

TABLE OF CONTENTS

1. Introduction	1-1
1.1 Methodology.....	1-2
1.2 Master Plan Vision and Goals	1-3
2. Inventory of Existing Conditions	2-1
2.1 Introduction	2-1
2.2 Airport Background and History.....	2-1
2.2.1 Historical Timeline	2-3
2.2.2 Regional Setting and Location.....	2-3
2.2.3 Airport Role and Classification.....	2-3
2.2.4 Airspace, Air Traffic Management	2-6
2.2.5 Meteorological Conditions.....	2-9
2.3 Airside Facilities	2-13
2.3.1 Runway System	2-13
2.3.2 Taxiway System	2-13
2.3.3 Airfield Geometry Hot Spots.....	2-23
2.3.4 Apron (Ramp) Facilities	2-23
2.3.5 Vehicle Service Roads and Access Points.....	2-25
2.3.6 Roadway Tunnel Structures.....	2-25
2.3.7 Airfield Pavement Conditions	2-25
2.4 Terminal and Concourse Facilities.....	2-26
2.4.1 Concourse Level.....	2-26
2.4.2 Ground Floor Level.....	2-44
2.4.3 Upper Levels and Mezzanines.....	2-44
2.4.4 Basement Level.....	2-44
2.4.5 International Arrivals Building and Concourse E Redevelopment.....	2-44
2.4.6 Air Carrier Aprons and Gate Positions.....	2-45
2.5 Landside Transportation Facilities	2-51
2.5.1 Regional Connectivity.....	2-51
2.5.2 Primary Airport Access Points.....	2-51

2.5.3	Secondary Airport Access Points.....	2-57
2.5.4	Terminal Circulation.....	2-58
2.5.5	Transit, Pedestrian, and Bicycle Facilities.....	2-58
2.5.6	Terminal Curbfront Operations Data Collection	2-64
2.5.7	Public and Employee Parking	2-65
2.5.8	Rental Car Facilities.....	2-84
2.6	Airport Tenant Facilities.....	2-86
2.6.1	Air Cargo.....	2-86
2.6.2	Airline Maintenance.....	2-95
2.6.3	General Aviation.....	2-96
2.7	Airport Maintenance and Support Facilities.....	2-98
2.7.1	Airport Maintenance	2-98
2.7.2	Aircraft Rescue and Fire Fighting Station.....	2-98
2.7.3	Ground Run-Up Enclosure.....	2-102
2.7.4	Electrical Vault.....	2-102
2.7.5	Fueling Systems.....	2-103
2.7.6	FAA Airport Traffic Control Tower.....	2-103
2.7.7	Amtrak Station	2-105
2.7.8	Deicing Operations.....	2-106
2.7.9	Connected Support Facilities.....	2-108
2.7.10	Other Non-Aeronautical Land Uses and Facilities	2-111
2.8	Utilities.....	2-114
2.8.1	Electric	2-114
2.8.2	Water	2-114
2.8.3	Sanitary	2-117
2.8.4	Natural Gas.....	2-119
2.8.5	Communications	2-119
2.8.6	Storm Sewer Utilities and Airport Drainage	2-119
2.9	Environmental Baseline	2-123
2.9.1	Air Quality	2-127
2.9.2	Historical, Architectural, Archaeological and Cultural Resources.....	2-127
2.9.3	Biotic Resources.....	2-128

2.9.4	Department of Transportation Act of 1966, Section 4(f) Lands.....	2-131
2.9.5	Hazardous Materials and Solid Waste.....	2-131
2.9.6	Natural Resources and Energy Supply.....	2-132
2.9.7	Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks.....	2-132
2.9.8	Water Resources.....	2-133
2.9.9	Airport Land Use.....	2-133
2.10	Sustainability Considerations.....	2-139
2.10.1	MKE Sustainability Vision.....	2-139
2.10.2	Sustainability Focus Areas.....	2-140
2.10.3	Sustainability Opportunities for the Master Plan Update.....	2-140
2.11	Facility Index.....	2-140
2.12	Issues Identification Summary.....	2-145
3.	Aviation Activity Forecasts.....	3-1
3.1	Historical Aviation Activity.....	3-1
3.1.1	Current Air Service.....	3-1
3.1.2	Passenger Activity.....	3-3
3.1.3	Aircraft Operations.....	3-9
3.2	Factors Affecting Aviation Demand.....	3-10
3.2.1	National Economy.....	3-10
3.2.2	State of the Airline Industry.....	3-11
3.2.3	Competing Airports.....	3-11
3.2.4	Cost of Aviation Fuel.....	3-13
3.2.5	Regional Economic Development.....	3-14
3.2.6	Threat of Terrorism and Geopolitical Issues.....	3-16
3.2.7	Airport Service Area.....	3-16
3.3	Forecasts of Passenger Airline Activity.....	3-17
3.3.1	Forecast Methodology.....	3-17
3.3.2	Key Assumptions.....	3-18
3.3.3	Near-Term (2019) Passenger Forecast Methodology.....	3-18
3.3.4	Long-Term (2020-2040) Passenger Forecast Methodology.....	3-18
3.3.5	Passenger Airline Operations and Fleet Mix Methodology and Results.....	3-29

3.3.6	Passenger Airline Fleet Mix Impact on Enplaned Passenger Forecast.....	3-31
3.4	Forecasts of Cargo Activity.....	3-33
3.4.1	Cargo Industry Trends.....	3-33
3.4.2	Milwaukee Cargo Market Overview.....	3-34
3.4.3	Milwaukee Cargo Activity Forecast.....	3-38
3.5	Forecasts of General Aviation and Other Air Taxi and Military Activity.....	3-41
3.5.1	General Aviation and Other Air Taxi Operations.....	3-41
3.5.2	General Aviation and Other Air Taxi Fleet Mix.....	3-42
3.5.3	General Aviation Based Aircraft.....	3-42
3.5.4	Military Aircraft Activity Forecast.....	3-45
3.6	Peak Hour Activity.....	3-48
3.7	Comparison to Other Forecasts.....	3-48
3.7.1	Enplaned Passenger Forecast Comparison.....	3-48
3.7.2	Aircraft Operations Forecast Comparison.....	3-50
3.7.3	Summary of Forecast – FAA Template.....	3-52
3.8	Alternative Demand Scenario.....	3-55
3.8.1	Passenger Airline Scenarios.....	3-55
3.8.2	Air Cargo Forecast Scenario.....	3-61
3.8.3	Compilation of All Scenario Element Results.....	3-66
3.9	Design Day Flight Schedules.....	3-72
3.9.1	Overview.....	3-72
3.9.2	Design Day Flight Schedule Development.....	3-72
3.9.3	Design Day Flight Schedule Summary.....	3-84
3.10	Critical Aircraft Determination.....	3-105
4.	Demand/Capacity Analysis and Facility Requirements.....	4-1
4.1	Overview.....	4-1
4.2	Airfield.....	4-4
4.2.1	Critical Aircraft.....	4-4
4.2.2	Airfield Geometry.....	4-6
4.2.3	Runway Length Analysis.....	4-14
4.3	Airfield Demand/Capacity Analysis.....	4-21
4.3.1	Factors Affecting Airfield Capacity.....	4-22

4.3.2	Airfield Demand/Capacity	4-25
4.3.3	Airspace Capacity	4-33
4.4	Aircraft Gate Requirements	4-33
4.4.1	Aircraft Gate Requirements	4-33
4.4.2	Gate Requirement Summary	4-47
4.4.3	Aircraft Remain Overnight Parking	4-48
4.4.4	Consolidated Deice Facilities	4-49
4.5	Terminal and Concourse Facilities	4-56
4.5.1	Planning Criteria	4-56
4.5.2	Operating Parameters	4-63
4.5.3	Terminal Program	4-79
4.5.4	Terminal Gap Analysis	4-86
4.6	Landside Access Roadway and Curbside Facilities	4-88
4.6.1	Existing Conditions and Determination of Peak Hours	4-89
4.6.2	Future Year Growth	4-92
4.6.3	Capacity Analysis and Requirement for on-Airport Roadways	4-94
4.7	Taxicab/Ground Transportation Staging Area	4-144
4.7.1	Taxicab Staging Area	4-144
4.7.2	Commercial Vehicle Staging Requirements	4-148
4.8	Public and Employee Parking Facilities	4-150
4.8.1	Public Parking Demand/Capacity and Requirements	4-150
4.8.2	Public Parking Revenue	4-157
4.8.3	Employee Parking Demand/Capacity and Requirements	4-160
4.9	Rental Car Facilities	4-162
4.9.1	Methodology	4-162
4.9.2	Customer Service Area	4-163
4.9.3	Ready and Return Vehicle Area	4-163
4.9.4	Quick Turnaround Area	4-166
4.9.5	Rental Car Facility Requirements Summary	4-175
4.10	Cargo Facilities	4-180
4.10.1	Air Cargo Standards For Facility Planning	4-180
4.10.2	Air Cargo Facility And Forecast Review	4-183

4.10.3	Cargo Facility Planning: Baseline Forecast.....	4-188
4.10.4	Ancillary Cargo Facility Requirements	4-192
4.10.5	Cargo Facility Recommendations: Baseline Forecast.....	4-195
4.10.6	Cargo Facility Planning: High Scenario.....	4-197
4.11	General Aviation Facilities	4-200
4.11.1	Forecast Review	4-201
4.11.2	Tenant Interviews.....	4-202
4.11.3	Facility Requirements	4-203
4.11.4	Conclusions and Recommendations	4-213
4.12	Maintenance/Ancillary/Support Facilities	4-213
4.12.1	Maintenance Facilities	4-214
4.12.2	Support Facilities.....	4-225
4.13	Utilities.....	4-236
4.13.1	Stormwater Drainage	4-236
4.13.2	Water	4-237
4.13.3	Wastewater.....	4-238
4.13.4	Electric and Gas.....	4-239
4.14	Landside Access Strategy	4-240
4.14.1	Analysis of Recent Ground Transportation Trends.....	4-240
4.14.2	Ground Transportation benchmarking and Fee Structure Analysis.....	4-252
4.14.3	Development of Future Ground Transportation Scenarios	4-255
4.14.4	Long Term Strategic Recommendations	4-261
4.14.5	Terminal Area Curbside Demand/Capacity Analysis.....	4-262
4.14.6	Taxicab and Commercial Vehicle Staging	4-262
4.14.7	Conclusions	4-265
5.	Alternatives Analysis.....	5-1
5.1	Goals.....	5-1
5.2	Alternatives Planning Process.....	5-2
5.3	Identification and Screening of Component Alternatives	5-3
5.3.1	Airfield Facilities Component Alternatives	5-4
5.3.2	Terminal Facilities Component Alternatives.....	5-13
5.3.3	Landside Facilities Component Alternatives	5-21

5.3.4	Support Facilities Component Alternatives.....	5-43
5.4	Integration and Initial Evaluation of Alternatives	5-72
5.4.1	Description of Integrated Alternatives.....	5-75
5.4.2	Evaluation of Initial Integrated Alternatives.....	5-75
5.4.3	Shortlisted Alternatives	5-91
5.5	Evaluation of Shortlisted Alternatives.....	5-105
5.6	Evaluation Criteria and Methodology.....	5-105
6.	Airport Development Plan	6-1
6.1	Refined Airfield Development	6-1
6.1.1	Airfield	6-1
6.1.2	Deice pads	6-5
6.1.3	Aircraft Remain Overnight / Hold Pads.....	6-5
6.2	Refined Terminal Development.....	6-12
6.3	Refined Landside Development	6-19
6.4	Refined Support Facilities Development.....	6-27
6.4.1	General Aviation Facilities	6-27
6.4.2	Cargo Facilities.....	6-29
6.4.3	Airline/aircraft Maintenance Facilities	6-33
6.4.4	Aircraft Rescue and Fire Fighting Facilities.....	6-33
6.4.5	Federal Aviation Administration Facilities.....	6-37
6.4.6	Other Airport Facilities.....	6-41
7.	Environmental Overview	7-1
7.1	Air Quality.....	7-1
7.2	Historical, Architectural, Archaeological, and Cultural Resources	7-2
7.3	Biological.....	7-2
7.4	Water Resources	7-2
7.4.1	Water Quality, Surface Water, and Groundwater	7-2
7.4.2	Wetlands.....	7-5
7.4.3	Floodplains	7-5
7.5	Compatible Land Uses.....	7-6
7.5.1	Runway Protection Zones.....	7-6
7.5.2	Wildlife Hazards	7-15

7.5.3	Department of Transportation Section 4(f)	7-20
7.6	Environmental Resources Overview Summary	7-20
7.6.1	Air Quality	7-20
7.6.2	Historical, Architectural, Archaeological, and Cultural Resources	7-20
7.6.3	Biological	7-20
7.6.4	Water Resources	7-20
7.6.5	Incompatible Land Use	7-21
8.	Noise Analysis	8-1
8.1	Noise and Effects on People	8-1
8.1.1	Characteristics of Sound	8-1
8.1.2	Propagation of Noise	8-1
8.1.3	Noise Metrics	8-2
8.2	Noise Regulations and Policies	8-2
8.3	Surrounding Jurisdiction Land Use	8-4
8.4	Code of Federal Regulations Part 150 Land Use Recommendations	8-4
8.4.1	Land Use Management Recommendations	8-4
8.4.2	Program Management and Administrative Recommendations	8-4
8.5	Noise Abatement Procedures	8-4
8.6	Existing and Future Noise Conditions	8-5
8.7	Existing Conditions Aircraft Activity	8-5
8.7.1	Aircraft Operations	8-5
8.7.2	Fleet Mix	8-6
8.8	Departure Stage Length	8-8
8.9	Runway Use	8-8
8.10	Flight Paths and Flight Path Use	8-9
8.11	Existing Conditions Noise Exposure	8-15
8.12	Future Year No Project Noise Conditions – 2023 and 2028	8-19
8.13	Future Year With Project Conditions – 2023 and 2028	8-22
8.14	Summary	8-30
9.	Implementation Plan	9-1
9.1	Factors Affecting Implementation and Phasing	9-1
9.1.1	Regulatory Requirements and Technological Changes	9-2

9.1.2	General Criteria for Planning Implementation.....	9-2
9.1.3	Implementation Indicators	9-3
9.2	Additional Studies	9-4
9.3	Phased Implementation Plan	9-4
9.3.1	Short-Term Projects (0 to 5 Years)	9-4
9.3.2	Medium-Term Projects (6 to 10 Years)	9-11
9.3.3	Long-Term Projects (11 to 22 Years)	9-20
9.4	Decision Tree	9-29
9.4.1	Decision Points	9-29
9.4.2	Defined Triggers	9-31
9.4.3	Activity Metrics to Monitor.....	9-31
9.4.4	Project Dependencies and Justifications	9-32
10.	Financial Analysis	10-1
10.1	Airport’s Organizational and Financial Framework.....	10-1
10.2	Proposed Capital Program	10-1
10.3	Proposed Funding Plan	10-11
10.3.1	Federal Aviation Administration Airport Improvement Program Grants	10-15
10.3.2	Airport Noise Discretionary Grants	10-17
10.3.3	Passenger Facility Charges	10-17
10.3.4	Wisconsin Department of Transportation Grants	10-17
10.3.5	Customer Facility Charges	10-17
10.3.6	Capital Improvement Reserve Account.....	10-19
10.3.7	Private Funding.....	10-19
10.3.8	Coronavirus Aid, Relief, and Economic Security Act Funds.....	10-19
10.3.9	Airport Development Fund	10-19
10.3.10	General Airport Revenue Bonds.....	10-19
10.4	Airline Rates and Charges Methodology	10-22
10.4.1	Landing Fees	10-22
10.4.2	Terminal Rental Rate.....	10-23
10.4.3	Apron Fee.....	10-23
10.4.4	Flexible Response Security Charges	10-23
10.5	Operation and Maintenance Expenses	10-23

10.5.1	Salaries and Fringe Benefits	10-23
10.5.2	Contractual Services.....	10-27
10.5.3	Intra-County Services	10-27
10.5.4	Commodities.....	10-27
10.5.5	Major Maintenance	10-28
10.5.6	Other	10-28
10.6	Revenues.....	10-28
10.6.1	Airfield Revenues.....	10-33
10.6.2	Terminal Revenues	10-33
10.6.3	Apron Revenues	10-35
10.6.4	Other	10-37
10.6.5	Pledged Passenger Facility Charge Revenues.....	10-37
10.6.6	Federal Relief Funds.....	10-39
10.6.7	Over-Collected Revenues	10-39
10.7	Debt Service Coverage	10-39
10.8	Signatory Airline Cost per Enplaned Passenger	10-41
10.9	Conclusions.....	10-41
11.	Community and Stakeholder Engagement	11-1

LIST OF APPENDICES

Appendix A	Facility Index
Appendix B	Waste Reduction, Reuse, and Recycling Plan
Appendix C	Ramp Charts
Appendix D	Alternatives Workshops
Appendix E	Community and Stakeholder Engagement
Appendix F	Airport Layout Plan

LIST OF TABLES

Table 2-1	Wind Coverage.....	2-9
Table 2-2	Runway Characteristics	2-17
Table 2-3	Runway Instrumentation and Lighting Systems	2-18

Table 2-4	Runway Use Configurations.....	2-21
Table 2-5	Taxiway Characteristics	2-22
Table 2-6	Apron Characteristics	2-23
Table 2-7	Passenger Terminal Space Inventory – Basement Level	2-39
Table 2-8	Passenger Terminal Space Inventory – Ground Floor Level.....	2-40
Table 2-9	Passenger Terminal Space Inventory – Concourse Level	2-41
Table 2-10	Passenger Terminal – Upper Levels and Mezzanine Levels.....	2-42
Table 2-11	Passenger Terminal Space Inventory – Overall Summary (All Levels).....	2-43
Table 2-12	Concourse Gate Positions and Usage.....	2-46
Table 2-13	Terminal Area Roadway Inventory	2-63
Table 2-14	Curbside Roadway Classification Observation Summary.....	2-67
Table 2-15	Curbside Roadway Classification Utilization Summary	2-69
Table 2-16	Parking Capacity by Lot.....	2-80
Table 2-17	Employee Parking Entry/Exit Counts	2-80
Table 2-18	Exit Tickets Per Enplaned Passengers.....	2-82
Table 2-19	On-Airport Rental Car Customer Service Area Summary.....	2-84
Table 2-20	Air Cargo Facilities	2-93
Table 2-21	Air Cargo Operators.....	2-93
Table 2-22	Airline Maintenance Facilities.....	2-95
Table 2-23	General Aviation Inventory.....	2-97
Table 2-24	Airport Maintenance Vehicles and Equipment.....	2-99
Table 2-25	Airport Maintenance Buildings	2-100
Table 2-26	Airport Support Facilities.....	2-101
Table 2-27	Fuel Tank Inventory	2-105
Table 2-28	Historic Glycol Use by Operator	2-109
Table 2-29	Estimated 128th Wisconsin Air National Guard Space.....	2-111
Table 2-30	Other Non-Aeronautical Land Uses and Facilities.....	2-112
Table 2-31	State and Federal Listed Species	2-128
Table 2-32	Airport Energy Use Summary (One Million British Thermal Units)	2-132
Table 2-33	Population Characteristics	2-133

Table 2-34	Summary of Opportunities to Integrate the Sustainability Management Plan into The Master Plan Update	2-141
Table 2-35	Inventory Summary of Identified Issues	2-145
Table 3-1	Current Airlines Serving the Airport	3-2
Table 3-2	Historical Air Carrier Base	3-2
Table 3-3	Historical Enplaned Passengers	3-5
Table 3-4	Historical Enplaned Passengers by Airline	3-6
Table 3-5	Historical O&D and Connecting Enplaned Passengers	3-7
Table 3-6	Top 20 MKE Domestic O&D Markets (Four Quarters Ending Q2 2018)	3-8
Table 3-7	Historical Aircraft Operations	3-9
Table 3-8	Historical Aircraft Fleet Mix	3-10
Table 3-9	Scheduled Service and Average Fares For MKE's Top 50 Markets (2017)	3-12
Table 3-10	Estimated Incremental Economic Impact of Foxconn	3-15
Table 3-11	MKE's Historical Share of United States Enplaned Passengers	3-19
Table 3-12	Historical and Forecast Socioeconomics	3-21
Table 3-13	Airport Service Area Socioeconomics Adjusted For Foxconn	3-23
Table 3-14	Socioeconomic Multi-Variable Regression Analysis Results	3-26
Table 3-15	Socioeconomic Single-Variable Regression Analysis Results	3-26
Table 3-16	O&D and Connecting Enplaned Passenger Forecast	3-28
Table 3-17	Domestic and International Enplaned Passenger Forecast	3-29
Table 3-18	Passenger Airline Operations Forecast	3-30
Table 3-19	Forecast Aircraft Fleet Mix	3-32
Table 3-20	Air Carrier and Commuter Enplaned Passenger Forecast	3-33
Table 3-21	Historical Air Cargo Activity	3-35
Table 3-22	Top Carriers Historical Air Cargo Tonnage	3-36
Table 3-23	Global Air Cargo Tonnage Forecasts	3-39
Table 3-24	Forecast of Air Cargo Tonnage	3-40
Table 3-25	Historical Freighter Aircraft Operations	3-40
Table 3-26	Freighter Operations Forecast	3-40
Table 3-27	Freighter Operations Forecast By Aircraft Category	3-41
Table 3-28	Historical and Forecast Itinerant and Local General Aviation and Other Air Taxi Operations	3-43

Table 3-29	Historical and Forecast General Aviation and Other Air Taxi Fleet Mix.....	3-44
Table 3-30	Historical and Forecast Based Aircraft.....	3-46
Table 3-31	Historical and Forecast Military Operations.....	3-47
Table 3-32	DDFS Summary – Peak Hour Passengers (Baseline Forecast).....	3-48
Table 3-33	DDFS Summary – Peak Hour Passenger Airline Operations (Baseline Forecast).....	3-48
Table 3-34	DDFS Summary – Peak Hour Total Airport Operations (Baseline Forecast).....	3-48
Table 3-35	Comparison of Enplaned Passenger Forecasts.....	3-49
Table 3-36	Comparison of Aircraft Operations Forecasts.....	3-51
Table 3-37	FAA Forecast Summary.....	3-53
Table 3-38	Comparison to Terminal Area Forecast (FAA Template).....	3-55
Table 3-39	Element 1 Enplaned Passenger Forecast.....	3-57
Table 3-40	Element 1 Aircraft Operations Forecast.....	3-58
Table 3-41	Element 2 Enplaned Passenger Forecast.....	3-59
Table 3-42	Element 2 Aircraft Operations Forecast.....	3-60
Table 3-43	Element 3 Enplaned Passenger Forecast.....	3-62
Table 3-44	Element 3 Aircraft Operations Forecast.....	3-63
Table 3-45	Alternative Demand Scenario Forecast of Air Cargo Tonnage.....	3-65
Table 3-46	Freighter Operations Alternative Demand Scenario Case Forecast.....	3-66
Table 3-47	Freighter Operations Alternative Demand Scenario Forecast By Aircraft Category.....	3-66
Table 3-48	Compilation of Alternative Demand Scenario Enplaned Passenger Elements.....	3-67
Table 3-49	Compilation of Alternative Demand Scenario Aircraft Operations Elements.....	3-69
Table 3-50	Aircraft Fleet Mix – Alternative Demand Scenario.....	3-71
Table 3-51	Historical Aircraft Operations – Airport.....	3-73
Table 3-52	Historical Scheduled Passenger Airline Departures.....	3-73
Table 3-53	Historical Enplaned Passengers.....	3-74
Table 3-54	Peak Month Daily Operations Metrics.....	3-75
Table 3-55	Top Ten Domestic O&D Markets Not Served in Base DDFS.....	3-78
Table 3-56	U.S. DOT All-Cargo Operations Summary – March 2018.....	3-80
Table 3-57	FAA Freighter Operations Summary – March 2018.....	3-80
Table 3-58	Peak Month Block Hour Operations Allocation – All-Cargo Airlines.....	3-81
Table 3-59	Peak Month Other Air Taxi/General Aviation Aircraft Operations.....	3-82

Table 3-60	Peak Month Block Hour Operations Allocation – Other Air Taxi/General Aviation	3-83
Table 3-61	DDFS Summary – Baseline Forecast	3-84
Table 3-62	DDFS Passenger Airline Fleet Summary – Baseline forecast	3-84
Table 3-63	DDFS Summary – Peak Hour Passengers (Baseline Forecast)	3-85
Table 3-64	DDFS Summary – Peak Hour Passenger Airline Operations (Baseline Forecast)	3-85
Table 3-65	DDFS Summary – Peak Hour Total Airport Operations (Baseline Forecast)	3-85
Table 3-66	Hourly Summary – Passengers (Baseline Forecast)	3-87
Table 3-67	Hourly Summary – Passenger Airline Operations (Baseline Forecast)	3-88
Table 3-68	DDFS Aircraft Operations Summary – Baseline Forecast	3-89
Table 3-69	DDFS Summary – Alternative Demand Scenario	3-92
Table 3-70	DDFS Passenger Airline Fleet Summary – Alternative Demand Scenario	3-93
Table 3-71	DDFS Summary – Peak Hour Passengers (Alternative Demand Scenario)	3-93
Table 3-72	DDFS Summary – Peak Hour Passenger Airline Operations (Alternative Demand Scenario)	3-93
Table 3-73	DDFS Summary – Peak Hour Total Airport Operations (Alternative Demand Scenario)	3-94
Table 3-74	Hourly Summary – Passengers (Alternative Demand Scenario)	3-95
Table 3-75	Hourly Summary – Passenger Airline Operations (Alternative Demand Scenario)	3-96
Table 3-76	DDFS Aircraft Operations Summary – Alternative Demand Scenario	3-97
Table 3-77	Forecast Annual Operations by Existing and Future Critical Aircraft	3-105
Table 4-1	Enplaned Passenger Forecast Summary	4-1
Table 4-2	Aircraft Operations Forecast Summary	4-2
Table 4-3	Most Demanding Aircraft by Runway (Preliminary Critical Aircraft Determination)	4-5
Table 4-4	Airplane Design Group Dimensional Planning Standards	4-6
Table 4-5	Taxiway Design Group Dimensional Planning Standards	4-7
Table 4-6	Existing Taxiway Dimensions	4-13
Table 4-7	Runway Separation Standards	4-14
Table 4-8	Nonstop Cargo Markets Served	4-15
Table 4-9	Operating Conditions for Airfield Capacity and Aircraft Delay Analysis	4-23
Table 4-10	Aircraft Classifications for Establishing Aircraft Mix Index	4-24
Table 4-11	Modeled Airfield Operating Configurations	4-27
Table 4-12	Runway Simulator Aircraft Fleet Mix Mapping	4-28
Table 4-13	Forecast Peak Hour by Type of Operation	4-29

Table 4-14	Estimated Hourly Capacities of Existing Airfield Configurations - Summary	4-32
Table 4-15	Comparison of Capacity/Demand and Annual Service Volume.....	4-33
Table 4-16	Existing Gate Inventory	4-35
Table 4-17	Gating Scenario 1 Operational Characteristics.....	4-39
Table 4-18	Scenario 1 Gate Requirements for Baseline and High Scenario Design Day Flight Schedules	4-40
Table 4-19	Gating Scenario 1 Aircraft Tow Operations	4-41
Table 4-20	Gating Scenario 2 Operational Characteristics.....	4-42
Table 4-21	Scenario 2 Gate Requirements for Baseline and High Scenario Design Day Flight Schedules	4-43
Table 4-22	Gating Scenario 2 Aircraft Tow Operations	4-44
Table 4-23	Gating Scenario 3 Operational Characteristics.....	4-44
Table 4-24	Scenario 3 Gate Requirements for Baseline and High Scenario Design Day Flight Schedules	4-46
Table 4-25	Gating Scenario 3 Aircraft Tow Operations	4-47
Table 4-26	Gate Requirement Summary	4-48
Table 4-27	Aircraft on the Ground.....	4-48
Table 4-28	Aircraft Hardstand/RON Requirements.....	4-49
Table 4-29	Existing Centralized Deice Areas and Aircraft Positions	4-51
Table 4-30	Deice Position Separation Criteria.....	4-53
Table 4-31	Peak Hour Departures and Deice Position Demand	4-53
Table 4-32	Average Origin and Destination.....	4-60
Table 4-33	Daily and Peak Hour Activity summary	4-60
Table 4-34	Passengers Checking Bags	4-63
Table 4-35	Example Number of Carts per Aircraft.....	4-69
Table 4-36	Outbound Baggage Make-up Operating Parameters.....	4-69
Table 4-37	Inbound Baggage Offload Device Operating Parameters.....	4-71
Table 4-38	Domestic Baggage Claim Operating Parameters.....	4-72
Table 4-39	Holdroom Planning Criteria.....	4-74
Table 4-40	Passenger Security Screening Checkpoint Operating Parameters	4-75
Table 4-41	Checked Baggage Screening Facility Operating Parameters.....	4-76
Table 4-42	Support Space Operating Parameters	4-78
Table 4-43	Terminal Program	4-80
Table 4-44	Check-in Requirements	4-81

Table 4-45	Baggage Handling System Requirements.....	4-82
Table 4-46	Baggage Claim Requirements.....	4-83
Table 4-47	Holdroom Requirements	4-84
Table 4-48	Airline Support Area Requirements.....	4-84
Table 4-49	Passenger Security Screening Requirements.....	4-85
Table 4-50	Checked Baggage Security Screening Requirements.....	4-85
Table 4-51	Support and Other Area Requirements	4-86
Table 4-52	Peak Hour Vehicle Classification Data at Terminal Curbsides.....	4-91
Table 4-53	O&D Passenger Forecast, by Scenario	4-92
Table 4-54	Roadway Levels of Service and Maximum Flow Rates	4-96
Table 4-55	On-Airport Roadway Demand/Capacity – Existing (2018) Conditions	4-99
Table 4-56	On-Airport Roadway Demand/Capacity Results – Baseline Forecast	4-103
Table 4-57	On-Airport Roadway Lane Requirements – Baseline Forecast	4-109
Table 4-58	On-Airport Roadway Demand/Capacity Results – High Scenario.....	4-113
Table 4-59	On-Airport Roadway Lane Requirements – High Scenario.....	4-119
Table 4-60	On-Airport Roadway Lane Requirements – Summary.....	4-121
Table 4-61	Link Density Analysis from Simulation Model for Airport Roadways - Baseline Forecast	4-123
Table 4-62	Link Density Analysis from Simulation Model for Airport Roadways – High Scenario	4-124
Table 4-63	Curbside Utilization and Level of Service.....	4-125
Table 4-64	Curbside Requirements Summary – Existing Conditions and Baseline Forecast.....	4-129
Table 4-65	Curbside Requirements Summary – Existing Conditions and High Scenario	4-130
Table 4-66	VISSIM Curbside Level of Service.....	4-142
Table 4-67	VISSIM and Static Modeling Level of Service Comparison by Vehicle Mode.....	4-145
Table 4-68	Taxicab Conversion Factors.....	4-147
Table 4-69	Three Taxicab Future Staging Requirement Scenarios	4-148
Table 4-70	Charter Bus Conversion Factors.....	4-149
Table 4-71	Three Charter Bus Future Staging Requirement Scenarios.....	4-150
Table 4-72	2018 Public Parking Demand.....	4-151
Table 4-73	Annual Public Parking Demand Adjusted for Customer Propensity to Park.....	4-152
Table 4-74	Public Parking Design Day Requirements - Baseline Forecast	4-153
Table 4-75	Public Parking Design Day Requirements - High Scenario.....	4-153

Table 4-76	Annualization Factor by Parking Product.....	4-158
Table 4-77	Projected Public Parking Revenue - Baseline Forecast.....	4-158
Table 4-78	Projected Public Parking Revenue - High Scenario	4-159
Table 4-79	Employee Parking Requirements - Baseline Forecast.....	4-161
Table 4-80	Employee Parking Requirements - High Scenario.....	4-161
Table 4-81	Rental Car Facility Requirements Summary – Baseline Forecast.....	4-178
Table 4-82	Rental Car Facility Requirements Summary – High Scenario	4-179
Table 4-83	ACRP 143 Tonnage Area Ratios (Annual Tons per Square Foot).....	4-182
Table 4-84	Existing Cargo Area Totals and TAR.....	4-186
Table 4-85	Air Cargo Forecast by Carrier Type (Baseline Forecast).....	4-187
Table 4-86	Air Freight Operations Forecast By Aircraft Category (Baseline Forecast)	4-187
Table 4-87	Ratios Used for Cargo Facility Requirements	4-188
Table 4-88	Peak Hour Cargo Aircraft Apron Analysis and Requirements.....	4-190
Table 4-89	Cargo Facility Requirements: Baseline Forecast	4-191
Table 4-90	Air Cargo Planning Aircraft.....	4-193
Table 4-91	Baseline Forecast Cargo Facility Requirements	4-196
Table 4-92	High Growth Scenario Cargo Demand	4-198
Table 4-93	Cargo Facility Requirements: High Growth Scenario	4-199
Table 4-94	High Growth Scenario Cargo Facility Requirements	4-200
Table 4-95	General Aviation Operations Forecast by Fleet	4-201
Table 4-96	Itinerant and Local General Aviation Operations.....	4-202
Table 4-97	General Aviation Forecast of Based Aircraft.....	4-202
Table 4-98	Area Requirements per Aircraft	4-207
Table 4-99	Hangar Requirements by Aircraft Type.....	4-209
Table 4-100	Hangar Requirements by Hangar Type	4-209
Table 4-101	Taxiway and Taxilane Surface Widths.....	4-210
Table 4-102	Projected Airside Area Requirements by Hangar Type	4-211
Table 4-103	Airside Area Requirements by Aircraft Type.....	4-211
Table 4-104	Projected Landside Area Requirements by Aircraft Type	4-212
Table 4-105	Projected Landside Area Requirements by Hangar Type	4-213
Table 4-106	General Aviation Facility Requirements Summary.....	4-213

Table 4-107	Existing Airfield Maintenance Facilities - Buildings and Grounds	4-216
Table 4-108	Airport Maintenance Facility Requirements.....	4-222
Table 4-109	Consolidated Aircraft Maintenance Campus Area Requirements.....	4-225
Table 4-110	ARFF Regulatory Comparisons.....	4-227
Table 4-111	2013-2018 Passenger and Large Cargo Carrier Fuel Demand (gallons).....	4-229
Table 4-112	2013-2018 Historical Passenger and Large Cargo Air Carrier Operations.....	4-229
Table 4-113	2013-2018 Passenger and Large Cargo Air Carrier Gallons-per-Operation Ratio.....	4-230
Table 4-114	Forecast Passenger and Large Cargo Air Carrier Aircraft Fuel Demand	4-230
Table 4-115	Jet-A Fuel Terminal Demand and Storage Projections.....	4-231
Table 4-116	Historical MARS Ridership and Vehicle Parking Capacity	4-233
Table 4-117	Forecast MARS Ridership and Parking Requirements – Baseline Forecast.....	4-234
Table 4-118	Projected MARS Ridership and Parking Requirements – Rail Passenger High Growth Scenario ...	4-235
Table 4-119	Recommended Square Footage for Administrative Areas.....	4-236
Table 4-120	Airport Water Consumption Forecast	4-237
Table 4-121	Forecast Future Airport Wastewater Generation	4-239
Table 4-122	Monthly Ground Transportation Transactions.....	4-241
Table 4-123	Monthly Ground Transportation Revenues.....	4-242
Table 4-124	Commercial Ground Transportation Fees and Charges at Benchmarked Airports	4-253
Table 5-1	Airfield Facilities Component Alternatives – Runway	5-10
Table 5-2	Terminal Facilities Component Alternatives.....	5-22
Table 5-3	Landside Facilities Component Alternatives – TNC and Curbside.....	5-25
Table 5-4	Landside Facilities Component Alternatives – Roadway	5-31
Table 5-5	Landside Facilities Component Alternatives – Parking and Rental Car	5-38
Table 5-6	Support Facilities Component Alternatives – Cargo	5-52
Table 5-7	Support Facilities Component Alternatives – General Aviation.....	5-60
Table 5-8	Support Facilities Component Alternatives – Aircraft Maintenance Facilities.....	5-66
Table 5-9	Support Facilities Component Alternatives – Airport Maintenance and Other Support Facilities....	5-71
Table 5-10	Description of Integrated Alternatives	5-77
Table 5-11	Shortlisted Alternative A Components	5-93
Table 5-12	Shortlisted Alternative B Components	5-97
Table 5-13	Shortlisted Alternative C Components.....	5-101

Table 5-14	Shortlisted Alternatives Evaluation Criteria	5-106
Table 5-15	Waterfall Analysis of Components of Preliminary Preferred Alternative.....	5-111
Table 8-1	Title 14 Code of Federal Regulations Part 150 Land Use Table	8-3
Table 8-2	Annual Operations by Aircraft Category – 2018 Existing Conditions	8-6
Table 8-3	Average Annual Day Fleet Mix Operations by Time of Day and Operation Model – 2018 Existing Conditions	8-7
Table 8-4	Runway Use – Existing and No Project Conditions.....	8-9
Table 8-5	Summary of Noise Exposure – 2018 Existing Conditions.....	8-15
Table 8-6	Forecast Annual Operations by Aircraft Category – 2023 and 2028	8-19
Table 8-7	Average Daily Fleet Mix Operations by Time of Day and Operation Model – 2023	8-20
Table 8-8	Average Daily Fleet Mix Operations by Time of Day and Operation Model – 2028	8-21
Table 8-9	No Project Conditions Noise Exposure Summary – 2023 and 2028.....	8-25
Table 8-10	With Project Conditions Runway Use – 2023 and 2028.....	8-26
Table 8-11	With Project Conditions Noise Exposure Summary – 2023 and 2028	8-29
Table 9-1	Short-Term Master Plan Development Projects (0 to 5 Years).....	9-5
Table 9-2	Medium-Term Master Plan Development Projects (6 to 10 Years).....	9-13
Table 9-3	Long-Term Master Plan Development Projects (11 to 22 Years)	9-21
Table 10-1	Estimated Capital Costs and Funding Sources for the Capital Improvement Program Projects	10-3
Table 10-2	Sources and Uses of Capital Funding	10-13
Table 10-3	Projected Airport Improvement Program Entitlements	10-16
Table 10-4	Projected Passenger Facility Charge Revenue	10-18
Table 10-5	Capital Improvement Reserve Account Cash Flow.....	10-20
Table 10-6	Airport Development Fund Cash Flow	10-20
Table 10-7	Projected Debt Service	10-21
Table 10-8	Historical Operation and Maintenance Expenses	10-24
Table 10-9	Projected Operation and Maintenance Expenses.....	10-25
Table 10-10	Historical Revenues.....	10-29
Table 10-11	Projected Revenues	10-31
Table 10-12	Projected Landing Fee	10-34
Table 10-13	Projected Terminal Rental Rate.....	10-36
Table 10-14	Projected Apron Fee.....	10-38

Table 10-15	Projected Debt Service Coverage.....	10-40
Table 10-16	Projected Cost per Enplaned Passenger.....	10-42

LIST OF EXHIBITS

Exhibit 1-1	Master Plan Process.....	1-3
Exhibit 2-1	Historic Timeline	2-4
Exhibit 2-2	MKE Location Map.....	2-5
Exhibit 2-3	MKE Airspace	2-7
Exhibit 2-4	Airfield Operating Configurations.....	2-8
Exhibit 2-5	Wind Roses.....	2-11
Exhibit 2-6	Airside Facilities	2-15
Exhibit 2-7	Existing Navigational Aid (NAVAID) Locations.....	2-19
Exhibit 2-8	Apron (Ramp) Facilities.....	2-24
Exhibit 2-9	2016 Pavement Condition Index Map	2-27
Exhibit 2-10	Pavement Condition Index by Use.....	2-29
Exhibit 2-11	Pavement Condition Index Distribution.....	2-29
Exhibit 2-12	Terminal Space Inventory – Concourse Level	2-31
Exhibit 2-13	Terminal Space Inventory – Ground Floor Level.....	2-33
Exhibit 2-14	Terminal Space Inventory – Upper, Mezzanine and Basement Levels	2-35
Exhibit 2-15	Terminal Space Inventory – IAB and Future Concourse E.....	2-37
Exhibit 2-16	Concourse Gate Positions and Aircraft Parking	2-49
Exhibit 2-17	Regional Transportation Network.....	2-53
Exhibit 2-18	Primary Airport Access Points	2-55
Exhibit 2-19	Secondary Airport Access Points	2-59
Exhibit 2-20	Terminal Area Roadways and Circulation.....	2-61
Exhibit 2-21	On-Airport Turning Movements	2-70
Exhibit 2-22	Off-Airport Turning Movements.....	2-71
Exhibit 2-23	Terminal Curbside Allocation	2-73
Exhibit 2-24	On-and Off-Airport Parking and Staging Areas	2-75
Exhibit 2-25	Parking Structure Levels 1 and 2.....	2-77
Exhibit 2-26	Parking Structure Levels 3 and 4.....	2-78

Exhibit 2-27	Parking Structure Levels 5 and 6.....	2-79
Exhibit 2-28	Historic Exit Tickets by Lot.....	2-81
Exhibit 2-29	Parking Rate History by Type.....	2-82
Exhibit 2-30	Average Parking Revenue per Transaction by Lot.....	2-83
Exhibit 2-31	Historic Parking Revenue by Lot.....	2-83
Exhibit 2-32	On-Airport Rental Car Customer Service Area.....	2-85
Exhibit 2-33	Total Annual Revenues by Rental Car Company.....	2-86
Exhibit 2-34	Ancillary Facility Locations – North.....	2-87
Exhibit 2-35	Ancillary Facility Locations – South.....	2-89
Exhibit 2-36	Ancillary Facility Locations – West and East.....	2-91
Exhibit 2-37	Airport Fueling Infrastructure.....	2-104
Exhibit 2-38	Deicing Operation Areas.....	2-107
Exhibit 2-39	Other Non-Aeronautical Land Uses and Facilities.....	2-113
Exhibit 2-40	Electric Utility Lines.....	2-115
Exhibit 2-41	Water Utilities.....	2-116
Exhibit 2-42	Sanitary Utilities.....	2-118
Exhibit 2-43	Landfill Gas and Natural Gas Utilities.....	2-120
Exhibit 2-44	Communication Utilities.....	2-121
Exhibit 2-45	Storm Sewer and Airport Drainage Utilities.....	2-122
Exhibit 2-46	Environmental Overview.....	2-125
Exhibit 2-47	Section 4(f) Lands and Historic Properties.....	2-129
Exhibit 2-48	Airport Area Land Uses.....	2-135
Exhibit 2-49	Milwaukee Area Height Limitation Zoning Ordinance.....	2-137
Exhibit 3-1	Domestic and International Nonstop Destinations.....	3-4
Exhibit 3-2	Average O&D Fares For MKE'S Top 50 Markets.....	3-12
Exhibit 3-3	Total Domestic O&D Passenger Volumes at MKE and ORD.....	3-13
Exhibit 3-4	Historical Monthly Averages of Jet Fuel and Crude Oil Prices.....	3-14
Exhibit 3-5	Airport Service Area.....	3-17
Exhibit 3-6	Incremental Impact of Foxconn-Related Employment.....	3-24
Exhibit 3-7	Incremental Impact of Foxconn-Related Total Earnings.....	3-24
Exhibit 3-8	Incremental Impact of Foxconn-Related Gross Regional Product.....	3-25

Exhibit 3-9	Share of Cargo Volume by Carrier Type	3-35
Exhibit 3-10	Truck Drive Radius From Chicago O’Hare International Airport	3-37
Exhibit 3-11	Based Aircraft at MKE per National Active General Aviation Hours Flown	3-45
Exhibit 3-12	Comparison of Enplaned Passenger Forecasts	3-50
Exhibit 3-13	Comparison of Aircraft Operations Forecasts.....	3-52
Exhibit 3-14	Amazon Air Hubs and Sortation Centers.....	3-64
Exhibit 3-15	Compilation of Alternative Demand Scenario Enplaned Passenger Elements	3-68
Exhibit 3-16	Compilation of Alternative Demand Scenario Aircraft Operations Elements	3-70
Exhibit 3-17	Scheduled Passenger Airline Operations – March 2018.....	3-76
Exhibit 3-18	Scheduled Passenger Airline Seat Capacity – March 2018.....	3-76
Exhibit 3-19	Rolling Hour Passengers – Total (Baseline Forecast)	3-89
Exhibit 3-20	Rolling Hour Passengers – Domestic (Baseline Forecast)	3-90
Exhibit 3-21	Rolling Hour Passengers – International (Baseline Forecast).....	3-90
Exhibit 3-22	Rolling Hour Passenger Airline Operations – Baseline Forecast	3-91
Exhibit 3-23	Aircraft on Ground– Passenger Airlines (Baseline Forecast)	3-91
Exhibit 3-24	Rolling Hour Airport Operations – Baseline Forecast	3-92
Exhibit 3-25	Rolling Hour Passengers – Total (Alternative Demand Scenario).....	3-97
Exhibit 3-26	Rolling Hour Passengers – Total 2023 (Baseline forecast vs Alternative Demand Scenario)	3-98
Exhibit 3-27	Rolling Hour Passengers – Total 2028 (Baseline forecast vs Alternative Demand Scenario)	3-98
Exhibit 3-28	Rolling Hour Passengers – Total 2040 (Baseline forecast vs Alternative Demand Scenario)	3-99
Exhibit 3-29	Rolling Hour Passengers – Domestic (Alternative Demand Scenario)	3-99
Exhibit 3-30	Rolling Hour Passengers – Domestic 2023 (Baseline forecast vs Alternative Demand Scenario).....	3-100
Exhibit 3-31	Rolling Hour Passengers – Domestic 2028 (Baseline forecast vs Alternative Demand Scenario).....	3-100
Exhibit 3-32	Rolling Hour Passengers – Domestic 2040 (Baseline forecast vs Alternative Demand Scenario).....	3-101
Exhibit 3-33	Rolling Hour Passengers –International (Alternative Demand Scenario)	3-101
Exhibit 3-34	Rolling Hour Passengers – International 2023 (Baseline forecast vs Alternative Demand Scenario)	3-102
Exhibit 3-35	Rolling Hour Passengers – International 2028 (Baseline forecast vs Alternative Demand Scenario)	3-102
Exhibit 3-36	Rolling Hour Passengers – International 2040 (Baseline forecast vs Alternative Demand Scenario)	3-103
Exhibit 3-37	Rolling Hour Passengers Airline Operations – Alternative Demand Scenario.....	3-103

Exhibit 3-38	Aircraft on Ground– Passenger Airlines (Alternative Demand Scenario).....	3-104
Exhibit 3-39	Rolling Hour Airport Operations – Alternative Demand Scenario	3-104
Exhibit 4-1	Existing Airfield Geometry – Preliminary ADG and TDG Designations.....	4-9
Exhibit 4-2	Existing Airfield Geometry – Preliminary Areas of Non-compliance with FAA Standards	4-11
Exhibit 4-3	Maximum Certified Takeoff Weight Runway Length Requirements.....	4-17
Exhibit 4-4	Cargo Stage Length Takeoff Length Runway Requirements	4-18
Exhibit 4-5	Potential Future Nonstop Cargo and Passenger Market Stage Lengths	4-19
Exhibit 4-6	Landing Distance Requirements at Maximum Gross Landing Weight	4-20
Exhibit 4-7	Historical and Forecast Aircraft Operations.....	4-21
Exhibit 4-8	Modeled Airfield Operating Configurations.....	4-27
Exhibit 4-9	Modeled VMC Total Operational Peak Hour Fleet Mix – Baseline Forecast.....	4-29
Exhibit 4-10	Modeled IMC Total Operational Peak Hour Fleet Mix – Baseline Forecast.....	4-30
Exhibit 4-11	Modeled VMC Total Operational Peak Hour Fleet Mix – High Scenario	4-30
Exhibit 4-12	Modeled IMC Total Operational Peak Hour Fleet Mix – High Scenario	4-31
Exhibit 4-13	Existing Gate Layout and Airline Allocations.....	4-36
Exhibit 4-14	Sample Ramp Chart	4-38
Exhibit 4-15	Gating Scenario 3 Airline Allocations.....	4-45
Exhibit 4-16	Existing Deice Operations Areas	4-50
Exhibit 4-17	South Ramp Deice Pad	4-52
Exhibit 4-18	Centralized Deice Facility Concept.....	4-55
Exhibit 4-19	International Air Transport Association Level of Service Space-Time Diagram	4-58
Exhibit 4-20	International Air Transport Association Level of Service Metrics.....	4-59
Exhibit 4-21	Daily Departing and Arriving Seats.....	4-61
Exhibit 4-22	Passenger Show-up Profiles	4-62
Exhibit 4-23	Passenger and Baggage Processes	4-63
Exhibit 4-24	Passenger Check-in Operating Parameters: Southwest Airlines	4-65
Exhibit 4-25	Passenger Check-in Operating Parameters: Other Domestic Airlines.....	4-66
Exhibit 4-26	Passenger Check-in Operating Parameters: International Airlines.....	4-67
Exhibit 4-27	Check-in Space Template	4-68
Exhibit 4-28	Outbound Baggage Make-up Space Template	4-70
Exhibit 4-29	Inbound Baggage Space Template.....	4-72

Exhibit 4-30	Indicative Domestic Baggage Claim Device Space Template.....	4-73
Exhibit 4-31	Representative Processing Rate Distribution Example.....	4-75
Exhibit 4-32	Passenger Security Screening Checkpoint Space Template.....	4-77
Exhibit 4-33	Domestic Baggage Claim Utilization.....	4-83
Exhibit 4-34	Baseline Forecast Terminal LOS Stoplight Chart	4-87
Exhibit 4-35	High Scenario Forecast Terminal LOS Stoplight Chart.....	4-88
Exhibit 4-36	Curbside Traffic Volumes (7-Day Count and Additional Peak Period Counts).....	4-90
Exhibit 4-37	Balanced Roadway Volumes 2018	4-93
Exhibit 4-38	On-Airport Roadway Links	4-95
Exhibit 4-39	Level of Service Definitions for Airport Terminal Area Roadways	4-97
Exhibit 4-40	Example of Timing of Improvement Implementation – LOS C versus LOS D	4-98
Exhibit 4-41	On-Airport Roadway Demand/Capacity Summary, Existing Conditions (2018) - Morning and Afternoon Peak Hours.....	4-101
Exhibit 4-42	On-Airport Roadway Demand/Capacity Summary, Baseline Forecast 2023 - Morning and Afternoon Peak Hours.....	4-105
Exhibit 4-43	On-Airport Roadway Demand/Capacity Summary, Baseline Forecast 2028 - Morning and Afternoon Peak Hours.....	4-106
Exhibit 4-44	On-Airport Roadway Demand/Capacity Summary, Baseline Forecast 2040 - Morning and Afternoon Peak Hours.....	4-107
Exhibit 4-45	On-Airport Roadway Demand/Capacity Summary, High Scenario 2023 - Morning. and Afternoon Peak Hours.....	4-115
Exhibit 4-46	On-Airport Roadway Demand/Capacity Summary, High Scenario 2028 - Morning and Afternoon Peak Hours.....	4-116
Exhibit 4-47	On-Airport Roadway Demand/Capacity Summary, High Scenario 2040 - Morning and Afternoon Peak Hours.....	4-117
Exhibit 4-48	Curbside Level of Service and Utilization Ranges, Multiple-Lane Loading.....	4-126
Exhibit 4-49	Curbside Utilizations Effect on Curbside Through-Lane Capacity.....	4-127
Exhibit 4-50	VISSIM Simulation Curbside Study Areas	4-134
Exhibit 4-51	VISSIM Simulation Results – Existing Conditions – Morning and Afternoon Peak Hours	4-135
Exhibit 4-52	VISSIM Simulation Results – Baseline Forecast 2023 – Morning and Afternoon Peak Hours.....	4-136
Exhibit 4-53	VISSIM Simulation Results – Baseline Forecast 2023 – Morning and Afternoon Peak Hours.....	4-137
Exhibit 4-54	VISSIM Simulation Results – Baseline Forecast 2040 – Morning and Afternoon Peak Hours.....	4-138
Exhibit 4-55	VISSIM Simulation Results - High Scenario 2023 - Morning and Afternoon Peak Hours	4-139

Exhibit 4-56	VISSIM Simulation Results - High Scenario 2028 - Morning and Afternoon Peak Hours	4-140
Exhibit 4-57	VISSIM Simulation Results - High Scenario 2040 - Morning and Afternoon Peak Hours	4-141
Exhibit 4-58	VISSIM Simulation Results – Speed Heatmap – Existing Conditions and 2040 (High Growth Scenario) Afternoon Peak Hour	4-143
Exhibit 4-59	Monthly Taxicab Transactions	4-146
Exhibit 4-60	Monthly Charter Bus Transactions.....	4-149
Exhibit 4-61	2018 Descending Order Peak Hour Daily Parking Occupancy.....	4-151
Exhibit 4-62	Public Parking Hourly Parking Requirements.....	4-154
Exhibit 4-63	Public Parking Daily Parking Requirements.....	4-154
Exhibit 4-64	Public Parking Surface Lot Requirements.....	4-155
Exhibit 4-65	Public Parking SuperSaver Lot A Requirements.....	4-155
Exhibit 4-66	Public Parking SuperSaver Lot B Requirements.....	4-156
Exhibit 4-67	Public Parking Milwaukee Airport Railroad Station Requirements.....	4-156
Exhibit 4-68	Projected Public Parking Revenue - Baseline Forecast.....	4-159
Exhibit 4-69	Projected Public Parking Revenue - High Scenario	4-160
Exhibit 4-70	Employee Parking Requirements	4-161
Exhibit 4-71	Example Customer Service Area Counter Sizing.....	4-163
Exhibit 4-72	Customer Service Counter Facility Requirements – Baseline Forecast.....	4-164
Exhibit 4-73	Customer Service Counter Facility Requirements – High Scenario	4-164
Exhibit 4-74	Example Rental and Return Space Layouts	4-165
Exhibit 4-75	Rental Car Rental and Return Requirements – Baseline Forecast	4-165
Exhibit 4-76	Rental Car Rental and Return Requirements – High Scenario.....	4-166
Exhibit 4-77	Example Fueling Position Layout.....	4-167
Exhibit 4-78	Fueling Nozzle Requirements – Baseline Forecast	4-168
Exhibit 4-79	Fueling Nozzle Requirements – High Scenario.....	4-168
Exhibit 4-80	Example Wash Bay Layout	4-169
Exhibit 4-81	Wash Bay Requirements – Baseline Forecast	4-170
Exhibit 4-82	Wash Bay Requirements – High Scenario.....	4-170
Exhibit 4-83	Light Maintenance Bay Requirements – Baseline Forecast.....	4-171
Exhibit 4-84	Light Maintenance Bay Requirements – High Scenario	4-172
Exhibit 4-85	Vehicle Stacking Space Requirements – Baseline Forecast.....	4-173

Exhibit 4-86	Vehicle Stacking Space Requirements – High Scenario	4-173
Exhibit 4-87	Rental Car Vehicle Storage Requirements – Baseline Forecast	4-174
Exhibit 4-88	Rental Car Vehicle Storage Requirements – High Scenario.....	4-175
Exhibit 4-89	Rental Car Facility Requirements Summary (Square Feet) – Baseline Forecast	4-175
Exhibit 4-90	Rental Car Facility Requirements Summary (Acres) – Baseline Forecast	4-176
Exhibit 4-91	Rental Car Facility Requirements Summary (Square Feet) – High Scenario	4-176
Exhibit 4-92	Rental Car Facility Requirements Summary (Acres) – High Scenario.....	4-177
Exhibit 4-93	Conceptual Cargo Facility Layout.....	4-192
Exhibit 4-94	Runway 7R-25L PART 77 Transitional Surface Influence.....	4-194
Exhibit 4-95	Typical Hangar Area Space Requirements Design Group I and II Aircraft - Single-/Multi-Engine (Piston & Turboprop).....	4-204
Exhibit 4-96	Typical Hangar Area Space Requirements Design Group II Aircraft (Mid-Sized Business Jets)	4-205
Exhibit 4-97	Typical Hangar Area Space Requirements Design Group III Aircraft (Large-Sized Business Jets) ..	4-206
Exhibit 4-98	Existing Airport Maintenance Campus Buildings and Grounds	4-215
Exhibit 4-99	Airport Maintenance – Existing Flow of Snow Removal Equipment	4-220
Exhibit 4-100	Historical Parking Transactions per Terminating Passenger	4-243
Exhibit 4-101	Historical Parking Revenue per Terminating Passenger	4-244
Exhibit 4-102	Rental Car Transactions per Terminating Passenger	4-245
Exhibit 4-103	Rental Car Revenue per Terminating Passenger.....	4-245
Exhibit 4-104	Ground Transportation Transactions per Terminating Passenger	4-246
Exhibit 4-105	Ground Transportation Revenue per Terminating Passenger	4-247
Exhibit 4-106	Transaction Mode Share Trend 2015-2018.....	4-248
Exhibit 4-107	Transactions per Thousand Terminating Passengers: CY 2015 versus CY 2018	4-249
Exhibit 4-108	Sources of Landside Revenue per thousand Terminating Passengers: CY 2018.....	4-250
Exhibit 4-109	Revenue per Thousand Terminating Passengers: CY 2015 versus CY 2018	4-251
Exhibit 4-110	Future TNC/AV Growth Scenarios.....	4-257
Exhibit 4-111	Projected Transaction Mode Share For Three Scenarios	4-258
Exhibit 4-112	Average Revenue per Transaction (CY 2018)	4-259
Exhibit 4-113	Projected Ground Transportation Revenue per O&D Passenger.....	4-260
Exhibit 4-114	Projected Total Ground Transportation Revenue.....	4-260
Exhibit 4-115	Projected Total Ground Transportation Revenue with \$3 TNC Pick-up Fee.....	4-261

Exhibit 4-116	Departures Curbside Utilization Level Of Service – Landside Strategy Demand Scenarios	4-263
Exhibit 4-117	Arrivals Curbside Utilization Level Of Service – Landside Strategy Demand Scenarios.....	4-264
Exhibit 5-1	Master Plan Update Goals	5-2
Exhibit 5-2	Alternatives Analysis Process.....	5-3
Exhibit 5-3	Initial Alternatives Development and Screening Process	5-4
Exhibit 5-4	Runway 1L-19R Extension Option 1.....	5-6
Exhibit 5-5	Runway 1L-19R Extension Option 2.....	5-7
Exhibit 5-6	Runway 1L-19R Extension Option 3.....	5-8
Exhibit 5-7	Airfield Runway Alternatives	5-9
Exhibit 5-8	Airfield Facilities Component Alternatives – Deicing.....	5-12
Exhibit 5-9	South Expansion – Concourse E Redevelopment Concept	5-14
Exhibit 5-10	Terminal Component Alternative 1.....	5-15
Exhibit 5-11	Terminal Component Alternative 2.....	5-15
Exhibit 5-12	Terminal Component Alternative 3.....	5-16
Exhibit 5-13	Terminal Component Alternative 4.....	5-16
Exhibit 5-14	Terminal Component Alternative 5.....	5-17
Exhibit 5-15	Refined Terminal Component Alternative 1	5-18
Exhibit 5-16	Refined Terminal Component Alternative 2.....	5-19
Exhibit 5-17	Refined Terminal Component Alternative 5.....	5-20
Exhibit 5-18	Terminal Facilities Component Alternatives – Consolidated Security Screening Checkpoint	5-23
Exhibit 5-19	Landside Facilities Component Alternatives – Remote Transportation Network Company Staging Area	5-27
Exhibit 5-20	Landside Facilities – Curbside Component Alternative 1	5-29
Exhibit 5-21	Landside Facilities – Curbside Component Alternative 2	5-30
Exhibit 5-22	Landside Facilities – Curbside Component Alternative 3	5-30
Exhibit 5-23	Landside Facilities – Roadway Component Alternative 1.....	5-32
Exhibit 5-24	Landside Facilities – Roadway Component Alternative 2.....	5-33
Exhibit 5-25	Landside Facilities – Roadway Component Alternative 3.....	5-34
Exhibit 5-26	Landside Facilities – Roadway Component Alternative 4.....	5-35
Exhibit 5-27	Landside Facilities – Roadway Component Alternative 5.....	5-36
Exhibit 5-28	Landside Facilities – Roadway Component Alternative 6 (Optional Garage Entrance Modification)	5-37

Exhibit 5-29	Landside Facilities – Parking and Rental Car Component Alternative 1.....	5-39
Exhibit 5-30	Landside Facilities – Parking and Rental Car Component Alternative 2.....	5-39
Exhibit 5-31	Landside Facilities – Parking and Rental Car Component Alternative 3.....	5-40
Exhibit 5-32	Landside Facilities – Parking and Rental Car Component Alternative 4.....	5-40
Exhibit 5-33	Landside Facilities – Parking and Rental Car Component Alternative 5.....	5-41
Exhibit 5-34	Landside Facilities – Parking and Rental Car Component Alternative 6.....	5-41
Exhibit 3-35	Landside Facilities – Parking and Rental Car Component Alternative 7.....	5-42
Exhibit 5-36	Landside Facilities – Parking and Rental Car Component Alternative 8.....	5-42
Exhibit 5-37	Cargo Facilities Component Alternative 1 (West 1).....	5-44
Exhibit 5-38	Cargo Facilities Component Alternative 2 (West 2).....	5-45
Exhibit 5-39	Cargo Facilities Component Alternative 3 (West 3).....	5-46
Exhibit 5-40	Cargo Facilities Component Alternative 4 (West 4).....	5-47
Exhibit 5-41	Cargo Facilities Component Alternative 5 (West 5).....	5-48
Exhibit 5-42	Cargo Facilities Component Alternative 6 (West 6).....	5-49
Exhibit 5-43	Cargo Facilities Component Alternative 7 (East)	5-50
Exhibit 5-44	Cargo Facilities Component Alternative 8 (South).....	5-51
Exhibit 5-45	General Aviation Facilities Component Alternative 1	5-54
Exhibit 5-46	General Aviation Facilities Component Alternative 2	5-55
Exhibit 5-47	General Aviation Facilities Component Alternative 3	5-56
Exhibit 5-48	General Aviation Facilities Component Alternative 4	5-57
Exhibit 5-49	General Aviation Facilities Component Alternative 5	5-58
Exhibit 5-50	General Aviation Facilities Component Alternative 6	5-59
Exhibit 5-51	Aircraft Maintenance Facilities Component Alternative 1.....	5-61
Exhibit 5-52	Aircraft Maintenance Facilities Component Alternative 2.....	5-62
Exhibit 5-53	Aircraft Maintenance Facilities Component Alternative 3.....	5-63
Exhibit 5-54	Aircraft Maintenance Facilities Component Alternative 4.....	5-64
Exhibit 5-55	Aircraft Maintenance Facilities Component Alternative 5.....	5-65
Exhibit 5-56	Airport Maintenance and Other Support Facilities Component Alternative 1.....	5-67
Exhibit 5-57	Airport Maintenance and Other Support Facilities Component Alternative 2.....	5-68
Exhibit 5-58	Airport Maintenance and Other Support Facilities Component Alternative 3.....	5-69
Exhibit 5-59	Airport Maintenance and Other Support Facilities Component Alternative 4.....	5-70

Exhibit 5-60	Alternatives Analysis – Facility Planning Hierarchy.....	5-73
Exhibit 5-61	Component Alternatives Integration – Screening Criteria.....	5-74
Exhibit 5-62	Integrated Alternative 1	5-79
Exhibit 5-63	Integrated Alternative 2	5-81
Exhibit 5-64	Integrated Alternative 3	5-83
Exhibit 5-65	Integrated Alternative 4	5-85
Exhibit 5-66	Integrated Alternative 5A.....	5-87
Exhibit 5-67	Integrated Alternative 5B.....	5-89
Exhibit 5-68	Integrated Alternatives Screening Results	5-91
Exhibit 5-69	Alternatives Shortlist Process	5-92
Exhibit 5-70	Shortlisted Alternative A	5-95
Exhibit 5-71	Shortlisted Alternative B.....	5-99
Exhibit 5-72	Shortlisted Alternative C.....	5-103
Exhibit 5-73	Alignment with Master Plan Update Goals	5-105
Exhibit 5-74	Process Diagram – Selection of Preliminary Preferred Alternative	5-110
Exhibit 5-75	Preliminary Preferred Alternative	5-121
Exhibit 6-1	Airport Development Plan	6-3
Exhibit 6-2	Future Runway 1L-19R Declared Distances.....	6-6
Exhibit 6-3	Future Runway 7L-25R Declared Distances.....	6-7
Exhibit 6-4	Central Deice Pad	6-8
Exhibit 6-5	South Deice Pad.....	6-9
Exhibit 6-6	Terminal Area Remain Overnight / Hold Pads	6-10
Exhibit 6-7	South Remain Overnight / Hold Pad.....	6-11
Exhibit 6-8	Refined Terminal Area Development Plan	6-13
Exhibit 6-9	Refined Terminal Space Allocation – Apron Level	6-15
Exhibit 6-10	Refined Terminal Space Allocation – Concourse Level	6-17
Exhibit 6-11	Refined Landside Development	6-20
Exhibit 6-12	Refined Terminal Curbside.....	6-21
Exhibit 6-13	Refined Airport Access Roadway Improvements	6-22
Exhibit 6-14	Outbound Air Cargo Way Vehicle Routing.....	6-24
Exhibit 6-15	Vehicle Staging Areas.....	6-25

Exhibit 6-16	Northwest GA Campus	6-28
Exhibit 6-17	Northeast GA Campus	6-30
Exhibit 6-18	West Cargo Campus Expansion	6-31
Exhibit 6-19	Future South Cargo Campus	6-32
Exhibit 6-20	Future Airline/Aircraft Maintenance Facility Campus	6-34
Exhibit 6-21	Future Airline/Aircraft Maintenance Facilities – Northwest Quadrant	6-35
Exhibit 6-22	Future Airline/Aircraft Maintenance Facilities – West.....	6-36
Exhibit 6-23	Air Traffic Control Tower Line-of-Sight.....	6-39
Exhibit 7-1	Environmental Overview: Future Conditions	7-3
Exhibit 7-2	Runway Protection Zone Land Uses – Runway 1L End.....	7-8
Exhibit 7-3	Runway Protection Zone Land Uses – Runway 19R End.....	7-9
Exhibit 7-4	Runway Protection Zone Land Uses – Runway 7R End.....	7-10
Exhibit 7-5	Runway Protection Zone Land Uses – Runway 25L End.....	7-12
Exhibit 7-6	Runway Protection Zone Land Uses – Runway 7L End	7-13
Exhibit 7-7	Runway Protection Zone Land Uses – Runway 25R End	7-14
Exhibit 7-8	Runway Protection Zone Land Uses – Runway 13 End	7-16
Exhibit 7-9	Runway Protection Zone Land Uses – Runway 31 End	7-17
Exhibit 7-10	Runway Protection Zone Land Uses – Runway 1R End.....	7-18
Exhibit 7-11	Runway Protection Zone Land Uses – Runway 19L End.....	7-19
Exhibit 8-1	Aircraft Departure and Arrival Radar Tracks.....	8-10
Exhibit 8-2	Daytime Jet Departure Radar Tracks.....	8-11
Exhibit 8-3	Nighttime Jet Departure Radar Tracks	8-12
Exhibit 8-4	Daytime Jet Arrival Radar Tracks.....	8-13
Exhibit 8-5	Nighttime Jet Arrival Radar Tracks.....	8-14
Exhibit 8-6	Existing Conditions 2018 Day-Night Average Sound Level Noise Contours.....	8-16
Exhibit 8-7	Residential Sound Insulation Boundary	8-17
Exhibit 8-8	2009 Future Year Conditions 14 Code of Federal Regulations Part 150 Day-Night Average Sound Level Noise Contours.....	8-18
Exhibit 8-9	No Project 2023 Day-Night Average Sound Level Noise Contours.....	8-23
Exhibit 8-10	No Project 2028 Day-Night Average Sound Level Noise Contours.....	8-24
Exhibit 8-11	With Project 2023 Day-Night Average Sound Level Noise Contours	8-27

Exhibit 8-12 With Project 2028 Day-Night Average Sound Level Noise Contours8-28

Exhibit 9-1 Short-Term Development Projects (0 to 5 Years)9-7

Exhibit 9-2 Medium-Term Development Projects (6 to 10 Years)9-15

Exhibit 9-3 Long-Term Development Projects (11 to 22 Years)9-23

Exhibit 9-4 Decision Tree9-33

Exhibit 10-1 Sources of Funds 10-15

THIS PAGE INTENTIONALLY LEFT BLANK