



SKY

HARBOR

INTERNATIONAL

AIRPORT

F.A.R.

PART 150

NOISE COMPATIBILITY

STUDY



NOISE EXPOSURE MAPS

**NOISE EXPOSURE MAP
DOCUMENTATION**

for

**PHOENIX SKY HARBOR
INTERNATIONAL AIRPORT**

Prepared for the

**CITY of PHOENIX
AVIATION DEPARTMENT
PHOENIX, ARIZONA**

By

Coffman Associates, Inc.

1987

TABLE OF CONTENTS

SKY HARBOR INTERNATIONAL AIRPORT

F.A.R. Part 150

Noise Compatibility Study

TABLE OF CONTENTS

PREFACE

WHAT IS A PART 150 STUDY?	i
STUDY PURPOSE	ii
STUDY OBJECTIVES	ii
STUDY APPROACH	iii
STUDY SPONSOR	iii
PLANNING ADVISORY COMMITTEE	iv
PUBLIC INVOLVEMENT	iv

Part One

NOISE EXPOSURE MAPS

CHECKLIST FOR NOISE EXPOSURE MAPS	CK-1
-----------------------------------	------

Chapter One

EXISTING CONDITIONS

AIRPORT LOCATION AND HISTORY	1-2
AIRPORT FACILITIES	1-2
Runway/Taxiway System	1-2
Navigational Aids	1-4
Lighting	1-5
Terminal Areas	1-6
AIRFIELD OPERATIONS	1-7
Activity Levels	1-7
Time of Day	1-9
Fleet Mix	1-10
Stage Lengths	1-10
Runway Utilization	1-12
Existing Noise Abatement Efforts	1-12

Chapter One (Cont.)

AIRSPACE AND ATC	1-14
NEIGHBORING AIRPORTS	1-16
STUDY AREA DELINEATION	1-17
JURISDICTIONS AND RESPONSIBILITIES	1-19
Federal	1-19
State and Local	1-20
Airport Proprietor	1-21
SOCIOECONOMIC PROFILE	1-22
Existing Land Use	1-22
Population	1-25
Economy	1-30
Comprehensive City Plans	1-31
Zoning	1-33
Subdivision Regulations	1-43
Building Codes	1-43
Capital Improvements Programs	1-43

Chapter Two

AVIATION NOISE

NOISE METHODOLOGY	2-1
Ldn Noise Metric	2-2
Noise Contours	2-4
AIRCRAFT NOISE CALIBRATION MEASUREMENT PROGRAM	2-5
Aircraft Noise Measurement Sites	2-6
Sound Propagation Effects	2-9
Acoustical Measurements	2-9
ANALYSIS OF AIRCRAFT NOISE	2-12
Integrated Noise Model	2-13
INM Program Input	2-13
INM Output	2-32
SUMMARY	2-38

Chapter Three

COMMUNITY NOISE

BACKGROUND NOISE EVALUATIONS	3-1
Indigenous Noise Exposure	3-2
Surface Transportation Noise Exposure	3-3
Ambient Noise Exposure	3-5
Total Noise	3-7
Differential Noise Exposure	3-7
BACKGROUND NOISE MEASUREMENTS	3-8
Ambient Noise Measurement Sites	3-8
Ambient Noise Measurement Results	3-11
SUMMARY	3-12

Chapter Four

NOISE IMPACTS

EFFECTS OF NOISE EXPOSURE	4-1
Physical And Psychological Effects	4-1
Land Use Compatibility	4-3
IMPACTS ON CURRENT POPULATION	4-6
NON-RESIDENTIAL IMPACTS	4-10
POTENTIAL GROWTH RISK	4-14
Methodology	4-14
Residential Development	4-15
FUTURE POPULATION IMPACTS	4-16

APPENDICES

APPENDIX A - PLANNING ADVISORY COMMITTEE	A-1
APPENDIX B - COORDINATION, CONSULTATION, AND PUBLIC INVOLVEMENT	B-1
APPENDIX C - INM NOISE CONTOUR DATA SUMMARIES	C-1

GLOSSARY

EXHIBITS

1A	AIRPORT VICINITY
1B	EXISTING AND PROPOSED FACILITIES
1C	HOURLY DISTRIBUTION OF AIR CARRIER TRAFFIC
1D	AIRSPACE STRUCTURE
1E	ARRIVAL AND DEPARTURE ROUTES
1F	PHOENIX AIRPORT RADAR SERVICE AREA AND CONTROL ZONES
1G	AIRPORT STUDY AREA
1H	EXISTING LAND USE
1I	COMPOSITE GENERAL PLAN FOR FUTURE LAND USE
2A	DAY-NIGHT SOUND LEVEL METHOD OF CALCULATION
2B	TYPICAL NOISE-PATTERN OF LDN SUMMATION METHODOLOGY
2C	DISTRIBUTION OF AIRCRAFT NOISE COMPLAINTS
2D	CALIBRATION NOISE MEASUREMENT SITES
2E	DEPARTURE TRACKS
2F	ARRIVAL TRACKS
2G	737-300 AND 727-1/200 DEPARTURE PROFILES
2H	737-1/200 DEPARTURE PROFILES
2I	TYPICAL SLANT RANGE DISTANCE CALCULATION
2J	1987 NOISE EXPOSURE CONTOURS
2K	1992 NOISE EXPOSURE CONTOURS
2L	1997 NOISE EXPOSURE CONTOURS
2M	2007 NOISE EXPOSURE CONTOURS
2N	CONTOUR VALIDATION MEASUREMENT SITES
3A (EAST)	INDIGENOUS NOISE EXPOSURE PATTERN
3A (WEST)	INDIGENOUS NOISE EXPOSURE PATTERN

EXHIBITS (Cont.)

- 3B (EAST) SURFACE TRANSPORTATION NOISE EXPOSURE PATTERN
- 3B (WEST) SURFACE TRANSPORTATION NOISE EXPOSURE PATTERN
- 3C (EAST) AMBIENT NOISE EXPOSURE PATTERN
- 3C (WEST) AMBIENT NOISE EXPOSURE PATTERN
- 3D (EAST) TOTAL NOISE EXPOSURE PATTERN
- 3D (WEST) TOTAL NOISE EXPOSURE PATTERN
- 3E (EAST) DIFFERENTIAL NOISE EXPOSURE
- 3E (WEST) DIFFERENTIAL NOISE EXPOSURE
- 3F BACKGROUND NOISE MEASUREMENT SITES

- 4A LAND USE SENSITIVITY MATRIX
- 4B (WEST) 1987 NOISE LEVELS OVER CURRENT RESIDENTIAL AREAS
- 4B (EAST) 1987 NOISE LEVELS OVER CURRENT RESIDENTIAL AREAS
- 4C (WEST) EXISTING NOISE SENSITIVE LAND USES
- 4C (EAST) EXISTING NOISE SENSITIVE LAND USES
- 4D (WEST) 1992 NOISE LEVELS OVER 1992 RESIDENCES
- 4D (EAST) 1992 NOISE LEVELS OVER 1992 RESIDENCES
- 4E (WEST) 1997 NOISE LEVELS OVER 1997 RESIDENCES
- 4E (EAST) 1997 NOISE LEVELS OVER 1997 RESIDENCES
- 4F (WEST) 2007 NOISE LEVELS OVER 2007 RESIDENCES
- 4F (EAST) 2007 NOISE LEVELS OVER 2007 RESIDENCES