Tempe Aviation Commission

Commissioner's Binder

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INVENTORY

1. Abbreviations

AEDT	Aviation Environmental Design Tool
AEE	FAA Office of Environment and Energy
AIP	Airport Improvement Plan/Program
ALP	Airport Layout Plan
ALPA	Airlines Pilots Association
ALS	Approach Lighting System
AOPA	Aircraft Owners and Pilots Association
ARTCC	Air Route Traffic Control Center
ARTS	Automated Radar Terminal System
ASDE	Area Surveillance Detection Equipment - (Radar)
ASDE-X	Airport Surface Detection Equipment (In use at PHX, shows all airport ground movements day and night on ATCT monitors).
ATC	Air Traffic Control
ATCT	Airport Traffic Control Tower
ATO	Air Traffic Organization
AVN	Aviation Standards National Field Office, Oklahoma City
AWP	Western Pacific Region
CAA	Clean Air Act
CATX	Categorical Exclusion
CDA	Continuous Descent Arrival
CFR	Code of Federal Regulations
CNS	Communications, Navigation and Surveillance
DA/H	Decision Altitude/Height
dBA	Decibels A-Weighted (sound measured at frequencies that reflect the sensitivity ranges of the human ear).
DEP	Departure
DH	Decision Height, (point of initiation of descent).
DME	Distance Measuring Equipment (4-DME means 4 NM from the measuring equipment, the PHX VORTAC close to the East Valley Bus Operations & Maintenance Facility in Tempe).

1. Abbreviations

GA	General Aviation
GDP	Ground Delay Program
GPS	Global Positioning System
GS	Glide Slope
GSE	Ground Support Equipment
HELI	Heliport
IAF	Initial Approach Fix
IAP	Instrument Approach Procedures
ICAO	International Civil Aviation Organization
IFP	Instrument Flight Procedures
IFR	Instrument Flight Rules
IGA	Intergovernmental Agreement (1994 Tempe/Phoenix on Noise Mitigation Flight Procedures).
ILS	Instrument Landing System
IM	Inner Marker (indicates the point at which an aircraft is at the decision height on the glidepath during a Category II ILS approach).
IMC	Instrument Meteorological Conditions
LAAS	Local Area Augmentation System (Enable smaller GA aircraft to use satellite based navigation/GPS).
MOA	Military Operations Area
MPO	Metropolitan Planning Organization (Maricopa Association of Governments, MAG)
NAAQS	National Ambient Air Quality Standards
NAS	National Airspace System
NATCA	National Air Traffic Control Association
NAVAID	Navigation Aid
NCP	Noise Compatibility Program
NEM	Noise Exposure Map

1. Abbreviations

NEPA	National Environmental Policy Act
NextGen	Next Generation Air Transportation System
NM	Nautical Mile
NPRM	Notice of Proposed Rulemaking
NTSB	National Transportation Safety Board
OE/AAA	Obstruction Evaluation/Airport Airspace Analysis
OEP	Operational Evolution Plan
OM	Outer Marker
OPS	Operations
PAPI	Precision Approach Path Indicator
RAIL	Runway Alignment Indicator Lights
RAPCON	Radar Approach Control (Luke AFB)
RASP	Regional Airport System Plan (Developed by MPOs)
RNAV	Area Navigation
RNP	Required Navigation Performance
ROD	Record of Decision
RSA	Runway Safety Area
RWY	Runway
SEL	Single Event Level
SFAR	Special Federal Aviation Regulations
SID	Standard Instrument Departure
SIP	State Implementation Plan
SM	Statute Mile
SPRKY	Satellite navigation fix (waypoint) for PHX RNAV IDP to the east, located at 4-DME in the center of the PHX Gate.
STAR	Standard Terminal Arrival Route

1. Abbreviations

STARS	Standard Terminal Automation Replacement System, (allowed display of display of both digital flight data and conventional analogue radar data for PHX TRACON).
TAC	Terminal Area Chart
TCA	Terminal Control Area. Traffic Control Airport or Tower Control Airport
TERP	Terminal Instrument Procedure
TFR	Temporary Flight Restriction
TRACON	Terminal Radar Approach Control
TWY	Taxiway
UAS	Unmanned Aircraft Systems
VALE	Voluntary Airport Low Emission Program
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VORTAC	Very High Frequency Omnidirectional Range Collocated Tactical Air
WAAS	Wide Area Augmentation System
ZAB	Albuquerque ARTCC (Air Traffic Control center takes over control high altitude departure traffic from PHX and feeds air traffic to air traffic controllers at PHX TRACON).

2. Functions and Responsibilities

City of Tempe Ordinance No. 95.15

ARTICLE V. BOARDS, COMMISSIONS, ETC.

DIVISION 1. GENERALLY

Sec. 2-181. Powers and duties.

(a) All boards and commissions established by the city shall have the following powers and duties unless otherwise specified:

(1) To act in an advisory capacity to the city council for the purpose of making recommendations consistent with its duties;

(2) To establish such rules and regulations as it deems necessary for its government and for the faithful performance of its duties; to set a time for regular meetings which shall be held at least once a month if there is business to transact; to establish the manner in which special meetings may be held and the notice to be given thereof; and to provide that a majority of the total number of members shall constitute a quorum. The affirmative vote of a majority of the members participating in the meeting shall be required for passage of any matter before the board;

(3) To organize by electing one of its members as chairman of the board and one as vice-chairman. The city staff representative assigned to the board or commission shall act as secretary but shall not be entitled to take part in any voting;

(4) To require attendance of the members at regular meetings and provide that absence from three (3) consecutive regular meetings or six (6) meetings within any twelve (12) month time period without consent from the chairman or vice-chairman if the chairman is unavailable, shall be deemed to constitute a resignation and such position shall thereupon be deemed vacant;

(5) To consult, through the chairman of the board, or the vice-chairman if the chairman is unavailable, with the assigned city department on the items to be included on the agenda of the meetings prior to preparation and distribution of the agenda by the assigned city department; and

(6) To review and approve the official minutes of the board or commission as prepared by the assigned city department no later than thirty (30) days after the meeting or commission and if such minutes cannot be approved, for any reason, within such period of time, such minutes shall be transferred to the city council without approval.

(b) All boards and commissions shall have the authority to create subcommittees, subject to the following restrictions:

(1) Subcommittees shall be created upon written notice to the city council. The request shall state in detail the purpose for its creation, the members of the board or commission who will comprise its membership and the anticipated additional resources needed to adequately staff the subcommittee;

(2) All subcommittees shall sunset within one (1) year of creation, or until its intended purpose has been met. The city council may dissolve a subcommittee at any time;

(3) All members of subcommittees must be current members of originating board or commission;

(4) No board or commission may have more than two (2) active subcommittees at the same time; and

(5) Subcommittees must meet all requirements of state law, the city charter and this code.

(Ord. No. 2008.01, 1-24-08; Ord. No. 2008.68, 11-20-08; Ord. No. 2012.35, 8-9-12)

Sec. 2-182. Terms and removal.

(a) The mayor, with the approval of the city council, shall select for appointment and reappointment the members of each board and commission. Unless otherwise specified, the members of each board and commission shall be selected from residents of the city.

(b) The term of office for each member of the board and commission shall be from the first of January of each year and end on the 31st day of December, three (3) years thereafter except if otherwise provided in this article.

(c) Members of the board and commission may not serve more than three (3) total terms on any board or commission, and not more than two (2) complete consecutive terms.

(d) Any vacancy shall be filled for the unexpired term of the member whose office is vacant in the same manner as such member received original appointment.

The mayor, with the approval of the city council, may for cause remove any member of the board or commission.

(Ord. No. 2008.01, 1-24-08)

Sec. 2-183. Compensation of members.

Members shall receive no compensation for their service.

(Ord. No. 2008.01, 1-24-08)

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Members shall receive no compensation for their service.

(Ord. No. 2008.01, 1-24-08)

Secs. 2-184—2-190. Reserved.

DIVISION 5. AVIATION COMMISSION

Sec. 2-215. Established; composition.

(a) There is hereby established the Tempe aviation commission to be composed of nine (9) members.

(b) In addition to the terms of office as specified in § 2-182 of this article, terms shall be staggered so that the term of no more than four (4) members shall conclude in any given year.

(c) There shall be commission members from neighborhoods located in geographic areas throughout the community that are impacted by aircraft operations including areas within the LDN 65 noise contour for the Phoenix Sky Harbor International Airport.

(d) The city manager or his designee shall serve the aviation commission in an advisory capacity.

(Ord. No. 95.15, 4-27-95; Ord. No. 2008.01, 1-24-08; Ord. No. 2010.36, 11-4-10; Ord. No. O2014.22, 6-12-14)

(Ord. No. 95.15, 4-27-95; Ord. No. 2008.01, 1-24-08)

Sec. 2-216. Repealed.

(Ord. No. 95.15, 4-27-95; Ord. No. 2008.01, 1-24-08)

Sec. 2-217. Repealed.

(Ord. No. 95.15, 4-27-95; Ord. No. 2008.01, 1-24-08)

Secs. 2-184—2-190. Reserved.

Sec. 2-219. Officers.

The initial officers of the commission shall be selected by the mayor, with the approval of the city council. Thereafter, the officers of the commission shall be selected by the commission members at the first meeting of commission following the 31st day of December of each year and shall serve from January 1 until the 31st day of December of the next succeeding year. No officer may serve in the same capacity for more than three (3) consecutive one-year terms.
(Ord. No. 95.15, 4-27-95)

Sec. 2-220. Powers and duties.

The aviation commission shall have the following powers and duties:

(1) To advise the mayor and city council and assist city regarding the impact of aircraft and airport operations on Tempe residents;

(2) To advise the mayor and city council and assist city departments in the monitoring, implementation and enforcement of agreements made between the City of Phoenix and City of Tempe concerning the operations of Sky Harbor International Airport;

(3) To advise the mayor and city council and assist city department in studies conducted of local airports and their development, with regard to potential impacts on Tempe residents; and;

(4) To advise the mayor and city council and assist city departments on land use measures that could mitigate the impact of aircraft and airport operations.

(Ord. No. 95.15, 4-27-95; Ord. No. 2008.01, 1-24-08; Ord. No. 2010.36, 11-4-10) (Ord.

Secs. 2-221—2-224. Reserved.

2. Functions and Responsibilities

Rules of Procedure of Tempe Aviation Commission

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TAVCO
Tempe Aviation Commission

Tempe
Municipal Utilities

February 9, 2021

Subject: TAVCO Resolution - Revised Rules of Procedure

Whereas the Tempe Aviation Commission in performance of its duties needs to update its Rules of Procedure to ensure members have access to appropriate meeting guidance, the commission has adopted by resolution on February 9, 2021, the attached revised rules of procedure. The rules were initially adopted on April 9, 1996, and last updated by resolution on February 20, 2020. This rule revision clarifies the selection of officers on an interim basis, the authority of the Chairperson to defer or decline matters brought before the commission that have previously been discussed and settled by the Commission, and clarifies that Commissioners may attend meetings telephonically or virtually through an online platform. There are also conforming changes.

On behalf of the Tempe Aviation Commission,

W. David Edison
Chairperson

Attachment: Rules of Procedure for the Tempe Aviation Commission with amendments of February 11, 2020.

RULES OF PROCEDURE

OF

TEMPE AVIATION COMMISSION

ARTICLE I

PURPOSE

The purpose of the Rules of Procedure is to assist members of the Tempe Aviation Commission to faithfully carry out their duties as set forth in Tempe City Code (T.C.C.) Sec. 2-220 adopted by the City Council of the City of Tempe, Arizona.

ARTICLE II

OFFICERS AND STAFF

SECTION 1. **Chairperson**. A member of the Commission shall be selected to serve as Chairperson by a majority vote of the members. The Chairperson shall decide all points of order and procedure, subject to these rules. The Chairperson may assign tasks to the Commissioners and may appoint members to any subcommittees established by the City Council to investigate the matters before the Commission under T.C.C. Sec. 2-220.

SECTION 2. **Vice-Chairperson**. A Vice-Chairperson shall be selected by majority vote of the Commissioners pursuant to T.C.C. Sec. 2-219. The Vice-Chairperson shall serve as Chairperson in the absence of the Chairperson, and at such times shall have the same powers and duties as the Chairperson.

SECTION 3. **Staff Representative**. The staff representative designated by the City Manager under T.C.C. Sec. 2-215 (d) shall serve the Commission in an advisory capacity and shall act as Commission secretary.

SECTION 4. **Selection of Officers**. By majority vote a Chairperson and a Vice-Chairperson shall be selected as provided in T.C.C. Sec. 2-219. If the Commission is left without a Chairperson or a Vice-Chairperson in office during a term, the selection of an interim officer midterm may occur if no current officers are able to attend the remaining meetings until new officer(s) are selected by a majority vote at the first meeting of the succeeding year as provided by T.C.C. Sec. 2-219.

ARTICLE III

COMMISSIONER DUTIES

SECTION 1. **Attendance**. Commissioners shall attend Commission meetings unless excused by the Chairperson on behalf of the Commission. If the Chairperson is unavailable or fails to participate, the Vice Chairperson shall consider requests for excused absences from Commissioners. Any Commissioner who is absent without reasonable cause and consent from the Chairperson (which consent shall not be unreasonably withheld) for three (3) consecutive meetings or six (6) meetings within any twelve (12) month period shall be deemed automatically to have resigned such Commissioner's office without notice or any further action of the Commission. For purposes of this Section 1, reasonable cause shall mean some cause affecting or concerning the ability or fitness of the Commissioner to perform the duties imposed, including the failure to participate in trainings or meetings of the Commission. A request to be excused shall be made to the staff liaison within twenty-

four (24) hours of a meeting to allow the Chairperson to ascertain whether attendance will satisfy the requirement for a quorum to conduct business under Sec. 2-181 (a) (2) and Sec. 2-215 (a). Participation in a meeting telephonically or virtually through an online platform pursuant to this section shall constitute attendance at the meeting.

SECTION 2. **Preparedness**. Prior to scheduled Commission meetings Commissioners should review all items on the agenda, draft meeting minutes or any other distributed material in order to contribute to deliberations and assist the Commission in making informed decisions.

SECTION 3. **Assistance**. Commissioners shall assist the Chairperson, to the best of their abilities, to explore matters before the Commission listed on the meeting agenda for discussions or actions as necessary, and defer other matters related to discussions to a future meeting when the matter(s) can be specifically listed on a Commission meeting agenda. The Chairperson has the authority to defer or decline matters brought before the commission that have previously been discussed and settled by the Commission to a future agenda.

SECTION 4. **Conflict-of-Interest**. Any Commissioner having a substantial interest as defined by Arizona Revised Statutes §38-501 et seq. on any matter being decided by the Commission, or who considers that they cannot make an unbiased decision, shall make that fact known in the official records of the Commission and shall refrain from participating in any manner in discussions concerning the matter, or voting on the matter.

SECTION 5. **Resignation**. Commissioners shall notify the Chairperson and the Tempe City Clerk of any change in their resident status under T.C.C. Sec. 2-182(a), or their

future ability or willingness to serve as a Commissioner. The Commissioner shall submit a written resignation from the Commission without delay by letter or e-mail.

ARTICLE IV

MEETINGS

SECTION 1. **Regular Meetings**. Regular meetings of the Commission shall be held on the same day of the week each month if the Commission has business to transact, unless the Commission has cause to hold a meeting on a different day from the regularly scheduled meeting.

SECTION 2. **Special Meetings**. Special meetings of the Commission may be called at the discretion of the Chairperson or at the request of at least three Commissioners.

SECTION 3. **Cancellation of Meetings**. If the Chairperson knows that there will not be a quorum to conduct the business of the Commission, the Chairperson may cancel a regular meeting by giving notice to all the members as soon as possible, and will use his or her best efforts to notify Commissioners at least forty-eight (48) hours before the time set to begin the meeting.

SECTION 4. **Notice of Meetings**. Except as otherwise provided in these Rules, notice of all Commission meetings shall be mailed at least three days before the meeting day, or sent by facsimile or e-mail at least twenty-four hours before the meeting, to the usual business, residential or email address designated by each Commissioner. The Commission shall not conduct any business for which notice complying with the Arizona Open Meeting Law, Arizona Revised Statutes § 38-431.02, has not lawfully been given.

SECTION 5. **Quorum**. Pursuant to T.C.C. Sec. 2-181 (a) (2) and Sec. 2-215a, the presence of five (5) Commissioners constitutes a quorum necessary for the transaction of business at any meeting. If less than a quorum is present at a meeting, a majority of those present may adjourn the meeting without notice to any absent Commissioner.

SECTION 6. **Place of Meetings**. Regular meetings of the Commission shall be held within the City of Tempe, however the Chairperson may decide to hold a meeting elsewhere with adequate notice under the Open Meetings Law, and may hold meetings telephonically or virtually through an online platform. All persons participating in the meeting, including the members of the public who wish to participate, must have a means be able to hear each other and communicate when appropriate. Accommodations will be made whenever possible, pursuant to the Americans for Disabilities Act, as amended from time to time.

SECTION 7. **Voting**. The Commissioners shall have equal voting rights on all matters before the Commission; each Commissioner shall have one vote.

ARTICLE V

SUBCOMMITTEES

The Commission may submit, by majority vote, a written notice to the City Council of the creation of a subcommittee pursuant to T.C.C. Sec. 2-181 (b). The written notice to the City Council shall include a detailed account for the subcommittee's need and purpose, the members of the Commission who will comprise the subcommittee's membership, and the anticipated additional resources needed to adequately staff the subcommittee. The Commission shall set a timeframe for the subcommittee's existence, which is not to exceed one year unless more time is deemed necessary to reach the intended purpose. The

Chairperson may only appoint subcommittee members from among the Commissioners. The Commission, with or without cause, may dissolve any such subcommittee or remove any subcommittee member at any time. The designation of a subcommittee and the delegation of authority to a subcommittee shall not relieve the Commission, or any Commissioner, of any responsibility imposed by law nor relieve the subcommittee from following all State Law, City Charter and the City Code requirements.

ARTICLE VI

PARLIAMENTARY RULES

Except as altered by these Rules or the laws of the City of Tempe or the State of Arizona, the meetings of the Commission shall be administered by consent. If a Commissioner requests to proceed more formally, the latest edition of Robert's Rules of Order, Newly Revised, shall govern the proceedings of Commission and committee meetings until the members present at a meeting agree to return to administration by consensus.

ARTICLE IX

REPEAL, ALTERATION OR AMENDMENT

The Commission, by a majority vote of the full Commission, may repeal, alter, or amend these Rules or adopt substitute rules at any time[iii].

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[i] The Commissioners of the Tempe Aviation Commission adopted rule amendments by resolution of July 8, 2014. to include City Code amendments made August 9, 2012, by the Tempe City Council's adoption of Ordinance No 2012.35 for the establishment of subcommittees and June 12, 2014, by adoption of Ordinance No O2014.22 relating to Boards and Commissions.

[ii] The Commissioners of the Tempe Aviation Commission adopted rule amendments that clarifies the meaning of the phrasing relating to attendance and assistance expected from members of the Commission by resolution of February 11, 2020.

2. Functions and Responsibilities

Excerpt from *Arizona Agency Handbook Chapter 7 Open Meetings*

CHAPTER 7

OPEN MEETINGS

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Revised 2018

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CHAPTER 7

OPEN MEETINGS

7.1 Scope of this Chapter. This Chapter discusses Arizona's Open Meeting Law, A.R.S. §§ 38-431 to -431.09, with particular emphasis on the application of the Open Meeting Law to the day-to-day operations of state officers, bodies, and agencies. This Chapter shall be conspicuously posted on the Secretary of State's website for state public bodies, the city or town clerk for municipal public bodies and the county clerk for all other local public bodies. A.R.S. § 38-431.01(G). Individuals elected or appointed to a public body shall review this Chapter at least one day before taking office. *Id.*

This Chapter does not resolve all issues that may arise under the Open Meeting Law, but rather is intended to serve as a reference for public officials who must comply with the Open Meeting Law. Officials faced with a situation not specifically addressed in this Chapter should consult their legal counsel before proceeding.

7.2 Arizona's Open Meeting Law.

7.2.1 History of Arizona's Open Meeting Law. All fifty states have enacted some type of legislation providing the public with a statutory right to openness in government. In addition, in 1976 the United States Congress enacted the Federal Open Meeting Act, 5 U.S.C. § 552b. Arizona enacted its Open Meeting Law in 1962 and has since amended it several times. For a detailed discussion of the early history of the Open Meeting Law through 1975, *see* Ariz. Att'y Gen. Op. 75-7.

7.2.2 Legislative Intent. The Legislature has repeatedly expressed its intent that the Open Meeting Law be construed to maximize public access to the governmental process. In first enacting the Open Meeting Law in 1962, the Legislature declared that: "It is the public policy of this state that proceedings in meetings of governing bodies of the state and political subdivisions thereof exist to aid in the conduct of the people's business. It is the intent of this act that their official deliberations and proceedings be conducted openly."

In 1978, after a series of court opinions narrowly construing the Open Meeting Law, the Legislature reiterated its policy by adding A.R.S. § 38-431.09(A). That statute now provides:

> It is the public policy of this state that meetings of public bodies be conducted openly and that notices and agendas be provided for such meetings which contain such information as is reasonably necessary to inform the public of the matters to be discussed or decided. Toward this end, any person or

> entity charged with the interpretation of this article shall construe any provision of this article in favor of open and public meetings.

A.R.S. § 38-431.09(A).

In keeping with this expressed intent, any uncertainty under the Open Meeting Law should be resolved in favor of openness in government. Any question whether the Open Meeting Law applies to a certain public body likewise should be resolved in favor of applying the law.

7.3 Government Bodies Covered by the Open Meeting Law.

7.3.1 Generally. The provisions of the Open Meeting Law apply to all public bodies. A public body is defined in A.R.S. § 38-431(6) as follows:

> "Public body" means the legislature, all boards and commissions of this state or political subdivisions, all multimember governing bodies of departments, agencies, institutions and instrumentalities of this state or political subdivisions, including without limitation all corporations and other instrumentalities whose boards of directors are appointed or elected by this state or a political subdivision. Public body includes all quasi-judicial bodies and all standing, special or advisory committees or subcommittees of, or appointed by, the public body. Public body includes all commissions and other public entities established by the Arizona Constitution or by way of ballot initiative, including the independent redistricting commission, and this article applies except and only to the extent that specific constitutional provisions supersede this article.

This definition specifically includes public bodies of all political subdivisions. A political subdivision is defined in A.R.S. § 38-431(5) to include "all political subdivisions of this state, including without limitation all counties, cities and towns, school districts and special districts."

The definition encompasses five basic categories of public bodies: 1) boards, commissions, and other multimember governing bodies, including those "established by the Arizona Constitution or by way of ballot initiative;" 2) quasi-governmental corporations; 3) quasi-judicial bodies; 4) advisory committees; and 5) standing and special committees and subcommittees of any of the above. *See* A.R.S. § 38-431(6).

7.3.2 Boards and Commissions. The Open Meeting Law covers all boards and commissions and other multimember governing bodies of the state or its political

subdivisions or of the departments, agencies, institutions, and instrumentalities of the state or its political subdivisions. *See* A.R.S. § 38-431(6). The multimember governing body must be created by law or by an official act pursuant to some legal authority. *See id.* Examples of public bodies created by law include the Arizona Legislature, county boards of supervisors, city and town councils, school boards, the governing boards of special districts, and all state, county, and municipal licensing and regulatory boards. *See*, *e.g,* Ariz. Att'y Gen. Op. I07-001 (Open Meeting Law applies to board appointed by governing bodies of various political subdivisions to administer employee benefits program). Ariz. Att'y Gen. Op. I04-001 (Open Meeting Law applies to joint underwriting association because it's a multimember governing body created by statute). In addition, the Legislature amended the definition of public body specifically to include "all commissions and other public entities established by the Arizona Constitution or by way of ballot initiative, including the independent redistricting commission, and this article applies except and only to the extent that specific constitutional provisions supersede this article." A.R.S. § 38-431(6).

The Open Meeting Law applies only to multimember bodies and does not apply to the deliberations and meetings conducted by the single head of an agency. *See* Ariz. Att'y Gen. Ops. I92-007, 75-7. Accordingly, the director of a department or state agency is not subject to the Open Meeting Law when meeting with staff members to discuss the operations of the department.

7.3.3 Quasi-Governmental Corporations. The boards of directors of corporations and instrumentalities of the state or its political subdivisions are subject to the Open Meeting Law when the members of the board are appointed or elected by the state or its political subdivisions. *See* A.R.S. § 38-431(5), (6). In order to determine whether a quasi-governmental corporation or other entity is an "instrumentality," and thus a "public body," under the Open Meeting Law, one should consider the following factors that indicate the degree to which governmental interests dominate the nature of the entity. *See* Ariz. Att'y Gen. Op. I07-001.

1. The entity's origin (whether it was created by the government or independently of the government). For example, the Open Meeting Law does not apply to a private non-profit hospital association that has a board of directors elected by the electorate of the hospital district. *Prescott Newspapers, Inc. v. Yavapai Cmty. Hosp. Ass'n*, 163 Ariz. 33, 785 P.2d 1221 (App. 1989). *See* Ariz. Att'y Gen. Op. I07-001.

2. The nature of the function assigned to and performed by the entity, *i.e.,* whether that function is one traditionally associated with government or is one commonly performed by private entities. For example, the board of trustees of a trust formed by several public bodies to administer employee benefit programs on their behalf would have a governmental function that supports a finding that the board is a public body.

3. The scope of authority granted to and exercised by the entity, *i.e.*, whether the entity has authority to make binding governmental decisions or is it limited to making nonbinding recommendations.

4. The nature and level of government financial involvement with the entity.

5. The nature and scope of government control over the entity's operation.

6. The status of the entity's officers and employees, *i.e.*, whether the officers and employees are government officials or government employees.

7.3.4 Quasi-Judicial Bodies. The Open Meeting Law defines a quasi-judicial body as "a public body, other than a court of law, possessing the power to hold hearings on disputed matters between a private person and a public agency and to make decisions in the general manner of a court regarding such disputed claims." A.R.S. § 38-431(7). The legislature added this definition in 1978 to reverse the Arizona Supreme Court's decision in *Ariz. Press Club, Inc. v. Ariz. Bd. of Tax Appeals*, 113 Ariz. 545, 558 P.2d 697 (1976), which held that the Open Meeting Law did not apply to bodies conducting quasi-judicial functions, such as license revocation proceedings. *See* Ariz. Att'y Gen. Op. 78-245. The Arizona Board of Tax Appeals and similar quasi-judicial bodies are now covered by the Open Meeting Law. A.R.S. § 38-431(6), (7).

Contested case proceedings or quasi-judicial or adjudicatory proceedings conducted by public bodies are subject to all of the requirements of the Open Meeting Law. *Rosenberg v. Ariz. Bd. of Regents*, 118 Ariz. 489, 578 P.2d 168 (1978); *City of Flagstaff v. Bleeker*, 123 Ariz. 436, 600 P.2d 49 (App. 1979); Ariz. Att'y Gen. Op. 75-7.

7.3.5 Advisory Committees. Advisory committees are subject to all of the requirements of the Open Meeting Law. A.R.S. § 38-431(6). An advisory committee is defined as

> any entity, however designated, that is officially established, on motion and order of a public body or by the presiding officer of the public body, and whose members have been appointed for the specific purpose of making a recommendation concerning a decision to be made or considered or a course of conduct to be taken or considered by the public body.

A.R.S. § 38-431(1).

This definition does not include advisory groups established by the single head of an agency unless they are created pursuant to a statute, city charter, or other provision of law or by an official act pursuant to some legal authority. *See* Ariz. Att'y Gen. Op. I92-007; Section 7.3.2.

7.3.6 Special and Standing Committees and Subcommittees. Special and standing committees and subcommittees of, or appointed by, any of the public bodies described above are also covered by the Open Meeting Law. A.R.S. § 38-431 (6). A special or standing committee may consist of members of the public body who have been appointed by or authorized to act for the public body. A.R.S. § 38-431(6). The fact that a committee consists, in whole or in part, of persons who are not members of the public body does not affect its status as a public body subject to the Open Meeting Law. *See* Ariz. Att'y Gen. Op. I80-202.

7.4 Government Bodies and Proceedings Not Covered by the Open Meeting Law. Certain public bodies need not comply with all or portions of the Open Meeting Law in particular circumstances. This section identifies some of those limited exceptions.

7.4.1 Judicial Appointment Commissions. The Commissions on Appellate and Trial Court Appointments and the Commission on Judicial Qualifications are expressly exempt from the Open Meeting Law. A.R.S. § 38-431.08(A)(3).

7.4.2 Proceedings Before Courts. The Open Meeting Law does not apply to judicial proceedings of courts within the judicial branch of government. A.R.S. §§ 38-431(7), -431.08(A)(1).

7.4.3 The Legislature. Meetings of legislative conference committees must be open to the public; however, the committees are exempted from all other requirements of the Open Meeting Law. A.R.S. § 38-431.08(A)(2). The Open Meeting Law does not apply to the activities of a political caucus of the Legislature. *Id.* § (A)(1); *cf.* Ariz. Att'y Gen. Op. I83-128. The Open Meeting Law permits either house of the Legislature to adopt a rule or procedure exempting itself from the notice and agenda requirements of the Open Meeting Law or to allow standing or conference committees to meet through technological devices rather than in person. A.R.S. § 38-431.08(D).

7.4.4 Student Disciplinary Proceedings. Actions concerning the "discipline, suspension or expulsion of a pupil" are not subject to the Open Meeting Law. A.R.S. § 15-843(A). This same statute, however, prescribes the procedures that the school board must follow in handling these matters.

7.4.5 Insurance Guaranty Fund Boards. Special meetings of the property and casualty insurance guaranty fund in which the financial condition of any member insurer is discussed are exempt from the Open Meeting Law. A.R.S. § 20-671.

7.4.6 Hearings Held in Prison Facilities. Hearings held by the Board of Pardons and Paroles in a prison facility are subject to the Open Meeting Law, but the Director of the State Department of Corrections may prohibit certain individuals from attending such hearings because they pose a serious threat to the safety and security of others or the prison. Other conditions on attendance, such as signing an attendance log and submitting to a reasonable search, may be imposed as well. A.R.S. § 38-431.08(B).

7.4.7 Board of Fingerprinting. Good cause exception hearings conducted by the Board of Fingerprinting pursuant to A.R.S. § 41-619.55 are exempt from the Open Meeting Law. A.R.S. § 38-431.08(A)(4).

7.4.8 Homeowners Associations. Because they are not governmental "public bodies," homeowners associations are not covered by the Open Meeting Law. Ariz. Att'y Gen. Op. 97-012. They must, however, comply with separate notification requirements. *Id.* Those requirements must be enforced privately because the Attorney General and County Attorneys have no jurisdiction over such matters. For more information on the requirements of homeowners associations, *see* A.R.S. § 33-1801 *et seq.*

7.5 Actions and Activities Covered by the Open Meeting Law.

7.5.1 Generally. All meetings of a public body shall be public, and all persons desiring to attend shall be permitted to attend and listen to the deliberations and proceedings. A.R.S. § 38-431.01(A). All legal action of public bodies shall occur during a public meeting. *Id.* A meeting is defined as "the gathering, in person or through technological devices, of a quorum of the members of a public body at which they discuss, propose or take legal action, including any deliberations by a quorum with respect to that action." A.R.S. § 38-431(4). It does not matter what label is placed on a gathering; it may be called a "work" or "study" session, or the discussion may occur at a social function. Ariz. Att'y Gen. Op. I79-4.

Put simply, all discussions, deliberations, considerations, or consultations among a majority of the members of a public body regarding matters that may foreseeably require final action or a final decision by the governing body, constitute "legal action" and, therefore, must be conducted in a public meeting or executive session in accordance with the Open Meeting Law. Ariz. Att'y Gen. Ops. 75-8, I79-4. *See also* A.R.S. §§ 38-431.01(A), -431(3) and Ariz. Att'y Gen. Op. I05-004. The key to this inquiry is whether the matter to be discussed may foreseeably require final action. It is difficult to say precisely when this foreseeability test has been met. Each case should be viewed on its own merits with doubts resolved in favor of compliance with the Open Meeting Law. The safest course of action is to assume the Open Meeting Law applies whenever a majority of the body discusses the business of the public body.

"Even if communications on a particular subject between members of a public body do not take place at the same time or place, the communications can nonetheless constitute a 'meeting.'" *See Del Papa v. Bd. of Regents of Univ. and Cmty. Coll. Sys. Of Nev.*, 114 Nev. 388, 393, 956 P.2d 770, 774 (1998) (rejecting the argument that a meeting did not occur because the board members were not together at the same time and place). Accordingly, the definition of meeting was modified by the Arizona Legislature in 2000 to prohibit a quorum of a public body from secretly communicating through technological devices (including, for example, facsimile machines, telephones, texting, and e-mail), and further modified in 2018 in order to provide additional guidance on electronic

communications. The following instances of electronic communication are now expressly considered "meetings" under the Open Meeting Law:

1. "A one-way electronic communication by one member of a public body that is sent to a quorum of the members of a public body and that proposes legal action."

2. "An exchange of electronic communications among a quorum of the members of a public body that involves a discussion, deliberation or the taking of legal action by the public body concerning a matter likely to come before the public body for action."

A.R.S. § 38-431(4)(b). If an electronic communication from one member of the public body proposes legal action and is sent to enough members of the public to form a quorum, a violation occurs even if no member of the public body responds to the electronic communication. A.R.S. § 38-431(4)(b)(i). However, other one-way communications, with no further exchanges, are not *per se* violations, and further examination of the facts and circumstances would be necessary to determine if a violation occurred. Ariz. Att'y Gen. Op. I05-004.

While discussion of the public body's business may take place only in a public meeting or an executive session in accordance with the requirements of the Open Meeting Law, the Open Meeting Law does not prohibit a member of a public body from voicing an opinion or discussing an issue with the public either at a venue other than a public meeting of the body, or through media outlets or other public broadcast communications or technological means, so long as the "opinion or discussion is not principally directed at or directly given to another member of the public body," and "there is no concerted plan to engage in collective deliberation to take legal action." A.R.S. § 38-431.09(B); Ariz. Att'y Gen. Op I07-013.

7.5.2 Circumventing the Open Meeting Law. Discussions and deliberations (in person or otherwise) between less than a majority of the members of a governing body, violate the Open Meeting Law when used to circumvent the purposes of the Open Meeting Law. *See* Ariz. Att'y Gen. Op. 75-8; *Town of Palm Beach v. Gradison*, 296 So. 2d 473 (Fla. 1974). Public officials may not circumvent public discussion by splintering the quorum and having separate or serial discussions with a majority of the public body members. Splintering the quorum can be done by meeting in person, by telephone, electronically, or through other means to discuss a topic that has been or later may be presented to the public body for a decision. Public officials should refrain from any activities that may undermine public confidence in the public decision making process established in the Open Meeting Law, including actions that may appear to remove discussions and decisions from public view.

7.5.3 Applicability to Staff Members and Others. The Open Meeting Law further provides that members of public bodies shall not knowingly direct any staff member to

communicate in violation of the Open Meeting Law. A.R.S. § 38-431.01(I). People knowingly aiding, agreeing to aid or attempting to aid another person in violating the Open Meeting Law can be liable for civil penalties, attorneys' fees, and costs pursuant to A.R.S. § 38-431.07(A). *See* Sections 7.13.3 and 7.13.4. Splintering a quorum may also occur when members of a public body share their positions and proposals with other public body members through staff members or other non-members. For example, a staff member who meets with each member individually regarding official business and then shares the comments made by other members would violate the Open Meeting Law. Although a staff member may provide information to members separately (*see* Ariz. Att'y Gen. Op. I05-004 at 9), that person must be careful not to facilitate a discussion or deliberation by a quorum through sharing information with other members in subsequent meetings.

7.6 Notice of Meetings.

7.6.1 Generally. The Open Meeting Law generally requires at least twenty-four hour advance notice of all meetings to the public body and to the general public. A.R.S. § 38-431.02(C). Notice enables members of the public to attend public meetings by informing them of when and where to go, and how to get information regarding the matters under consideration. Arizona courts have emphasized the importance of sufficient notice. The Arizona Court of Appeals explained, "[t]he notice provisions in the open meeting law are obviously designed to give meaningful effect to provisions such as A.R.S. §§ 38-431.01(A) and 38-431.09. The goal of exposing the public decision-making process to the public itself could be significantly, if not totally thwarted, in the absence of mandatory notice provisions and their enforcement." *Carefree Improvement Ass'n v. City of Scottsdale*, 133 Ariz. 106, 111, 649 P.2d 985, 990 (App. 1982).

7.6.2 Notice to Members of the Public Body. Notice of all meetings, including executive sessions, must be given to the members of the public body. A.R.S. § 38-431.02(B), (C).

7.6.3 Notice to the Public. Notice of all meetings, including executive sessions, must be given to the public. A.R.S. § 38-431.02. Giving public notice is a two-step process. *Id.*

7.6.3.1 Disclosure Statement. The first step is for the public body to conspicuously post a disclosure statement identifying the physical and electronic locations where public notices of meetings will be displayed. A.R.S. § 38-431.02(A). *See* Form 7.1. Public bodies of the State, counties, school districts, and governing bodies of charter schools must post the disclosure statement on their websites. *Id.* § (A)(1)-(2). Special districts governed by Title 48, A.R.S., must post the required disclosure statement on their own website or may file it with the Clerk of the Board of Supervisors. *Id.* § (A)(3). Public bodies of cities and towns must post the required information on their own websites or on the website of an association of towns and cities. *Id.* § (4). The notification location identified in the statement must be a place to which the public has reasonable access.

Carefree Improvement Ass'n v. City of Scottsdale, 133 Ariz. 106, 111, 649 P.2d 985, 990 (App. 1982). The location should have normal business hours, should not be geographically isolated, should not have limited access, and should not be difficult to find.

7.6.3.2 Public Notice of Meetings. Once the disclosure statement has been filed or posted, the second step is for the public body to give notice of each of its meetings by posting a copy of the notice on its website as well as at the location identified in the disclosure statement. A.R.S. § 38-431.02(A). *See* Forms 7.2, 7.3, 7.4. Public bodies shall also give "additional public notice as is reasonable and practicable as to all meetings." *Id.* § (A)(1)(a).

If there is a "technological problem or failure that either prevents the posting of public notices on a website or that temporarily or permanently prevents the use of all or part of the website" and all other public notice requirements are met, then the meeting can convene as scheduled. *Id.* § (A)(1)(b). Given the possibility of complaints or litigation in such situations, the public body should document the nature and duration of the technological problem or failure along with an explanation of how it affected the ability of the public body to post proper notice of the public meeting.

In addition to complying with the requirements of the Open Meeting Law, the notice should conform with the provisions of the Americans with Disabilities Act (ADA), 42 U.S.C. §§ 12101 - 12213. *See* Section 15.27. This may include the addition of a statement such as the following in any notices that the public body issue: "Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting [name of designated agency contact person] at [telephone number and TDD telephone number]. Requests should be made as early as possible to allow time to arrange the accommodation."

7.6.4 Contents of the Notice. Generally, the notice should include information identifying the public body and the date, time, and place of the meeting. *See* Forms 7.2, 7.3. In identifying the place of the meeting, the notice should specify the street address of the building and the room number or other information identifying the specific room in which the meeting will be held. *See* Form 7.7 (Sample Notice and Agenda).

In addition, notices of public meetings and notices of executive sessions must contain an agenda of the matters to be considered by the public body at the meeting or information on how the public may obtain a copy of such an agenda. A.R.S. § 38-431.02(G). For a complete discussion of the agenda requirements, *see* Section 7.7. Notice of a public meeting at which the public body intends to ratify a prior act must contain additional specific information. *See* Section 7.12; Form 7.12.

7.6.5 Time for Giving Notice. As a general rule, a meeting may not be held without giving the required notice at least twenty-four hours before the meeting. A.R.S. § 38-431.02(C). For purposes of the statute, the twenty-four hour period excludes Sundays and holidays. *Id.* Saturdays are included in the period if the public has access to

the physical and electronic posted locations. *Id.* Of course, the best practice is for public bodies to give as much notice as possible. The public body may consider including with the notice a certification by the person responsible for posting the notice that states the time and location that the notice was posted. *See* Form 7.8 below.

There are three exceptions to the twenty-four hour notice requirement.

First, in the case of an "actual emergency," the meeting may be held upon such shorter notice as is "appropriate to the circumstances." § 38-431.02(D). An actual emergency exists when, due to unforeseen circumstances, immediate action is necessary to avoid some serious consequence that would result from waiting until the required notice could be given. *See Carefree Improvement Ass'n v. City of Scottsdale*, 133 Ariz. 106, 113, 649 P.2d 985, 992 (App. 1982). The existence of an actual emergency does not dispense with the need to give twenty-four hours written notice to an employee who is to be discussed in executive session. A.R.S. § 38-431.03(A)(1); Ariz. Att'y Gen. Op. I90-19; *see* Sections 7.7.9 and 7.9.5.1.

Second, notice of a meeting at which the public body will consider ratifying a prior act taken in violation of the Open Meeting Law must be given seventy-two hours in advance of the meeting. A.R.S. § 38-431.05(B)(4); *see* Section 7.12.

Finally, less than twenty-four hours notice may be given when a properly noticed meeting is recessed to the next day. A.R.S. § 38-431.02(E). A meeting may be recessed and resumed with less than twenty-four hour notice if public notice of the initial session of the meeting is given and, if before recessing, notice is publicly given as to the time and place of the resumption of the meeting or the method by which notice shall be publicly given. *Id.* Notice of the resumption of a meeting must comply with the agenda requirements respecting the matters to be addressed when resumed. *Id.* § (G). This may be accomplished by the presiding officer of the public body either stating at the meeting the time, place, and agenda of the resumed meeting or stating where a written notice and agenda of the resumed meeting will be posted. If an executive session is to be recessed and resumed with less than twenty-four hour notice, the time, place, and agenda of the resumed meeting should be communicated to the members of the public body and to the public by reconvening in public session and following one of the two steps described above. If the meeting will not reconvene for more than twenty-four hours, a new meeting notice and agenda is recommended.

7.6.6 Notice of Regular Meetings. A public body that intends to meet for a specified calendar period on a regular day or date during the calendar period, and at a regular place and time, may post public notice of such meetings at the beginning of such period and need not post additional notices for each meeting. A.R.S. § 38-431.02(F); *see* Form 7.4. The notice must specify the applicable notice period. *Id.* However, this method of posting notice will not satisfy the agenda requirements unless the notice also contains a clear statement that the agenda for any such meeting will be available at least twenty-four

hours in advance of the meeting and a statement as to where and how the public may obtain a copy of the agenda. A.R.S. § 38-431.02(G).

7.6.7 Notice of Executive Sessions. When a public body intends to conduct an executive session, the notice must state the specific provision of law authorizing the executive session. A.R.S. § 38-431.02(B); *see* Form 7.5. This provision requires that the notice specify the numbered paragraph of subsection (A) of A.R.S. § 38-431.03 that authorizes the executive session. A general citation to A.R.S. § 38-431.03 or subsection (A) of that section is insufficient. For example, a public body intending to meet in executive session for purposes of discussing the purchase or lease of real property must cite in its notice "A.R.S. § 38-431.03(A)(7)." The public body must cite only the paragraphs applicable to the matters to be discussed and cannot issue a standardized form notice that cites all executive session provisions. In addition, an agenda is required for an executive session and must contain only a "general description of the matters to be considered." A.R.S. § 38-431.02(I); *see* Section 7.7.3.

In the case of an executive session concerning personnel matters, the public body must give written notice to the affected officer, appointee, or employee in addition to the public notice described above. A.R.S. § 38-431.03(A)(1); *see* Section 7.9.5.1; Form 7.13. Such written notice must be provided not less than twenty-four hours before the scheduled meeting. A.R.S. § 38-431.03(A)(1).

Many public bodies do not know whether they will have any legal questions regarding matters on the agenda until the discussion occurs. The Attorney General previously opined that public bodies may provide with their notices and agendas a statement that matters on the public meeting agenda may be discussed in executive session for the purpose of obtaining legal advice thereon, pursuant to A.R.S. § 38-431.03(A)(3). Ariz. Att'y Gen. Op. I90-19. An example of such a statement is "The Board may vote to hold an executive session for the purpose of obtaining legal advice from the Board's attorney on any matter listed on the agenda pursuant to A.R.S. § 38-431.03(A)(3)." Similar statements are not sufficient for other types of executive sessions. *See* Section 7.7 for further discussion.

7.6.8 Maintaining Records of Notice Given. Best practice provides that each public body keep a record of its notices, including a copy of each notice that was posted and information regarding the date, time, and place of posting. A suggested procedure is to file in the records of the public body a copy of the notice and a certification in a form similar to Form 7.8.

7.7 Agendas.

7.7.1 Generally. In addition to notice of the time, date, and place of the meeting, the public body must provide an agenda of the matters to be discussed, considered, or decided at the meeting. A.R.S. § 38-431.02(G).

Although this Section provides guidelines for the preparation of agendas, it does not answer every question that may arise. Specific problems should be discussed with the public body's legal counsel. As a general rule, public bodies should always be mindful of the Legislature's declaration of policy that agendas "contain such information as is reasonably necessary to inform the public of the matters to be discussed or decided." A.R.S. § 38-431.09(A). When in doubt, resolve questions in favor of greater disclosure of information.

7.7.2 Contents of the Agenda -- Public Meeting. The agenda for a public meeting must contain a listing of the "specific matters to be discussed, considered or decided at the meeting." A.R.S. § 38-431.02(H). This requirement does not permit the use of generic agenda items such as "personnel," "new business," "old business," "reports," or "other matters" unless the specific matters or items to be discussed are separately identified in conjunction with the general terms. *See Thurston v. City of Phoenix*, 157 Ariz. 343, 344, 757 P.2d 619, 620 (App. 1988). The degree of specificity depends on the circumstances. *See* Form 7.7 (Sample Notice and Agenda). Consider the following examples:

- "Discussion and possible action to approve the application of pesticides within 1/4 mile of a school" if an environmental board is going to consider whether to approve the application of any pesticide within 1/4 mile of a school;

- "Discussion and possible action to remove Pesticide-A from list of approved pesticides" if the environmental board is going to consider removing a specific pesticide from an approved list;

- "Discussion and possible action regarding budget priorities and revisions for upcoming fiscal year" if a board intends to generate and discuss a number of different options for managing its budget;

- "Discussion and possible action regarding elimination of funding from budget for travel reimbursements, computer upgrades, and laptops for board members" if a board intends to only focus on specific options to revise a budget.

If it is likely that the public body will find it necessary to discuss any particular agenda item in executive session with the public body's attorney, the agenda should plainly state so, even if the general notice of executive session for legal advice is on the agenda. For example, the agenda might include a provision stating "The Board may vote to hold an executive session for the purpose of obtaining legal advice from the Board's attorney on the approval of pesticides for application within ¼ mile of a school pursuant to A.R.S. § 38-431.03(A)(3)."

7.7.3 Contents of the Agenda -- Executive Session. The agenda for an executive session must contain a "general description of the matters to be considered." A.R.S. § 38-431.02(I). The description must amount to more than just a recital of the statutory provisions authorizing the executive session, but should not contain any information that "would defeat the purpose of the executive session, compromise the legitimate privacy interests of a public officer, appointee or employee or compromise the attorney-client privilege." *Id.*

In preparing executive session agenda items, the public body must weigh the legislative policy favoring public disclosure and the legitimate confidentiality concerns underlying the executive session provision. For example, if a board desires to consider the possible dismissal of its executive director, the board may list on the agenda "Personnel matter - consideration of continued employment of the board's executive director." However, when the public disclosure of the board's consideration of charges against an employee might needlessly harm the employee's reputation or compromise the employee's privacy interests, the board may eliminate from the agenda a description of the identity of the employee being considered, but must still indicate on the agenda that an employee of the public body is the subject of the executive session. If it is already publicly known that the board is considering charges against the employee, disclosure of the employee's identity in the agenda would not defeat the purpose of the executive session.

7.7.4 Distribution of the Agenda. The agenda may be made available to the public by including it as part of the public notice or by stating in the public notice how the public may obtain a copy of the agenda and then distributing the agenda in the manner prescribed. A.R.S. § 38-431.02(G); *see* Forms 7.2 - 7.4, 7.6, 7.7. Because both the public notice and the agenda must be available at least twenty-four hours in advance of a meeting, the simplest procedure is to include the agenda with the public notice. *See* Form 7.7 (Sample Notice and Agenda). However, when issuing public notice well in advance of a meeting, as in the case of notice of regularly scheduled meetings, *see* Section 7.6.6, it may be more appropriate to state how the public may obtain a copy of the agenda and distribute it accordingly.

7.7.5 Consent Agendas. Public bodies may use "consent agendas" if they meet certain requirements. Consent agendas are typically used as a time-saving device when there are certain items on the agenda which are unlikely to generate controversy and are ministerial in nature. Some examples are approval of travel requests and approval of minutes. Public bodies often take one vote to approve or disapprove the consent agenda as a whole. When using a consent agenda format for some of the items on a meeting agenda, public bodies should fully describe the matters on the agenda and inform the public where more information can be obtained. A good practice is to require the removal of an item from the consent agenda upon the request of any member of the public body. *See* Form 7.7 (Sample Notice and Agenda).

Public bodies should exercise caution when using consent agendas. The Arizona Supreme Court previously held that taking legal action, taken after an executive session,

must be preceded by a disclosure of "that amount of information sufficient to apprise the public in attendance of the basic subject matter of the action so that the public may scrutinize the action taken during the meeting." *Karol v. Bd. of Educ. Trustees*, 122 Ariz. 95, 98, 593 P.2d 649, 652 (1979). The Court also condemned the practice of voting on matters designated only by number, thereby effectively hiding actions from public examination. *Id.*

7.7.6 Discussing and Deciding Matters Not Listed on the Agenda. The public body may discuss, consider, or decide only those matters listed on the agenda and "other matters related thereto." A.R.S. § 38-431.02(H). The "other matters" clause provides some flexibility to a public body but should be construed narrowly. The "other matters" must in some reasonable manner be "related" to an item specifically listed on the agenda. *Thurston v. City of Phoenix*, 157 Ariz. 343, 344, 757 P.2d 619, 620 (App. 1988).

If a matter not specifically listed on the agenda is brought up during a meeting, the better practice, and the one that will minimize subsequent litigation, is to defer discussion and decision on the matter until a later meeting so that the item can be specifically listed on the agenda. If the matter demands immediate attention and is a true emergency, the public body should consider using the emergency exception described in Section 7.7.9.

However, if action is taken at a meeting on an item not properly noticed, then that particular action violates the Open Meeting Law and is null and void. *Johnson v. Tempe Elementary Sch. Dist. No. 3 Governing Bd.*, 199 Ariz. 567, 570, 20 P.3d 1148, 1151 (App. 2001); A.R.S. § 38-431.05(A). The public body may ratify the action pursuant to A.R.S. § 38-431.05(B), although the violation may still subject the public body to the penalties described in A.R.S. § 38-431.07(A). Any other actions that were taken at the meeting and were properly noticed are not void. *Karol v. Bd. of Educ. Trustees*, 122 Ariz. 95, 98, 593 P.2d 649, 652 (1979); Ariz. Att'y Gen. Op. I08-001.

7.7.7 Calls to the Public. A public body may include a call to the public on a meeting agenda. A.R.S. § 38-431.01(H); *see also* Section 7.10.1 for more discussion on public participation. Should a public body include a call to the public during a public meeting, members of the public body may not discuss or take action on matters raised during the call to the public that are not specifically identified on the agenda. A.R.S. § 38-431.01(H). Individual public body members may, however, respond to criticism made by those who have addressed the public body, ask staff to review a matter, or ask that a matter be put on a future agenda. *Id.; see also* Ariz. Att'y Gen. Op. I99-006.

The best practice is to include language similar to the following on the agenda to explain in advance the reason members of the public body cannot respond to topics brought up during the call to the public that are not on the agenda: "Call to the Public: This is the time for the public to comment. Members of the Board may not discuss items that are not specifically identified on the agenda. Therefore, pursuant to A.R.S. § 38-431.01(H), action taken as a result of public comment will be limited to

directing staff to study the matter, responding to any criticism or scheduling the matter for further consideration and decision at a later date."

7.7.8 Current Event Summaries. The Open Meeting Law allows the chief administrator, presiding officer or a member of a public body to present a brief summary of current events without listing in the agenda the specific matters to be summarized, provided that the summary is listed on the agenda and that the public body does not propose, discuss, deliberate or take legal action at that meeting on any matter in the summary unless the specific matter is properly noticed for legal action. A.R.S. § 38-431.02(K). Thus, the summary of current events consists merely of one of the above-referenced people summarizing recent occurrences without any discussion or feedback from the remainder of the public body. The agenda should specifically list "Summary of Current Events" as an agenda item and identify who will present the summary.

Reports that address matters other than a summary of current events or that are delivered by someone other than a proper official with the public body do not come within the provision authorizing current events summaries and must comply with the agenda requirements of the Open Meeting Law. The only report that can be given without listing the contents of the presentation is the brief summary of current events by the chief administrator, the presiding officer of the Council, or a member under A.R.S. § 38-431.02(K). As to other reports presented to a public body, the agenda must list descriptions of the topics that will be presented and state whether the public body will discuss or take action on such matters. A generic agenda item, such as "Police Department Report, " "Fire Department Report," or "Executive Director Report" does not satisfy the requirement that the agenda provide information that is "reasonably necessary to inform the public of the matters to be discussed or decided." A.R.S. § 38-431.02(H). Public bodies should limit the use of the current events summary provision to appropriate situations and should strive to provide as much advance information as possible to the public.

7.7.9 Emergencies. A public body may discuss, consider, and decide a matter not on the agenda when an actual emergency exists requiring that the body dispense with the advance notice and agenda requirements. A.R.S. § 38-431.02(D). *See* Section 7.6.5 for a discussion of what constitutes an actual emergency.

To use the emergency exception, the public body must do several things. First, the public body must give "such notice as is appropriate to the circumstances." A.R.S. § 38-431.02(D). Next, prior to the emergency discussion, consideration, or decision, the public body must announce in a public meeting the reasons necessitating the emergency action. A.R.S. § 38-431.02(J). If the emergency discussion or consideration is to take place in an executive session, this public announcement must occur at a public meeting prior to the executive session. *Id.*

After the emergency exception has been used, "the public body must post a public notice within twenty-four hours declaring that an emergency session has been held," which sets forth the same information required in an agenda for a regular meeting. A.R.S. § 38-431.02(D); *see* Form 7.9.

Additionally, the public body must place in the minutes of the meeting a statement that sets forth the reasons necessitating the emergency discussion, consideration, or decision. A.R.S. § 38-431.02(J). In the case of an executive session, this statement will appear twice, once in the minutes of the public meeting where the reasons were publicly announced, and again in the minutes of the executive session where the emergency discussion or consideration took place. *See* Sections 7.8.2(8) and 7.8.3(5).

7.7.10 Changes to the Agenda. If a public body finds it necessary to change an agenda by modifying the listed matters or adding new ones, a new agenda must be prepared and distributed in the same manner as the original agenda, at least twenty-four hours in advance of the meeting. Ariz. Att'y Gen. Op. I79-45. Changes in the agenda within twenty-four hours of the meeting may be made only in case of emergency. Ariz. Att'y Gen. Op. I79-192; *see* Section 7.7.9. However, the public body is not required to discuss or act on an item that appears on the agenda for the meeting and can vote at the meeting to remove agenda items from consideration without violating the Open Meeting Law.

7.8 Minutes. Minutes must be taken of all public meetings and executive sessions. A.R.S. § 38-431.01(B)

7.8.1 Form of and Access to the Minutes. Minutes may be taken in writing or may be recorded by an audio or video recorder. A.R.S. § 38-431.01(B); *see* Forms 7.10, 7.11. Written minutes or a recording of a public meeting must be available for public inspection within three working days after the meeting. A.R.S. § 38-431.01(D). Public bodies concerned about distributing minutes before they have been officially approved at a subsequent meeting should mark the minutes "draft" or "unapproved" and make them available within three working days of the meeting. If the minutes have been recorded by an audio or video recorder, allowing the public to have access to that recording is sufficient. However, if the minutes were taken in shorthand, those minutes must be typed or written out in longhand in order to comply with this requirement. *See* Form 7.10. The minutes of an executive session are confidential and may not be disclosed except to certain authorized persons. A.R.S. § 38-431.03(B); *see* Section 7.9.4. To ensure confidentiality and avoid inadvertent disclosure, minutes of executive sessions should be stored separately from regular session minutes.

The approved minutes of council meetings for cities or towns with a population of more than 2,500 persons must be posted on the city's website within two working days of their approval. A.R.S. § 38-431.01(E)(2). Minutes must be reduced to a form that is readily accessible to the public. *See* A.R.S. § 38-431.01(D). Additionally, a public body of a city or a town with a population exceeding 2,500 people shall, within three working days

after any meeting, post on its website a statement showing legal actions taken by the public body or any recordings made during the meeting. A.R.S. § 38-431.01(E)(1). Subcommittees and advisory committees of such public bodies have ten working days after the meeting to post the recording or statement. A.R.S. § 38-431.01(E)(3), (J). Such posted minutes, statements, and recordings shall remain accessible on the website for at least one year after the meeting. *Id.* § (J). In addition, any recordings and minutes are public records subject to record retention requirements.

7.8.2 Contents of the Minutes of Public Meetings. The minutes of a public meeting must contain the following information:

1. "The date, time and place of the meeting." A.R.S. § 38-431.01(B)(1).

2. "The members of the public body recorded as either present or absent." *Id.* § (B)(2).

3. "A general description of the matters [discussed or] considered." *Id.* § (B)(3). Minutes must contain information regarding matters considered or discussed at the meeting even though no formal action or vote was taken with respect to the matter. *See id.* § (B)(4). Although the minutes do not need to be a verbatim transcript of the meeting to satisfy this requirement, they must summarize the discussion, including the topics addressed, and identify all speakers who participated in the discussion, including members of the public body.

4. "An accurate description of all legal actions proposed, discussed or taken, including a record of how each member voted." *Id.* Best practice includes roll call votes in most circumstances, as this encourages open government. However, for voice votes, minutes should still include a record of how each member voted, which includes noting abstentions, recusals, or those otherwise not voting. This could be accomplished in several ways. One way of ensuring such a recording would be to follow any voice vote for which no dissent or disagreement was noted with a request that any member who abstained or otherwise did not vote identify themselves; this would ensure the ability to record in detail how each member voted.

5. "[T]he names of the members who propose each motion[.]" *Id.*

6. "[T]he names of the persons, as given, who make statements or present material to the public body and a [specific] reference to the legal action," (*see* item 4) to which the statement or presentation relates. *Id.*

7. If the discussion in the public session did not adequately disclose the subject matter and specifics of the action taken (such as an action to approve matters on a consent agenda), the minutes of the public meeting at which

such action was taken should contain sufficient information to permit the public to investigate further the background or specific facts of the decision. *See* Section 7.7.5; *Karol v. Bd. Of Educ. Trustees*, 122 Ariz. 95, 98, 593 P.2d 649, 652 (1979).

8. If matters not on the agenda were discussed or decided at a meeting because of an actual emergency, the minutes must contain a full description of the nature of the emergency. A.R.S. § 38-431.02(J); *see* Sections 7.6.5 and 7.7.9.

9. If a prior act was ratified, the minutes must contain a copy of the disclosure statement required for ratification. A.R.S. § 38-431.05(B)(3); *see* Section 7.12.2; Form 7.10.

7.8.3 Contents of the Minutes of Executive Sessions. The minutes of executive sessions must remain confidential, except as provided in Section 7.9.4, and must contain the following information:

1. "The date, time and place of the meeting." A.R.S. § 38-431.01(B)(1), (C).

2. "The members of the public body recorded as either present or absent." *Id.* § (B)(2), (C).

3. "A general description of the matters considered." *Id.* § (B)(3), (C); *see* Section 7.8.2(3). Like the minutes for a public session of the public body, the minutes must summarize the discussion, including the topics addressed, and identify all speakers who participated in the discussion, including members of the public body.

4. An accurate description of all instructions given to attorneys or designated representatives pursuant to A.R.S. § 38-431.03(A)(4), (5) and (7). *See* Sections 7.9.5.4, 7.9.5.5 and 7.9.5.7.

5. A statement of the reasons for emergency consideration of any matters not on the agenda. *See* A.R.S. § 38-431.02(J); Section 7.8.2(8).

6. Such other information as the public body deems appropriate. For example, the public body might record in its minutes that those present were advised that the information discussed in the session and the session minutes are confidential. *See* Form 7.11.

"A party who asserts that a public body violated the open meeting laws has the burden of proving that assertion." *Tanque Verde Unified Sch. Dist. No. 13 of Pima County v. Bernini*, 206 Ariz. 200, 205, 76 P.3d 874, 879 (App. 2003). However, Arizona courts have held that once a complainant alleges facts from which a reasonable inference may be

drawn supporting an Open Meeting Law violation, the burden of proof immediately shifts to a public body to prove that an affirmative defense or exception to the Open Meeting Law authorized an allegedly inappropriate executive session. *Fisher v. Maricopa County Stadium Dist.*, 185 Ariz. 116, 122, 912 P.2d 1345, 1351 (App. 1995); *see also Tanque Verde,* 206 Ariz. at 205, 76 P.3d at 881. The best practice is for public bodies to keep an audio or video recording of the executive session or to transcribe the executive session to ensure that they are prepared to meet their burden of proof in the event a complaint is filed.

7.9 Executive Sessions. A.R.S. Section 38-431.03 contains an exception to the general requirement that all meetings must be open to the public. That exception is for an executive session, which is defined as "a gathering of a quorum of members of a public body from which the public is excluded for one or more of the reasons prescribed in [A.R.S.] § 38-431.03." A.R.S. § 38-431(2); *see* Sections 7.9.5.1 - 7.9.5.7.

While the Open Meeting Law does permit executive sessions for discussing certain matters, it does not require that these discussions take place in executive session. If public disclosure of the public body's discussion is not prohibited by any other statutory provision and government interests are not threatened, a public body may choose to conduct all of its discussions in a public setting.

7.9.1 Deciding to Go Into Executive Session. Before a public body may go into an executive session, proper notice must be provided. *See* Section 7.6.7 for a discussion of the notice required for an executive session; *see also* section 7.7.9. Once the public body is satisfied that notice requirements have been met, a majority of the members constituting a quorum must vote in a public meeting to hold the executive session. A.R.S. § 38-431.03(A). The motion must state the ground(s) for the executive session so that the public understands why the public body is entering executive session. For example, a member of the public body may make the following motion: "I move to enter executive session for the purpose of receiving legal advice on [agenda topic]." Generally, the vote will be taken immediately before going into executive session.

7.9.2 Executive Session Requirements. Once the majority of members of a public body votes to hold an executive session, the chairman of the public body should ask the public to leave and to take with them all materials such as briefcases and backpacks to ensure that no recording devices are left in the room. In the alternative, the public body can move to a separate room to conduct the executive session. Only members of the public body and those individuals whose presence is reasonably necessary for the public body to carry out its executive session responsibilities may attend the executive session. A.R.S. § 38-431(2). The chairman should remind all present that the business conducted in executive sessions is confidential pursuant to A.R.S. § 38-431.03(C).

7.9.3 Taking Legal Action. In an executive session, the public body may discuss and consider only the specific matters authorized by the statute. These specific authorizations are discussed in Sections 7.9.5.1 – 7.9.5.7. Furthermore, the public body may not take a vote or make a final decision in the executive session, but rather must

reconvene in a public meeting for purposes of taking the binding vote or making final decisions. *See* A.R.S. § 38-431.03(D). For example, "[a] decision to appeal transcends 'discussion or consultation' and entails a 'commitment' of public funds. Therefore, once [a] Board [has] finished privately discussing the merits of appealing, the open meeting statutes require[] that board members meet in public for the final decision to appeal." *Johnson v. Tempe Elementary Sch. Dist. No. 3 Governing Bd.*, 199 Ariz. 567, 570, 20 P.3d 1148, 1151 (App. 2001). Taking a straw poll or informal or preliminary vote in executive session is unlawful under the Open Meeting Law. *See* A.R.S. § 38-431.03(D). No motion or vote is taken to adjourn the executive session; the chair is responsible for adjourning the executive session and reconvening the public session.

7.9.4 Confidentiality of Executive Sessions. The minutes of and discussions that take place during an executive session are confidential under A.R.S. § 38-431.03(B) and may not be disclosed to anyone except the following people:

1. Any member of the public body, regardless of whether he or she attended the executive session. A.R.S. § 38-431.03(B)(1); *Picture Rocks Fire Dist. v. Updike*, 145 Ariz. 79, 81, 699 P.2d 1310, 1312 (App. 1985).

2. Any officer, appointee, or employee who was the subject of discussion at an executive session authorized by A.R.S. § 38-431.03(A)(1) may see those portions of the minutes directly pertaining to them. A.R.S. § 38-431.03(B)(2); *see* Section 7.9.4.

3. Staff personnel, to the extent necessary for them to prepare and maintain the minutes of the executive session.

4. The attorney for the public body, to the extent necessary for the attorney to represent the public body.

5. The Auditor General in connection with the lawful performance of its duty to audit the finances or performance of the public body. A.R.S. § 38-431.03(B)(3); Ariz. Att'y Gen. Op. I79-I30.

6. The Attorney General or County Attorney when investigating alleged violations of the Open Meeting Law. A.R.S. § 38-431.03(B)(4).

7. The court, for purposes of a confidential inspection where an open meeting violation has been alleged. A.R.S. § 38-431.07(C).

The Open Meeting Law requires a public body to advise all persons attending an executive session that such minutes and information are confidential. A.R.S. § 38-431.03(C). Members of a public body and others attending the executive session must ensure that the information remains confidential. In addition to violating the Open Meeting Law, criminal charges may arise from a release of confidential information.

Executive sessions are not applicable to the commission's business under its powers and duties.

7.10 Public Participation and Access to Meetings.

7.10.1 Public Participation. While the public must be allowed to attend and listen to deliberations and proceedings taking place in all public meetings, A.R.S. § 38-431.01(A), the Open Meeting Law does not establish a right for the public to participate in the discussion or in the ultimate decision of the public body. Ariz. Att'y Gen. Op. 78-1. Other statutes may, however, require public participation or public hearings. For example, before promulgating rules, state agencies must permit public participation in the rule making process, including the opportunity to present oral or written statements on the proposed rule. *See* Chapter 11. *See also* Section 7.7.7 for a discussion of the authorization (but not requirement) for public bodies to use an open call to the public.

The Open Meeting Law does not prevent a public body from requiring persons who intend to speak at the meeting to sign a register so as to permit the public body to comply with the minute-taking requirements. *See* Section 7.8.2(6).

7.10.2 Public Access. The public body must provide public access to public meetings. *See* A.R.S. § 38-431.01(A). This requirement is not met if the public body uses any procedure or device that obstructs or inhibits public attendance at public meetings, such as holding the meeting in a geographically isolated location, in a room too small to accommodate the reasonably anticipated number of observers, in a place to which the public does not have access, such as private clubs, or at an unreasonable time. Relatedly, the public body must ensure that the public can observe and listen to the full contours of public meetings. For example, a public meeting in which the public cannot hear discussions by members of the public body because of the low volume of the microphone or speaker systems would likely violate the Open Meeting Law.

"All or any part of a public meeting . . . may be recorded by any person in attendance by means of a tape recorder or camera or other means of sonic reproduction." A.R.S. § 38-431.01(F). A public body may prohibit or restrict such recordings only if they actively interfere with the conduct of the meeting. *Id.*

In addition to complying with the Open Meeting Law, the notice and accommodations should conform with the provisions of the Americans with Disabilities Act (ADA), 42 U.S.C. §§ 12101 - 12213. *See* Section 15.27*; see also* section 7.6.3.2 (notice requirements relating to reasonable accommodations).

7.10.3 Remote Conferencing. If members of a public body are unable to be present in person at a public meeting, they may participate by telephone or video or internet conference if the practice is not prohibited by statutes applicable to meetings of the public body. Ariz. Att'y Gen. Ops. I08-008, I91-033, I83-135. In addition, nothing prohibits the public body from allowing people to attend meetings or to address the public body by telephone or through other telecommunications technology. *See* A.R.S. § 38-431(4). In order to comply with the requirements of the Open Meeting Law, the members of the public

body and the public must be able to hear the member of the public body that is attending by telephone or other technological device. The public body must also ensure that the members attending by telephone or other technological device can hear any discussion from the public body and other persons making statements to the body.

A public body should consider the following guidelines to minimize any difficulties arising from remote conferencing.

1. Notify the public body and the public by including a statement on the notice and the agenda that one or more members of the public body may participate by telephonic, video or internet communications. In the appropriate notice, insert the following after the first sentence: "Members of the [name of public body] may attend either in person or by telephone, video or internet conferencing."

2. Ensure that the public meeting place where the public body normally meets has facilities that permit the public to observe and hear all telephone, video or online communications.

3. Develop procedures to clearly identify members that are participating by telephonic, video or internet communications.

4. Identify in the minutes of the meeting the members who participated by telephonic or video communications.

7.11 Quorum. Arizona statutes generally define a quorum as a majority of the members of a board or commission. A.R.S. § 1-216(B). In applying the Open Meeting Law, this definition applies in the absence of a more specific definition.

7.12 Ratification. A public body may ratify action previously taken in violation of the Open Meeting Law. *See* A.R.S. § 38-431.05(B). Ratification is appropriate when the public body needs to retroactively validate a prior act in order to preserve the earlier effective date of the action. For example, a public body may be required by law to approve its budget by a certain date. If the public body discovered after the statutory deadline that its earlier approval violated the Open Meeting Law, it could face serious legal problems. Even if the body met quickly to properly approve the budget, the approval would not have been made prior to the statutory deadline. Accordingly, the 1982 amendments permit the public body to meet and approve retroactively the action previously taken—that is, to ratify its prior action.

7.12.1 Generally.

Ratification must take place "within thirty days after discovery of the violation or after such discovery should have been made by the exercise of reasonable diligence." A.R.S. § 38-431.05(B)(1). This can be triggered in different ways. A judicial determination

that the public body took legal action in violation of public meeting laws triggers the thirty-day period. *Tanque Verde Unified Sch. Dist. No. 13 of Pima County v. Bernini*, 206 Ariz. 200, 208-210, 76 P.3d 874, 882-884 (App. 2003). However, it is not triggered by letters from attorneys notifying the board of their intent to challenge the legal action or by filing a lawsuit. *Id.* at 209, 76 P.3d at 883.

Ratification merely validates the prior action; it does not eliminate liability of the public body or others for sanctions under the Open Meeting Law, such as civil penalties and attorney's fees. Moreover, ratification under the Open Meeting Law may well fail to resolve other notice failure. For example, ratification under the Open Meeting Law may not resolve the specific notice requirements of a zoning or taxation statute.

A public body can take the same legal action at a subsequent properly noticed public meeting without following the ratification procedure, but the action will not have the earlier effective date. *See Cooper v. Arizona Western Coll. Dist. Governing Bd.*, 125 Ariz. 463, 468-469, 610 P.2d 465, 470-71(App. 1980) ("We find no provision in the Arizona statutes relating to public meetings which precludes a public body from adopting at a subsequent public meeting action which was legally ineffective from a previous meeting of the public body.")

7.12.2 Procedure for Ratification. The Open Meeting Law provides the following detailed procedure for ratification under A.R.S. § 38-431.05(B):

1. The decision to ratify must take place at a public meeting held in accordance with the Open Meeting Law.

2. Ratification must take place within thirty days after discovery of the violation or after such discovery should have been made by the exercise of reasonable diligence.

3. The public notice of the meeting at which ratification is to take place, in addition to complying with the other requirements of the Open Meeting Law, *see* Sections 7.6 and 7.7, must include (a) a description of the action to be ratified, (b) a clear statement that the public body proposes to ratify a prior action, and (c) information on how the public may obtain a written description of the action to be ratified. *See* Form 7.12.

4. In addition to the notice and agenda of the meeting, the public body must make available to the public a detailed written description of the action to be ratified and a description of all prior deliberations, consultations, and decisions by members of the public body related to the action to be ratified.

5. The description required under paragraph 4 must be included as part of the minutes of the meeting at which the decision to ratify was made.

6. The public notice, agenda, and written description discussed in paragraphs 3 and 4 must be made available to the public at least seventy-two hours prior to the public meeting.

7.13 Sanctions for Violations of the Open Meeting Law.

7.13.1 Nullification. All legal action transacted by any public body during a meeting held in violation of any provision of the Open Meeting Law is null and void unless subsequently ratified. A.R.S. § 38-431.05(A). The procedures for ratification are described in Section 7.12.2. However, the Open Meeting Law does not render null and void all legal action taken at a meeting at which a violation occurs with respect to a single improperly noticed agenda item. Ariz. Att'y Gen. Op. I08-001.

The Arizona Supreme Court, however, has held that legal actions taken in violation of the Open Meeting Law are voidable at the discretion of the court. *Karol v. Bd. Of Educ. Trustees*, 122 Ariz. 95, 97, 593 P.2d 649, 651 (1979). In *Karol*, the court held that "a technical violation having no demonstrated prejudicial effect on the complaining party does not nullify all the business in a public meeting when to conclude otherwise would be inequitable, so long as the meeting complies with the intent of the legislature." *Id.* at 98, 593 P.2d at 652. This decision imposes a substantial compliance test and requires a weighing of the equities before a court will declare an action void. The decision, however, preceded the 1982 amendment to the Open Meeting Law which specifically authorized a procedure for ratification. It remains to be seen whether this change will cause the court to follow the literal language of the Open Meeting Law. Nevertheless, serious consequences flow from having an action of a public body declared void, and the public body should take every precaution to avoid even technical violations of the Open Meeting Law.

In some cases, the public body may have discussed a matter at an unlawful meeting, but thereafter met in a lawful open meeting at which it took a formal vote as its "final action." The Arizona Court of Appeals has held that the subsequent final action taken at a lawful meeting is not void. *Cooper v. Arizona Western Coll. Dist. Governing Bd.*, 125 Ariz. 463, 468-469, 610 P.2d 465, 470-71(App. 1980); *Valencia v. Cota*, 126 Ariz. 555, 617 P.2d 63 (App. 1980). The public body taking the final action at the subsequent lawful meeting should make available at that time the substance of all discussions that took place at the earlier unlawful meeting. If the public body wishes to preserve the effective date of the earlier action rather than simply redecide the matter, it must go through the ratification process. *See* Section 7.12.

7.13.2 Investigation and Enforcement. The 2000 Legislature enacted substantial revisions to the Open Meeting Law, including extensive changes to the investigation and enforcement provisions. The Attorney General and County Attorneys are authorized to investigate alleged Open Meeting Law violations and enforce the Open Meeting Law. A.R.S. § 38-431.06.

The Open Meeting Law specifically provides that the Attorney General and County Attorneys shall have access to executive session minutes when they are investigating alleged violations of the Open Meeting Law. A.R.S. § 38-431.03(B)(4). The Open Meeting Law also provides that disclosure of executive session information (such as disclosure to the Attorney General) does not constitute a waiver of the attorney-client privilege and directs courts reviewing executive session information to protect privileged information. *Id.* § (F).

The investigative authority of the Attorney General and County Attorneys was strengthened by the 2000 Legislature. The Attorney General and County Attorneys may issue written investigative demands to any person, administer oaths or affirmations to any person for the purpose of taking testimony, conduct examinations under oath, examine accounts, books, computers, documents, minutes, papers and recordings, and require people to file written statements, under oath, of all the facts and circumstances requested by the Attorney General or County Attorney. A.R.S. § 38-431.06(B). If a person fails to comply with a civil investigative demand, the Attorney General or County Attorney may seek enforcement of the demand in Superior Court.

"Any person affected by an alleged violation of [the Open Meeting Law], the Attorney General or the County Attorney for the county in which the alleged violation … occurred," may file suit in superior court against a public body as a whole to require compliance with or prevent violations of the Open Meeting Law or to determine whether the law is applicable to certain matters or legal actions of the public body. A.R.S. § 38-431.07.

Additionally, when the provisions of the Open Meeting Law have been violated, a court of competent jurisdiction may issue a writ of mandamus requiring a meeting to be open to the public. A.R.S. § 38-431.04. A writ of mandamus is an order of the court compelling a public officer to comply with certain mandatory responsibilities imposed by law.

In 2007, in an effort to increase government awareness and provide the citizens of Arizona an effective and efficient means to get answers and resolve public access disputes, legislation expanded the Arizona Ombudsman-Citizens' Aide Office to provide free services to citizens and public officials regarding public access issues. The duties of the Ombudsman include: preparing materials on public access laws, training public officials, coaching, assisting and educating citizens, investigating complaints, requesting testimony or evidence, conducting hearings, making recommendations, and reporting misconduct. A.R.S. § 41-1376.01.

7.13.3 Civil Penalties. In addition to suits brought in order to require compliance with, prevent violations of, or determine the applicability of the Open Meeting Law, "[t]he attorney general may also commence a suit . . . against an individual member of a public body for a knowing violation of [the Open Meeting Law]." A.R.S. § 38-431.07(A). In such a suit, the court may impose a civil penalty not exceeding five hundred dollars for a second offense, and not exceeding two thousand five hundred dollars for third or subsequent offenses against each person who knowingly violates the Open Meeting Law. *Id.* This

penalty can also be assessed against a person who knowingly aids, agrees to aid or attempts to aid in violating the Open Meeting Law. *Id.* This penalty is assessed against the individual and not the public body, and the public body may not pay the penalty on behalf of, or otherwise reimburse, the person assessed. *Id.* If a "person who might otherwise be liable under [the Open Meeting Law] objected to the action of the public body and the objection is noted on a public record, the court may choose not to impose a civil penalty on that person." *Id.*

7.13.4 Attorney's Fees. The court may also order payment of reasonable attorney's fees to a successful plaintiff in an enforcement action brought under the Open Meeting Law. A.R.S. § 38-431.07(A). Normally those fees will be paid by the state or political subdivision of which the public body is a part or to which it reports. *Id.* However, if the court determines that a public officer knowingly violated the Open Meeting Law "with intent to deprive the public of information," the court must assess all of the costs and attorney's fees awarded to the plaintiff against that public officer or the person who knowingly aided, agreed to aid or attempted to aid the public officer in violating the Open Meeting Law. *Id.* As in the case of an award of civil penalties, the public body may not pay such an award of attorney's fees assessed against the public officer individually. *See id.*

7.13.5 Expenditure for Legal Services by Public Body Relating to the Open Meeting Law. A public body may not retain counsel or expend monies for legal services to defend an action brought under the Open Meeting Law unless the public body has legal authority to make such an expenditure pursuant to other provisions of law and it approves the expenditure at a properly noticed open meeting prior to incurring the obligation. A.R.S. § 38-431.07(B).

7.13.6 Removal From Office. If the court determines that a public officer knowingly violated the Open Meeting Law "with intent to deprive the public of information," the court may remove the public officer from office. A.R.S. § 38-431.07(A).

Form 7.1

Disclosure Statement

Section 7.6.3.1

STATEMENT OF LOCATIONS WHERE ALL NOTICES OF THE MEETINGS OF THE [NAME OF PUBLIC BODY] WILL BE POSTED

Pursuant to A.R.S. § 38-431.02, the [name of public body] hereby states that all notices of the meetings of the [name of public body] and any of its committees and subcommittees will be posted [identify the location where notices will be posted and include the hours during which such locations are open to the public, for example, "in the lobby of the State Capitol located at 1700 West Washington, Phoenix, Arizona, and at the press room of the State Senate Building, 1700 West Washington, Phoenix, Arizona. Both locations are open to the public Monday through Friday from 8:00 a.m. to 5:00 p.m. except legal holidays."] Such notices will indicate the date, time, and place of the meeting and will include an agenda or information concerning the manner in which the public may obtain an agenda for the meeting.

Dated this _____ day of _____, 20__.

[name of public body]

By [authorized signature]

Form 7.2

Notice of Public Meeting of a Public Body

Sections 7.6.3, 7.7.4, 7.10.1

NOTICE OF PUBLIC MEETING OF THE
[NAME OF PUBLIC BODY]

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the [name of public body] and to the general public that the [name of public body] will hold a meeting open to the public on [date, time, and exact location].

The agenda for the meeting is as follows:

> [List the specific matters to be discussed, considered, or decided. *See* Form 7.7 (Sample Notice and Agenda)]

[OR]

A copy of the agenda for the meeting will be available at [location where the agenda will be available] at least twenty-four hours in advance of the meeting.

Dated this _____ day of _____, 20___.

[name of public body]

By [authorized signature]

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting [name, telephone number, TDD telephone number]. Requests should be made as early as possible to arrange the accommodation.

Form 7.3

Notice of Public Meeting of a Subcommittee or Advisory Committee of a Public Body

Sections 7.6.3, 7.10.1

NOTICE OF MEETING OF THE [NAME OF SUBCOMMITTEE OR ADVISORY COMMITTEE] OF THE [NAME OF PUBLIC BODY]

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the [name of committee] of the [name of public body] and to the general public that the [name of committee] of the [name of public body] will hold a meeting open to the public on the [date, time, and exact location].

The agenda for the meeting is as follows:

> [List the specific matters to be discussed, considered or decided. *See* Form 7.7 (Sample Notice and Agenda)]

[OR]

A copy of the agenda for the meeting will be available at [location where the agenda will be available] at least twenty-four hours in advance of the meeting.

Dated this _____ day of _____, 20__.

[name of public body]

By [authorized signature]

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting [name, telephone number, TDD telephone number]. Requests should be made as early as possible to arrange the accommodation.

Form 7.4

Notice of Regular Meetings of a Public Body

Sections 7.6.3, 7.6.6, 7.7.4, and 7.10.1

NOTICE OF REGULAR MEETINGS OF THE
[NAME OF PUBLIC BODY]

Pursuant to A.R.S. § 38-431.02(F), notice is hereby given to the members of the [name of public body] and to the general public that the [name of public body] will hold regular meetings on the [specific day of month] of each month during the year [year]. The meetings will begin at [time] and will be held at [exact location].

A copy of the agenda for the meeting will be available at [location where the agenda will be available] at least twenty-four hours in advance of the meeting.

Dated this _____ day of _____, 20__.

[name of public body]

By [authorized signature]

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting [name, telephone number, TDD telephone number]. Requests should be made as early as possible to arrange the accommodation.

Form 7.5

Notice of Meeting and Possible Executive Session of a Public Body

Sections 7.6.8 and 7.10.1

NOTICE OF MEETING AND POSSIBLE EXECUTIVE SESSION OF THE [NAME OF PUBLIC BODY]

Pursuant to A.R.S. § 38-431.02, notice is hereby given to the members of the [name of public body] and to the general public that the [name of public body] will hold a meeting open to the public on [date, time, and exact location] for the purpose of deciding whether to go into executive session. If authorized by a majority vote of the [name of public body], the executive session will be held immediately after the vote and will not be open to the public.

The agenda for the meeting is as follows:

[Include a general description of the matters to be discussed or considered, but exclude information that would defeat the purpose of the executive session. *See* Form 7.7 (Sample Notice and Agenda)]

[OR]

A copy of the agenda for the meeting will be available at [location where the agenda will be available] at least twenty-four hours in advance of the meeting.

This executive session is authorized under A.R.S. § 38-431.03, Subsection (A), paragraph [list applicable provision].

Dated this _____ day of _____, 20__.

[name of public body]

By [authorized signature]

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting [name, telephone number, TDD telephone number]. Requests should be made as early as possible to arrange the accommodation.

Form 7.9

Special Notice of Emergency Meeting

Section 7.7.9

SPECIAL NOTICE OF AN EMERGENCY MEETING OF [NAME OF PUBLIC BODY] HELD [DATE]

Pursuant to A.R.S. § 38-431.02(D), notice is hereby given that an emergency session of the [name of public body] was held on [date, time, and exact location].

At the emergency session the [name of public body] [describe the specific matters discussed, considered, or decided, or in the case of matters considered in an emergency executive session, a general description of the matters considered, provided that no information is included that would defeat the purpose of the executive session].

Dated this _____ day of _____, 20__.

[name of public body]

By [authorized signature]

Form 7.10

Minutes of Public Meeting

Sections 7.8.1 and 7.8.2

MINUTES OF PUBLIC MEETING OF THE
[NAME OF PUBLIC BODY] OF MEETING HELD [DATE]

A public meeting of the [name of public body] was convened on [date, time, and exact location]. Present at the meeting were the following members of the [name of public body]: [names of members present]. Absent were: [names of members absent]. The following matters were discussed, considered, and decided at the meeting:

1. [Generally describe all matters discussed or considered by the public body.]

2. [Describe accurately all legal actions proposed, discussed, or taken, the names of persons who proposed each motion, and a record of how each member voted].

3. [Identify each person making statements or presenting material to the public body, making specific reference to the legal action about which they made statements or presented material.]

4. [Other required information. *See* Section 7.8.2(7), (8), (9).]

Dated this _____ day of _____, 20__.

[name of public body]

By [authorized signature]

Form 7.12

Notice of Action to be Ratified

Sections 7.6.4, 7.10.1, and 7.12.2

**NOTICE OF PUBLIC MEETING OF THE [NAME OF PUBLIC BODY]
FOR THE PURPOSE OF RATIFYING PAST ACTION TAKEN
IN VIOLATION OF OPEN MEETING LAW**

Pursuant to A.R.S. § 38-431.05, notice is hereby given to the members of the [name of public body] and to the general public that the [name of public body] will hold a meeting open to the public on [date, time, and exact location].

The purpose of the meeting is to ratify an action of the [name of public body] that may have been taken in violation of the Open Meeting Law. This action involved:

[Describe the action.]

The public may obtain a detailed written description of the action to be ratified, and all deliberations, consultations, and decisions by members of the public body that preceded and relate to this action to be ratified at [identify the location and include hours] at least 72 hours in advance of the meeting.

Dated this _____ day of _____, 20__.

[name of public body]

By [authorized signature]

Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting [name, telephone number, TDD telephone number]. Requests should be made as early as possible to arrange the accommodation.

3. Commissioners

The current list of commissioners are posted by the City of Tempe Clerk on the City Boards & Commissions website.

Phoenix/Tempe Aviation History

1935 Phoenix purchased Sky Harbor, which consisted of a small building and three runways forming a triangle.

1952 Phoenix constructed Terminal 1 and a new runway capable of operating DC-3's, the most common carrier of the day. Phoenix resolved that flights should "avoid the City of Tempe."

1958 Phoenix Ordinance G-262 of June 10, 1958 amended the Phoenix City Code declaring air traffic patterns for the Phoenix Sky Harbor airport. Section 6 stated that the first turn for departures from Runways 8L and 8R shall be made more than 3,000 feet beyond the airport boundary, and that flight patterns in any event shall be flown to avoid the populated areas of the City of Tempe. This wording was changed a few months later by Phoenix Ordinance G-271 of September 30, 1958, declaring that the first turn south be made east of the Tempe Butte, and that Phoenix Tower approval was required prior to making turns to the north. It also stated that all flight patterns will be flown to avoid the City of Tempe.

1962 Terminal 2 was constructed and publicity stated that it would be adequate till the end of the century.

1969 Phoenix Ordinance G-969 of November 4, 1969 regulated activities at City of Phoenix airports. The Phoenix City Code did not include language specific to the Sky Harbor Air Traffic Pattern with its abatement measures over Tempe.

1970 Concerned citizens formed the Tempe Environmental Improvement Committee (TEIC). The group adopted Phoenix Sky Harbor noise and plans for expansion as an issue because of citizen complaints about the noise of commercial aircraft over-flights of their neighborhoods.

1971 On November 22, 1971 the City of Phoenix held a public hearing on a Master Plan for the development of Phoenix Sky Harbor Airport. The document contained an old topographical map of Tempe, which listed ASU as AZ State College. No hospitals, schools, or residential areas were noted, and the noise exposure contour maps did not show the impact of turns over Tempe. At the time ASU had more than 26,000 students, and the City of Tempe had more than 80,000 citizens. The public process resulted in negotiations between the City of Tempe, the City of Phoenix Aviation Department, the FAA, the Air Transport Association, and also Williams AFB in December.

DOT/FAA issued a Draft Environmental Impact Statement dated December 27, 1971 that was based on the Phoenix Sky Harbor development plan.

1972 The City of Phoenix and the FAA met with Tempe and Tempe Environmental Improvement Committee. The topographic map presented in the Phoenix master plan was updated. C. E. Wallace Ph.D/ASU did a noise exposure forecast for Tempe.

1973 On March 28, 1973 Landrum & Brown presented at the Phoenix Sky Harbor Airport their Noise Impact Evaluation requested by Phoenix to update noise contour studies in the master plan. The

evaluation was presented to Tempe at a public meeting in Tempe Council Chambers on April 19th. Tempe asked for a formal public hearing of the Landrum & Brown evaluation. A request was also made by the City of Scottsdale. The officially recommended "Noise Abatement and Operative Procedures" were approved and released by the Phoenix Aviation Director. In addition to other specifics, aircraft were directed to avoid developed residential areas both north and south of the river. In August 1973 the radarscope was monitored for deviations. Tempe learned that 2/3 of the east departures were deviations/not flying over the riverbed.

1974 In April 1974 the radio beacon procedure was proposed at a meeting held in Tempe. Meetings were held between Tempe, Tempe Environmental Improvement Committee and the City of Phoenix Aviation Department. The Rio Salado Radio Beacon was installed as a navigational aid to keep departing aircraft over the "river route". Using the radio beacon, headings were established for the north and south runways. These headings were designed to keep planes flying over the riverbed corridor instead of over houses in Tempe. With the riverbed radio beacon and permanent FAA riverbed procedures, Tempe rescinded its request for a formal public hearing in a letter from the Mayor Dale R. Shumway dated June 10, 1974. The Final Environmental Impact Statement for the Phoenix Sky Harbor International Airport Improvement Program was issued August 1974. Plans for expansion of the now north runway were subsequently approved.

1976 Phoenix Sky Harbor became the second Air National Guard station in the nation to have its C-97 tanker fleet replaced with KC-135s. The City of Tempe had supported this effort.

1978 The US airline industry was deregulated, after which the major air carriers developed systems of connecting hubs throughout the nation.

1979 Terminal 3 was constructed to accommodate additional flights including 727s and 707s. The Maricopa Association of Governments (MAG) completed the first Regional Aviation System Plan (RASP).

1980 Tempe City Council appointed the Tempe Aircraft Noise Abatement Committee (ANACOM) to make policy recommendations to Council on noise generated by Sky Harbor aircraft operations.

1981 Southwest Airlines initiated service at Sky Harbor.

1982 ANACOM submitted a report to Tempe City Council noting that noise would increase due to recent deregulation, deviations from flight patterns and expansion of the airport (including a third runway proposed in the PRC Speas Master Plan Update). The ANACOM report criticized the lack of FAA enforcement of the river route and recommended that Tempe oppose the expansion plans at Sky Harbor until Tempe's problems and concerns were addressed.

Citizens near the river formed an organization to support the City of Tempe in their attempts to address the noise from aircraft that stray from the river bottom. The group, DAWN (Diminish Aircraft Wayward Noise) collected and donated $10,000 to the City to initiate legal remedies for the aircraft over-flights of neighborhoods.

1983 Phoenix City Council approved the Sky Harbor Master Plan. Phoenix committed in writing to Tempe that if a third runway was constructed, it would be used for general aviation only. Tempe opposed the plan and approval by the Phoenix Sky Harbor Noise Abatement Committee of existing east departure patterns that did not avoid heavy residential areas in Tempe, contrary to procedures for arrivals and departures approved by the Phoenix Aviation Director in 1979, which the Committee determined was not followed by the airlines.

America West Airlines initiated service at Sky Harbor.

1985 Michael Brandman Associates, Inc. hired by Tempe in 1984, completed an Aircraft Noise Mitigation Study recommending that the City formally request modifications to the Sky Harbor flight paths and departure procedures to protect property in Tempe. Tempe hired Stewart Udall, who completed a study of political and legal remedies to end the noise mitigation impasse at Sky Harbor. Tempe also hired Jay Dushoff. Dushoff worked with Stewart Udall to develop a platform for entering into negotiations with the FAA and the airport over noise mitigation measures at Sky Harbor, and joint sponsoring with the City of Phoenix of a federally funded FAR Part 150 Noise Compatibility Study for the airport.

1986 MAG updated the RASP with forecasts to 2005. Phoenix committed in writing to Tempe that flight departures would be distributed equally over Tempe and Phoenix, and that the existing flight paths would be altered to protect Tempe.

Phoenix Sky Harbor, the FAA, and other stakeholders worked together to change the Williams Air Force Base Military Operating Area so that, among other benefits, planes departing Phoenix Sky Harbor could fly further east before initiating their north or south turns. The 1 DME procedure was established.

1987 The AZ Department of Transportation (ADOT) completed a preliminary study of 12 potential sites for a Metropolitan Regional Jetport. ADOT concluded that Coolidge and Casa Grande appeared to be the most promising locations. The Gila River Indian Community was not included in the study.

1989 Phoenix completed the Sky Harbor Master Plan predicting that annual operations (landing and take offs) would increase from 416,415 to 567,934 by 2007 and that the total number of passengers would increase from 15 million to 40 million in the same time period. The report predicted an increase in average delays from 1.5 minutes to 7.3 minutes per operation unless a third runway was constructed. Eliot R. Cutler was hired to prepare the City's response the EIS for the approved Sky Harbor Master Plan.

The "Apogee Report" on facts and laws affecting critical airport capacity decisions prepared for the City of Tempe, stated that a third parallel runway at Sky Harbor would not provide a long-term solution to the airport's capacity problem.

1990 A Noise Compatibility Program (NCP) was approved by the FAA on April 2, 1990.

A State Aviation Needs Study (SANS) estimated that a third runway would be sufficient at Sky Harbor until 2007. By the year 2040, however, annual demand would exceed capacity by 840,000 operations and a regional airport could begin in the 2001 – 2008 time period.

America West Airlines, Southwest Airlines, Phoenix Tower and P-50 Phoenix TRACON signed a letter of agreement for the 1 DME procedure (later redefined as the 4 DME procedure after the VOTAC was moved) with the expectation that this procedure would become an FAA approved Standard Instrument Departure (SID) for all aircraft departing Sky Harbor to the east.

Phoenix completed construction of and put into service the Terminal 4 building.

1991 Tempe submitted extensive critical comments on the Draft Environmental Impact Statement (DEIS) for a third runway at Sky Harbor. The City of Tempe subsequently filed suit against the FAA and the EPA, in part alleging violations of the Clean Air Act. The suit was mediated, though not decided, by the 9th Circuit Court of Appeals.

AWA filed for Chapter 11 bankruptcy protection, emerging in 1994.

1992 The Governor's Regional Airport Advisory Committee and ADOT completed the Arizona Regional Airport Feasibility Assessment Study recommending that the State support a regional airport as a supplement to a 3-runway Sky Harbor to attract intercontinental carriers and promote integrated economic development in Arizona.

Sky Harbor Terminal 1 was demolished.

At the request of the Phoenix Aviation Director, Tempe agreed to modification of the 4-DME procedure to allow a change from 80 degrees to 85 degrees when departing runway 8L.

1993 MAG updated the RASP recommending that a third runway be constructed at Sky Harbor, that Williams Gateway be developed as a reliever airport and that runway extensions be made at several general aviation airports, which would be adequate for commercial air service to the year 2015.

1994 Tempe filed two lawsuits in the 9th Circuit Court of Appeals, one against the FAA (Docket No. 94-70030) and one against the Environmental Protection Agency (Docket No. 94-1063) in opposition to construction of a third runway. These suits were later dismissed pursuant to the adoption of an Intergovernmental Agreement on Noise Mitigation Flight Procedures (IGA) between the City of Tempe and the City of Phoenix and a modification of The Record of Decision (ROD) by the FAA.

FAA amended the ROD as signed by the Acting Regional Administrator Mr. Larry Andriesen. The modified ROD was submitted to the City of Tempe under a letter signed by D. B. Kessler.

AWA emerged from Chapter 11 bankruptcy proceedings.

1995 The City of Tempe, by Ordinance No. 95.15, created a Tempe Aviation Commission (TAVCO) with the responsibility to, among other things, assist and advise the Mayor and City Council and City Departments regarding the impact of aircraft noise on the citizens of Tempe. TAVCO replaced ANACOM.

1997 The City of Phoenix finished the installation of twenty fixed noise monitors which included eight monitors at sites in North Tempe on both sides of the dry Rio Salado riverbed. The noise monitors were part of the Noise and Flight Track Monitoring System (NFTMS) which the City of Phoenix agreed to install to control of how the operation of the airport complied with Noise Mitigation Flight Procedures included in the 1994 IGA.

1999 In May 1999, Mesa voters rejected the Rio Salado Crossing Proposal for the location of a new Cardinals' multi-purpose facility (football stadium).

In November the Governor appointed "Plan B" Task Force to develop a plan for a new stadium site.

TAVCO got Council approval for conducting a study of public perception of aircraft noise in Tempe. Dr. Bruce Merrill concluded based on study data collected in November and December 1999, that aircraft noise was primarily a problem north of Apache Boulevard.

An update of the Maricopa Association of Governments (MAG) Regional Aviation System Plan (RASP) was initiated.

2000 The City of Tempe responded to draft updates on the Phoenix Sky Harbor International Airport FAR Part 150 Noise Compatibility Study prepared by Coffman Associates. The City explained why the proposed recommendation to amend mixed use land designations inside the Rio Salado redevelopment area to exclude residential would be problematic to implement in view of existing plans.

The Plan B Task Force crafted recommendations for the general framework of SB1200/ Proposition 302 for definition and funding of a new Cardinals' football stadium. Proposition 302 was approved by a Maricopa County vote in November.

Coffman Associates completed a FAR Part 150 Noise Compatibility Study for Sky Harbor. This report presented noise contour maps for a 3-runway airport and recommended strategies for reducing the impact of airport noise by means of flight procedures, run-up prohibitions, soundproofing of homes, controlling adjacent land use, and other measures.

In October the third runway opened.

2001 Dr. Bruce Merrill presented the results of a study covering the public perception of aircraft noise in Tempe between 1999 and 2000 to TAVCO. The study indicated that the public is generally more aware of the problem and that the problem is getting worse in all areas surveyed. Study data was collected from November and December 2000.

In a special meeting with the City Council, TAVCO submitted a resolution concerning the lack of good faith by Phoenix to honor commitments made to Tempe in the 1994 IGA. The resolution recommended Tempe consider the feasibility of a return to the Courts for relief.

Tempe petitioned the U.S. District Court for the District of Columbia to review actions taken by the FAA in incorporating changes to the departure procedures including those in the NW 2000 Plan (Case # 011479).

The Arizona Tourism and Sports Authority (TSA) selected the Tempe site for the location of the new Cardinals' stadium consisting of 68 acres bounded by Priest Drive, Washington Street, Center Parkway and Loop 202.

The Tourism and Sports Authority submitted stadium plans to the FAA resulting in a determination of Hazard to Air Navigation by the FAA Western Pacific Regional Office. The determination was contested, and the US Department of Transportation reviewed the determination. In a letter dated August 16, 2002 from Sabra Kaulia (USDOT) to Barbara Lichman (Tempe) the determination of Hazard was upheld.

TAVCO recommended that Tempe City Council join with Phoenix and the Air National Guard to support retrofit/ make upgrades to the 161 Air Refueling Wing tanker fleet to become quieter.

2002 Tempe petitioned the U.S. District Court for the District of Columbia to enjoin the FAA from funding and the City of Phoenix from proceeding with the reconstruction of the center runway, alleging Clean Air Act violations, Civil Action No.02-2029 (EGS). Tempe's request for injunction was denied.

2003 A new site for the construction of the Cardinals' stadium was selected in Glendale, AZ.

2004 The Tempe City Council agreed to settle case # 011479 (departure procedures) for the consideration that FAA would notify Tempe and the Phoenix Airspace Users Working Group (PAUWG) of their intentions to change flight procedures.

2005 The newly established Governor's Advisory Council on Aviation held its first meeting January 31, 2005. The Governor's Executive Order 2004-22 charged the commission with studying important aviation issues within the state including the following areas of interest:

- Air space and airport capacity
- Land use compatibility
- Funding
- Current aviation needs
- Future aviation needs

TAVCO enquired into the possibility of having the City of Tempe added to the Council's stakeholder list. Because the list was carried over from the previous Council established by Governor Hull January 30, 2002, ADOT did not consider adding any new stakeholders to the list when the new Council was established by Governor Napolitano in 2004.

In April the Air National Guard completed conversion of the tanker fleet, and became operational with the KC-135R military tanker model, which is in compliance with the civil aircraft Stage 3 noise standard.

2006 The Governor's Advisory Council on Aviation delivered a preliminary report dated January 31, 2006, that included the status reports from committees that worked on land use compatibility, aviation capacity, and minutes from meetings held by the Council in 2005.

TAVCO recommended 6 aviation issues for Council consideration:

- Set up a non-airport linked noise monitoring system
- Make a policy statement on further runway expansions at Sky Harbor
- Explore ways to get the FAR Part 150 NCP for Sky Harbor expanded to include all significantly impacted neighborhoods irrespective of housing type
- Investigate the side-step suspension and possible damages suffered by residents because of the suspension, and because of departures over populated areas on both sides of the Salt River riverbed
- Promote a statewide aviation plan
- Evaluate existing noise mitigation flight procedures in Tempe and identify new issues that can be agreed upon with the City of Phoenix

The Maricopa Association of Government (MAG) accepts a Regional Aviation System Plan (RASP) Policy Committee recommendation of a selected long range airport development alternative for further detailed airspace analysis. Tempe's reservations from supporting the preferred alternative proposed by the MAG RASP Technical Advisory Committee were expressed in a committee minority report.

2007 The Governor's Advisory Council on Aviation delivered a final report dated January 31, 2007, recommending legislation to protect airports against encroachment by new non-compatible developments near airports, and encouraging the state legislature to increase funding to airport development. The report listed 24 airport development projects in the state, among others a new 4th runway at Sky Harbor that was part of the Maricopa Association of Governments (MAG) Regional Aviation System Plan (RASP) maximized airport development alternative for the 2005-2025 planning period. The MAG Policy Committee did not support alternatives presented in the RASP update, including the proposed maximized airport development alternative. The need for an airspace study to determine feasibility of implementing the maximized alternative for the evaluated airports, and with regard to Sky Harbor, the potential negative impacts the alternative would have on Luke AFB operations were raised by Committee members.

2008 The City of Phoenix entered into a new contract with ERA Beyond Radar to host and maintain the Noise & Flight Track Monitoring System (NFTMS) for the Phoenix Sky Harbor International Airport, which included replacing hardware and wiring at all Noise Monitoring Sites (NMS's). Upon recommendation from TAVCO to have the City do independent noise monitoring, Tempe hired QED to do a noise study based on data collected at sites located within its borders.

2009 The QED aircraft noise impact evaluation was completed and presented to TAVCO. TAVCO wrote a letter to the Tempe Mayor and Council supporting some recommendations of the report

regarding the relocation of some of the fixed monitoring sites of the Sky Harbor Noise and Flight Track Monitoring System (NFTMS). TAVCO also objected to the fact that the QED report used the Phoenix "gate" as NFTMS departure compliance measure. TAVCO asserted that the Phoenix "gate" concept is an inadequate measure to enforce noise mitigation agreed upon in the Intergovernmental Agreement (IGA) between Phoenix and Tempe, mitigation flight procedures the FAA has assured to uphold.

During the summer months, the City of Phoenix replaced noise monitoring equipment at the noise monitoring sites.

TAVCO recommended that the City of Tempe start monthly discussions with the City of Phoenix to develop and enhance low flow channels and other appropriate measures for diversion of water from the west end of the Town Lake dam to the west border of Tempe

2010 Upon recommendations from the Tempe Aviation Commission, the Tempe City Council adopted Ordinance No. 2010.36, 11-4-10, reducing the membership of the Commission from 13 to 11, and expanding the powers and duties of the Commission from the impact of aircraft noise on Tempe residents to (all) impacts of aircraft and airport operations on Tempe residents.

2012 The Tempe Aviation Commission made a recommendation to the Tempe Transportation Council Committee that Tempe consider membership in the National Organization to Insure a Sound Controlled Environment (N.O.I.S.E).

2013 A web based survey developed by the Tempe Aviation Commission show that aircraft noise continues to be a problem for Tempe residents. The growing dominance of larger airlines in a receding economy have reduced the total number of take offs and landings at the Phoenix Sky Harbor International Airport. Residents in north Tempe appeared to be more bothered by westbound arrival operations than eastbound departure operations, and in south Tempe residents are troubled by an increase in the number of arrival operations. Survey responses also pointed to helicopters and military jets as significant contributors to the aircraft noise problem in Tempe.

Landrum & Brown presented draft noise exposure contour maps for 2013 and a forecast for 2018 for the Phoenix Sky Harbor International Airport in public meetings in Tempe and Phoenix.

2014 At the February 13, 2014 Phoenix Airspace Working Group (PAUWG) meeting the P-50 Phoenix TRACON announced that proposed Area Navigation (RNAV) instrument departure procedures for Phoenix Sky Harbor International Airport needed to be redesigned because of design criteria changes, but the FAA would still keep to the scheduled September 18, 2014 publishing date.

Tempe voters approved the Tempe General Plan 2040, where an aviation element is included in the plan's circulation chapter, and aircraft noise is addressed in the environmental planning element.

The City of Phoenix submitted the final Noise Exposure Map Update for the Phoenix Sky Harbor International Airport to the FAA fore review and acceptance on June 27, 2014. The maps included a 2013 base year exposure map and a noise exposure forecast for 2018. The maps were

not approved. The FAA had the above mentioned RNAV procedures changes scheduled for publication, which altered flight paths on which the modeling of future noise exposure was based.

The Tempe Aviation Commission invites the P-50 Phoenix TRACON officials to the August 6, 2014 TAVCO meeting to talk about the proposed RNAV procedures due to be published on September 18, 2014. The officials disclosed to the TAVCO Commissioners that the proposed east flow instrument departure procedures will have a "Sparky" flyover waypoint located in the middle of the imaginary gate at the SR101/202 intersection to assist more consistent navigation of departing jets. The City of Phoenix had established a gate in the NFTMS to determine how jet aircraft departures to the east complied with a Noise Mitigation Flight Procedures included in the 1994 IGA.

2015 The City of Tempe was notified by the FAA of the intent to prepare an Environmental Assessment of the Phoenix Metroplex Project. In a letter dated April 25, 2015 Tempe responded to the FAA offering to host meetings within Tempe to allow the FAA to hear concerns specific to Tempe citizens.

June 1, 2015 the City of Phoenix petitioned the Court of Appeals for the D.C. Circuit to review the FAA's implementation of September 18, 2014 Area Navigation (RNAV) departure routes. The FAA decided to put the Phoenix Metroplex Project on hold.

2016 The Tempe Aviation Commission proposed that a drafted letter be sent to the FAA's administrator requesting formal recognition of the City as a stakeholder in the future planning of Phoenix airspace. The Tempe sent a letter on June 29, 2016 asking the FAA administrator to make the NextGen flight procedure implementation more inclusive and to designate the Tempe and its residents as stakeholders in the development and implementation of NextGen.

Tempe hosted a Sky Harbor community workshop at the Tempe Public Library on October 27, 2016 to inform residents about FAA's NextGen Area Navigation (RNAV) routing for the Phoenix Sky Harbor International Airport.

The Tempe Aviation Commission established a noise abatement subcommittee to develop recommendations to the commission about "fly friendly' flight procedures.

2017 The Tempe Aviation Commission Noise Abatement Subcommittee recommended to the Commission that the City of Tempe consider inviting officials from neighboring cities to support the creation of a regional Noise Abatement Office (NAO) to establish channels of communication with the FAA and major airlines at the Phoenix Sky Harbor International and Phoenix-Mesa Gateway Airports. Within the date of the Noise Abatement Subcommittee's sunset, the Commission decides to establish a new subcommittee to further explore a framework for a regional Noise Abatement Office (NAO).

The Court of Appeals for the D.C. Circuit ruled August 29, 2017, with a two to one majority, to vacate the FAA's decision to publish Area Navigation (RNAV) routing for the Phoenix Sky Harbor International Airport on September 18, 2014. The ruling was later amended after the

Phoenix petitioners and the FAA agreed to ask the court to limit the ruling to only vacate the published RNAV flight procedures that changed the departure headings off the runways to the west of the airport.

2018 The City of Phoenix issued an RFP to replace existing noise monitoring hardware at all sites. The Brüel & Kjær equipment last updated in 2009 and maintained by ERA Beyond Radar together with the flight track monitoring component, was approaching the end of useful life. The NFTMS had after 2008 been taken over by ITT Exelis and L3Harris, and as a web based application undergone program upgrades that included the integration of flight data from the airport's new Standard Terminal Automation Replacement System (STARS). Phoenix later decided to enter into a new contract with L3Harris and gradually replace the noise monitors with new Larson Davis equipment, and include solar power panels at some sites.

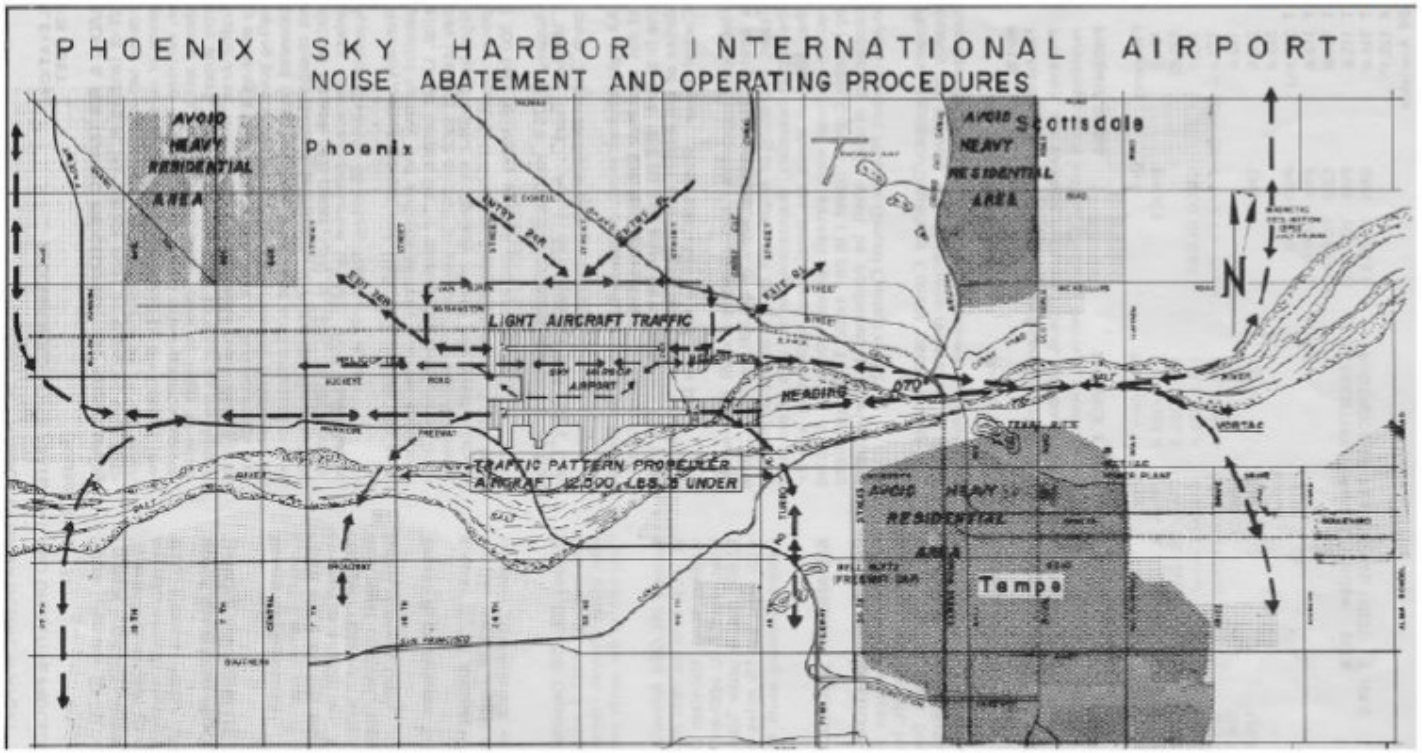
The FAA conducted workshops in the City of Phoenix to get public input on plans to revert RNAV departure routes west of the airport to how departure routes were published prior to September 18, 2014, called "Step One" of the agreement with the Phoenix petitioners. Revised procedures were published in March and May 2018 with approximate departure headings to the west of the airport to those in place prior to September 2014. Tempe Mayor, Mark Mitchell asked in a letter dated February 15, 2018, that the FAA consider realigning the paths of arrivals from the west to relieve neighborhoods in South Tempe along Western Canal from overflight impacts of dual routing, a west departure route and the east arrival route under "Step One." The letter also asked the FAA to include under "Step Two" NextGen navigation technology to develop routing that accomplished more precise navigation by airlines all the way into Phoenix Sky Harbor International Airport.

2019 Under "Step 2" of the agreement, the FAA conducted additional workshops in the City of Phoenix to solicit public input from communities within a radius of fifteen miles of the Phoenix Sky Harbor International Airport about their concerns regarding aircraft operations.

TAVCO conducted a public meeting on June 19, 2019 at Tempe City Hall because none of the FAA's "Step 2" workshops were located outside City of Phoenix borders. The meeting was preceded by soliciting citizen input on selected aviation topics through a questionnaire posted on the Tempe's website.

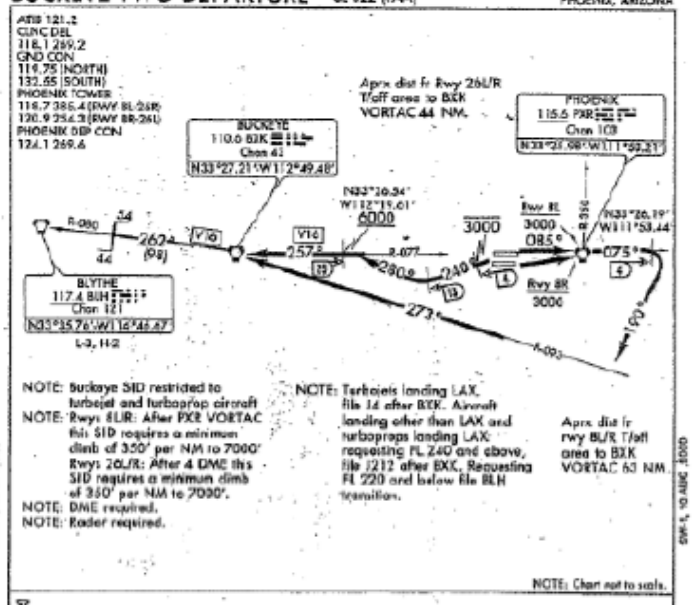
2020 On January 10, 2020, the FAA announced it would take no further actions under "Step Two" to those already taken under "Step One," made effective in March and May of 2018.

Attachments: 1973 Phoenix Sky Harbor Noise Mitigation Flight Procedure Map,
Jeppesen: Buckeye 2 and Drake August 2000 Standard Instrument Departure Procedures


PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
NOISE ABATEMENT AND OPERATING PROCEDURES
AVOID HEAVY RESIDENTIAL AREA
Phoenix
AVOID HEAVY RESIDENTIAL AREA
Scottsdale
LIGHT AIRCRAFT TRAFFIC
HEADING 070°
TRAFFIC PATTERN PROPELLER AIRCRAFT 12,500 LBS. & UNDER
AVOID HEAVY RESIDENTIAL AREA
Tempe
N

(PILOT NAV) (BXK2.BXK) 99140 330

BUCKEYE TWO DEPARTURE SL-322 (FAA) PHOENIX SKY HARBOR INTL (PHX)
PHOENIX, ARIZONA



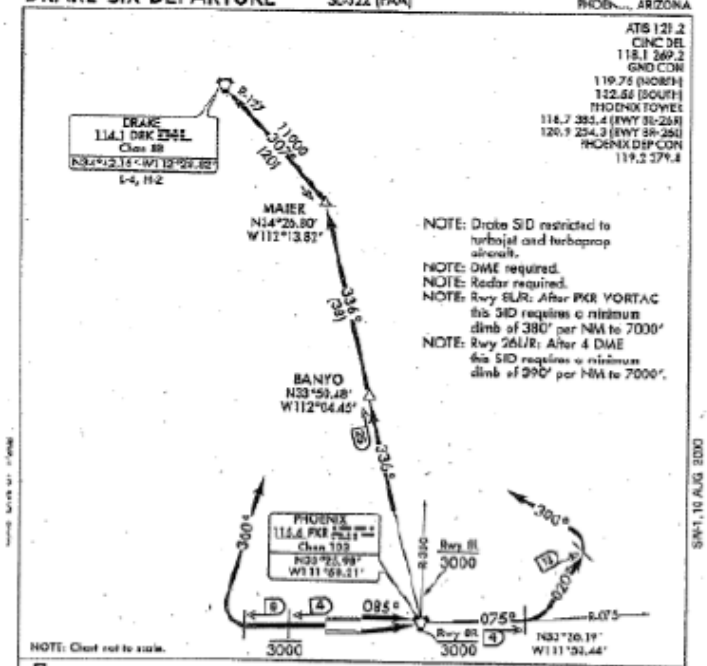
DEPARTURE ROUTE DESCRIPTION

TAKE-OFF RUNWAY 8L: Fly heading 085° to intercept PXR-075, cross PXR R-350 at or below 3,000'. At 4 DME east of PXR VORTAC, turn right heading 190° to intercept BXK R-093 to BXK. Thence. . . .
TAKE-OFF RUNWAY 8R: Fly direct PXR VORTAC, cross PXR at or below 3,000'. Proceed via PXR R-075 to 4 DME east, turn right heading 190° to intercept BXK R-093 to BXK. Thence. . . .
TAKE-OFF RUNWAYS 26L/R: Fly heading 240° or heading assigned by ATC. Cross 4 DME west of PXR VORTAC at or below 3,000'. At 13 DME west of PXR VORTAC turn right heading 280° to intercept BXK R-077 to BXK VORTAC, cross 25 DME east of BXK VORTAC at or above 6,000'. Thence. . . .
. . . . via (transition) or (assigned route).
LOST COMMUNICATIONS: Expect filed altitude 3 minutes after departure.
BLYTHE TRANSITION (BXK2.BLH): From over BXK VORTAC via BXK R-262 and BLH R-080 to BLH VORTAC.

BUCKEYE TWO DEPARTURE PHOENIX, ARIZONA

(PILOT NAV) (DRK6.DRK) 01223 381

DRAKE SIX DEPARTURE SL-322 (FAA) PHOENIX SKY HARBOR INTL (PHX)
PHOENIX, ARIZONA



DEPARTURE ROUTE DESCRIPTION

TAKE-OFF RUNWAY 8L: Climb via heading 085° to intercept and proceed via PXR R-075, cross PXR R-350 at or below 3000'. At 4 DME east of PXR VORTAC, turn left heading 020°, at 13 DME turn left heading 300° to intercept the PXR R-336 to MAIER INT. Then via DRK R-127 to DRK VORTAC. Expect filed altitude 3 minutes after departure.
TAKE-OFF RUNWAY 8R: Proceed direct to PXR VORTAC, thence via PXR R-075, cross PXR VORTAC at or below 3000'. At 4 DME east of PXR VORTAC turn left heading 020°, at 13 DME turn left heading 300° to intercept PXR R-336 to MAIER INT. Then via DRK R-127 to DRK VORTAC. Expect filed altitude 3 minutes after departure.
TAKE-OFF RUNWAY 26L/R: Climb via runway heading or via heading assigned by ATC. Cross 4 DME west of PXR VORTAC at or below 3000'. At 9 DME west of PXR VORTAC, turn right heading 360° to intercept PXR R-336 to MAIER INT. Then via DRK R-127 to DRK VORTAC. Expect filed altitude 3 minutes after departure.

5. Phoenix Sky Harbor International Airport - Noise Mitigation

The Intergovernmental Agreement (IGA) on Noise Mitigation Flight Procedures between City of Tempe and City of Phoenix, September 2, 1994.

Intergovernmental Agreement
On Noise Mitigation Flight Procedures

between City of Tempe

and City of Phoenix

C94-175

INTERGOVERNMENTAL AGREEMENT ON NOISE
MITIGATION FLIGHT PROCEDURES

69311

THIS INTERGOVERNMENTAL AGREEMENT, is made and entered into this 2ND day of SEPTEMBER, 1994, by and between the CITY OF TEMPE, ARIZONA, a municipal corporation of the state of Arizona ("Tempe"), and the CITY OF PHOENIX, ARIZONA, also a municipal corporation of the state of Arizona ("Phoenix") (sometimes jointly referred to as the "Parties").

W I T N E S S E T H

WHEREAS, Phoenix, the current owner and operator of Phoenix Sky Harbor International Airport (the "Airport" or "Sky Harbor"), currently proposes to expand the Airport by adding, among other things, additional terminal facilities and a 7,800-foot third parallel runway (the "Third Runway"); and

WHEREAS, Tempe has experienced for many years, and continues to experience, noise impacts resulting from the operation of aircraft using the Airport; and

WHEREAS, to lessen the noise impacts resulting from jet and large turboprop aircraft arriving from, and departing to, the east over Tempe, aircraft currently follow certain FAA-approved noise mitigation flight procedures, designed, in part, to restrict flights to the airspace over the Salt River riverbed; and

WHEREAS, Phoenix and Tempe agree that it is in the best interests of the citizenry and communities in the Phoenix metropolitan area to resolve differences with regard to the current use and proposed expansion of the Airport; and

WHEREAS, the Parties acknowledge and agree that maintaining and implementing noise mitigation flight procedures and measures at the Airport will facilitate compatible land use planning in communities near the Airport; and

WHEREAS, Phoenix and Tempe recognize the FAA's jurisdiction under Title III of the Federal Aviation Act of 1958, as amended, over navigable airspace, including aircraft flight paths and air traffic rules, regulations and procedures, and, accordingly, have sought from the FAA the strongest possible assurances of permanence of the noise mitigation procedures; and

WHEREAS, Tempe, the FAA and Phoenix have agreed to file a Stipulation and Dismissal to dismiss with prejudice the actions titled City of Tempe v. FAA (9th Circuit, Docket No. 94-70030, 1994) and City of Tempe v. Environmental Protection Agency (D.C. Circuit, Docket No. 94-1063, 1994) on the conditions (a) that the FAA will issue an amended Record of Decision ("ROD") reaffirming its commitment to the use of the noise mitigation procedures and

acknowledging that it will be reasonable for Tempe to rely upon the FAA's ordinary policy of not abandoning or changing flight procedures or the use of noise abatement procedures absent a formal request by the airport proprietor, and (b) that Tempe will not oppose the construction of the Third Runway or an application for a Passenger Facility Charge ("PFC") for such runway and other projects described in the Final Environmental Impact Statement issued by the FAA on November 5, 1993 ("FEIS"); and

WHEREAS, Tempe makes the commitments in this Agreement based upon Phoenix's commitments made herein, and upon the FAA's declaration and assurance that Tempe may reasonably rely upon the FAA's ordinary policy of not abandoning or changing flight procedures or the use of noise abatement procedures absent a formal request by the airport proprietor or operator;

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, Phoenix and Tempe hereby agree as follows:

ARTICLE I.
LEGISLATIVE ENABLEMENT

Tempe enters into this Agreement pursuant to its powers under Title 9, Arizona Revised Statutes and Article I of the Tempe City Charter, and Phoenix enters into this Agreement pursuant to its powers under Title 9, Arizona Revised Statutes, Chapter 2 of the Phoenix City Charter and Chapter 4 of the Phoenix City Code.

ARTICLE II.
DEFINITIONS

"Agreement" means this Intergovernmental Agreement by and between Tempe and Phoenix.

"Aircraft operation" means either a landing or a take off by a jet or large turboprop aircraft at the Airport.

"Aircraft Owner/Operator" means the commercial air carrier or other entity or person, including foreign entity or person, responsible for retaining the aircraft pilot and/or operating the aircraft which use the Airport.

"Airport" or "Sky Harbor" means Phoenix Sky Harbor International Airport.

"ATCT" means Phoenix Air Traffic Control Tower.

"Distance Measuring Equipment" or "DME" means navigational equipment used to measure in nautical miles the

slant range distance of an aircraft from ground-based equipment at a fixed location.

"Effective Date" means the first day upon which this Agreement is approved by the respective City Councils of Tempe and Phoenix, executed by the appropriate officials from Phoenix and Tempe and filed with the Recorder of Maricopa County.

"Federal Aviation Administration" or "FAA" means the United States Federal Aviation Administration or other authority, corporation or entity succeeding to the FAA's regulatory or operational powers and functions applicable to this Agreement.

"Large turboprop aircraft" means all turboprop aircraft required to be certified and operated pursuant to F.A.R. § 121 or § 135 or any general aviation turboprop aircraft with a gross weight exceeding 12,500 pounds.

"Modification" or "modify," as applied generally to flight procedures in use at the Airport and to the noise mitigation procedures referenced in Section 1.1 of this Agreement in particular, means to abandon, alter, vary, change, add provisions to or delete provisions from such flight procedures or the noise mitigation procedures in any way, except for temporary deviations made by the aircraft pilot, ordered by the ATCT or required by the FAA, because of an emergency, adverse weather conditions or temporary safety considerations.

"Noise and Flight Track Monitoring System" or "NFTMS" means the system to monitor noise from, and flight tracks of, aircraft using Sky Harbor which Phoenix has agreed by this Agreement to develop and implement at the Airport.

"Operations Commencement Date" means the date upon which aircraft operations are first commenced on the Third Runway.

"Phoenix" means the municipal corporation of Phoenix, Arizona, and its officials, representatives, agents, or attorneys.

"Tempe" means the municipal corporation of Tempe, Arizona, and its officials, representatives, agents, or attorneys.

ARTICLE III
COVENANTS AND AGREEMENTS

1. Noise Mitigation Procedures

1.1 Procedures. The noise mitigation procedures pertinent to this Intergovernmental Agreement are as described on page 15 of the FAA's Record of Decision, dated January 18, 1994 (as amended by that agency's Amended Record of Decision which is described in Exhibit A attached hereto), consisting of the "4 DME," the "side-step" and the "equalization" of departing jet and large turboprop aircraft.

1.2 Modifications. Phoenix shall not request the FAA to abandon or modify these noise mitigation procedures and will affirmatively oppose any abandonment or modification by filing with the FAA Administrator an official written statement of opposition to any abandonment, modification or change of these noise mitigation procedures proposed for reasons other than safety.

1.3 No Restriction on Additional Noise Abatement or Mitigation Measures. Nothing in this Agreement shall be construed to in any way limit or restrict the Parties or the FAA from implementing additional noise abatement or mitigation measures.

2. Additional Studies

No later than the Operations Commencement Date, Phoenix shall submit to the FAA an update of the F.A.R. Part 150 Noise Compatibility Plan and Program for the Airport.

3. Land Use

Tempe and Phoenix agree to take all actions necessary, consistent with applicable laws and regulations, to implement the land use management strategies recommended in the F.A.R. Part 150 Noise Compatibility Plan and Program. Tempe, consistent with applicable laws and regulations, will take such measures as are necessary to ensure that new development undertaken in connection with the Rio Salado project or in noise sensitive environs within its jurisdiction will be compatible with the noise levels predicted in the F.A.R. Part 150 Noise Compatibility Plan and Program.

4. Noise and Flight Track Monitoring

4.1 Noise and Flight Track Monitoring System (NFTMS). Phoenix shall develop and install, and maintain and operate, on a permanent and continuing basis, noise and flight track equipment capable of monitoring compliance with the noise mitigation procedures by (a) specifically identifying by type and flight those aircraft which fail to comply with the noise mitigation procedures relating to the 4 DME and side step procedure, (b) specifically identifying the flight tracks of all non-military jet and large turboprop aircraft departing to and/or arriving from the east, and (c) measuring and reporting, using L_{max}, the single-event noise levels resulting from each noncomplying aircraft at predetermined monitoring locations within Tempe. The NFTMS shall measure noise, and monitor flight tracks, continuously and shall be capable of storing, for an eighteen (18) month period, all such data for immediate or future use.

4.2 Implementation Schedule. The Parties expressly acknowledge that there are substantial lead times for the procurement, development, installation, testing and complete implementation of a noise and flight track monitoring system at Sky Harbor. Accordingly, Phoenix shall use its best efforts to implement the procurement, development, installation, testing and operation of the Noise and Flight Track Monitoring System in accordance with the schedule set forth below.

Implementation Date	Element
Nine months (9) after the Effective Date	Issue bid invitations for procurement, development and installation of the NFTMS
Eighteen (18) months after the Effective Date	Implement operational test system capable of identifying specific aircraft violating the noise mitigation procedures
Twenty-four (24) months after the Effective Date	Implement a complete and fully operational NFTMS with data access availability

4.3 Consultation with Tempe. Phoenix shall consult with Tempe regularly throughout the procurement, development, installation, testing and operation of the Noise and Flight Track Monitoring System, and specifically with regard to: the selection of contractors and/or vendors; development and design of the NFTMS; installation and operation of the NFTMS; specifications for the components and capabilities of the NFTMS, including monitoring and external data acquisition components, the number and site selection of noise monitors located within Tempe, the noise monitoring technology and capability, the flight track monitoring and event correlation technology and capability, data access, acquisition and transfer technology and capability, and computer technology and capability. Phoenix shall be entitled to make all final decisions on all aspects of the NFTMS.

4.4 Data and Software Access. Phoenix shall install a NFTMS with a direct computer link to Tempe in order to provide Tempe with the data generated on a real time basis. Phoenix shall take all reasonable steps necessary (including, if needed, obtaining a license) to ensure Tempe's use of the computer technology and software needed to obtain and utilize data supplied through the computer link, and shall provide Tempe with reasonable training on all hardware and software required to access that computer link.

4.5 Temporary Non-Operation. Nothing contained herein shall restrict Phoenix, as operator of the NFTMS, from shutting the system down in whole or in part from time to time on a temporary basis, as may be required for maintenance, calibration, repairs or similar circumstances.

4.6 Equalization Data. Phoenix shall provide Tempe with data and related information needed to assess compliance with equalization (described in Section 1.1 of this Agreement) both on a twenty-four (24) hour basis and separately for nighttime hours. Phoenix shall monitor departures and use its best efforts to persuade the FAA to compensate for quarterly patterns which, if annualized, would not comply with equalization.

4.7 Notification of Non-Compliance. Within twenty-four (24) regular business hours of any aircraft's failure to comply with the noise mitigation procedures relating to the 4 DME and side-step procedures, Phoenix shall

provide written notice of such non-compliance to the Aircraft Owner/Operator with copies to the FAA Flight Standards District Office and Tempe.

4.8 Publication of Data. Nothing in this Agreement shall restrict or prohibit Tempe from publishing or otherwise making available to the public the NFTMS data or related reports, in a form and manner Tempe chooses.

5. Opposition

Tempe agrees not to oppose, or assist others in opposing the construction of the Third Runway or other projects described in the FEIS, or the imposition of a Passenger Facility Charge for any such other project or projects described in the FEIS.

6. General Provisions and Construction of the Agreement

6.1 Remedies. The Parties may enforce this Agreement or compel performance of this Agreement and compliance with its conditions and terms by filing an action for specific performance of the terms of this Agreement, an action to enjoin a party from violating the terms of this Agreement, or mandamus or other appropriate actions to enforce the terms of the Agreement.

6.2 Attorney's Fees. The prevailing party in any lawsuit to enforce this Agreement, or any subsection of this Agreement, shall be entitled to recover reasonable attorney's fees and costs from the opposing party.

6.3 Liability of Officials, Agents. No elected or appointed officers, nor employees, agents or attorneys of Tempe or Phoenix shall be liable with respect to any action taken (or not taken) in good faith in connection with this Agreement.

6.4 Merger. The January 1994 Letter of Intent by and between Tempe and Phoenix shall merge into this final Intergovernmental Agreement.

6.5 Time is of the Essence. The Parties agree that in the performance of the covenants, agreements, terms and conditions under this Agreement, time is of the essence.

6.6 Amendments, Modifications and Waivers. Any and all amendments, waivers and modifications of this Agreement must be made in writing and signed by the party to be bound.

6.7 Singular and Plural. Whenever the context shall so require, the singular shall include the plural and the plural shall include the singular.

6.8 Validity and Enforceability. Phoenix and Tempe agree not to challenge the validity or enforceability of all or any part of this Agreement and will oppose any effort to challenge the validity or enforceability of all or any part of this Agreement.

6.9 Severability. If any provision of this Agreement shall be invalid, illegal or unenforceable, it shall not affect or impair the validity, legality or enforceability of any other provision of this Agreement, and there shall be substituted for the affected provision a valid and enforceable provision as similar as possible to the affected provision.

6.10 Actions Prohibited. Whenever this Agreement prohibits a particular action by any party hereto, the party also is prohibited from causing such action to be taken by a third party.

6.11 Binding on Successors and Conditions on Transfer of the Airport. This Agreement shall be binding upon and shall inure to the benefit of the successors of Phoenix, to the successors and assigns of the Airport and to the successors of Tempe. Phoenix shall expressly condition any transfer of the Airport to a new owner or operator upon such owner or operator accepting the Procedures and the obligations set forth in this Agreement.

6.12 Term of Agreement. The term of this Agreement shall be fifty (50) years.

6.13 Filing with County Recorder. Upon execution, Tempe shall file this Agreement with the Recorder of Maricopa County.

6.14 Interpretation of Agreement. This Agreement shall be interpreted and construed as though drafted by both Phoenix and Tempe. No question or issue of construction or interpretation of any provision of this Agreement shall be resolved by assertion of application of any rule or presumption that the language shall be construed against the drafting party.

6.15 Government Laws. The laws of the State of Arizona shall govern the interpretation and enforcement of this Agreement.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed the day and year first above written.

City of Phoenix,
a municipal corporation

FRANK A. FAIRBANKS, City Manager

By: Frank A. Fairbanks

ATTEST:

Vicky Mueller
City Clerk

APPROVED AS TO FORM:

Michael D. Hamer
ACTING City Attorney

City of Tempe,
a municipal corporation

NEIL GIULIANO, Mayor

By: Neil Giuliano

ATTEST:

Helen R. Fowler
City Clerk

APPROVED AS TO FORM:

David R. Merkel
City Attorney

REVIEWED AND APPROVED:

Thelda Williams
THELDA WILLIAMS
Mayor, City of Phoenix

1994 SEP -1 AM 9:41
CITY CLERK DEPT.

5. Phoenix Sky Harbor International Airport - Noise Mitigation

The Federal Aviation Administration Record of Decision (ROD) for Proposed Master Plan Update Improvements at Phoenix Sky Harbor International Airport Phoenix, Arizona, January 18, 1994 pages 1 & 15

RECORD OF DECISION

FOR THE

PROPOSED MASTER PLAN UPDATE IMPROVEMENTS
AT
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA

United States Department of Transportation
Federal Aviation Administration
Western-Pacific Region
Hawthorne, California

JANUARY 18, 1994

The FAA has stated in writing in the FEIS, the Memorandum of Agreement with the Arizona State Historic Preservation Officer and the Advisory Council on Historic Preservation and in this Record that it intends to continue to use the "One-DME" departure procedure for easterly departures to minimize aircraft noise impacts over Tempe. Further, substantial modification or deletion of the Standard Instrument Departure Procedures commonly known as the "One-DME" departure procedure will not occur without full compliance with FAA Order 1050.1D *Policies and Procedures for Considering Environmental Impacts*. This requires completion of full environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. Coordination with the affected communities and a public participation process is a requirement of the Order.

For the purposes of this Record, a "substantial modification" to a flight procedure, as described Section 5.1.3 of the FEIS, means a change that results in a 1.5 Ldn **increase** in noise over any noise sensitive areas located with the 65 Ldn contour as described in Paragraph 1(b)(1) of Attachment 2 to FAA Order 1050.1D.

In addition to the FAR Part 150 program elements, an informal "side step" procedure is proposed at PHX for west flow approaches. This procedure is appropriate for use at airports with closely spaced runways such as Los Angeles International, Denver Stapleton International, San Jose International, Fresno Air Terminal, Seattle-Tacoma International, and Ontario International. This procedure would be used during Visual Flight Rule conditions with arrival aircraft executing a typical approach to Runway 26L (West flow) until a point approximately three miles east of the runway end. At that point, which is located approximately over Sun Devil Stadium and Mill Avenue, the pilot would "side-step" by turning left and aligning with the centerline of the new runway. As stated in the FEIS, this procedure is considered to be practical due to the low level of activity which would occur on the Runway 26L approach path, the 800 foot runway separation distance and the excellent visibility in the area. This procedure would be an informal procedure, with the option to use or not use by the pilot-in-command, weather and air traffic permitting. The purpose of this procedure is to further minimize flights over noise sensitive areas in the city of Tempe.

Section 4.14 of the FEIS also provides for noise mitigation of aircraft noise impacts to the west of the airport. This includes the continued equalization of departure procedures to the east and west. This measure attempts to "equalize" departing aircraft to the east and west during day and nighttime hours, weather and traffic permitting. The FAA has adjusted the hours used for westerly departures in an effort to equalize easterly and westerly operations. It is important to note that hourly or daily equalization is not a reasonable goal in terms of actual aeronautical operations due to several factors including seasonal weather patterns, diurnal wind changes, air traffic conditions and the density of aircraft operations at specific times of day. The appropriate period for definition of equalization is over a 12-month period. This time frame will account for the daily change in weather patterns and more importantly, for the seasonal wind change. It is also important to realize that the majority of aircraft operations occur during the daylight hours of a 24-hour period.

5. Phoenix Sky Harbor International Airport - Noise Mitigation

Amendment to the Federal Aviation Administration Record of Decision (ROD) for Proposed Master Plan Update Improvements at Phoenix Sky Harbor International Airport Phoenix, Arizona, January 18, 1994.

United States Department of Transportation
Federal Aviation Administration
Western-Pacific Region
Hawthorne, California

Amendment to Approved RECORD OF DECISION
Dated: January, 18, 1994

For The Proposed Master Plan Update Improvements At
Phoenix Sky Harbor International Airport, Phoenix, Arizona

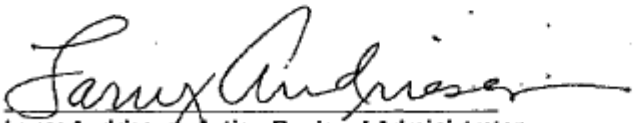
On January 18, 1994, the Federal Aviation Administration (FAA) issued a Record of Decision (ROD) for the proposed master plan update improvements at Phoenix Sky Harbor International Airport, Phoenix, Arizona. The following amendment to that ROD is made for the purposes of clarification and does not reopen the underlying decision.

The FAA reaffirms its commitment to the noise mitigation measures described on page 15 of the ROD. It is the FAA's understanding that the city of Phoenix, as owner and operator of Phoenix Sky Harbor International Airport, is not expected to ask the FAA to change the noise mitigation measures described on page 15 of the ROD. Consistent with its ordinary policy, the FAA does not initiate changes to noise abatement flight procedures on its own, absent a request from an airport operator. In this context, the FAA agrees that it is reasonable for the city of Tempe, Arizona to rely upon that ordinary practice. The FAA commits to consider the following factors, among others, in exercising its discretion to change or delete the noise mitigation measures described on page 15 of the ROD purely for reasons of capacity enhancement:

- The reasonable reliance by the city of Tempe upon these noise mitigation measures, and

- The reasonable reliance by the city of Tempe upon the FAA's ordinary practice regarding the initiation of changes.

Any such changes will be preceded by the application of FAA environmental review, including a public meeting, and consideration of mitigation measures and alternatives. Any additions, deletions, or changes to the noise mitigation procedures described on page 15 of the ROD that require preparation of an environmental assessment or an environmental impact statement will be issued by the FAA as a final order pursuant to Section 1006 of the Federal Aviation Act.



9-13-94

Larry Andriesen, Acting Regional Administrator,
Western-Pacific Region, Federal Aviation Administration

Date

This amendment constitutes an order of the Administrator which is subject to review by the Courts of Appeals of the United States in accordance with the provisions of Section 1006 of the Federal Aviation Act of 1958, as amended, 49 U.S.C. 46110.

5. Phoenix Sky Harbor International Airport - Noise Mitigation

Noise Mitigation Flight Procedures

4-DME: *".it (the FAA) intends to continue the use of the "One-DME" departure procedure for easterly departures to minimize noise impacts over Tempe. Substantial modification or deletion will not occur without full compliance with FAA Order 1050.1D"*

The One-DME radio beacon was moved to where W. Rio Salado Parkway turns south to 52 Street when the SR 202 was built, which changed the name of the procedure to "Four-DME" standard instrument departure procedure,

Side Step (*" informal"*): *"This procedure is appropriate for airports with closely spaced runways such as (LAX, ONT)." Would be used during VFR conditions with arrival aircraft executing a typical approach to Runway 26L (West flow) approximately three miles east of the runway end."*

The side-step procedure and its formal implementation as a charted visual procedure was suspended in March of 2002.

Equalization: *" This measure attempts to "equalize" departing aircraft to the east and west during day and nighttime hours, weather and traffic permitting."*

City of Tempe
P. O. Box 5002
Tempe, AZ 85280
www.tempe.gov

Tempe

January 6, 2005

Ms. Carlette Young
FOIA Coordinator
U.S. Department of Transportation
Federal Aviation Administration
Western-Pacific Region AWP-4
P.O. Box 92007
Los Angeles, CA 90009-20007

RE: FOIA REQUEST

Dear Ms. Young:

Pursuant to the Freedom of Information Act, 5 U.S.C. § 552, and on behalf of the City of Tempe, I request access to and copies of all documents issued and received by the Federal Aviation Administration dealing with the suspension of the side step visual approach procedure to Runway 25L at Phoenix Sky Harbor International Airport and the implementation of a straight-in approach procedure to this runway in 2002. This request includes but is not limited to the following documents: Noise Level Memorandum, Environmental Review Checklist and Categorical Exclusion Determination.

Thank you in advance for your assistance and cooperation. Should you have any questions regarding this request, please contact me via e-mail at Shelley_Hearn@tempe.gov or at 480 350-8906.

Sincerely,

Shelley Hearn

Shelley Hearn
Community Relations Manager
City of Tempe
31 E. Fifth Street
Tempe, AZ 85281
480 350-8906

5. Phoenix Sky Harbor International Airport - Noise Mitigation

14 CFR (Code of Federal Regulations) Federal Aviation Regulation Part 150

The FAR Part 150 Airport Noise Compatibility Planning Program

An Overview

Background

Federal Aviation Regulation, Part 150, Airport Noise Compatibility Planning, is the primary Federal regulation guiding and controlling planning for aviation noise compatibility on and around airports. Part 150 was issued as an interim regulation (46 FR 8316; January 19, 1981) under the authority of the Aviation Safety and Noise Abatement Act of 1979 [49 U.S.C. App. 2104(c)] (ASNA Act). Implementation of noise compatibility planning under the ASNA Act was delegated to the FAA. Part 150 established procedures, standards, and methodologies to be used by airport operators for the preparation of Airport Noise Exposure Maps (NEM's) and Airport Noise Compatibility Programs (NCP's) which they may submit to the FAA under Part 150 and the ASNA Act. The final rule was issued on January 18, 1985 (49 FR 49260) and, on March 16, 1988, was amended to include freestanding heliports (53 FR 8722). The rule has since had several conforming amendments, including one to conform to 14 CFR Part 161. The program has been quite active. One hundred and ninety two NCP's have been approved to date, and more than 230 are currently in the program. Over $1.9 billion has been provided to airports for noise mitigation, with the bulk of these dollars implementing Part 150 NCP'S.

The FAA believes that the Part 150 process is a balanced approach for mitigating the noise impacts of airports upon their neighbors while protecting or increasing both airport access and capacity as well as maintaining the efficiency of the national aviation system. Part 150 provides for the following:

- Establishes standard noise methodologies and units.
- Establishes the Integrated Noise Model (INM) as the standard noise modeling methodology.
- Identifies the land uses which normally are compatible or noncompatible with various levels of airport noise.
- Provides for voluntary development of NEM's and NCP's by airport operators.
- Provides for review of NEM's to insure compliance with the Part 150 regulations.
- Provides for review and approval or disapproval of Part 150 NCP's submitted to the FAA by airport operators.
- Establishes procedures and criteria for making projects eligible for funding as noise projects through the Airport Improvement Program (AIP).

The regulations contained in Part 150 are voluntary and airport operators are not required to participate. However, an approved Part 150 NCP is the primary vehicle for gaining approval of applications for Federal grants for noise abatement projects, and provides the required analyses for evaluating the impacts of any proposed constraints upon an airport's operations. The Part 150 program responds to the principles set forth in the Aviation Noise Abatement Policy Statement of 1976, as well as to the requirements of the ASNA Act.

Noise Methodologies and Metrics

The ASNA Act requires the FAA to designate two noise metrics: a single system for measuring aviation noise in the community; and a single system for determining the exposure of individuals to noise resulting from the operation of an airport:

- The system for measuring aviation noise in the community required a demonstrated relationship between projected noise exposure and the surveyed reactions of people to noise. For these purposes, the A-weighted sound level and its derivatives were selected.
- The system for determining the exposure of individuals to airport noise (i.e., for evaluating the cumulative impacts of multiple noise events) required consolidation of the effects of intensity, duration, frequency, and time of occurrence. The metric selected is the yearly day-night average sound level (DNL or Ldn, the scientific notation), which was derived from the A-weighted sound level.

The Integrated Noise Model

A standard noise forecasting methodology is required to assure uniformity and comparability of the NEM's submitted under the program. The FAA Integrated Noise Model (INM) has been adopted as the program's standard noise modeling methodology. The FAA believes that this is a well proven model and has refined the model to its fifth generation. The INM is available for use on microcomputers, as well as on mainframe computers, thus reducing the costs of running noise contours and permitting more alternatives to be explored in developing NCP'S. For freestanding heliports, the Heliport Noise Model (HNM) is used.

Land Use and Noise Compatibility

A standard table of land uses normally compatible, or noncompatible, with various exposures of individuals to airport-related noise is essential to assure uniform treatment of both airport operations and noise-sensitive land uses or activities. Part 150's Table 1, entitled "Land Use Compatibility With Yearly Day-Night Average Sound Levels," provides a standard reference for land uses compatible with various levels of airport noise, and contains the basic criteria used in preparing Part 150 programs. This is the only noise and land use compatibility table currently in the Code of Federal Regulations.

Noise Exposure Map

The Part 150 Noise Exposure Map (NEM) is designed to identify clearly an airport's present and future noise patterns and the land uses which are not compatible with those noise patterns. When reviewed and found in compliance with applicable rules and regulations, an airport's NEM serves as a standard reference to the airport's existing and future noise impacts for anyone proposing noise sensitive development in the vicinity of the airport. An NEM consists of two maps of the airport with noise contours plotted over land uses, plus supporting documentation. The noise contours for the DNL 65, 70, and 75 noise levels are shown on these maps. The first map indicates the current conditions and, in effect, identifies the airport's noise compatibility problems. The second map projects the noise contours which can reasonably be predicted five years in the future taking into account changes in land use and in airport operations, plus any

improvements in compatibility from noise mitigation actions which may be planned for that five-year period. An NEM is prepared in consultation with airport's users, the public, local governments, land use control agencies, and the FAA.

Noise Compatibility Program

The purpose of the Part 150 Noise Compatibility Program (NCP) for an airport is to show what measures the airport operator has taken or proposes to take to reduce noncompatible land uses and for preventing the introduction of additional noncompatible uses within the area covered by the airport's NEM. The NCP serves as the primary vehicle for guiding and coordinating the efforts and actions of all the agencies and individuals whose combined efforts are essential to achieving the maximum degree of noise compatibility between an airport and its neighbors while taking into account the requirements of the national aviation system.

The NCP is also the primary analytical tool for appraising the possible impact of any proposed airport operational constraints on interstate or foreign commerce.

Developing a Part 150 NCP is a multi-step process. It must be carried out in close consultation with the affected local governments, the airport's users, those people impacted by either the noise or the solutions, and the FAA. The airport's NEM is a basic element of the NCP. It gives a clear indication of the nature of the airport's noise problems. Also, the FAA cannot accept an airport's NCP for review until its NEM has been found to be in compliance with all applicable laws and regulations.

A series of alternative measures, or combinations of measures, to mitigate an airport's noise impact is developed by the airport operator. These measures must be reasonably consistent with achieving the goals of reducing, or mitigating the impact on, existing noncompatible land uses around the airport and of preventing the introduction of additional noncompatible land uses. Consideration of the environmental consequences of the proposed noise compatibility actions should be an integral part of this planning process; however, formal environmental assessment is required only in conjunction with the decision to implement an action. Alternatives must not unduly burden interstate commerce, discriminate unjustly, reduce the level of aviation safety, adversely affect efficient use of the navigable airspace, or adversely affect any other powers or responsibilities of the Administrator of the FAA.

Each NCP must include an agreed upon schedule for implementation of the program, including: the period covered by the program; identification of the entity responsible for implementing each of its proposed noise compatibility action; plus identification and sources of the necessary funds. These are intended to be working programs. Finally, the NCP must include specific provision for its own timely revision so that it remains a live and viable program responding to changes in both the aviation and the local environmental components of the plan.

FAA Approval of NCP's

Noise Compatibility Programs submitted by airport operators to the FAA and accepted for Federal review, must be acted upon by the FAA within 180 days or, with the exception of flight procedures, the NCP's mitigation measures are, by statute, automatically approved. Additionally, FAA

has issued a policy which limits approval of remedial mitigation measures, e.g., soundproofing, to noncompatible land uses that were in place as of October 1, 1998. Approval of measures to address proposed new noncompatible development will be limited to preventive measures, such as zoning, subdivision regulation, building codes, and similar land use and/or building controls. This policy effectively limits Federal funding for noise compatibility measures in a similar way when Part 150 approval is a prerequisite for funding. The objective is to strongly encourage preventative actions where there are currently no noncompatible land uses and to limit remedial actions and dollars to those uses which are already noise impacted. Note that 14 CFR Part 161 severely limits the use of restrictions on airport operations for noise purposes.

Federal Funding

Implementation of NCP's depends on two basic things: (1) Enactment and implementation of the local noise compatibility actions, including land use controls, building codes, and disclosure of the noise impact areas to potential residents; and (2) the provision of the funds necessary to carry out the planning, acquisitions, relocations, and construction involved.

The Airport and Airway Safety and Capacity Expansion Act of 1987, and subsequent legislation, provide for continued funding of noise compatibility planning and implementation through 34 percent of

Airport Improvement Program (AIP) discretionary funds. This Federal funding is provided in the form of matching grants obtained from the Aviation Trust Fund, providing a 75 percent to 90 percent Federal share, dependent upon the emplanement level and size of the airport. The Aviation Trust Fund is sustained by an ad valorem plus flight segment tax on tickets, by other taxes on air cargo, and by taxes on fuel and other expendables, such as tires, used by general aviation. Thus, the monetary cost of the program is largely paid for by those who benefit from aviation services. Total Federal grant funds for implementation of Part 150 NCP's through fiscal year 1999 were approximately $2,501,546,814.

Additional Information

For additional information on the Part 150 Program contact your nearest FAA District Office, the Airports Division of your FAA Regional Office, or FAA's Office of Environment and Energy, Noise Division at 202-267-8933, Fax 202-267-5594.

5. Phoenix Sky Harbor International Airport - Noise Mitigation

Phoenix Sky Harbor International Airport FAR Part 150 Noise Compatibility Plan, Inventory and Noise Compatibility Study, Chapter 6 table summary

TABLE 6F
Summary of Noise Compatibility Program, 1999-2015
Phoenix Sky Harbor International Airport

Measure	Cost to Airport or Government	Direct Cost to Users[1]	Timing	Lead Responsible Agency[2]	Potential Funding Sources
NOISE ABATEMENT ELEMENT					
1. Continue the runway use program calling for the equalization of departure operations to the east and west for both daytime and nighttime.	None	None	Ongoing	City of Phoenix	N.A.
2. Continue promoting use of AC 91-53A Noise Abatement Departure Procedures by air carrier jets.	Administrative[3]	None	Ongoing	City of Phoenix	N.A.
3. Continue promoting use of NBAA noise abatement procedures, or equivalent manufacturer procedures, by general aviation jets.	Administrative[3]	None	Ongoing	City of Phoenix	N.A.
4. Continue SID procedure from Runway 26L requiring a turn to a 240-degree heading.	Administrative[3]	None	Ongoing	City of Phoenix, (FAA Airport Traffic Control)	N.A.
5. Continue the 4 DME departure route procedure which overflies the Salt River by all jets and large propeller aircraft departing Runways 8R/L.	Administrative[3]	None	Ongoing	City of Phoenix	N.A.
6. Continue compliance with the Airport's Engine Test Run-up Policy.	Administrative[3]	Negligible	Ongoing	City of Phoenix,	N.A.

TABLE 6F (Continued)
Summary of Noise Compatibility Program, 1999-2015
Phoenix Sky Harbor International Airport

Measure	Cost to Airport or Government	Direct Cost to Users[1]	Timing	Lead Responsible Agency[2]	Potential Funding Sources
NOISE ABATEMENT ELEMENT (Continued)					
7. Implement the 4 DME departure route procedure which overflies the Salt River by all jets and large propeller aircraft departing Runway 7.	Administrative[3]	Negligible	2000	FAA Airport Flight Standards Division	N.A.
8. Direct small piston aircraft departing Runway 7 to turn to a 120-degree heading upon reaching the end of the runway.	Administrative[3]	Negligible	2000	FAA Airport Flight Standards Division	N.A.
9. Direct aircraft departing Runway 25 to turn to a 240-degree heading upon reaching the end of the runway.	Administrative[3]	Negligible	2000	FAA Airport Flight Standards Division	N.A.
10. Establish a "side-step" approach to Runway 25.	Administrative[3]	Negligible	2000	FAA Airport Flight Standards Division	N.A.
11. Encourage the use of DGPS, RNAV, FMS equipment to enhanced noise abatement navigation.	Administrative[3]	Negligible	2000	City of Phoenix, FAA Airport Traffic Control Tower	N.A.
12. Build engine maintenance run-up enclosure.	$2,000,000	None	Dependent upon funding	City of Phoenix	FAA (80%) Airport capital budget (20%)
13. Support 161st air refueling wing of the Arizona Air National Guard's efforts to re-engine KC-135 aircraft.	Administrative[3]	Negligible	2000	City of Phoenix	N.A.

TABLE 6F (Continued)
Summary of Noise Compatibility Program, 1999-2015
Phoenix Sky Harbor International Airport

Measure	Cost to Airport or Government	Direct Cost to Users[1]	Timing	Lead Responsible Agency[2]	Potential Funding Sources
NOISE MITIGATION ELEMENT					
1. Sound Insulate single family homes within the 1992 65 DNL contour and single family homes outside the 1992 65 DNL contour but inside the 1999 65 DNL contour.	$72,600,000	None	Ongoing	City of Phoenix	FAA (80%)[4] Airport capital budget (20%)
2. Sound Insulate approximately ten schools within the 1999 65 DNL contour.[5]	$30,000,000	None	Dependent upon funding	City of Phoenix	FAA (80%) Airport capital budget (20%)
3. Acoustical Treatment of community centers and Church class/meeting rooms within the 1999 65 DNL contour.	$7,500,000	None	Dependent upon funding	City of Phoenix	FAA (80%) Airport capital budget (20%)
4. Voluntary Acquisition and Redevelopment: Acquire dwellings north and west (to 7th Street) of the airport within the 1999 70 DNL contour.	$106,555,950	None	Dependent upon funding	City of Phoenix	FAA (80%) Airport capital budget (20%)
5. Exchange dwellings impacted within the 70 DNL noise contour with a dwelling outside the 65 DNL noise contour.	$11,839,550	None	Dependent upon funding	City of Phoenix	FAA (50%) Airport capital budget (50%)

TABLE 6F (Continued)
Summary of Noise Compatibility Program, 1999-2015
Phoenix Sky Harbor International Airport

Measure	Cost to Airport or Government	Direct Cost to Users[1]	Timing	Lead Responsible Agency[2]	Potential Funding Sources
LAND USE PLANNING ELEMENT					
1. Update General Plans to reflect the 1999 65 DNL noise contour planning boundary (NCPB) from Part 150 Study as basis for noise compatibility planning.	Administrative[3]	None	2001	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community	N.A.
2. Amend General Plan designations to reflect existing compatible and existing lower density land uses with the NCPB.	Administrative[3]	None	2001	Phoenix and Tempe	N.A.
3. General Plan Amendment: Amend Mixed Use designations within the 1999 65 DNL contour to exclude residential.	Administrative[3]	None	2001	Tempe	N.A.
4. Enact guidelines specifying noise compatibility criteria for the review of development projects within the NCPB	Administrative[3]	None	2001	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community	N.A.
5. Retain compatible land use zoning within the NCPB.	Administrative[3]	None	2001	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community	N.A.

TABLE 6F (Continued)
Summary of Noise Compatibility Program, 1999-2015
Phoenix Sky Harbor International Airport

Measure	Cost to Airport or Government	Direct Cost to Users[1]	Timing	Lead Responsible Agency[2]	Potential Funding Sources
LAND USE PLANNING ELEMENT (Continued)					
6. Amend Zoning Map to reflect General Plan and existing compatible land uses within the NCPB.	Administrative[3]	None	2001	Phoenix and Tempe	N.A.
7. Encourage rezoning several large tracts of land currently developed with low density residential but zoned for higher density non-compatible land uses within the 1999 65 DNL noise exposure contour.	Administrative[3]	None	2000 - 2001	City of Phoenix	N.A.
8. Airport Noise Overlay Zoning: Enact overlay zoning to provide noise compatibility land use standards near Airport.	Administrative[3]	None	2000 - 2001	Phoenix, Tempe, Scottsdale, and Salt River Pima-Maricopa Indian Community	N.A.
9. Subdivision Regulations Amendment: Require recording of fair disclosure agreements and covenants and overflight easements within the NCPB.	Administrative[3]	None	2000 - 2001	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community	N.A.
10. Building Code Amendment: Enact construction standards within the NCPB.	Administrative[3]	None	2000 - 2001	Phoenix, Tempe, and Salt River Pima-Maricopa Indian Community	N.A.

6. TAVCO Initiatives, Examples

Report and Recommendations on Gate Configuration and the Implementation for the Sky Harbor Noise and Flight Track Monitoring System, December 10, 1996

TEMPE AVIATION COMMISSION

REPORT AND RECOMMENDATIONS ON GATE CONFIGURATION AND IMPLEMENTATION FOR THE SKY HARBOR NOISE AND FLIGHT TRACK MONITORING SYSTEM

December 10, 1996

INTRODUCTION

History and Background

Sky Harbor International Airport is owned and operated by the City of Phoenix. The airport is located immediately west of Tempe's municipal limits on the north side of the Salt River. Tempe realizes benefits from its proximity to Sky Harbor but it also bears the brunt of the noise, air pollution and crash risk associated with the east-side operations at Sky Harbor.

Since adding the capacity to handle commercial jet carrier service in the 1950's, Sky Harbor has experienced massive growth, including a seven-fold increase in passenger traffic between 1970 and 1990. With that growth in operations, and the accompanying increase in take-offs and landings, Sky Harbor's noise impacts on Tempe also increased dramatically.

In 1987, Sky Harbor sought to retain its position as the primary commercial airport by the addition of a third runway. The proposed third runway aligned with Fifth Street in Tempe and triggered extensive debate. It also renewed the State-level interest in constructing a regional airport. The proposal to add the third runway required that Phoenix and the FAA undertake an Environmental Impact Statement. In 1991, Tempe submitted formal, extensive and critical comments to the resulting draft Environmental Impact Statement for the third runway. Thereafter, Tempe filed lawsuits against the FAA and the EPA challenging the adequacy of the Final Environmental Impact Statement and contending that the FAA was subject to the new federal Clean Air Act "conformity " requirement.

As a result of mediation sponsored by the federal Ninth Circuit Court of Appeals, in September 1994, Phoenix and Tempe signed an Intergovernmental Agreement on Noise Mitigation Flight Procedures (the "Agreement"). The Agreement sought to "lessen the noise impacts resulting from jet and large turboprop aircraft arriving from, and departing to, the east over Tempe" and to cause airlines to comply with "certain FAA-approved noise mitigation flight procedures, designed, in part, to restrict flights to the airspace over the Salt River riverbed." Agreement, page 1, Recital 3.

Among the procedures described in the Agreement is the procedure referred to as the "4-DME" procedure, which is the subject of this Report. ("DME" means distance measuring equipment.) The 4-DME procedure imposes a fixed departure procedure on aircraft taking off to the east from Sky Harbor. That procedure was described in the FAA's Record of Decision dated January 18, 1994, the pertinent part of which is attached as Attachment A to this Report. In the Agreement, the City of Phoenix agreed that it would not request the FAA to abandon or modify the 4-DME Procedure and would instead "affirmatively oppose any abandonment or modification" of the 4-DME Procedure. Agreement, page 4, Section 1.2. Further, under the Agreement, Phoenix must provide an airline with written notice of non-compliance with the

Noise Mitigation Procedures, including the 4-DME Procedure, within 24 hours of an aircraft's non-compliance. Agreement, pages 6-7, Section 4.7.

Purpose and Definition of "Gates"

To monitor and encourage airlines' compliance with the 4-DME Procedure, the Agreement obligates Phoenix to install a Noise and Flight Track Monitoring System ("NFTMS") that will, among other things, "specifically identif[y] by type and flight those aircraft which fail to comply with the [4-DME] noise mitigation procedures." Agreement, page 5, Section 4.1(a). In connection with the design of the NFTMS, Tempe's Aviation Commission ("TAVCO") has sought to assist in establishing the boundaries that define an acceptable 4-DME corridor, know as "gates," that will identify, through the NFTMS computer system, the aircraft that do not comply with the 4-DME Procedure.

This Report describes the analysis TAVCO undertook to determine appropriate outer boundaries of the 4-DME corridor, or gates; the conclusions of TAVCO regarding the appropriate design logic for constructing the outer boundaries of the 4-DME corridor; and makes recommendations to the Tempe City Council regarding its adoption of the corridor boundary gates that should be used to monitor compliance with the 4-DME Procedure and the Agreement. In doing so, TAVCO has sought to require compliance with the Agreement, protect Tempe neighborhoods from aircraft noise while at the same time, establish achievable goals for airlines in their efforts to comply with the 4-DME Procedure.

ANALYSIS TO ESTABLISH GATES

The Idealized 4-DME Procedure

As noted in the Recitals to the Agreement, the purpose of the 4-DME Procedure is designed to restrict fights to the airspace over the Salt River riverbed. Accordingly, the starting point for TAVCO's analysis is to encourage east-bound takeoffs from Sky Harbor's north runway to remain inside some established northern boundary and those from Sky Harbor's south runway to remain inside a similarly established southern boundary.

TAVCO began its analysis by identifying a single, "ideal" flight path from each of Sky Harbor's two current runways, 8L (the current north runway) and 8R (the current south runway). These "ideal" flight paths establish the starting point for constructing the acceptable outer boundaries for the corridors, which are the wide paths that allow pilots to deviate from the ideal flight path and still be deemed to have complied with the 4-DME Procedure.

For the north runway, 8L, the FAA outlined a Standard Instrument Departure ("SID") that instructs pilots taking off to the east to "turn right" after takeoff and fly a compass

bearing of 085 degrees until the aircraft reaches a "radial beam"--which is essentially a radar signal--that is projected from the Sky Harbor VORTAC. The VORTAC is the large bowling-pin shaped object located in the Salt River channel near Priest Drive. The "radial beam" that an aircraft is to follow is on a compass bearing of 075 degrees. This radial beam is often referred to as the 075 VOR radial beam. The radial beam essentially follows a line that bisects the Salt River riverbed east from Sky Harbor. An aircraft then follows this 075 VOR radial beam until it reaches the 4-DME, which is a position four nautical miles from the VORTAC (measured at a slant distance, not as a distance over ground). Once a plane reaches the 4-DME point, the plane may then turn north and south from the Salt River riverbed.

For the south runway, 8R, the FAA outlined a SID that instructs pilots taking off to the east to "turn left" after takeoff and fly directly over the VORTAC. Once a plane reaches the VORTAC, it is then to follow the 075 VOR radial beam until it reaches the 4-DME.

In establishing the "idealized" 4-DME flight procedure, TAVCO started with the most extreme eastern points on the two existing runways. Because the focus of attention for the north runway are aircraft that fly north of an acceptable boundary, TAVCO granted airlines the benefit of the doubt and established the beginning point of the north runway's idealized 4-DME flight procedure from the extreme east end of that runway. It applied the same benefit for the south runway's "idealized" 4-DME procedure by establishing the beginning point from the extreme east end of that runway. TAVCO then followed the SIDs for the north and south runways from these extreme beginning points to construct the "idealized" 4-DME Procedures for each of the two existing runways. The "idealized" 4-DME Procedure for Sky Harbor's north runway is set forth on Exhibit B and is represented by the line connecting points L, Z and A. The "idealized" 4-DME Procedure for Sky Harbor's south runway is set forth on Exhibit B and is represented by the line connecting points R, V and A.

Once TAVCO established the "idealized" 4-DME Procedures for the two runways, it then analyzed a variety of factors and issues to establish the "logic" it should apply to establish the outer most boundaries of the 4-DME flight corridors for each of the two existing runways. In other words, TAVCO examined and determined the factors that expand the accepted flight paths from the "idealized" 4-DME Procedures to establish the acceptable corridors through which aircraft that comply with the 4-DME Procedure would be expected to fly. Those factors and issues are discussed below and are (1) Purpose of Gates (2) Fairness, (3) Wind Effects, (4) Aircraft Compass Error, (5) Pilot Error, (6) Airborne Component Error, (7) Instrument Setting Error, (8) Radial Signal Error, and (9) Radar Error. The following also describes TAVCO's determination regarding the extent each factor should be considered in establishing the accepted 4-DME Procedure corridors.

Purpose of Gates

The purpose of TAVCO's work is to establish gates that mark the outermost boundaries of flight corridors that should be accepted as reflecting flights that comply with the 4-

DME Procedure. Flights that do not remain within the bounds of the accepted outermost boundaries should be deemed "non-complying" under the terms of the Agreement. To achieve this purpose, TAVCO considered the fundamental goal of the Agreement as well as the specific purpose of the Agreement's requirements on the City of Phoenix.

The fundamental goal of the Agreement is to restrict east-bound flights to the Salt River riverbed. It does so for the purpose of limiting the noise impacts imposed on the residents and businesses in Tempe. When that fundamental goal is not achieved, the Agreement requires the City of Phoenix to notify an airline when one of its aircraft does not comply with, among other things, the 4-DME Procedure.

The underlying purpose of the notice requirement is to cause airlines voluntarily to comply, as well as possible, with the 4-DME Noise Mitigation Procedure. TAVCO believes that it is in Tempe's best interests to seek agreement with the City of Phoenix, Sky Harbor officials, airline officials and the FAA on the definition of the 4-DME Procedure as long as that definition satisfies the fundamental goal of the Agreement. Doing so will add the weight of all parties to encourage compliance with the Procedure.

Such agreement among the interested parties should not, however, come at the expense of not achieving the Agreement's fundamental goal of restricting flights to the Salt River riverbed: An agreement among the parties that allows airlines to fly a wide, east-bound course might enhance compliance with a Procedure, but such compliance is of little use if it does not restrict flights to the airspace over the Salt River or protect Tempe's neighborhoods and businesses. Finding the balance between reaching an agreement that enhances voluntary compliance and one that appropriately defines the 4-DME Procedure to protect Tempe may be difficult and take time to achieve. TAVCO believes that this Report contains an appropriate recommendation for a gate configuration that should receive support and agreement from the Tempe City Council and the other interested parties.

Fairness

In analyzing issues and factors, TAVCO also sought to construct gates that were "fair" to all parties who may be directly affected by the establishment of the gates, primarily the Tempe residents and businesses on whom most aircraft noise is imposed (those on the north and south banks of the Salt River) and the aircraft pilots who might be notified that their chosen flight paths did not comply with the 4-DME Procedure. Accordingly, TAVCO considered the need to establish gates that were sufficiently restrictive--in fairness to the residents and businesses along the banks of the Salt River--while establishing gates that cause notification, within a reasonable rate of error, only to pilots who fail to comply with the 4-DME Procedure as a result of errors within their control.

In examining fairness to the Tempe residents and businesses, TAVCO adopted as its standard of fairness the Agreement's promise to restrict flights to the airspace over the Salt

River riverbed. Accordingly, TAVCO seeks to establish gates within the boundaries of the historic Salt River Channel. In examining fairness to aircraft pilots, TAVCO adopted a model of fairness established by the FAA in its analysis of pilots' performance abilities when flying a designated radial beam from a VORTAC. Fortunately, for most of the length of the accepted 4-DME Procedure corridor constructed by TAVCO, the two models of fairness are essentially compatible.

While the fairness parameter established by the Salt River Channel is relatively easy to understand, the fairness parameter established by the FAA requires additional explanation. That fairness standard is set forth in the FAA's Advisory Circular 00-31A-US National Aviation Standards for VORTAC and DME. In that Advisory Circular, the FAA established compliance standards for aircraft pilots' performance in flying an established radial beam. The FAA applies a 95% tolerance standard: That is, 95% of the time, components of the system tested (the acceptable distance from a radial beam that one would expect a pilot to be able to fly if one accounted for error tolerances not within a pilot's control) must be within certain limits specified in the Circular, or the system would be regarded as defective. While it would not be "fair" to expect pilots and equipment to be perfectly accurate, we believe it is fair to neighbors and to pilots to apply the same tolerances that the FAA applies and to expect flights to be within the FAA's 95% tolerance limits. Accordingly, TAVCO has combined the independent sources of error that it determined appropriate and that might cause a pilot to fly some distance from the "idealized" flight path, and TAVCO did so using the FAA's accepted statistical techniques to derive the "fair" boundaries within which we would expect pilots to fly at least 95% of the time even if flights were subject to some combination of the identified errors. Further, because, as identified in the discussions of the errors, TAVCO sought to be generous in is measurement of the non-pilot errors to which a flight might be subject, TAVCO believes that the "fair" boundaries it proposes actually will result in substantially fewer violations of the "fair" boundaries if pilots are well informed of the 4-DME Procedure and are instructed, by the FAA, the airlines' internal control personnel and officials at Sky Harbor, to "fly the SIDs."

This "95%" model of fairness is rather like the model that police forces use when issuing speeding tickets based on the use of radar speed detectors. Such equipment is not infallible, but instead performs within an accepted rate of error. As a result, society accepts the fact, whether or not widely known, that radar speed detectors are not 100% accurate. Instead, detectors are expected to perform within some accepted range of accuracy. Accordingly, it is possible that a police officer might issue a speeding ticket to a driver because the officer's radar speed detection equipment indicated that the driver had exceeded the acceptable speed limits when, in fact, the driver had not done so. Society accepts such "unfairness" to drivers because the consequences of the "unfairness," the improper issuance of a speeding citation, carries relatively minor consequences.

The same principle was applied by the FAA in its Advisory Circular and by TAVCO in establishing the outer boundaries of the accepted 4-DME Procedure corridor using the 95% fairness standard. That is, in the rare case that an airline might receive notice that a

flight of its aircraft did not comply with the accepted 4-DME Procedure, the only consequence of the event is that the City of Phoenix provided the airline with a written notice of non-compliance. Such a consequence seems mild even when compared to the wrongful issuance of a speeding ticket. According to the Agreement, an airline merely is given a notice (not a ticket or any other punitive warning) from the City of Phoenix. The intent is to raise the airline's awareness of the SIDs and the 4-DME Procedure and to encourage improved observance of the Procedure over time. The corridors will allow Tempe also to identify pilots who consistently "fly friendly." It is hoped that the expertise of those pilots will then be shared with others in the area to improve performance as well.

As noted, the FAA Circular establishes the method by which all adjustments to the outer boundaries of the accepted 4-DME Procedure should be factored into the design when determining those outer boundaries. The accepted mathematical method for factoring in errors that occur following a statistical pattern considers the probability that all such errors rarely simultaneously occur in their maximum magnitude. Accordingly, when factoring in such errors, such as error caused by wind and error caused by compass flaws and the like, to establish the outer boundary of the accepted 4-DME Procedure, the accepted method adopted by the FAA in its Advisory Circular, requires that one apply an approach called "vector summing," or that one determine "the square-root of the sum of the squared errors." The formula for doing so (including all errors desired from Error 1 to Error *n*) takes the following form:

$$(E1^2 + E2^2 + E3^2 + \ldots\ldots\ldots\ldots En^2)^{1/2}$$

Accordingly, in determining the amount of flight error that should be added to expand the outer boundaries of the accepted 4-DME Procedure corridor, TAVCO followed the FAA model and adopted the use of vector summing.

The following describes the factors considered in determining the outer boundaries of the accepted 4-DME Procedure for the current runways.

Wind Effects Planes flying off the north runway are required to follow a compass heading of 085 degrees until they intercept the 075 VOR radial beam. The FAA requires that pilots follow the heading and they not adjust for the effects of wind that might tend to push an aircraft left, to the north, or right, to the south, of the direction in which the aircraft otherwise is flying. Accordingly, a pilot that follows the written procedure for flying the "idealized" 4-DME Procedure from the north runway might, through no fault of his or her own, be forced off course, north or south, by wind. Such wind effects would only impact the flight from takeoff until the affected aircraft intercepts the 075 VOR radial beam because, once the interception occurs, the aircraft must fly along the 075 VOR radial beam. The radial beam, unlike a compass heading, occupies a fixed place in space and is projected by the VORTAC. In other words, regardless of wind effects, an aircraft must follow the radial beam.

Following the standards for fairness applied by the FAA, TAVCO expanded the accepted 4-DME Procedure from the north runway to account for the maximum wind that would be expected to occur 95% of the time in and around Sky Harbor. According to the wind data collected by Sky Harbor and reflected in Attachment C, one would expect that 95% of the time, wind speed of winds blowing south to north would be no greater that 5.6 knots and winds blowing north to south would be no greater than 4.3 knots. TAVCO adjusted the outer boundaries of the accepted 4-DME Procedure for the north runway to take such wind impacts into account. (This is an example of an instance in which TAVCO has been particularly generous. The formula applied by TAVCO assumes that the wind at the speed used occurs continually during the entire time a plane is within the corridor area for which wind is considered an error factor. Planes are substantially less likely to be subject to such wind effects than assumed by TAVCO and the wind effects factored into the formula account for a large portion of the flight error used to create the expanded 4-DME Procedure.)

Planes flying off the south runway are required to fly directly over the VOR. Accordingly, unlike the Procedure for the north runway, the Procedure for the south runway is not affected by wind. Accordingly, no wind effect technically should be included when forming the accepted 4-DME Procedure corridor for the south runway. However, although pilots technically are required to fly to the VOR, pilots typically can not see the VOR or similar landmarks on takeoff because, among other things, the flight deck is angled up for takeoff, causing the aircraft fuselage to obscure a pilot's view of ground-based landmarks.

Because of this difficulty, and from examining flight track data and printouts, it appears to TAVCO that pilots may actually be following a heading or otherwise making educated guesses as to the location of the VOR. By doing so, the aircraft of pilots who may be making a good-faith effort to comply with the 4-DME Procedure would be subject to wind effects. Accordingly, TAVCO concluded that it should include wind effects in establishing the accepted 4-DME Procedure gates for the south runway. However, as with the north runway Procedure, such wind effects would only impact the flight from takeoff until the affected aircraft intercepted the 075 VOR radial beam because, once the intercept occurs, the aircraft must fly along the 075 VOR radial beam, which occupies a fixed place in space and is projected by the VORTAC. Accordingly, TAVCO expanded the accepted 4-DME Procedure corridor for the south runway for the corridor section from the end of the south runway to the expected point of intercept along the 075 VOR radial beam and in a fashion to account for the maximum wind that would be expected to occur 95% of the time in and around Sky Harbor.

Compass Error Pilots fly from the north runway following a compass heading. Accordingly, TAVCO examined the available information regarding the error tolerances accepted for compass readings. That is, TAVCO determined to expand the width of the accepted 4-DME Procedure for the north runway to allow for the error in flying the "idealized" 4-DME Procedure that a pilot might make because an aircraft's compass erroneously indicated, within the industry accepted error tolerance, a heading of 085. According to Tempe's consultant, Jerry Bogan, the accepted compass error rate is .5 degrees. Accordingly, TAVCO adjusted the outer

boundary of the accepted 4-DME Procedure by this error tolerance for the portion of the north runway takeoff procedure during which a pilot follows a compass heading--from takeoff to the aircraft's intercept of the 075 VOR radial beam.

Because pilots are to fly directly over the VOR after takeoff from the south runway, no compass error is appropriate. However, as described in the section on wind, although pilots technically are required to fly to the VOR, pilots typically can not see this or similar landmarks on takeoff, as described above. Again, from examining flight track data and printouts, it appears to TAVCO that pilots may actually be following a heading or otherwise making educated guesses as to the location of the VOR. By doing so, the aircraft of pilots who may be making a good-faith effort to comply with the 4-DME Procedure would be subject to compass error to the extent they attempt to fly a compass heading to "reach" the VOR. Accordingly, TAVCO determined it would include compass error in establishing the accepted 4-DME Procedure gates for the south runway. However, as with the north runway Procedure, such compass error only would impact the flight from takeoff until the affected aircraft intercepted the 075 VOR radial beam because, once the intercept occurs, the aircraft must fly along the 075 VOR radial beam. TAVCO applied the industry accepted error tolerance of .5 degrees.

Pilot Error In its Advisory Circular, the FAA provides the answer and calculation to the most difficult factor to assess: Pilot error resulting from the accuracy (or inaccuracy) with which a pilot may be expected to control an aircraft. As the FAA puts the issue, this error, "refers to the accuracy with which the pilot controls the aircraft as measured by his success in causing the indicated aircraft position to match the indicated command for desired position." Advisory Circular at Appendix 2, page 1, Section 2d. As the FAA further notes, such error should not and does not include "procedural blunders." TAVCO adjusted the outer boundary of the accepted 4-DME Procedure by this error tolerance (2.3 degrees of error) for the entire distance of the north runway's accepted 4-DME Procedure because such error may occur along any portion or all of the Procedure.

As in the Procedure for the north runway, TAVCO included in its consideration the pilot error that falls within FAA tolerance but does not include "procedural blunders." TAVCO adjusted the outer boundary of the accepted 4-DME Procedure by this error tolerance (2.3 degrees of error) for the entire distance of the south runway's accepted 4-DME Procedure because such error may occur along any portion or all of the Procedure. (This is another item that TAVCO considers generous because the FAA even considers its estimates of pilots' errors to be generous and "pessimistic" with respect to pilots' abilities.)

Airborne Component Error This error arises because of the error tolerance in an aircraft's airborne equipment that must translate the bearing information contained in the signal emitted by the VOR. TAVCO adjusted the outer boundary of the accepted 4-DME Procedure by this error tolerance (3 degrees of error) for the distance of the north runway's accepted 4-DME Procedure only along the portion of the Procedure during which aircraft must follow the 075 VOR radial beam, from the intercept of the radial beam to 4-DME. During the early leg of the

flight, from takeoff to the intercept of the 075 VOR radial beam, an aircraft does not follow a radial beam.

As with the north runway and for the same reasons described above, TAVCO adjusted the outer boundary of the accepted 4-DME Procedure for the south runway by this error tolerance (3 degrees of error) for the distance of the south runway's accepted 4-DME Procedure only along the portion of the Procedure during which aircraft must follow the 075 VOR radial beam, from the intercept of the radial beam to 4-DME. (This item demonstrates an additional source of "generous" treatment by TAVCO. The FAA Circular is more than 10 years old. Since the Circular was written, many technical improvements have been made to airborne components that make the FAA's original estimates of error pessimistic.)

Instrument Setting Error This error arises because of the error tolerance that exists due to the resolution limitations of omni-bearing selector units on aircraft. TAVCO adjusted the outer boundary of the accepted 4-DME Procedure by this error tolerance (2 degrees of error) for the distance of the north runway's accepted 4-DME Procedure only along the portion of the Procedure during which aircraft must follow the 075 VOR radial beam for which the OBS units are relevant, again, only from the intercept of the radial beam to 4-DME.

TAVCO adjusted the outer boundary of the accepted 4-DME Procedure corridor for the south runway by this error tolerance (2 degrees of error) for the distance of the south runway's accepted 4-DME Procedure only along the portion of the Procedure during which aircraft must follow the 075 VOR radial beam for which the OBS units are relevant, again, only from the intercept of the radial beam to 4-DME. (This item also demonstrates an additional source of "generous" treatment by TAVCO. Since the Circular was written, many technical improvements have been made to omni-bearing units that make the FAA's original estimates of error pessimistic.)

Radial Signal Error This error arises because the radial beam emitted by the VOR has an error tolerance associate with its performance. That error is made up of certain elements that likely are fixed over long periods of time, such as errors caused by terrain configurations, and those that may vary randomly over short periods of time, such as errors arising from the ground components of the system. TAVCO adjusted the outer boundary of the accepted 4-DME Procedure by this error tolerance (1.4 degrees of error) for the distance of the north runway's accepted 4-DME Procedure only along the portion of the Procedure during which aircraft must follow the 075 VOR radial beam, again, only from the intercept of the radial beam to 4-DME.

TAVCO adjusted the outer boundary of the accepted 4-DME Procedure by this error tolerance (1.4 degrees of error) for the distance of the south runway's accepted 4-DME Procedure only along the portion of the Procedure during which aircraft must follow the 075 VOR radial beam, again, only from the intercept of the radial beam to 4-DME.

Radar Error This error arises because the accuracy of radar used to track commercial aircraft, such as the radar equipment installed at Sky Harbor, tolerates some inexactitude. Accordingly, TAVCO has accepted a 400 foot error rate for radar error. This estimate is based on the FAA's and Sky Harbor official's estimate of the radar error and no documentation supporting it has been supplied to date. Accordingly, the estimate is subject to revision pending the receipt of further, more accurate data. It is understood that the error estimate is generous because it is based on the error resulting from the indeterminate position of a plane as it moves downrange from the radar between sweeps of the radar. While a plane flies the 4-DME Procedure, a plane moves laterally (north and south) a vary small amount (as opposed to east, down the flight path) and so the error associated with north to south radar readings likely is very small and substantially less than 400 feet. Because the tracking of aircraft locations within the accepted 4-DME Procedure occurs via radar throughout the Procedure, TAVCO adjusted the outer boundary of the accepted 4-DME Procedure along the entire distance of the north runway Procedure. For the same reasons, TAVCO adjusted the outer boundary of the accepted 4-DME Procedure along the entire distance of the south runway Procedure.

Based on the above, and upon calculating the values of the factors to be considered, the outer north boundary of the accepted 4-DME Procedure for the north runway is then indicated on Attachment B by the lines connecting, on the north side to the Procedure, points D, M and W. The outer south boundary of the accepted 4-DME Procedure for the south runway is indicated on Attachment B by the lines connecting, on the south side of the Procedure, points E, X and D. The Procedure for each of the runways also allows for calculation of a south boundary for the north runway and a north boundary for the south runway, but because the area separating the two corridors is not of concern to Tempe, such "interior" corridor lines are omitted to aid in clarity and, further, would not be useful in any notice or awareness program. Instead, the outer boundaries should be the focus of concern for all parties involved.

CALCULATIONS OF GATE CONFIGURATION

The calculation of the accepted 4-DME Procedure corridors or gates is set forth on Attachment D. The mathematical formulae and application of them also is described in Attachment D.

FURTHER CONSIDERATIONS

Single Point of Departure.

The 4-DME Procedure contemplates a single point of departure 4 nautical miles east of Sky Harbor. Simultaneous departures from the north and south runways are prohibited under the Procedure. Based on the type of aircraft, the FAA has imposed a distance that must be

maintained between departing aircraft. The distance is established by determining the time interval that must pass following a plane's takeoff before another plane may take off from the opposite runway (or the same runway). When pilots and the airtraffic controllers fail to keep the time and distance spacing requirements, the controllers direct the trailing pilot to adjust his flight path, usually by moving laterally toward the outside edge of the 4-DME Procedure, and maintain sufficient distance between the planes in that fashion. Such circumstances should be avoided and should not be contemplated as an "excuse" for not complying with the 4-DME Procedure except in the instances in which the pilot is not at fault for anticipating his or her departure time. Further, the NFTMS software may be modified to allow detection of such "close-in-time" departures for further review and follow-up with the FAA to make controllers more careful in complying with the time and distance separation rules.

Obvious Violations

In attempting to construct corridor demarcations, TAVCO requested and received substantial data from the NFTMS, which became operational in September, 1996. The data were in the form of flight track printouts that indicated the east-bound flight path taken by aircraft during a variety of time periods and under a variety of conditions. Essentially, the printouts reflect flights beginning at the east end of Sky Harbor's two current runways, the 8L or north runway, and 8R or the south runway. In examining the data, several trends presented themselves.

It appears that many aircraft "violate" the concept of 4-DME by flying "straight off" the runways, with little attempt to turn toward the center of the Salt River riverbed. Further, many aircraft anticipate a north or south turn prior to reaching the 4-DME, that is, prior to reaching a point four nautical miles from the VORTAC. TAVCO intends to establish short-hand rules to allow Phoenix and Tempe to handle such obvious violations of the spirit of the 4-DME Procedure without expending substantial staff time to address the violation.

Implementation

TAVCO reached consensus that the adoption of gates, the application of those gates, and initiation of the notice procedure should follow a six-month introduction phase. During the introduction phase, TAVCO would encourage implementation of an education and information campaign designed to inform airline pilots about the 4-DME Procedure. As described above under "Obvious Violations," from data collection efforts, it appears that a large number of aircraft flights make no attempt to follow the 4-DME Procedure. TAVCO believes that, upon fully educating pilots and airlines, performance by pilots in flying the 4-DME Procedure likely will dramatically improve.

Further, TAVCO believes that "catching" pilots who violate the accepted 4-DME Procedure corridors is not the purpose of establishing the corridors: Instead, the purpose of

establishing corridors and educating pilots is to gain voluntary compliance with and encourage voluntary efforts to improve pilots' performance in flying the 4-DME Procedure. Accordingly, TAVCO seeks to use the implementation period to work with officials from Sky Harbor and the airlines to reach agreement regarding the accepted 4-DME Procedure corridor and seek voluntary compliance with the 4-DME Procedure.

West-End Gate Configuration

The NFTMS software generates certain "false" flights as a result of erroneous radar readings, among other things. Such anomalies tend to occur near the east end of Sky Harbor on the NFTMS printouts. These anomalies cause loss of data and, if they cross a gate, generate false violations that have to be screened out manually. To minimize the nuisance of these anomalies, TAVCO recommends that the west end of the corridor "gates" be expanded to "capture" these false flights within the gate corridors to reduce the occurrence of readings suggesting an aircraft "violated" the 4-DME corridor. Drawing the gates around the area in question will reduce the problems of false data events. Because we don't actually expect aircraft to fly in the space created by these wide gates near the airport, these entry points of the gates can take whatever shape they need to avoid the false flight data.

Flexibility

The logic for constructing the proposed 4-DME flight corridors should be reviewed periodically by TAVCO and be subject to continuing review and approval by the Tempe City Council, legal council and professional consultants. In addition, Tempe's aviation consultants who may provide design and implementation assistance should have some leeway to make minor adjustments to the design.

Further, over time, aircraft will be fitted with and use inertial guidance systems or satellite based global positioning system. These systems substantially increase flight path accuracy over current systems. As these systems become more widespread, the flight corridors should be narrowed to require significantly tighter performance.

ATTACHMENT A

FAA RECORD OF DECISION

RECORD OF DECISION

FOR THE

PROPOSED MASTER PLAN UPDATE IMPROVEMENTS
AT
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
PHOENIX, ARIZONA

United States Department of Transportation
Federal Aviation Administration
Western-Pacific Region
Hawthorne, California

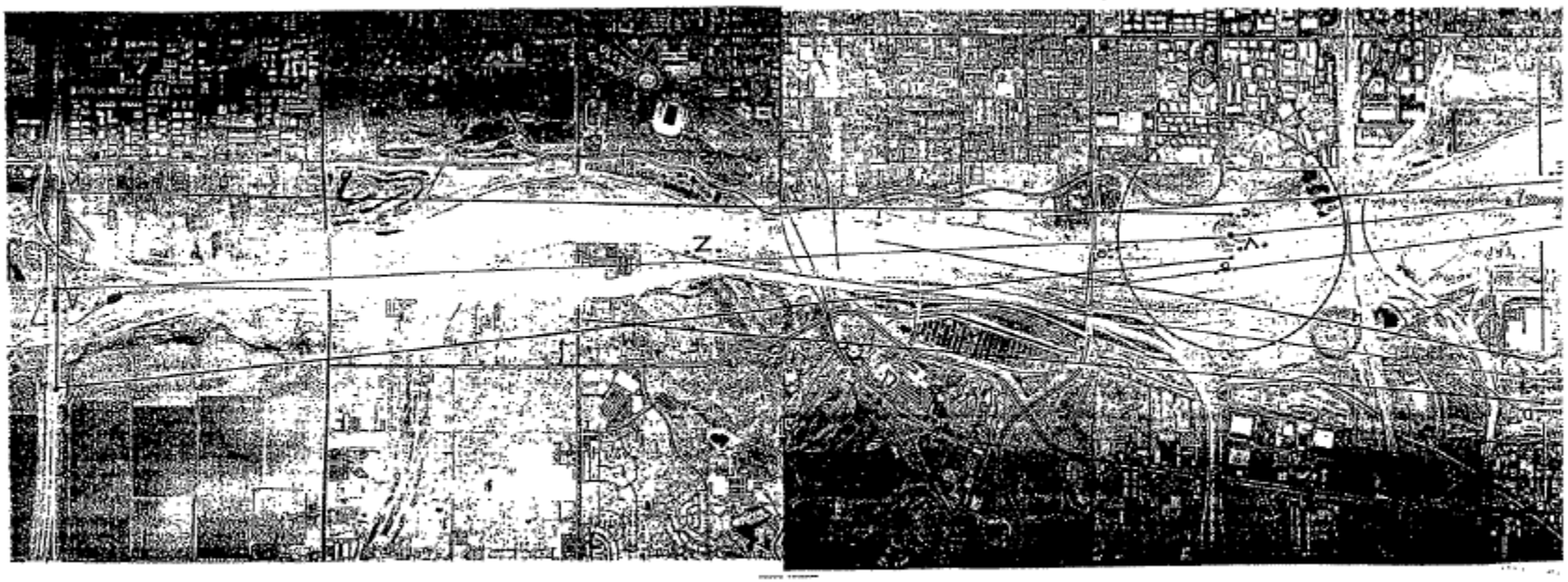
JANUARY 18, 1994

The FAA has stated in writing in the FEIS, the Memorandum of Agreement with the Arizona State Historic Preservation Officer and the Advisory Council on Historic Preservation and in this Record that it intends to continue to use the "One-DME" departure procedure for easterly departures to minimize aircraft noise impacts over Tempe. Further, substantial modification or deletion of the Standard Instrument Departure Procedures commonly known as the "One-DME" departure procedure will not occur without full compliance with FAA Order 1050.1D *Policies and Procedures for Considering Environmental Impacts*. This requires completion of full environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. Coordination with the affected communities and a public participation process is a requirement of the Order.

For the purposes of this Record, a "substantial modification" to a flight procedure, as described Section 5.1.3 of the FEIS, means a change that results in a 1.5 Ldn increase in noise over any noise sensitive areas located with the 65 Ldn contour as described in Paragraph 1(b)(1) of Attachment 2 to FAA Order 1050.1D.

In addition to the FAR Part 150 program elements, an informal "side step" procedure is proposed at PHX for west flow approaches. This procedure is appropriate for use at airports with closely spaced runways such as Los Angeles International, Denver Stapleton International, San Jose International, Fresno Air Terminal, Seattle-Tacoma International, and Ontario International. This procedure would be used during Visual Flight Rule conditions with arrival aircraft executing a typical approach to Runway 26L (West flow) until a point approximately three miles east of the runway end. At that point, which is located approximately over Sun Devil Stadium and Mill Avenue, the pilot would "side-step" by turning left and aligning with the centerline of the new runway. As stated in the FEIS, this procedure is considered to be practical due to the low level of activity which would occur on the Runway 26L approach path, the 800 foot runway separation distance and the excellent visibility in the area. This procedure would be an informal procedure, with the option to use or not use by the pilot-in-command, weather and air traffic permitting. The purpose of this procedure is to further minimize flights over noise sensitive areas in the city of Tempe.

Section 4.14 of the FEIS also provides for noise mitigation of aircraft noise impacts to the west of the airport. This includes the continued equalization of departure procedures to the east and west. This measure attempts to "equalize" departing aircraft to the east and west during day and nighttime hours, weather and traffic permitting. The FAA has adjusted the hours used for westerly departures in an effort to equalize easterly and westerly operations. It is important to note that hourly or daily equalization is not a reasonable goal in terms of actual aeronautical operations due to several factors including seasonal weather patterns, diurnal wind changes, air traffic conditions and the density of aircraft operations at specific times of day. The appropriate period for definition of equalization is over a 12-month period. This time frame will account for the daily change in weather patterns and more importantly, for the seasonal wind change. It is also important to realize that the majority of aircraft operations occur during the daylight hours of a 24-hour period.



ATTACHMENT C

WIND DATA

NORTH RUNWAY
wind to north 1990 - 1993 at PHX NWS

wind-mph	wind-hrs	percent	cumulative
0	18665	55.5	55.5
1	2676	8.0	63.4
2	2184	6.5	69.9
3	2884	8.6	78.5
4	2235	6.6	85.1
5	1628	4.8	90.0
6	1321	3.9	93.9
7	964	2.9	96.8
8	488	1.5	98.2
9	319	0.9	99.2
10	113	0.3	99.5
11	65	0.2	99.7
12	38	0.1	99.8
13	26	0.1	99.9
14	11	0.0	99.9
15	8	0.0	99.9
16	7	0.0	99.9
17	6	0.0	100.0
18	0	0.0	100.0
19	2	0.0	100.0
20	2	0.0	100.0
21	2	0.0	100.0
22	1	0.0	100.0
23	3	0.0	100.0
24	0	0.0	100.0
25	1	0.0	100.0
totals	33649	100.0	100.0

ata stated in miles per hour. To convert miles to knots, multiply miles by 0.869.

SOUTH RUNWAY

wind to south 1990 - 1993 at PHX NWS

wind-mph	wind-hrs	percent	cumulative
0	25094	74.6	74.6
1	1874	5.6	80.1
2	1250	3.7	83.9
3	1801	5.4	89.2
4	1258	3.7	93.0
5	744	2.2	95.2
6	669	2.0	97.1
7	328	1.0	98.1
8	232	0.7	98.8
9	142	0.4	99.2
10	89	0.3	99.5
11	65	0.2	99.7
12	39	0.1	99.8
13	22	0.1	99.9
14	16	0.0	99.9
15	10	0.0	100.0
16	3	0.0	100.0
17	5	0.0	100.0
18	2	0.0	100.0
19	4	0.0	100.0
20	1	0.0	100.0
21	0	0.0	100.0
22	1	0.0	100.0
23	0	0.0	100.0
24	0	0.0	100.0
25	0	0.0	100.0
totals	3649	100.0	100.0

Data stated in miles per hour. To convert miles to knots, multiply miles by 0.869.

ATTACHMENT D

STEPS FOR CONSTRUCTING GATES

1. **Radial:** Label the VOR "V" and draw the 075 radial eastward from "V".

2. **4 DME distance:** Locate point "A" on the 075 radial 23,510 feet (approximately 3.9 nautical miles) from the VOR. Draw a "north-south" line (ie. parallel to the vertical axis of the NFTMS grid, which is perpendicular to the runways and therefore not quite true north-south) through "A". This line is the 4 DME line. Note: Planes may turn when they reach 4 nautical miles slant distance from the VOR. The 23,510 over-the-ground distance is computed using Pythagorus' theorem, assuming the plane's altitude at 4 DME is 6100', the maximum altitude observed in a sample of jet departures.

3. **VOR zone of confusion:** Draw a circle around "V" with a radius of 2,250', the approximate radius of an inverted cone at 3,000' above-ground-level (AGL), the maximum departure altitude allowed at that point.

4. **"Idealized" flight path:** Mark point "L" at the eastern threshold of the north runway (8L) centerline. Draw a line at an 085 heading from point "L" to the point where it intersects the 075 radial from the VOR. Mark the intersection point "Z." The line LZA is the idealized flight path for departures from runway 8L.

   Mark point "R" at the eastern threshold of the south runway (8R) centerline. Draw a line from "R" to "V." RVA is the idealized flight path for departures from 8R.

5. **Access gate:** Draw a "north-south" line (ie. parallel to the vertical axis on the NFTMS grid) through "L" or at some other location to form an appropriate entrance gate, as discussed in the TAVCO report. The length and location of the access gate should be set so that the gate captures essentially all jet and large turboprop departures, but is not longer than necessary.

6. **Variables:** Several independent, random errors might cause a plane to be off (or to appear to be off) the idealized flight path despite the pilot's best efforts to follow the procedure precisely. The appropriate way to determine aggregate error for multiple independent random error sources is the root-sum-square method, which is also called the vector-summing method. This method is used by the FAA and explained in FAA Advisory Circular 00-31A, Attachement 2 (the "Circular"). Accordingly, to compute the corridor boundaries use the following formula:

$$(E1^2 + E2^2 + E3^2 + \ldots\ldots\ldots\ldots En^2)^{1/2}$$

where E1, E2, En are independent random variables with the same probability and in the same units.

A) To determine north and south boundaries of corridor along VA leg of idealized path (east of the VOR):

Locate point "W" on the 4-DME line north of point "A" and locate point "K" on the 4-DME line south of "A." The distances of W and K from A are determined by the combined error factors radar error (assumed to be 400' maximum), radial signal error (1.4 degrees), airborne component error (3.0 degrees), instrumentation setting error (2.0 degrees) and flight technical error (ie. pilot error) of 2.3 degrees. See pages 9 and 10 of the TAVCO report and Appendix 2 of the Circular.

Errors expressed as degrees must be converted to feet before aggregating. To do this assume VAW and VAK are right triangles (an approximation) and multiply the tangent of the angle by 23,510 (the length of VA).

For example, for radial signal error

tan (1.4 degrees) X 23,510 = approximate radial signal error in feet
0.024439 X 23,510 = 575 feet

Use the same technique for the other variables and then combine all five variables (expressed in feet) using the root-sum-square formula. (Note: "W" and "K" are approximately 1890 feet north and south of "A", respectively.)

Locate point "B" 400 feet north of "V" and point "C" 400 feet south of "V". (Note: at this location all errors except radar error equal zero, therefore the result of the root-sum-square formula is 400 feet, the radar error.) Draw lines BW and CK.

B) To determine north boundary of the corridor along the LZ leg of the idealized path (from the north runway):

Mark point "D" 400 feet north of "L", per explanation above.

Estimate the length of LZ by measurement. (Estimated at 17,000') Mark point "F" so LZF is a right angle Point "F" marks the width of the corridor along the LZ leg at point "Z." The width is determined by the three combined errors, pilot error (2.3 degrees), compass error (0.5 degrees) and wind drift. Convert pilot error and compass error to feet at point Z using technique above. Compute wind drift in feet. (Using wind data in Attachment C, 95% of time south to north wind is less than 6.5 mph or approximately 5.6 knots per hour. Wind drift equals 101 feet per knot per minute. Estimated maximum observed flying time along LX is 72 seconds.)

Combine the three errors (now expressed in feet) using root-square-sum formula. This gives the length of AF. Draw line DF. Mark the intersection of DF and BW as point "M." The north boundary of the expected flight corridor is DMW.

C) To determine the south boundary of the corridor along leg RV (from the south runway):

Mark point "E" 400 feet south of "R", per explanation above.

Extend line RV out to the eastern edge of the cone of confusion, marking point "Q." Estimate length of RQ by measuring. Mark point "X" south of "Q." Per discussion in the TAVCO report, compute combined error due to 95% probability wind drift, compass error, pilot error and radar error for planes attempting to fly along RQ. Convert errors expressed in degrees to feet using technique above. To determine wind drift, multiply 95% probability north-to-south wind speed in knots by 101 by expected maximum flight time in minutes. (Using wind data in Attachment C, wind speed is less than 5 mph (4.3 knots) 95% of the time. Estimated maximum flying time to Q is 50 seconds.) Combine all error, now expressed in feet, using root-sum-square formula. This gives location of "X" south of Q. The south boundary of the expected flight corridor is EXK.

7. **Locate gates near runways:** Per discussion in the TAVCO report, determine configuration for north and south gates near the runways sufficient to avoid most data anomalies ("artifacts"). Connect these gates to the north end of the entrance gate and the DMW boundary as appropriate. On the south side, connect the side gate to the south end of the entrance gate and the EXK boundary.

6. TAVCO Initiatives, Examples

Report and Recommendation for an Aviation Corridor Positive Awareness Program, September 8, 1998

TEMPE AVIATION COMMISSION

REPORT AND RECOMMENDATION FOR AN AVIATION CORRIDOR POSITIVE AWARENESS PROGRAM

SEPTEMBER 8, 1998

TEMPE AVIATION COMMISSION
AVIATION CORRIDOR POSITIVE AWARENESS PROGRAM

I. INTRODUCTION

History and Background

Sky Harbor International Airport is owned and operated by the City of Phoenix. The airport is located immediately west of Tempe's municipal limits on the north side of the Salt River. Tempe realizes benefits from its proximity to Sky Harbor but it also bears the brunt of the noise, air pollution and other issues associated with the east-side operations at Sky Harbor.

Since adding the capacity to handle commercial jet carrier service in the 1950's, Sky Harbor has experienced massive growth, including a seven-fold increase in passenger traffic between 1970 and 1990. With that growth in operations, and the accompanying increase in take-offs and landings, with more than one-half million operations per year, Sky Harbor's noise impacts on Tempe also increased dramatically.

In 1987, Phoenix proposed adding a third runway south of and parallel to its existing runways. The proposal to add the third runway required that Phoenix and the Federal Aviation Administration ("FAA") undertake an Environmental Impact Statement. In 1991, Tempe submitted formal, extensive and critical comments to the resulting draft Environmental Impact Statement for the third runway. Thereafter, Tempe filed lawsuits against the FAA and the Environmental Protection Agency challenging the adequacy of the Final Environmental Impact Statement and contending that the FAA was subject to the new federal Clean Air Act "conformity " requirement.

As a result of mediation sponsored by the federal Ninth Circuit Court of Appeals, Phoenix and Tempe signed an Intergovernmental Agreement on Noise Mitigation Flight Procedures (the "Agreement") in September 1994. The Agreement sought to "lessen the noise impacts resulting from jet and large turboprop aircraft arriving from, and departing to, the east over Tempe" and to cause airlines to comply with "certain FAA-approved noise mitigation flight procedures, designed, in part, to restrict flights to the airspace over the Salt River riverbed." Agreement, page 1, Recital 3. One of the noise mitigation procedures applicable to eastbound departing aircraft is referred to as the "4-DME" procedure and is described in the FAA's Record of Decision dated January 18, 1994.

Purpose and Definition of Aviation Corridor

To monitor and encourage airlines' compliance with the 4-DME Procedure, the Agreement obligates Phoenix to install a Noise and Flight Track Monitoring System ("NFTMS") that, among other things, "specifically identifies by type and flight those

aircraft which fail to comply with the [4-DME] noise mitigation procedures." Agreement, page 5, Section 4.1(a). The NFTMS became operational in September, 1996. Article III, section 4.7 of the Agreement requires Phoenix to notify an airline, the FAA and Tempe of any aircraft's failure to comply with the 4-DME procedure. The 4-DME procedures published by the FAA are in the form of instructions to pilots to follow certain courses east from Sky Harbor. Because pilots' actions cannot be directly observed, the only practical method of determining compliance with the 4-DME procedure is to infer it from flight tracks recorded by the NFTMS.

To provide a definition of 4-DME compliance, Tempe's Aviation Commission ("TAVCO") developed a specific Aviation Corridor described in TAVCO's "Report and Recommendations on Gate and Corridor Configuration and Implementation for the Sky Harbor Noise and Flight Track Monitoring System," adopted by Tempe's City Council on March 27, 1997. Concurrent with any program conducted by Phoenix to provide notices to noncomplying airlines, TAVCO recommends that Tempe adopt an Aviation Corridor Positive Awareness Program to raise awareness of the Aviation Corridor, seek compliance by airlines with the Aviation Corridor and the IGA and, thereby, better protect Tempe neighborhoods from aircraft noise. A diagram of the Aviation Corridor is located at **Tab A.**

II. GENERAL PROGRAM APPROACH

The objectives of the Positive Awareness Program are to raise awareness of the Aviation Corridor, encourage pilot compliance with the Aviation Corridor and thereby reduce the negative effect of aircraft noise on Tempe residents and businesses. This furthers Objective 4 in the Tempe General Plan 2020.

The general approach of the Positive Awareness Program is to (1) communicate Tempe's concerns about aircraft noise to airline managers and pilots through a variety of means and (2) use private and public publicity of airline compliance with the Aviation Corridor as an incentive for airlines to help achieve the objectives for the Corridor. The Commission recommends that the Aviation Corridor be used as the standard for measuring airline performance under the Positive Awareness Program. The Corridor is a fair and reasonable definition of what it means to "follow the 4-DME procedure" and, accordingly, is an appropriate standard for measuring airlines' overall compliance with the Procedure. The Program, then, has two parts: (A) The informational campaign directed at informing airlines about the Aviation Corridor, its boundaries and Tempe's concerns and (B) The measurement of airline performance and the rewards and publicity based on performance.

The Aviation Corridor Positive Awareness Program should be undertaken independently by the City of Tempe. The Program is separate from the Agreement, does not affect the rights or obligations of either Phoenix or Tempe under the Agreement, and does not require the participation of officials from Phoenix or the FAA.

The information portion of the Program seeks to create initial awareness of the Aviation Corridor among airline pilots and then provide periodic reminders about the

Aviation Corridor to the pilots who fly to and from Sky Harbor. The Program's second portion, the positive rewards programs and publicity regarding exceptional and poor performance, is based, like speed limits, on an objective determination of whether or not each aircraft was flown within the Aviation Corridor boundaries. The focus of the Program's reward effort and publicity effort, as more fully described below, is rates of compliance and non-compliance with the Aviation Corridor. Tempe's definition of the Aviation Corridor sets forth what it means to "follow the 4-DME procedure." Accordingly, using rates of compliance and non-compliance with the Aviation Corridor measures how carefully airlines' pilots are following the procedure.

Based on the import of public perception and resources spent on marketing, it appears that most airlines regard a positive public image and favorable publicity as good business. Consequently, with better understanding of Tempe's concerns (through the informational portion of the Program), and with some encouragement to comply (through the rewards and publicity program), it is hoped that most airlines will seek to comply with the Aviation Corridor and thereby reduce aircraft noise impacts on Tempe.

The Positive Awareness Program applies to all commercial carriers, both passenger and freight, that regularly fly jets in and out of Sky Harbor.

III. PROGRAM STEPS

Initial and Continuing Awareness.

1. Initial Awareness.

To seek the broadest cooperation, understanding and participation in the Program, Tempe should initiate the Program with an informational letter to all airlines that explains Tempe's concerns, asks for their help and describes the program in detail. A sample initial letter is attached at Tab B. The Program uses a "carrot and a stick" approach, seeking to reward good compliance and discourage non-compliance. At the outset, the Program provides its target audience -- airlines -- with a full appreciation of the Program rewards and publicity efforts as well as a full understanding of the Aviation Corridor as the likeliest way to achieve compliance with the Aviation Corridor.

2. Maintain Direct Contact with the Two Largest Operators.

Two airlines, America West Airlines and Southwest Airlines, account for a significant majority of Sky Harbor's east-bound jet aircraft departures. Cooperation by these two airlines with the Program is critical to the success of the Program. Accordingly, Tempe City staff and elected officials should be encouraged to maintain personal contact with officials from these airlines to achieve the best possible communication with and cooperation from both of these airlines.

3. Communicate Tempe's concerns to pilots

The success of the Program depends on the actions of pilots. However, direct communication with pilots may be difficult because Tempe has no access to them. Further, with respect to the large airlines that employ thousands of pilots, some pilots come to Sky Harbor just a few times a year. As a result, such communication likely would be expensive and ineffective. However, regardless of a pilot's tenure at Sky Harbor, Tempe can seek direct communication with pilots through a variety of means that are directed to pilots when they are at Sky Harbor. The following approaches are recommended:

Runway Signs

Tempe should seek to have Sky Harbor and the FAA place signs with brief reminders regarding the Aviation Corridor and the noise sensitive areas surrounding the Aviation Corridor. Such signs are authorized in FAA AC 150/5340-18C, page 12, paragraph 11. Applicable FAA guidance indicates that such informational signs, which include "noise abatement and other specialized information," shall be black inscriptions on a yellow background. (Id. Chapter 2.) In the case of Sky Harbor, these signs should be placed near the west end of the runways so that pilots will be able to see them before starting takeoff. Such signs are in place at a number of other airports, including Los Angeles International Airport.

Encourage airlines to include noise abatement in written instructions to pilots

Tempe should encourage all airlines to include noise abatement reminders in their written Sky Harbor departure instructions that are maintained in pilot manuals. For example, one air carrier has included in its instructions a note stating, "Noise sensitive areas north and south of the riverbed." Officials at the Sky Harbor Executive Terminal have long distributed information cards noting "Noise Abatement Procedures: All aircraft specifically avoid the City of Tempe. Fly to NDB Departure from Runway 8." **See Tab C.**

Put signs in areas of airport where flight crews will see them

Tempe should ask Phoenix to place posters with explanations of noise problems and the 4-DME procedure at appropriate locations in the airport, in crew lounges and on crew buses.

Encourage airline management to inform pilots

Tempe should request that airline managers directly explain to pilots Tempe's noise concerns regarding Sky Harbor, appeal to pilots' professionalism and exhort them to follow procedures. One air carrier has done so, and has, on occasion, achieved compliance with the Aviation Corridor at rates in excess of 90%. An example of a letter to pilots is attached at **Tab D.**

Compliance Measurement and Publicity.

1. Publish Departure Path Reports.

Background

The NFTMS records in computer files the flight paths for all civilian aircraft in the vicinity of Sky Harbor. From these computer files any user can create one or more imaginary boundaries in almost any configuration the user chooses. The user then can obtain a printed report or a computer file identifying all aircraft whose flight paths do or do not pass through one of the boundaries. Flights can be screened by airline, type of aircraft, type of operation, date and several other attributes to produce selected lists. Using this method, the NFTMS can be used to identify flights that cross outside of the Aviation Corridor. TAVCO estimates that staff could prepare reports identifying noncomplying aircraft in a few hours each month. If the vendor of the NFTMS programmed the reports into its software, such reports could be produced even more easily.

The reports TAVCO proposes would disclose overall rates of compliance with the Aviation Corridor by each airline. For all airlines, some flights will be outside the corridor for reasons beyond the pilots' control. Indeed, the corridor is designed so that, on average, there is a 5 percent probability that a pilot making a good faith effort to follow the FAA procedures carefully will stray outside the Aviation Corridor. Hence, TAVCO would regard any airline that achieves a 95 percent compliance rate as achieving full compliance.

Such compliance reports, more fully described below, fairly compare airlines to each other regardless of the expected error rate because all airlines on average are equally affected by factors that would cause noncompliance for unavoidable reasons. For example, the proportion of flights affected by strong cross winds, thunderstorms, navigational equipment error and the like should be approximately the same for all airlines.

Reports

Based on TAVCO's work, TAVCO recommends that Tempe publish three reports showing the number of flights and rates of compliance with the Aviation Corridor. Those reports are:

A. Monthly reports showing compliance rates and associated data for all carriers that regularly use the airport. They should be distributed to all such airlines.

B. Quarterly reports showing compliance rates and associated data distributed to airlines with a copy of the report and a press release to be distributed to the news media. As

described below, quarterly reports only would include carriers with 100 or more jet departures during the preceding three months.

C. Annual reports showing compliance rates and associated data distributed to airlines with a copy of the report and a press release to be distributed to the news media. As with quarterly reports, annual reports only would include carriers with 100 or more jet departures during the preceding twelve months. This report would provide the basis for the annual awards program described below.

Sample reports are included at Tab E.

To provide substantial credibility to the reports, compliance rates should meet acceptable standards of statistical significance tests to avoid inappropriate comparisons. Accordingly, TAVCO recommends that a standard minimum number of flights of one hundred be used as the criterion for including an airline's flights in publicly disseminated reports. This minimum is recommended because the accuracy of non-compliance rates is +- 10% at a 95% statistical confidence level for 100 flights. On the other hand, all data generated by the Noise and Flight Track Monitoring System is public information. Accordingly, anyone wishing access to the data for all carriers has an opportunity to seek it.

Because the annual report likely will include most if not all carriers despite the use of the minimum flight count, most if not all carriers would be eligible for the annual awards described below and, hence, may be encouraged to improve compliance with the Aviation Corridor.

The methodology for defining the Aviation Corridor contemplates non-compliance due to weather, equipment and radar error and certain "acceptable" pilot deviation consistent with the safe operation of aircraft. Accordingly, TAVCO anticipates a maximum rate of non-compliance of five percent, and therefore, recommends that, for purposes of the Positive Awareness Program, an airline achieving a ninety-five percent or better compliance rate be deemed to be in "full compliance" with the Aviation Corridor.

Data Control

For an initial period of one hundred eighty days during which data may be collected to assess data control, airlines will have an opportunity to eliminate from the data count flights that do not comply with the Aviation Corridor due to certain acceptable circumstances outside a pilot's control (as described in TAVCO's Report and Recommendations on Gate and Corridor Configuration). Airlines will be offered the opportunity to request that Tempe's staff eliminate noncomplying flights from the data counts. This process of self-policing the NFTMS data reports will be undertaken to minimize objections to the Program and reduce administrative costs. Accordingly, staff should log the explanations from air carriers and delete such explained-but-noncomplying flights from the database so they will

not be included in the quarterly or annual reports. If an airline does not make such a request within thirty days of a monthly report's release, data will stand as reported by the NFTMS.

2. Offer Annual Rewards and Incentives

Tempe should present annual awards to the top three airlines that achieve the highest rate of compliance exceeding eighty percent compliance with Tempe's Aviation Corridor. Given the current compliance rates, we expect that, with minor improvements, all airlines will be able to achieve the minimum compliance standard. As airlines improve compliance, TAVCO recommends that the standard be adjusted in later periods to encourage further improvement in performance. If appropriate, Tempe may also present an award for the most improved performance.

Because favorable publicity is the main incentive Tempe can offer to airlines for complying with its Aviation Corridor, Tempe should energetically publicize the awards and the best performing airlines in a variety of ways. TAVCO's suggestions are as follows:

Public ceremonies

The Mayor and other Tempe officials might present a plaque or trophy to a representative of the winning airlines (preferably the CEOs or chief pilots) at a public ceremony.

Public statements

Public officials should make an effort to comment on the good performance of the best airlines in appropriate situations.

Recognition of pilots

The good work of pilots should be publicly recognized and efforts made to get the message to the pilots that Tempe residents appreciate their effort. Management of the best performing airlines should be encouraged to publicize the award internally and to disseminate a message of appreciation from Tempe to the pilots. If practical, Tempe could distribute tokens of appreciation directly to successful pilots.

News press releases

Tempe public relations staff should prepare press releases about the awards and airline performance for the general news media. Staff also should seek to have information published in trade publications read by airline executives, airport managers, pilots, city officials and others with an interest the industry.

Web site

A page on the City's website should be devoted to publicizing award winners and reporting airline performance data. Such a site might include a "hot" link to the winning airline's own website.

Advertisements

Tempe should place paid and public service (free) advertisements with local newspapers and radio stations describing awards and reporting airline performance. Such advertisements might be included with Tempe water bills.

Opportunities to display logos

Airlines that comply with the Aviation Corridor should be offered the opportunity to display their logos and publicize their good performance in appropriate locations, such as on banners or signs at public functions, on street banners, in city publications, or on printed programs, snack packages, napkins, or other small items used at public functions. Such advertising opportunities might include free advertising space in local publications.

Publicize Poor Performance

The annual reports for all airlines should be widely distributed even though the worst performing airlines may not like the publicity. The distribution of full reports benefits the best airlines by showing how much better they are than the least performing airlines and provides an incentive to the poor performers to improve. Occasionally, it may be appropriate for Tempe to generate some additional publicity about non-compliance to provide further incentive for poor performers to comply with the Aviation Corridor.

EXAMPLE OF AN INITIAL LETTER TO AIRLINES EXPLAINING THE POSITIVE AWARENESS PROGRAM

Dear _____,

I write to acquaint you with some of the aircraft noise concerns in Tempe, to ask your help in alleviating them, and to introduce our Aviation Corridor Positive Awareness Program.

The City of Tempe is located just east of Sky Harbor Airport, which is owned and operated by the City of Phoenix. As can be seen on the attached aerial photograph, there are residential neighborhoods in Tempe east of the Airport, on both sides of the Salt River riverbed. These are mostly long-established neighborhoods, built when Sky Harbor was a far smaller airport than it is now. It is important to preserve these areas as attractive, affordable parts of the community. Aircraft noise and direct overflights seriously stress these neighborhoods. Therefore, I am requesting your help in alleviating this problem and in protecting these neighborhoods.

The City of Tempe believes that the most practical way to effect some immediate improvement is for carriers to follow the " 4-DME procedure." The 4-DME is the long-standing noise mitigation procedure applicable to large aircraft departing to the east over Tempe. While the procedure obviously does not eliminate the noise problem, it keeps aircraft over the Salt River riverbed and away from residential areas. Accordingly, it helps reduce aircraft noise imposed on nearby neighborhoods and minimizes overflights.

Since most [some] of your flights depart from the south runway (8R) I would like to call your attention to the situation on the south side. The first part of the SID for 8R instructs pilots to fly "direct" to the VOR, which is approximately 750 feet north of the runway centerline. One would expect aircraft to turn slightly north after becoming airborne. This is not the case. Data from the Noise and Flight Track Monitoring System show that instead, most aircraft follow a runway heading or even move south after takeoff, putting them near or over the neighborhoods south of the riverbed. More precise observance of the 4-DME, which would shift the departing traffic stream 600 or 800 feet further north, would be a considerable benefit to these areas. While the distances may seem small, the aircraft are still low at this point and the 60 and 65 LDN noise contours are only about 1,100 to 1,400 feet apart in this area according to the last FAR Part 150 study and a recent planning study.

To encourage carriers to follow the 4-DME carefully, Tempe is creating the Aviation Corridor Positive Awareness Program which annually will honor the best performing airlines as well as a "most improved" one, if appropriate. Press releases, webpage information, and

publicity at City events and in local publications will highlight the selected airlines' neighborliness.

The performance standard we propose as the basis for awards is the percent of each carrier's annual eastbound jet departures that stay within an Aviation Corridor that sets out the outer boundary of the 4-DME procedure. The corridor surrounds an "idealized" 4-DME flight path and its width allows for normal cross winds, navigational equipment errors and other factors. All data would come from the Noise and Flight Track Monitoring System. An explanatory report is available from the City.

Tempe does *not* expect all flights to remain within the corridor. Indeed, because of the way the corridor was designed, a 95 percent compliance rate will be deemed full compliance.

Presently, there are large differences among airlines in their average compliance rates, which currently range from about 85 percent (or better in some months) down to about 50 percent. The effects of storms, hazards, navigational equipment errors and the like should be about the same across airlines. Therefore, it can be concluded that some carriers are considerably more effective than others in following the 4-DME procedure. We hope that by highlighting the differences among airlines and generating some favorable publicity for those that achieve high levels of compliance, all carriers will realize that the 4-DME procedure is practical.

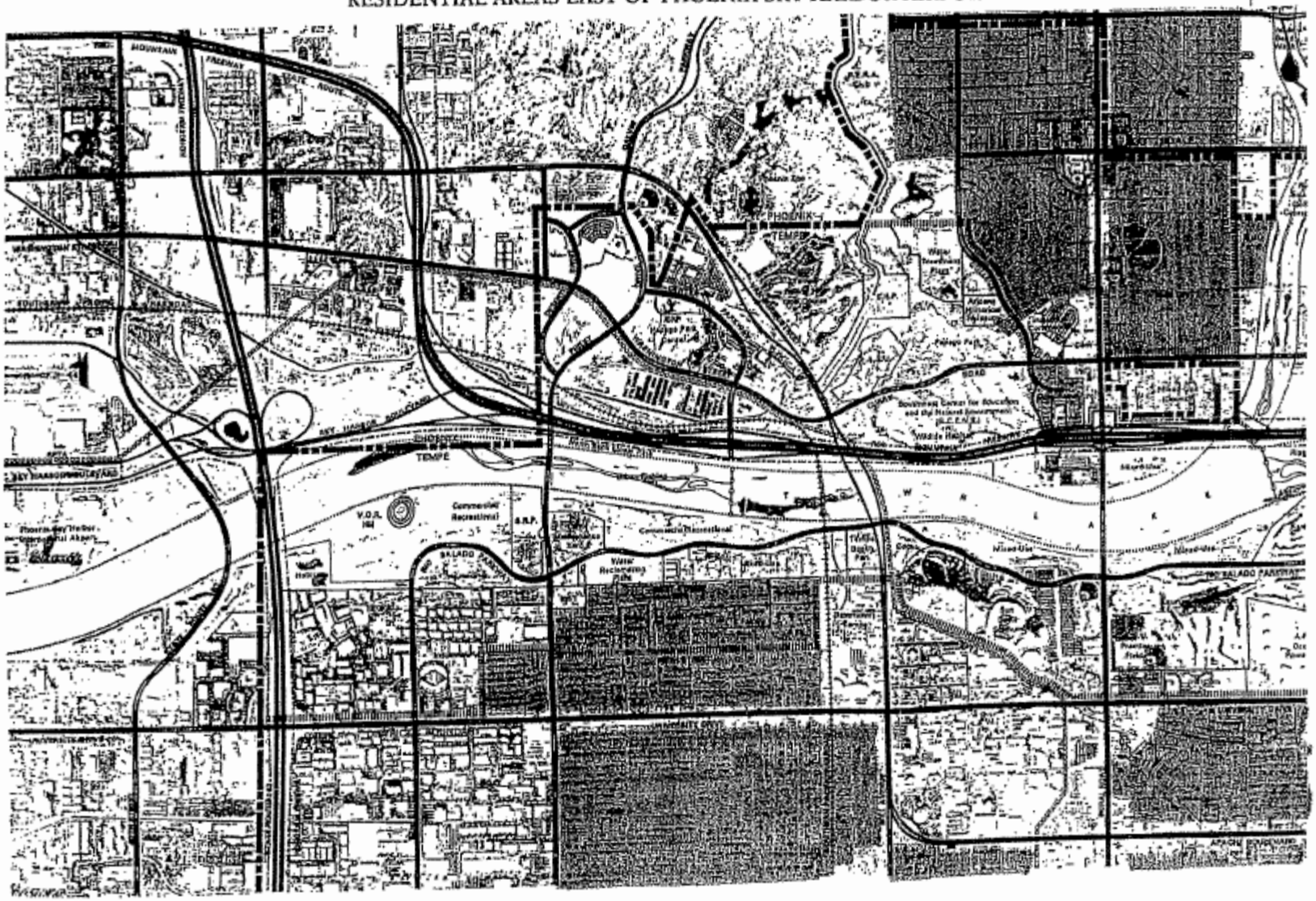
Once the Aviation Corridor Positive Awareness Program is underway, Tempe will regularly publish quarterly and annual reports for both the public and the airlines. Monthly reports will also be provided to carriers as a source of information to assist in improving performance and compliance with the Aviation Corridor. (However, all NFTMS data are public information and cannot be withheld from anyone who requests it.) Reports with current data are attached. In order to give carriers time to comment or make changes, we plan to postpone publishing reports until _____, although in the meantime we will provide airlines with updates.

We are certainly interested in your comments and questions. Please feel free to contact _____ at _____ . We would appreciate your input.

I would be delighted to announce later this year that _____ Airlines is one of our most neighborly.

Signature

RESIDENTIAL AREAS EAST OF PHOENIX SKY HARBOR AIRPORT



Runways VOR Neighborhoods

10-7 KPHX PHOENIX, ARIZ
MST + 7/MDT + 7 PHOENIX SKY HARBOR INTL

GROUND INFORMATION

FSS Prescott (800) 992-7433 OPERATIONS / HP RAMP CONTROL TOWER (602) 693-4160 FAA TOWER (602) 273-4875 ATIS (602) 244-0963 FLIGHT CONTROL (800) 348-8550	See 10-7-2 and 10-9B for gate info and coordinates.	FSS 122.2/122.6 OPERATIONS Book times, Runway Changes: 128.97 Control Transfer Point (CTP), Gate Assignment, Servicing and all other requests: 131.77 FLT CONTROL .130.17 PHX RAMP CONTROL Inner Gates: 129.62 Outer Gates: 130.72 (See 10-7-2)
SR. DIR. FLT. CONTROL (602) 693-3881 MAINTENANCE (602) 693-3063		SHORT CLEARANCE READBACK Yes
	MAINTENANCE Inbound/At Gate – 130.95 (0530-2230) Outbound - 130.17 (0530-2230) Inbound/Outbound - 130.17 (2230-0530)	PUSHBACK Contact Ramp Control for pushback and engine start.
	5-2-3	FLT DOCUMENTS Pick up in Flt. Control

GROUND SERVICES		AIRCRAFT SERVICES	
Jetway:	Available	Catering:	Available
APU at Gate:	Available	Lavatory:	Available
Ground Power:	Available	Water:	Available
Air Start:	Available	De-ice:	Available

SPECIAL APPROACH/DEPARTURE PROCEDURES:

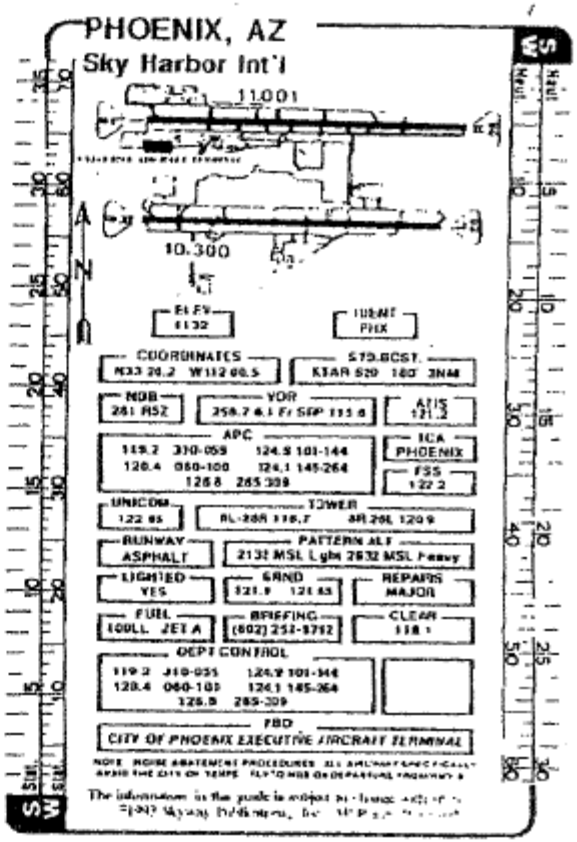
Yes

ARRIVAL CONSIDERATIONS

- Contact PHX Ops at 131.77 for gate assignment and other info.
- Advise PHX Ops of requests & advise if APU is inop.
- Contact PHX Ramp as duties permit on assigned freq. when exiting runway and advise which runway just exited.
- See 10-7-2 page for gate location.
- One pilot monitor PHX ramp control freq. when approaching CTP.

DEPARTURE CONSIDERATIONS

- Obtain PHX Ramp approval for any engine start.
- Advise PHX Ops on freq. 128.97 of revised souls on board total or runway changes.
- Approx. 10 min. prior to departure monitor freq. 130.17 per FOM procedure.
- Noise sensitive areas north and south of the riverbed east and west of the airport.



To: All America West Pilots

Subject: Noise Flight Track Monitoring System at Phoenix Sky Harbor International Airport

Date: March 15, 1997

The City of Phoenix has installed a Noise Flight Track Monitoring System (NFTMS) east and west of Phoenix Sky Harbor International Airport. This equipment installation is part of an inter-governmental agreement between the cities of Phoenix and Tempe that resolved the conflict concerning the proposed construction of a third runway at Phoenix Sky Harbor.

The NFTMS is in a test mode now and is expected to be operational in the next few months. There are twelve (12) monitoring stations east of the airport and eight (8) stations west of Phoenix Sky Harbor. The cities are in the process of developing "electronic gates" that parallel the standard instrument departures out to 4 DME east of the airport. At present, there are no plans to develop "electronic gates" west of the airport.

The NFTMS receives tracking data from the Phoenix TRACON Radar System two (2) days after the fact. Citizens of Tempe and the Tempe Aviation Commission are able to review this data (with the associated aircraft ID tag) on a 48 hour delayed basis.

When testing of the NFTMS first began, Ken Carr examined data for an approximate one (1) month period, consisting of 3500 easterly departures. This data revealed an America West Airlines compliance rate of 99.9% of what AWA considers to be both reasonable and prudent, e.g., within ½ mile either side of the departure radial. Obviously, the pilots of America West Airlines are performing their duties in an exemplary manner - flying both ***professionally*** and ***neighborly.***

Consistent with safety and ATC instructions, we urge you to continue to fly with consideration and respect for the noise sensitive areas in our system. If you have any questions concerning the NFTMS, please call Ken at 693-8569.

Best regards.

Ed Methot
Vice President
Flight Operations

EM/dp

TEMPE AVIATION COMMISSION
POSITIVE AWARENESS PROGRAM

COMPLIANCE WITH AVIATION CORRIDOR
BY JETS LEAVING SKY HARBOR INTERNATIONAL AIRPORT

DECEMBER 1997

CARRIER	TOTAL EASTBOUND JET DEPARTURES	NUMBER COMPLIED WITH CORRIDOR	COMPLIANCE RATE (Percent)
America West	1738	1448	83.3
Western Pacific	21	16	76.2
Shuttle by United	372	271	72.8
Northwest	136	99	72.8
Continental	125	87	69.6
Delta	258	177	68.6
United Parcel Service	54	36	66.7
Southwest	1478	971	65.7
Federal Express	49	32	65.3
Alaska	108	67	62.0
Evergreen Int.	21	13	61.9
American Trans.	36	22	61.1
Trans World Airlines	95	58	61.1
Ryan Aviation	37	21	56.8
Frontier	35	19	54.3
US Air	99	53	53.5
Airboune Express	24	12	50.0
American	204	94	46.1
DHL Airways	14	5	35.7
Total for above	4904	3501	71.4
All others	95	54	56.8
Grand total	4999	3555	71.1

Includes all carriers likely to have 100 or more eastbound jet departures during the year

TEMPE AVIATION COMMISSION
POSITIVE AWARENESS PROGRAM

COMPLIANCE WITH AVIATION CORRIDOR
BY JETS LEAVING SKY HARBOR INTERNATIONAL AIRPORT

FOURTH QUARTER 1997

CARRIER	TOTAL EASTBOUND JET DEPARTURES	NUMBER COMPLIED WITH CORRIDOR	COMPLIANCE RATE (Percent)
America West	5185	4503	86.8
Northwest	388	283	72.9
Delta	802	583	72.7
Shuttle by United	1146	807	70.4
American Trans.	106	72	67.9
Federal Express	160	106	66.3
Southwest	4490	2957	65.9
Cóntinental	389	254	65.3
United Parcel Service	168	98	58.3
Alaska	296	172	58.1
Trans World Airlines	289	166	57.4
US Air	253	125	49.4
American	668	315	47.2
Total for above	14340	10441	72.8
All others	657	409	62.3
Grand total	14997	10850	72.3

Includes all carriers with 100 or more eastbound jet departures during quarter

TEMPE AVIATION COMMISSION
POSITIVE AWARENESS PROGRAM

COMPLIANCE WITH AVIATION CORRIDOR
BY JETS LEAVING SKY HARBOR INTERNATIONAL AIRPORT

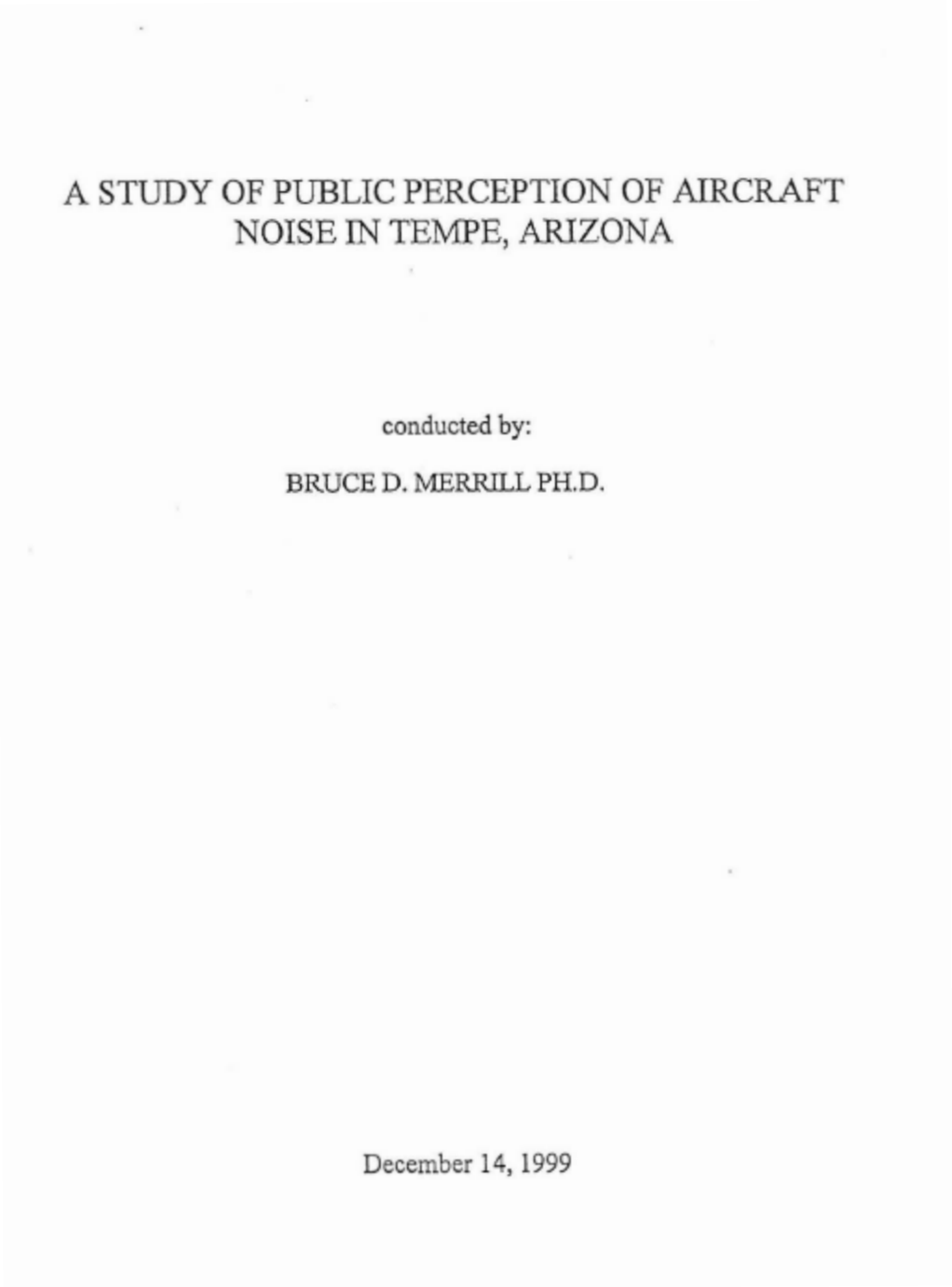
1997 ANNUAL REPORT

CARRIER	TOTAL EASTBOUND JET DEPARTURES 1997	NUMBER COMPLIED WITH CORRIDOR	COMPLIANCE RATE (Percent)	RANK
America West	18933	16420	86.7	1
Western Pacific (1)	386	324	83.9	2
Northwest	1436	1103	76.8	3
Shuttle by United	4042	2908	71.9	4
Delta	3150	2233	70.9	5
Continental	1521	1055	69.4	6
Federal Express	581	402	69.2	7
American Trans.	338	233	68.9	8
Southwest	17126	11483	67.1	9
Frontier	319	210	65.8	10
United Parcel Service	554	335	60.5	11
Airboune Express	292	170	58.2	12
Ryan Aviation	305	175	57.4	13
Alaska	1033	590	57.1	14
Evergreen Int.	212	121	57.1	15
Trans World Airlines	951	540	56.8	16
US Air	707	367	51.9	17
DHL Airways	189	98	51.9	18
American	2673	1353	50.6	19
Total for above	54748	40120	73.3	
All others	530	329	62.1	
Grand total	55278	40449	73.2	

Includes all carriers with 100 or more eastbound jet departures during year

6. TAVCO Initiatives, Examples

A Study of Public Perception of Aircraft Noise in Tempe, Bruce D. Merrill Ph.D. December 14, 1999 (year before opening of the third runway).



A STUDY OF PUBLIC PERCEPTION OF AIRCRAFT NOISE IN TEMPE, ARIZONA

conducted by:

BRUCE D. MERRILL PH.D.

December 14, 1999

PURPOSE OF THE RESEARCH.

This research was commissioned with four objectives.

(1) Is there a problem with aircraft flying over people's homes in Tempe? If there is a problem, how extensive is it?

(2) What is it about aircraft flying over people's homes that bothers them?

(3) Is aircraft noise more of a problem in some areas of the City than others?

(4) To establish a baseline measurement for aircraft noise in Tempe.

METHODOLOGY:

The information in this report is based on telephone interviews with 1050 adult heads of household living in Tempe, Arizona. The City was divided into three geographical areas by the Tempe Aviation Committee. The areas were determined by examining landing and take-off patterns associated with Sky Harbor International Airport. Three-hundred and fifty (n=350) interviews were taken in each geographic area. A map of the three areas is presented in the report as Appendix A. A brief description of the three areas is given below.

Area One:	North of Apache Boulevard
Area Two:	North of the Superstition Freeway and south of Apache; east of Mill Ave.
Area Three:	Tempe south of the Superstition Freeway

The sampling error for each area when the proportion giving a dichotomous response is 50% and assuming the 95% level of significance is plus or minus 5.2%. Percentages above or below 50% have smaller sampling errors. Sampling errors for a few representative percentages follow:

percentage	error
50	5.2
40	4.2
30	3.1
20	2.1
10	1.0

This study generalizes to adult heads of household living in the city limits of Tempe who are not full-time students of Arizona State University. The initial sampling frame was a list of all registered voters living in Tempe. However, when telephone numbers were changed, non-registered voters living at that telephone number were included in the sample. Eleven percent (11%) of the sample was with non-registered voters. Based on other surveys, eleven to fifteen percent of the adult population in Tempe is non-registered so the sample appears to be a valid microcosm of all adult heads of household living in the city limits of Tempe, Arizona.

The questions were developed by the Tempe Aviation Committee with the help of Dr. Bruce D. Merrill the study director. The questions were pre-tested before interviewing. Interviewing was conducted by professional interviewers using a CATI (Computer Assisted Telephone) system. The interview schedule is included as Appendix B. Interviewing was conducted the last week of November and the first week of December, 1999. The data were compiled using SPSS (Statistical Package Social Sciences). A disc with both the data and program files is available.

It is important to point out one aspect of the interview schedule. In order to insure that respondents would not know why the survey was being conducted, people were first asked what they liked most about living in their neighborhood. The responses to this question were not recorded. By asking people both what they liked and disliked about the area where they lived protected the neutrality of the study.

Dr. Bruce D. Merrill designed and conducted the research. Dr. Merrill holds a Ph.D. in Political Behavior from the Institute for Social Research at the University of Michigan where he trained at the Survey Research Center. Dr. Merrill has conducted literally hundreds of behavioral research studies throughout the United States and several foreign countries. Currently Dr. Merrill is Professor of Mass Communications and Director of the Media Research Program in the Walter Cronkite School at Arizona State University. This research was conducted by Dr. Merrill as a private consultant and is not a product of Arizona State University.

OVERVIEW OF FINDINGS:

(1) Aircraft noise is primarily a problem in survey area one which is the area north of Apache Boulevard (see Appendix A). In this area, 16% of the residents, in an open-ended question, mentioned aircraft noise as a problem. In addition, when asked later in the interview how much aircraft flying over the area bothered them, 48% said aircraft noise was frequently (31%) or occasionally (17%) a problem. Only 3% of the people living in area two and 2% of those living in area three said, in response to the open-ended question, that airplane noise was a problem.

(2) Noise was overwhelmingly the problem most associated with aircraft flying overhead. Smaller numbers of people mentioned low flying aircraft, aircraft flying outside of prescribed patterns, and safety considerations as problems.

(3) Aircraft noise appears to be more of a problem during morning and evening hours when there are more takeoffs and landings and when people tend to be at home.

(4) Aircraft noise was perceived as more of a problem during takeoffs rather than landings.

Table One: Is there anything that you dislike or that annoys you about where you live?

Area One

Dislike	percent households
Traffic in area, speeding, cutting through, noise	18
Aircraft noise, low flying aircraft	16
Property not being kept up, too many renters	4
Crime, need more police, gangs	3
Loud neighbors	3
Too much growth, congestion	2

Area Two

Traffic in area, speeding, cutting through, noise	20
Property not kept up, too many renters	6
Air pollution	3
Aircraft noise, low flying aircraft	3
Too much growth, congestion	2
Noise from train	1

Area Three

Traffic in area, speeding, cutting through, noise	28
Air pollution	5
Property not kept up, too many renters	3
City government not responsive, overbearing	2
Crime, need more police, gangs	1
Aircraft noise, low flying aircraft	1

- Numbers are percent of all households in each district. There were 181 comments in District One, 188 in District Two, and 184 in District Three. The number of mentions about issues that annoyed people were divided by the total sample size, 350, in each district. About 50% of the people living in each area mentioned something that annoyed them.

Table Two: Is there anything else that bothers or annoys you?

	Area One	Area Two	Area Three
First mention	16%	3%	1%
Second mention	5	*	1
Total airplane noise	21%	3%	2%

- This table was constructed by adding the number of people who mentioned aircraft related problems in the first open-ended question to the number of comments recorded when the follow-up question was asked – Is there anything else that bothers or annoys you? The total number of first and follow-up mentions in each district was then divided by 350. In the above table, the total percentage of all households mentioning aircraft related problems in District One was 16% in response to the first question plus 5% in the follow-up question for a total of 21%.

Table Three: Thinking about the area where you live, do any of the following bother you:

Cars Driving Through Your Neighborhood

	Area One	Area Two	Area Three
Frequently	24%	21%	18%
Occasionally	19	26	17
Rarely	20	18	27
Never	37	35	38
	100%	100%	100%

Aircraft Flying Over the Area Where You Live

Frequently	31%	9%	6%
Occasionally	17	13	13
Rarely	14	19	17
Never	38	59	64
	100%	100%	100%

Table Four: What is it about aircraft flying over your area that bothers you the most? Anything else? Asked open-ended to people who indicated airplanes flying over their homes was a problem.

	Area One	Area Two	Area Three
Noise, noise vibration	79%	73%	74%
Pattern violations	9	13	1
Flying too low	6	7	8
Pollution, fumes, soot	3	*	3
Afraid of crash, safety	1	1	6
Police, medical helicopters	*	5	6
Interferes with electronics	*	0	*
	100%	100%	100%
Number of comments	(233)	(147)	(123)

- Asterisks represent less than one percent

Table Five: When aircraft flying over your home bothers you, does it happen most often during a particular time of the day? Asked open-ended to people who indicated airplanes flying over their homes was a problem.

	Aea One	Area Two	Area Three
Morning hours	18%	17%	12%
Around midday	2	3	6
Afternoons	7	9	9
Evenings	13	16	23
During the night	7	8	8
All times/no difference	53	47	42
	100%	100%	100%

Table Six: Does the noise from airplanes bother you more when airplanes are landing or taking off? Asked to people who indicated airplanes flying over their homes was a problem.

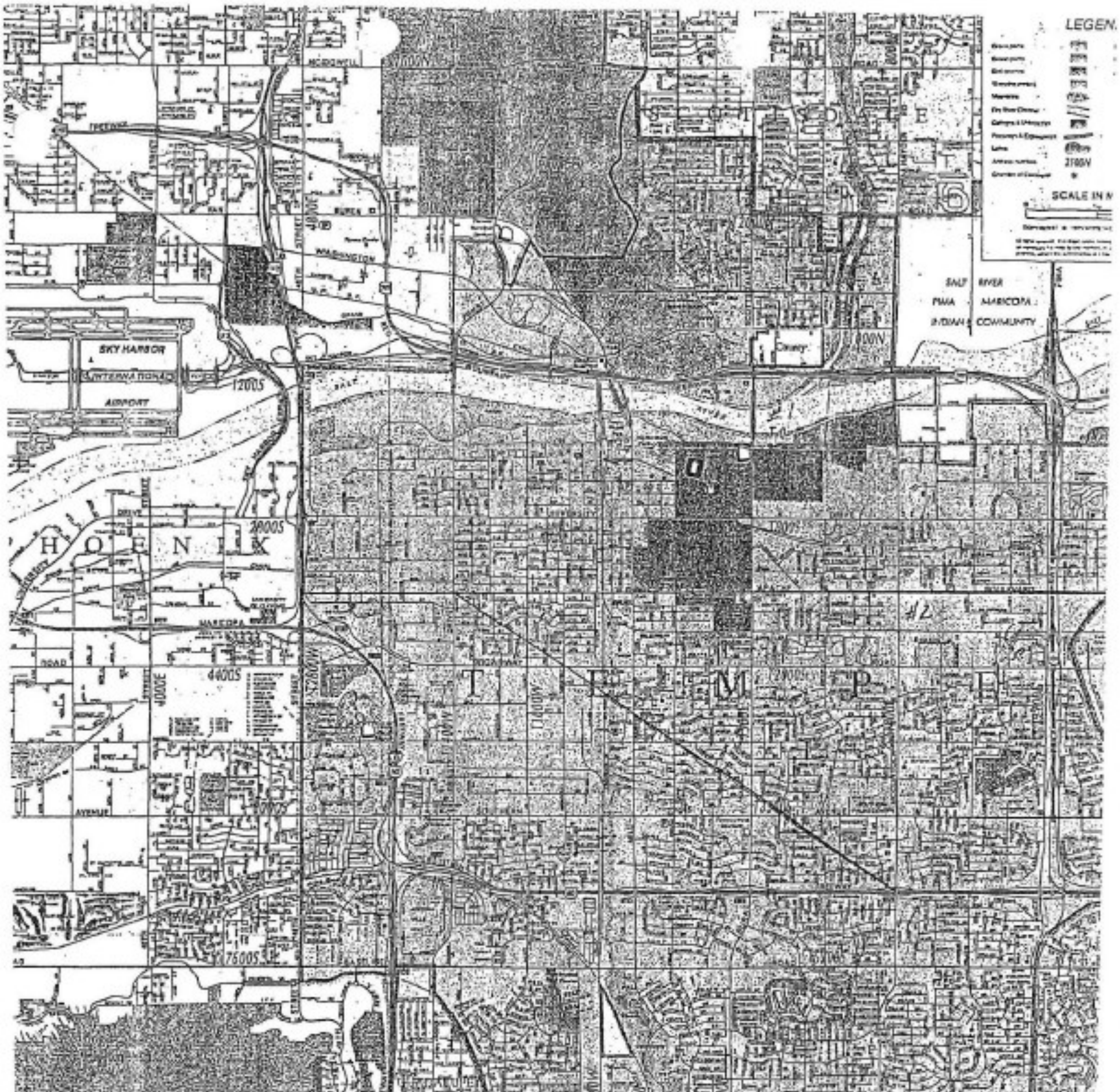
	Area One	Area Two	Area Three
During landing	18%	16%	12%
Takeoffs	35	29	9
No difference	42	43	65
Not aware	5	12	19
	100%	100%	100%

Table Seven: Does it seem to you that the problem of aircraft flying over your area has been getting better, getting worse, or hasn't changed much the past few years? Asked to everyone.

	Area One	Area Two	Area Three
Getting better	9%	7%	7%
Getting worse	28	13	8
No Change	55	67	65
Don't know	8	13	20
	100%	100%	100%

APPENDIX A

Map of sampling area


LEGEN
SCALE IN
SKY HARBOR
INTERNATIONAL
AIRPORT
SALT RIVER
PIMA MARICOPA
INDIAN COMMUNITY
T E M P E
#2
#3

APPENDIX B

Interview Schedule

Hello, my name is _____ and I am doing a survey for Dr. Bruce Merrill. He is doing a survey to look at how people feel about living in the City of Tempe. Have you lived in Tempe at least one year?
IF YES: Are you a student fulltime student at ASU? IF NO: CONTINUE
IF YES – THANK AND END

The survey is very short and your input could have an impact on future developments in the City. Will you answer a few questions for us please!

1. What do you like most about where you live? (don't code)

2. Is there anything you dislike or that annoys you about where you live? (be specific) (COMMENTS ABOUT AIRPLANES SHOULD BE VERY SPECIFIC –I.E. WHAT IS IT ABOUT AIRPLANES THAT ANNOYS YOU – NOISE, TOO LOW ETC)

3. Is there anything else that you dislike or that annoys you? (be specific) (CODE ONLY COMMENTS ABOUT AIRPLANES)

Again, thinking about the area where you live, do each of the following bother you: (1) frequently, (2)occasionally , (3) rarely or (4) never. Let's start with:

	1.	2.	3.	4.
4. cars driving thru the area where you live	___	___	___	___
5. aircraft flying over the area where you live	___	___	___	___

IF 1,2,OR 3 ABOVE ASK QUESTIONS 6 - 8

6. What is it about aircraft flying over your area that bothers you the most? (BE SPECIFIC)

7. When you are bothered by aircraft flying over your home, does it happen most often during a particular time during the day? (ASK OPEN-ENDED)
   1. during the morning hours
   2. around midday
   3. during the afternoon
   4. during the evening hours
   5. during the night
   6. all the time/no difference by time of day
   7. Other: _____

8. Does aircraft flying over your area seem to bother you more when airplanes are
   1. landing or 2. taking off? 3. no difference 4. Don't know/no opinion

9. Does it seem to you the that the problem of aircraft flying over your area has been
   1.getting better, 2.getting worse, or 3.hasn't changed much the past couple of years?
   4. no opinion

Now, just a few questions about you for statistical purposes:

10. Is the your home constructed with 1.block, brick, or stone or 2.wood and stucco?

11. Are you registered to vote in Tempe? IF YES: Are you registered as a 1.Republican, a 2.Democrat or as something 3. other than a Republican or Democrat?

12. CODE ONLY: District: 1 2 3

13. CODE ONLY: Gender 1.male 2.female

LEAH OR PAUL:

I want 350 REGISTERED VOTERS in each of the three districts outlined on the map I gave to Mike. It is okay to get the numbers for the areas by using registered voters but notice I am not asking them at the beginning of the survey if they are registered. That comes later. This will probably allow a few unregistered voters to be surveyed which is what I want.

When you have the people draw the sample, please have them tell me how many total registered voters there are in each area. In other words, what was the total population in each of the three districts that they drew the sample from. I need that to weight the sample when I do the report.

Last, if you have someone around, do a pre-test of 10 or 12 interviews tonight to see if there are any problems with the questionnaire. Call me in the morning and I can probably get them to sign off on the questions tomorrow which means you can begin this study as soon as you get the samples. Thanks Bruce

6. TAVCO Initiatives, Examples

A Study of Public Perception of Aircraft Noise in Tempe, Arizona between 1999 and 2000, Bruce D. Merrill Ph.D. December 1, 2000 (Just after the opening of the third runway in October).

A STUDY OF THE PUBLIC PERCEPTION OF AIRCRAFT NOISE IN TEMPE, ARIZONA BETWEEN 1999 AND 2000

conducted by:

BRUCE D. MERRILL PH.D.

December 1, 2000

PURPOSE OF THE RESEARCH.

This research was commissioned by TAVCO to determine four objectives.

(1) See if there is a problem with aircraft flying over people's homes in Tempe. If there is a problem, how extensive is it?

(2) What is it about aircraft flying over people's homes that bothers them?

(3) Is aircraft noise more of a problem in some areas of the City than others?

(4) To determine if there have been changes in the perception of aircraft noise in the City of Tempe between 1999 and 2000

METHODOLOGY:

The information in this report is based on telephone interviews with 900 adult heads of household living in Tempe, Arizona. The City was divided into three geographical areas by the Tempe Aviation Commission. The areas were determined by examining landing and take-off patterns associated with Phoenix Sky Harbor International Airport. Three-hundred and fifty (n=300) interviews were taken in each geographic area. A map of the three areas is presented in the report as Appendix A. A brief description of the three areas is given below.

Area One:	North of Apache Boulevard
Area Two:	North of the Superstition Freeway and south of Apache; east of Mill Ave.
Area Three:	Tempe south of the Superstition Freeway

The sampling error for each area when the proportion giving a dichotomous response is 50% and assuming the 95% level of significance is plus or minus 5.6%. Percentages above or below 50% have smaller sampling errors. Sampling errors for a few representative percentages follow:

percentage	error
50	5.6
40	4.5
30	3.4
20	2.3
10	1.3

This study generalizes to adult heads of household living in the city limits of Tempe who are not full-time students of Arizona State University. The initial sampling frame for both the 1999 and 2000 samples was a list of all registered voters living in Tempe. However, when telephone numbers were changed, non-registered voters given the old telephone numbers were included in the sample. Eleven percent (11%) of the sample in 1999 and ten percent (10%) of the 2000 sample was non-registered voters. The Maricopa County Election Department estimates that about fifteen percent of the adult population in Tempe is non-registered.

The questions were developed by the Tempe Aviation Commission with the help of Dr. Bruce D. Merrill the study director. The questions were pre-tested before interviewing. Interviewing was conducted by professional interviewers using a CATI (Computer Assisted Telephone) system. The questions are presented as part of the body of the accompanying report as Appendix B. Interviewing for the 1999 survey was conducted the last week of November and the first week of December, 1999. Interviewing for the 2000 survey was done the third week of November. The data were analyzed using SPSS (Statistical Package Social Sciences). A disc with both the data and program files is available.

It is important to point out one aspect of the interview schedule. In order to insure that respondents would not know why the survey was being conducted, people were first asked what they liked most about living in their neighborhood. The responses to this question were not recorded. By asking people both what they liked and disliked about the area where they lived protected the neutrality of the study.

Difference in Proportions Tests (Z-scores) and Chi Square Analyses were used to determine if the differences reported in the 1999 and 2000 samples were "real" or could have "occurred by chance". Differences that occurred by chance less than five times out of one hundred (an .05 significance level) are indicated by the designation $P<.05$. These differences should be assumed to have been the result of factors other than sampling error.

Dr. Bruce D. Merrill designed and conducted the research. Dr. Merrill holds a Ph.D. in Political Behavior from the Institute for Social Research at the University of Michigan where he trained at the Survey Research Center. Dr. Merrill has conducted literally hundreds of behavioral research studies throughout the United States and several foreign countries. Currently Dr. Merrill is Professor of Mass Communications and Director of the Media Research Program in the Walter Cronkite School at Arizona State University. This research was conducted by Dr. Merrill as a private consultant.

OVERVIEW OF FINDINGS:

(1). Aircraft noise continues to be reported as a problem most often in Area One, which is the area north of Apache Boulevard (see Appendix A). In this area, 34% of the residents, in an open-ended question, mentioned aircraft noise as a problem. In addition, when asked later in the interview how much aircraft flying over the area bothered them, 52% said aircraft noise was frequently (35%) or occasionally (17%) a problem.

(2). There has been an increase in awareness of aircraft noise in all three areas surveyed. In 1999, 21% of the people living in Area One said aircraft noise was a problem. In 2000, 34% reported noise from aircraft as bothersome. In Area Two, the percentage of people reporting aircraft noise as a problem rose from 3% to 12%. In Area Three the increase was from 2% to 8%.

(3). When asked what bothers people the most about aircraft flying overhead, by far the most frequent response in all three areas was "noise", or "noise vibrations". There were no significant changes in the responses to this question between 1999 and 2000.

(4). There were no significant changes between 1999 and 2000 in terms of when, during the day, aircraft noise was most bothersome.

(5). One of the strongest findings of the research is that the proportion of people who can make a distinction between noise during landings and takeoffs has increased significantly from 1999 to 2000. The percentage of people reporting "no difference" dropped from 47% to 27% in Area One, from 55% to 44% in Area Two, and from 79% to 53% in Area Three.

(6). In all three survey areas, noise continues to be more of a problem when aircraft are departing Sky Harbor rather than when landing.

(7). When asked if the aircraft noise problem has been getting better or worse the past few years, there were significant increases in the percentage of people in all three areas who felt the problem is getting worse. In Area One the increase "worse" responses increased from 28% to 37%. In Area Two, from 13% to 26% and in Area three from 8% in 1999 to 14% in 2000.

(8). When asked specifically about aircraft noise the past 12 months, most people (49% in Area One; 58% in Area Two; 70% in Area Three) felt things haven't changed much in the last year. Thirty-three percent (33%) of those living in Area One, 19% living in Area Two, and 8% of those living in Area Three felt the "noise problem" has become worse during the past 12 months.

TABLE ONE

PERCENTAGE OF PEOPLE INDICATING AIRPLANE NOISE WAS BOTHERSOME OR ANNOYING IN 1999 AND 2000

	AREA ONE		AREA TWO		AREA THREE	
	1999	2000	1999	2000	1999	2000
First mention	16%	22%	3%	8%	1%	5%
Second	5%	12%	*	4%	1%	3%
Total mentions	21%	34%	3%	12%	2%	8%
	P<.05		P<.05		P<.05	

This table compares the extent to which airplane noise was perceived as a problem in 1999 and 2000. The question was asked open-ended, that is, no response categories were provided. In addition, the question was "disguised" by first asking people what they liked about where they live. "Disguising" the question prevents respondents from knowing the purpose of the study.

The percentage of people living in Tempe giving an open-ended response that aircraft noise is a problem has increased in the past year. In Area One the increase was from 21% to 34%; in Area Two from 3% to 12; and in Area Three from 2% to 8%. Difference in Proportion Tests (Z scores) were used to determine whether or not the increases could have occurred by chance. As indicated in Table One, the probability that the increases were due to chance was less than 5% (P<.05) in all three areas.

TABLE TWO

COMPARISON OF HOW PEOPLE RESPONDED TO A CLOSED ENDED QUESTION MEASURING HOW OFTEN AIRCRAFT FLYING OVER THE AREA WHERE THEY LIVE IS A PROBLEM

	AREA ONE		AREA TWO		AREA THREE	
	1999	2000	1999	2000	1999	2000
Frequently	31%	35%	9%	11%	6%	4%
Occasionally	17	17	13	21	13	12
Rarely	14	11	19	20	17	19
Never	38	37	59	48	64	65
	100%	100%	100%	100%	100%	100%
	P>.05		P<.05		P>.05	

This table indicates that the frequency Tempe residents report being bothered by aircraft flying over the area where they live, as measured by a closed-ended question, increased only in Area Two. The changes in areas One and Three could have occurred by chance more than five times in one hundred (Chi Square; P>.05).

TABLE THREE

COMPARISON OF HOW PEOPLE RESPONDED TO A CLOSED ENDED QUESTION MEASURING THE EXTENT TO WHICH CARS DRIVING THROUGH THEIR AREA WAS A PROBLEM

	AREA ONE		AREA TWO		AREA THREE	
	1999	2000	1999	2000	1999	2000
Frequently	24%	21%	21%	19%	18%	13%
Occasionally	19	24	26	23	17	20
Rarely	20	20	18	23	27	27
Never	37	35	35	35	38	40
	100%	100%	100%	100%	100%	100%
	P>.05		P>.05		P>.05	

This question was asked as a control question so that the incidence of changes in how often aircraft flying over neighborhoods was seen as a problem could be compared with changes in the perception that cars driving through the same neighborhoods was a problem. As can be seen above, there has been no change in any of the three areas in the past year.

TABLE FOUR

COMPARISON OF WHAT IT IS ABOUT AIRCRAFT FLYING OVER THEIR AREA THAT BOTHERS TEMPE RESIDENTS

AREA ONE

	1999	2000
Noise, noise vibration	79%	70%
Pattern violations	9	7
Flying too low	6	7
Pollution, fumes, soot, odors	3	5
Afraid of crash, safety	1	7
Police, medical helicopters	*	*
Interferes with electronics	*	3
	100%	100%

* Less than one percent

(Chi Square P>.05)

AREA TWO

	1999	2000
Noise, noise vibration	73%	64%
Pattern violations	13	9
Flying too low	7	12
Pollution, fumes, soot, odors	*	6
Afraid of crash, safety	1	8
Police, medical helicopters	5	1
Interferes with electronics	*	*
	100%	100%

* Less than one percent

(Chi Square P>.05)

AREA THREE

	1999	2000
Noise, noise vibration	74%	73%
Pattern violations	1	9
Flying too low	8	11
Pollution, fumes, soot, odors	3	2
Afraid of crash, safety	6	3
Police, medical helicopters	6	*
Interferes with electronics	*	*
	100%	100%

* Less than one percent

(Chi Square P>.05)

TABLE FIVE

COMPARISON OF WHEN DURING THE DAY AIRCRAFT NOISE IS MOST TROUBLESOME

AREA ONE

	1999	2000
1. Morning hours	18%	26%
2. Around midday	2	3
3. Afternoons	7	5
4. Evenings	13	18
5. During the night	7	5
6. All times/no difference	53	43
	100%	100%

AREA TWO

	1999	2000
1. Morning hours	17%	15%
2. Around midday	3	5
3. Afternoons	9	4
4. Evenings	16	19
5. During the night	8	9
6. All times/no difference	47	48
	100%	100%

AREA THREE

	1999	2000
1. Morning hours	12%	14%
2. Around midday	6	3
3. Afternoons	9	6
4. Evenings	23	17
5. During the night	8	7
6. All times/no difference	42	53
	100%	100%

Chi Square P>.05

TABLE SIX

COMPARISON OF WHETHER AIRCRAFT NOISE IF MORE BOTHERSOME DURING TAKEOFFS OR LANDINGS

AREA ONE

	1999	2000
1. During landings	18% (34)	22% (30)
2. Takeoffs	35	51
3. No difference	47	27
	100%	100%

(Chi Square P<.05) Numbers in parentheses are for those who were aware of a difference. In 2000 in Area One, there was an increase in the percentage of residents who distinguished between landings and takeoffs. There was no change regarding whether the noise bothered them more during landings or takeoffs. Takeoffs continue to be perceived as more of a noise problem.

AREA TWO

	1999	2000
1. During landings	16% (36)	17% (30)
2. Takeoffs	29	39
3. No difference	55	44
	100%	100%

(Chi Square P>.05) Numbers in parentheses are for those who were aware of a difference. In Area Two there was increased awareness but no change in the proportion of people who said the noise bothered them more during landings or takeoffs.

	AREA THREE	
	1999	2000
1. During landings	12% (57)	22% (47)
2. Takeoffs	9	25
3. No difference	79	53
	100%	100%

(Chi Square P<.05) Numbers in parentheses are for those who were aware of a difference. In Area Three more people mentioned a difference and more people felt the noise from airplanes bothered them more during takeoffs.

TABLE SEVEN

COMPARISON OF WHETHER AIRCRAFT NOISE APPEARS TO BE GETTING BETTER OR WORSE

	AREA ONE	
	1999	2000
getting better,	9%	8%
getting worse, or	28	37
hasn't changed much the past few years?	55	41
don't know/no opinion	8	14
	100%	100%

(Difference in Proportions testing whether or not airplane noise is getting worse P<.05.) In Area One, there has been an increase in the proportion of people who report aircraft noise getting worse.

AREA TWO

	1999	2000
getting better,	7%	7%
getting worse, or	13	26
hasn't changed much the past few years?	67	52
don't know/no opinion	13	15
	100%	100%

(Difference in Proportion testing whether or not airplane noise is getting worse P<.05.) In Area Two, there has been an increase in the proportion of people who report aircraft noise getting worse.

AREA THREE

	1999	2000
getting better,	7%	8%
getting worse, or	8	14
hasn't changed much the past few years?	65	62
don't know/no opinion	20	16
	100%	100%

(Difference in Proportion testing whether or not airplane noise is getting worse P<.05.) In Area Two, there has been an increase in the proportion of people who report aircraft noise getting worse.

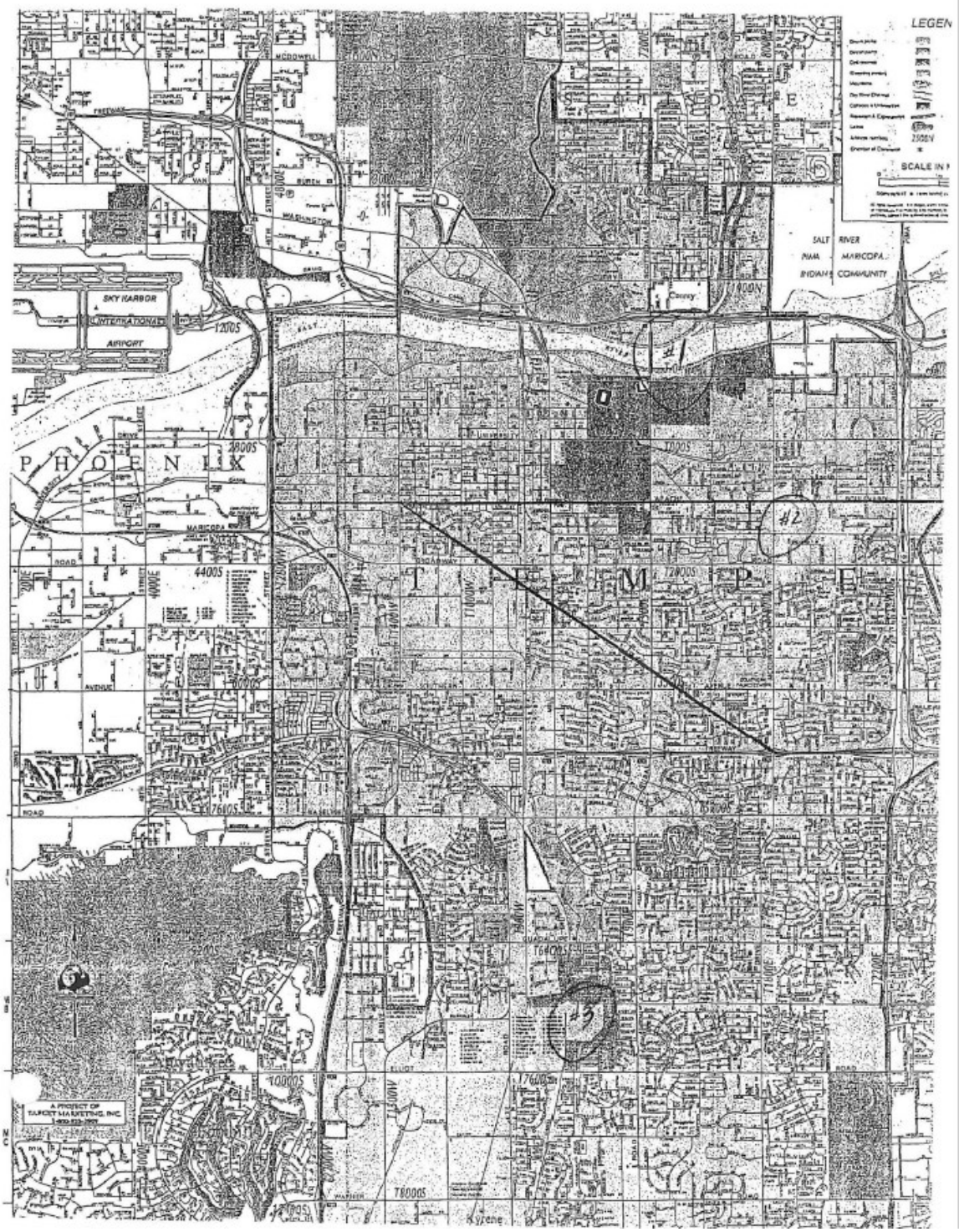
TABLE EIGHT

PERCEPTION OF WHETHER AIRCRAFT NOISE HAS BEEN GETTING BETTER OR WORSE DURING THE PAST TWELVE MONTHS

	AREA ONE	AREA TWO	AREA THREE
getting better,	5%	5%	6%
getting worse, or	33	19	8
hasn't changed much?	49	58	70
Don't know/no opinion	13	18	16
	100%	100%	100%

APPENDIX A

Map of sampling area


LEGEN
SCALE IN
SALT RIVER
MARICOPA
COMMUNITY
SKY HARBOR
INTERNATIONAL
AIRPORT
PHOENIX
TEMPE
#1
#2
#3
A PROJECT OF
TARGET MARKETING, INC.

APPENDIX B

THE INTERVIEW SCHEDULE

Hello, my name is _____ and I am calling for Dr. Bruce Merrill, an ASU professor who is doing a short but important survey regarding how people feel about living in the City of Tempe. Will you answer just a few questions for us please? Are you an ASU student only living in Tempe during the school year? IF YES: Thank and end interview

1. What is the most important thing you enjoy about where you live in Tempe? (DO NOT CODE)

2. Is there anything that you dislike or that annoys you about where you live?
    1. any mention of AIRCRAFT, noise, low flying, etc.
    2. other

3. Is there anything else that bothers or annoys you?

    1. any mention of AIRCRAFT noise, low flying, etc

Now, thinking about the area where you live, do any of the following bother you, (4) frequently, (2) occasionally, (3) rarely, or (4)never.

4. cars driving through your neighborhood _____
5. aircraft flying over the area where you live _____

IF AIRCRAFT WAS MENTIONED IN QUESTIONS 2, 3 OR 5, ASK Q'S 6 – 9

6. What is it about aircraft flying over your area that bothers you the most? Ask open-ended and code below:

1. Noise, noise vibration
2. Pattern violations
3. Flying too low
4. Pollution, fumes, soot, odors
5. Afraid of crash, safety
6. Police, medical helicopters
7. Interferes with electronics
8. other: specify

7. Is there anything else about aircraft flying over your area that bothers you?

1. Noise, noise vibration
2. Pattern violations
3. Flying too low
4. Pollution, fumes, soot, odors
5. Afraid of crash, safety
6. Police, medical helicopters
7. Interferes with electronics
8. other: specify

8. When you are bothered by aircraft flying over your home, does it happen most often during a particular time of the day? IF YES: When?
Ask open-ended CODE BELOW

1. Morning hours
2. Around midday
3. Afternoons
4. Evenings
5. During the night
6. All times/no difference
7. other: specify

9. Does the noise from airplanes bother you more when airplanes are landing or taking off?

1. During landing
2. Takeoffs
3. No difference
4. Not aware

10. ASK EVERYONE. Does it seem to you that the problem of aircraft flying over your area has been 1. getting better, 2. getting worse, or 3. hasn't changed much the past few years? 4. Don't know/no opinion

11. Thinking now specifically about the past 12 months, does it seem to you that the problem of aircraft flying over your area has been 1. getting better, 2. getting worse, or 3. hasn't changed much? 4. Don't know/no opinion

6. TAVCO Initiatives, Examples

Miscellaneous recommendations made after 2000

RESOLUTION FOR CONSIDERATION BY TEMPE CITY COUNCIL

by

TEMPE AVIATION COMMISSION[1]

Whereas, agreements and commitments have been in place since the early 1970's to mitigate noise over Tempe from Sky Harbor by directing departing aircraft to the East over the Salt River riverbed to a distance of 1DME, and after the VORTAC was moved 4DME, east of the VORTAC; and

Whereas, the cities of Phoenix and Tempe entered into a signed legal agreement regarding take off and landing procedures and other considerations (Reference: Inter Governmental Agreement, IGA), signed 9-2-94; and

Whereas, the IGA was recognized by the 9th Circuit Court as a legal basis for stipulation and dismissal of inter governmental actions (City of Tempe v. FAA, 9th Circuit, Docket No. 9470030, 1994, and City of Tempe v. Environmental Protection Agency, C.D. Circuit, Docket No. 94-1063, 1994); and

Whereas, the FAA Amendment to thee approved Record of Decision (ROD) in which the FAA acknowledged the IGA stipulates that the FAA would not seek to change landing and departure procedures unless requested by Phoenix; and

Whereas, the City of Phoenix agreed to not request changes to landing or departure procedures without the FAA doing an Environmental Review conduct public hearings and certain other requirements, and

Whereas, no such prerequisite public hearings have been conducted, and

Whereas, the IGA stipulates that Phoenix will notify the offending air carrier of deviations from the agreed upon take off and landing procedures, and

Whereas, at least three types of major violations have been observed, and in many cases documented, including:

(1) There have been at least two changes in the FAA operations that violate the IGA,
(2) There have been several types of landing approach violations of the FAA procedures apparently sanctioned, and
(3) There have been no notifications of violations given to the offending air carriers; and

Whereas, the ongoing violations have a steadily increasing impact on the quality of life for Tempe residents;

THEREFORE BE IT RESOLVED THAT: The Tempe Aviation Commission believes that Phoenix and the FAA have not acted in good faith to uphold their commitments relative to the IGA. The Tempe City Council should seek appropriate legal advice to determine the feasibility of obtaining relief through a return to the courts.

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[1] Passed by the Tempe Aviation Commission 4-10-01 and presented to Tempe City Council 5-10-01

City of Tempe
P. O. Box 5002
31 East Fifth Street
Tempe, AZ 85280
480-350-8241
www.tempe.gov

Tempe

January 18, 2004

Dear Mayor, Vice Mayor and Council Members:

The Tempe Aviation Commission (TAVCO) has reviewed the 1994 Intergovernmental Agreement (IGA) on Noise Mitigation Flight Procedures, the 1993 F.A.A. Record of Decision (ROD), the 1994 ROD Amendment, and several years of flight graphs specifically showing runway departure and arrival operations over Tempe.

TAVCO believes the City of Phoenix does not accurately determine the compliance rate of the 4 DME departure procedure. This results in an overstatement of compliance.

We recommend that the Mayor and Council open up a dialogue with the City of Phoenix to resolve disagreements over flight path monitoring and how the 4 DME departure procedures should be interpreted and implemented as a noise mitigation flight procedure.

We continue to support the ongoing dispute resolution process by Mayor and Council members.

If you have any questions, comments or suggestions please do not hesitate to contact me or any of the Committee members. We realize that this issue involves many complex, technical details. Please know that we would be glad to meet with you to review any of the information contained in this letter and attachments.

Respectfully

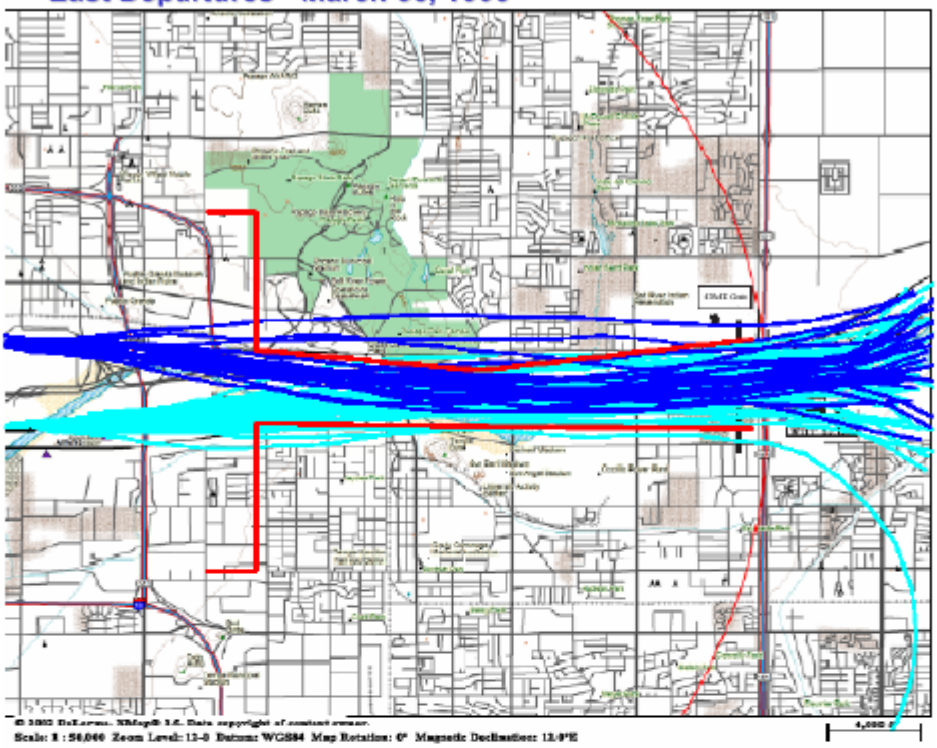
Tempe Aviation Commission
Greg Ellison, Chairman

Copy:
Richard A. Collins, Bernard A. Eilers, John P. Hefferman, Cyndi Newburn, Jay L. Norton, Joe Salvatore, Peter H. Schelstraete, Carl R. Triphahn, James B. Vandeventer, Joseph Young

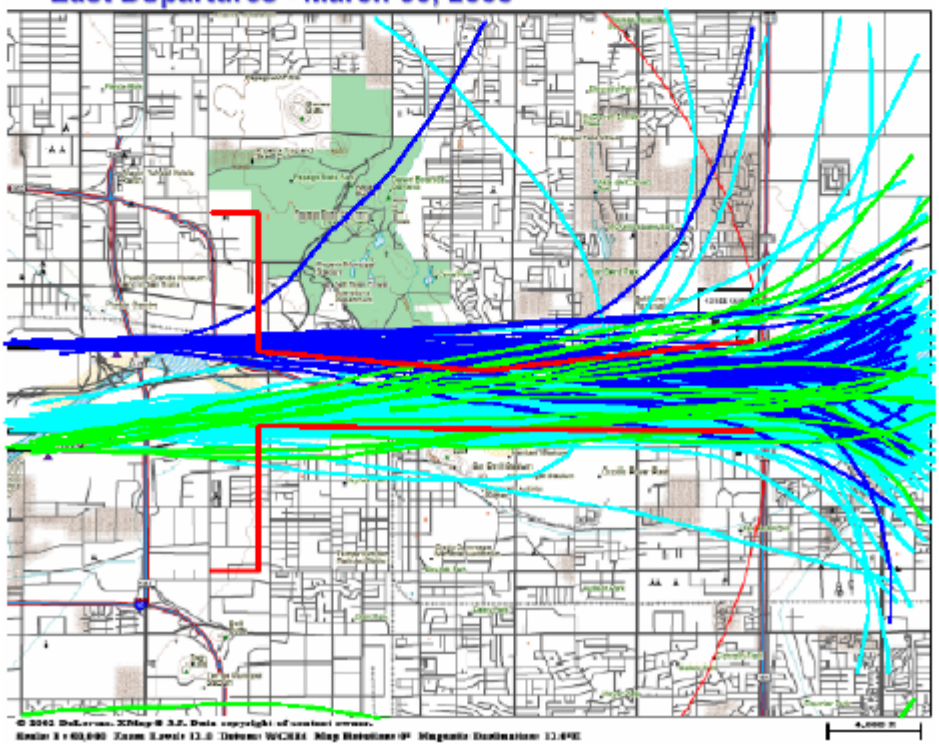
Attachments

Attachment 1: Departure operations before and after the opening of the third runway

Phoenix Sky Harbor International Airport
East Departures - March 30, 1999



Phoenix Sky Harbor International Airport
East Departures - March 30, 2003



Attachment 2: City of Phoenix - Noise Report p. 3.

Airline Code	Airline Name	Deviations	Total Departures to the East	% Compliance
AAH	Aloha Airlines	1	30	96.67%
AAL	American	16	272	94.12%
ABX	Airborne Express	3	41	92.68%
ACA	Air Canada	0	9	100.00%
AJI	Ameristar	0	1	100.00%
AJM	Air Jamaica	0	1	100.00%
AMF	Ameriflight	0	2	100.00%
AMT	American Trans Air	0	82	100.00%
AMX	Aero Mexico	3	9	66.67%
ASA	Alaska	5	122	95.90%
ASH	Mesa Air	32	617	94.81%
AWE	America West	36	2449	98.53%
AWI	Air Wisconsin	2	17	88.24%
BAW	British Airways	0	3	100.00%
BSK	Biscayne-Miami Air	0	2	100.00%
CCI	Capital Air Cargo	1	3	66.67%
CCP	Champion Air	0	1	100.00%
COA	Continental	3	171	98.25%
CSK	Cascade	1	1	0.00%
CXP	Casino Express	0	1	100.00%
DAL	Delta	2	195	98.97%
DHL	DHL Airways	0	25	100.00%
DLH	Lufthansa	0	1	100.00%
DOJ	Dept. of Justice	1	2	50.00%
ECJ	East Coast Jet	0	1	100.00%
EJA	Executive Jet Aviation	3	35	91.43%
FDX	Federal Express	7	51	86.27%
FFT	Frontier	3	70	95.71%
FIV	Citation Shares	1	7	85.71%
FRL	Farelins	12	411	97.08%
HAL	Hawaiian	0	17	100.00%
KHA	Kitty Hawk	2	24	91.67%
LXJ	Flexjet	0	7	100.00%
MEP	Mid West Express	0	17	100.00%
N	General Aviation	22	206	89.32%
NWA	Northwest	3	173	98.27%
OPT	Corporate Wings	5	26	80.77%
PCJ	Pacific Jet	0	1	100.00%
PKW	Pak West	0	1	100.00%
RYN	Ryan Air	1	4	75.00%
SCX	Sun Country	0	1	100.00%
SKW	Sky West	18	262	93.13%
SPA	Sierra Pacific	0	1	100.00%
SWA	Southwest	61	2125	97.13%
SWQ	Swift	2	18	88.89%
UAL	United	1	271	99.63%
UPS	United Parcel Service	5	65	92.31%
USA	U.S. Air	2	139	98.56%
USC	US Check	14	44	68.18%
VRT	Averitt Air	0	1	100.00%
	Totals	268	8035	96.66%

October 2003, 4 DME Results

Weather	AC
10/3/03 0612-0949	37
10/9/03 0536-0643	7
10/17/03 0638-0722	8
10/25/03 1907-2026	29
10/26/03 0855-0923	8
10/30/03 0643-0836	14
10/31 0658-0915	28
Total	131

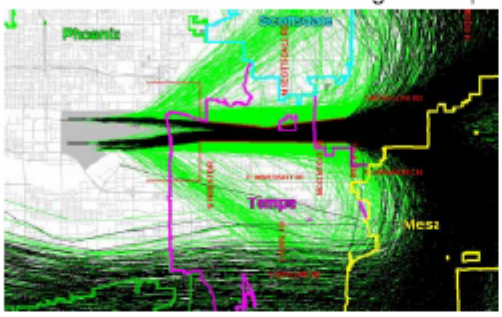
The 4DME departure procedure directs jets departing to the east to travel approximately 5 miles from the airport (4DME) before turning on any assigned heading.

The 4DME Gate that monitors these departures is 5,550 feet long and runs 1,000 feet north of the north runway (RWY 8/26) to 1,000 feet south of the center runway (RWY 7L/25R).

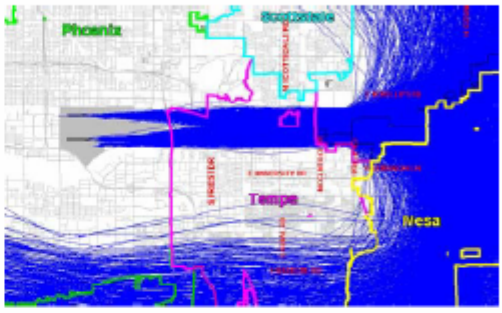
3. Departure Compliance

Compliance

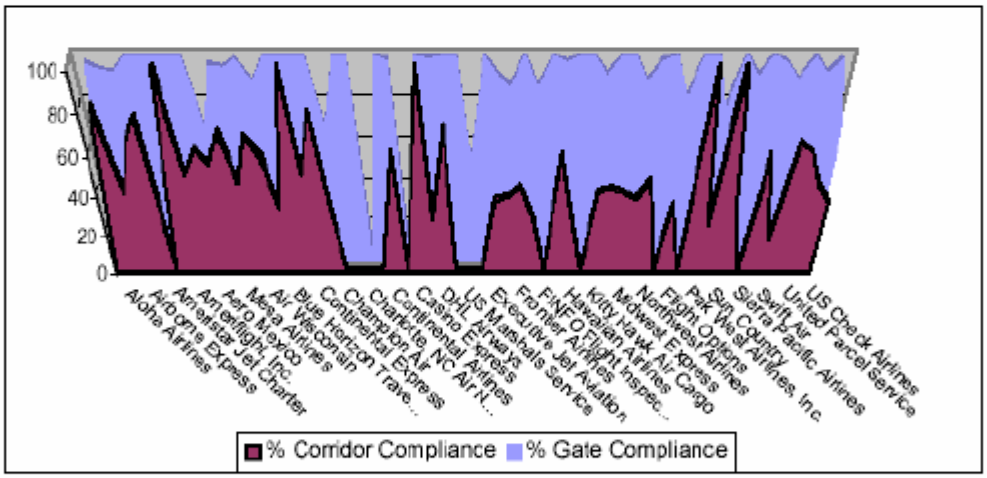
Including the large turboprop aircraft, which routinely are routed on approximate departure angles of 120° towards the southeast and 60° towards the northeast, **57.5%** of all jet and larger turboprop aircraft departures to the east complied with the Tempe Corridor during the month of October 2003. 96.8% of the jets complied with the Phoenix 4 DME gate. Departures by large turboprop aircraft are not included in the Phoenix gate compliance rate.



Flight tracks outside the Tempe Corridor are depicted in green.



Flight tracks inside the Phoenix Gate are depicted in blue.



Departures excluded[3]:

10/3/2003	6:12 - 9:49 a.m.	**10/25/2003**	7:07 - 8:26 p.m.	**10/30/2003**	6:43 - 8:36 a.m.
10/9/2003	5:36 - 6:43 a.m.	**10/26/2003**	8:55 - 9:23 a.m.	**10/31/2003**	6:58 - 9:15 a.m.
10/17/2003	6:23 - 7:22 a.m.				

[3] Based on Phoenix evaluations of weather influencing navigation east to 4DME

City of Tempe
P. O. Box 5002
31 East Fifth Street
Tempe, AZ 85280
480-350-8241
www.tempe.gov

Tempe

January 9, 2007

Dear Mayor, Vice Mayor and Council Members:

The members of the Tempe Aviation Commission (TAVCO) agreed on October 12, 2006 to recommend 6 aviation issues for your consideration. One of the issues was to support expansion of the Sky Harbor FAR Part 150 Community Noise Reduction Program to include residential noise mitigation services beyond single family housing. Inside the 65DNL noise exposure contour line for Sky Harbor only single family homes were eligible to receive noise abatement services from the City of Phoenix between the initiation of the program in 1992 and 2005. The City of Phoenix Aviation Department has for the city's fiscal year 2008 agenda recommended that the Phoenix Council appropriate $15,000,000 for the Community Noise Reduction Program to continue to respond to citizen requests for renovations to doors and windows that insulate homes within the 65DNL noise contours at Sky Harbor.

The Commission discussed the issue further at the December 14, 2006 meeting, and we agreed to recommend that the City accelerate ways to have multifamily dwellings, (apartments, duplexes, townhouses, condominiums), inside the 65DNL noise contour for the Phoenix Sky Harbor International Airport included among dwellings eligible to receive noise abatement. We believe that equity should prevail for all citizens' regardless of social economic standing to have immediate and full access to residential noise mitigation treatments, (windows, doors, additional sound insulation), inside an area considered by the airport to be heavily impacted by noise generated from airport operations. Although the City of Phoenix original program provided welcome relief to many residents in single family dwellings, we believe it missed a substantial number of residents who live in multifamily and/or other rental dwellings, who are negatively impacted by aircraft noise created by the opening of the third runway. Impacts that remain detrimental to residents located close to Sky Harbor runways, considering among other factors the flight paths to the third runway that got established after the suspension of the side-step noise mitigation flight procedure back in 2002 that makes it necessary to have the current noise contour line projections made in the 2000 FAR Part 150 study reviewed. We believe that the City of Phoenix and the FAA have been remiss in their duty as outlined in the IGA between Phoenix and Tempe and the ROD maintaining the substance and intent of the side-step in providing some form of noise relief to the residents of north Tempe.

We would be honored to provide our assistance in answering any questions you may have regarding this important matter. We recommend that this matter is given a top priority.

Respectfully,

Tempe Aviation Commission
Duane Washkowiak, Chair

Copy:
Shannon S. Bradley, Bernard A. Eilers, Troy McCraw, Richard Pagoria, Joseph Salvatore, David Swanson, Edwin R. Wiggington

Attachment: October 12, 2006 Recommendation

RECOMMENDATION FOR CONSIDERATION BY THE TEMPE CITY COUNCIL

by the
TEMPE AVIATION COMMISSION[1]

Whereas, the members of the Tempe Aviation Commission under powers and duties listed in Tempe City Code Chapter 2, Article V, Division 5, Section 2-220 (5) thought (10) are entrusted advisory duties in the areas of aircraft noise, land use and the monitoring of how the Intergovernmental Agreement with the City of Phoenix on procedures for aircraft operations at the Phoenix Sky Harbor International Airport is implemented; and

Whereas, the Tempe Aviation Commission was asked by the Finance & Aviation Council Committee on April 18th 2006 to review citizen input on the committee's work plan; and

Whereas the citizens input question the adherence to and enforcement of measures included in the Intergovernmental Agreement with the City of Phoenix and express the need for expanded programs to deal with the aircraft related impacts on Tempe neighborhoods,

The following 6 issues are recommended for your consideration in prioritized order:

1. Noise Monitoring
   Invest in a noise monitoring system and hire a noise consultant to run it.

2. Policy Statement
   Make a policy statement against the construction of a 4th runway at Sky Harbor.

3. Noise Abatement
   a. Explore and expand residential noise abatement to include all significantly noise impacted residential areas in Tempe.
   b. Support expansion of the Sky Harbor FAR Part 150 Noise Protection Program to include more than single family housing.

4. IGA Issues
   a. Provide sufficient staff resources to investigate all issues related to the suspension of the side step and later action to implement a straight-in visual approach procedure to the third runway.
   b. Define noise damages caused by the suspension of the side-step procedure.
   c. Define noise damages caused by applying the 4-DME Gate instead of the Tempe Corridor.

5. Political outreach
   Write a letter to the Governor to promote a state wide aviation plan that takes full advantage of the future potential of commercial aviation in the region and the state of Arizona.

6. Future Issues
   a. Evaluate existing noise mitigation flight procedures, and revisit assumptions made when the cities agreed to continue the One-DME departure procedure and to equalize departures.
   b. Look beyond the current IGA and identify new issues that can be agreed upon.

If you would like us explain, follow up or discuss any aspects of our recommendation please let us know.

Sincerely
The Tempe Aviation Commission;

Seth W. Chalmers (Chair), Joe M. Salvatore (Vice Chair),
Shannon S. Bradley, Richard A. Collins, Bernard A. Eilers, Mark Lymer, Troy McCraw, Richard Pagoria, Peter H. Schelstraete, David Swanson, Edwin R. Wiggington

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[1] Passed by the Tempe Aviation Commission October 12, 2006.

City of Tempe
P. O. Box 5002
Tempe, AZ 85280
www.tempe.gov

Tempe

March 18, 2009

Aviation Director Danny Murphy
City of Phoenix
3400 Sky Harbor Blvd.
Phoenix, Arizona 85034-4420

Re: TAVCO Recommendation for use of CIP funds

Dear Mr. Murphy:

The Tempe Aviation Commission is charged with advising the Mayor and Council of Tempe on aircraft noise and other issues related to the operations at the Phoenix Sky Harbor International Airport as they affect the citizens of Tempe.

We have become aware that the City of Phoenix has included ready to go capital improvement projects at Phoenix Sky Harbor in a request for economic stimulus moneys under the American Recovery and Reinvestment Act. We are disappointed that noise mitigation is not among the ready to go projects.

The Commission is concerned that the urgency of securing noise mitigation funding for the most aviation noise-impacted areas in Tempe has not been recognized. Residential sound assistance has been provided to single family homeowners only since 1992, funded by the Passenger Facility Charge to be reimbursed up to 80% by FAA grants from the Airport Improvement Program.

The Commission has for some time now recommended that mitigation services be offered to multi-family homes and public facilities such as schools and community buildings inside the 65 DNL noise exposure contour for the airport. Because of the slowdown in airline activity and subsequent reductions in airport revenues, and likely reductions in future noise impact footprints, the many residents who live in older multi-family homes inside the same areas as residents of single family units will become disadvantaged unless measures are put in place today to secure funding for future sound assistance projects.

We recommend that you use, to the extent legally and fiscally appropriate, CIP moneys freed up as a result of allocations you receive for ready to go projects under the American Recovery and Reinvestment Act for sound assistance to remaining residences within the 65 DNL of the Phoenix Sky Harbor International Airport. This would reduce the risks associated with waiting until a new Part 150 update is completed, and not having sufficient rebound in PFC revenues to provide necessary matching grants from the AIP, should you decide to expand the program to include multi-family homes inside a new 65 DNL exposure contour.

Sound assistance projects would help ease the unprecedented slowdown in the Arizona home building industry, and would provide long awaited relief for many Tempe residents close to Sky Harbor International Airport.

Thank you for your consideration of this request.

Our Sincere Regards,

Gloria Regensberg, Chair
The Tempe Aviation Commission

CC:
Phillip Gordon, Mayor of Phoenix
Hugh Hallman, Mayor of Tempe
Shana Ellis, Chair, Tempe City Council Transportation Committee
Frank Fairbanks, City Manager, City of Phoenix
Charles Meyer, City Manager, City of Tempe

Memorandum

City of Tempe

Tempe

Date: December 1, 2014

To: Steven Methvin
Corey Woods, Joel Navarro, Robin Arredondo-Savage, Kolby Granville, Parrish Spisz, Mike Branom, Elizabeth Higgins, Sue Taaffe

From: Oddvar Tveit,

Subject: PHX Flight Procedure Changes – the FAA's NextGen Initiative

At the November 19th, 2014 Tempe Aviation Commission (TAVCO) meeting the commission received an update on flight paths over Tempe. The commission discussed and agreed to make statement about flight paths over Tempe to inform Tempe officials about what have occurred after the FAA implemented new satellite based area navigation, instrument flight procedures (RNAVs) at PHX. The new procedures is part of a national effort to transition from ground based navigation aids to satellite based navigation system interacting with new technology installed in most jet and turboprop aircraft using major airports like PHX.

1. Instrument Departure Paths

The new PHX RNAVs were in place on September 18th and created reactions from residents on the west side of the airport when departures that used to go straight out above arrival paths over downtown Phoenix before turning north, were directed on a new diagonal path north west over Grand Avenue.

We have not seen the same thing happening east of the airport with departures in the airspace over Tempe. This is mainly due to the IGA on noise mitigating flight procedures between Phoenix and Tempe that restrict jets from making turns after take-off before they reach 4-DME or approximately the 202/101 intersection. A new satellite flyover waypoint at this location was introduced in the recently published PHX RNAV Standard Instrument Departure procedures (SIDs), which appears to have created improved flight path accuracy for most airlines departing jets over the riverbed. US Airways has assisted the FAA locally to develop the new RNAVs, and managed in October 2014 to have 90.9% of its east departures stay within the "Tempe Corridor." This level of departure compliance by a large airline has not been measured previously or after the third runway was opened in 2000. Typical high scores have been around 70% compliance over a month time. The Tempe Corridor is a number of imaginary gates the City of Tempe set up in the PHX flight monitoring system back in 1997 to measure compliance with 4-DME noise mitigation SID. The official measure is the "PHX Gate", which shows 99.7% of US Airways departures made it through the PHX Gate in October, 2014[1].

Outgoing paths at higher altitudes over Tempe have narrowed after the change, but no complaints specifically related to narrower departure paths have been received so far.

2. Instrument Arrival Paths

North Tempe is also the area where arriving planes to PHX are merged into parallel landing paths on when the runways are operated in a west flow configuration. Because the RNAV Standard Terminal Arrival Routes (STARs) are designed to end when they reach the airspace over Tempe, the Tempe airspace is still used by PHX Tower to vector arrivals on to two parallel final approach paths over north Tempe, one along the south of the riverbed approximately between 1st and 3rd streets and one over Curry Road . Therefore no changes have been made in how arriving planes enter Tempe airspace to land from the east. South Tempe is located under the end of two

[1] This is US Airways planes that currently operate under the America West flight code. TAVCO is in support if a positive statement from the City of to the airline about its jets' recently improved departure performance.

confined RNAV RNP Standard Terminal Arrival Routes (STARs) one coming in from the southwest over South Mountain Park and one from the southeast (Coolidge) established January 13, 2011.

TAVCO discussed at their November 19th, 2014 meeting the possibility of the two cities discussing the addition of an imaginary arrival gate in the PHX flight monitoring system for jets and large turboprop aircraft on both sides of the airport to encourage airlines to avoid short final approach or keep a minimum height when intercepting final approach course to towards the runways. Flight track data and complaints received from residents point to higher efficiency incoming RNAV RNP (Required Navigational Performance) routes periodically create some compression issues at PHX. We can see this happening during times with peak amounts of incoming traffic. Some planes are merged into to the parallel final approach path closer to the airport or pilots can occasionally make late S-turns away from a straight in approach path. The reason why these approach maneuvers outside the main parallel pathway over Mesa and Tempe are done is to accommodate required distance between planes bound for the same runway. Southwest's preference for landing on the center runway mainly used for departures to the west, also contributes to the problem. Tempe did discuss with PHX TRACON back when two parallel incoming flight paths were established over Tempe, the problem we had with the clearing of planes for final approaches that are shorter than 4 nautical miles. The PHX Tower approach clearances are depending on traffic volume, minimum separation, airline runway preferences, and the air speed and the rate of descent of incoming planes that merge over Tempe from several different arrival routes. The vectoring of incoming planes to final approach courses over north Tempe, give air traffic controllers the flexibility they have deemed necessary to operate PHX safely and efficiently.

December 2014 Memo to the Tempe Mayor and Council

Cc: Andrew Ching, Steven Methvin, Don Bessler, Chuck of City Attorney's Office

STATEMENT FROM TAVCO, AGREED UPON at NOVEMBER 18th, 2014 meeting

We have been appointed as your advisory committee on aviation. Consequently, we wish to share some information with you about the recent change to Performance Based Navigation procedures at Phoenix Sky Harbor International Airport.

At the invitation of Oddvar Tveit, the FAA made a presentation to TAVCO at the August meeting regarding the proposed procedures. So we were informed in Tempe about the procedures before they were initiated September 18, 2014. This allowed us to prepare for before and after analysis. Oddvar has prepared some information, which is appended. Flight tracks before and after the departure change are shown.

There is a new mandatory waypoint, "Sparky", designed to keep departing planes over the riverbed. The new waypoint appears to narrow the flight track dispersal. Note that all departing flights are more concentrated over the riverbed. On the other hand, observations have shown that there are a continuing and significant number of planes flying north of the riverbed. Arrivals, in particular, have been repeatedly observed to fly up to a mile north of the waypoint over our neighborhoods. Arrival noise is significant for Tempeans because of the planes' lower altitude. In summary, the "Sparky" waypoint, which is mandatory for pilots, seems to improve flight departure paths by tightening them over the riverbed.

The new procedures tighten flight tracks throughout the city. Thus planes are concentrated over a narrower flight path. Those who live under the flight path have legitimate complaints about the increased noise. The concentration of tracks means that new complaints are also coming from areas in south Tempe under the flights. Please note the maps attached.

Our focus is shifting from departures to arrivals. In addition to departures, we are continuing to analyze arrivals, altitudes and dispersal. It appears that arrival procedures need a flyover way point similar to the departure "Sparky" waypoint. Data and complaints suggest that departure problems may solve themselves. Arrivals have become a problem that needs to be solved.

We wish to thank you for requesting a meeting with Phoenix to talk about issues such as Tempe and Phoenix Sky Harbor, among others. We are hoping for some progress on mutual understanding and additional relief from aviation noise.

TAVCO Commissioners offer some suggestions about arrivals and other issues. For arrivals, a step down approach with an arrival "Gate" or "Corridor" might work. An arrival congestion holding pattern might help approaching planes avoid making turns over neighborhoods. Routes for helicopters could help limit the number of helicopter pathways over Tempe neighborhoods. The City of Tempe could help residents with installation of double or triple pane glass windows to reduce noise exposure problems and create

greater energy efficiency and sustainability. The City of Tempe could help make sure that future exterior design of new buildings in Tempe does not reflect or amplify noise from aircraft and other sources.

Thank you for your consideration of these important issues.

Sincerely,

Barbara Sherman, Chair,

and Tempe Aviation Commissioners : Lane Carraway, Sally Clements, Shannon Dutton, Mark Garrigan, Gordon Gauss, Karyn Gitlis, Lance McIntosh, James Wennlund

MEMORANDUM

TO: Don Bessler
THROUGH: David McNeil and Justin Bern
FROM: Oddvar Tveit
DATE: 10/20/2017
SUBJECT: Tempe Aviation Commission – Noise Abatement Office Recommendation

1. The Commission's Request:
   At the October 17, 2017 meeting, the Tempe Aviation Commission asked staff to provide the documentation and follow-up needed to bring a recommendation for consideration to the City Council to create a noise abatement office.

2. Background:
   The commission has discussed at great length the idea of Tempe leading the effort to create a "Noise Office" in collaboration with Tempe's neighboring cities.

   The idea was introduced by a commission member at a November 16, 2016 special meeting attended by Jordan Feld, Deputy Aviation Director, Planning & Environmental for the City of Phoenix. The commission established a subcommittee to explore noise abatement measures in July 2016, and the subcommittee explored noise abatement opportunities through its expiration in July 2017. At that time, a new subcommittee was formed to explore establishment of a Noise Office.

3. Purpose and Need:
   The Commission realizes that the east valley needs a regional voice for noise-impacted communities. As the most impacted city by PHX noise outside of Phoenix, which owns and operates PHX, Tempe is in the best position to take a leadership role in establishing that voice. The purpose of the Commission's recommendation is to prepare the ground for joint representation by cities in a forum staffed with expertise that can establish a permanent dialogue with the FAA Air Traffic Organization locally, airlines and airport operators, and inform the public of air traffic plans before implementation.

   The City of Tempe does not have an airport and is not a formal stakeholder in federal actions related to the planning and regulation of airspace, including air traffic routing over Tempe neighborhoods, nor is Tempe provided the opportunity to participate in decisions made by City of Phoenix regarding the operation of the airport (PHX), or the airlines regarding operations in Tempe airspace.

   After Tempe negotiated a settlement agreement with the FAA in 2004, Tempe was encouraged to attend the Phoenix Airspace Users Group (PAUWG) meetings to stay informed about local airspace planning. These meetings have not been a productive forum where communities, such as Tempe, can access or provide input on the FAA's plans for the routing of aircraft.

   The Aviation Commission also realizes that what they propose has no exact parallel to what currently exists in other metropolitan areas with one or several commercial service airports. The closest similarities are the community noise roundtables which can struggle to keep unity among participants, such as when Airport Community Advisory Committee for Boston Logan, which represents over thirty communities, found equitable distribution of noise lacking from a new runway use program. However, if the goals of a Tempe noise office included the facilitation of trust, disclosure and information exchange between Tempe and the FAA, valley airports, and airline officials, it could become a model for inclusive and solution-driven partnerships, and a trusted source of collective east valley aviation noise concerns.

   Attachment: Tempe Aviation Commission's Discussion Points

Noise Abatement Office Discussion Points

Goal:
Phase 1: Establish an intergovernmental Noise Abatement Office (NAO) or a joint forum initially through an MOA with an airport operating neighboring city as part of a pilot program that can establish permanent lines of communication with the FAA and valley airports about Instrument Flight Procedure (IFP) and the use of east valley airspace by civil aviation, and to keep communities informed about flight path development.
Phase 2: For the NAO to be recognized as stakeholder able representing east valley cities surrounding PHX to actively engage with the FAA, the airports and airlines about "fly friendly" procedures and propose operational changes that have potential of easing the noise burden by proposing preferred flight paths, altitudes, performance settings of aircraft that can eliminate or reduce "unnecessary" noise over valley neighborhoods.

1. Why the system in place today cannot solve the issue/ accomplish the goal that the NAO would be able to accomplish?

What is in place today	Problem	Recommended Solution
Phoenix Airspace Users Group (PAUWG)	PAUWG is not a party in FAA, for valley air traffic the PHX TRACON (P-50)'s Instrument Flight Procedure (IFP) development projects.	PAUWG has not proven to be a conducive forum to participate in where topics discussed are within the realm of what is interesting to aviation professionals, the safe and efficient use of valley airspace for both civil and military aviation.
Phoenix Airspace Users Working Group (PAUWG) has previously agreed to establish ad-hoc subgroups to deal with specific issues.	PAUWG consists of groups promoting airports and aviation. Complaints on airport noise can be reported by attending airport staff, but PAUWG is not set up to be a forum for discussion of how to reduce or eliminate "unnecessary" aircraft noise.	Noise Abatement Office (NAO) will enable city aviation staff to work as more powerful group v. the FAA and industry officials to focus on a single issue, to limit "un-necessary" noise over noise sensitive areas of the valley. Creating an ad hoc noise group as part of a pilot project if is preferable to PHX TRACON (P-50) and other cities to test how a joint forum would work.
Valley airports already have a professional relationship with the FAA and existing staff to interact with the FAA to address flight paths and "unnecessary" noise.	Airport staff has the interest in common with the FAA to ensure the operation of the airport stays efficient, and potential for airport growth is not diminished.	NAO can work with airport noise staff to examine noise from several airports using the same airspace.
The FAA's public engagement to inform about planned airspace actions and possible noise impacts is limited.	Most plans for flight path changes subject to FAA's categorical exclusions from the public NEPA process	NAO will provide the FAA with a community forum similar to the PAUWG that can help with noise reduction and community noise public outreach.
The FAA's five phase/ eighteen-step process to implement Performance Base Navigation (PBN) procedures, (Order 7100.41), is complicated, lengthy, and driven by FAA officials and representatives of one or more airlines.	The FAA determines who in the agency's air traffic organization, airline(s) and airport(s) need to be participating in Instrument Flight Procedure (IFP) projects.	NAO would need access to all Instrument Flight Procedures (IFPs) and air traffic plans and operational decisions that involve air traffic and flight paths in the east valley.
Requests to the FAA regarding changes or amendments to new flight procedures typically originate from industry stakeholders.	Requests are not public knowledge before the procedures are developed and listed on the FAA's publication schedule	NAO taking part in the FAA's Instrument Flight Procedure (IFP) processing can open up the evaluation and enable local assessment of indirect and cumulative impacts of Performance Base Navigation (PBN) and re-routing of aircraft on communities located close to the airports.
Tempe is located in the immediate terminal area of PHX.	The FAA's procedure actions regularly deal with changes to routing of aircraft after initial climb or before final descent outside Tempe airspace.	

Noise Abatement Office Discussion Points

2. Is there a model airport that has a forum similar to what has been proposed?		
What is in place today	Problem	Recommended Solution
Maricopa County Air Quality Department: Does emission inventory updates that include modeling local airport emissions.	Does regional modeling of air quality using the EDMS (Emissions and Dispersion Modeling System) to estimate airport pollution only. Noise exposure modeling is up to individual airports.	With an NAO, the valley could develop both noise and emissions data for airport operations using the AEDT (Aviation Environmental Design Tool).
ADEQ/ADOT: ADOT Aeronautics group updates state airport system plans and manages a development grant program for airports that includes grants for compatible land uses near airports	No state noise studies of airports. The ADOT five-year program has the dual objective of maximizing the use of state dollars for airport development and maximizing FAA funding for Arizona airports.	Not likely that the state will examine airport noise unless it deals with operations of the Grand Canyon National Park Airport and related sightseeing operations.
Maricopa Association of Governments: Is the city's regional forum for transportation planning and where members make decisions on how to distribute federal funds.	MAG has secured federal grant for Regional Aviation System Plan (RASP) update in 1999, but access to FAA airport planning funds are project based.	The city could bring up airport noise in MAG as a regional development planning and environmental issue, and perhaps get federal funding to study airport noise impacts regionally, but MAG working with the FAA on airspace planning matters and be consulted in FAA's decisions process for Instrument Flight Procedure (IFP) development seems unlikely based on how FAA conducts its planning process nationwide.
Maricopa Association of Governments: The FAA has appropriated funds for Regional Aviation System Plan (RASP) updates, but has no special federal incentives to plan aviation for noise reduction.	Last MAG RASP update was the 2005 update. The study did evaluate noise impacts resulting from the development alternatives. The noise impact analysis was based on existing available noise exposure contours for valley airports. The FAA does not do airspace analysis base on Regional Aviation System plans.	NAO could help with noise impact analysis of MAG RASPs if the process of updating RASPs is resumed in Maricopa County.
Airport Regional forums: • SFO Airport/Community Roundtable, • LAX Community Noise Roundtable, • ORD, O'Hare Noise Compatibility Commission (ONCC). • Boston Logan Airport Community Advisory Committee (CAC) • Tampa International Airport, Community Noise Consortium (CNC)	Forums created for large airports run by a state or a separate airport authority serving multiple jurisdictions. Have a formal relationship with airport and agency officials, and has a seat at airport and Instrument Flight Procedure (IFP) projects. CAC was actively involved in developing a runway use plan for Boston Logan, but the plan has been criticized for not having noise abatement goals, and therefore cannot produce a measurable success.	Communities are in the need for a forum that can be a link between residents and valley airports, its operational staff including the FAA.

Noise Abatement Office Discussion Points

<table>
<tr><th>3. What would be the NAO's mission statement?</th><th colspan="2">4. What would be the composition and duties of a joint NAO?</th></tr>
<tr><td rowspan="2">NAO Mission Statement:
• Actively engage with the FAA and the airlines to make certain that proper procedures are being followed and deviations are addressed so that "unnecessary" noise can be reduced or eliminated, irrespective of whether the city runs an airport and has formal recognition by the FAA as a stakeholder in a proposed project or pending federal action.
• Inform the public of pending federal actions that have potential impact on flight paths and lobby valley airports to work with airlines to develop fly friendly operational procedures for PHX and Phoenix Mesa Gateway (IWA).</td><td>Composition:
Noise officer from each participating municipality
Need access to:
• FAA planning staff at Phoenix TRACON (P-50), and as needed officials in the Western-Pacific Region of the FAA's Air Traffic Organization (ATO).
• Expertise or themselves use FAA environmental tools such as AEDT (Aviation Environmental Design Tool)</td><td>Duties:
• Evaluate airspace actions that change changes in flight paths, altitudes and keep track of compliance with published routing of aircraft described in published Instrument Flight Procedures.
• Call meetings with city officials and present at public meetings to inform neighborhoods</td></tr>
<tr><td colspan="2">If established through a Memorandum of Agreement (MOA) with e.g. the City of Phoenix that other cities can join, no additional expenditures may be required to establish a joint forum. The City of Phoenix has formal status as stakeholder in federal planning of airspace actions and have accessed 14 CFR Part 150 Noise Compatibility Planning funds (AIP) as operator of PHX, Goodyear (GYR), and Deer Valley (DVT).</td></tr>
</table>

5. What are the outcomes and benefits of creating a joint NAO?	6. What process do you suggest for the creation of a joint NAO?
The NAO could actively engage with valley communities below PHX major flight paths, and become a facilitator of communications with the FAA about new Performance Base Navigation (PBN) procedures that typically are excluded from environmental assessments.	1. If approved TAVCO brings the proposal to Mayor and Council. 2. City formal outreach to other cities at city manager level. 3. Each city to collect and disseminate own agency and public input. 4. Develop a pilot forum that cities can agree on that have necessary communication lines with key planning staff in the FAA and airports.
A regional NAO intends to ensure that residents have city representatives who can actively engage with the FAA and the airlines to make certain that proper procedures are being followed and deviations are addressed so that "unnecessary" noise can be reduced or eliminated, irrespective of whether the city runs an airport and has formal recognition by the FAA as a stakeholder in a proposed project or pending federal (FAA) action.	We propose a pilot program, primarily to test: • Lines of communication and the potential of staff to have substantive input on a specific flight path planning project, e.g. the PHX Metroplex including PHX and IWA. • Communication to the public about ongoing flight path projects outside a formal setting of an Environmental Assessment or Impact Statement where an FAA consultant is conducting stakeholder meetings and forums open to the public. • This would practically occur through NAO taking part in one of the FAA's Instrument Flight Procedure (IFP) project or a project involving operational changes where an airport operator is the proponent.

MEMORANDUM

TO: Tempe Mayor and City Council

FROM: Tempe Aviation Commission & Tempe Sustainability Commission

DATE: December 15, 2020

SUBJECT: PHX Comprehensive Asset Management Plan & Urban Heat Effects

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Dear Mayor and City Councilmembers,

The Tempe Aviation Commission (TAVCO) is concerned about the development projects proposed in the Comprehensive Asset Management Plan (CAMP) for the Phoenix Sky Harbor International Airport There is potential for increasing the urban heat island effect at the airport, which would in turn affect Tempe. TAVCO is also concerned about the plan to consolidate and expand the air cargo facilities at the airport which will increase freighter traffic over Tempe during the overnight hours. The CAMP was presented to the Mayor and Council of the City of Phoenix in June 2019 and includes several large concrete paving projects (see attached images), specifically the addition of new terminal areas, aircraft staging areas, taxiways and paved additions to road access points for a 10 to 20 years planning period.

This summer we experienced 50 days at or above 110 degrees, which broke the previous record of 33 days from 2011. The airport is already a source for accumulation of heat on summer days. Tempe is located directly east of the airport and hot air accumulated on hot days and stagnant weather conditions is transported towards Tempe during the afternoon hours with the diurnal shifts in the east and west air flow. Although an ongoing analysis of the Environmental Assessment (EA) of the CAMP is taking place, an analysis of the heat island effects of airport developments is not a required part of it. The draft EA for the CAMP is expected to be available in March or April 2021.

TAVCO will continue to monitor the EA process for the CAMP and work with the Sustainability Commission on this important issue. We are aware that there are a number of technical requirements for pavement material and restrictions on tall vegetation at airports – both of which are potential heat mitigation strategies - but considering the challenges both cities face with the increasing number of summer days with excessive heat, we recommend that the City of Tempe work in partnership with the City of Phoenix to influence the construction plans for developments proposed in the CAMP to include heat island mitigation.

Sincerely,

Lane Carraway,

TAVCO Chair

K. Jung

Kendon Jung

Sustainability Commission Chair

Attached: Excerpts from PHX CAMP Summary

CAMP Project Renderings

West Terminal with North and South Concourse Piers (looking west)

26

Proposed within 10 to 15 years, additional terminal expansions, including aprons and taxiways between Terminals 3 and 4 and on both sides of Terminal 3 with improvements and new alignments of Sky Harbor Blvd.

CAMP Project Renderings

North Cargo, Rail Trench, and General Aviation Layout (looking south)

PHX RICONDO

Proposed within 10 to 15 years, air cargo, airline support, aero business and industrial at Honeywell south of E. Jefferson St.

CAMP Project Renderings

North Cargo, Rail Trench, and General Aviation Layout (looking east)

PHX RICONDO

Proposed within 20 years or more, new air cargo consolidated facility north of the Union Pacific Railroad.

Comments from the Tempe Aviation Commission to Docket No. FAA-2021-0037 Overview of FAA Noise Policy and Research Efforts: Request for Input on Research Activities to Inform Aircraft Noise Policy.

The FAA is inviting comments on what could potentially inform future noise policy based on the research programs the agency currently sponsors.

The posting in the federal register invites the public to suggest additional investigation, analysis, or research the agency should consider within the science of aircraft noise and human impacts, but does not disclose why public input on the science is needed at this point in time for the agency to make a decision on updating a policy or regulation.

In 2015 the FAA decided to start a multiyear update the scientific evidence on the relationship between aircraft noise exposure and its effects on communities. The notice states that no single set of findings can completely guide decision making. However, without identifying a specific remaining need after years of research, the purpose of requesting public input on more research appears to be motivated by the sole objective of enhancing academic understanding rather than to complete an overdue update of regulations or regulatory guidance needed to enhance aircraft noise protections for airport communities.

The focus in any additional research should in our opinion be practical, exemplified by applied research projects conducted through TRB to assist airports and the agency to improve community interaction on aircraft and airport noise exposure.

a) Aircraft noise research on the effect of aircraft noise on individuals and communities;

Annoyance can occur at low SEL levels if the event is occurring at lower flight altitudes, off a normal flight path, is abrupt or as science has shown if events are replicated without respite over longer periods than expected. "Time above" is an attempt to capture several events which outcome depends on the threshold used. We would like to see more noise research to enable higher fidelity in available modeling tools to specific local circumstances that include flight track diversions of a normalized track or other operational circumstance that exist under high demand situations. In parts of the country like Arizona where good weather allows significantly higher acceptance rates per hour to PHX than during instrument flight conditions that exist just a few days during the year, the sequencing of regional and longer haul jets on to the parallel runway approaches bring some arrivals on a regular basis off the normal approach paths because of pilots executing S-turns over North Tempe neighborhoods, because pilots know this is a last option that can be used to arrive on or before the scheduled arrival time.

We also recommended that annoyance and social or environmental justice becomes an area of further research. A study by Robin R. Sobotta published in 2007 studied whether people in communities west of PHX mostly Hispanic communities, moved to the aviation noise impacted areas or the noise encroached on the people, and examined controls for economic and political costs as well as the possibility of racial and ethnic prejudice. The results indicated that ethnicity is the primary cause of the disproportionate burden of aviation noise pollution in the area analyzed. The City of Phoenix did receive federal funds to offer a voluntary home acquisition and exchange program to relocate several of the communities that were analyzed. 782 properties were acquired and 3,000 people were relocated with the airports 1999 exposure contours. The areas analyzed borders a major highway alignment and the west end of PHX runways. The Aviation Environmental Design Tool (AEDT) with Motor Vehicles Emissions Simulator (MOVES) integration can now be used to quantify emission exposures for these populations, but more research and resulting guidance is needed for airports to asses combined exposures that includes noise in the context of environmental justice and equity. Environmental justice is addressed in the more rarely occurring studies, when federal actions have grave enough consequences to warrant an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). We are interested in information about any additional tools or exiting tool

optimizations that can be expected to give the public and airport administrations the ability to analyze noise and socio-economic aspects of airport developments.

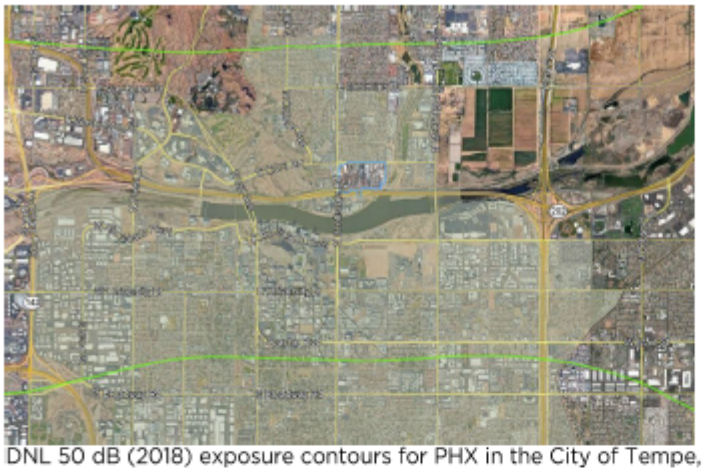
b) Noise Modeling, Noise Metrics, and Environmental Data Visualization.

Because the study of the negative impacts of aircraft noise on human health and wellbeing is using event noise or SEL in the search for a common threshold by which scientists can determine interference with sleep, cognitive functions and cardiovascular health, the problem of explaining and visualizing how noise metrics that use averaged Day Night Level (DNL) link to human response to noise remains. The use of supplemental metrics has helped visualize community exposure relative to the effects noise on human health and wellbeing, but has yet to be integrated into the Aviation Environmental Design Tool (AEDT), which is used by both local and federal agencies. DNL is the metric that ultimately determines if a proposed federal airspace action becomes subject to a CATEX or a complete environmental review. The relevance of DNL beyond its use in airport noise compatibility land use plans is not intuitive or obvious to a community based on available science. We understand from the notice that the agency is a developing a noise screening tool to decrease the amount of time needed to assess noise impact of a proposed federal action that validates results in a format that is readily understandable by the public. We would expect that fully validated mean it would not be a less robust research tool than AEDT in terms of outcomes, and that the screening tool will publicly accessible for download as is the full AEDT version.

A DNL of 50 dB was chosen as the minimum noise exposure to be eligible for inclusion in the Neighborhood Environmental Survey (NES). The comparisons made between NES and various Schultz Curve annoyance levels, the NES annoyance level at DNL 50 dB appears to be the annoyance level that is most comparable to the DNL 65 dB for the updated Schultz Curve from the 1992 FICON Report, for which the percentage of highly annoyed was 12.3%. Because the NES was conducted to create a new nationally representative dose-response curve to understand how community response to aircraft noise may have changed, a new threshold for significant DNL exposure of e.g. DNL 50 dB would need to be followed up in agency guidance. In North Tempe, most of which is currently in a DNL 60 dB or lower, a significant amount of additional averaged aircraft noise exposure is needed for a full AEDT modeling to happen in connection with future federal actions. Under current guidance the AEDT is used to identify the following noise level changes:

- For DNL 65 dB and higher plus/minus 1.5 dB
- For DNL 60 dB to <65 plus/minus 3 dB
- For DNL 45 dB to <60 plus/minus 5 dB

If a DNL 50 dB threshold was to be considered as the aircraft noise exposure area for potential noise mitigation and abatement, the eligible area in North Tempe would be within the green lines in the depiction shown:


DNL 50 dB (2018) exposure contours for PHX in the City of Tempe, Arizona

However, if the noise level changes caused by a future action that would change the aircraft noise exposure in North Tempe, a step change for the areas exposed to DNL 50 dB then would require a change in DNL of plus or minus 4 dB to warrant further review. Under current guidance for sound attenuation for existing structures inside the DNL 65 dB a residence, place of worship, school, or hospital, must be both in the DNL 65 dB exposure contour and be experiencing interior aircraft noise levels that are 45 dB or greater with the windows closed before the start of any noise attenuation improvements to a building. A lowering to 30 dB or greater level for interior aircraft noise, will still under a lower standard make it difficult for airports to qualify sound attenuation projects costs for federal reimbursement or access to AIP contributions under Part 150 Noise Compatibility Plan (NCP) guidelines. We anticipate further analysis of the effects of applying the change in public aircraft noise annoyance to how noise impact screens and assessment may impact future opportunities noise mitigation and abatement for airport communities will follow.

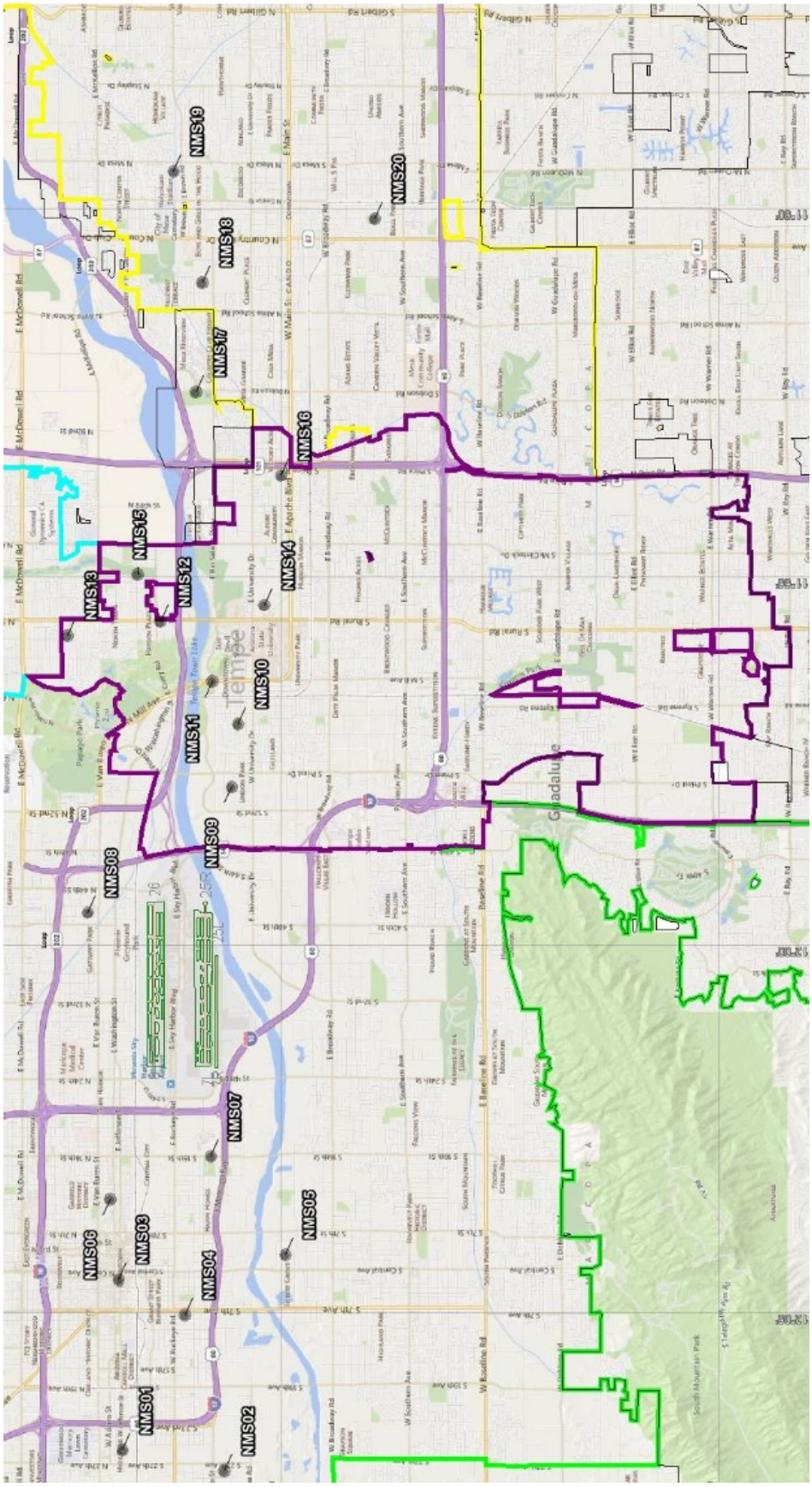
The plan is to follow up the NES with an empirical assessment of the economic impacts to businesses located underneath aircraft flight paths by MIT. We would like to see more of the various impacts of aircraft noise exposure included in screening tool, the socio economic impact and equity mentioned above, but also land use changes in in living conditions to account for increases in home time due to teleworking with post COVID lifestyle changes increasing populations working in non-compatible residential land use settings instead of in traditional business/ commercial locations. The integration of American National Standard (ANSI) for sleep deprivation (ANSI / ASA S12.9-2008 / Part 6) into the AEDT and research into threshold of significance specifically related to aircraft noise during night-time hours.

c) Reduction, Abatement, and Mitigation of Aviation Noise.

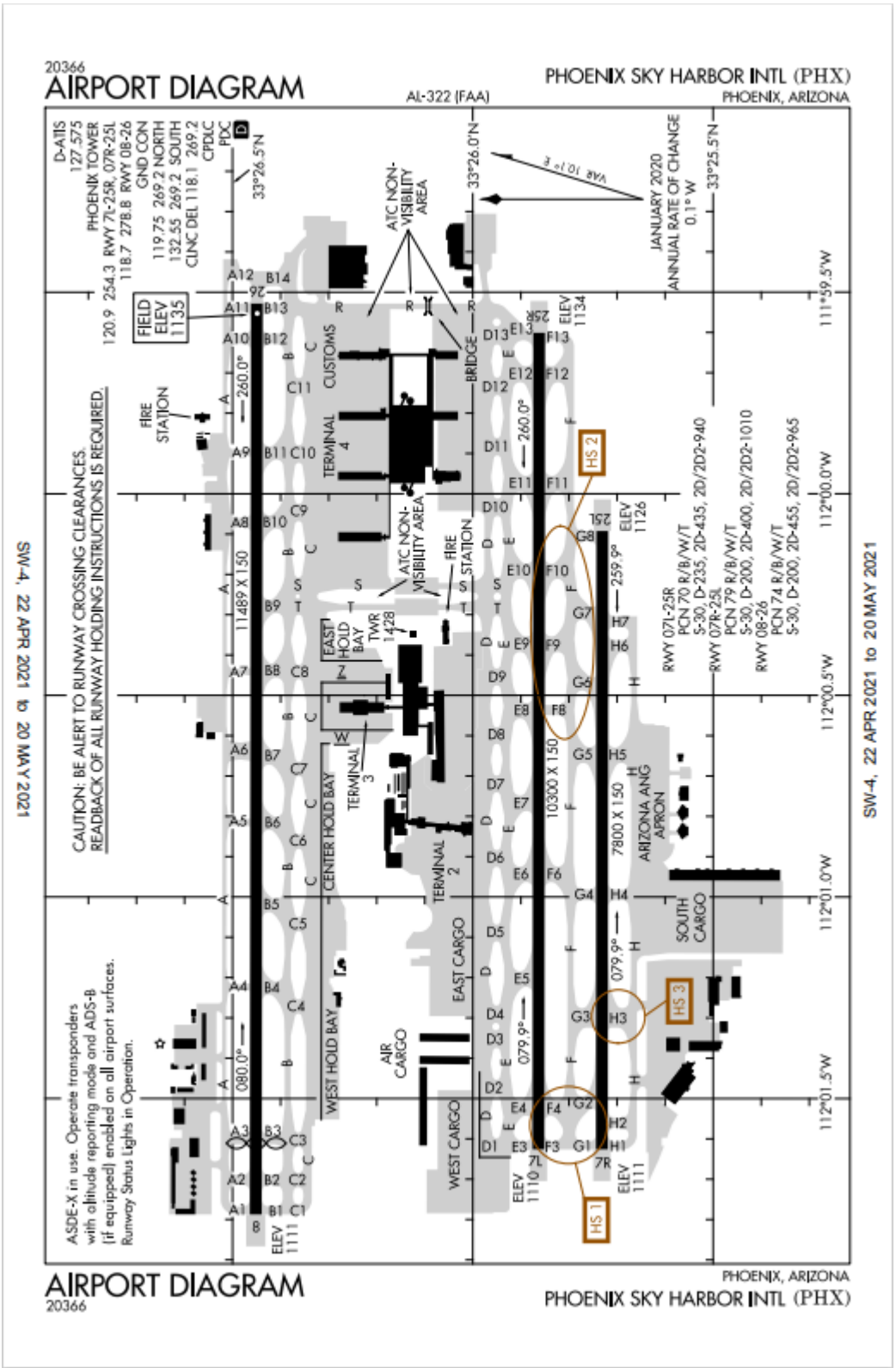
The City of Tempe has an intergovernmental agreement with the City of Phoenix on noise mitigation from 1994 on the departure operations by jets and large turboprop aircraft. The agreement requires the City of Phoenix to notify airlines with departure operations to the east fail to comply with the departure mitigation, but if airlines take notice and take action to avoid future deviations from a mitigation flight procedure is largely unknown. More research is needed to assess flight mitigations and to which extent they are effective and how channels of communication between airport operators and airlines over mitigation implementation can be enhanced.

7 Maps

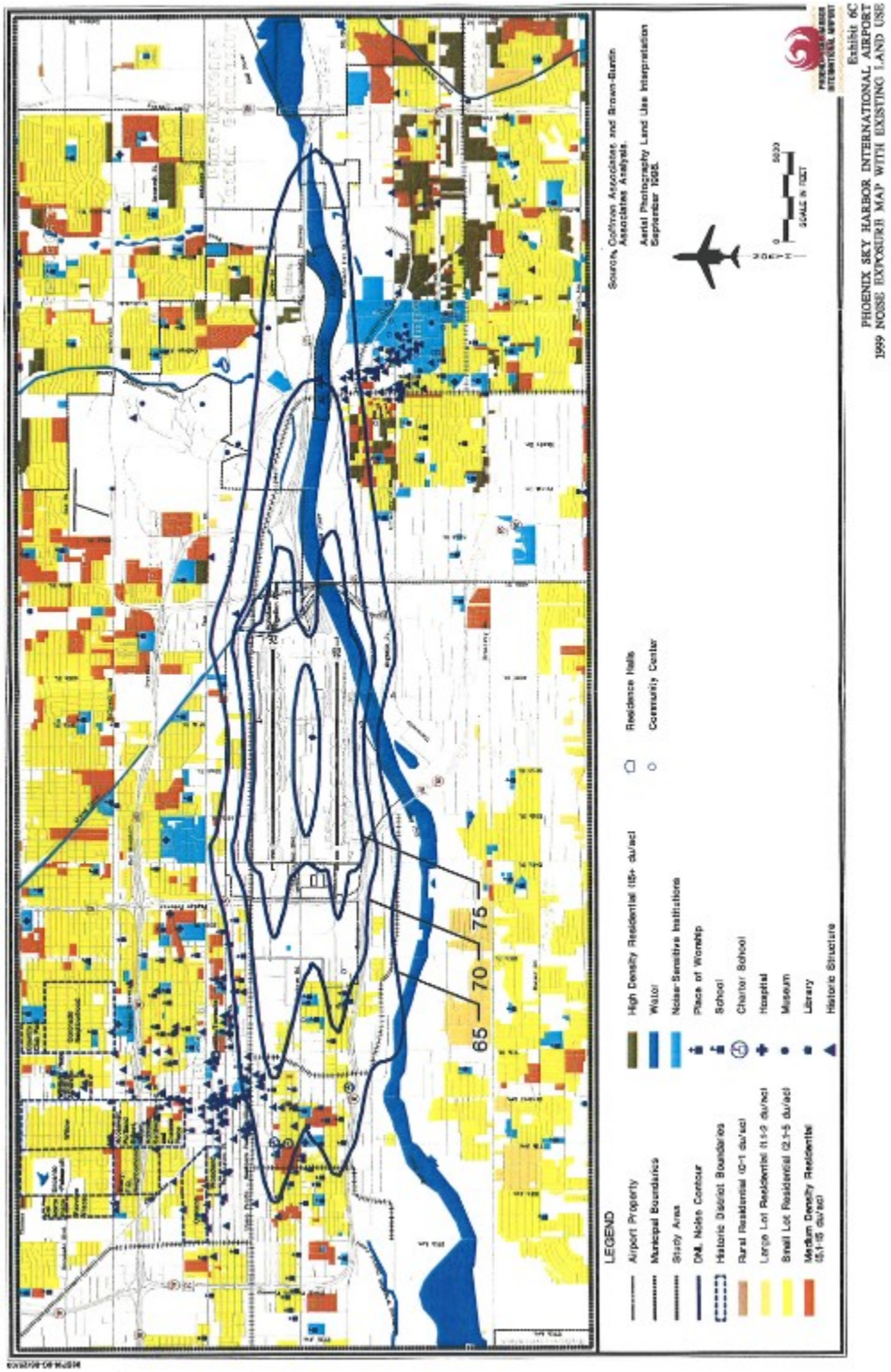
NFTMS Monitoring Stations (20 fixed sites, 8 inside City Tempe on both sides of the Rio Salado riverbed).



Runway Configuration
Phoenix Sky Harbor International Airport



Noise Contours (1999)



Airports in the region

Wickenburg (E25), Glendale (GEU), Deer Valley (DVT), Scottsdale (SDL), Buckeye (BXK), Goodyear (GYR), Phoenix Sky Harbor (PHX), Falcon Field (FFZ), Gila Bend (E63), Chandler (CHD), Phoenix Mesa Gateway (IWA)

Not included: Eagle Roost Airpark, Aguila, Pleasant Valley Airport, Peoria, Sky Ranch, Carefree, Estrella Sailport, Stellar Airpark, Chandler.

Source Kimley-Horn 2018 Sate Aviation System Plan