & Delay Analysis System (CODAS)	Annually
Based aircraft, general aviation itinerant and based operations	Operations Survey of Tenants	Annually
Number of aircraft on waiting list for conventional hangar space and tie down space	Operations Survey of Tenants	Annually
Parking: total number of parkers, totals for each type of lot (short term, long term, shuttle) entry and exit data from lots and toll plaza	Department of Airports parking reports	Parking volume: monthly. Entrance and exit data: for 2 weeks during peak month.

- Passenger enplanements - domestic, international, connecting, O&D
- Aircraft operations - total, cargo, air carrier, air taxi, military, general aviation-based and itinerant, overflights
- Annual average delay per aircraft
- Number of flights per gate and number of departing seats, overall and by airline
- Commercial fleet mix
- Cargo tonnage - enplaned and deplaned, domestic and international
- Based aircraft fleet
- Number of (general aviation) aircraft waiting for hangar or tie-down space
- Number of vehicles using parking facilities and entry and exit data for designated periods

The DOA currently collects a large portion of this data. While overall growth is tracked, no detailed analysis is being done with the information to assess and monitor the character of growth relative to expansion needs. The DOA should record and assess these statistics to understand the character of growth and prepare for implementation of the Composite Development Plan. **Table VII-12** lists the primary and secondary indicators for airfield, terminal, general aviation, and air cargo, respectively, for which the statistics should be analyzed. Similarly, **Table VII-13** presents the primary and secondary indicators for the public parking facilities. Although some statistics, such as airport delay, may be far below the implementation trigger, the data should be collected and recorded to begin long-term tracking of trends.

Annual average delay per aircraft is the primary indicator for airfield development. Planning should be initiated when delay reaches four minutes per aircraft. For the existing airfield, the Strategic Plan estimated that this level of delay would be reached under the Alternate Service Patterns Demand Scenario beyond PAL 2 (i.e., the year 2020). However, demand/delay relationships change over time as fleet mix, demand distributions, and, particularly, operating procedures change. Historical operations data can be used to project aircraft activity growth and estimate when activity benchmarks may be reached. This will provide the DOA with insight for planning long-term capital improvements.

Aircraft operations during peak periods should also be monitored and compared to the activity profiles of the demand scenarios to determine the character of growth and impacts to the annual service volume (ASV) of the airfield. As peak hour and peak day traffic increases, more delays are likely, as is a lower ASV. Likewise, changes in the fleet mix can impact airfield capacity. Data should be monitored for long term trends. Comparison to the fleet mixes of the various demand scenarios will help verify whether or not growth is occurring comparable to the demand scenarios.

Passenger terminal indicators are considered secondary and relate to demand on terminal facilities. The primary indicators measure gate usage by aircraft and passengers and terminal utilization by passengers. By assessing these indicators, the DOA can develop an understanding of what constitutes typical (i.e., Balancing processing capabilities with an acceptable level of service) utilization for PBIA. Planning factors used by the Strategic Plan are listed for comparison. Sustained increases in utilization may indicate an upcoming need for facility expansion. Since airline schedules and passenger traffic fluctuate, assessments should be based on long-term trends, not monthly or seasonal variations.

Terminal area parking should also be tracked. The primary trigger for development of new parking is occupancy. Planning for new facilities should be initiated when 85 percent to 88 percent occupancy in the peak month is reached and facilities should be in place by the time that 90 percent

Table VII-12

Development Triggers and Indicators

Metric					Action Required
Primary Indicator	Secondary Indicator	Indicates	Benchmark		
AIRFIELD					
1	Average annual delay	Overall performance of the airfield, planning trigger	4 minutes of average annual delay	Initiate planning to improve airfield capacity	
2	Aircraft operations by category (commercial service, cargo, air taxi, based and itinerant GA, etc)	Segments of traffic in which growth is occurring	6 to 10 minutes of average annual delay	Implement capacity improvements	
3			Master Plan Demand Scenarios (see summary table)	Monitor for long-term trends and compare with projected operations of the Demand Scenarios.	
4		Peaking factor, impacts annual service volume (ASV)	Master Plan Demand Scenarios (see summary table)	Monitor for long-term trends. Assess changes in seasonal distribution of activity	
5		Peaking factor, impacts annual service volume (ASV)	Master Plan Demand Profiles (Design Day Schedule)	Monitor for long-term trends. Increase in peak hour traffic may indicate a decrease in ASV. Assess options to mitigate peak hour operational impacts.	
6	Average annual growth in operations, past year, 5 years and 10 years	Identifies long-term trends rather than short term blips	Master Plan Demand Scenarios (see summary table and profile characteristics)	Project growth to determine time remaining to operations benchmark of 4 minutes of delay. Under the alternative service pattern Demand Scenario, this is approx. 280,000 annual operations.	
6	Fleet mix changes	Trends in the aviation industry on operational changes by specific carriers	Master Plan Fleet Mix Projections	Significant changes may require airfield and/or terminal facility upgrades or enhancements	
TERMINAL FACILITIES					
1	Square foot of terminal/ annual enplaned passenger	General terminal utilization	0.08 - 0.12 sf/annual enplaned passenger is typical planning range	Initiate planning for expansion of terminal facilities when utilization ratio reaches 0.12. Expanded facilities should be in place by the time the utilization ratio reaches 0.08.	
2	Enplaned passengers/gate: overall, by terminal, and by carrier	Passenger demand at terminal gates	180,000 - 220,000 passengers per gate	Monitor for indication of overall demand at gates. Figures in the higher range may indicate need for additional capacity or more balanced gate utilization.	
3	Connecting passengers as a percent of total passengers	Connecting vs. Origin/ Destination passengers	Recent 5-year historical range: approximately 4.4% of total	Monitor for long term trends. Increase in connections may reflect more hubbing activity by carrier(s) and more demand on concourses rather than rest of terminal area.	
4	International passengers as a percent of total passengers	International vs. Domestic passengers	Recent 5-year historical range: 2% of total	Monitor for long term and year round trends. Significant changes to peak hour international passenger volumes may require FIS expansion beyond the current processing capacity of 200 passengers per hour.	
5	Daily aircraft departures/gate: overall, by terminal, and by carrier	Efficiency of gate utilization	>7 daily departures/ gate indicates heavy utilization overall. Quick turn-around carriers such as Southwest may reach 15 daily departures/gates	Planning for gate expansion should commence when the average gate utilization for all existing gates reaches 7 departures per day.	
6	Scheduled daily seat departures per gate: overall, by terminal, and by carrier	Intensity of gate utilization	Average number will vary from carrier to carrier	Monitor for long term trends by terminal and carrier to develop understanding of typical utilization, assess changes in number of scheduled seats.	
7	Average annual growth in passengers, past year, 5 years and 10 years	How fast is occurring	Master Plan Demand Scenarios	Use to track growth with respect to the Demand Scenarios.	
GENERAL AVIATION/FIXED BASE OPERATOR					
1	Number of based aircraft, in total and by type of aircraft	Possible demand for GA facilities	Recent 5-year historical: Agressive growth (>10%) in the capacity/demand ratio for all FBO's at PBIA	Monitor to determine continued growth in demand. Significant changes may require airfield and facility upgrades or enhancements.	
2	Based and itinerant general aviation operations	General aviation activity levels	Master Plan Demand Scenarios	No action. Monitor to determine whether fleet is increasing and nature of increase	
3	Corporate traffic vs. private/GA traffic	Change in GA profiles demand for conventional hangar	Recent 5-year historical GA fleet shows growth in corporate share mix	Monitor to determine continued growth in demand. Significant changes may require airfield and facility upgrades or enhancements.	
4	Number of aircraft waiting for tie-down space per FBO reports	Demand for tie-down space/additional GA apron	-Characterized primarily by itinerant traffic -Limited capacity at NCO and LAN	Monitor to determine if growth trends by the individual FBO's significant needs for additional apron and/or facilities may trigger the development initiated by tenants	
CARGO FACILITIES					
1	Cargo building area vs. enplaned and deplaned tonnage of freight and mail	Building utilization	Currently averaging apperently 1 sq.ft. per enplaned ton. Current Building 1475 is approximately 50% vacant	Monitor for growth. Expect overall utilization ratio to be higher if belly cargo activity increases. Initiation of GA/FBO relocation to Golfview on 8th street arena	
2	Cargo ramp area vs. enplaned and deplaned tonnage of freight only	Ramp utilization	Averaging 3 SY per ton	New entrant cargo operator or increased activity by UPS may require the need for addition aircraft ramp space for cargo activities.	

Source: Ricondo & Associates, Inc.

Source: Ricondo & Associates, Inc.

Table VII-13
Public Parking Demand Indicators

	Metric	Indicates	Benchmark	Action Required
PRIMARY INDICATOR	Parking Lot occupancy, Peak Month, all facilities	Adequacy of Parking Capacity	85% to 88% Occupancy 90% to 95% Occupancy	Initiate planning for new facility Implement new facility development
SECONDARY INDICATORS	Total parkers/originating enplanements	Annually: Establish average annual utilization factor ^{1,2}	2.3 to 2.5 parkers per 1,000 annual O&D enplanements	Project the parking demand based on projected annual enplanements to estimate when occupancy factors may be reached.
		Monthly: Variations in annual average, peaks	Compare annual factor and peak month factor of parkers per 1,000 O&D enplanements	Assess variation in planning factor to determine peak month usage and adjust planning utilization factor
	Total parkers, by month and by type of lot: short-term, long term, and overflow	Utilization of parking lots	Compare to 2.3 to 2.5 parkers per 1,000 annual O&D enplanements in peak month. Develop peak and average utilization factors for each lot.	Monitor demand for each facility to determine averages and track shifts in demand for various lots. May be used to assess effectiveness of rate changes on lot utilization.

Notes:

¹ An average annual utilization factor 2.5 parkers per 1,000 annual originating enplanements is representative of comparable size airports having O&D passenger activity representing between 90% and 95% of total passenger activity that include operations by Southwest Airlines.

² The 1995 Parking Demand and Capacity Analysis Study completed for PBIA by RS&H utilized a ratio of 2.3 parkers per 1,000 annual originating enplanements in its demand projections.

Sources: 1995 Parking Demand and Capacity Analysis Study, Ricondo & Associates, Inc.
Prepared by: Ricondo & Associates, Inc., September 2000

to 95 percent peak month occupancy is reached. The Strategic Plan used the parking demand figure of 2.3 to 2.5 parkers (parking spaces) per 1,000 annual originating enplaned passengers to determine requirements. This figure is consistent with the demand thresholds identified in the 1995 Parking Demand and Capacity Analysis Study. The DOA should monitor parking demand to verify or adjust this planning metric. Secondary indicators are also listed in Table VII-13 and provide the basis for tracking and assessing the planning factor. Actual utilization may suggest that adjustments should be made to the peak planning factor. If so, projections of parking demand (based on enplaned passengers) should be revised to reassess the timing for development. The DOA should also develop peak factors for the various types of parking facilities and average utilization figures for each type of lot and all facilities. By tracking seasonal demand by facility, the DOA can adjust parking supply to accommodate peak usage periods.

Demand indicators are listed in Table VII-12 for both general aviation and cargo facilities. General aviation activity for both based and itinerant aircraft may be tracked easily along with annual demand for hangar and tie down space. Due to the large variation in the general aviation fleet and facilities, these metrics should not be the only indicators for the need to expand these facilities. However, they will show growth patterns in this activity component and the characteristics of general aviation at the Airport. By monitoring utilization of hangars and ramp, the DOA can determine typical utilization rates by facility and be ready for the need to expand these facilities.

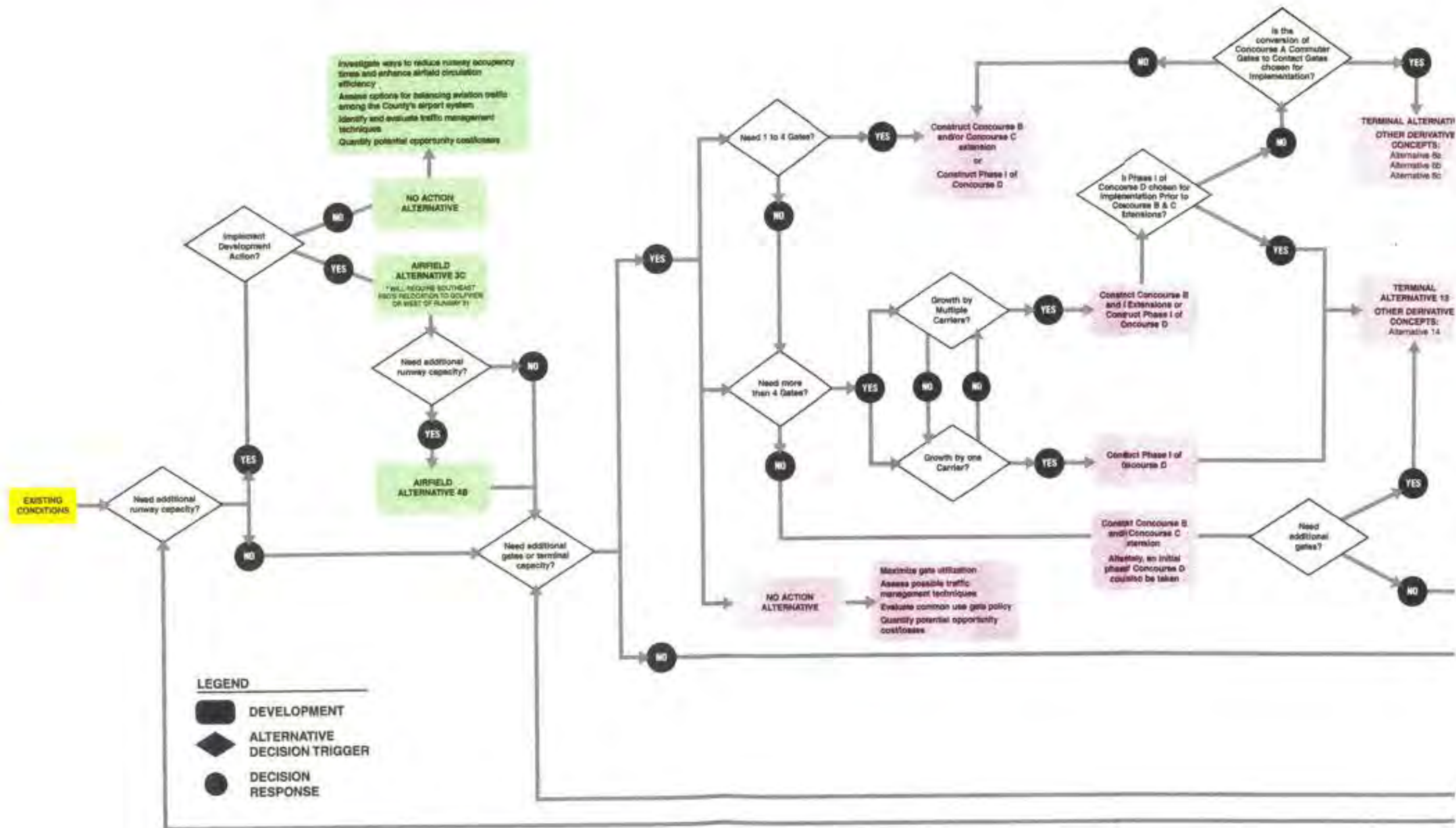
In summary, the primary and secondary indicators presented in Tables VII-12 and VII-13 help ensure that demand-driven facility development characterizes future development actions by the DOA. The following sub-section further discusses these development triggers within the context of a decision tree matrix derived to assist the DOA in responding to changing demand profiles and operating conditions.

7.4 Adjusting Development Patterns

A key component of PBIA's Strategic Plan was the development of a decision tree matrix ("decision tree"). The decision tree will assist the DOA with the implementation of its Composite Development Plan while providing the flexibility to adjust to changing conditions in the aviation industry, the needs of the community, and/or the operating characteristics of the Airport. The decision tree serves to illustrate the implementation characteristics of the proposed strategy and establish decision points as well as possible alternatives to the development actions to be taken.

The decision tree for PBIA represents an integration of the short-listed alternatives and the preferred alternatives for each of the various airport components and summarizes the conditions under which each alternative offers the most appropriate development action. In addition, the decision tree helps to illustrate those development decisions that may compromise the flexibility to adjust the course of development in order to serve changing demand sources or unique needs. The primary purpose of the decision tree is to identify patterns of development as conditions may change over time. In the context of strategic planning, these patterns of development and decision milestones are more significant than the specific development concepts (i.e., facility layouts) involved. Since it is the patterns of development that will determine future development flexibility.

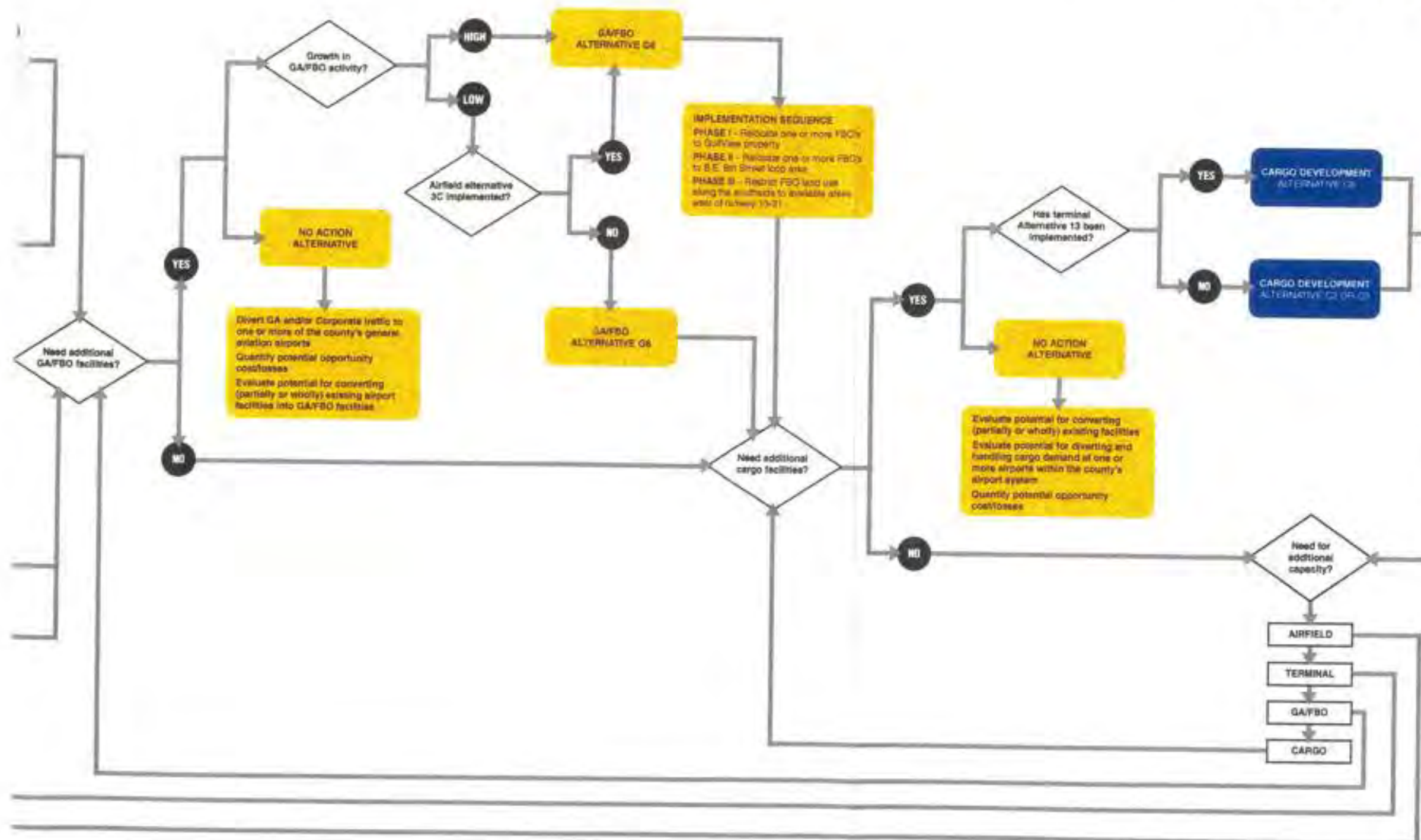
Exhibit VII-16 illustrates the decision tree matrix containing the strategic options derived for PBIA. The following sub-sections summarize the decision tree framework and the associated demand triggers previously presented. This discussion is provided for each airport component at PBIA.



Note: Refer to implementation plan phasing sequence for development impacts, parking requirements/facilities, and ancillary/support facility development.

Source: Ricondo & Associates, Inc.

DECISION TREE MATRIX
Exhibit VII-16



7.4.1 Airfield Development Actions

The need for additional runway development will be triggered by the necessity for additional runway capacity. As previously described, the implementation of a runway development action should occur when aircraft begin to experience an average delay of four minutes per operation. However, prior to reaching this delay threshold, the DOA should monitor growth patterns and operating characteristics in annual aircraft operations, peak month average day operations, peak hour operations, and fleet mix. This will help the DOA identify short-term anomalies and long-term trends. Moreover, by monitoring these operating characteristics, the DOA will be in a better position to gage the appropriate implementation timeline for a development action.

Three airfield development actions have been included within PBIA's decision tree. As the need for additional runway capacity becomes evident, the DOA may choose to either take no action or implement Alternatives A3C or A4B. The no action alternative may be the only option for the DOA due to either community sensitivity or opposition to additional airfield development, environmental conditions, and/or public policy limiting airfield development beyond its current conditions. As such, the DOA must still be able to enhance the operating characteristics of the airfield to the maximum extent possible in an effort to reduce aircraft operating delays. The no action alternative would result in the following subsequent actions by the DOA:

- Investigation of opportunities to reduce runway occupancy times and enhance airfield circulation efficiency
- Assessment of options for balancing aviation traffic among the County's airport system
- Identification and evaluation of traffic management techniques
- Quantification of potential opportunity costs/losses

A second course of action that the DOA may take is the implementation of the preferred airfield development alternative, Alternative A3C. Alternative A3C represents the construction of a new air carrier runway 800 feet south of Runway 9L-27R (centerline to centerline distance). The continued desirability of this runway separations should be re-examined at the time of implementation. The construction of a parallel taxiway, centered between Runway 9L-27R and the new air carrier runway, would also be provided. The implementation of this airfield alternative would require the closure of the existing general aviation runway, Runway 9R-27L. In addition, the general aviation/FBO facilities located east of Runway 13-31 would have to be relocated to either the Town of Golfview property or the sites proposed within the 8th Street loop. The general aviation/FBO leaseholds located west of Runway 13-31 would have to be reconfigured to preserve the recommended clearances associated with the new runway.

The third development alternative that the DOA may implement is Airfield Alternative A4B. Although this alternative was not one of the short-listed airfield alternatives, it has been included within the portfolio of possible airfield alternatives to implement in response to the request by the Master Plan Committee. Airfield Alternative A4B represents the extension of Runway 13-31 to the northwest, across Belvedere Road, to provide an operating length of 8,000 feet between the end of Runway 13 and the hold bar for the intersection with Runway 9L-27R. This length would enhance the air carrier processing capability of this crosswind runway, which also represents the Airport's noise abatement runway.

It is important to recognize that Alternatives A3C and A4B are not mutually exclusive development actions. The decision to implement one of these airfield development alternatives does not preclude the ability to implement the other alternative at a later date.

7.4.2 Terminal Development Actions

The timing for expansion of the terminal facilities will be guided by either the level of annual passengers utilizing PBI's terminal facilities or the average number of daily departures by the Airport's signatory airlines and their sub-tenants. In general, the planning of additional terminal capacity should be initiated when the average terminal utilization factor reaches between 0.08 square feet and 0.12 square feet per enplaned passenger. Similarly, heavy gate utilization is generally characterized by seven or more departures per gate. Quick gate-turn carriers like Southwest Airlines may reach up to 15 daily departures per gate or more.

In addition to the primary indicators described above relative to terminal and gate utilization, the DOA should also monitor the level of connecting and international passengers as a percentage of total passengers. This will help assess any changes in the Airport's role as a predominantly O&D airport and will identify any required facility enhancements to the terminal facilities (e.g., FIS expansion, interline bag transfers) that are necessary for processing these types of activities.

A no action alternative has also been identified for the terminal facilities. The no action alternative requires the DOA to find ways to maximize the Airport's gate utilization, assess possible traffic management techniques, and evaluate common use gate policies. The DOA should also quantify the opportunity costs/losses associated with not developing the necessary terminal facilities.

In addition, the fact that PBI does not serve as a hub to any of its signatory airlines is indicative of the likelihood for the demand for additional gates in small increments. As such, the decision tree recognizes that the demand for additional gates may emerge in either a small increment (i.e., one to four gates) or a large increment (i.e., more than four gates). If the need for a small increment of additional gates materializes, the DOA should explore the opportunities for expanding Concourse B and/or Concourse C.

If the need for a large increment of gates materializes and/or the demand for these gates is by one carrier, then an initial phase of Concourse D, as shown under Terminal Development Alternative T13, should be developed. However, if the need for a large increment of gates by multiple carriers materializes, then the DOA may choose to either construct the expansions for Concourses B and C or an initial phase of Concourse D. In this case, the DOA may also choose to convert the commuter gates in Concourse A into air carrier (loading-bridge equipped) contact gates.

If the DOA selects to expand Concourses B and C or construct an initial phase of Concourse D, any subsequent gate development should occur on Concourse D as depicted under Terminal Alternatives T13 or T14. However, if the DOA selects the initial increment of gates to be provided by converting Concourse A into a dual-level, air carrier concourse, then several opportunities exist for subsequent gate development. The DOA may choose to continue developing gate and terminal facilities to the west, as shown under Alternatives T1, T6A, T6B, or T6C. These four alternatives provide varying concourse configurations for the linear expansion of Concourse A towards the 8th Street loop area. Alternately, the DOA may choose to limit development to the west to that associated with the initial incremental gate expansion (i.e., the conversion of Concourse A as described above). In this case,

the DOA would provide subsequent gate capacity by either expanding Concourses B and/or C or implementing a Concourse D as shown under Terminal Alternatives T13 and T14.

7.4.3 General Aviation/FBO Development Actions

Additional general aviation facilities will be needed if growth in the number of based aircraft at PBIA continues. In order to understand these demand characteristics, the DOA should monitor growth in based and itinerant general aviation operations at the Airport. Growth in based aircraft activity will often influence the demand for covered storage facilities (i.e., hangars) whereas growth in itinerant operations will have a greater effect on the demand for apron and tie-down space.

In addition, the DOA should monitor the sources of demand. The demand for additional hangar and tie-down parking positions by either corporate aircraft or private (i.e., single-engine or twin-engine) aircraft will govern the size of the new facilities.

The group of general aviation/FBO development actions also includes a no action alternative. Under the no action alternative, the DOA should undertake the following actions:

- Divert general aviation and/or corporate to one or more of the County's general aviation airports
- Evaluate the potential for converting (partially or wholly) some existing airport facilities into general aviation facilities
- Quantify the potential opportunity costs/losses resulting from not developing additional general aviation facilities at PBIA

Besides the no action alternative, General Aviation/FBO Development Alternatives G2 and G6 provide development opportunities for the DOA to implement. Alternative G2 provides the best development action if the demand for additional facilities is small (i.e., limited to the development envelopes provided by Alternative G2). However, this alternative is not feasible if the new air carrier runway, as shown under Airfield Alternative A3, is constructed.

Alternative G6 provides the best course of action if general aviation growth is aggressive, resulting in the demand for extensive general aviation facility development. Alternative G6 is also the preferred development action if the new air carrier runway has been constructed or will be implemented within the foreseeable future (i.e., five to 10 years). This alternative recommends a three-phase implementation sequence. Phase I includes the relocation of one or more of the FBO tenants to the Town of Golfview property. The second phase proposes the continued relocation of the south side FBO's to the 8th Street loop site. The reconfiguration of the general aviation/FBO leaseholds west of Runway 13-31 would occur during Phase III.

Alternative G6 can be implemented subsequent to Alternative G2. However, the opposite is not true.

7.4.4 Cargo Development Actions

The levels of building utilization and/or aircraft ramp utilization and the demand for such facilities will influence the timing for additional cargo development. To help assess the timing for additional cargo facilities, the DOA should monitor the levels of enplaned and deplaned cargo tonnage relative to the available building and apron area.

Presently, PBIA averages one square foot per enplaned cargo ton. This ratio includes the 14,000 square feet of vacant space that is available within Building 1475. Similarly, the Airport averages approximately three square yards of aircraft apron area per enplaned cargo ton. Although Building 1475 is nearly 50 percent vacant, the aircraft apron area is fully utilized by UPS. General ratios for cargo development indicators are not available due to the fact that most on-airport cargo facilities are tailored to the unique needs and demand of the local users and cargo operators. In fact, Building 1475 at PBIA was designed and constructed with input from most of the tenants currently leasing space within the building. As such, development triggers will materialize in the form of induced tenant demand or the need for additional facilities by the current cargo operators. The DOA should monitor cargo growth and consult with the local operators regarding the adequacy of the existing facilities to handle and process the ongoing activity in order to identify development indicators that are unique for PBIA and better identify the timing for additional cargo development at the Airport.

Like the general aviation/FBO development actions presented above, four development actions for cargo facilities at PBIA have been identified for the DOA's consideration. The first of these, the no action alternative, recognizes that additional cargo development at PBIA may not be feasible or desirable. As such, the DOA should undertake the following actions in response to the demand for additional cargo facilities:

- Assess the potential for diverting cargo traffic/activity to one or more of the County's airports
- Evaluate the potential for converting (partially or wholly) some existing airport facilities into cargo facilities
- Quantify the potential opportunity costs/losses resulting from not developing additional cargo facilities at PBIA

The other three development actions include Alternatives C2, C3, and C6. Alternatives C2 and C3 represent cargo development west of Building 1475. However, if passenger activity grows at more aggressive levels than cargo traffic and cargo tonnage, thus resulting in the construction of Concourse D prior to the development of additional cargo facilities, then neither of these alternatives may be desirable. The DOA may choose to preserve the properties east of the future Concourse D for subsequent terminal and concourse development and, thereby, elect Alternative C6, which proposes cargo development within the Town of Golfview property as the preferred course of action for cargo facility development.

In summary, this section provides a phasing sequence and management tools to assist the DOA in the implementation of the Composite Development Plan derived for PBIA to respond to the projected demand scenarios developed for the 20-year planning horizon. The fact that the DOA has emphasized, as part of the Strategic Plan's goals and objectives, that future development will be dictated by demand-driven needs, the identification of demand triggers and recognition of the primary and secondary demand indicators is fundamental for an effective implementation plan for PBIA. As such, monitoring the factors that comprise these demand indicators is the first step, in an ongoing process that should be adopted by the DOA in the implementation of this Strategic Plan.



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