

TABLE OF CONTENTS

TABLE OF CONTENTS	i
LIST OF APPENDICES	iv
LIST OF TABLES.....	vi
LIST OF FIGURES.....	viii
LIST OF ACRONYMS AND ABBREVIATIONS	x

<u>SECTION</u>	<u>PAGE</u>
1 INTRODUCTION	
1.1 THE PART 150 PROCESS.....	1
1.2 KEY WEST INTERNATIONAL AIRPORT NEM UPDATE.....	2
1.3 HISTORY AND SUMMARY OF THE NOISE COMPATIBILITY PLANNING PROCESS AT EYW	3
2 MUNICIPAL JURISDICTIONS AND LAND USE	
2.1 INTRODUCTION.....	5
2.2 EXISTING LAND USE	5
2.2.1 Residential	6
2.2.2 Community Facilities	6
2.2.3 Parks and Recreational Properties	7
2.2.4 Historical Resources	8
2.3 FUTURE LAND USE.....	10
2.4 DEMOGRAPHICS.....	10
2.5 LAND USE CONTROLS	19
2.5.1 City of Key West.....	21
2.5.2 County of Monroe.....	22
2.6 LAND USE COMPATIBILITY GUIDELINES.....	24
3 AIRPORT AND AIRSPACE CONSIDERATIONS	
3.1 INTRODUCTION.....	27
3.2 AIRFIELD CONFIGURATION.....	27
3.3 AIRSPACE/AIR TRAFFIC CONTROL PROCEDURES	28
3.3.1 Neighboring Airports	28
3.3.2 Operational Procedures	29
3.3.3 Flight Corridors.....	30
3.3.4 Existing Published Approaches	34
3.4 METEOROLOGICAL DATA.....	34

TABLE OF CONTENTS, CONTINUED

<u>SECTION</u>		<u>PAGE</u>
4	EXISTING CONDITION: YEAR 2022 NOISE EXPOSURE	
4.1	INTRODUCTION.....	42
4.2	METHOD FOR DEVELOPING FLEET MIX AND NUMBER OF OPERATIONS.....	42
4.2.1	Data Sources	42
4.2.1.1	FlightRadar24.....	43
4.2.1.2	OPSNET	43
4.2.1.3	TFMSC	44
4.2.1.4	EYW Landing Reports	44
4.2.2	Existing Condition Fleet Mix.....	44
4.2.2.1	Air Carrier / Air Taxi Jet.....	44
4.2.2.2	Air Carrier / Air Taxi Prop.....	45
4.2.2.3	General Aviation Jet.....	45
4.2.2.4	General Aviation Prop.....	45
4.2.2.5	Military.....	45
4.2.2.6	Helicopters	45
4.2.3	Existing Condition Number of Operations.....	46
4.2.4	Existing Condition Fleet Mix and Number of Operations.....	46
4.2.5	Time of Day	49
4.2.6	Departure Profiles and Stage Length	50
4.2.7	Runway Utilization	51
4.2.8	Back Taxi Operations.....	52
4.2.9	Standing Takeoff Operations	53
4.2.10	Low Approach, Touch-and-Go, and Go-Around Operations	54
4.2.11	Flight Tracks and Flight Track Utilization.....	54
4.2.12	Summary of Existing Condition NEM Modeled Operations	66
4.3	NOISE CONTOURS AND NONCOMPATIBLE LAND USES.....	67
5	FUTURE CONDITION: YEAR 2028 NOISE EXPOSURE	
5.1	INTRODUCTION.....	72
5.2	METHOD FOR DEVELOPING FLEET MIX AND NUMBER OF OPERATIONS.....	72
5.2.1	Data Sources	72
5.2.1.1	FAA Terminal Area Forecast	72
5.2.1.2	EYW Landing Reports	73
5.2.2	Future Condition Fleet Mix	74
5.2.2.1	Air Carrier / Air Taxi Jet.....	74
5.2.2.2	Air Carrier / Air Taxi Prop.....	75
5.2.2.3	General Aviation Jet.....	75

TABLE OF CONTENTS, CONTINUED

<u>SECTION</u>	<u>PAGE</u>
5.2.2.4 General Aviation Prop.....	75
5.2.2.5 Military.....	75
5.2.2.6 Helicopters	75
5.2.3 Future Condition Number of Operations	75
5.2.4 Future Condition Fleet Mix and Number of Operations	76
5.2.5 Time of Day.....	78
5.2.6 Departure Profiles and Stage Length	79
5.2.7 Runway Utilization	80
5.2.8 Back Taxi Operations.....	81
5.2.9 Standing Takeoff Operations	81
5.2.10 Low Approach, Touch-and-Go, and Go-Around Operations	82
5.2.11 Flight Tracks and Flight Track Utilization.....	82
5.2.12 Summary of Future Condition NEM Modeled Operations	83
5.3 NOISE CONTOURS AND NONCOMPATIBLE LAND USES.....	84
6 CONSULTATION AND PUBLIC PARTICIPATION	
6.1 INTRODUCTION.....	91
6.2 IDENTIFICATION OF CONSULTED PARTIES.....	91
6.3 MONROE COUNTY AD HOC COMMITTEE ON NOISE	92
6.4 DRAFT NEM UPDATE REPORT	94
6.5 PUBLIC INVOLVEMENT	95
6.6 MONROE COUNTY BOARD OF COUNTY COMMISSIONERS	95
6.7 AIRPORT OPERATOR'S CERTIFICATION	95
6.8 FAA REVIEW AND ACCEPTANCE OF NEMS	96
LIST OF REFERENCES	98

LIST OF APPENDICES

<u>APPENDIX</u>		<u>PAGE</u>
APPENDIX A HISTORY OF THE NOISE COMPATIBILITY PROGRAM AT KEY WEST INTERNATIONAL AIRPORT		
A.1	INTRODUCTION.....	A-1
A.2	MEASURES RECOMMENDED BY THE AIRPORT SPONSOR AND APPROVED BY THE FAA.....	A-2
A.3	MEASURES RECOMMENDED BY THE AIRPORT SPONSOR THAT DO NOT REQUIRE FAA APPROVAL.....	A-10
A.4	MEASURES RECOMMENDED BY THE AIRPORT SPONSOR IN THE 1999 NCP APPROVED BY THE FAA	A-13
A.5	MEASURES RECOMMENDED BY THE AIRPORT SPONSOR IN THE 1999 NCP DISAPPROVED BY THE FAA	A-15
A.6	HISTORY AND STATUS OF THE NOISE INSULATION PROGRAM	A-16
A.7	REFERENCES.....	A-19
APPENDIX B AIRCRAFT NOISE		
B.1	AIRCRAFT NOISE	B-1
B.2	AIRCRAFT NOISE TERMINOLOGY	B-1
B.3	EFFECTS OF AIRCRAFT NOISE ON PEOPLE	B-16
B.3.1	Speech Interference.....	B-16
B.3.2	Effect on Children's Learning.....	B-17
B.3.3	Sleep Disturbance.....	B-18
B.3.4	Vibration from Aircraft Operations.....	B-20
B.4	REFERENCES.....	B-22
APPENDIX C SUMMARY OF CONSULTATION		
C.1	INTRODUCTION.....	C-1
C.2	RESPONSES TO LETTER/EMAIL TO CONSULTED PARTIES	C-2
C.3	ONGOING COMMUNICATION WITH CONSULTED PARTIES	C-2
C.4	SUMMARY OF CONSULTATION WITH THE FEDERAL AVIATION ADMINISTRATION	C-3
C.5	SUMMARY OF CONSULTATION WITH DELTA AIRLINES	C-4
C.6	SUMMARY OF CONSULTATION WITH THE BUREAU OF HISTORIC PRESERVATION	C-4
C.7	SUMMARY OF CONSULTATION WITH THE AIRPORT TRAFFIC CONTROL TOWER	C-4
C.8	SUMMARY OF CONSULTATION WITH THE CITY OF KEY WEST PLANNING DEPARTMENT	C-4

LIST OF APPENDICES, CONTINUED

<u>APPENDIX</u>		<u>PAGE</u>
C.9	REFERENCES.....	C-5
APPENDIX D AD HOC COMMITTEE MINUTES AND PROOF OF PUBLICATION FOR MEETING ADVERTISEMENTS		
D.1	INTRODUCTION.....	D-1
D.2	OCTOBER 6, 2020	D-2
D.3	DECEMBER 1, 2020.....	D-15
D.4	MARCH 2, 2021.....	D-25
D.5	JUNE 1, 2021.....	D-42
D.6	OCTOBER 5, 2021	D-72
D.7	DECEMBER 7, 2021.....	D-94
D.8	MARCH 1, 2022.....	D-122
D.9	JUNE 7, 2022.....	D-146
D.10	OCTOBER 4, 2022	D-162
APPENDIX E PUBLIC COMMENTS AND RESPONSES		
E.1	INTRODUCTION.....	E-1
E.2	COMMENTS AND QUESTIONS RECEIVED DURING DEVELOPMENT OF THE NEMS.....	E-1
E.2.1	October 6, 2020	E-1
E.2.2	December 1, 2020	E-1
E.2.3	March 2, 2021	E-2
E.2.4	June 1, 2021	E-2
E.2.5	October 5, 2021	E-2
E.2.6	December 7, 2021	E-3
E.2.7	March 1, 2022	E-3
E.2.8	June 7, 2022	E-3
E.3	COMMENTS SUBMITTED DURING PUBLIC REVIEW PERIOD.....	E-3
E.4	REFERENCES.....	E-6
APPENDIX F NEM REVIEW AND ACCEPTANCE DOCUMENTATION		
F.1	INTRODUCTION.....	F-1
F.2	REFERENCES.....	F-2
APPENDIX G LARGE SCALE FLIGHT TRACK MAPS AND NOISE EXPOSURE MAPS		
G.1	INTRODUCTION.....	G-1
G.2	REFERENCES.....	G-1

LIST OF TABLES

<u>TABLE</u>	<u>PAGE</u>
2.1 HISTORICAL AND ANTICIPATED FUTURE POPULATION LEVELS	11
2.2 TITLE 14 CFR PART 150 LAND USE COMPATIBILITY GUIDELINES.....	25
3.1 AIRPORTS AND HELIPORTS WITHIN 25 NM OF EYW	29
3.2 FLIGHT CORRIDORS WITHIN 25 NM OF EYW	31
3.3 AVERAGE WINDSPEED AT EYW	35
4.1 SUMMARY OF DATA SOURCES	46
4.2 FLEET MIX AND NUMBER OF FLIGHT OPERATIONS.....	47
4.3 DAYTIME VS. NIGHTTIME DISTRIBUTION.....	49
4.4 STAGE LENGTH DEFINITIONS	51
4.5 STAGE LENGTH DISTRIBUTION.....	51
4.6 RUNWAY UTILIZATION – DEPARTURES	52
4.7 RUNWAY UTILIZATION – ARRIVALS	52
4.8 BACK TAXI DISTRIBUTION.....	53
4.9 STANDING TAKEOFF OPERATIONS	53
4.10 TOUCH-AND-GO OPERATIONS	54
4.11 SUMMARY OF EXISTING FLIGHT OPERATIONS	66
4.12 EXISTING CONDITION NOISE EXPOSURE ESTIMATES - ACREAGE	68
4.13 EXISTING CONDITION NOISE EXPOSURE ESTIMATES – HOUSING UNITS AND POPULATION.....	69
5.1 FAA TERMINAL AREA FORECAST FOR EYW FOR 2028.....	73
5.2 SUMMARY OF EYW LANDING REPORTS	74
5.3 INTERIM AC/AT JET FLEET MIX AND NUMBER OF OPERATIONS	76
5.4 FINAL AC/AT JET FLEET MIX AND NUMBER OF OPERATIONS	76
5.5 FLEET MIX AND NUMBER OF ANNUAL FLIGHT OPERATIONS	77
5.6 DAYTIME VS. NIGHTTIME DISTRIBUTION	79
5.7 STAGE LENGTH DISTRIBUTION.....	80
5.8 RUNWAY UTILIZATION – DEPARTURES	80
5.9 RUNWAY UTILIZATION – ARRIVALS	81
5.10 STANDING TAKEOFF OPERATIONS	81
5.11 TOUCH-AND-GO OPERATIONS	82
5.12 SUMMARY OF FUTURE FLIGHT OPERATIONS	83
5.13 FUTURE CONDITION NOISE EXPOSURE ESTIMATES - ACREAGE	85
5.14 FUTURE CONDITION NOISE EXPOSURE ESTIMATES HOUSING UNITS AND POPULATION.....	86
6.1 MEMBERS OF THE AD HOC COMMITTEE ON NOISE	93

LIST OF TABLES, CONTINUED

<u>TABLE</u>	<u>PAGE</u>
A.1 NUMBER OF HOMES INSULATED IN THE “ORIGINAL” NIP, BY PHASE	A-17
A.2 NUMBER OF KWBTS CONDOMINIUMS INSULATED IN THE NIP, BY PHASE	A-18

LIST OF FIGURES

<u>FIGURE</u>	<u>PAGE</u>
2.1 GENERAL STUDY AREA.....	13
2.2 DETAILED STUDY AREA.....	14
2.3 EXISTING LAND USE	15
2.4 COMMUNITY AND RECREATIONAL FACILITIES.....	16
2.5 HISTORICAL RESOURCES.....	17
2.6 CITY OF KEY WEST FUTURE LAND USE MAP.....	18
3.1 EYW AIRSPACE	32
3.2 EYW AIRSPACE LEGEND	33
3.3 PUBLISHED RNAV (GPS) RWY 09 APPROACH PROCEDURE.....	36
3.4 PUBLISHED RNAV (GPS) RWY 27 APPROACH PROCEDURE.....	37
3.5 PUBLISHED NDB-A APPROACH PROCEDURE	38
3.6 ANNUAL WIND DIRECTION FREQUENCY	39
3.7 MONTHLY WIND DIRECTION FREQUENCY, JANUARY — JUNE	40
3.8 MONTHLY WIND DIRECTION FREQUENCY, JULY — DECEMBER	41
4.1 EAST FLOW AC/AT JET FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	56
4.2 EAST FLOW AC/AT PROP FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	57
4.3 EAST FLOW GA JET FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	58
4.4 EAST FLOW GA PROP FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	59
4.5 WEST FLOW AC/AT JET FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	60
4.6 WEST FLOW AC/AT PROP FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	61
4.7 WEST FLOW GA JET FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	62
4.8 WEST FLOW GA PROP FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	63
4.9 HELICOPTERS FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	64
4.10 TOUCH & GO FR24 FLIGHT TRAJECTORIES WITH AEDT MODELED FLIGHT TRACKS AND UTILIZATION	65
4.11 2022 EXISTING CONDITION NOISE EXPOSURE MAP	70
4.12 COMPARISON OF 2022 EXISTING CONDITION AND 2013 EXISTING CONDITION NOISE EXPOSURE MAPS.....	71

LIST OF FIGURES, CONTINUED

<u>FIGURE</u>	<u>PAGE</u>
5.1 2028 FUTURE CONDITION NOISE EXPOSURE MAP	88
5.2 COMPARISON OF 2022 EXISTING CONDITION AND 2028 FUTURE CONDITION NOISE EXPOSURE MAPS.....	89
5.3 COMPARISON OF 2028 FUTURE CONDITION AND 2018 FUTURE CONDITION NOISE EXPOSURE MAPS.....	90
A.1 VOLUNTARY NOISE ABATEMENT PROCEDURES, PILOT HANDOUT PAGE 1	A-21
A.2 VOLUNTARY NOISE ABATEMENT PROCEDURES, PILOT HANDOUT PAGE 2.....	A-22
A.3 PROGRAM MITIGATION AREA BASED ON THE YEAR 2003 FUTURE CONDITION NEM...A-23	A-23
A.4 PHASE 6 BASED ON THE 2005 NOISE CONTOUR UPDATE.....	A-24
A.5 PHASE 7 BASED ON THE 2008 NEM UPDATE	A-25
A.6 295 HOMES INSULATED IN THE "ORIGINAL" NIP	A-26
A.7 185 CONDOMINIUMS INSULATED IN THE KWBTS NIP	A-27
A.8 296 HOMES INSULATED IN THE NIP	A-28
B.1 COMMON OUTDOOR AND INDOOR SOUND LEVELS	B-3
B.2 COMPARISON OF MAXIMUM SOUND LEVEL (L_{MAX}) AND SOUND EXPOSURE LEVEL (SEL).....	B-5
B.3 TYPICAL RANGE OF OUTDOOR COMMUNITY DAY-NIGHT AVERAGE SOUND LEVELS ...B-7	B-7
B.4 STEP 1: WHAT DID YOU HEAR?	B-8
B.5 STEP 2: HOW LOUD IS THAT?	B-9
B.6 STEP 3: HOW LONG DID IT LAST?	B-10
B.7 DAY-NIGHT AVERAGE SOUND LEVEL EQUATION.....	B-11
B.8 STEP 4: HOW OFTEN DID YOU HEAR IT?	B-12
B.9 ANOTHER AIRBUS A-319 L_{MAX} SAMPLE MEASUREMENT ON APPROACH.....	B-13
B.10 ANOTHER SOUND EXPOSURE COMPARISON.....	B-14
B.11 ANOTHER DAY-NIGHT AVERAGE SOUND LEVEL SAMPLE CALCULATION.....	B-15
B.12 PERCENT SENTENCE INTELLIGIBILITY FOR INDOOR SPEECH	B-17
B.13 SLEEP DISTURBANCE DOSE-RESPONSE RELATIONSHIP	B-19
B.14 NUMBER OF AWAKENINGS AS A FUNCTION OF MAXIMUM INDOOR NOISE LEVEL	B-20
G.1 EAST FLOW FLIGHT TRACKS	
G.2 WEST FLOW FLIGHT TRACKS	
G.3 2022 NOISE EXISTING CONDITION EXPOSURE MAP	
G.4 2028 FUTURE CONDITION NOISE EXPOSURE MAP	