

Table of Contents

	Page
Chapter 1 Inventory	
1. Introduction	1-1
1.1 Community Profile.....	1-2
1.1.1 Location and Setting	1-1
1.1.2 Climate	1-2
1.1.3 Socioeconomic Conditions.....	1-5
1.1.4 Area Land Use	1-5
1.2 The Airport’s Control.....	1-7
1.2.1 Airport Ownership and Management.....	1-8
1.2.2 Spokane’s Aviation History.....	1-8
1.2.3 Airport Activities.....	1-10
1.2.4 The Airport’s Service Area.....	1-10
1.3 Airfield Facilities	1-10
1.3.1 Airport Layout.....	1-13
1.3.2 Runway 3/21.....	1-13
1.3.3 Runway 7/25.....	1-14
1.3.4 Taxiways.....	1-14
1.3.5 Runway Setbacks and Protections.....	1-14
1.3.6 Navigational and Weather Aids.....	1-15
1.3.7 Airfield Lighting.....	1-16
1.3.8 Signage and Markings.....	1-16
1.4 Airline Passenger Terminal Facilities.....	1-17
1.5 Ancillary Facilities.....	1-19
1.5.1 Support Facilities.....	1-19
1.5.2 North Building Area.....	1-21
1.5.3 East Ramp.....	1-23
1.5.4 South Ramp.....	1-25
1.5.5 Airport Security Inventory.....	1-27
1.6 Business Park.....	1-27
1.7 Regional Circulation and Access.....	1-29
1.7.1 Airport Ground Access.....	1-29
1.7.2 Airport Roadway and Curbside Facilities.....	1-30

1.7.3 Parking Facilities.....1-30

1.7.4 Public Transportation.....1-30

1.7.5 Rental Car Facilities.....1-30

1.7.6 Existing Traffic Conditions and Planned Roadway Improvements.....1-30

1.8 Environmental Inventory Overview.....1-33

1.8.1 Floodplains, Surface Water and Wetlands.....1-33

1.8.2 Aquifer Recharge Areas.....1-33

1.8.3 Critical Farmland.....1-35

1.8.4 Hazardous Material Sites.....1-37

1.8.5 Threatened and Endangered Species Habitat.....1-37

1.8.6 Air Quality Maintenance Areas.....1-37

1.8.7 Cultural and Historic Sites.....1-42

1.9 Utility Overview.....1-42

1.9.1 Water Service.....1-42

1.9.2 Sanitary Sewer Service.....1-44

1.9.3 Storm Drainage.....1-44

1.9.4 Solid Waste Disposal.....1-44

1.9.5 Telephone and Fiber Optic Lines.....1-44

1.9.6 Electrical Power.....1-44

1.9.7 Natural Gas Supply.....1-44

1.9.8 Fuel Storage and Distribution.....1-45

1.10 Aeronautical Setting.....1-45

1.10.1 Nearby Airports.....1-45

1.10.2 Regional Airspace and Air Traffic Control.....1-45

1.10.3 Terminal Instrument Procedures.....1-49

1.11 Conclusion.....1-51

Chapter 2 Airport Forecast

2. Overview 2-1

 2.1 Forecasting Approach..... 2-2

 2.1.1 Time Series Methodologies 2-2

 2.1.2 Market Share Methodology 2-3

 2.1.3 Socioeconomic Methodology 2-3

 2.2 Airline Passenger Forecasts 2-3

 2.2.1 Enplanement History 2-4

 2.2.2 Federal Aviation Administration Forecast 2-4

 2.2.3 Method Comparison and Preferred Projection Methodology 2-5

 2.3 Aircraft Operations Forecasts..... 2-13

 2.3.1 Air Carrier Fleet Mix..... 2-13

 2.3.2. Commercial Operations Projections..... 2-14

 2.4. Enplaned/Deplaned Cargo 2-16

 2.5 Cargo Aircraft Fleet Mix Projections..... 2-17

 2.6 Based Aircraft Forecasts 2-18

 2.7 Based Aircraft Fleet Mix 2-24

 2.8 General Aviation Operations Forecasts..... 2-25

 2.9 Instrument Operations Forecasts..... 2-28

 2.10 Local/Itinerant Operations Forecasts..... 2-29

 2.11 Military Operations Forecasts 2-30

 2.12 Peak Passenger Activity and Operations Forecasts..... 2-31

 2.12.1 Peak Enplanements and Passenger Activity Forecasts..... 2-31

 2.12.2 Peak Daily Passenger Activity Forecasts..... 2-32

 2.12.3 Peak Hourly Passenger Activity Forecasts 2-33

 2.12.4 Passenger Activity Peaking Characteristics Summary 2-34

 2.12.5 Peak Operations Forecasts 2-35

 2.13 Forecast Summary and FAA TAF Comparison 2-36

 2.14 50-Year Forecast..... 2-39

Chapter 3 Airport Facilities

3. Airside Overview 3-1

 3.1 Airfield Capacity..... 3-2

 3.1.1 Factors that Influence Capacity 3-2

 3.1.2 Capacity/Delay Measures 3-4

 3.1.3 Third Runway Trigger Points..... 3-4

 3.1.4 Capacity Recommendations 3-6

 3.1.5 Airspace Compatibility..... 3-6

 3.2 Fundamental of Airport Design 3-6

 3.2.1 Design Standards Concept and Terminology..... 3-6

 3.3 Design Aircraft Selection 3-9

 3.3.1 Runway 3/21 and Runway 7/25 Operational Analysis 3-10

 3.3.2 Forecast Trends 3-12

 3.3.3 Extended Outlook..... 3-12

 3.3.4 Design Aircraft Selections and Recommendations..... 3-13

 3.4 Wind Coverage and Weather Considerations 3-14

 3.5 Runway 3/21 Facilities..... 3-16

 3.5.1 Runway 3/21 and Runway Design Code (RDC)..... 3-16

 3.5.2 Runway 3/21 Design Standards..... 3-16

 3.5.3 Runway 3/21 Length..... 3-18

 3.5.4 Runway 3/21 Pavement Strength..... 3-19

 3.5.5 Runway 3/21 Lighting, Marking, Signage, and Instrumentation 3-20

 3.5.6 Runway 3/21 End Protections 3-22

 3.6 Runway 7/25 Facilities..... 3-25

 3.6.1 Runway 7/25 Runway Design Code (RDC)..... 3-25

 3.6.2 Runway 7/25 Design Standards..... 3-26

 3.6.3 Runway 7/25 Length and Width..... 3-28

 3.6.4 Runway 7/25 Pavement Strength..... 3-28

 3.6.5 Runway 7/25 Lighting, Marking, Signage, and Instrumentation 3-29

 3.6.6 Runway Ends 7 and 25 Protection..... 3-29

 3.7 Taxiway System 3-29

 3.7.1 Taxiway Design Standards 3-29

 3.7.2 System Design Principals 3-31

 3.7.3 Exit Taxiway Analysis 3-32

 3.7.4 Taxiway Recommendations..... 3-34

3.8 Future Runway Alternatives 3-36

 3.8.1 Future Runway Alignment Alternatives 3-36

 3.8.2 Disposition of Runway 7/25 3-41

3.9 Airport Support Facilities..... 3-43

 3.9.1 Airport Rescue and Fire Fighting (ARFF) Station 3-43

 3.9.2 Fuel Facilities 3-45

 3.9.3 Airfield Maintenance Center 3-46

 3.9.4 Snow Removal and Aircraft Deicing 3-46

 3.9.5 Custom Facilities..... 3-48

 3.9.6 Air Traffic Control Tower (ATCT) 3-48

3.10 Building Areas..... 3-49

 3.10.1 North Cargo Area..... 3-49

 3.10.2 South Area 3-52

 3.10.3 West Area 3-57

 3.10.4 East 3-57

3.11 Ultimate Airfield Vision 3-61

Chapter 4 Terminal Facilities

4. Introduction 4-1

 4.1 Fundamentals of Terminal Design..... 4-2

 4.1.1 GEG-Specific Considerations 4-3

 4.2 Improve Functional Efficiency 4-4

 4.3 Configuration Location 4-5

 4.4 Terminal Building Capacity 4-6

 4.4.1 Terminal A/B Capacity Planning 4-7

 4.4.2 Terminal C Capacity Planning 4-7

 4.5 Gate Capacity..... 4-8

 4.6 Building Systems..... 4-9

 4.6.1 Mechanical/Electrical Systems and Utilities..... 4-9

 4.6.2 Terminal Wayfinding 4-10

 4.6.3 Technology 4-10

 4.6.4 Sustainability 4-12

 4.6.5 Level of Service (LOS) Expectations 4-13

 4.6.6 Other Improvements 4-14

 4.7 Terminal Alternatives 4-18

 4.7.1 Terminal Area Development Considerations 4-20

 4.7.2 Typical Terminal Configurations..... 4-21

 4.7.3 Projected Gate Requirements 4-22

 4.7.4 Terminal Options 4-23

 4.8 Summary of Terminal Facility Requirements and Recommendations 4-43

Chapter 5 Landside Facilities

5. Introduction 5-1

 5.1 Terminal Access and Curbside Facilities 5-2

 5.2 Parking Facilities 5-4

 5.3 Ultimate Terminal Access and Parking Concepts 5-5

 5.4 Other Roadway Access Considerations 5-6

 5.5 Public Transportation Access 5-8

 5.6 Summary..... 5-8

Chapter 6 Aircraft Noise Analysis

6. Introduction 6-1

 6.1 Aircraft Noise..... 6-1

 6.1.1 Day-Night Noise Level (DNL)..... 6-2

 6.2 Contours 6-5

 6.2.1 Noise Model Inputs 6-5

 6.2.2 Aircraft Operations and Fleet Mix 6-9

 6.2.3 Aircraft Substitutions..... 6-9

 6.2.4 Aircraft Groups 6-14

 6.2.5 Day/Night Split..... 6-14

 6.2.6 Flight Tracks..... 6-14

Chapter 7 Airport Land Use Compatibility

7. Introduction 7-1

 7.1 Understanding the Significance..... 7-1

 7.1.1 Safety..... 7-2

 7.1.2 Human Environment 7-2

 7.1.3 Airport Utility..... 7-2

 7.1.4 Sustaining Economic Vitality 7-2

 7.2 Roles and Responsibility 7-3

 7.2.1 Federal Aviation Administration (FAA)..... 7-3

 7.2.2 Local Land Use Controls..... 7-3

 7.3 Airport Land Use Policy Recommendations 7-6

 7.4 Conclusions..... 7-6

Chapter 8 Financial Implementation Analysis

8. Financial Analysis Objective 8-1

 8.1 Overall Approach 8-1

 8.2 Capital Funding Sources 8-2

 8.2.1 Airport Improvement Program Grants 8-2

 8.2.2 Transportation Security Administration Funding 8-3

 8.2.3 Washington State Grants 8-3

 8.2.4 Voluntary Airport Emission Program (VALE) Grants 8-3

 8.2.5 Passenger Facility Charges 8-4

 8.2.6 Debt Financing 8-5

 8.2.7 Rental Car Customer Facility Charges 8-5

 8.2.8 Private 3rd Party Funding 8-5

 8.2.9 Cash Reserves/Airport Net Operating Revenues 8-5

 8.2.10 Other Unidentified Funding 8-6

 8.3 Financial Analysis and Implementation for the Master Plan Capital Improvement Program 8-6

 8.3.1 Estimated Project Costs and Development Schedule 8-6

 8.3.2 Sources and Uses of Capital Funding 8-7

 8.3.3 Debt Capacity and Debt Funding Requirements 8-10

 8.3.4 Projected Operations and Maintenance Expenses 8-11

 8.3.5 Projected Operating Revenues 8-12

 8.3.6 Financial Analysis Summary for the Master Plan Capital Improvement Program 8-17

 8.4 Financial Analysis Tables 8-18

 8-1 Estimated Project Costs and Development Schedule

 8-2 Projected Capital Funding Sources

 8-3a Debt Issue Serviced with PFCs

 8-3b Hangar Development Debt Issue Serviced with Airport Cash

 8-4 Actual, Estimated and Projected Operations & Maintenance Expenses

 8-5 Actual, Estimated and Projected Operating Revenues

 8-6 Financial Plan Summary - Projected Net Revenues,
 Capital Funding and Capital Expenditures

Appendix A Real Estate Revenue Enhancement

- Exhibit 1 – Aeronautical/Non Aeronautical Property
- Exhibit 2 – Selected Reference Documents

Appendix B Copy of Approved Airport Layout Plan (ALP) Set