

## Chapter 6 - Potential Noise Abatement Measures

**INTRODUCTION.** This chapter provides a general overview of the potential noise abatement and noise reduction measures that are required for consideration during the Part 150 Study process. Recommendations from the 2004 and 1985 Records of Approval are detailed in Chapter 1, **Table 1-4** and **Table 1-5**. This chapter describes each alternative required for consideration in a Part 150 Study, whether they apply to JAC, and the reasoning for each decision. Due to the noise abatement measures already in place at JAC, many alternatives normally examined in a Part 150 Study do not apply. Alternatives that have the potential to address specific local noise issues, including issues pertaining to the GTNP, are also included. In addition, this chapter contains explanations of the roles and responsibilities of various parties in noise abatement planning and the implementation of various noise abatement measures. Alternatives that are not eliminated are brought forward into Chapter 7 (Operational Alternatives) or Chapter 8 (Land Use and Administration Alternatives) for further analysis.

Information on required program standards, alternatives, guidelines, and regulatory limitations may be found herein. Chapter 6 is laid out as follows:

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## 6.1 Background

The Part 150 regulations list the criteria that every alternative must meet to be considered for inclusion in the NCP. The regulation states that, “the airport operator shall evaluate alternative noise control actions and develop a NCP which:

- (a) Reduces existing non-compatible uses and prevents or reduces the probability of the establishment of additional non-compatible uses;
- (b) Does not impose undue burden on interstate and foreign commerce;
- (c) Provides for revision in accordance with the regulation.
- (d) Is not unjustly discriminatory.
- (e) Does not derogate safety or adversely affect the safe and efficient use of airspace.
- (f) To the extent practicable, meets both local needs and needs of the national air transportation system, considering tradeoffs between economic benefits derived from the airport and the noise impact.
- (g) Can be implemented in a manner consistent with all of the powers and duties of the Administrator of FAA.”

The first portion of this regulation related to reducing existing non-compatible land uses is important at JAC because, as detailed in Chapter 5 (Land Use), there are no non-compatible land uses within the 65 DNL and greater contours. Therefore, based on the definition of non-compatible land uses in Part 150, there are no non-compatible land uses at JAC. The alternatives considered in this Study are outside the scope of a Part 150 and as a result, the FAA may not be able to approve them as part of the NCP. However, this doesn't prevent JAC from implementing these measures voluntarily with the support of the FAA outside of the Part 150 process.

In addition to the program standards that each alternative must meet, Part 150 identifies a number of specific alternatives that must be considered in developing a Part 150 NCP. These *required* alternatives are:

1. Acquisition of land and interests therein, including, but not limited to air rights, easements, and development rights, to ensure the use of property for purposes which are compatible with airport operations.
2. The construction of barriers and acoustical shielding, including the soundproofing of public buildings.
3. The implementation of a preferential runway system.



4. The use of flight procedures (including the modifications of flight tracks) to control the operation of aircraft to reduce exposure of individuals (or specific noise sensitive areas) to noise in the area around the airport.
5. The implementation of any restriction on the use of the airport by any type or class of aircraft based on the noise characteristics of those aircraft. Such restrictions may include, but are not limited to—
  - a. Denial of use of the airport to aircraft types or classes which do not meet Federal noise standards;
  - b. Capacity limitations based on the relative noisiness of different types of aircraft;
  - c. Requirement that aircraft using the airport must use noise abatement takeoff or approach procedures previously approved as safe by the FAA;
  - d. Landing fees based on FAA certificated or estimated noise emission levels or on time of arrival; and
  - e. Partial or complete curfews.
6. Other actions or combinations of actions which would have a beneficial noise control or abatement impact on the public.
7. Other actions recommended for analysis by the FAA for the specific airport.

Every alternative above was reviewed to determine whether it is applicable to JAC, and whether the implementation of each alternative meets the criteria requirements for alternatives set out in Part 150. Although this Study follows the Part 150 process, it is important to note that there are other federal laws and regulations that limit how/when alternatives may be implemented.

This Part 150 Study also considers the requirements of the Use Agreement between JAC and the DOI (**Appendix A**). The Use Agreement contains the following noise abatement measures:

- Moose noise measurement location cannot exceed 55 DNL annually (**Figure 1-7**, see Site 4),
- Critical Area Boundary of 45 DNL within the noise sensitive areas of GTNP (**Figure 1-6**), and
- Aircraft single event noise limit on approach is 92 dBA.



The requirements of the Use Agreement are examined and considered as existing conditions for purposes of this preliminary alternatives discussion.

## 6.2 Roles and Responsibilities

Before considering the specific aircraft noise and land use measures in more detail, it is important to understand the authority various parties have in order to make a change that results in additional noise reduction. This is referred to as roles and responsibilities.

The FAA's 1976 *Noise Abatement Policy* established the following policies regarding roles and responsibilities:

“The **Federal Government** has the authority and responsibility to control aircraft noise by the regulation of source emissions, by flight operational procedures, and by management of the air traffic control system and navigable airspace in ways that minimize noise impact on residential areas, consistent with the highest standards of safety. The federal government also provides financial and technical assistance to airport proprietors for noise reduction planning and abatement activities and, working with the private sector, conducts continuing research into noise abatement technology.

**Airport Proprietors** are primarily responsible for planning and implementing actions designed to reduce the effect of noise on residents of the surrounding area. Such actions include optimal site location, improvements in airport design, noise abatement ground procedures, land acquisition, and restrictions on airport use that do not unjustly discriminate against any user, impede the federal interest in safety and management of the air navigation system, or unreasonably interfere with interstate or foreign commerce.

**State and Local Governments and Planning Agencies** provide for land use planning and development, zoning, and housing regulation that will limit the uses of land near airports to purposes compatible with airport operations.

The **Air Carriers** are responsible for retirement, replacement, or retrofit of older jets that do not meet federal noise level standards, and for scheduling and flying airplanes in a way that minimizes the impact of noise on people.

**Air Travelers and Shippers** generally should bear the cost of noise reduction, consistent with established federal economic and environmental policy that the adverse environmental consequences of a service or product should be reflected in its price.

**Residents and Prospective Residents** in areas surrounding airports should seek to understand the noise problem and what steps can be taken to minimize its effect on people. Individual and community responses to aircraft noise differ substantially and, for some individuals, a reduced level of noise may not eliminate the annoyance or irritation. Prospective residents of areas impacted by airport noise thus should be aware of the effect of noise on their quality of life and act accordingly.”



For this Study, the NPS, guided by the Use Agreement, has a fundamental role in the consideration of aircraft noise exposure.

The Airport Board has a long history of studying and then implementing practicable measures that are compatible with national efforts designed to reduce aircraft noise effects on communities and in areas of natural quiet, while continuing to meet the requirements of its Use Agreement with the DOI. Thus, through the conduct of this Study, the Airport Board is committed to continuing such efforts.

### **6.3 Regulatory Context - National Noise Reduction Efforts**

The history of noise regulations is important to understanding the regulatory context for potential alternatives that can be included in a Part 150 Study. This regulatory context is broadly discussed in Chapter 3.

Therefore, while this Part 150 study examines use restrictions as potential alternatives, a Part 161 application, analysis and FAA approval would need to occur prior to any use restrictions being implemented and only after all non-regulatory alternatives have been examined. This is important for the alternatives discussions below.

The outcome of a Part 150 Noise Compatibility Study is intended to define a balanced and cost-effective program for reducing land uses incompatible with existing and future noise levels. The development of reasonable measures is the focus of the 14 CFR Part 150 noise compatibility planning process. The objective is to explore a wide range of feasible land use measures, noise control actions, and noise exposure measures, seeking optimum accommodation of both airport users and airport neighbors within acceptable safety, economic, and environmental parameters.



These feasible measures must meet all the program standards set out in Part 150, and must not conflict with regulations (see Chapter 3 for discussion on regulations). The measures must also meet the requirements of the Use Agreement between JAC and the DOI. See **Appendix A** for the full Use Agreement and subsequent amendments.

## 6.4 Discussion of Measures Available

As stated above, there are a number of measures that are required to be examined under Part 150 Studies. This section contains a generalized description of potential noise abatement and mitigation measures or actions that may be considered for JAC.

A general evaluation of each measure is made based on the regulatory criteria (outlined in Chapter 3) that dictate what an alternative must follow to be considered for inclusion in the NCP. To summarize these criteria, an alternative must: 1) Have the potential of resolving the problem; 2) Be implementable within acceptable economic, environmental, and social costs; and, 3) Be implementable in compliance with federal, state, and local legislation, regulations, and ordinances. Specific to JAC, the alternative must also 4) not conflict with the requirements of the Use Agreement.

Based on Part 150 requirements, the noise alternatives must be presented according to the following categories:

- a) Noise abatement alternatives for which the airport operator has adequate implementation authority;
- b) Noise abatement alternatives for which the requisite implementation authority is vested in a local agency or political subdivision governing body or a state agency or political subdivision governing body; and,
- c) Noise abatement options for which requisite authority is vested in the FAA or other Federal agency.

However, it is important to note that these categories refer to the generalized implementation authority (identifying who is most likely to implement), and there is some overlap within measures on who can implement a measure or who plays a part in implementation. While implementation may lie with JAC, in certain cases, there might be federal regulations that regulate how an alternative is implemented and the steps required to take to implement an action. For instance, many noise actions that lie under the implementation authority for JAC are also regulated under Part 161.



Therefore, these alternatives cannot be implemented without JAC completing the steps required in Part 161 application and having it approved by the FAA. As described above, this study does not include modeling alternatives that would require a Part 161 study, because all non-regulatory alternatives must be examined first.

Additionally, under 14 CFR Part 150, the FAA must review the NCP alternatives with respect to the program standards outlined in Section B150.5 of the Part 150 regulation and approve or disapprove each measure brought forward in a formal Record of Approval to be potentially eligible for federal funding. AIP eligibility will be determined when a project is ready to be implemented.

The measures listed in **Table 6-1** are required to be addressed in a Part 150 Study. However, due to the unique conditions and considerations at JAC, many of these alternatives do not apply. Therefore, the table below includes a list of all alternatives considered in a Part 150 Study, as well as an explanation why an alternative is or is not brought forward into analysis. Further, each measure is assigned to one of three categories identifying whether the airport operator, a state/local government, or the federal government is responsible for implementing the measure if it is included in the final NCP.<sup>1</sup>

Those alternatives that are brought forward are examined further in Chapter 7, which discusses operational alternatives and Chapter 8, which discusses land use, facility and administrative alternatives. The alternatives that involve operational procedures (Chapter 7) will undergo a FAA review considering operational, safety, and airspace considerations. Alternatives that are ultimately selected may be modeled in the Future NEM and included in the final NCP.

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<sup>1</sup> The NCP refers to the final work product of the study that documents the recommended noise abatement and land use compatibility actions.

**Table 6-1: APPLICABILITY OF MEASURES**

Measures For Consideration		Implementation Authority			Measure Carried Forward	Summary
		Airport	Local Jurisdictions	FAA		
<b>Airport &amp; Airspace Use Restrictions</b>	Limit Airport Access if Aircraft Do Not Meet Certain Noise Standards	◆			No	A CFR Part 161 Study can be performed, however due to existing restrictions in place at JAC and the difficulty of conducting a Part 161 process, this will not be brought forward.
	Restrictions Based on Cumulative Impact using aircraft noise levels, aircraft type, or number of operations	◆			No	JAC has an existing cumulative restriction in place; Therefore, this will not be brought forward.
	Restrictions Based on Part 36 Certified Single-Event Noise Levels	◆			No	Restricting aircraft operations based on compliance with published noise certification data generally does not meet Part 150 program standards and would put the airport in noncompliance with their grant assurances. JAC already has an aircraft single event noise limit of 92 dBA on approach; therefore this measure will not be brought forward.
	Landing Fees Based on Noise	◆			No	The implementation of this measure, which would be to charge a landing fee based on the noise emitted by an individual aircraft, would require a Part 161 Study. It is extremely difficult to have a Part 161 application approved by the FAA. This measure will not be brought forward.
	Implementation of a Complete or Partial Curfew	◆			No	JAC has a voluntary nighttime curfew for non-emergency operations that is followed a large majority of the time. There are no scheduled commercial operations during the voluntary curfew hours; implementing a mandatory curfew would require a Part 161 Study. This measure will not be brought forward.
<b>Airport Infrastructure or Airport Facilities</b>	Ban All Jet Aircraft	◆			No	This measure has been documented by case law that it is not legally possible, putting undue burden on interstate e-commerce and is a discriminatory regulation that violates the tenets of the U.S. Constitution. This measure will not be brought forward.
	Restrict Touch and Go Operations	◆			No	Aircraft that operate landings and takeoffs in a series in the airport environment. This measure may not be legal as it can limit access or be considered a capacity restriction. This measure will not be brought forward.
	Noise Barriers	◆			No	At JAC, there are no substantial run-ups or other substantial ground related noise that would require this type of mitigation. This measure will not be brought forward.
	Construct a New Runway in a Different Orientation	◆			No	Runway orientation is based on many factors, primary among this is orientation to the prevailing winds, which is the case at JAC. Based on limited available area and the terms of the Use Agreement, a new runway is not feasible. This measure will not be brought forward.
	Runway Extension	◆			No	Based on the limited available area at JAC as well as the terms of the Use Agreement, a runway extension is not feasible without an amendment; therefore, this alternative is not considered further in this Study.
	High-Speed Taxiway Exits	◆			No	A high-speed taxiway is angled, providing the ability to exit the runway more quickly and reduce use of reverse thrust, therefore reducing noise. While this can be useful, based on the single runway configuration and limited runway length at JAC, high-speed taxiways are not feasible; therefore, this alternative is not considered further in this Study.

<b>Land Use Measures</b>	Acquisition of Land or Interest Therein	◆			No	Land use measures related to aircraft noise at airports can include purchasing noise-impacted properties, purchasing an easement from the property owner effectively purchasing the right to create noise, or sound attenuating a home within the 65 DNL and higher noise contours. There are no non-compatible land uses with the 65 DNL. These acquisition and insulation alternatives are not considered further.
	Noise Monitoring Program	◆			Yes, Chapter 8	JAC has a permanent noise monitoring system in place, connected to a radar system that meets the FAA’s requirements for a noise system installed using FAA funding. Potential updates to the noise monitoring system are included in Chapter 8.
	Land Use Controls		◆		Yes, Chapter 8	Most airport operators, including JAC, do not have land use control over the land use development around airport, as the lands are owned by other jurisdictions. However, there are many measures local jurisdictions can use to improve the compatibility of land uses around an airport including: zoning, easements, transfer of development rights, building code modifications, Capital Improvement Plan, subdivision regulations, and comprehensive planning. These alternatives are examined further in Chapter 8.
<b>Operational Measures</b>	Departure Thrust Cutback			◆	Yes, Chapter 7	Aircraft that perform a departure thrust cutback use the application of thrust cutbacks at various stages of the take-off; use of this procedure is dependent on the type of land uses around the airport. The FAA defines two types of noise abatement departure profiles, one that reduces noise close in to the airport, and one that reduces noise further from the airport. Departure thrust cutback procedures are considered in the operational alternatives chapter along with potential satellite-based procedures.
	Designated Noise Abatement Take-Off/Approach Paths			◆	Yes, Chapter 7	This measure would result in the designation of arrival and/or departure paths that minimize overflights of noise-sensitive land uses. JAC has existing noise abatement procedures. This measure for noise abatement flight tracks are considered in the operational alternatives chapter as part of the RNP procedures.
	NextGen: Performance Based Navigation (PBN) Required Navigation Performance (RNP)			◆	Yes, Chapter 7	The FAA is upgrading the airspace and the associated tools aircraft use for navigation, including transitioning from ground-based navigation to satellite-based navigation. Procedures that use RNP technology are considered in the Chapter 7.
	Preferential Runway Use System			◆	No	JAC has published preferential noise abatement procedures that designate preferred arrival and departure runways. Because JAC has successfully implemented arrival and departure runways for noise abatement, this alternative is not considered further.
	Power and Flap Settings			◆	Yes, Chapter 7	Aircraft on approach generate noise from the landing gear and flaps being extended and these surfaces coming into contact with the air. As part of the RNP alternatives, reduced or delayed deployment of flaps and landing gear is integral to their design. This alternative is addressed in consideration of other RNP procedures in the Chapter 7.

## 6.8 Summary

The potential measures presented in this chapter are general in nature and provide a broad perspective of actions that could be recommended for further study and implementation and those actions that would have regulatory or other limitations. Those alternatives noted in this chapter are discussed further, along with additional alternatives, in Chapter 7 (operational alternatives) and Chapter 8 (land use alternatives).