



# Audit of the Department of Aviation's Noise Abatement Program

March 2, 2021

Mark S. Swann, City Auditor

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# Executive Summary

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## Objective and Scope

The objective of this audit was to determine whether the Department of Aviation has minimized the noise impact from Dallas Love Field operations. The scope of the audit included Dallas Love Field noise abatement operations between October 1, 2018, and November 30, 2019.

## What We Recommend

We recommend the Department of Aviation improve or design controls to effectively monitor and document program participation and performance.

## Background

The City's Department of Aviation administers the Dallas Love Field airport which is in a noise sensitive area of the City, near residential neighborhoods. To balance the operating needs of the airport with the needs of the surrounding communities, the City officially adopted the Voluntary Noise Abatement Program that includes voluntary noise abatement measures. A Noise Office of the Department of Aviation is responsible for noise program activities. Several program components initiated by the Department of Aviation have had a positive impact on noise reduction. (Refer to [Exhibit 1](#)).

## What We Found

Opportunities exist for the Department of Aviation to improve or design controls to effectively monitor and document program participation and performance. Specifically,

- The land area and population exposed to excessive noise have been increasing and can soon exceed the projections but the City of Dallas does not have a plan of action aimed at reversing, slowing down, or holding steady the growing land area and population exposed to excessive noise.
- Documentation to support program monitoring and program performance for noise complaint resolution, nighttime preferential runway, Trinity departure, prohibition of engine maintenance run-ups, and optimal take-off profile is either incomplete or absent.

# Introduction

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## The City's Voluntary Noise Abatement Program

The City is responsible for operating and maintaining airport facilities and ensuring that runways, taxiways, and other facilities meet the regulations of the Federal Aviation Administration and are available for use. The Federal Aviation Administration is responsible for regulating airport operations and aircraft, managing the airspace, and ensuring the safe and expeditious flow of traffic.

In 1981, the City commissioned a consulting team to conduct a comprehensive study to determine the impact on the surrounding community of the noise generated by operations at Dallas Love Field and to develop a noise abatement program, if appropriate. At the completion of the study, the consulting team recommended, and the City Council adopted several of the noise abatement measures including:

- Voluntary nighttime preferential runway program.
- Voluntary use of the river route departure for night operations on runway 13R.
- Channelization of tracks, and revised altitude restrictions for helicopters.
- Ban on all training flights at night and restriction of touch-and-go activity during busy periods.
- Optimization of jet aircraft orientation during engine maintenance run-ups.
- Optimization of turbo-jet take-off profiles.
- Construction of new high-speed exit for runway 13R.
- Establishment of a system to monitor and manage the noise abatement program.

However, in 1990, the U.S. Congress passed the *Air Noise and Capacity Act*. In accordance with the *Air Noise and Capacity Act*, the Federal Aviation Administration has phased out older, noisier Stage 2 aircraft and required that by December 31, 2015, all civil jet aircraft, regardless of weight, meet quieter Stage 3 or Stage 4 engine noise levels to fly within the contiguous U.S. In return, airports could no longer implement mandatory noise restrictions and curfews without going through the Federal Aviation Administration's stringent evaluation process. As a result, while the City through the Department of Aviation can monitor some of the original components of the noise abatement program, the City cannot enforce compliance.

On June 15, 2006, the City of Dallas, the City of Fort Worth, Southwest Airlines, American Airlines, Inc, and DFW International Airport entered a joint agreement to resolve the Wright Amendment<sup>1</sup> issues. In the agreement, the City of Dallas agrees that it will negotiate a voluntary noise curfew at Dallas Love Field, precluding scheduled airline flights between 11:00 pm and 6:00 am. Subsequently, in the Dallas Love Field Airport Use and Lease Agreement executed on February 13, 2009, Southwest Airlines agreed to adhere to a voluntary noise curfew at the Airport.

According to the Department of Aviation's Noise Office, the City currently monitors the following noise reduction components:

- **Nighttime Preferential Runway:** all turbojet aircraft and any aircraft weighting over 12,500 pounds should use runway 13R-31L rather than runway 13L-31R between the hours of 9:00 p.m. and 6:00 a.m. if it does not interfere with flight safety. Runway 13R-31L is located further from residential neighborhoods. Pilots can request any runway, and ultimately air traffic controllers make the decision about which runway to assign.
- **Trinity Departure:** all turbojet aircraft and any aircraft weighting over 12,500 lbs. departing on runway 13R during night operations and when flying south should use a departure route over the Trinity River, which is adjacent to less densely populated areas.
- **Restrictions on Engine Run-Ups:** prohibition of aircraft engine maintenance run-ups between the hours of midnight and 6:00 a.m., expanded with a voluntary moratorium between 10:00 p.m. and midnight.
- **Optimal Take-Off Profile:** the use of a departure profile to quickly achieve a higher altitude and reduce noise.

Other than the restriction on engine run-ups, the abovementioned Noise Abatement Program components are voluntary for the airlines and the Federal Aviation Administration. Since the program is voluntary, the City is unable to penalize air traffic controllers or pilots that do not follow the suggested preferences.

Some additional components of the noise abatement program initiated by the Department of Aviation have had a positive impact (see [Exhibit 1](#) on page 4):

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<sup>1</sup> The 1979 Wright Amendment restricted nonstop flights from Dallas Love Field to cities outside of Texas, Arkansas, Louisiana, New Mexico, and Oklahoma. In 2014, the Wright Amendment was repealed by the United States Congress.

**Exhibit 1:**



**Source:** The Department of Aviation Noise Office's personnel

## Noise Abatement

Additional measures to minimize the noise impact available to the City of Dallas may include a study in accordance with the Code of Federal Regulations, 14 CFR Part 150, *Airport Noise Compatibility Planning*, which allows airport operators to apply for federal grants for noise abatement projects. The 14 CFR Part 150 study is voluntary and airport operators are not required to participate.

## Audit Results

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As required by *City Council Resolution 88-3428*, departments will establish internal controls in accordance with the standards established by the Comptroller General of the United States pursuant to the *Federal Managers' Financial Integrity Act of 1982*. Administrative Directive 4-09, *Internal Control* prescribes the policy for the City to establish and maintain an internal control system. The audit observations listed are offered to assist management in fulfilling their internal control responsibilities.

### **Observation A:** Noise Level Monitoring

The land area and population exposed to excessive noise have been increasing and can soon exceed the projections (see [Exhibit 2](#) on page 6). As a result, more residences and other noise sensitive facilities, including churches and schools, may experience adverse effects of excessive noise exposure.

Between 2013 and 2019, the annual noise level analysis reports by Harris Miller Miller & Hanson Inc. have identified the actual population and land areas exposed to noise levels above 65 decibels<sup>2</sup> and compared these to the 2006 projection of what the population and land areas would be in 2020.<sup>3</sup> The Department of Aviation has used the comparison to inform the community of the noise levels.

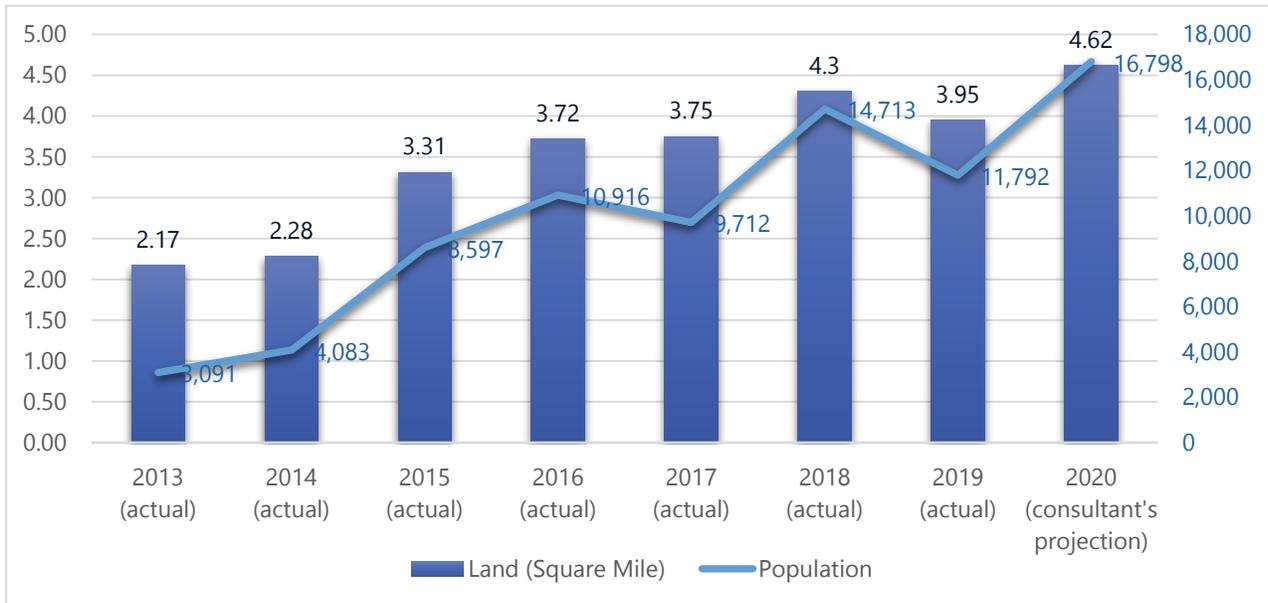
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<sup>2</sup> Code of Federal Regulations, 14 CFR Part 150, *Airport Noise Compatibility Planning* and Code of Federal Regulations, 24 CFR Part 51, *Environmental Criteria and Standards*, establish 65 decibels as a noise threshold, above which the noise is unacceptable for residential areas, except under limited circumstances.

<sup>3</sup> According to the Department of Aviation, the 2006 projection was developed to model potential noise impact without the Wright Amendment.

**Exhibit 2:**

Land Area and Population Exposed to Noise Levels Above 65 Decibels



**Source:** Dallas Love Field 2013-2019 Day-Night Average Sound Level Contours by Harris Miller Miller & Hanson Inc.

**\*Note:** 2013 data was prior to the repeal of Wright Amendment. Refer to [page 3](#) for more information about the Wright Amendment.

In 2021 and going forward, the consultant will only compare current measurements to the measurements from the previous year. The Department of Aviation receives and reviews the consultant reports for the sole purpose of informing the community but the City of Dallas does not have a plan of action aimed at reversing, slowing down, or holding steady the growing land area and population exposed to excessive noise.

**Criteria**

- ❖ Standards for Internal Control in the Federal Government:
  - *Principal 9 – Identify, Analyze, and Respond to Change*
  - *Principle 10 – Design Control Activities*

Assessed Risk Rating:

**Low**

We recommend the **City Manager:**

**A.1:** Develop a plan of action aimed at reversing, slowing down, or holding steady the growing land area and population exposed to excessive noise.

## Observation B: Program Management

Although the Department of Aviation primarily monitors key program components including noise complaint resolution, nighttime preferential runway, Trinity departure, prohibition of engine maintenance run-ups, and optimal take-off profile; documentation to support program monitoring and program performance is either incomplete or absent. As a result, the Department of Aviation's Voluntary Noise Abatement Program may not be effective in monitoring and encouraging program participation. The causes include the following:

### 1. Incomplete or Absent Procedures

- The Department of Aviation's Noise Office receives and investigates excessive noise complaints from Dallas residents. However, documented *Noise Complaint Resolution Work Instructions* do not include procedures for investigating excessive noise complaints. As a result, noise investigations may be inconsistent.
- The Department of Aviation does not have procedures to monitor airline participation in the following program components — Trinity departure, prohibition of engine maintenance run-ups, and optimal take-off profile (see [Exhibit 3](#)), which makes these program components vulnerable to non-participation, and the City less likely to recognize whether or not non-participation is occurring.

#### Exhibit 3:

##### Trinity Departure:

- The Trinity departure component of the Voluntary Noise Abatement Program instructs turbojet aircraft and any aircraft weighting over 12,500 lbs. — departing on runway 13R during night operations and when flying south — to use a departure route over the Trinity River, which is adjacent to less densely populated areas.

##### Prohibition of Engine Run-Ups:

- According to Dallas City Code, Chapter 5-25, *Maintenance run-ups*, aircraft engine maintenance run-ups are prohibited between the hours of midnight and 6:00 a.m. The Department of Aviation expanded upon this measure with a voluntary moratorium between 10:00 p.m. and midnight.

##### Optimal Take-Off Profile:

- Optimal take-off profile is the use of a departure profile to quickly achieve a higher altitude and reduce noise.

**Source:** The Department of Aviation Noise Office's personnel

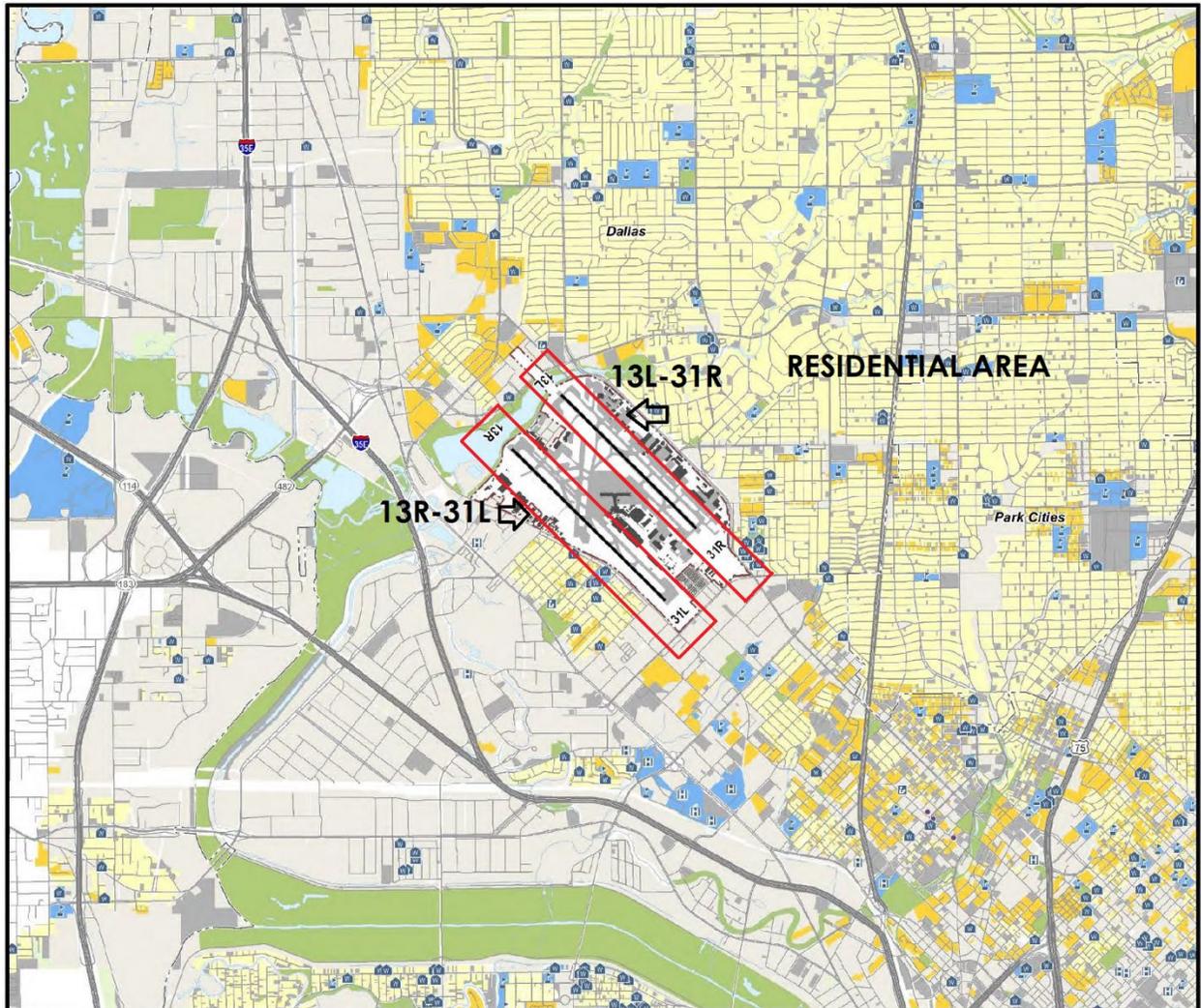
### 2. No Performance Measures

The Department of Aviation does not have performance measures associated with the nighttime preferential runway usage that indicate what percentage of low usage should trigger an escalated response from the Department of Aviation's Noise Office.

The nighttime preferential runway has been a focus for the Department of Aviation's Noise Office. This program component encourages turbojet aircraft and any aircraft weighting over 12,500 pounds to use runway 13R-31L between the hours of 9:00 p.m. and 6:00 a.m. rather than runway 13L-31R (if it does not interfere with flight safety), as Runway 13R-31L is located further from residential neighborhoods. [Exhibit 4](#) shows the runway locations in relationship to residential neighborhoods.

**Exhibit 4:**

Dallas Love Field and Land Use of the Surrounding Area

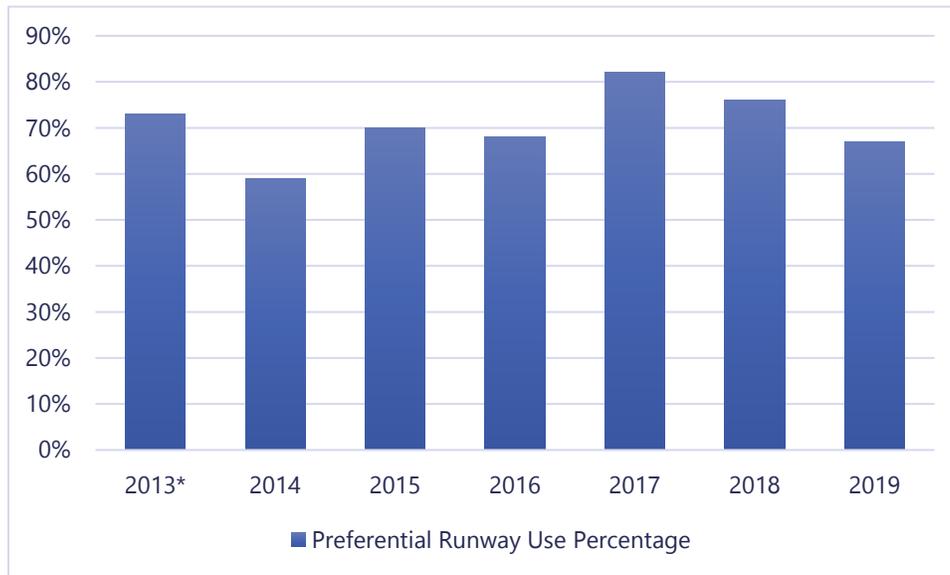


**Source:** Dallas Love Field 2018 Day-Night Average Sound Level Contours by Harris Miller Miller & Hanson Inc., Figure 26.

Without performance measures in place, there is no guarantee that the current positive trend in usage (see [Exhibit 5](#)) will be sustainable or that it will continue to be prioritized.

**Exhibit 5:**

Nighttime Preferential Runway Utilization



**Source:** Dallas Love Field 2013-2019 Day-Night Average Sound Level Contours by Harris Miller Miller & Hanson Inc.

**\*Note:** 2013 data was prior to the repeal of the Wright Amendment. Refer to [page 3](#) for more information about the Wright Amendment.

Criteria

- ❖ Standards for Internal Control in the Federal Government:
  - *Principle 3.09 – Documentation of the Internal Control System*
  - *Principle 6 – Define Objectives and Risk Tolerances*
  - *Principle 10 – Design Control Activities*
  - *Principle 16 – Perform Monitoring Activities*

- ❖ *The Texas Performance Measure Management Guide*

Assessed Risk Rating:

**Low**

We recommend the **Director of the Department of Aviation:**

**B.1:** Develop and implement documented work procedures for investigating excessive noise complaints.

**B.2:** Develop and implement documented work procedures for monitoring airline participation in the following program components — Trinity departure, prohibition of engine maintenance run-ups, and optimal take-off profile.

**B.3:** Create performance measures specifying the participation percentage for the nighttime preferential runway usage that would initiate an escalation to next level of actions.

## Appendix A: Methodology

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### Methodology

The audit methodology included: (1) analyzing the processes, controls, and transactions of the Dallas Love Field Voluntary Noise Abatement Program; (2) interviewing Noise Office personnel from the Department of Aviation; and (3) reviewing policies and procedures, applicable Federal Aviation Regulations, Dallas City Code, consultant's reports, and relevant contracts.

This performance audit was conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based upon our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

### Major Contributors to the Report

Lina Wang, CPA – In-Charge Auditor  
Anatoli Douditski, MPA, CIA, ACDA – Audit Manager

## Appendix B: Management's Response

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### Memorandum



**DATE:** March 1, 2021  
**TO:** Mark S. Swann, City Auditor  
**SUBJECT:** Response to Audit of the Department of Aviation's Noise Abatement Program

This letter acknowledges the City Manager's Office received the *Audit of the Department of Aviation's Noise Abatement Program* and submitted responses to the recommendations in consultation with the Department of Aviation.

We recognize the importance of noise management to ensure residents living near Dallas Love Field can have a full awareness of the levels of noise resulting from the activities of the airport. To better educate residents about noise management at Dallas Love Field, the City's Department of Aviation launched a comprehensive noise lab with easy-to-use resources in 2018. Further, the Department of Aviation commissioned a system of noise monitors to be installed at Dallas Love Field, the last of which was installed in 2020.

The City does not have authority to mandate airlines participate in noise reduction initiatives and, the City cannot enact any measures that would limit or curtail aircraft activity. Nevertheless, the Department of Aviation recognizes the benefit of monitoring compliance with noise reduction initiatives and ensuring transparency to residents. The Department of Aviation will develop procedures for monitoring airline participation across several components of the noise reduction initiative. Further, the Department of Aviation will develop procedures to ensure a consistent process for investigating excessive noise complaints.

As the City Auditor has identified, the Voluntary Noise Abatement Program for Dallas Love Field has not been reviewed and formally adopted by the City Council for more than 30 years. The Department of Aviation will bring forward recommendations to update the program and seek Council adoption of a revised Voluntary Noise Abatement Program that is consistent with Federal Law as well as consistent with the City's commitment to equity for all of the residents that live around the airport.

However, we will accept the risk associated with limiting the affected area and population impacted by higher levels of noise at Dallas Love Field. The current City building code requires sound insulation for new construction in areas exposed to higher levels of noise. We feel this is a preferable solution that ensures comfortable noise levels while allowing continued development of needed residences in the City.

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Empathy | Ethics | Excellence | Equity

Additionally, we will accept the risk associated with developing performance measures for nighttime preferential runway usage. Instead, we will further study the issue to ensure an equitable approach for managing noise of nighttime flight operations.

Sincerely

A handwritten signature in black ink, appearing to read 'T.C. Broadnax', written over a white background.

T.C. Broadnax  
City Manager

C: Kimberly Bizer Tolbert, Chief of Staff  
M. Elizabeth Reich, Chief Financial Officer  
Majed A. Al-Ghafry, Assistant City Manager  
Mark Duebner, Director, Department of Aviation

"Our Product is Service"  
Empathy | Ethics | Excellence | Equity

Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date	
Low	We recommend the <b>City Manager</b> :				
	<b>A.1:</b> Develop a plan of action aimed at reversing, slowing down, or holding steady the growing land area and population exposed to excessive noise.	<b>Accept Risk:</b>	The City Manager accepts the risk as revised building codes now include requirements for sound insulation for all new buildings and some modified buildings, which require soundproofing to achieve a DNL of 45 or less inside the building.	N/A	N/A
	We recommend the <b>Director of the Department of Aviation</b> :				
	<b>B.1:</b> Develop and implement documented work procedures for investigating excessive noise complaints.	<b>Agree:</b>	The Department of Aviation will update the existing procedure and develop a checklist for staff to follow and detailed instructions for the training of future staff.	6/30/2021	12/31/2021
	<b>B.2:</b> Develop and implement documented work procedures for monitoring airline participation in the following program components — Trinity departure, prohibition of engine maintenance run-ups, and optimal take-off profile.	<b>Agree:</b>	Trinity Departure: Aviation will initiate reporting on level of use using the Casper Flight Tracking System. However, until the RNAV procedures are implemented by the FAA, the use of the Trinity Departure will remain low.  Maintenance run-ups: Aviation will log maintenance run-ups to track compliance with the current measure.  Optimal Takeoff Profile: Aviation will receive a written acknowledgment from airlines stating that they are flying the optimal takeoff profile.	6/30/21	6/30/2022

Assessed Risk Rating	Recommendation	Concurrence and Action Plan	Implementation Date	Follow-Up/ Maturity Date
	<p><b>B.3:</b> Create performance measures specifying the participation percentage for the nighttime preferential runway usage that would initiate an escalation to next level of actions.</p>	<p><b>Accept Risk:</b> The City Council has not formally reviewed and re-adopted the noise program, including the preferential runway component, in 30 years. The program has some policies which are no longer applicable. In order to update the program to align with the current legal environment, the Department of Aviation will review the Noise Program and make recommendations to Council to revise the program as needed and sunset outdated practices.</p>	<p>N/A</p>	<p>N/A</p>