DEPARTMENT OF THE AIR FORCE

Realistic Bomber Training Initiative

Final

Environmental Impact Statement **January 2000**

Volume I

In cooperation with the Federal Aviation Administration

The NEPA Process

NEPA – the National Environmental Policy Act of 1969 – is our national charter for protecting the environment. The goals of NEPA are to consider all appropriate environmental factors when making decisions, not basing decisions solely on technical and economic factors, involve the affected and interested public early in the environmental analysis process, seek less environmentally damaging ways to do our jobs, and document in plain language for the decisionmaker (in this case the Air Force) and the public the environmental process we used for RBTI. The product that we use to document our analyses is the Environmental Impact Statement, or EIS. This is the highest level of analysis prepared under NEPA and we are using it for RBTI. Compliance with NEPA guidance for our EIS preparation involved several critical steps:

1. *Announce that an EIS will be prepared*. For this EIS, a Notice of Intent was published on December 19, 1997, in the Federal Register.

2. *Conduct scoping*. This was the first major step in identifying the relevant issues to be analyzed in depth and eliminating the issues that were not relevant. Within this process we were very active in soliciting comments from the public, local governments, federal and state agencies, tribes, and environmental groups to ensure their concerns and issues about the proposed project were included in the analyses. For RBTI, the Air Force held scoping meetings in January and February 1998 in New Mexico, Texas, Arkansas, and Colorado. In addition, in December 1997, the Air Force sent over 100 Intergovernmental Interagency Coordination of Environmental Planning (IICEP) letters to announce the Air Force's proposal and planned scoping meetings and to request input from government agencies.

3. *Prepare a draft EIS.* The first comprehensive document for public and agency review was the draft EIS. This document examined the environmental impacts of the proposed project determined to be relevant from our scoping initiatives and analyzed all reasonable alternatives, as well as a No-Action alternative. Over 900 copies of the draft EIS were distributed to agencies, the public that had requested copies, and numerous repositories to ensure the widest dissemination possible. The draft EIS was also placed on a web site. After the notice of availability of the draft EIS was filed in the Federal Register and the document was distributed, we began a 90-day public comment period that extended to June 16, 1999.

4. *Have a public comment period.* Our goal during this process was to solicit oral and written comments about the draft EIS. We accomplished this by receiving comments through the mail as well as conducting public hearings. The public hearings were held at 11 communities in Texas, New Mexico, Colorado, and Arkansas. The hearings provided a feedback mechanism for the public and agencies to orally address or submit written comments directly to the Air Force. A total of 1,541 written and oral comments on the draft EIS were received by the Air Force. In the final EIS, we have provided written responses to all substantive oral and written issues submitted during the public comment period. As appropriate, clarification regarding substantive issues has been included in the final EIS. All of the issues documented as part of this phase are disclosed to the decisionmaker as part of the administrative record.

5. *Prepare a final EIS.* Following the public comment period, a final EIS was prepared. This document is a revision of the draft EIS, includes all public and agency comments and the Air Force's responses, and provides the decisionmaker a comprehensive review of the alternatives and their environmental impacts.

6. *Issue a Record of Decision (ROD).* The final step in the NEPA process is the ROD. It identifies which alternative has been selected by the decisionmaker and what measures will be carried out by the Air Force to reduce adverse impacts to the environment.

REALISTIC BOMBER TRAINING INITIATIVE

FINAL ENVIRONMENTAL IMPACT STATEMENT

Volume I

JANUARY 2000

COVER SHEET
ENVIRONMENTAL IMPACT STATEMENT
COVERING THE PROPOSED ALTERNATIVES
FOR THE REALISTIC BOMBER TRAINING INITIATIVE

a. *Responsible Agency:* U.S. Air Force.

b. *Cooperating Agencies:* Federal Aviation Administration (FAA) Southwest Region, Fort Worth Air Route Traffic Control Center (ARTCC), and Albuquerque ARTCC.

c. *Proposals and Actions:* This Environmental Impact Statement (EIS) evaluates the environmental effects associated with alternatives addressing the need to establish an Electronic Scoring Site (ESS) system to support realistic B-52 and B-1 bomber training operations within approximately 600 nautical miles of Barksdale and Dyess Air Force Bases (AFBs). The four Realistic Bombing Training Initiative (RBTI) alternatives consist of Alternative A: No-Action, Alternative B: IR-178/Lancer MOA, Alternative C: IR-178/Texon MOA, and Alternative D: IR-153/Mt. Dora MOA. Under the No-Action Alternative, bombers would continue to use existing airspace and existing Electronic Scoring Sites at current levels. Alternatives B, C, and D would each involve: (1) changes in structure and use of airspace; (2) closure of the Electronic Scoring Sites at Harrison, Arkansas, and La Junta, Colorado; and (3) construction of ten new emitter sites and two Electronic Scoring Sites. Airspace modifications include some new and eliminated airspace. Alternatives B and C lie almost wholly in western Texas, while Alternative D is located in northeastern New Mexico. Alternative B is both the Air Force's preferred alternative and the environmentally preferred alternative.

d. *For Additional Information:* Ms. Brenda Cook, RBTI EIS Project Manager, HQ ACC/CEVP, 129 Andrews Street, Suite 102, Langley AFB VA 23665-2769. Telephone inquiries may be made to the Dyess AFB Public Affairs office at (915) 696-2863.

e. *Designation:* Final Environmental Impact Statement.

f. *Abstract:* This final EIS has been prepared in accordance with the National Environmental Policy Act. This document includes analyses of the potential environmental consequences of the four RBTI alternatives to airspace and aircraft operations, land management and use, biological resources, cultural resources, socioeconomics, environmental justice, and soils and water. For the three action alternatives (B, C, and D), the findings indicate that impacts to airspace management, air safety, socioeconomics, environmental justice, cultural resources, and soils and water resources would be negligible to minimal. Alternative B would consist of approximately 85 percent existing airspace, Alternative C would be about 80 percent existing airspace, and Alternative D about 90 percent existing airspace. Aircraft noise levels would undergo an increase of 2 to 13 decibels in some parts of the proposed Military Training Routes associated with Alternative B and C airspace and 1 to 18 decibels in portions of the proposed Military Training Route for Alternative D airspace. Land management and use would not be affected, but Alternatives B and C would overfly two, and Alternative D thirteen special use land management areas (e.g., state parks, wild and scenic rivers) and expose these areas and their users to increased noise levels. Minimal acreage of Prime Farmland and Conservation Reserve Program land would be affected under all three action alternatives although it would not result in an irreversible change in land use. Negligible to minimal effects on biological resources would occur under Alternatives B and C. Both alternatives would result in continued and increased low-altitude overflights over estimated aplomado falcon historic range. The potential for an aircraft to disturb an aplomado falcon would be negligible, however, since 11 have been observed in the region since 1991. Alternative D would result in continued and increased low-altitude overflights of known or suspected habitat for federally listed threatened or endangered bird species: Mexican spotted owl and bald eagles. No cumulative impacts are expected. The Air Force has defined measures to mitigate impacts and management actions to address concerns raised by the public and agencies.

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Organization Of This Environmental Impact Statement

Our goal is to provide you with a document that is reader-friendly coupled with an in-depth, accurate analysis to help you fully understand all of our alternatives and their environmental impacts as they affect you. To ensure you understand all of the alternatives and their environmental impacts, we have synthesized the analysis in a concise document. We have also provided separate volumes for the appendices, supporting administrative documentation, and scientific data that are referenced throughout this document, as well as comments on the draft EIS and responses to those comments.

In addition, we have incorporated topical environmental analyses and their impacts into each resource area discussion as it applies—such as within airspace and aircraft operations or land management and use. The consolidation of all these external and internal influences that affect a resource area as it is discussed will hopefully provide you a concise understanding of each area in its entirety before reading the next resource area of discussion.

Throughout the document we have also introduced a sidebar column to pull out pertinent information or definitions that will allow you to remain focused while you read. Our sidebars will help to minimize the amount of flipping between definition pages or appendices, focus attention to key facts, and ultimately enhance the flow of this document. For your convenience, a glossary and a keyword index are found in Chapters 9 and 11, respectively.

For readers who want to quickly review and compare the impacts from the different alternatives, there are summary tables at the end of Chapter 2 and at the end of each resource discussion in Chapter 4.

Comments submitted by the public and agencies during the comment period and the Air Force's responses to these comments are in Volume II. An index allows each reader to review the responses to the comments he or she submitted. The appendices are contained in Volume III.

This EIS focuses on the resources potentially affected by the RBTI proposal. Additionally, we addressed issues raised by the public and agencies during the scoping and public comment processes. Based on these issues, the EIS includes the following sections:

EIS Section	**Title**	**Resources/Topics Covered**
4.1	Airspace and Aircraft Operations	Airspace management and use; aircraft noise; aircraft safety; aircraft emissions and air quality
4.2	Land Management and Use	Land use; land ownership; recreation; visual resources; special use land management areas
4.3	Biological Resources	Vegetation; habitat; wildlife; threatened and endangered species; livestock
4.4	Socioeconomics and Environmental Justice	Employment; revenue; population
4.5	Cultural Resources	Archaeological and historic sites; Native American traditional resources; Indian reservations and pueblos
4.6	Soils and Water Resources	Erosion; water use, availability, and quality; fugitive dust

In response to public and agency input, and due to review of Air Force requirements, the final EIS includes the following noteworthy clarification and changes:

EIS Section	Title	Clarification/Change
2.2	Description of Study Area	Elimination of MTR IR-102/141 and its sortie-operations from baseline and projected conditions.
2.4	Action Alternatives	Summary of the preferred alternative and environmentally preferred alternative.
2.6	Measures to Address Environmental Effects and Community/Agency Concerns	Listing of proposed mitigation measures and management actions to address public and agency concerns.
4.1	Airspace and Aircraft Operations	Refinement of data on noise levels resulting from elimination of IR-102/141 and its sortie-operations.
4.3	Biological Resources	Clarification of FWS consultation, addition of information on data sources used in the biological resources analysis, and enhancement of the discussion of overflight effects on wildlife.
Appendix B	Sortie-Operations	Elimination of MTR IR-102/141 and its sortie-operations from baseline and projected conditions.
Appendix E	Field Survey Results	Clarification of survey methods for Candidate Emitter Sites and Electronic Scoring Sites.
Appendix G	Noise	Additional description of overflight effects on wildlife and livestock.
Appendix H	Biological Support Documentation	Updating Federally listed threatened, endangered, and sensitive species table with the most current information.
Appendix K	Preferred Alternative Selection	Methods for identification of preferred and environmentally preferred alternatives.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This Environment Impact Statement (EIS) evaluates the environmental effects associated with a proposal to establish realistic bomber training assets within approximately 600 nautical miles (nm) of Barksdale AFB in Louisiana and Dyess AFB in Texas. The Realistic Bomber Training Initiative, or RBTI, proposes to establish linked military airspace and ground-based assets to support realistic training. For this proposal, the training airspace and ground-based assets would be arranged to provide a sequence of training activities that mirror combat missions. The Air Force proposes to use existing assets and establish new assets in either western Texas or northeastern New Mexico to support aircrews from Barksdale and Dyess AFBs. Aircrews currently cannot conduct needed training without flying long distances and wasting valuable training time. Existing airspace and other training components closer to these bases lack realism and do not allow realistic, integrated training. RBTI would allow B-52 and B-1 aircrews to receive needed combat training and maximize combat training time.

Clarifications and Changes in the EIS

This final EIS is a revision of the draft EIS. The clarifications and changes in this final EIS stem from three sources. First, the Air Force reexamined its requirements for B-52 and B-1 training to ensure the EIS reflected the most up-to-date concepts for training. Second, the Air Force evaluated recent changes to the expected structure and eliminated use of secondary military training routes (MTRs) (IR-102/141) that interact with RBTI primary airspace. Third, the Air Force made clarifications and changes in response to public and agency comments on the draft EIS. The following highlights these clarifications and changes in the EIS.

The most substantive set of clarifications and changes is related to secondary MTRs, IR-102/141. In Section 2.2 of the draft EIS, the Air Force anticipated that changes to the structure and use of IR-102/141 would occur, so it reflected these changes under baseline conditions. As secondary MTRs, IR-102/141 overlapped or intersected 12 segments of IR-178 and added almost 1,100 sortie-operations in the affected areas for Alternatives A, B, and C. The Air Force, subsequent to the public comment period, withdrew the proposed changes to IR-102/141. This means that IR-102/141 reverts to its current structure. Currently, the charted location of IR-102/141 overlaps or intersects with five segments, but it has never supported any aircraft sortie-operations.

The final EIS reflects the reversion of IR-102/141 to its currently charted structure and eliminates 1,094 sortie-operations from baseline and projected conditions. Zero sortie-operations are attributed to IR-102/141 and total sortie-operations for IR-178 under alternative A (segments AB-KL and CDCE), B (segments AB-KL and ST), and C (segments AB-KL and ST) have been reduced. These reductions in total sortie-operations also result in decreases in cumulative noise levels, air emissions, numbers of average daily overflights, and other potential impacts. All topics affected by the changes to IR-102/141 have been updated in the final EIS.

In accordance with NEPA and Council on Environmental Quality (CEQ) guidelines, the Air Force identified preferred and environmentally preferred alternatives. Section 2.4 of this final EIS incorporates a summary of the methods used to identify these alternatives and the results of the process. Appendix K, which details the identification process, has been added to the supporting documentation for the EIS.

Certain topics concerning biological resources (section 4.3) also received clarification. Additional information on the data sources used in describing the affected environment is now incorporated into the EIS. Similarly, additional information on past studies of overflight effects on wildlife and livestock is included in section 4.3 and Appendix G.

Purpose and Need for the Realistic Bomber Training Initiative

During the Cold War, the primary combat mission of B-52 and B-1 bombers was long-range, nuclear strategic attack. Today, the bombers' role has changed; the primary mission is worldwide tactical operations, including attacks into enemy territory, support of ground troops, neutralizing enemy air defenses, and supporting maritime operations. This shift in emphasis has broadened the requirements for bomber aircrew mission readiness and training.

The Air Force's philosophy is to match training to meet the diversified demands of any future conflicts. To ensure that bomber aircrews possess the skills and readiness for combat, they must conduct realistic training that: 1) mirrors activities used in combat, 2) links a realistic sequence of training activities into a cohesive mission, and 3) hones aircrew teamwork. To conduct realistic training that emphasizes teamwork and combat situations, bomber aircrews need linked airspace and ground-based assets collectively defined as an Electronic Scoring Site (ESS) system composed of:

- Ground-based assets known as electronic emitters that simulate enemy threats from surface-to-air missiles, anti-aircraft artillery, and radar;

- Ground-based assets called Electronic Scoring Sites that can score simulated ordnance delivery and the effectiveness of electronic combat measures performed by aircraft; and

- Training airspace, principally composed of a military training route (MTR) and a military operations area (MOA) with an overlying Air Traffic Control Assigned Airspace (ATCAA), where aircrews perform their required training activities at high, medium, and low altitudes.

In short, bomber aircrews need the proper training assets arranged and sequenced in a way that provides realism and is located close enough to the using base to ensure wise use of valuable flying time.

Current training opportunities for the bombers from Barksdale and Dyess AFBs do not fulfill these needs. Three problems exist with the airspace and training components available to the bombers from these bases. First, electronic training facilities close to the bases lack an MTR that provides the terrain variability for effective terrain following and avoidance training. Second, the two ESS systems within the United States that provide linked, sequenced combat training are so distant and require such long transit times that the amount of training received versus flight time expended makes their daily use impractical. Third, training assets within reasonable distance of the bases are not linked in a system that allows realistic sequencing of events. This makes it necessary to fly to several locations of varying distances to complete mission requirements and results in piecemeal, unrealistic training interspersed with low-value transit time.

The Air Force has proposed RBTI to overcome these problems and provide the realistic, integrated training necessary to develop the combat skills bomber crews need now and will need in the future.

Meeting the Need for Realistic Bomber Training: the Proposed Action

The proposed action is to establish a set of linked training assets comprising an ESS system to provide realistic bomber training close enough to Barksdale and Dyess AFBs to efficiently use limited flying hours. This ESS system would be located within approximately 600 nm of Barksdale and Dyess AFBs and would involve the following components:

- Creating an MTR that offers variable terrain for use in terrain following and terrain avoidance, overlies lands capable of supporting electronic threat emitters and electronic scoring sites, permits flights down to 300 feet above ground level (AGL) in some segments and links to a MOA.
- Creating a MOA measuring at least 40 by 80 nm with a floor altitude of 3,000 feet AGL and extending to 18,000 feet above mean sea level (MSL) used for simulated attacks and avoiding simulated threats.
- Creating an ATCAA above the MOA at 18,000 to 40,000 feet MSL to be used for high-altitude training.
- Establishing a set of five locations (15 acres each) for placing electronic threat emitters under or near the MTR corridor and five locations (15 acres each) for placing electronic emitters under or near the MOA that would simulate the variety of realistic threats expected in combat.
- Constructing two Electronic Scoring Sites co-located with operations and maintenance centers, one under or near the MTR corridor and the other en route from the bases to the MTR and MOA.
- Decommissioning two existing Electronic Scoring Sites in Harrison, Arkansas, and La Junta, Colorado.

There are three alternative locations that could fulfill the need defined under the proposed action. *Alternative B: IR-178/Lancer MOA* and *Alternative C: IR-178/Texon MOA* are almost entirely in western Texas with only a small portion of airspace extending into New Mexico. *Alternative D: IR-153/Mt. Dora MOA* is located primarily in northeastern New Mexico with portions of the MTR extending into northwestern Texas. All three action alternatives (B, C, and D) predominantly coincide with existing MTR or MOA airspace; little area not currently exposed to overflights would be affected. Under *Alternative A: No-Action*, the Air Force would continue using existing assets and airspace would remain unchanged. All three action alternatives meet operational goals defined for RBTI. Based on the analysis presented in this EIS, agency input, and public comments, the Air Force deemed Alternative B to be preferable to Alternatives C and D. Alternative B meets all operational requirements with somewhat less potential for environmental impacts than Alternatives C and D. Therefore, Alternative B has also been identified as the Air Force's environmentally preferred alternative. Appendix K presents the methods and results of the process used for identifying the preferred and environmentally preferred alternatives.

Environmental Consequences

This EIS presents the existing environmental and potential environmental consequences that could result from each alternative. Public involvement focused the analysis on six resource categories. Issues of primary concern to agencies and the public included potential impact of noise on humans, livestock, and wildlife from aircraft overflight; conflict with local aviation; potential degradation of aircraft safety; and the potential to alter the quality of life. Each of the six resources and the anticipated environmental consequences are summarized below. Table 2.6-1 in Chapter 2 presents a detailed comparison of alternatives for all resources.

Potential Effects of RBTI Alternatives

EIS Section	*Resource*	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
4.1	Airspace and Aircraft Operations	⊗	♦	♦	♦♦[1]
4.2	Land Management and Use	⊗	♦	♦	♦♦
4.3	Biological Resources	⊗	⊗	⊗	♦
4.4	Socioeconomics and Environmental Justice	⊗	⊗	⊗	⊗
4.5	Cultural Resources	⊗	⊗	⊗	⊗
4.6	Soils and Water Resources	⊗	⊗	⊗	⊗

⊗ = Negligible/inconsequential effects
♦ = Potential adverse effects
♦♦ = Magnitude of potential adverse effects
[1] = Applies to noise

Analysis indicates that the potential exists for impacts within three resource categories: Airspace and Aircraft Operations, Land Management and Use, and Biological Resources.

Airspace and Aircraft Operations

Airspace use is regulated and managed by the Federal Aviation Administration (FAA) through the use of air traffic control procedures and separation criteria, flight rules, and airspace use designations. Historically, the affected airspace has been able to accommodate aircraft overflights, military flight training activities, and civil aviation. Existing airspace would be used to the maximum extent possible for proposed MTRs and MOAs; however, under all action alternatives some airspace would be eliminated and new airspace added. Under action Alternatives B and D, airspace management would remain similar to that found today. The potential for conflicts with civil aviation would not be significant, although coordinating with cloud seeding, crop dusting, and other similar management activities would require increased attention and resources. FAA input revealed Alternative C to have substantive conflicts with federal jet routes. These conflicts would require changes in airspace management and could reduce the proposed Texon MOA's usefulness for training.

Operations within military airspace would increase under all action alternatives. However, for Alternatives B and C, average daily overflights would range from 1 to 10, depending upon the segment of the MTR. This would not represent a substantial increase (1 to 6 sortie-operations) from recent or historic airspace use. Under Alternative D, average daily overflights would range from 1 to 24 (depending upon the segment) per day with an increase of 1 to 10 sortie-operations. Noise levels would range from less than 45 to 61 DNL for Alternative A, from 46 to 61 DNL for Alternatives B and C, and from less than 45 to 64 DNL for Alternative D. DNL, the Day-Night Average Sound Level, is used to assess aircraft noise and is the most widely accepted metric for this purpose. There would be a 1 to 18 dB increase in noise levels in the Alternative D affected area with a 2 to 13 dB increase in Alternatives B and C. Effects from aircraft emissions and the potential for aircraft mishaps would be inconsequential for all alternatives.

Results of the noise analysis indicate an increase in the potential for the percentage of people highly annoyed by aircraft noise under all three action alternatives. For Alternatives B and C, the percentage of highly annoyed people could rise to a maximum of 8 percent; for Alternative D, it could increase to a maximum of 11 percent for some affected segments. While this analysis suggests that roughly 90 percent of the population would potentially not be highly annoyed, individual responses to aircraft noise vary. Under the proposed MOAs, approximately 1 percent of the people could be highly annoyed.

Land Management and Use

Land management and use focus on designated land use, recreation, and the visual setting. Overall, there would be no likely effects to land use, recreation, or visual resources for any of the alternatives. Increases in noise levels from aircraft could be perceived by some people as affecting their quality of life. Six communities under Alternative B would experience increases in noise levels of 2 to 8 dB; five communities under Alternative C would have increases of 4 to 5 dB; and four communities under Alternative D would have increases of 10 to 16 dB. Estimated populations under the proposed airspace vary for each alternative: Alternative B-50,300 people; Alternative C-22,800 people; and Alternative D-11,900 people. Under Alternative D, 13 special use land management areas, including the Rio Grande Wild and Scenic River, would experience increases in noise levels of 4 to 17 dB. Under Alternatives B and C, no special use land management areas would have increases in noise levels of more than 3 dB.

Biological Resources

The biological resources section addresses potential impacts on vegetation and wildlife, including threatened, endangered, and sensitive plant and animal species. Consultations with regional wildlife experts and literature reviews were conducted to collect biological baseline data. Potential effects to biological resources could occur from aircraft overflights or from construction or ground operations. However, field surveys at the candidate emitters and Electronic Scoring Sites did not identify any threatened, endangered, or sensitive plant or animal species; therefore, construction and ground operations would not impact these species. Total acreage disturbed by construction under Alternatives B, C, and D is less than 20 acres for each alternative.

Under all three action alternatives, segments of MTRs would exist over regions with the potential to support threatened, endangered, or sensitive species. Under Alternatives B and C, increased overflights would occur over estimated historic aplomado falcon habitat, but only 11 aplomado falcons have been observed in the region since 1991. For Alternative D, segments of MTR airspace would lie over regions that support a number of threatened and endangered species, including wintering and nesting bald eagles and potential habitat for Mexican spotted owls and mountain plovers. The Air Force has consulted with the U.S. Fish and Wildlife Service (FWS) on the Endangered Species Act issues associated with RBTI. After discussion with the FWS, the Air Force has determined that aircraft flights on portions of MTRs associated with the action alternatives may affect, but are not likely to adversely affect threatened and endangered bird species, and is currently seeking FWS concurrence with that determination.

Socioeconomics and Environmental Justice

The analysis of socioeconomics consists of an examination of the social and economic activities associated with the human environment. Economic activity includes employment, personal income, and population. The economic activities in the counties where the Electronic Scoring Sites would be constructed and the existing Electronic Scoring Sites decommissioned were analyzed. Socioeconomic impacts in the affected counties from decommissioning existing Electronic Scoring Sites or constructing new emitters and Electronic Scoring Sites would be minimal (less than 1 percent). The effects of flying activities are not expected to produce measurable impacts on the economic value of the land since this area has been generally overflown since the 1940s. Other factors, such as drought, market prices, community amenities, and proximity to urban areas, are more likely to affect land values than military aircraft overflights.

The environmental justice analysis established that no adverse impact would occur because none of the proposed airspace exceeds a noise level over 65 DNL. The use of 65 DNL as a guideline for the evaluation of environmental justice issues is consistent with the intent of Executive Order 12898. This noise measure comprised one of several criteria considered individually and collectively to assess effects on environmental justice. Because there would be no adverse impact from noise, employment, or facility-related actions, no further environmental justice analysis was necessary.

Cultural Resources

Cultural resources include prehistoric or historic districts, sites, buildings, or objects important to a culture or community. Cultural resources are classified as archaeological sites, architectural resources, and traditional cultural properties. Field surveys of all candidate emitters and Electronic Scoring Sites identified cultural resources potentially affected by construction and ground operations. One archaeological site could be affected under Alternative B, two under Alternative C, and five under Alternative D. However, impacts to these sites could be avoided in most cases or mitigated through completion of the Section 106 process of the National Historic Preservation Act. Existing research and consultation with appropriate Native American tribes provided information on resources within the affected airspace. Although 6 to 15 National Register-listed properties could be overflown, overflights would occur in areas already subject to military aircraft overflights and aircraft would not create a new visual or audible feature in an otherwise historic or traditional landscape. Under Alternative D noise levels over National Historic Landmarks would increase by 1 to 17 dB. Noise would not reach levels likely to damage structures. Therefore, the effects of visual or audible intrusions or damage from noise or vibrations would be negligible. Additional cultural resources under the airspace may be eligible for the National Register. To have the potential to be affected by the noise and visual intrusions of airspace use, the setting of such resources must be an integral characteristic of its eligibility. Since the analysis demonstrated that RBTI would not affect these characteristics of resources already listed on the National Register, it may be presumed that other eligible resources would also be unaffected.

Soils and Water Resources

The soils and water resources section addresses soil and bedrock materials, including paleontological resources, as well as surface and groundwater resources. Estimated soil loss during construction would not exceed 5 tons per candidate emitter or Electronic Scoring Site on any of the action alternatives. Fugitive dust would not exceed 0.4 tons for emitter sites and 2.0 tons for Electronic Scoring Sites. Proper management would be followed to reduce effects of any potential short-term wind and water erosion of surface soils to insignificant levels. Landowners would retain control of any mineral or water rights. No long-term impacts to water resources would occur as a result of construction or use of the Electronic Scoring Sites or emitters.

Cumulative Effects

Past, present, and future actions that could result in cumulative effects with RBTI include several Air Force actions. These past and present actions involve use of airspace either directly included in, overlapping, or intersecting one of the RBTI action alternatives. Flight operations of each of these actions have been incorporated into the analysis in this EIS as part of the conditions in the affected airspace environment for the relevant action alternative and then incorporated into the analysis for each alternative. The cumulative effects analysis indicates that none of the future actions would add to the impacts resulting from RBTI.

CHAPTER 1

PURPOSE AND NEED
FOR THE PROPOSED ACTION

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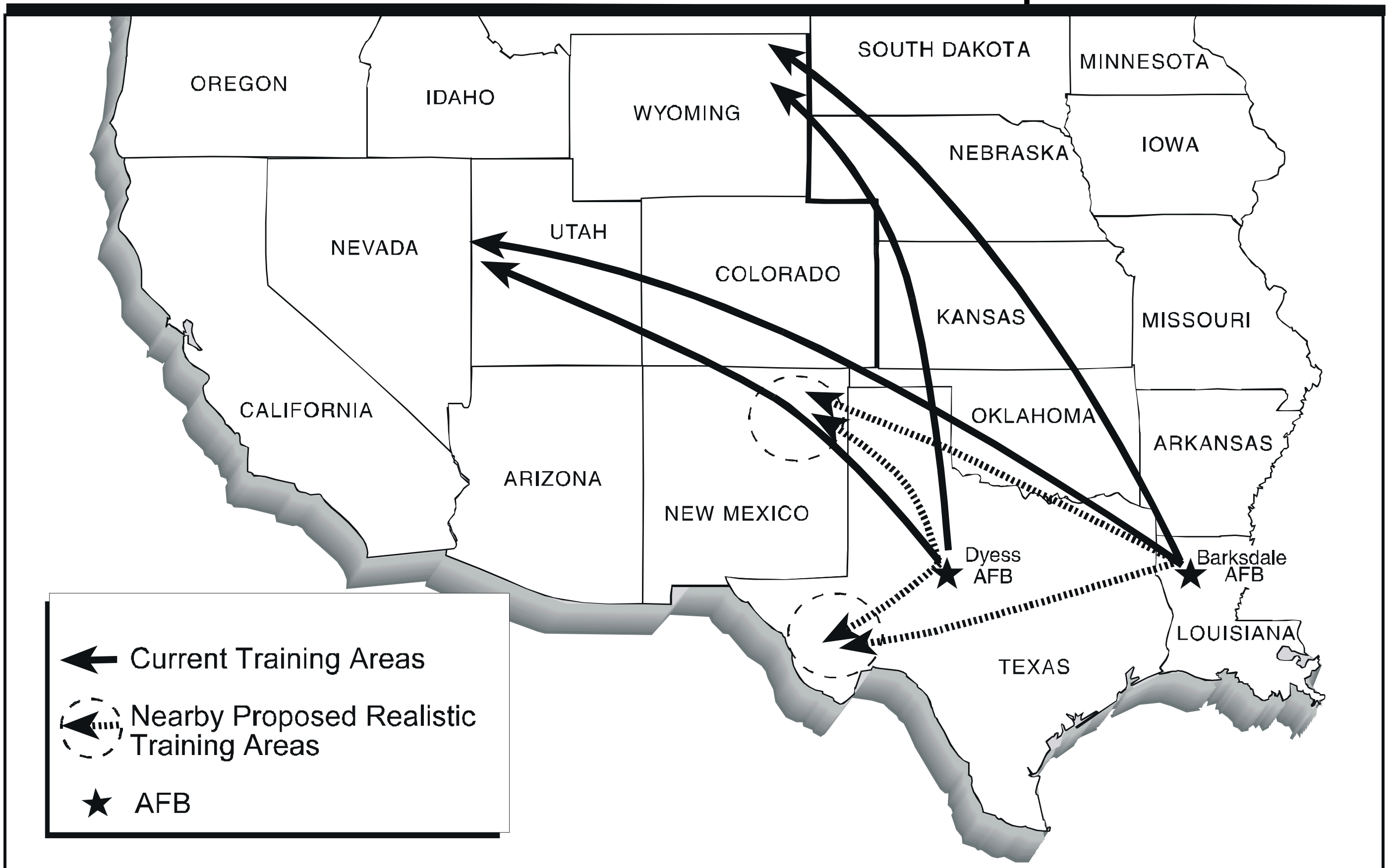
PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 INTRODUCTION

The United States Air Force (Air Force) seeks to improve realistic training for B-52 and B-1 bomber aircrews stationed at Barksdale Air Force Base (AFB), Louisiana, and Dyess AFB, Texas, respectively (Figure 1.1-1). Currently, these crews must fly very long distances to conduct needed realistic training. The flight time required to reach these areas results in inefficient use of available flying hours. Existing airspace and other training assets closer to these bases are scattered and lack realism. The Realistic Bomber Training Initiative (RBTI) would allow B-52 and B-1 aircrews to receive required mission training and maximize combat training time. The RBTI is a proposal to develop an Electronic Scoring Site (ESS) system consisting of airspace and ground-based assets that provide a sequence of training activities resembling combat. Specifically, the Air Force proposes to establish and modify airspace and ground-based facilities in either western Texas or northeastern New Mexico to support realistic, integrated training.

Realistic training mirrors the type of situations aircrews will face during combat.

Integrated aircrew training is achieved when all members are working as a team to perform training activities in sequence with the speed and pace of combat.



Current and Proposed Realistic Bomber Training Areas for Barksdale and Dyess AFBs

Figure 1.1-1

1.2 BACKGROUND

1.2.1 Bomber Aircrews Train for a Variety of Missions

The overriding objective of any military force is to be prepared to conduct combat operations in support of national political objectives. Aerospace power, capabilities in the air and in space, can rapidly provide the nation's leaders a full range of military options for meeting national objectives and protecting national interests. Responsiveness, range, and combat capability make our bomber force a key asset in national defense.

During the Cold War, the primary combat mission of the B-52 and B-1 bombers was long-range, nuclear attack. Their secondary mission was an array of conventional operations that included bombing enemy transportation systems, troop concentrations, airfields, air defense facilities, and other similar targets. Today, the bombers' primary role has changed; the primary mission is worldwide, rapid-response operations. This shift in emphasis has broadened the requirements for bomber aircrew readiness and training. However, secondary missions are still needed.

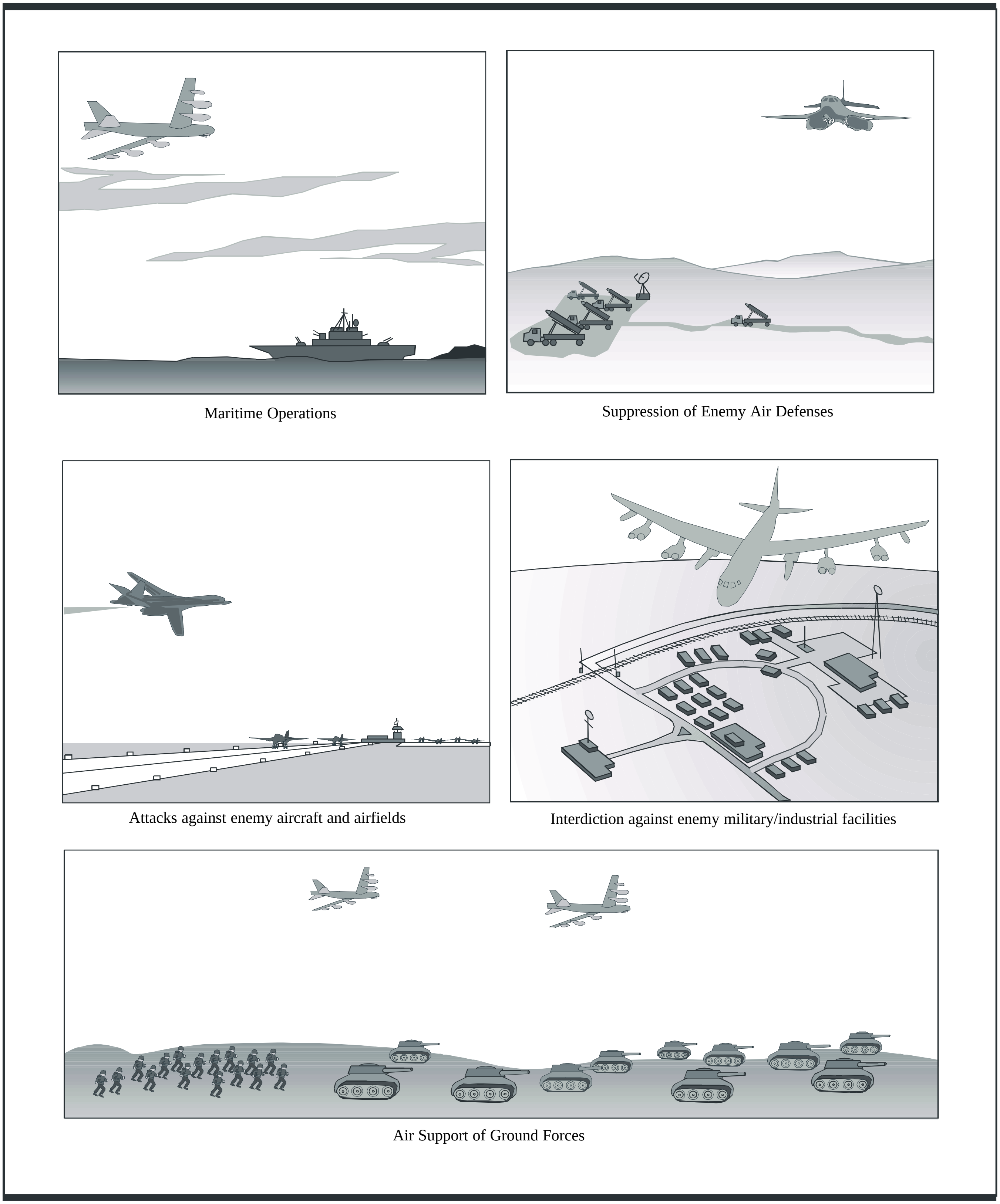
Ordnance is any item carried by an aircraft for dropping or firing (i.e., chaff, flares, bombs). All ordnance delivery for RBTI would be electronically simulated.

Bombers now have a varied range of mission responsibilities (Figure 1.2-1), each involving different targets, weapons, situations, altitudes, and flight profiles. These missions range from supporting maritime operations (e.g., laying mines from the air) to interdiction (e.g., bombing military industries deep in enemy territory). Bomber aircrews must perform all their missions using teamwork to penetrate enemy air defense systems, fly the aircraft into the proper position for releasing ordnance, and maintain the aircraft's geographic position and timing to stay in formation with other aircraft. Difficult decisions must be made in split seconds to determine if a maneuver will move the bomber out of position preventing ordnance release or putting the aircraft within range of enemy missiles or guns. Added challenges include complicated missions occurring at night, under bad weather conditions, or in mountainous terrain. To survive combat, aircrews must conduct training simulating these situations to the greatest degree possible. Not only must aircrews within individual aircraft work together in a closely coordinated manner, they must often function as part of a larger composite force composed of 40 or more different aircraft, each with a specific mission goal.

Computer simulators alone cannot replicate the problems and teamwork needed for realistic training.

Fundamental bomber combat missions involve a range of activities, including air refueling, high-altitude flight to the combat theater, entry into enemy territory, avoidance of enemy threats, delivering ordnance, and returning safely to base. These activities can occur at a variety of altitudes, depending upon the mission. Despite mission differences, bomber aircrews must always navigate accurately to the combat theater and target(s), avoid or neutralize enemy air defenses, deliver the ordnance on time and on target, and survive. In its simplest terms, combat is about defeating the enemy and preventing harm to U.S. and allied forces. When aircrews enter combat, they risk their lives. To reduce that risk and increase the chance for a successful mission, bomber aircrews need the most realistic training possible.

In the Gulf War, bombers performed long-range, low- and high-altitude attacks on communication and industrial facilities in Iraq and later provided support to ground forces by bombing the entrenched Republican Guards. More recently, bomber aircrews from Barksdale and Dyess AFBs flew halfway around the world to launch cruise missiles and other ordnance at facilities for weapons of mass destruction in Iraq. Each time these aircrews entered the Iraqi theater, they needed to be ready for any threat or contingency. A different set of threats faced B-52 and B-1 aircrews recently in Kosovo. This variation in threats underlies the need for flexible realistic training.



B-52 and B-1 Aircraft Missions

Figure 1.2-1

Bombing Interdiction in Iraq

Currently, bombers are an integral part of the Air Expeditionary Force concept. The Air Expeditionary Force mission is to provide theater commanders with rapid, responsive, and reliable airpower in their area of responsibility. Bombers provide the speed, mass, and long reach needed to rapidly halt an enemy's advance during the initial phases of an attack. To accomplish this mission, bomber aircrews must be constantly prepared to respond to global events. Since 1995, as part of the Air Expeditionary Force, bombers have deployed numerous times to fly Operation Southern Watch combat missions with coalition forces, enforcing the no-fly zone south of the 33rd parallel in southern Iraq.

1.2.2 Bomber Combat Roles Define Training Requirements

Bomber combat missions vary day-to-day as enemy locations, targets, air defenses, and objectives change. For one mission, a bomber aircrew could be tasked to perform high-altitude bombing of an enemy's fuel depot; the next mission could involve a low-altitude attack on enemy troop concentrations. Each combat mission involves a number of different aircraft performing a precisely timed and planned sequence of events. Failure by a single aircraft to achieve the necessary timing, coordination, and positioning could jeopardize an entire mission. Each combat mission is unique, so aircrews must be fully trained to accomplish a wide variety of tasks.

The types of bomber missions and tactics also vary from time to time as a result of changes in world situations, increases in enemy capabilities, and advances in our own aircraft and weapons. Air Force personnel must consistently adapt and train to meet the challenge of these changes. Such changes can influence the altitude at which aircraft fly, the types of ordnance used, the tactics used in attacking targets and avoiding threats, and other aspects of combat missions. Because the Air Force needs to respond to such changes, aspects of aircrew training can vary from year to year. Preparing for these varied missions means that aircrews must have flexibility in training to respond to evolving global situations.

1.2.3 Successful Combat Missions Require Realistic, Integrated Training

Integrated aircrew training is achieved when all members of the crew are working together as a team to perform the events and activities in sequence and with the speed and pace of combat. Integrated, realistic training requires a combination of airspace and ground-based assets that are linked and arranged to provide a sequence of events most like combat. In order to achieve realistic, integrated training, the Air Force has structured bomber training to correspond to typical combat mission events (Table 1.2-1).

Table 1.2-1 Realistic Bomber Training is Derived From Combat		
Event Sequence	*Combat Event Description**	*Training Activities*
Event No. 1	Fly high altitude to refueling rendezvous; locate and join tanker aircraft; refuel and fly to combat	◆ Navigation and communication ◆ In-flight rendezvous with tanker aircraft ◆ Aerial refueling along an established track ◆ Formation flying
Event No. 2	Enter combat airspace; coordinate with command and control (e.g., Airborne Warning and Control Systems [AWACs]); join other aircraft in "strike package" conducting mission	◆ High and/or low altitude navigation ◆ Defensive tactics against airborne and ground threats - Aircraft maneuvering - Terrain following/terrain avoidance - Electronic countermeasures - Course deviations (lateral and vertical) - Airspeed changes - Communication ◆ Formation flying
Event No. 3	Fly to initial point of attack; avoid ground-based threats; attack target and deliver ordnance (i.e., bombs or missiles)	◆ Defensive tactics against airborne and ground threats - Aircraft maneuvering - Terrain following/terrain avoidance - Electronic countermeasures - Course deviations - Airspeed changes - Communication ◆ Ordnance delivery - High/low altitude delivery (actual or simulated) ◆ Formation flying
Event No. 4	Exit target area; rejoin returning "strike package"	◆ Navigation and communication ◆ Defensive tactics against airborne and ground threats - Aircraft maneuvering - Terrain following/terrain avoidance - Electronic countermeasures - Course deviations - Airspeed changes ◆ Formation flying
Event No. 5	Exit combat airspace and return to base	◆ Navigation and communication ◆ In-flight rendezvous with tanker aircraft ◆ Aerial refueling along an established track ◆ Formation flying
*Assumes a takeoff and landing as part of the overall mission.		

A sortie consists of a take-off, flying mission, and landing by a single military aircraft.

A sortie-operation is the use of one airspace area (e.g., MOA, MTR) by one aircraft. During a single sortie, an aircraft may conduct several sortie-operations.

Realistic, integrated training ensures that bomber aircrews possess the skills and readiness for combat that: (1) mirrors combat events, (2) links a realistic sequence of training activities into a cohesive mission, and (3) hones aircrew teamwork. In other words, each training sortie (whether an individual aircraft or as part of a larger exercise) should involve realistic, linked, and sequenced activities that equate to combat events.

1.3 CURRENT TRAINING OPPORTUNITIES ARE NOT REALISTIC OR EFFICIENT

An MTR is a corridor of airspace established for conducting military flight training.

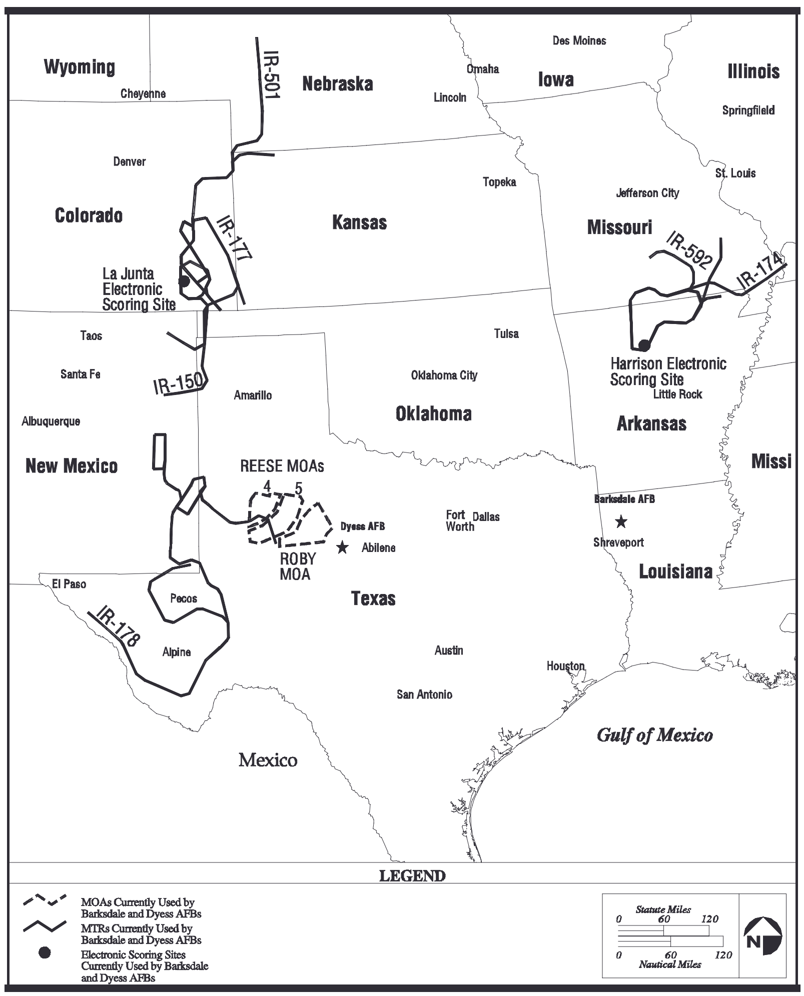
A MOA is airspace established to separate military activities from nonparticipating air traffic operating under instrument flight rules.

An ATCAA is airspace normally overlying a MOA assigned by air traffic control to separate nonhazardous military activities from other aircraft.

Bombers have been training in western Texas and northeastern New Mexico since the 1940s. All B-1 aircrews are trained initially at Dyess AFB, while all B-52 aircrews are trained initially at Barksdale AFB. In addition to bombers, F-16s, F-18s, T-38s, and numerous other aircraft use the airspace in western Texas and northeastern New Mexico.

The B-52 and B-1 bombers from Barksdale and Dyess AFBs presently use airspace and ranges throughout the western U.S. However, in terms of the frequency of use, they primarily use the Military Training Routes (MTRs), Military Operations Areas (MOAs), and associated Air Traffic Control Assigned Airspace (ATCAAs) of western Texas and northeastern New Mexico; Electronic Scoring Sites at Harrison, Arkansas, and La Junta, Colorado; and the remote ranges and ESS systems in other areas of the west (Figure 1.3-1).

Training currently is conducted at two existing Electronic Scoring Sites and two existing ESS systems. Only the two Electronic Scoring Sites are located near Barksdale and Dyess AFBs: Harrison in Arkansas, and La Junta in Colorado. The ESS systems with integrated airspace and ground-based assets are located more than



Training Areas Most Frequently Used by Bombers from Barksdale and Dyess AFBs

Figure 1.3-1

900 nautical miles (nm) from Barksdale AFB at Granite Peak in Utah and Belle Fourche in South Dakota. In addition to the Electronic Scoring Sites and ESS systems, ranges like Nellis Air Force Range in Nevada, Utah Test and Training Range (UTTR), and Smoky Hill Range in Kansas provide training in the use of tactics and ordnance delivery.

The use of these training assets varies from year to year depending upon the number of flying hours allocated, changes in training and tactics, mission deployments to other areas, and limitations in supplies and maintenance requirements. For example, variations in use occurred within Reese 4 and 5 and the Roby MOAs located in western Texas. Several years ago, T-38s or other trainers used these areas for pilot training; hundreds of flights took place in these MOAs each year. Today, T-38s do not use the MOAs, and they are used infrequently by other aircraft.

Units from Barksdale and Dyess AFBs use five MOAs in western Texas and eastern New Mexico: Reese 4 and 5, Texon, Mt. Dora, and Roby. Other MOAs used during bomber training are dispersed across the western U.S. These MOAs and their associated ATCAAs provide maneuvering airspace for air-to-air training, simulated air-to-ground activities, and access to nearby ranges. Bombers also use MTRs: two associated with Harrison Electronic Scoring Site (IR-174, IR-592), three associated with La Junta Electronic Scoring Site (IR-177/501, IR-150), and one in western Texas (IR-178).

Three major problems exist with the airspace and other training assets available to the bombers from Barksdale and Dyess AFBs. First, the Harrison and La Junta Electronic Scoring Sites closer to the bases lack terrain variability and a linked system of airspace and ground-based assets needed to be an ESS system that provides realistic combat training. Second, those ESS systems at Belle Fourche and Granite Peak that provide for linked and sequenced combat training are distant from the bases, requiring long transit times. Such long transit times contribute little to combat training and do not efficiently use valuable flight hours. Third, the current locations and arrangement of realistic training assets force aircrews to use available flight time to fly to and among realistic assets, causing disjointed training and decreasing realistic combat training time.

1.3.1 Nearby Training Assets Do Not Support Realistic Combat Training

Existing airspace and ground-based assets located in the region surrounding Barksdale and Dyess AFBs do not provide realistic bomber training. For instance:

- the Electronic Scoring Sites closer to the bases lack terrain variability and adequate training airspace;
- those areas surrounding the two bases with attributes crucial to realistic training, such as variable terrain, lack an ESS system to support simulated ordnance delivery and realistic electronic combat training; and
- MTRs and MOAs in the region are neither linked to allow integrated training nor associated with an ESS system.

The airspace and ground-based assets in the region are separated, so aircrews can conduct only parts of a training mission (e.g., low-altitude training and electronic scoring) during any one training sortie. Aircrews cannot accomplish all the training activities needed to form a single integrated combat training mission during a single sortie; instead aircrews must achieve their training piecemeal during multiple sorties, thus wasting limited flying hours (Figure 1.3-2). Likewise, aircrews cannot perform the linked sequences of training activities that are necessary for combat readiness (Figure 1.3-2).

1.3.2 Flight Restrictions Minimize the Training Value of Existing Electronic Scoring Sites

Currently, the Air Force supports two Electronic Scoring Sites and two ESS systems throughout the nation. The two ESS systems, Granite Peak in northwestern Utah and Belle Fourche in South Dakota, lie too far from Barksdale and Dyess AFBs to permit frequent, realistic training (see discussion below). The two Electronic Scoring Sites, Harrison in north central Arkansas and La Junta in southeastern Colorado, are within 1 to 2 hours flight time from the bases. At La Junta, the underlying lands do not have the variable terrain needed for realistic terrain masking and terrain avoidance training, nor does the Electronic Scoring Site have an associated MOA and ATCAA. The amount of suitable terrain and airspace also minimizes the training value of the Electronic Scoring Site at Harrison. Neither of these Electronic Scoring Sites fulfills the training needs for Barksdale and Dyess AFBs.

1.3.3 Flight Time to and among Existing Training Assets Reduces Available Combat Training Time

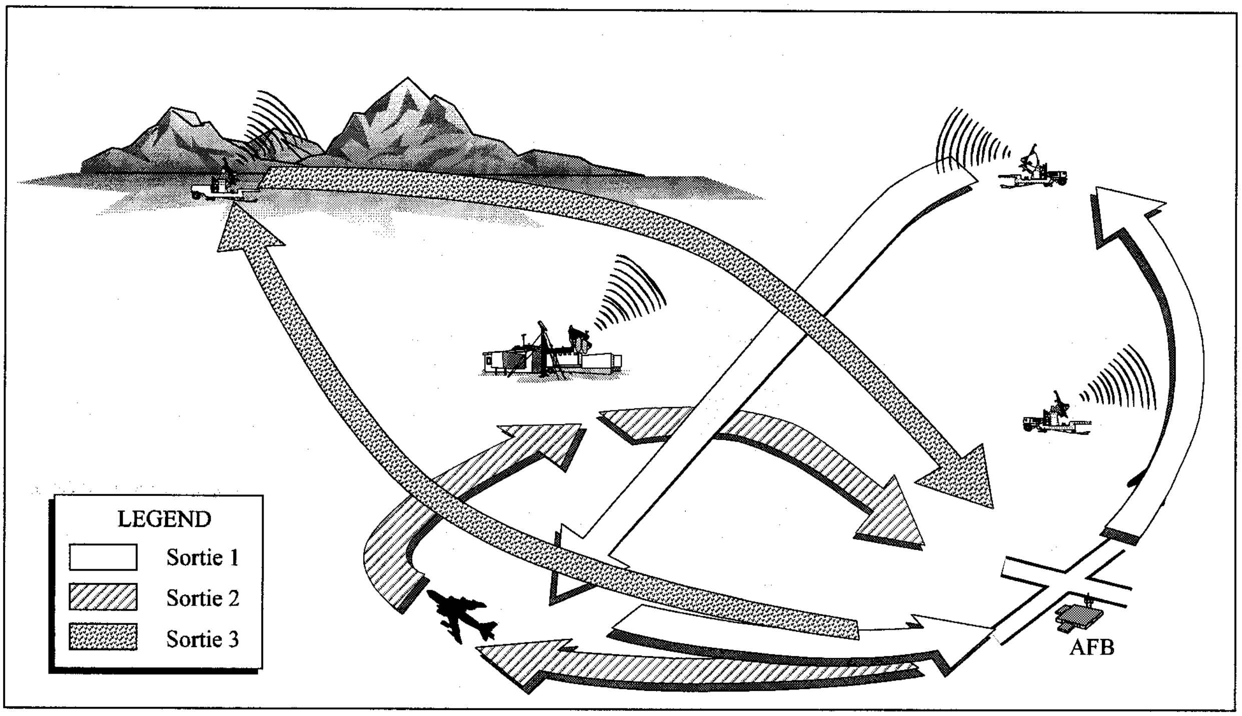
The amount of time for training is based on flying hours. Air Force annual flying hours are determined through the federal budgeting process. Reductions in flying hours mean that aircrews need to accomplish efficient, realistic training in less time. Currently, time spent traveling to and among training assets decreases time available to engage in combat training activities.

By creating the right training components, in proximity to both bases, aircrews can train frequently in a realistic, integrated manner. Aircrews must conduct frequent realistic training to maintain combat readiness. The efficiency of such training depends upon two related factors: (1) the time required to depart from a base, conduct a sortie that includes all the linked training activities needed for a specific mission, and return to base; and (2) the distance and flight time to and among the training assets needed for that sortie. The longer the transit time, the less time can be used for training.

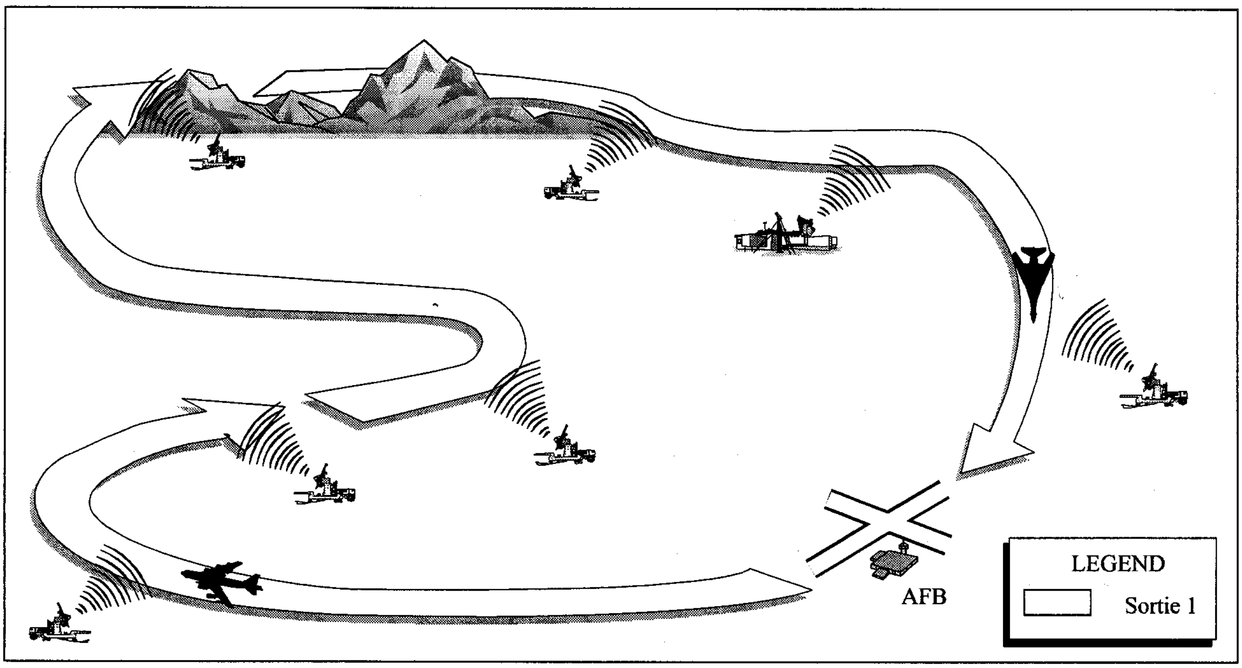
The current locations and arrangement of realistic training assets results in 37 to 50 percent of total sortie flight time being used in low value transit time. Aircrews are forced to use valuable time flying to and among the training assets, increasing the total amount of time flown during each sortie, while decreasing combat training time. Existing linked components that provide comprehensive, realistic bomber training are in Utah and South Dakota. To fly to and train at these distant training areas, B-52 and B-1 aircrews must fly 515- and 415-minute average sorties. Because aircrews must use these distant assets, low-value transit flight time typically accounts for 255 minutes out of a 515-minute sortie for the B-52s and 155 minutes out of a 415-minute sortie for the B-1s. Low-value transit time occurs when aircrews are flying to and from MTRs and MOAs in which they conduct combat training. For example, in an average sortie for a B-1 to training assets in South Dakota, aircrews spend 130 minutes flying to and between an MTR and a MOA. Valuable and limited flight hours are used without achieving training goals (Figure 1.3-3; Appendix A). Under optimum circumstances, a sortie would take less time and provide maximum training with minimum transit time.

1.4 BARKSDALE AND DYESS AIRCREWS NEED REALISTIC COMBAT TRAINING

To conduct realistic, integrated training that emphasizes teamwork in combat situations, bomber aircrews need a system of linked airspace and ground-based assets that support the required training activities, including:

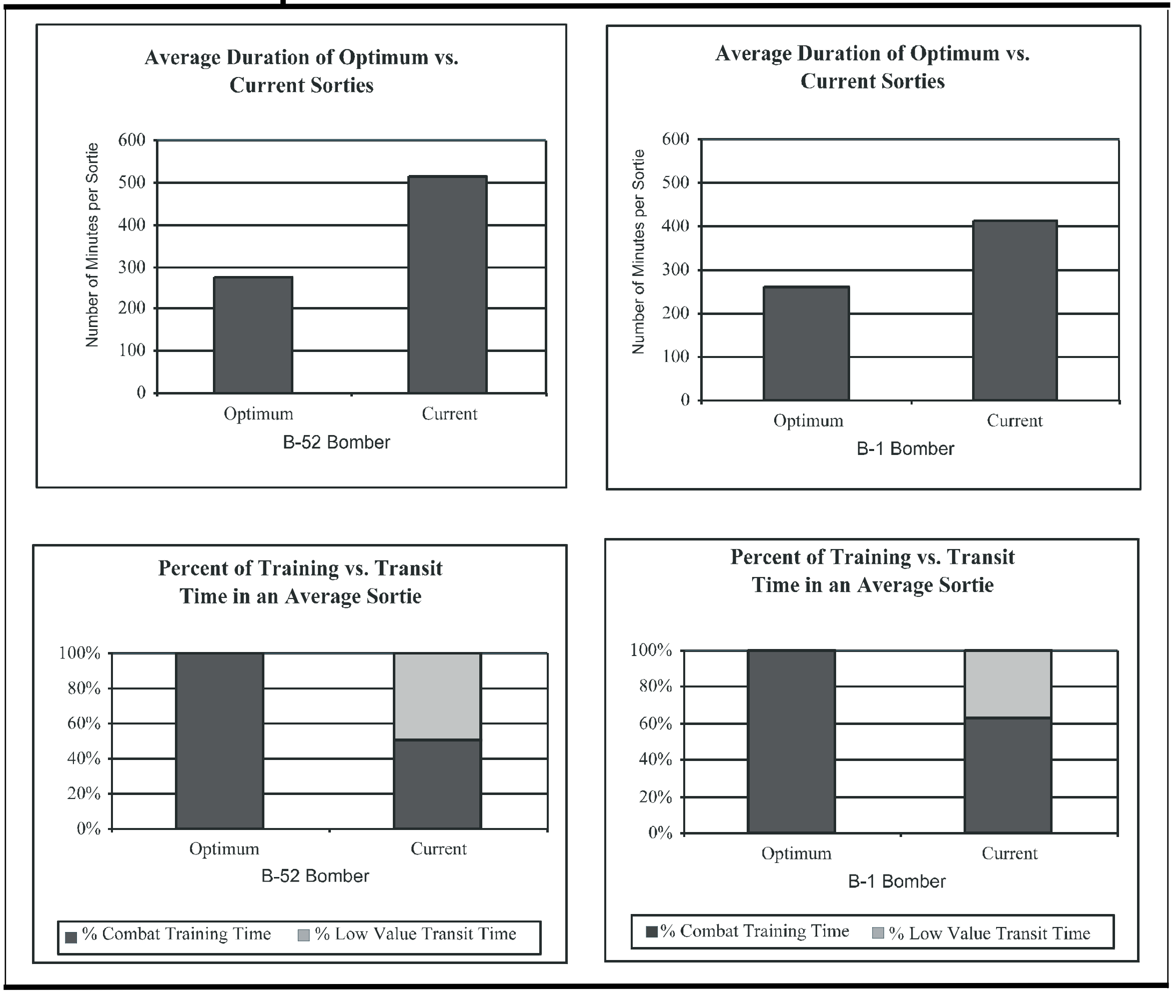


Scattered, unrelated training components make aircrews fly more individual sorties, none of which involve the sequencing of activities like a combat mission



Interrelated, nearby training components allow for realistic combat

Realistic Combat Training Components **Figure 1.3-2**



Comparison of Optimum and Current Training for B-52 and B-1 Bombers **Figure 1.3-3**

Electronic countermeasures include jamming enemy weapon systems using sophisticated electronic equipment on board the aircraft.

- training airspace that allows aircrews to perform their required training activities at high, medium, and low altitudes;
- facilities that simulate enemy threats from surface-to-air missiles, anti-aircraft artillery, and search radar; and
- facilities that can electronically score simulated ordnance delivery and the effectiveness of electronic countermeasures.

Each of these assets supports a variety of activities needed for training (Table 1.4-1). Air Force training philosophy dictates that bomber aircrews conduct sorties that use training assets in a sequence that mirrors combat. To accomplish this, training assets must have the appropriate characteristics, be arranged in a fashion that enables sequencing, and permit the full range of training activities.

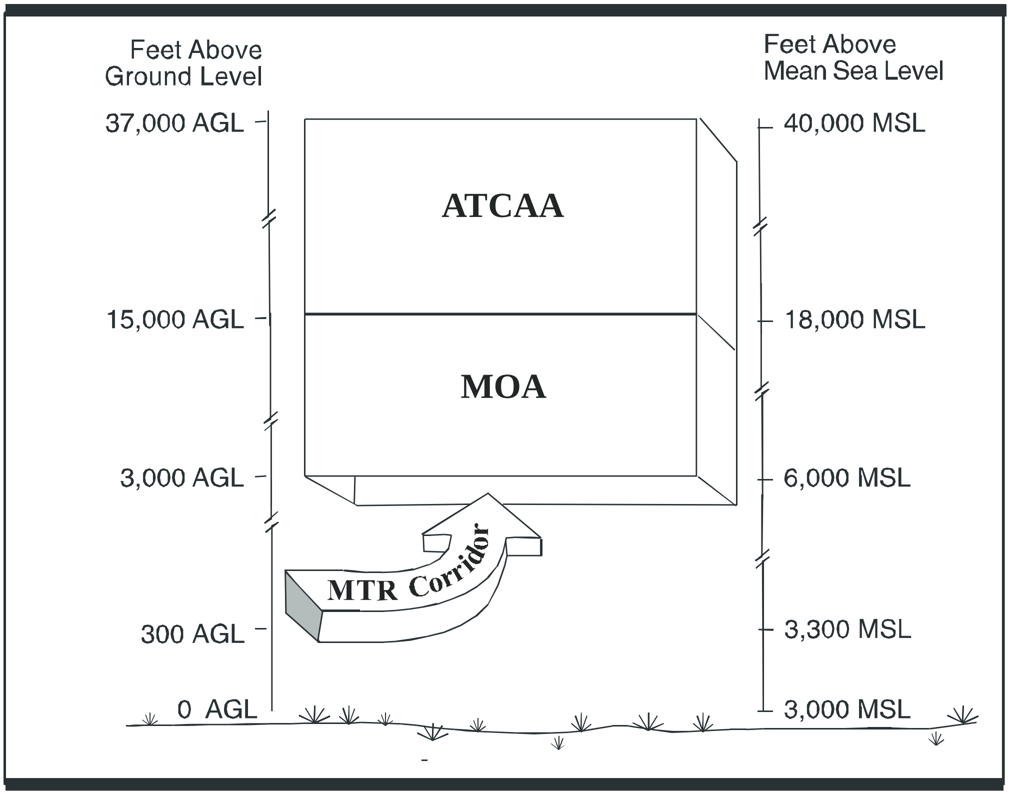
1.4.1 A Variety of Linked Airspace is Needed to Support Training

Combat training for bombers requires a variety of linked airspace, including MTRs, MOAs, and ATCAAs (Figure 1.4-1). These different types of airspace must not only be of adequate size, they must also be shaped and positioned appropriately to provide realistic training.

Table 1.4-1
Combat Training Requires Realistic Linked Training Assets

Event Sequence	Combat Event Description	Training Activities	Needed Training Assets: Ground-based: Simulated Threats	Needed Training Assets: Ground-based: Ordnance Delivery and ECM Scoring	Needed Training Assets: Airspace: Training Airspace
Event No. 1	Fly high altitude to refueling rendezvous; locate and join tanker aircraft; refuel and fly to combat airspace	◆ Navigation and communication			✔
		◆ In-flight rendezvous with tanker aircraft			✔
		◆ Aerial refueling along an established track			✔
		◆ Formation flying			✔
Event No. 2	Enter combat airspace; coordinate with command and control (e.g., AWACs); join other aircraft in "strike package" conducting mission	◆ High and/or low-altitude navigation		✔	✔
		◆ Defensive tactics against airborne and ground threats	✔	✔	✔
		- Aircraft maneuvering	✔	✔	✔
		- Terrain following/avoidance	✔	✔	✔
		- Electronic countermeasures	✔	✔	✔
		- Course deviations	✔	✔	✔
		- Airspeed changes	✔	✔	✔
		- Communication	✔	✔	✔
		◆ Formation flying	✔	✔	✔
Event No. 3	Fly to initial point of attack; avoid ground-based threats; attack target and deliver ordnance (i.e., bombs or missiles)	◆ Defensive tactics against airborne and ground threats	✔	✔	✔
		- Aircraft maneuvering	✔	✔	✔
		- Terrain following/avoidance	✔	✔	✔
		- Electronic countermeasures	✔	✔	✔
		- Course deviations	✔	✔	✔
		- Airspeed changes	✔	✔	✔
		- Communication	✔	✔	✔
		◆ High-low ordnance delivery (actual and simulation)	✔	✔	✔
		◆ Formation flying	✔	✔	✔
Event No. 4	Exit target area; rejoin returning "strike package"	◆ Navigation and communication		✔	✔
		◆ Defensive tactics against airborne and ground threats	✔	✔	✔
		- Aircraft maneuvering	✔	✔	✔
		- Terrain following/avoidance	✔	✔	✔
		- Electronic countermeasures	✔	✔	✔
		- Course deviations		✔	✔
		- Airspeed changes		✔	✔
		◆ Formation flying			✔
Event No. 5	Exit combat airspace and return to base	◆ Navigation and communication			✔
		◆ In-flight rendezvous with tanker aircraft			✔
		◆ Aerial refueling along an established track			✔
		◆ Formation flying			✔

MTRs may be defined with floors below 300 feet, but RBTI bomber aircraft would not fly below 300 feet.



Airspace Needed for Combat Training **Figure 1.4-1**

MILITARY TRAINING ROUTES

Defensive maneuvers are designed to neutralize an enemy's attack or ordnance.

MTRs consist of narrow corridors of airspace designed to allow aircrews to practice low-altitude navigation as well as ordnance delivery and defensive maneuvers. Low-altitude training in an MTR represents one important facet of realistic combat training. It allows bomber aircrews the opportunity to simulate penetration into enemy territory, flying undetected below the horizon of enemy radar and dealing with surface-to-air missiles and other threat systems. An MTR must be long enough, wide enough, and with enough altitude variation to allow bomber aircrews to practice maneuvers that are required to negate enemy defenses and to accomplish the assigned ordnance delivery mission. Aircrews must accomplish terrain masking on MTRs overlying variable terrain. Aircrews use the terrain to mask the aircraft from threat emitters, avoid detection, and employ defensive maneuvers to escape threats.

MILITARY OPERATIONS AREAS AND AIR TRAFFIC CONTROL ASSIGNED AIRSPACE

MOAs are special use airspace designated by the Federal Aviation Administration (FAA) to identify those areas where nonhazardous military operations are being conducted and to separate certain military flight activities from nonparticipating air traffic. ATCAA is airspace, often overlying a MOA, extending above 18,000 feet mean sea level (MSL). ATCAAs are established by a letter of agreement between a military unit and the local FAA Air Route Traffic Control Center. The purpose of an ATCAA is to provide separation between nonhazardous military training and other nonparticipating aircraft. ATCAAs are released to military users by the Air Route Traffic Control Center at the time they are to be used, allowing maximum use by civilian aviation. MOAs and ATCAAs are used by military aircraft for both air-to-air and simulated air-to-ground training. To survive in high-threat environments, aircrews use increasingly complex tactics. Bomber aircrews must train at a variety of altitudes using tactics that minimize their exposure to hostile ground and air defenses. MOAs and ATCAAs allow bomber aircrews to train against these threats using situations they would encounter in combat.

1.4.2 Simulating Enemy Threats

During conflicts, the enemy can be expected to protect its key assets (e.g., fuel supplies, communication systems) from attack by U.S. forces by positioning air defense weapons around a key target or as part of a regional air defense system. These air defenses commonly consist of surface-to-air missiles, anti-aircraft artillery, and radar-tracking systems. A realistic training environment must simulate such devices and the tactics used in their operation to provide aircrews with the challenges they would face in combat. Electronic emitters provide this capability, simulating hundreds of different air defense ordnance from around the world. Used in sufficient numbers and positioned effectively to reflect realistic air defenses, these electronic emitters can replicate the threats likely to be faced by aircrews in future conflicts.

In combat, enemy air defenses must be able to see or detect (electronically) an aircraft in order to shoot it down. The best way for a bomber aircrew to defeat the enemy's air defenses is to stay out of range. That is not always possible. Alternatively, the bomber aircrew can use terrain masking--using terrain features, such as mountains, ridges, or hills, to mask visual or electronic detection by air defenses. Aircrews need to train against emitters that simulate enemy threats in airspace where they can use terrain masking.

An ESS system offers the flexibility and variety needed by bomber aircrews to prepare for the range of threats and targets they could expect to face in combat.

1.4.3 Electronic Scoring Sites Provide Aircrews Feedback in Training

Avoiding enemy threats is only part of accomplishing the mission. Counteracting those threats effectively and delivering ordnance onto the assigned target are other essential mission requirements. To ensure that aircrew's can meet these requirements in combat, they must conduct training that includes ordnance delivery and provides feedback on their performance. Training ranges that include targets allow aircrews to perform a wide variety of ordnance delivery events, using different types of ordnance, altitudes, and tactics. Some training ranges have scoring systems that measure the accuracy of ordnance delivery and provide feedback to aircrews. An ESS system offers another way to meet these needs by providing:

- training in use of electronic countermeasures, maneuvering, and terrain avoidance/terrain following;
- ability to perform simulated, electronic ordnance delivery; and
- immediate scoring and feedback to aircrews.

An Electronic Scoring Site consists of a facility with equipment and personnel capable of scoring an aircrew's effectiveness at simulated ordnance delivery and electronic combat. Situated under or near training airspace, this facility tracks an aircraft and measures when and under what flight conditions (e.g., altitude, speed, and location) the aircrew simulates ordnance release.[1] The Electronic Scoring Site measures the distance between the simulated ordnance impact area and the target and also scores how well an aircrew performs electronic combat. An Electronic Scoring Site determines if aircrews effectively avoided (using terrain avoidance/terrain following, or defensive maneuvering) or negated (by electronic jamming) threats posed by arrays of electronic emitters. Because aircrews and the Electronic Scoring Sites can communicate, the aircrews receive immediate feedback on their performance.

[1]No actual ordnance leaves the aircraft.

Electronic combat forms another way for bombers to defeat enemy air defenses. In electronic combat, bomber aircrews employ a suite of electronic countermeasures designed to jam, confuse, or render useless enemy tracking and targeting systems.

Electronic emitters that simulate such threats, when combined with an Electronic Scoring Site, provide an opportunity for aircrews to conduct realistic training. Arrays of emitters linked with Electronic Scoring Sites and appropriate airspace assets and terrain conditions form an ESS system.

1.4.4 Linked Airspace and Ground-Based Assets Offer the Most Realistic Training

Training assets that are separated from one another and not interrelated provide limited value to bomber aircrews. Assets that let aircrews fly linked sequences of training activities mirror the patterns they could encounter in combat and provide better training. Each component must support the other. For example, an array of electronic emitters situated in completely flat terrain would not support terrain masking to avoid threats. An MTR that does not permit low-altitude flight would not support terrain-masking training, even with an appropriate emitter array. But, an array of electronic emitters situated in variable terrain overlain by an MTR that permits low-altitude flights makes up linked training assets that allow terrain masking and other training activities. When combined with an Electronic Scoring Site and airspace assets to form an ESS system, aircrews can fly a realistic sequence of combat training activities blended into a single mission.

1.5 PURPOSE OF THE RBTI PROPOSAL

Currently, available training assets have numerous limitations affecting their ability to support efficient, realistic, integrated training for bomber aircrews. The Air Force proposes to improve the efficiency and effectiveness of bomber aircrew training by establishing an ESS system of linked airspace and ground-based training assets through implementing RBTI (see Section 1.1). RBTI would:

Linked training assets provide a sequence of integrated, realistic training in a single sortie.

- permit aircrews from Barksdale and Dyess AFBs to train for their various missions while maximizing combat training time;
- provide the type and linked arrangement of airspace and other assets that support realistic training for bomber aircrews; and
- ensure that flexibility and variability in training support bomber combat missions.

RBTI would meet these goals by establishing linked training assets, consisting of airspace (MTR, MOA, and ATCAA) and ground-based facilities (electronic emitters and Electronic Scoring Sites). Combat training time is maximized by locating assets in the right relationship to one another and close enough to Barksdale and Dyess AFBs.

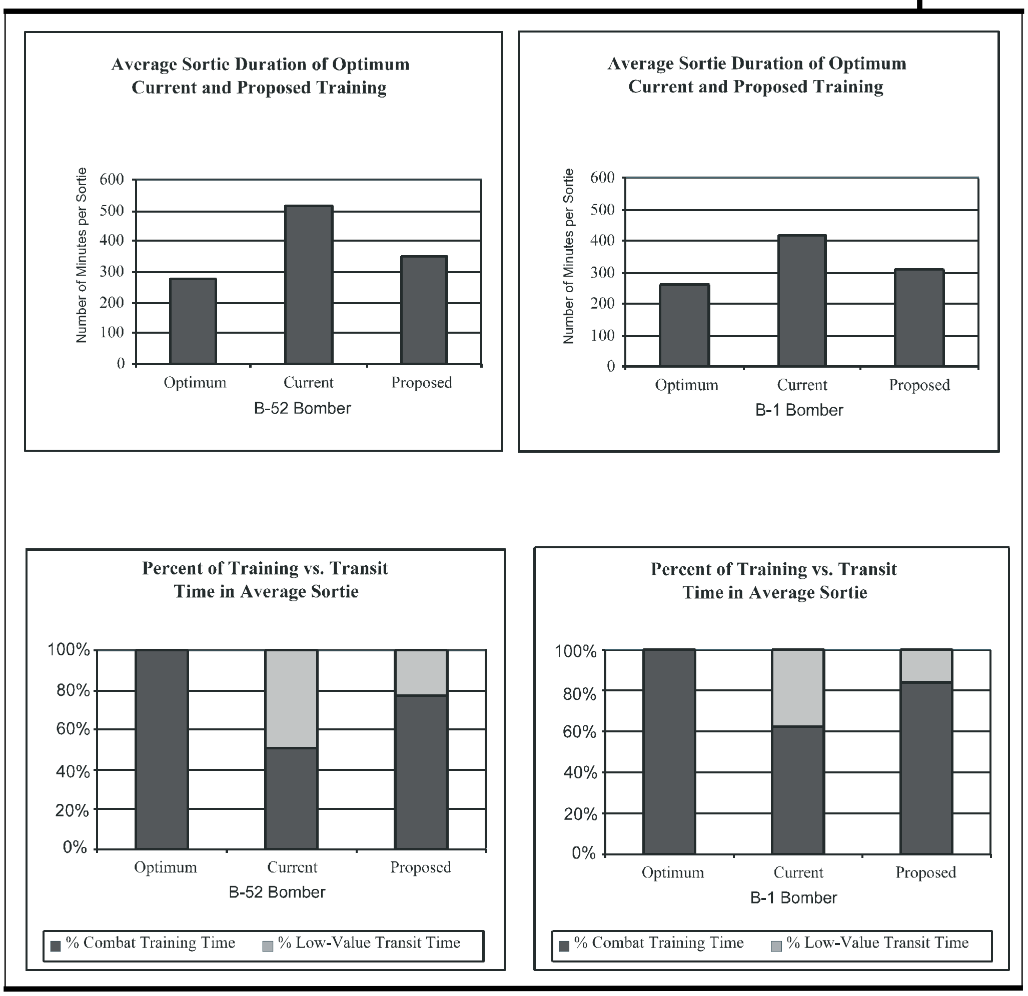
RBTI airspace and other training assets would support the full range of low to high altitude bomber aircrew training and include:

- an MTR that overlies variable terrain and allows bomber aircrews to fly at low altitudes, avoid simulated enemy threats, and conduct simulated attacks;
- a MOA and ATCAA that permit maneuvers to avoid simulated threats and simulated attacks through a range of altitudes;
- a set of electronic emitters simulating the variety of realistic threats that aircrews would expect in combat; and
- Electronic Scoring Sites where bomber aircrews can simulate ordnance delivery from a range of altitudes.

1.6 EXPECTED OUTCOME

Implementing RBTI would result in the environmental consequences detailed in Chapter 4 and summarized in Table 2.6-1. The combat and training units from Barksdale and Dyess AFBs would be provided:

- realistic, integrated training using linked training assets that simulate the conditions of combat missions;
- training assets close enough to maximize combat training time, reduce low-value transit time (Figure 1.6-1), and train replacement crews within limited flying hour allocations; and
- flexibility and variability in training to support bomber combat mission requirements.



Comparison of Optimum, Current and Proposed Training for B-52 and B-1 Bombers **Figure 1.6-1**

CHAPTER 2

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

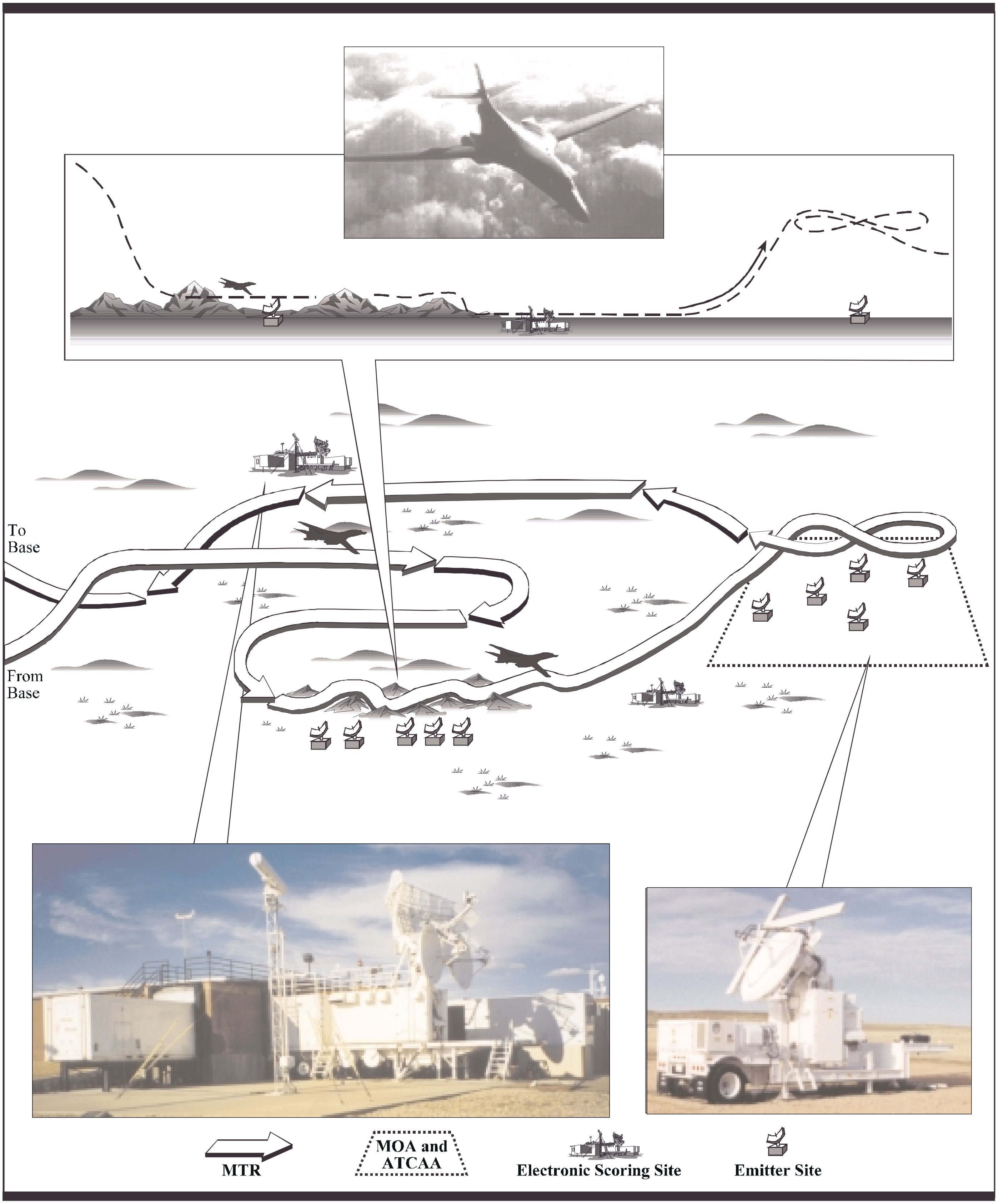
CHAPTER 2
DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This chapter describes the RBTI proposal and the action alternatives that would meet the need defined by the proposal. The proposed action is to establish a set of linked training assets comprising an ESS system (Figure 2.0-1) to provide realistic, integrated bomber training close enough to Barksdale and Dyess AFBs to efficiently use limited flying hours. Based on an examination of training needs, a maximum distance of approximately 600 nm was determined to be needed to efficiently and effectively use allocated flying hours. See Section 2.1.2 and Appendix A for discussions of training and flying time.

Integrated training means that aircrews perform their mission roles together as a team, under conditions similar to those in combat.

The proposed action has three alternative locations, two in western Texas and one in northeastern New Mexico. Each of these three action alternatives meets the operational requirements outlined in Chapter 1. In conformance with the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14(e)), the Air Force has used the results of the analysis in the draft Environmental Impact Statement (EIS), as well as public and agency comments, to identify a preferred and environmentally preferred alternative in this final EIS. The Air Force has identified Alternative B, IR-178/Lancer MOA, as both the preferred and environmentally preferred alternative. Appendix K presents the analysis leading to this identification.

The three action alternatives (Alternatives B, C, and D) and the No-Action Alternative (Alternative A) are described in detail in this chapter. The No-Action Alternative reflects the status quo, without development of any new linked training assets. CEQ regulations (40 CFR 1502.14(d)) require analysis of the No-Action Alternative.



Realistic Bomber Training Initiative **Figure 2.0-1**

PROPOSED ACTION OVERVIEW

The proposed action for RBTI is to establish an ESS system consisting of linked airspace and ground-based training assets to conduct realistic, integrated bomber training operations within approximately 600 nm of Barksdale AFB, Louisiana, and Dyess AFB, Texas. The ESS system would include:

Airspace Assets

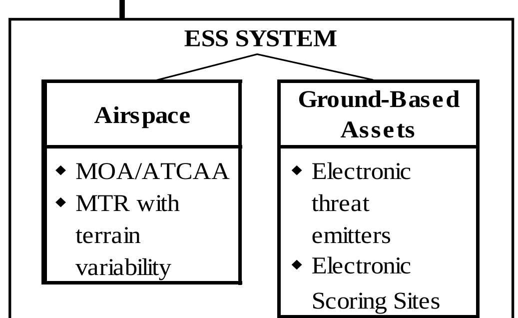
- ✔An MTR allowing flight down to 300 feet AGL in some segments, offering high to moderate terrain variability for use in terrain following and avoidance, overlying lands capable of supporting electronic threat emitters and ESSs, and linked to a MOA.
- ✔A MOA and overlying ATCAA measuring at least 40 by 80 nm with a floor (lower) altitude of 3,000 feet AGL and an available ceiling (upper) altitude up to 40,000 feet MSL.

Ground-Based Assets

- ✔Five locations (15 acres each) for placing electronic threat emitters under or near the MTR corridor and five additional locations (15 acres each) for placing emitters under the MOA to simulate the variety of realistic threats expected in combat.
- ✔Two Electronic Scoring Sites co-located with operations and maintenance centers, one under or near the MTR corridor and the other en route from the training airspace to Barksdale and Dyess AFBs where bomber aircrews can simulate ordnance delivery and conduct electronic combat at a variety of altitudes.

All three of the action alternatives (Alternatives B, C, and D) provide these linked assets and could fulfill the need defined under the proposed action. Operationally and environmentally, Alternative B is the preferred alternative.

This EIS also presents the rigorous process used to identify and screen candidate alternatives and a description of alternatives considered but not carried forward for further analysis in Section 2.1. Readers interested in the descriptions of the alternatives can begin with Section 2.2 for a discussion of the RBTI study area and Sections 2.3 and 2.4 for Alternatives A, B, C, and D. Section 2.5 presents the approach to the analysis and the major issues identified through the scoping process. Section 2.6 summarizes the project impacts identified in Chapter 4 and presents a comparison of the effects of all four alternatives. Section 2.6.2 presents both mitigation measures and management actions directed at reducing impacts or addressing concerns raised by the public and agencies.



2.1 ALTERNATIVE IDENTIFICATION PROCESS

2.1.1 Requirements for Electronic Scoring Site System

Currently available training assets have numerous limitations affecting their ability to support realistic training for bomber aircrews. Existing assets near Barksdale and Dyess AFBs (i.e., approximately 600 nm) do not include linked, sequenced airspace and ground-based assets (refer to Figure 1.3-2). All existing assets are either dispersed and cannot provide a package of sequenced training or lie too far from the bases to maximize combat training time. The Air Force proposes to remedy this situation by establishing an ESS system linking airspace and ground-based training assets within approximately 600 nm of Barksdale and Dyess AFBs. To select alternatives that would meet the need, the Air Force used the following considerations:

- Alternatives should accommodate an ESS system providing for realistic, sequenced, integrated training;
- Alternatives considered for RBTI should offer the potential to establish linked airspace and ground-based assets located near to one another and in sufficient proximity to Barksdale and Dyess AFBs to maximize combat training time and minimize low-value transit time that does not achieve training goals; and
- Alternatives should use existing military airspace and other assets to the maximum extent feasible while also meeting training needs.

REQUIRED AIRSPACE ASSETS

To support realistic training for various missions while maximizing combat training time, RBTI would require airspace located over land within approximately 600 nm of both Barksdale and Dyess AFBs. The types of airspace required include both an MTR and a MOA with an overlying ATCAA.

An MTR is essentially a three-dimensional "aerial highway" used for different kinds of military flight training.

MTR Requirements. In order to meet training requirements, an MTR comprising part of an RBTI alternative should be large enough horizontally to allow bomber aircraft to practice offensive and defensive maneuvers to hide from enemy defenses while accomplishing the simulated ordnance delivery. These maneuvers require aircrews to start at a specific entry point in the MTR, proceed through the MTR corridor in a manner that realistically simulates combat conditions, use terrain masking and threat avoidance through variable terrain, and practice simulated ordnance delivery.

Realistic, integrated combat training begins at an entry point to an MTR outside the range of the simulated radar threat with the aircraft at a typical altitude of 15,000 to 25,000 feet MSL. The aircraft descends below the threat radar horizon and continues the mission undetected. Flight continues to the area of variable terrain and the aircraft maneuvers at low altitude using terrain following (B-1) or terrain avoidance (B-52). The aircraft proceeds along the MTR avoiding threats and minimizing exposure when threat avoidance is not possible. The aircrew uses the terrain to mask the aircraft from threat emitters and to avoid detection, then focuses on simulated ordnance delivery using a preplanned target, such as a bridge or other feature of the landscape. After simulated ordnance delivery, where nothing is released from the aircraft, the aircrew can fly along the MTR directly to the MOA to practice higher-altitude maneuvers. Or the aircrew can fly along the MTR to a re-entry route that allows the aircraft to return to the MTR and repeat a portion of the training sequence again. Given this sequence of activities, an MTR for RBTI should:

- Provide a minimum of 300 nm of length to support the bomber training activities.
- Permit bomber flight training at altitudes ranging from 300 to 3,000 feet AGL or higher.
- Have sufficient width (8 to 16 nm) so that bomber aircrews can practice maneuvers (only turns of less than 90 degrees are permitted in MTRs).
- Overlie lands that:
  - offer 240 nm of contiguous high to moderate terrain variability that lets aircrews conduct terrain following or avoidance training and

- support siting of a set of five electronic emitters and an Electronic Scoring Site arrayed under or near the MTR to provide a realistic threat environment and the ability for aircrews to simulate ordnance delivery and electronic combat.

- Accommodate a re-entry route along the MTR to allow bomber aircrews to loop back to the MTR and use the Electronic Scoring Site more than once during a single sortie-operation.
- Provide direct exits to a MOA.

The 300 nm minimum length for an RBTI MTR is based on the need for bomber aircrews to set up for terrain following or avoidance, fly through variable terrain while defeating or avoiding simulated threats from electronic emitters, conduct simulated ordnance delivery and receive feedback from an Electronic Scoring Site, and exit the threat area. On average, B-52s fly at 360 nm/hour and B-1s fly at 420 to 550 nm/hour on these routes. Completing all of these training activities in a linked and integrated manner requires a minimum of between 40 and 50 minutes for bomber aircrews, depending upon the aircraft's speed. This amount of time ensures sufficient training opportunities while maximizing the value of limited flight hours.

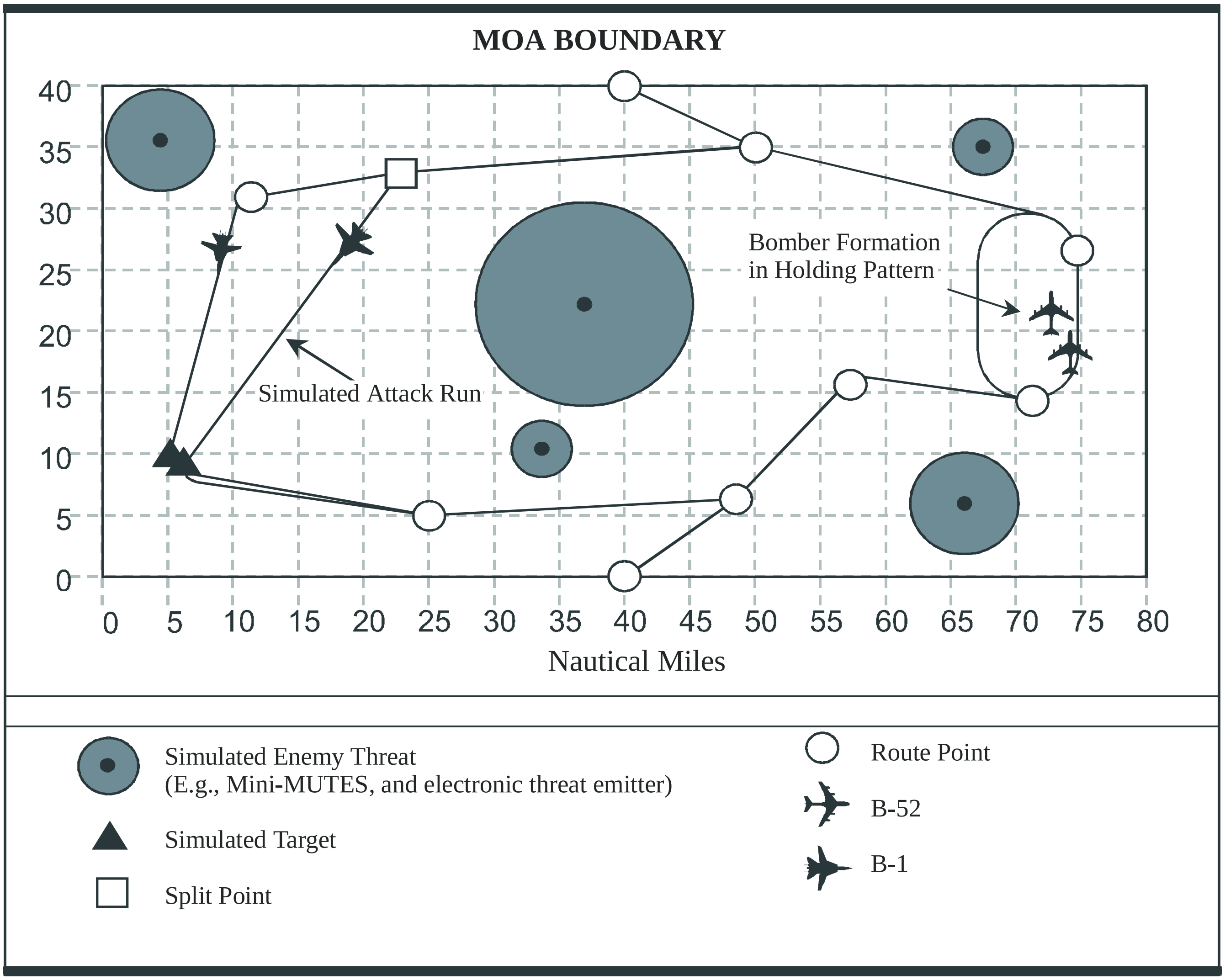
High to moderate terrain variability under an MTR is important to realistic aircrew training.

To support realistic integrated training, an RBTI MTR should overlie a minimum of 240 nm of contiguous terrain with high to moderate variability. With 240 nm of this type of contiguous variable terrain, a bomber pilot and copilot can practice critical low-altitude training for 15 to 20 minutes each. Terrain variability, as a measure of training value, represents a combination of slope differences and elevation differences. Appendix A includes further details on how differences in terrain were determined. Moderate to high terrain variability generally consists of a mix of hills and/or mountains interspersed with lower elevation areas; it must have peaks and valleys so that the aircraft can fly up and down or around them. The differences between high and low points, and the distance between those points, define terrain variability. Continuous high points, like a mesa, or low points, like a plain, do not offer the variability aircrews need to hone their reactions.

MOA and ATCAA Requirements. The MOA and overlying ATCAA for RBTI should meet the following minimum characteristics based on training requirements:

A MOA is a large "box" or airspace designed to allow military aircraft to conduct a range of nonhazardous training activities.

- *A Size of 40 nm by 80 nm.* A MOA/ATCAA must be large enough horizontally to accommodate multiple aircraft performing all of the combat maneuvering training requirements that cannot be accomplished in an MTR while permitting responses to simulated enemy defenses (i.e., electronic emitters). The horizontal extent of this airspace must allow bomber aircraft to practice offensive and defensive maneuvers to neutralize enemy defenses and simulate ordnance delivery. The size of the MOA/ATCAA is determined by the amount of space needed relative to the aircraft speed, maneuvering capability, ordnance delivery systems, and threat avoidance tactics. A MOA/ATCAA measuring 40 nm by 80 nm allows bombers to maneuver against a ground-based simulated threat (electronic emitter) and successfully line up on the proper heading to simulate ordnance delivery (Figure 2.1-1). First, aircrews would plan for a 5 nm buffer between the limits of maneuvers and the edge of the MOA/ATCAA. This prevents aircraft from "spilling out" of the MOA/ATCAA but reduces the usable MOA/ATCAA dimensions to 30 nm by 70 nm. Second, bomber aircrews need approximately 70 nm to set up and simulate an attack on a target. Third, neither under combat conditions nor during combat training would an aircrew enter and exit a target area by the same route. Such a move could



Bomber Operations in MOAs/ATCAAs **Figure 2.1-1**

subject the aircrew to attacks from already alerted enemy defenses and could interfere with other aircraft attacking the target area. So, realistic combat training activities in a MOA/ATCAA would require about 30 nm in width to accommodate both entry and exit from a target area.

- *Available altitudes from 3,000 feet AGL up to 40,000 feet MSL.* A MOA/ATCAA combination should offer sufficient vertical maneuvering space to permit all of the activities described above. To evade simulated threats and simulate different ordnance delivery events, bombers need to use a wide range of altitudes as part of a maneuver. Thousands of vertical feet of altitude are required to accomplish these activities and maneuvers.

- *Accessible from an MTR.* Because the training assets should be linked and in an appropriate sequence, the MOA/ATCAA must be accessible from an MTR so that higher altitude training activities can be sequenced realistically with lower altitude training in the MTR in the same sortie.

- *Overlie lands suitable for the placement of electronic threat emitters.* Electronic emitters should be dispersed effectively on land under the MOA/ATCAA to provide a threat environment requiring aircrews to react realistically. To be effective, the underlying lands for each emitter would need to allow unobstructed tracking of aircraft in the MOA/ATCAA.

REQUIRED GROUND-BASED ASSETS

A realistic training environment requires both an array of simulated threats as well as a means of determining how well aircrews respond to and defeat those threats while simulating on-target ordnance delivery. These assets must also be linked to reflect the kinds of situations aircrews might encounter in actual combat. Under RBTI, the ground-based assets of the ESS system would need to consist of:

Linked airspace and ground-based training assets permit aircrews to conduct training in a manner mirroring the sequence of events used in combat.

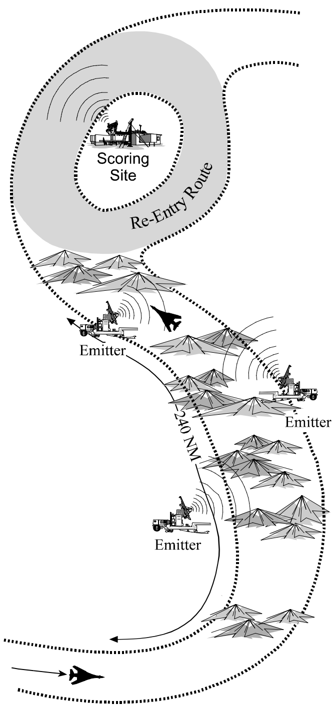
- A set of five electronic emitters situated under or near the MTR;
- An Electronic Scoring Site located under or near the MTR in the vicinity of the re-entry route;
- A set of five electronic emitters dispersed effectively under the MOA/ATCAA; and
- An Electronic Scoring Site located en route between the MTR and MOA/ATCAA and Barksdale and Dyess AFBs.

To meet the defined need, an alternative must offer appropriate locations for these linked sets of electronic emitters and Electronic Scoring Sites. The criteria used by the Air Force to identify such locations are detailed below. Minimizing the amount of construction needed and ensuring that the locations of the emitters and Electronic Scoring Sites would permit their proper function formed overriding considerations for identifying alternatives. In addition, sites for all electronic emitters and Electronic Scoring Sites need to meet these basic requirements:

- Access to pre-existing roads and on land having no more than 5 percent slope;
- Ability to connect to pre-existing telephone and power lines;
- Avoidance of electromagnetic interference with established radio observatories; and
- Land that can be leased, purchased, or withdrawn.

MTR Emitter Sites. Based on the size of the emitters themselves and safety requirements (see Section 2.4.1 Ground Operations), the MTR emitters need to be located in 15-acre parcels. Emitter sites also require unobstructed radar tracking distances of at least 30 nm; positioned ideally within 15 nm of the MTR centerline; and separated by approximately 20 to 50 nm.

MTR Electronic Scoring Site. Within the 15-acre site, an Electronic Scoring Site provides for scoring of ordnance delivery, simulates threats from an electronic emitter, and provides feedback on electronic combat training by bomber aircrews. The MTR Electronic Scoring Site also needs to be co-located with headquarters and maintenance facilities for the MTR emitters. To fulfill the need, an alternative must offer a site for an MTR Electronic Scoring Site that is offset from the MTR centerline, but approximately centered relative to the MTR re-entry route. The MTR Electronic Scoring Site must be positioned to permit the electronic equipment to track low-altitude aircraft to at least 50 nm.



MOA Emitter Sites. The 15-acre MOA emitter sites need to be located on lands that ideally allow radar-tracking in all directions for 30 nm. These five sites should be dispersed effectively throughout the lands under a MOA to provide coverage of most of the area and to offer the potential to vary the threat environment to enhance aircrew training realism.

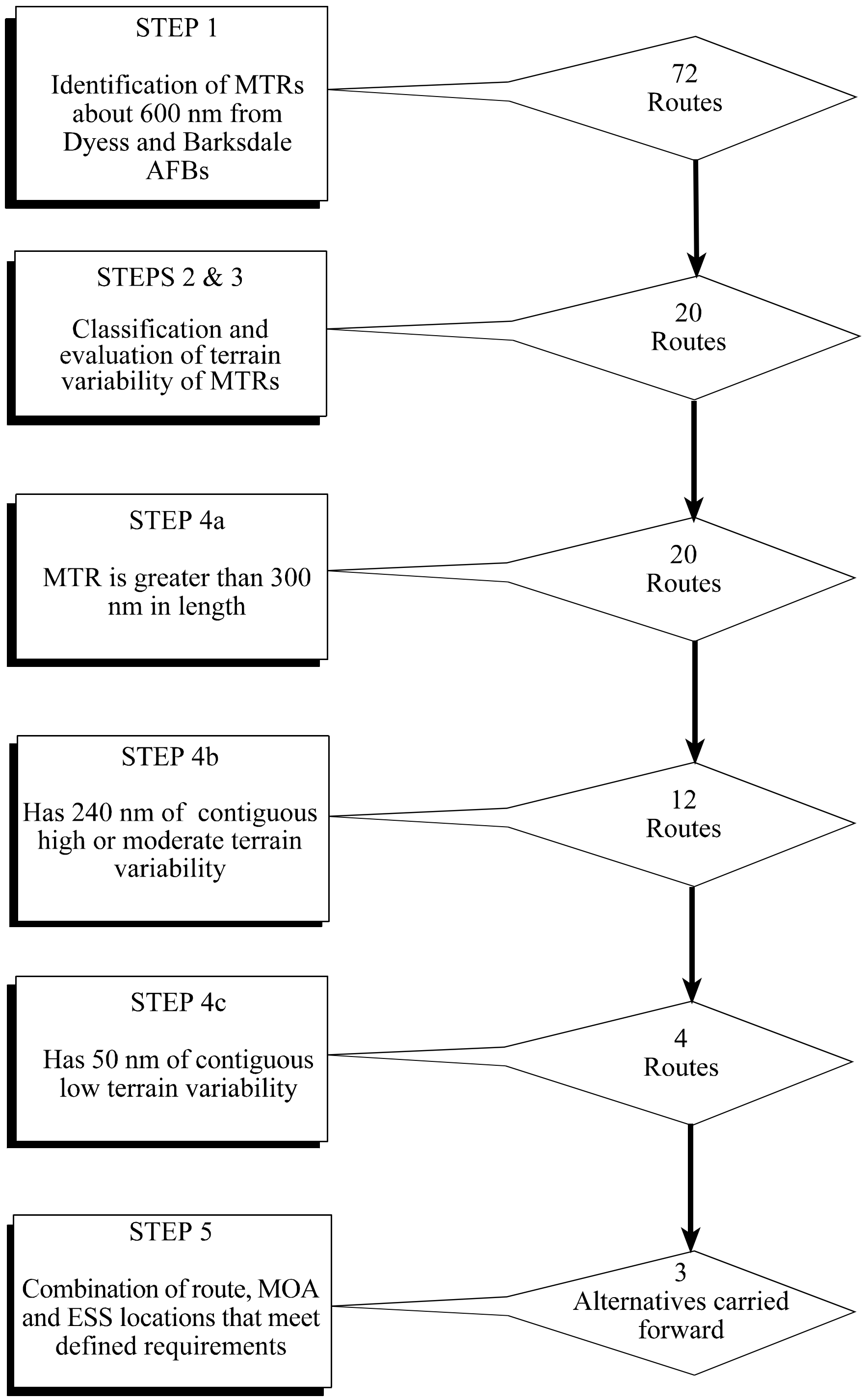
En Route Electronic Scoring Site. To optimize the use of finite flight hours for training, an alternative needs to offer a site for an Electronic Scoring Site situated en route to or from Barksdale or Dyess AFBs and the other training assets. This 15-acre Electronic Scoring Site must fulfill all of the same criteria as the MTR Electronic Scoring Site, although permitting low-angle tracking distances is not as important for this en route Electronic Scoring Site. No special use airspace, like a MOA, would be required over this Electronic Scoring Site, since aircraft would fly at high altitudes and according to standard FAA rules.

2.1.2 Alternative Identification Methodology

To maximize training time, an alternative must be within approximately 600 nm of Barksdale and Dyess AFBs.

The requirements detailed above, along with the overall considerations related to fulfilling the need, were applied through an alternative identification methodology. The first criterion in the identification of the alternatives was nearness to Barksdale and Dyess AFBs. The overlapping area within approximately 600 nm was defined as the search area for identifying the alternatives. This distance represents the maximum extent that a B-52 or B-1 aircraft conducting a training sortie could travel and still achieve the defined training goal while minimizing transit time (refer to Section 1.3.3). Individual units at bases must complete a specified number and type of sorties based on the mission, training program, available aircraft, and personnel. These sorties must be completed using the allocated flying hours based on funding from Congress. Dividing the number of required sorties into the flying hours yields an average sortie duration. The average sortie durations for the B-52 from Barksdale AFB and the B-1 from Dyess AFB are 4.6 and 4.3 hours, respectively. In that time, the bombers must take off, conduct training, and return to base. This allows the bombers to fly about 600 nm each way (out to train and back to base) while accomplishing training. As such, the search area for alternatives needed to fall within the overlapping area encompassed by approximately 600 nm from Barksdale and Dyess AFBs (see Appendix A for further discussion). After definition of the search area, five steps were performed to identify final candidate alternatives (Figure 2.1-2).

Step 1. Identification of existing MTRs within approximately 600 nm: Since the focus of this effort was to use existing airspace assets to the maximum extent feasible, the alternative identification process first considered existing MTRs within



The Air Force examined 72 routes within approximately 600 nm of Barksdale and Dyess AFBs to choose the three action alternatives carried forward.

RBTI Alternative Identification Process **Figure 2.1-2**

the search area. This step in the identification process yielded 72 existing MTRs within the 3.3 million-square-mile search area consisting of the overlapping zone within approximately 600 nm of the two bases.

Step 2. Terrain Variability MTR Classification: Sufficient high to moderate terrain variability along the MTR for performing low-altitude maneuvers is critical for realistic training. Terrain variability ranking included the combination of slope variability and elevation differences. Based on this analysis and modeling, three classes of terrain variability (low, moderate, and high) were defined, as discussed above and in Appendix A.

Step 3. Identification and Evaluation of Terrain Variability for Individual MTRs: To determine those MTRs that could meet the training objectives under RBTI, all 72 routes within the study area were analyzed using the terrain variability model. The analysis yielded 20 MTRs that possessed moderate or high terrain variability. A total of 52 MTRs offered only low terrain variability, excluding them from further consideration.

Step 4. Refinement of Possible Candidate Alternatives: In this step, the process shifted from a focus solely on MTRs to developing candidate alternatives consisting of a combination of linked training components. The analysis evaluated each of the 20 MTRs according to the following hierarchy of required characteristics:

a) The MTRs must be more than 300 nm long in order to provide adequate flight time for all training elements to be accomplished. All 20 MTRs met this characteristic.
b) The MTRs must overlie at least a total of 240 nm of contiguous high or moderate terrain variability. A total of 12 MTRs offered the required extent of terrain variability.
c) The location for the Electronic Scoring Site associated with the MTR requires unimpeded, low angle line-of-sight for 50 nm along the MTR. As such, a 50-nm zone of contiguous low terrain variability must follow the section of high or moderate terrain variability. Four MTRs met this requirement.

The action alternatives developed by the Air Force maximized the use of existing airspace.

Step 5. Final Development of Alternatives: The Air Force developed three alternatives, using the most operationally suitable elements of the four candidate alternatives from Step 4 as the framework. One MTR derived in Step 4 was eliminated because it was essentially identical to one of the other alternatives considered. The three alternatives developed by the Air Force included:

- General locations for a set of MTR emitters and an MTR Electronic Scoring Site;
- A zone in which an en route Electronic Scoring Site could be located;
- MOA airspace and general locations for a set of five MOA emitters; and
- Connection of the MTR to a MOA.

The final candidate alternatives included MTRs that were already linked or near one another to maximize the amount of existing airspace in an alternative. Combining two or more routes also permitted inclusion of those segments from each route that best supported training objectives. The alternatives also linked MTRs with existing MOAs, although some modification of the MOAs was necessary to meet the size characteristic of 40 nm by 80 nm.

2.1.3 Alternatives Considered but not Carried Forward

Application of the alternative identification methodology resulted in the elimination of 69 MTRs. These 69 MTRs were not carried forward for further detailed analysis.

Additional potential alternatives, including concepts raised during scoping, were evaluated but either did not meet the fundamental purpose and need for RBTI or were not reasonable alternatives. The following describes why each of these concepts was not carried forward for detailed analysis in this EIS.

Increase Funding to Provide More Flight Hours: Members of the public have suggested that the Air Force consider increased funding as an alternative to implementing RBTI. It was reasoned that increased funding would allow increases in average sortie durations, thereby permitting bomber aircrews from Barksdale and Dyess AFBs to fly to distant training assets more frequently. In this way, according to the public commentors, development and use of RBTI would not be needed.

This concept does not represent a reasonable alternative for several reasons. First, Congress and the President set funding levels for the Air Force through the federal budget process. Setting these levels involves accounting for numerous factors and variables outside the control of the Air Force. Second, longer average sortie durations would still use large amounts of transit time that do not contribute to achieving training goals. Third, longer durations would affect aircraft maintenance and associated costs. Maintenance activities on aircraft are phased according to hours of use. With longer average sortie durations, aircraft would require phased maintenance more frequently relative to the combat training time achieved during the sorties. Lastly, longer duration sorties reduce aircrew availability.

Use of Simulators: Use of nonflying simulators represented an often repeated suggestion to provide the training sought in implementing RBTI. While simulators have improved over the years and represent a valuable training aid, they cannot meet the bomber aircrew training requirements and do not comprise a reasonable alternative warranting further analysis.

Simulators cannot provide the training or physical challenges aircrews need to be ready for combat.

Simulators lack the realism of actual flying. Aircrews do not receive the same physical or training challenges in simulators that occur in actual flight. Simulators cannot replicate the problems and teamwork associated with flying with other aircraft. Using simulators also excludes other parts of the Air Force team essential in completing actual missions, including maintenance, supply, and weather analysis. In summary, relying on simulators for the type of training proposed under RBTI would not fulfill the need as described in Chapter 1.

Move Bombers: Through public involvement, commentors suggested relocating the bombers from Barksdale and Dyess AFBs to other bases nearer to assets that might meet training needs. As noted in Chapter 1, only two ESS systems exist that might meet those needs: Belle Fourche in South Dakota and Granite Peak in Utah. Relocation of the bombers to bases near these ESS systems does not, however, represent a reasonable alternative. Congress and the President, through the Base Realignment and Closure process, made the decision to base additional bombers at Barksdale and Dyess AFBs. Shifting the bombers to a new location would require similar authorization or basing decisions outside the scope of this analysis.

2.1.4 Alternatives Carried Forward for Detailed Analysis

Application of the alternative identification methodology (see Section 2.1.2) defined three action alternatives in addition to the No-Action Alternative:

- Alternative A: No-Action
- Alternative B: IR-178/Lancer MOA
- Alternative C: IR-178/Texon MOA
- Alternative D: IR-153/Mt. Dora MOA

MTRs are composed of segments that vary in length and width; segments are given letter designations like AB.

As its designation implies, Alternative A: No-Action would not involve changes to the current situation. Alternatives B, C, and D would use existing airspace to the degree feasible but would require modifications to existing airspace structure and use, as well as establishment of ground-based assets. Each of the three action alternatives meet the criteria used in the alternative identification process, including distance from the bases, MTR length, 240 nm high to moderate contiguous terrain variability, lands suitable to accommodate electronic emitters, and locations for the Electronic Emitter Sites. For a few segments (or parts) of the MTRs in Alternatives B, C, and D, the proposed width is less than the desired 8 nm. These smaller route widths, which do not impede the training value of the MTR, were defined for both operational and environmental reasons.

2.1.5 Identification of the Preferred and Environmentally Preferred Alternatives

Identification of the preferred and the environmentally preferred action alternative used independent processes (see Appendix K). Both processes involved review of the technical and/or environmental analysis, as well as public and agency comments on the draft EIS. For the preferred alternative, the Air Force first conducted a coarse screening followed by a fine screening. These screenings indicated that Alternatives B and C provide somewhat more combat training time than Alternative D. Alternative D has a greater potential for training to be constrained by weather. The northeastern New Mexico area, where Alternative D is located, is prone to afternoon thunderstorms during summer months and severe snowstorms during the winter months. Further, the FAA indicated that the proposed Texon MOA in Alternative C could significantly impair certain types of civil and commercial aviation traffic, require rigid management, and limit operational flexibility. For these reasons, the Air Force has identified Alternative B as the preferred alternative.

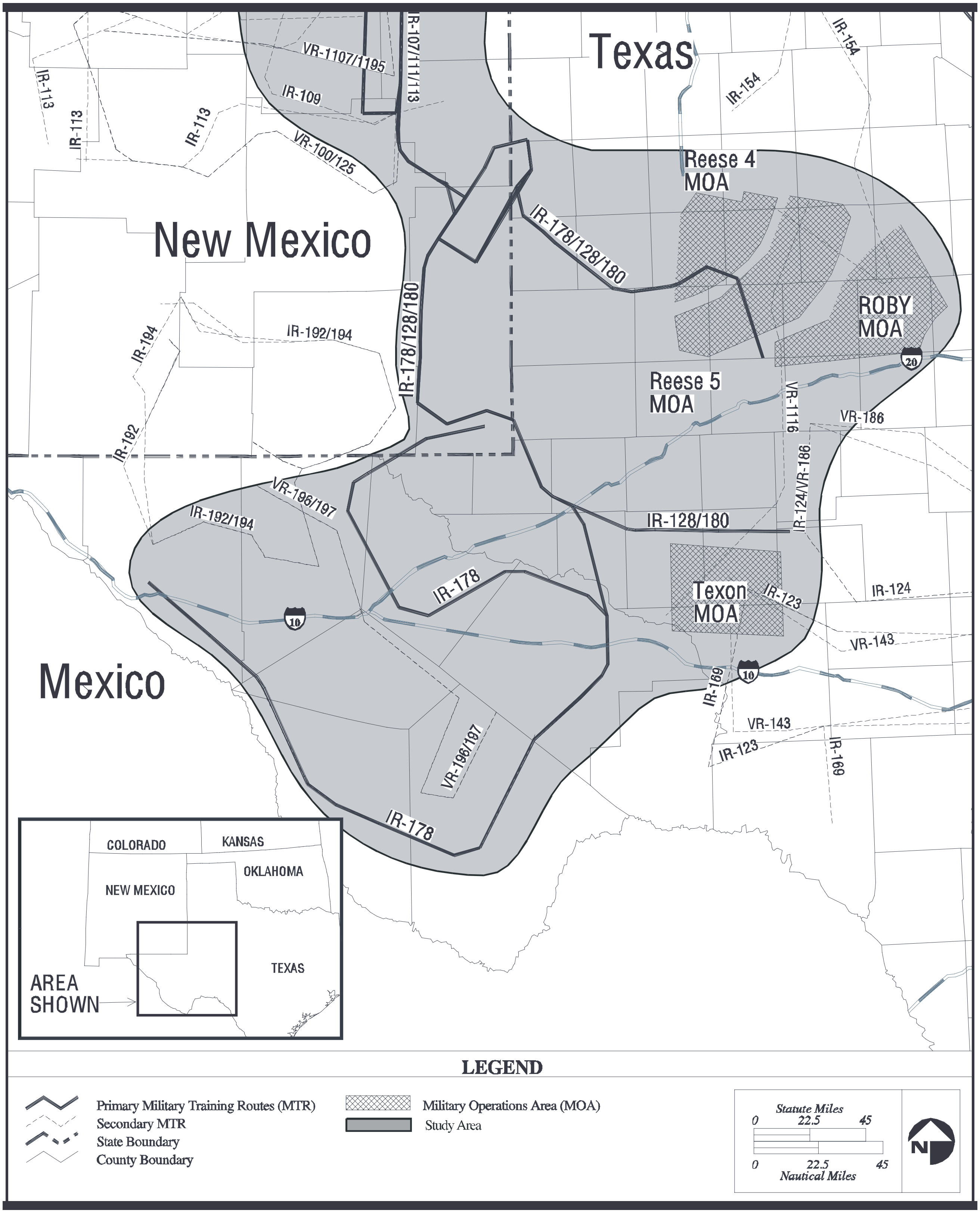
Coarse and fine screenings were used to identify the environmentally preferred action alternative. At the coarse level, the analysis demonstrated Alternative D would result in impacts whose magnitude exceeded those defined for Alternatives B and C. Fine screening revealed that Alternative B would result in somewhat less potential for environmental impacts than Alternative C. These factors led the Air Force to identify Alternative B as the environmentally preferred alternative.

2.2 DESCRIPTION OF STUDY AREA

The study area for RBTI includes the locations of the No-Action and three action alternatives.

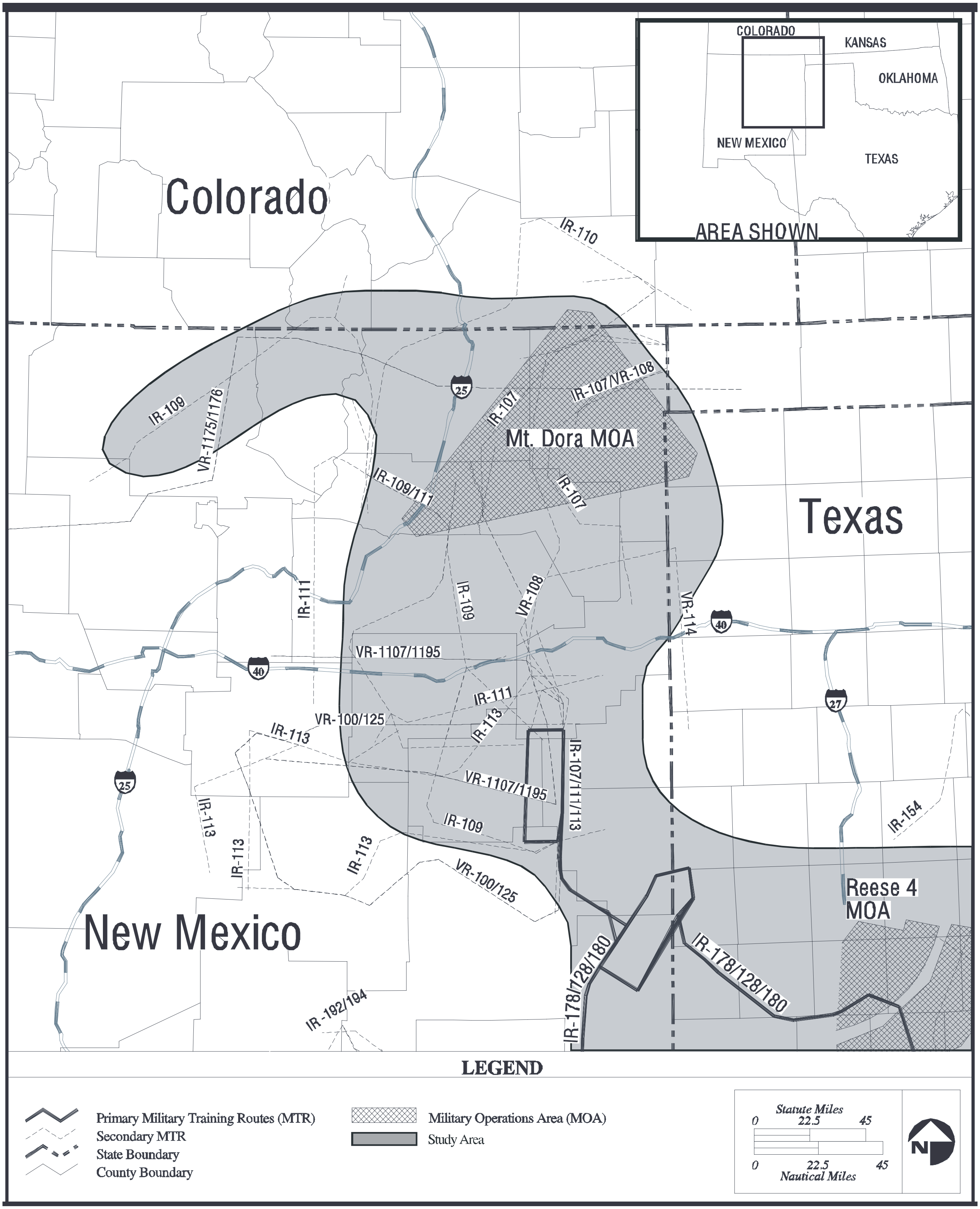
The study area for the RBTI proposal extends from western Texas to northeastern New Mexico (Figures 2.2-1a and 2.2-1b), and includes geographically separated locations in Colorado and Arkansas (Figure 2.2-2). The study area provides an overall context for portraying general military aircraft activities (Table 2.2-1) that could affect or be affected by RBTI alternatives. The definition of the study area derives from a combination of the areas potentially affected under each of the four alternatives, including the No-Action Alternative. These potentially affected areas are formed by primary airspace (i.e., MTRs and MOA) used by the bombers from Barksdale and Dyess AFBs, as well as secondary airspace that interacts (i.e., overlaps or intersects) with primary airspace. The following summarizes the affected environment within the study area for each alternative:

- Alternative A: No-Action. Based on primary airspace, the No-Action Alternative focuses on west Texas, centered on the existing MTR designated as IR-178. This alternative's primary airspace also extends into New Mexico (IR-128/180) and includes the airspace associated with the Harrison and La Junta Electronic Scoring Sites in Arkansas and Colorado, respectively. Within the Texas and New Mexico portion of the affected area, many secondary airspace units interact with primary airspace and form a part of the affected area (refer to Figures 2.2-1a and 2.2-1b).

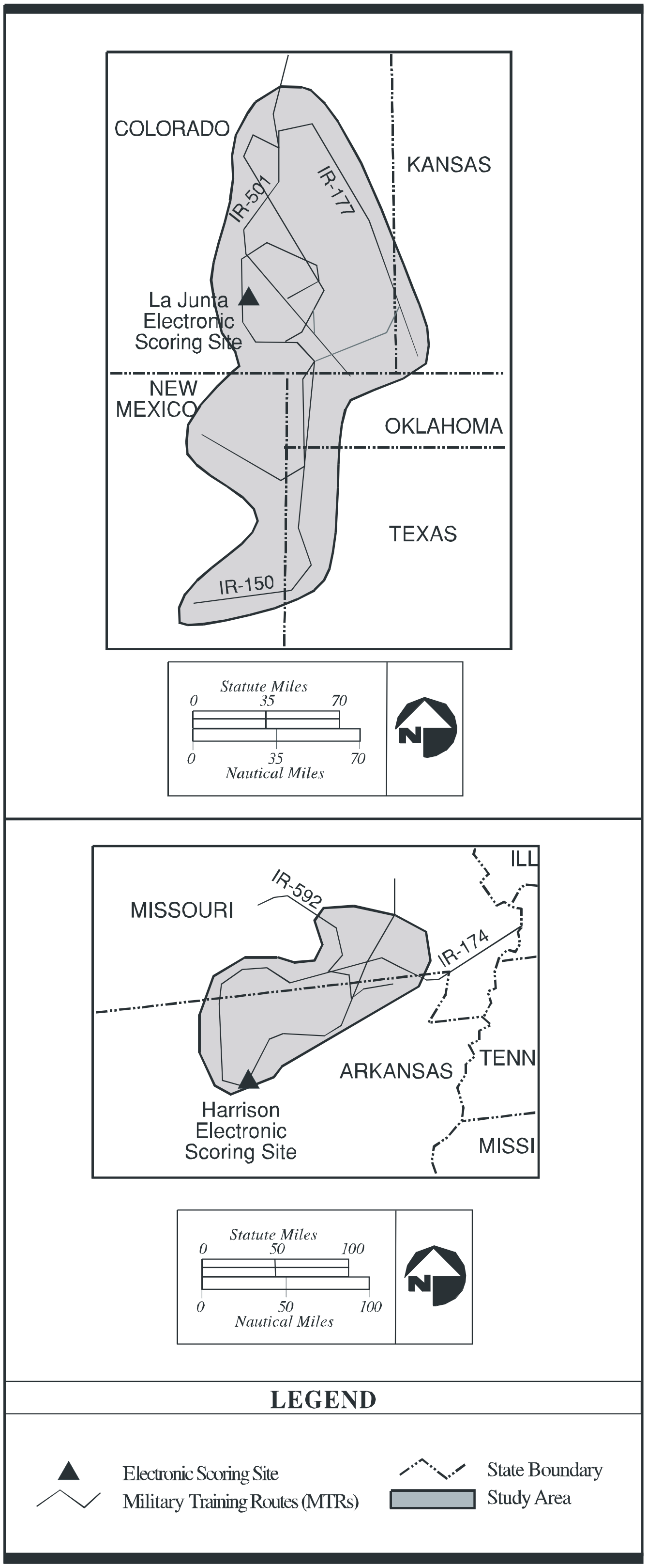


RBTI Study Area: Texas

Figure 2.2-1a



RBTI Study Area: New Mexico **Figure 2.2-1b**



RBTI Study Area: Harrison, Arkansas and La Junta, Colorado

Figure 2.2-2

Table 2.2-1
Baseline Airspace Use in Study Area

		Bomber Aircraft Annual Sortie-Operations			*Other Aircraft Annual Sortie-Operations*						
Airspace Units	*Class*	*B-1s: Dyess*	*B-52s: Barksdale*	*Bombers: Other Bases*	*Air Force Fighter Aircraft* [1]	*Navy Aircraft* [2]	*GAF Aircraft* [3]	*RSAF Aircraft* [4]	*Trainer Aircraft* [5]	*Other Aircraft* [6]	*Total*
MTRs											
VR-100/125	S				964	8	100	188	1	4	1,265
VR-108	S				97	25		18	3		143
VR-114	S				805			146	56	7	1,014
VR-143	S			100	50	400			70		620
VR-186	S			100	50	400			625		1,175
VR-196/197	S								512		512
VR-1107/1195	S				1,050						1,050
VR-1116	S			30							30
VR-1175/1176	S			50							50
IR-107	S			10	71			13	10		104
IR-109	S			50	188	28		33		11	310
IR-110	S										0
IR-111	S				80		9	14	18	9	130
IR-113	S				110	170		20			300
IR-123	S			1	1	35			13		50
IR-124	S			10	10	20			40	60	140
IR-128/180	**P**	**25**	**25**						**150**		**200**
IR-150	**P**	**200**	**80**								**280**
IR-154	S				10					60	70
IR-169	S								465		465
IR-174	**P**	**40**	**25**	**121**							**186**
IR-177/501	**P**	**275**	**150**								**425**
IR-178[7]	**P**	**805**	**555**	**150**	**50**						**1,560**
IR-192/194	S						637			21	658
IR-592	**P**		**190**	**317**						**3**	**510**
MOAs											
Reese 4	**P**	**3**									**3**
Reese 5	**P**	**3**									**3**
Roby	**P**	**100**									**100**
Texon	S				15	30			40	15	100
Mt. Dora	**P**	**6**	**5**		**321**	**4**		**33**		**10**	**379**

Class: P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
Class: S = Secondary airspace unit intersects with airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale.
VR = Visual Route
IR = Instrument Route
[1] Consists predominantly of F-16s
[2] Consists of F-14s and F-18s
[3] German Air Force Tornados at Holloman AFB
[4] Republic of Singapore F-16s at Cannon AFB
[5] T-38 and T-1 trainers
[6] Includes primarily transport aircraft such as C-141s and C-17s
[7] Total sortie-operations represent maximum for segments of MTR; other segments are used less.

- Alternative B: IR-178/Lancer MOA. The affected area for Alternative B is very similar to that described for Alternative A: No-Action, with the exception of proposed airspace changes to create the Lancer MOA/ATCAA. The affected area also includes airspace associated with the Harrison and La Junta Electronic Scoring Sites.

- Alternative C: IR-178/Texon MOA. With the exception of the proposed modifications to the existing Texon MOA (instead of establishment of the

Lancer MOA/ATCAA), the affected area for Alternative C matches that described for Alternatives A and B. An ATCAA would be established atop the proposed Texon MOA.

- Alternative D: IR-153/Mt. Dora MOA. Alternative D is focused in northeastern New Mexico and centers on the proposed MTR designated IR-153 and the Mt. Dora MOA/ATCAA. Secondary airspace associated with Alternative D differs from that in Alternatives A, B, and C. Reduced use of primary airspace associated with the Harrison and La Junta Electronic Scoring Sites would continue, so this airspace would remain part of the affected area.

Changes resulting from the alternatives are evaluated against the baseline. Baseline conditions include both current operations and already approved actions that would occur at the same time as the proposed RBTI.

Existing airspace in the study area already receives considerable use. Table 2.2-1 above presents baseline sortie-operations for the primary and secondary airspace within the study area (also see Appendix B). Baseline sortie-operations were derived by incorporating current and approved impending actions in the study area as described below. Approved impending actions would be implemented by the time RBTI would start. Baseline sortie-operations include activities by all aircraft users, irrespective of organization or service affiliation.

Actual Sortie-Operations Fiscal Year (FY) 97: Actual counts of aircraft activities based on scheduling and usage information maintained by airspace managers formed the foundation for annual baseline sortie-operations. Airspace managers at Cannon AFB, Barksdale AFB, Dyess AFB, Tinker AFB, Holloman AFB, and others supplied these data. Sortie-operations by all aircraft types (e.g., B-1s, B-52s, F-16s, F-18s) documented as users of primary or secondary airspace are reflected in the FY 97 counts.

A sortie-operation is a way to count airspace use. A sortie-operation is the use of any part of one specific MTR or MOA by one aircraft.

German Air Force (GAF) Training Activities: The GAF has been conducting sortie-operations within airspace in the study area since 1992. These sortie-operations, as conducted by GAF F-4 and Tornado aircraft, form part of the FY 97 data. In addition, the total baseline sortie-operations used in this EIS account for GAF flight activities resulting from the decision to beddown 30 additional GAF Tornados at Holloman AFB. This decision also affects secondary airspace in the study area. Use of IR-102/141, as proposed in the Environmental Assessment on Airspace Modifications to Support Units at Holloman AFB (USAF 1997a), has been eliminated by the Air Force. Other than activity on IR-102/141, the GAF sortie-operations were integrated into the baseline for RBTI, since the action is anticipated to be fully implemented by the time RBTI would be established.

Force Structure and Foreign Military Sales at Cannon AFB: As part of the Department of Defense (DOD) Quadrennial Defense Review, Cannon AFB, New Mexico, was selected to undergo a conversion of one type of F-16s for another type, and to support F-16 training for Republic of Singapore Air Force (Foreign Military Sales) personnel. These changes resulted in the addition of 12 F-16 aircraft at Cannon AFB and increases in sortie-operations in secondary airspace within the RBTI study area. An Environmental Assessment (USAF 1998b) was prepared. A Finding of No Significant Impact was signed for this action which was initially implemented in Fall 1998. Projected Cannon AFB F-16 sortie-operations in the affected secondary airspace were incorporated into the RBTI baseline since they have begun and would be fully implemented before any action relating to RBTI would be taken.

Force Structure Changes at Dyess AFB: As documented in an Environmental Assessment (USAF 1996) and Finding of No Significant Impact, addition of eight more B-1s to Dyess AFB was approved in 1994. This action, which is expected to be implemented by 2000, generates sortie-operations in primary airspace that are incorporated into the baseline for the RBTI study area.

2.3 ALTERNATIVE A: NO-ACTION

Under NEPA, "No-Action" means that a proposed action would not take place, and the resulting environmental effects from taking no action would be compared with the effects of allowing the proposed activity to go forward. Under Alternative A: No-Action, the Air Force would not establish an ESS system in proximity to Barksdale and Dyess AFBs. No additional airspace, emitter, or scoring sites would be developed and no airspace would be eliminated. Bombers from Barksdale and Dyess AFBs would continue to use existing Electronic Scoring Sites at Harrison and La Junta, in addition to the remote training assets throughout the U.S. MTR and MOA use would continue unchanged relative to baseline conditions (refer to Table 2.2-1 and Section 2.2).

2.3.1 Airspace and Flight Operations

The affected area for Alternative A would comprise a subset of the primary and secondary airspace (MOAs and MTRs) within the study area in Texas and New Mexico (Figure 2.3-1) and would include the MTRs associated with the Harrison, Arkansas, and La Junta, Colorado, and Electronic Scoring Sites (refer to Figure 2.2-2). Aircrews from Barksdale and Dyess AFBs would not use secondary airspace in the study area; other Air Force, Navy, and National Guard, as well as GAF and Republic of Singapore aircrews, use the secondary airspace.

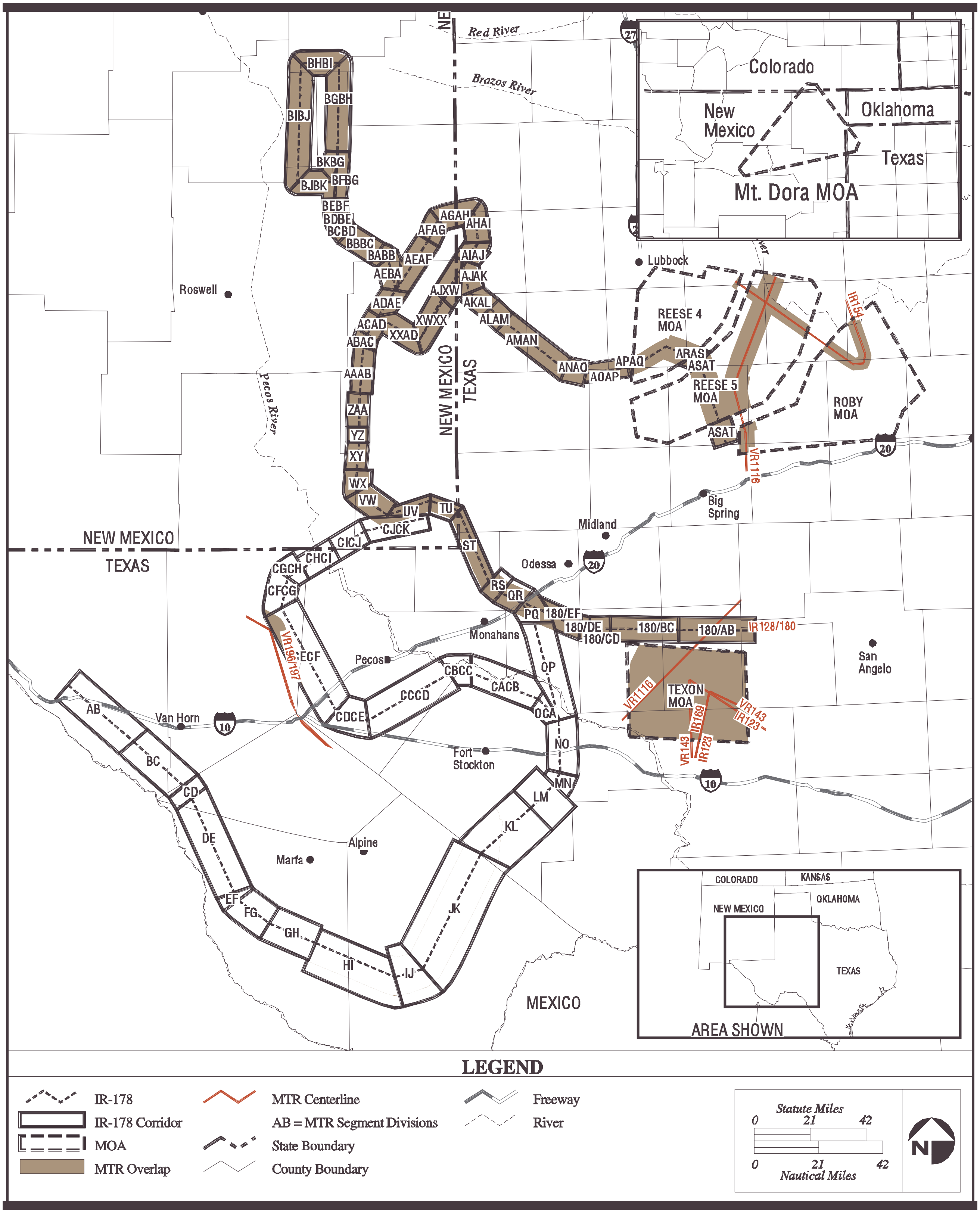
Primary airspace consists of those MTRs and MOAs used by bombers from Barksdale and Dyess AFBs. Secondary airspace includes MTRs and MOAs that overlap or intersect with primary airspace and are not used by Barksdale and Dyess AFBs.

Sortie-operations (Table 2.3-1) on MTRs by Barksdale and Dyess AFBs would continue to focus on IR-178 (Texas and New Mexico), with lesser emphasis on the routes associated with the Harrison (IR-174, IR-592) and La Junta (IR-150, IR-177/501) Electronic Scoring Sites. MOA use in the study area centers on the Roby MOA, but this use is limited with only 100 sortie-operations per year. Use of the three other primary airspace MOAs (Reese 4, Reese 5, and Mt. Dora) is 11 or fewer bomber sortie-operations per year.

Of the primary MTRs in the affected area for Alternative A, IR-178 receives the most annual use by the bombers. This use differs by segment, which is a defined portion of the corridor (e.g., AB or CD) with a length, width, as well as floor and ceiling altitudes (see Appendix C). A total of 71 segments comprise IR-178 for Alternative A. Within IR-178, the most annual sortie-operations (1,560) occur in segments AB to LM (Table 2.3-2), whereas other segments receive much less use. B-1s and B-52s account for 97 to 100 percent of the sortie-operations in all segments (see Appendix B). F-16 fighters also use segments AB to LM, but only account for about 3 percent of total sortie-operations.

Other primary and secondary MTRs overlap or intersect with IR-178. Overlapping applies when two or more MTRs or MOAs coincide or mostly coincide horizontally and vertically (Figure 2.3-2). For IR-178, segments PQ to BIBJ overlap completely with IR-128/180. Intersections occur when one or more MTRs cross a part of another MTR, like IR-178 (Figure 2.3-3). In segments CECF and CFCG, VR-196/197 intersects IR-178.

These overlapping and intersecting MTRs receive use distinct from IR-178. Where these overlaps and intersections occur, the total sortie-operations for that finite area include the combined use of IR-178 and use of the overlapping or intersecting MTR. For example, in segments ZAA to AGAH of IR-178, 765 baseline sortie-operations occur annually; IR-128/180 overlaps this segment and supports 200 sortie-operations per year. Considered together, 965 sortie-operations fly through the area defined by segments ZAA to AGAH of IR-178. Table 2.3-2 presents the total sortie-operations for each segment of IR-178.



Alternative A: No-Action

Figure 2.3-1

2.0 Description of Proposed Action and Alternatives: Alternative A

Table 2.3-1
Alternative A: No-Action (Baseline) Airspace Use

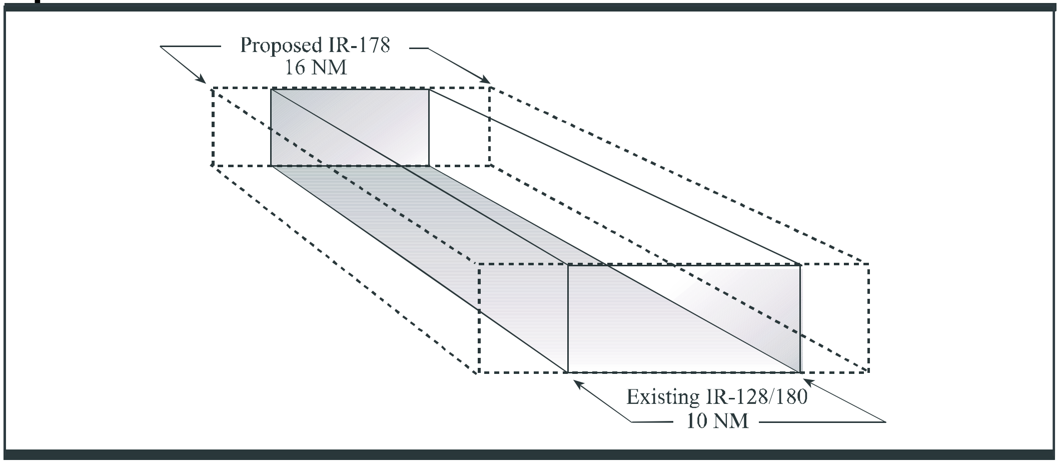
		Bomber Aircraft Annual Sortie-Operations			*Other Aircraft Annual Sortie-Operations*						
Airspace Units	*Class*	*B-1s: Dyess*	*B-52s: Barksdale*	*Bombers: Other Bases*	*Air Force Fighter Aircraft* [1]	*Navy Aircraft* [2]	*GAF Aircraft* [3]	*RSAF Aircraft* [4]	*Trainer Aircraft* [5]	*Other Aircraft* [6]	*Total*
MTRs											
VR-100/125	S				964	8	100	188	1	4	1,265
VR-108	S				97	25		18	3		143
VR-114	S				805			146	56	7	1,014
VR-143	S			100	50	400			70		620
VR-186	S			100	50	400			625		1,175
VR-196/197	S								512		512
VR-1107/1195	S				1,050						1,050
VR-1116	S			30							30
VR-1175/1176	S			50							50
IR-107	S			10	71			13	10		104
IR-109	S			50	188	28		33		11	310
IR-110	S										0
IR-111	S				80		9	14	18	9	130
IR-113	S				110	170		20			300
IR-123	S			1	1	35			13		50
IR-124	S			10	10	20			40	60	140
IR-128/180	**P**	**25**	**25**						**150**		**200**
IR-150	**P**	**200**	**80**								**280**
IR-154	S				10					60	70
IR-169	S								465		465
IR-174	**P**	**40**	**25**	**121**							**186**
IR-177/501	**P**	**275**	**150**								**425**
IR-178 [7]	**P**	**805**	**555**	**150**	**50**						**1,560**
IR-192/194	S						637			21	658
IR-592	**P**		**190**	**317**						**3**	**510**
MOAs											
Reese 4	**P**	**3**									**3**
Reese 5	**P**	**3**									**3**
Roby	**P**	**100**									**100**
Texon	S				15	30			40	15	100
Mt. Dora	**P**	**6**	**5**		**321**	**4**		**33**		**10**	**379**

Class: P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
Class: S = Secondary airspace unit intersects with airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
VR = Visual Route
IR - Instrument Route
[1] Consists predominantly of F-16s
[2] Consists of F-14s and F-18s
[3] German Air Force Tornados at Holloman AFB
[4] Republic of Singapore F-16s at Cannon AFB
[5] T-38 and T-1 trainers
[6] Includes primarily transport aircraft such as C-141s and C-17s
[7] Total sortie-operations represent maximum for segments of MTR; other segments are used less.

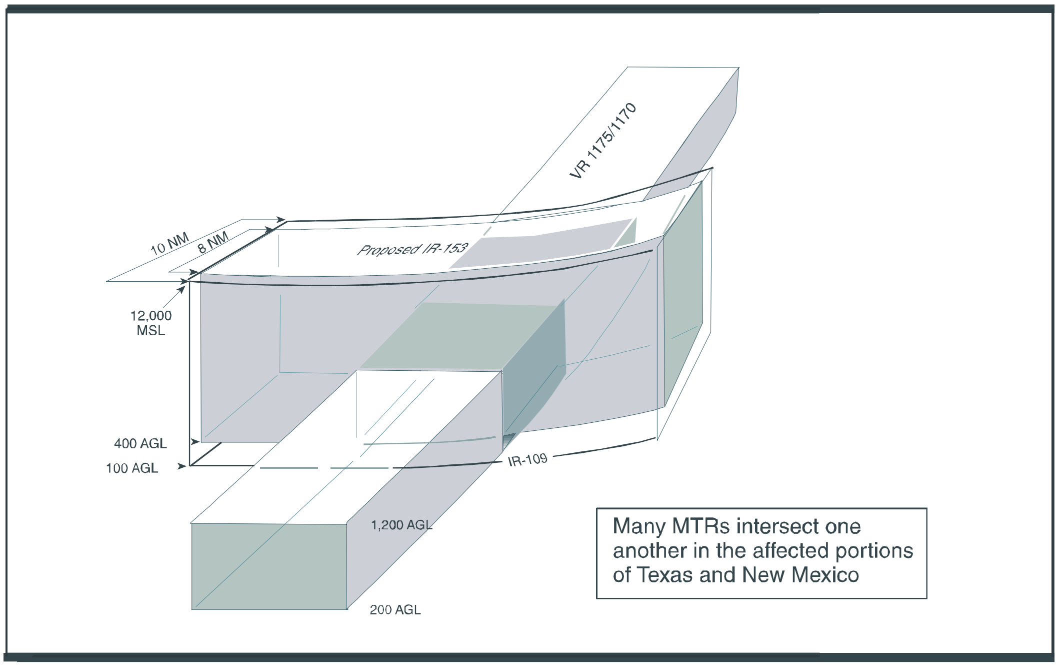
Table 2.3-2
Alternative A: No-Action Existing Annual Sortie-Operations IR-178[1]

IR-178		Secondary MTR		Total[2]	IR-178		Secondary MTR		Total
Segment	Sortie-Operations	MTR	Sortie-Operations		Segment	Sortie-Operations	MTR	Sortie-Operations	
AB	1,560	not applicable	not applicable	1,560	AKAL	65	IR-128/180	200	265
BC	1,560	not applicable	not applicable	1,560	ALAM	65	IR-128/180	200	265
CD	1,560	not applicable	not applicable	1,560	AMAN	65	IR-128/180	200	265
DE	1,560	not applicable	not applicable	1,560	ANAO	65	IR-128/180	200	265
EF	1,560	not applicable	not applicable	1,560	AOAP	65	IR-128/180	200	265
FG	1,560	not applicable	not applicable	1,560	APAQ	65	IR-128/180	200	265
GH	1,560	not applicable	not applicable	1,560	AQAR	65	IR-128/180	200	265
HI	1,560	not applicable	not applicable	1,560	ARAS	65	IR-128/180	200	265
IJ	1,560	not applicable	not applicable	1,560	ASAT	65	IR-128/180	200	265
JK	1,560	not applicable	not applicable	1,560	AI1XX	0	IR-128/180	200	200
KL	1,560	not applicable	not applicable	1,560	AE1BA	125	IR-128/180	200	325
LM	1,560	not applicable	not applicable	1,560	BABB	125	IR-128/180	200	325
MN	955	not applicable	not applicable	955	BBBC	125	IR-128/180	200	325
NO	955	not applicable	not applicable	955	BCBD	125	IR-128/180	200	325
OP	765	not applicable	not applicable	765	BDBE	125	IR-128/180	200	325
PQ	765	IR-128/180[3]	200	965	BEBF	125	IR-128/180	200	325
QR	765	IR-128/180	200	965	BFBG	125	IR-128/180	200	325
RS	765	IR-128/180	200	965	BGBH	125	IR-128/180	200	325
ST	765	IR-128/180	200	965	BHBI	125	IR-128/180	200	325
TU	765	IR-128/180	200	965	BIBJ	125	IR-128/180	200	325
UV	765	IR-128/180	200	965	BJBK	125	IR-128/180	200	325
VW	765	IR-128/180	200	965	BKBG1	0	IR-128/180	200	200
WX	765	IR-128/180	200	965	AIXW	0	IR-128/180	200	200
XY	765	IR-128/180	200	965	XWXX	0	IR-128/180	200	200
YZ	765	IR-128/180	200	965	O1CA	190	not applicable	not applicable	190
ZAA	765	IR-128/180	200	965	CACB	190	not applicable	not applicable	190
AAAB	765	IR-128/180	200	965	CBCC	190	not applicable	not applicable	190
ABAC	765	IR-128/180	200	965	CCCD	190	not applicable	not applicable	190
ACAD	765	IR-128/180	200	965	CDCE	190	not applicable	not applicable	190
ADAE	765	IR-128/180	200	965	CECF	190	VR-196/197	512	702
AEAF	65	IR-128/180	200	265	CFCG	190	not applicable	not applicable	190
AFAG	65	IR-128/180	200	265	CGCH	190	IR-192/194	658	848
AGAH	65	IR-128/180	200	265	CHCI	190	not applicable	not applicable	190
AHAI	65	IR-128/180	200	265	CICJ	190	not applicable	not applicable	190
AIAJ	65	IR-128/180	200	265	CJCK	190	not applicable	not applicable	190
AJAK	65	IR-128/180	200	265					

[1] See Appendix B for break-out of sortie-operations by aircraft type.
[2] Total represents the sortie-operations flown on the primary MTR (IR-178) plus those flown on overlapping or intersecting segments of other MTRs.
[3] IR-128/180 is a primary MTR under Alternative A.
See Figure 2.3-1 for segment locations.



Illustrative Representation of Overlapping MTR Airspace **Figure 2.3-2**



Illustrative Representation of Intersecting MTRs **Figure 2.3-3**

Within the primary MTRs, aircraft would use altitudes between 300 and 3,000 feet AGL (Table 2.3-3). On average, all aircraft types including bombers from Barksdale and Dyess AFBs fly most of the time at 500 to 1,000 feet AGL in the primary MTRs. For B-52s, average flight altitudes can vary with changes to mission requirements. Two altitude regimes for B-52s can apply depending upon these requirements. In one regime, B-52s use altitudes between 300 and 1,000 feet AGL about 85 percent of the time. In the other regime, B-52s avoid use of altitudes from 300 to 1,000 feet AGL in the MTRs, with flight activity occurring at 1,000 to 3,000 feet AGL.

In all the primary MOAs, except the Mt. Dora MOA, bombers conduct sortie-operations above 3,000 feet AGL all the time. The floors (lower altitude limits) of the primary airspace MOAs are higher than 3,000 feet AGL. In the Mt. Dora MOA, F-16 aircraft use altitudes from 1,500 to 3,000 feet AGL an average of 45 percent of the time. The few (11) annual bomber sortie-operations in the Mt. Dora MOA also use the full range of available altitudes. In all primary MOAs, 45 percent of B-1 flight activity occurs above 15,000 feet AGL, and 60 to 80 percent of B-52 activity

Table 2.3-3
Altitude Distribution in MTRs and MOAs

Altitude (Feet AGL)	B-1	B-52[1]		Other Aircraft
MTRs: Percentage of Time				
100-299	0%	0%	0%	0%
300-499[2]	5%	5%	0%	0%
500-999	80%	80%	0%	90%
1,000-1,999	10%	10%	70%	7%
2,000-2,999	5%	5%	30%	3%
3,000 and above	0%	0%	0%	0%
MOAs: Percentage of Time				
Altitude (Feet AGL)	B-1	B-52[1]		Other Aircraft
100-2,999	0%	0%	0%	0%[3]
3,000-4,999	40%	30%	15%	20%
5,000-9,999	20%	10%	5%	60%
10,000-14,999	0%	0%	0%	20%
15,000-19,999	5%	0%	0%	0%
20,000 and above	35%	60%	80%	0%

[1] Average altitude use for B-52s would vary with mission requirements. Two altitude regimes can apply to B-52 activities.

[2] Only selected aircrews are authorized to fly below 500 feet AGL on specified segments. Numbers presented are averages; not every mission would include flight below 500 feet AGL.

[3] In the Mt. Dora MOA only, other aircraft use from 1,500 to 3,000 feet AGL about 45% of the time. This is not included in the overall calculations since the three other primary airspace MOAs involve no flight below 3,000 AGL.

B-52s can fly MTRs using two altitude regimes. In one regime, they fly between 300 and 1,000 feet AGL about 85 percent of the time. In the other, B-52s fly only above 1,000 feet AGL.

is above 20,000 feet AGL. As in the MTRs, B-52 use of the MOAs can involve two altitude regimes, with one employing higher altitudes to a greater extent.

In a MOA, bombers would conduct training activities for approximately 30 to 45 minutes at airspeeds ranging from 360 to 550 nm/hour. About five training periods would be scheduled per weekday. Within the MTRs, B-1 and B-52 aircrews fly, on average, 420 to 550 and 360 nm/hour, respectively. These represent cruising speeds used for training. Depending upon the specific training mission, aircrews could fly all or part of the MTR.

Training activities in the primary and secondary MTRs and MOAs would continue to be conducted during the day and night (Table 2.3-4). For purposes of environmental analysis, day extends from 7:00 AM to 10:00 PM, and night spans from 10:00 PM to 7:00 AM. B-1s and B-52s, respectively, fly 80 and 85 percent of the time during the day; other aircraft using the airspace fly 93 to 99 percent of the time during the day. Night vision goggles would normally be used by aircrews during night operations. Flight activities by bombers from Barksdale and Dyess AFBs would occur 260 days per year. Training is planned for weekdays, although bad weather and special training requirements may necessitate occasional weekend flights.

Flight activities in MOAs and MTRs occur predominantly during weekdays.

Daily flight operations by bombers on an MTR such as IR-178 commonly involve flying with two aircraft of the same type. If one aircraft trails the other in formation, they are separated by 3 to 9 nm; when they fly abreast of one another in formation, 1 to 3 nm separates them. On a typical day, two to three formations of two B-1s or B-52s use IR-178. Commonly, flights of two aircraft schedule the MTR for an hour and use the hours between 9:00 and 11:00 AM, 1:00 to 3:00 PM, and 7:00 to 8:00 PM (winter) or 9:00 to 10:00 PM (summer). Throughout the day, single bombers and other aircraft could also fly on the MTR.

Table 2.3-4
Percent of Day vs. Night Flight Activities

	Bomber Aircraft		*Other Airspace Users*					
Day vs. Night	*B-1s*	*B-52s*	*Air Force Fighter Aircraft* [1]	*Navy Aircraft* [2]	*GAF Aircraft* [3]	*RSAF Aircraft* [4]	*Trainer Aircraft* [5]	*Other Aircraft* [6]
Day (7:00 AM-10:00 PM)	80%	85%	98%	99%	93%	95%	99%	99%
Night (10:00 PM-7:00 AM)	20%	15%	2%	1%	7%	5%	1%	1%

[1] Consists predominantly of F-16s
[2] Consists of F-14s and F-18s
[3] German Air Force Tornados at Holloman AFB
[4] Republic of Singapore F-16s at Cannon AFB; 5% night activity applies to MOAs only; no night activity on MTRs
[5] T-38 and T-1 trainers
[6] Includes primarily transport aircraft such as C-141s and C-17s

When flying, aircrews comply with FAA avoidance rules. Aircraft must avoid congested areas of a city, town, or settlement or any open-air assembly of people by 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. Outside congested areas, aircraft must avoid persons, vessels, vehicles, or structures by 500 feet.

2.3.2 Use of Electronic Scoring Sites

Under the No-Action Alternative, existing ground operations at the Harrison and La Junta Electronic Scoring Sites would continue at current levels, along with the staffing of those sites. There are about 30 employees at the Harrison Electronic Scoring Site and 31 employees at the La Junta Electronic Scoring Site. Both sites contain buildings providing administration, maintenance, and recreation space for assigned personnel and equipment. Each site contains a storage van connected to an assigned radar and electronic countermeasures equipment van. Septic systems provide waste treatment for the sites. Power, telephone, and water lines are adjacent to the sites. Operations take place in two shifts, mostly during weekdays. Most activities occur from midmorning to early evening, based on flight schedules. Ground operations at each of these facilities would remain the same under the No-Action Alternative.

2.4 ACTION ALTERNATIVES

RBTI has three Action Alternatives: B, C, and D. B is the preferred and environmentally preferred alternative.

The proposed action for RBTI is to provide an ESS system with airspace and ground-based training facilities to conduct training operations within approximately 600 nm from Dyess AFB, Texas, and Barksdale AFB, Louisiana. There are three action alternatives that could fulfill the need defined under the proposed action. All three RBTI action alternatives (Alternatives B, C, and D) would involve the same set of elements and subelements. These are the focus for the impact analysis presented in Chapter 4. The differences among the three action alternatives, as described in Sections 2.4.2 through 2.4.4, consist primarily of the alternatives' locations and some variations in airspace use. Alternative B is the preferred and environmentally preferred alternative.

2.4.1 Elements Common to Action Alternatives

There are four project elements common to the action alternatives: airspace and flight operations, construction, ground operations, and decommissioning

Table 2.4-1
Project Elements and Sub-Elements

Element	*Sub-Element*
AIRSPACE & FLIGHT OPERATIONS	• MTR and MOA/ATCAA establishment/modification • Changing flight operations in MTRs and MOAs • Change in noise from flight operations
CONSTRUCTION	• Land acquisition • Site grading, preparation, fencing • Electronic Scoring Site construction • Emitter site construction and emitter placement • Driveway, telephone, and powerline construction
GROUND OPERATIONS	• Staffing and personnel activities at operations sites • Operations/maintenance of emitters and scoring sites • Radio frequency emissions • Increased vehicle traffic
DECOMMISSIONING	• Disposal of property and termination of lease • Elimination of staff jobs and activities at sites • Removal of equipment/facilities/infrastructure • Elimination of radio frequency emissions • Reduction in vehicle traffic

(Table 2.4-1). Should a decision be made to implement one of the action alternatives, the Air Force estimates the airspace changes could be instituted within two years of the Record of Decision, and full implementation of the proposal could occur within three years.

Airspace and Flight Operations

All three action alternatives would involve changes to the structure or use of airspace. While the Air Force would propose these changes, the FAA would be responsible for evaluating, processing, and charting them. Appendix C presents the FAA's procedures for processing airspace. Only primary airspace (refer to Table 2.3-1) would be affected, although the alternatives would result in interaction with some secondary airspace not currently affected. There are three categories of changes to airspace structure alternatives:

1. *Modification:* This category applies to existing airspace that would be incorporated into and/or redesignated as part of a proposed MTR or MOA/ATCAA. For example, under Alternatives B and C, IR-178 would be modified with many existing segments of IR-178 incorporated into modified IR-178. Similarly, portions of the Reese 4, Reese 5, and Roby MOAs would be incorporated into and redesignated as the proposed Lancer MOA/ATCAA in Alternative B.

2. *Establishment:* This category of change refers to instances where new MTR or MOA/ATCAA airspace would be established for an alternative. Newly established airspace would not include existing airspace that would be simply redesignated. Each of the three action alternatives includes establishment of new airspace. In Alternative D, for example, proposed IR-153 would be established overlapping and intersecting almost entirely with segments of numerous existing secondary MTRs. The portions of proposed IR-153 not overlapped or intersected would be considered new MTR airspace (refer to Figure 2.4-10).

Throughout the remainder of the EIS, IR-178 may be referred to as “proposed IR-178.” It should be noted that “proposed IR-178” in Alternatives B and C represents modifications to existing IR-178, not a proposal for an entirely new MTR.

3. *Elimination:* This category applies to segments of MTRs or parts of MOAs that would be eliminated and no longer used. All three action alternatives would involve elimination of airspace, primarily existing MOA airspace. For MTRs, this category of change applies only to segments of IR-178 in Alternatives B and C.

Combinations of all three categories of airspace structure changes apply to each of the three action alternatives (Alternatives B, C, and D). Specific descriptions of the proposed airspace structure changes for each alternative site are presented below in Sections 2.4.2 through 2.4.4.

The pattern of daily flight activities under the action alternatives would remain similar to current conditions.

The three action alternatives have some commonalities with regard to proposed airspace use. First, proposed increases in airspace use (i.e., annual sortie-operations) stem from projected B-1 and B-52 bomber activity. Sortie-operations by other aircraft (such as F-16 fighters) would not change relative to baseline conditions for either primary or secondary airspace. Second, proposed increases in sortie-operations would affect only primary MTRs and MOA/ATCAAs associated with each alternative. The few secondary airspace units affected would be subject to decreases in sortie-operations. Third, aircraft in primary and secondary airspace would continue to fly according to current altitude distributions (refer to Table 2.3-3). Based on mission requirements, B-52s would continue to employ two altitude regimes--one emphasizing flight at altitudes between 300 and 1,000 feet AGL and one emphasizing altitudes from 1,000 to 3,000 feet AGL or higher (refer to Table 2.3-3). Fourth, the daily pattern of flight activities would remain similar to that described under the No-Action Alternative (refer to Section 2.3.1). To accommodate increased use of the airspace by bombers, one to two additional formation flights of two aircraft apiece would occur on an average day. The percentage of night (after 10:00 PM), flights would not increase under Alternatives B, C, and D, but the number of night sortie-operations in the MTR and MOA/ATCAA associated with each alternative would increase in conjunction with the overall increase in sortie-operations. Fifth, air speeds used for training in the MTR and MOA/ATCAA would remain the same as under the no-action alternative. On an MTR, aircrews could fly all or part of its length, depending upon mission requirements. For example, each of the proposed MTRs associated with Alternatives B, C, and D allows aircraft to exit to the MOA without flying the entire route or to conduct additional training by using the re-entry route. These variations would create the following differences in the approximate amount of time the aircraft fly along the MTR:

- Alternative B - 0.6-1.9 hours for B-52s; 0.4-1.1 hours for B-1s
- Alternative C - 0.6-1.6 hours for B-52s; 0.4-1.0 hours for B-1s
- Alternative D - 0.4-1.7 hours for B-52s; 0.3-0.8 hours for B-1s

CONSTRUCTION

Each RBTI action alternative would require two sets of five emitter sites, one associated with the MTR and one associated with the MOA/ATCAA (Figure 2.4-1), and two Electronic Scoring Sites, one located near the proposed MTR and associated MTR re-entry route and one for the en route Electronic Scoring Site (Figure 2.4-2). In total, these 12 sites, each encompassing 15 acres, would comprise the ground-based assets for the proposed ESS system in the three action alternatives. Construction of the MTR and MOA emitter sites would involve installing a chain-link fence around the perimeter of the 15-acre (800- by 800-foot) site; clearing, grading, and graveling a 0.25-acre pad in the center of the site; and constructing a 14-foot-wide gravel driveway. To power and operate the emitter, the site would be

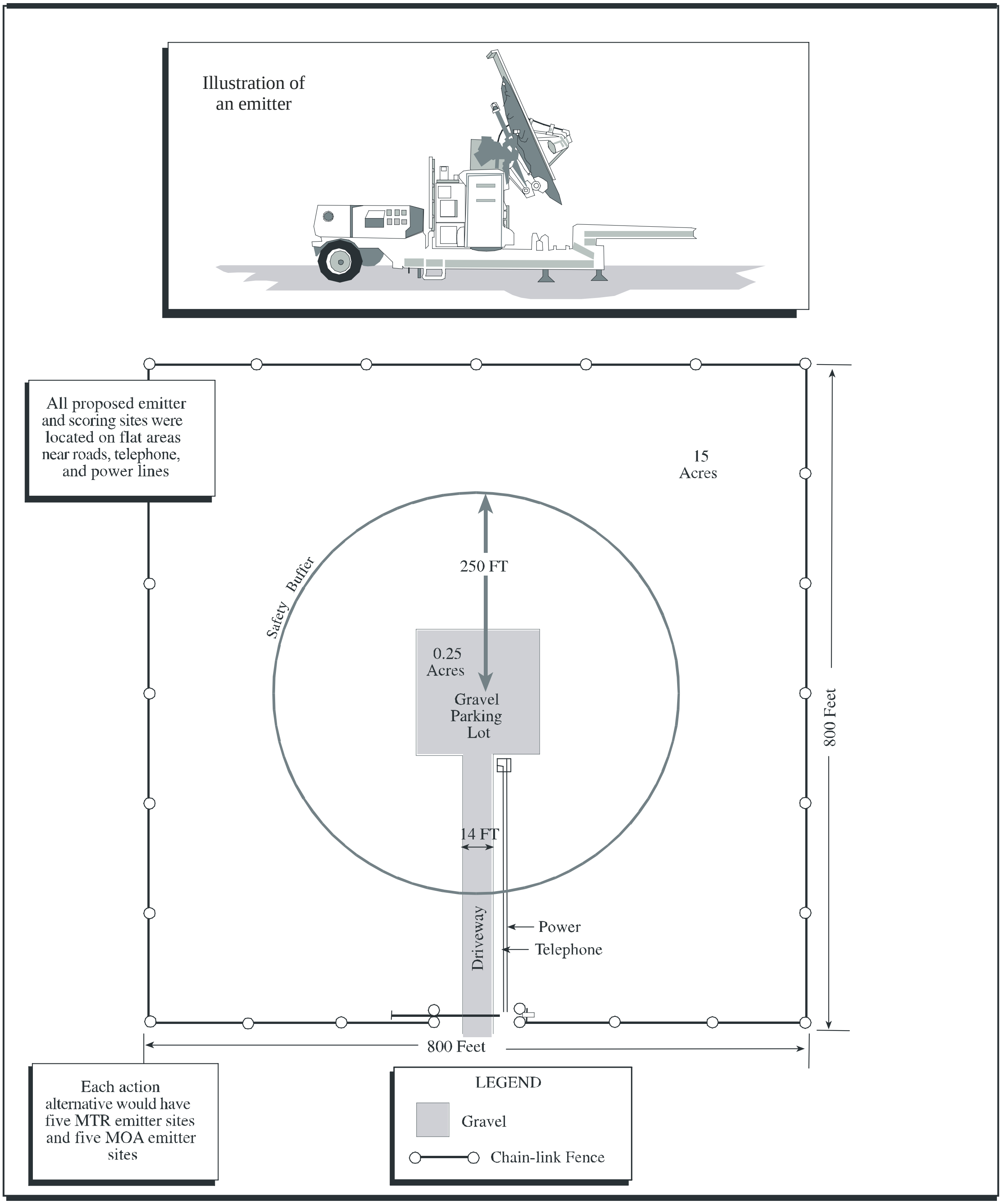
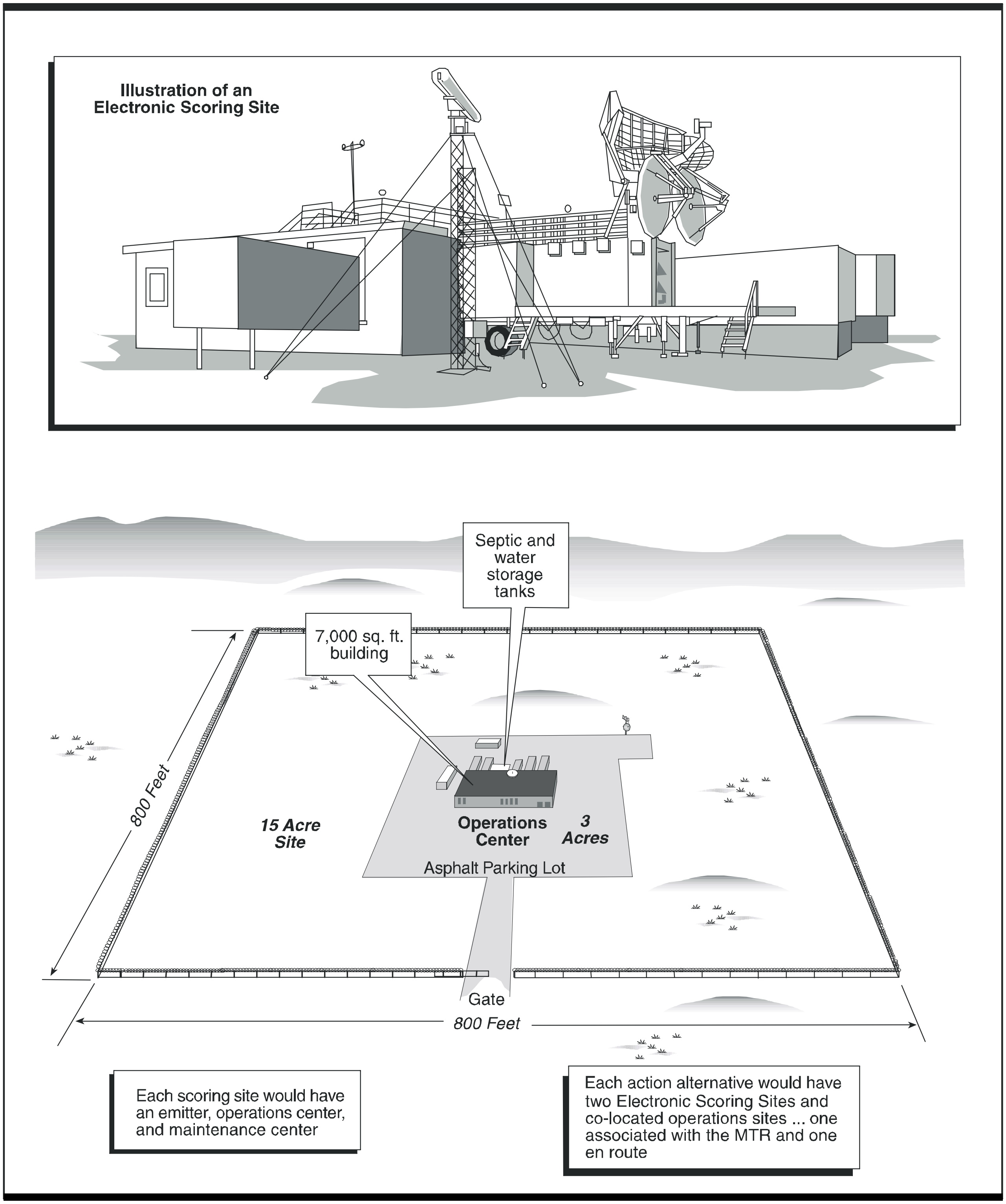


Diagram of MTR and MOA Emitter Sites **Figure 2.4-1**



Illustrations of Electronic Scoring Site **Figure 2.4-2**

linked to existing power and telephone lines. Construction of an emitter site would span 1 to 2 months of intermittent effort.

Construction for the Electronic Scoring Sites would follow a similar pattern with installation of a perimeter chain-link fence, clearing and grading for a 14-foot-wide driveway and 3-acre central pad, and asphalting of the pad and driveway. The Electronic Scoring Sites would require power and communications, so the sites would use existing utility lines. A 7,000-square-foot, one-story operations center would be constructed in the center of the pad. Septic and water storage tanks would be installed on site.

In some instances, existing power lines, telephone lines, and roads lie more than several hundred feet from the sites. To connect the utilities to the sites would require acquisition of a utility easement and installation of poles or underground cables. The Air Force has estimated the route for these lines, although the final responsibility for design and construction would be with the appropriate utility company. Some dirt roads may need to be upgraded or roads to the sites may need to be constructed. These locations have not been determined and any additional environmental studies that may be needed due to changes to the Air Force's estimated route would be accomplished prior to the start of construction and are not part of this impact analysis. Construction of the Electronic Scoring Sites would require 12 to 18 months, including connecting power and telephone lines to the sites. Actual ground disturbance would occur only a fraction of the time during construction.

Identification of locations for emitters and Electronic Scoring Sites followed a systematic process to ensure that candidate sites met operational requirements (refer to Section 2.1.2) and addressed environmental factors. The Air Force used the following steps for identifying candidate sites for MTR emitters, MTR Electronic Scoring Sites, MOA emitters, and the en route Electronic Scoring Site for each alternative:

1. Examined maps of the lands under and near the proposed MTR and MOA for operationally suitable regions.
2. Using more detailed maps, refined the regions into smaller zones associated with existing roads and power lines.
3. Conducted driving visits to the zones to establish multiple smaller parcels encompassing at least 15 acres and offering potentially good line-of-sight; considered many more parcels than would be needed for the emitters and Electronic Scoring Sites; and eliminated parcels containing or close to homes (within 3,000 feet), known historical sites, large structures, and obvious bodies of water from further consideration, as well as parcels farther than 2 miles from power and telephone lines.
4. Performed initial research at county courthouses and other public record storehouses to identify owners of parcels.
5. Contacted owners of parcels to determine willingness to consider leasing lands for emitter or Electronic Scoring Site placement; carried forward parcels of willing owners and eliminated those where owners declined interest in leasing.
6. Prepared and obtained signatures on formal rights-of-entry for parcels; eliminated parcels where owners previously expressing interest declined the right-of-entry.
7. Conducted on-the-ground visits to all parcels with rights-of-entry to perform investigation of available lines-of-sight for emitter and Electronic Scoring Site operation; evaluated distances to roads, power lines, and telephone lines; refined boundaries to match the 15-acre size requirement; eliminated parcels failing to meet operational requirements; and defined parcels meeting requirements as numbered candidate sites (see Appendix D for locations).

The Air Force carefully studied each candidate site for emitters and Electronic Scoring Sites.

8. Performed background research on all candidate sites to determine previous land uses, evidence of hazardous materials use and waste disposal, wetlands, soils, endangered species, and cultural resources.
9. Completed comprehensive, on-the-ground environmental baseline surveys for indications of hazardous materials and waste, biological surveys, and archaeological surveys of each candidate site (see Appendix E for survey results).

This process resulted in identification of more candidate sites than would be needed for the emitters and Electronic Scoring Sites under each action alternative (Table 2.4-2). Should an action alternative be selected in a Record of Decision, the required number of sites for emitters and Electronic Scoring Sites would also be selected. Offering more than the required number of candidate sites provides greater flexibility for addressing potential environmental impacts.

Table 2.4-2
Comparison of Candidate and Required Emitter Sites and Electronic Scoring Sites

	Alternative B		*Alternative C*		*Alternative D*	
	Candidate Sites	*Sites Required*	*Candidate Sites*	*Required Sites*	*Candidate Sites*	*Required Sites*
MTR Emitters	6	5	6[1]	5	9	5
MTR Electronic Scoring Site	2	1	2[1]	1	3	1
MOA/ATCAA Emitters	6	5	6	5	8	5
En Route Electronic Scoring Site	2[2]	1	2[2]	1	2[2]	1

[1] Same candidate sites as in Alternative B

[2] Same candidate sites in all three alternatives

Of the cumulative total of 42 different candidate sites, 40 lie on private property. To acquire the right to construct and operate the ground-based assets on such sites, the Air Force would need to lease or purchase the 11 sites (for five MTR emitters, five MOA emitters, and one MTR Electronic Scoring Site) selected as candidates for each alternative. The twelfth site needed for the package of ground-based assets consists of the location for the en route Electronic Scoring Site. Two sites located near and managed by Dyess AFB represent the only candidates for the single en route Electronic Scoring Site under all three action alternatives. Both sites are Department of Defense (DoD) lands and contain existing but unused structures. To meet the requirements for the Electronic Scoring Site, the Air Force would construct a new building, connect to on-site power, telephone, and water sources, and install a septic system.

MTR and MOA emitters would be activated only as needed for training; they would not operate constantly.

GROUND OPERATIONS

The combination of the Electronic Scoring Sites and the sets of MTR and MOA emitters form the ground-based assets for an ESS system. Use of the system would occur more than 98 percent during weekdays, with less than 2 percent during weekends. About 85 percent of flight activities would be performed between 7:00 AM and 10:00 PM, with the remaining 15 percent occurring after 10:00 PM. Personnel would be present at the Electronic Scoring Sites when aircraft use the system. Approximately 30 employees would work at each Electronic Scoring Site and live off-site in nearby communities. The Electronic Scoring Sites would include a threat emitter, electronic scoring facilities, and parking. Commonly, panel trucks containing integrated electronic equipment are connected into the building on one side. The MOA and MTR emitters would also operate in response to scheduled use. These unmanned emitters would be remotely activated and programmed from an Electronic Scoring Site only during those periods when aircraft would use them for training. They would not operate constantly but would be turned on and off as needed. Not all emitters would be used all the time. Use would depend upon the type of training and expected threats. By varying which emitters were operating at a given time, aircrews would receive more realistic training by having to quickly respond to an unfamiliar scenario.

For RBTI, the Air Force would use emitters known as "mini-MUTES" at the MTR and MOA sites. These unmanned emitters are programmed to simulate numerous types of threats. The emitters are about 17 feet tall, including an antenna, and are similar in size to a flatbed semi-tractor trailer. During operation, the antenna would be pointed skyward. When they are to be activated, a warning horn sounds and lights flash for a few seconds. The horn is equivalent to a luggage carousel horn, and the light is a standard warning light equivalent to those used on construction barriers.

Emitters generate radio frequency (RF) emissions. RF energy is absorbed by an animal or human body in the form of heat. The result is a temperature increase that can be accommodated by species temperature regulation capabilities or avoided by movement away from the source of energy. Department of Defense Instruction 6055.1 (1995) sets the permissible exposure limits for humans. These limits are designed for personnel working around and near emitters, but they also serve to protect the public who would be further away from the RF source. The potential impact to wildlife would be extremely small. As mentioned above, the animal would experience a rise in its body temperature if it stayed in direct line of the RF emission. However, before the animal could be harmed, it would naturally move away from the area.

For the types of emitters proposed under RBTI, a safe separation distance of 250 feet has been established to prevent exposure to RF energy. This distance is based on tests with the emitter beam pointed parallel to the ground and held in one spot. The test results are very conservative because when the emitters are in actual use, they would be pointed skyward and in motion. As such, the distance around the emitter affected by RF energy would be less than 250 feet.

Placing the emitter in the center of a fenced 15-acre (800- by 800-foot) site provides more than 150 feet beyond the safe separation distance. Maintenance of the emitters would occur monthly and when required for emergency repairs. Personnel from the Electronic Scoring Sites would conduct the maintenance.

DECOMMISSIONING

The Electronic Scoring Sites at Harrison, Arkansas, and La Junta, Colorado, would be closed under any of the three action alternatives. This would include closure of associated emitter sites. For the Electronic Scoring Sites, all equipment would be removed from the building/facility, leaving an intact building with all utilities. All equipment would be moved to the Electronic Scoring Sites for RBTI. For Harrison, where the Air Force leases the land, the Air Force would end its lease through agreement with the property owner. Retention or disposition of the building would be decided as part of terminating the lease. For La Junta, which lies on land owned by the DoD and managed by the Air Force, the site would be disposed of through standard procedures for excess government property.

Existing emitter sites associated with the Harrison and La Junta Electronic Scoring Sites are not greatly developed. Improvements at the sites include electrical lines, telephone connections, and a gravel pad. The Air Force proposes to remove the emitters and transport them to the sites for whichever action alternative may be selected. If the emitter site land is leased, it would be returned to the owner through ending the agreement with the Air Force. If the lands are owned by the Air Force, they would be disposed of through standard procedures for excess government property.

The existing mix (military and civilian) of employees at the Harrison and La Junta Electronic Scoring Sites is similar to that proposed for the Electronic Scoring Sites under RBTI. Air Force personnel working at these existing facilities would be offered the opportunity to relocate to the new sites to continue their jobs. Currently, about 61 employees work at the Harrison and La Junta sites.

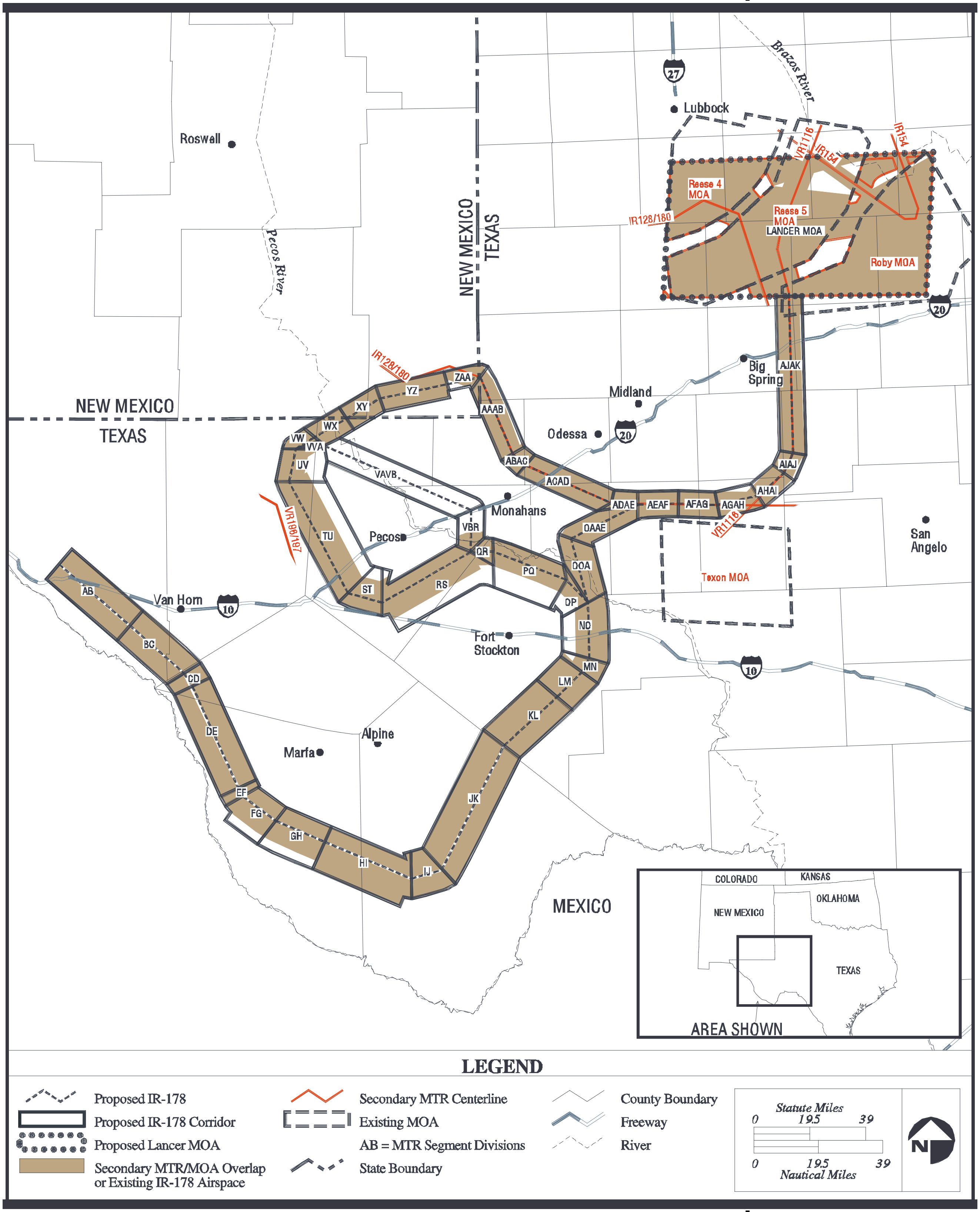
2.4.2 Alternative B: IR-178/Lancer MOA

The affected area for Alternative B occurs mostly in western Texas, with only a small portion of MTR airspace falling within southeastern New Mexico (Figure 2.4-3). It also includes the Mt. Dora MOA (refer to Figure 2.3-1) as well as the MTRs associated with Electronic Scoring Sites at Harrison and La Junta (refer to Figure 2.2-2). This affected area, which represents a subset of the overall study area, corresponds to the locations of primary airspace (MTRs and MOAs) that would undergo changes in structure or use as a result of implementing Alternative B. Secondary airspace forms part of the affected area only where secondary MTRs and MOAs overlap or intersect primary airspace.

AIRSPACE AND FLIGHT OPERATIONS

Airspace Modifications. Alternative B airspace centers on existing IR-178 and the proposed Lancer MOA/ATCAA, where the bombers would conduct about 96 percent of their sortie-operations within the affected area. In addition to changes in the amount of use, IR-178 would undergo some structural modifications (Figure 2.4-4). Most of IR-178 would remain intact, but changes would include the following:

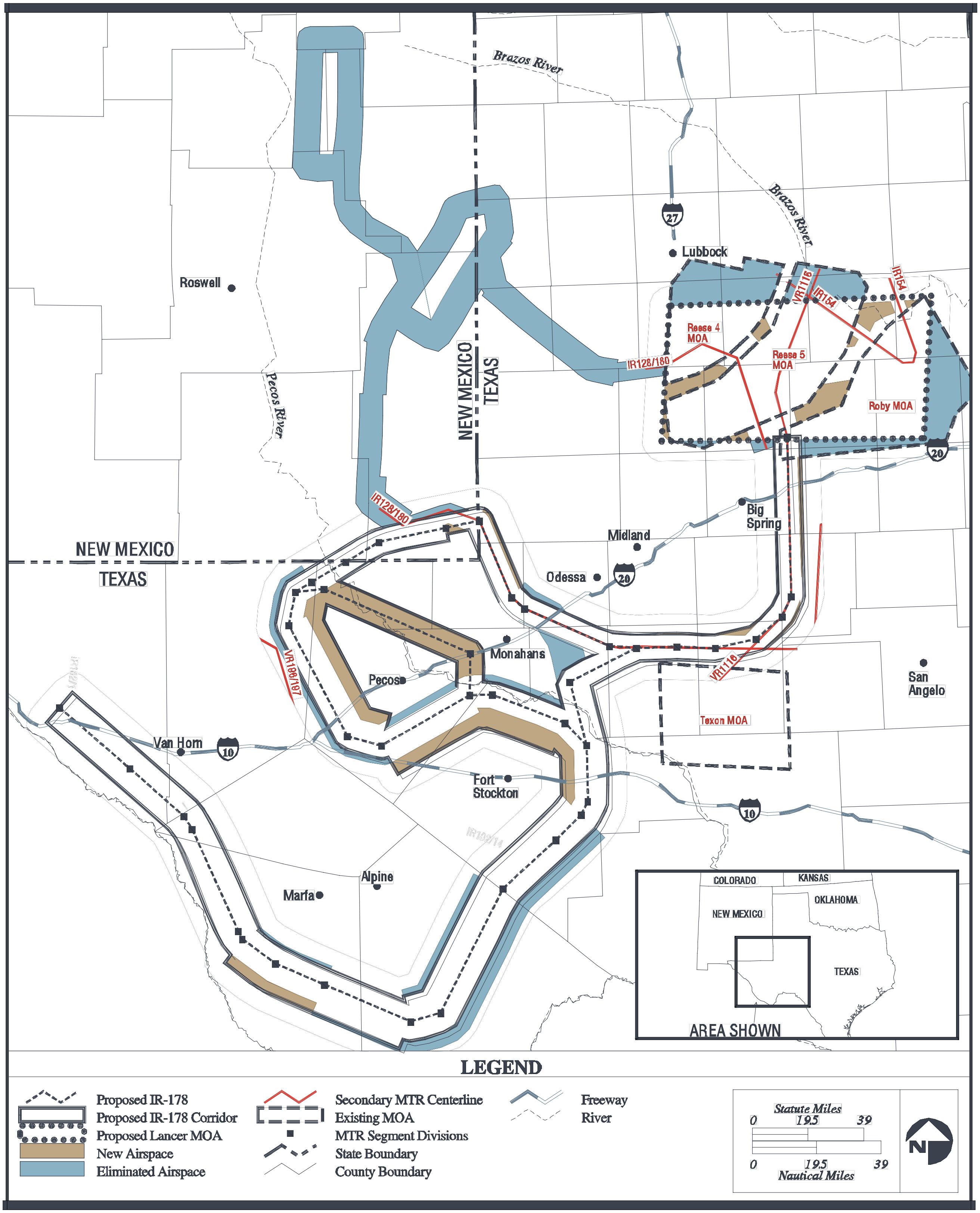
- Modification of the width and alignment of the MTR corridor to accommodate alternative exits to the proposed Lancer MOA/ATCAA (segment OOA), establishment of the re-entry route (segments VAVB to VBR), and elimination of the potential for overflights of Big Bend National Park (segment JK).



Affected Area for Alternative B: IR-178/Lancer MOA

Figure 2.4-3

2.0 Description of Proposed Action and Alternatives: Alternative B



Alternative B: IR-178/Lancer MOA Proposed Airspace Modifications **Figure 2.4-4**

- Establishment of new IR-178 segments VAVB to VBR, ADAE to AEAF, and AGAH. Of these segments, only a portion of segment VAVB-VBR represents new airspace not currently overlapped or intersected by existing primary or secondary MTRs (refer to Figure 2.4-3).
- Elimination of all IR-178 segments north of segment ZAA. However, existing IR-128/180 would continue to occupy this same corridor and flights would continue.
- Modification of the floor (lower limit) and ceiling (upper limit) altitudes for many segments of IR-178 to support its modified structure. Appendix C details the existing and proposed floor and ceiling altitudes for all alternatives.

Most of proposed IR-178 overlaps or intersects with existing primary or secondary airspace. Of the 41 proposed segments, two comprise completely new airspace and 10 include some new airspace. New airspace represents about 15 percent of the proposed route. Segments ZAA to AGAH overlap with IR-128/180 and AHAI to AJAK overlap with VR-1116. Other secondary MTRs (VR-196/197) intersect with partial segments of IR-178. The structure of the overlapping and intersecting MTRs would not change under Alternative B.

Proposed IR-178 would consist of about 85 percent existing airspace.

The proposed Lancer MOA/ATCAA would be created from existing Reese 4, Reese 5, and Roby MOAs. Most of these existing MOAs would be redesignated and incorporated into the proposed Lancer MOA/ATCAA. New airspace would be established to connect the MOAs, and portions of the existing MOAs that fall outside the proposed Lancer MOA/ATCAA would be eliminated. Roughly 10 percent of the area outlined by the proposed Lancer MOA/ATCAA would consist of new airspace not currently covered by a MOA or MTR. The altitude structure of the proposed Lancer MOA/ATCAA would differ from that of the existing Reese 4, Reese 5, and Roby MOAs. The floor of the proposed Lancer MOA/ATCAA would be 3,000 feet AGL, with a ceiling of 18,000 feet MSL. An overlying ATCAA would provide available airspace up to 40,000 feet MSL. Currently, the Reese 4 MOA extends from 10,000 feet MSL (about 6,000 to 7,000 feet AGL) to 18,000 feet MSL; both the Reese 5 and Roby MOAs have a floor altitude of 12,000 feet MSL (about 8,000 to 9,000 feet AGL) and extend to 18,000 feet MSL. The existing ATCAA overlying the three MOAs extends from 18,000 feet MSL to 23,000 feet MSL. So the proposed Lancer MOA/ATCAA would expand the upper and lower limits of the airspace in the area.

Proposed changes to IR-178 and Lancer MOA/ATCAA would reduce the total amount of land under the airspace in comparison to current conditions (Table 2.4-3).

Table 2.4-3
Comparison of Existing and Proposed Area Under Alternative B: IR-178/Lancer MOA

	Area Under Airspace (square nm)				
	Existing Airspace	*Eliminated Airspace*	*Existing Airspace As Part of Proposed Airspace*	*New Airspace*	*Total Proposed Airspace*
IR-178	9,717	3,292	6,425	1,124	7,549
Lancer MOA	3,854[1]	824	3,030	318	3,348

[1] Combination of existing Reese 4, Reese 5, and Roby MOAs and secondary MTRs.

A reduction of about 2,300 square nm would result from changes to IR-178, but most of this derives from eliminating the segments of IR-178 that coincide with IR-128/180 in New Mexico. Since IR-128/180 would remain intact, MTR airspace would continue to overlie the lands. Consolidation of the Reese 4, Reese 5, and Roby MOAs would expose about 300 square nm of land below new airspace to flight activities above 3,000 feet AGL. This change, however, would also eliminate such activities over more than 1,000 square nm.

. . . Alternative B: IR-178/Lancer MOA

Annual sortie-operations for primary airspace would change under Alternative B (Table 2.4-4). Annual sortie-operations along portions of proposed IR-178 and in the proposed Lancer MOA/ATCAA would increase predominantly due to bomber flight activities. All other primary MTRs and MOAs would receive decreased use; sortie-operations in secondary MTRs would not change.

Total sortie-operations analyzed for proposed IR-178 also include existing sortie-operations on overlapping and intersecting MTRs.

For the 41 individual segments of proposed IR-178, sortie-operations would increase in all but four segments (ZAA to ACAD). The increases in use of the other segments would vary, depending upon the amount of continuing sortie-operations in overlapping or intersecting MTRs (Figure 2.4-5 and Table 2.4-5). Increases in sortie-operations would range from 210 (segments OOA to OAAE) to 1,620 (segments ST-UV). B-1s and B-52s would form the dominant users of proposed IR-178, although B-2s and F-16s are projected to fly on portions of the route. Appendix B provides details on sortie-operations by different aircraft.

A total of 2,350 annual sortie-operations would occur in the proposed Lancer MOA/ATCAA. Current use of the Reese 4, Reese 5, and Roby MOAs totals 106 annual sortie-operations, and underlying secondary MTRs (VR-1116 and IR-154) account for another 100 sortie-operations.

CONSTRUCTION

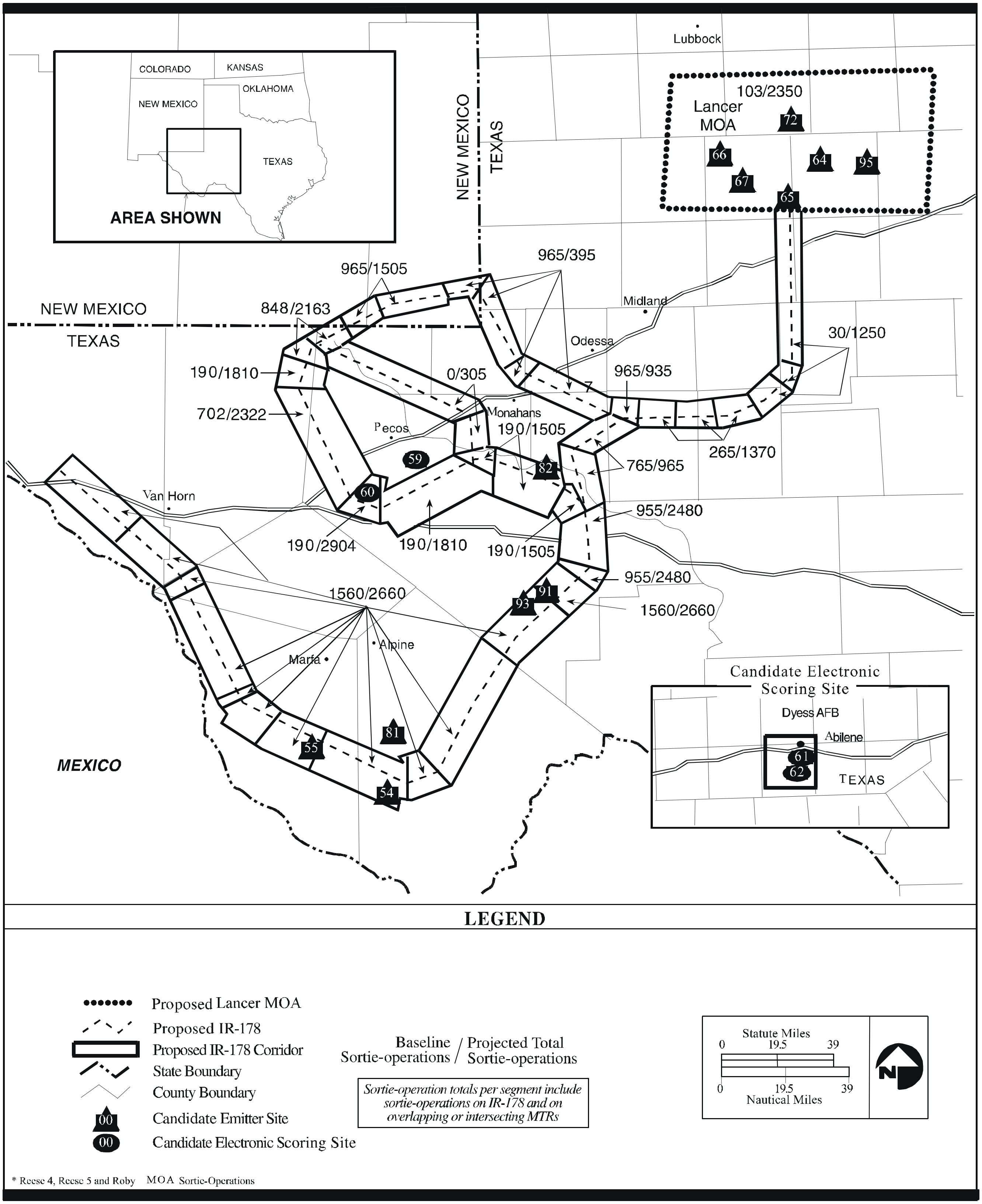
As described in Section 2.4.1, the Air Force identified more candidate sites for MTR emitters, MOA emitters, and Electronic Scoring Sites than would be selected and used under Alternative B (refer to Table 2.4-2). Table 2.4-6 lists the candidate sites for Alternative B along with their road, power, telephone, water, and wastewater requirements. The table provides distances from the juncture of the existing paved road, telephone line, and power line to the center of each site (approximately 400 feet from the edge). The affected area associated with driveway and power line construction would have a 40-foot-wide right-of-way, whereas telephone line construction would require a 25-foot-wide right-of-way.

Candidate site locations are dispersed in many counties in western Texas (refer to Figure 2.4-5). Appendix D provides maps of their locations within counties.

Table 2.4-4. Alternative B: IR-178/Lancer MOA Projected Airspace Use

Airspace Units	Class	Bomber Aircraft Annual Sortie-Operations: B-1s: Dyess	Change from Baseline	B-52s: Barksdale	Change from Baseline	Bombers: Other Bases	Change from Baseline	Other Aircraft Annual Sortie-Operations: Air Force Fighter Aircraft[1]	Navy Aircraft[2]	GAF Aircraft[3]	RSAF Aircraft[4]	Trainer Aircraft[5]	Other Aircraft[6]	Totals: Alternative B Total	Baseline/ No-Action Total	Change from Baseline
MTRs																
VR-100/125	S							964	8	100	188	1	4	1,265	1,265	*0*
VR-108	S							97	25		18	3		143	143	*0*
VR-114	S							805			146	56	7	1,014	1,014	*0*
VR-143	S					100		50	400			70		620	620	*0*
VR-186	S					100		50	400			625		1,175	1,175	*0*
VR-196/197	S											512		512	512	*0*
VR-1107/1195	S							1,050						1,050	1,050	*0*
VR-1116	S					30								30	30	*0*
VR-1175/1176	S					50								50	50	*0*
IR-107	S					10		71			13	10		104	104	*0*
IR-109	S					50	*50*	188	28		33		11	310	310	*0*
IR-110	S													0	0	*0*
IR-111	S							80		9	14	18	9	130	130	*0*
IR-113	S							110	170		20			300	300	*0*
IR-123	S					1		1	35			13		50	50	*0*
IR-124	S					10		10	20			40	60	140	140	*0*
IR-128/180	**P**	**0**	***-25***	**0**	***-25***							**150**		**150**	**200**	***-50***
IR-150	**P**	**80**	***-120***	**20**	***-60***									**100**	**280**	***-180***
IR-154	S							10					60	70	70	*0*
IR-169	S											465		465	465	*0*
IR-174	**P**	**0**	***-40***	**0**	***-25***	**121**								**121**	**186**	***-65***
IR-177/501	**P**	**55**	***-220***	**20**	***-130***									**75**	**425**	***-350***
IR-178[7]	**P**	**1,330**	***525***	**905**	***350***	**375**	***225***	**50**						**2,660**	**1,560**	***1,100***
IR-192/194	S									637			21	658	658	*0*
IR-592	**P**			**20**	***-170***	**317**							**3**	**340**	**510**	***-170***
MOAs																
Reese 4	R	0	*-3*											0	3	*-3*
Reese 5	R	0	*-3*											0	3	*-3*
Roby	R	0	*-100*											0	100	*-100*
Proposed Lancer	**P**	**1,850**	***1,850***	**400**	***400***	**50**	***50***	**50**	**0**			**0**	**0**	**2,350**	**106**	***2,244***
Texon	S							15	30		0	40	15	100	100	*0*
Mt. Dora	S	0	*-6*	0	*-15*			321	4		33		10	368	379	*-11*

Class P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
Class S = Secondary airspace unit intersects with airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
Class R = Redesignated airspace to form the Proposed Lancer MOA.
[1] Consists predominantly of F-16s
[2] Consists of F-14s and F-18s
[3] German Air Force Tornados at Holloman AFB
[4] Republic of Singapore F-16s at Cannon AFB
[5] T-38 and T-1 trainers
[6] Includes primarily transport aircraft such as C-141s and C-17s
[7] Total sortie-operations represent maximum for segments of MTR; other segments used less.



Alternative B: IR-178/Lancer MOA Current and Proposed Sortie-Operations

Figure 2.4-5

Table 2.4-5
Alternative B: IR-178/Lancer MOA Projected Sortie-Operations

IR-178		*Secondary MTR*		*Total*[3]	*Baseline Total*[3]	*Change from Baseline*
Segments	*Projected Sortie-Operations*	*MTR*	*Sortie-Operations*			
AB	2,660	not applicable	not applicable	2,660	1,560	1,100
BC	2,660	not applicable	not applicable	2,660	1,560	1,100
CD	2,660	not applicable	not applicable	2,660	1,560	1,100
DE	2,660	not applicable	not applicable	2,660	1,560	1,100
EF	2,660	not applicable	not applicable	2,660	1,560	1,100
FG	2,660	not applicable	not applicable	2,660	1,560	1,100
GH	2,660	not applicable	not applicable	2,660	1,560	1,100
HI	2,660	not applicable	not applicable	2,660	1,560	1,100
IJ	2,660	not applicable	not applicable	2,660	1,560	1,100
JK	2,660	not applicable	not applicable	2,660	1,560	1,100
KL	2,660	not applicable	not applicable	2,660	1,560	1,100
LM	2,660	not applicable	not applicable	2,660	1,560	1,100
MN	2,480	not applicable	not applicable	2,480	955	1,525
NO	2,480	not applicable	not applicable	2,480	955	1,525
OP	1,505	not applicable	not applicable	1,505	190	1,315
PQ	1,505	not applicable	not applicable	1,505	190	1,315
QR	1,505	not applicable	not applicable	1,505	190	1,315
RS	1,810	not applicable	not applicable	1,810	190	1,620
ST	1,810	not applicable	not applicable	1,810	190	1,620
TU	1,810	VR-196/197	512	2,322	702	1,620
UV	1,810	not applicable	not applicable	1,810	190	1,620
VW	1,505	IR-192/194	658	2,163	848	1,315
WX	1,505	IR-192/194	658	2,163	848	1,315
XY	1,505	not applicable	not applicable	1,505	190	1,315
YZ	1,505	not applicable	not applicable	1,505	190	1,315
ZAA	245	IR-128/180	150	395	965	-570
AAAB	245	IR-128/180	150	395	965	-570
ABAC	245	IR-128/180	150	395	965	-570
ACAD	245	IR-128/180	150	395	965	-570
ADAE[1]	245	IR-128/180	150	395	965	395
AEAF[1]	1,220	IR-128/180	150	1,370	265	1,370
AFAG[1]	1,220	IR-128/180	150	1,370	265	1,370
AGAH[1]	1,220	IR-128/180	150	1,370	265	1,370
AHAI[2]	1,220	VR-1116	30	1,250	30	1,370
AIAJ[2]	1,220	VR-1116	30	1,250	30	1,250
AJAK[2]	1,220	VR-1116	30	1,250	30	1,250
VVA	305	not applicable	not applicable	305	not applicable	305
VAVB	305	not applicable	not applicable	305	not applicable	305
VBR	305	not applicable	not applicable	305	not applicable	305
OOA	975	not applicable	not applicable	975	765	210
OAAE	975	not applicable	not applicable	975	765	210

[1] Proposed IR-178 segments AD through AH overlap existing segments of IR-128/180.
[2] Proposed IR-178 segments AH through AK overlap existing segments of VR-1116.
[3] Totals represent sortie-operations flown on primary MTR (IR-178) plus those flown on overlapping or intersecting segments of other MTRs. See Figure 2.4-3 for segment locations.

Table 2.4-6
Candidate Emitter and Electronic Scoring Sites Analyzed for Alternative B: IR-178/Lancer MOA

Candidate Sites [1]	*Function* [2]	*Driveway Construction (feet)*	*Power Lines (feet)*	*Telephone Lines (feet)*	*Water*	*Wastewater Treatment*
54	MTR Emitter	300	700	700	NA	NA
55	MTR Emitter	400	1,600	1,600	NA	NA
81	MTR Emitter	600	10,600	10,600	NA	NA
82	MTR Emitter	400	1,600	700	NA	NA
91	MTR Emitter	9,500	2,000	3,200	NA	NA
93	MTR Emitter	600	Existing	1,000	NA	NA
59	MTR Electronic Scoring Site	400	500	400	Truck-in	Construct
60	MTR Electronic Scoring Site	400	500	4,200	Truck-in	Construct
64	MOA Emitter	400	400	800	NA	NA
65	MOA Emitter	400	500	400	NA	NA
66	MOA Emitter	400	500	700	NA	NA
67	MOA Emitter	400	600	400	NA	NA
72	MOA Emitter	400	500	4,200	NA	NA
95	MOA Emitter	600	500	2,100	NA	NA
61	En Route Electronic Scoring Site	400	Existing	Existing	Existing	Construct
62	En Route Electronic Scoring Site	400	Existing	Existing	Existing	Construct

[1] Each site was given a unique number to aid in analysis.
[2] Five MTR Emitter Sites, one MTR Electronic Scoring Site, five MOA Emitter Sites, and one En Route Electronic Scoring Site would be required and selected.

2.4.3 Alternative C: IR-178/Texon MOA

As a subset of the overall study area, the affected area for Alternative C (Figure 2.4-6) corresponds closely to that of Alternative B. The affected area is focused on western Texas with a small portion of MTR in southeastern New Mexico, as well as the portions of Arkansas and Colorado associated with the Harrison and La Junta Electronic Scoring sites (refer to Figure 2.2-2). The existing Mt. Dora MOA is also part of the affected area, although only because bombers would no longer fly there.

Airspace and Flight Operations

Alternative C airspace centers on proposed IR-178 and the proposed Texon MOA/ATCAA, both of which comprise existing airspace that would undergo the following structural changes (Figure 2.4-7):

- Modification of the width and alignment of the MTR corridors to accommodate establishment of the re-entry route (segments VAVB to VBR) and to eliminate overflights of Big Bend National Park (segment JK).
- Establishment of new IR-178 segments NNA and VAVB to VBR consisting of new airspace not currently overlapped or intersected by existing primary or secondary MTRs.
- Elimination of all IR-178 segments north of segment ZAA. Existing IR-128/180 would continue to occupy this same corridor.
- Modification of floor and ceiling altitudes for many segments of IR-178 to support the modified structure (see Appendix C).

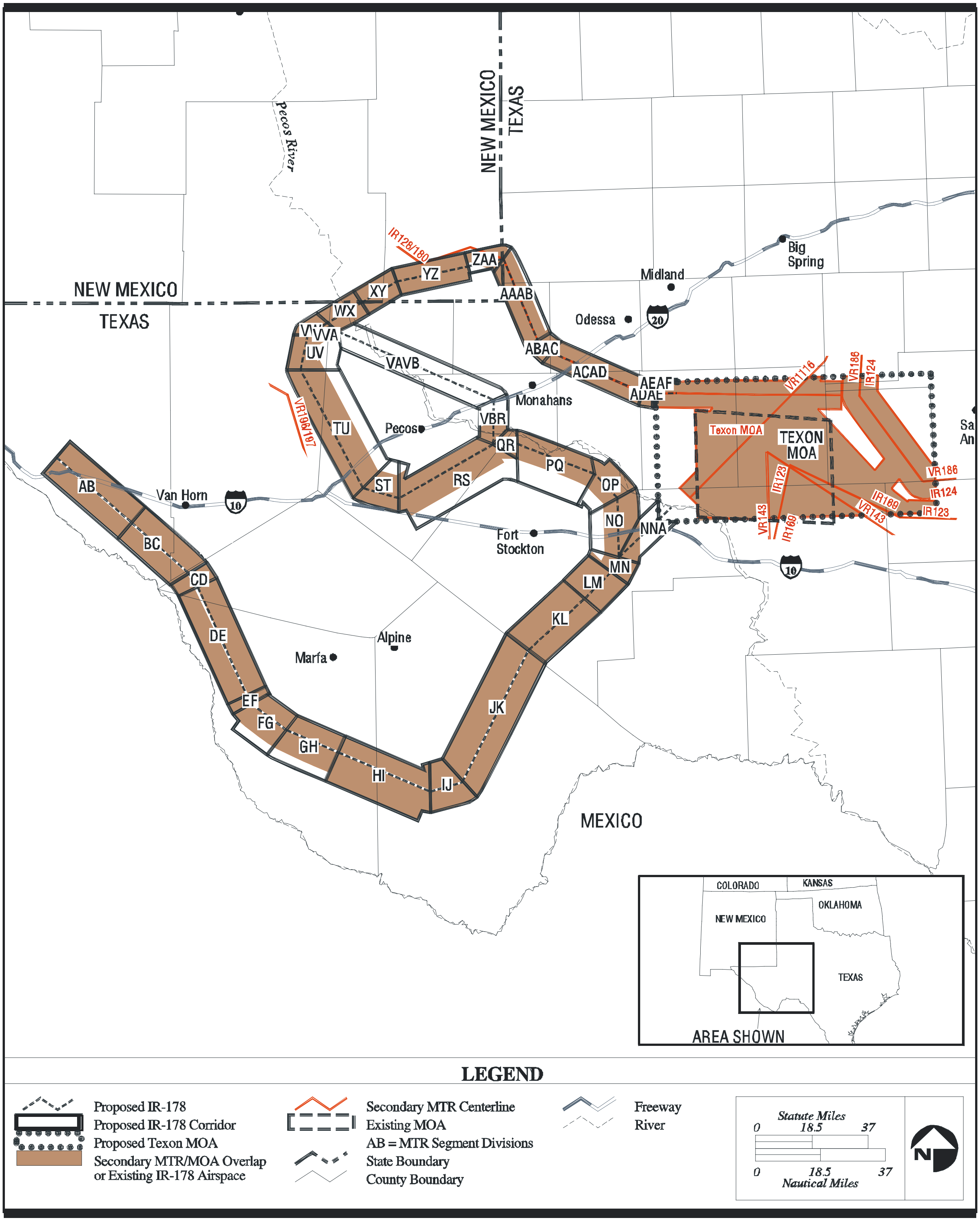
Of 35 total segments in proposed IR-178, 32 consist wholly or partially of existing airspace.

Almost all of proposed IR-178 under Alternative C would overlap or intersect with existing primary or secondary airspace. Proposed IR-178 contains 35 segments, three of which comprise completely new airspace and nine with some portions of new airspace. About 20 percent of proposed IR-178 represents new airspace. Segments ZAA to AEAF overlap with existing IR-128/180. Other secondary MTRs (VR-196/197) intersect with segments of IR-178. No structural changes to overlapping or intersecting primary and secondary MTRs would occur under Alternative C.

The proposed Texon MOA/ATCAA under Alternative C would be an expansion of the existing Texon MOA (refer to Figure 2.4-6). Expansion of the MOA with new airspace would occur primarily to the west, east, and north. Along the south, the proposed and existing boundaries would be similar, although a small sliver of the existing Texon MOA would be eliminated in this area. About 25 percent of the proposed Texon MOA/ATCAA would consist of new airspace. The floor altitude for the proposed Texon MOA/ATCAA would change from its current limits of 6,000 feet AGL to 3,000 feet AGL. Ceiling altitude for the MOA would remain 18,000 feet MSL, but an overlying ATCAA extending up to 40,000 feet MSL would be added.

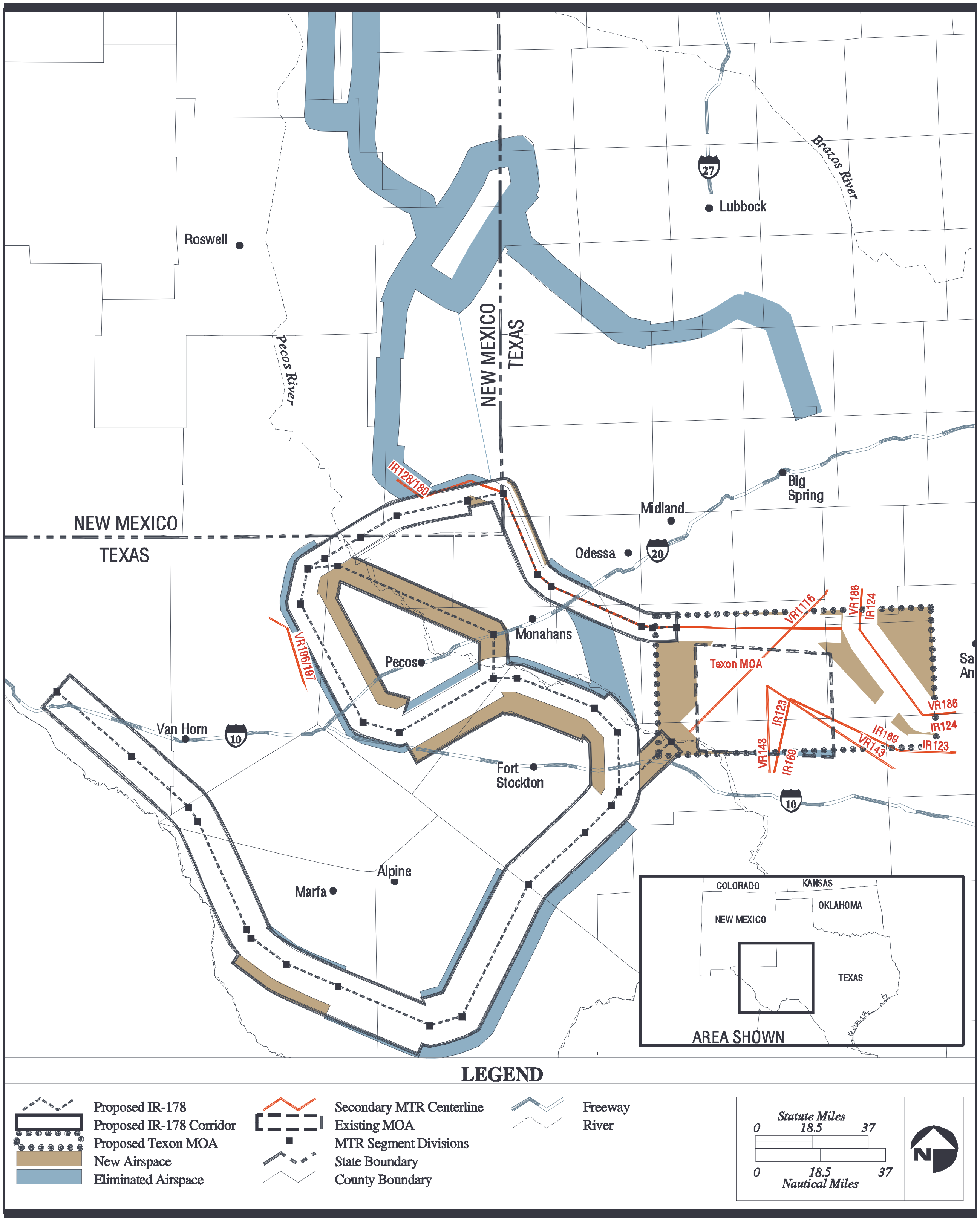
Proposed changes to IR-178 would reduce the total amount of land underlying this MTR by about 3,000 square nm (Table 2.4-7). However, the corridor for IR-128/180 would remain intact and cover the same area as the eliminated IR-178 segments did. Expansion of the proposed Texon MOA/ATCAA would increase the affected area by more than 2,000 square nm, including about 800 square nm of new airspace.

Relative to baseline conditions, annual sortie-operations for primary airspace would change under Alternative C (Table 2.4-8). Increases would occur for portions of



Affected Area for Alternative C: IR-178/Texon MOA

Figure 2.4-6



Alternative C: IR-178/Texon MOA Proposed Airspace Modifications **Figure 2.4-7**

Table 2.4-7 Comparison of Existing and Proposed Area Under Alternative C: IR-178/Texon MOA					
	Area Under Airspace (square nm)				
	Existing Airspace	*Eliminated Airspace*	*Existing Airspace As Part of Proposed Airspace*	*New Airspace*	*Total Proposed Airspace*
IR-178	9,717	3,292	5,417	1,139	6,556
Texon MOA	1,157	40	2,348[1]	800	3,148

[1] Includes both existing Texon MOA airspace and multiple secondary MTRs that also cross over the lands under the MOA.

proposed IR-178 and the proposed Texon MOA/ATCAA.[1] Bombers from Barksdale and Dyess AFBs would conduct about 96 percent of their total sortie-operations in the study area in IR-178 and the proposed Texon MOA/ATCAA. Fewer sortie-operations than under baseline conditions would occur on all other primary MTRs and MOAs. Use of secondary MTRs would not change under Alternative C.

Total sortie-operations for proposed IR-178 also include existing sortie-operations on overlapping and intersecting MTRs.

Sortie-operations would increase in all but five of 35 segments of proposed IR-178 (Figure 2.4-8 and Table 2.4-9). In five segments (ZAA to ADAE), sortie-operations would decrease. For the other 30 segments, increases in use would range from 130 (segment AEAF) to 1,605 (segment RS to TU) annual sortie-operations. Overlapping and intersecting MTRs would contribute to the segment-by-segment totals, although their use would not increase above baseline. B-1s and B-52s would be the major users of IR-178 (see Appendix B).

A total of 2,300 annual sortie-operations would be conducted in the proposed Texon MOA/ATCAA. Current use of the existing Texon MOA totals 100 annual sortie-operations, with five underlying MTRs accounting for 1,305 more annual sortie-operations.

CONSTRUCTION

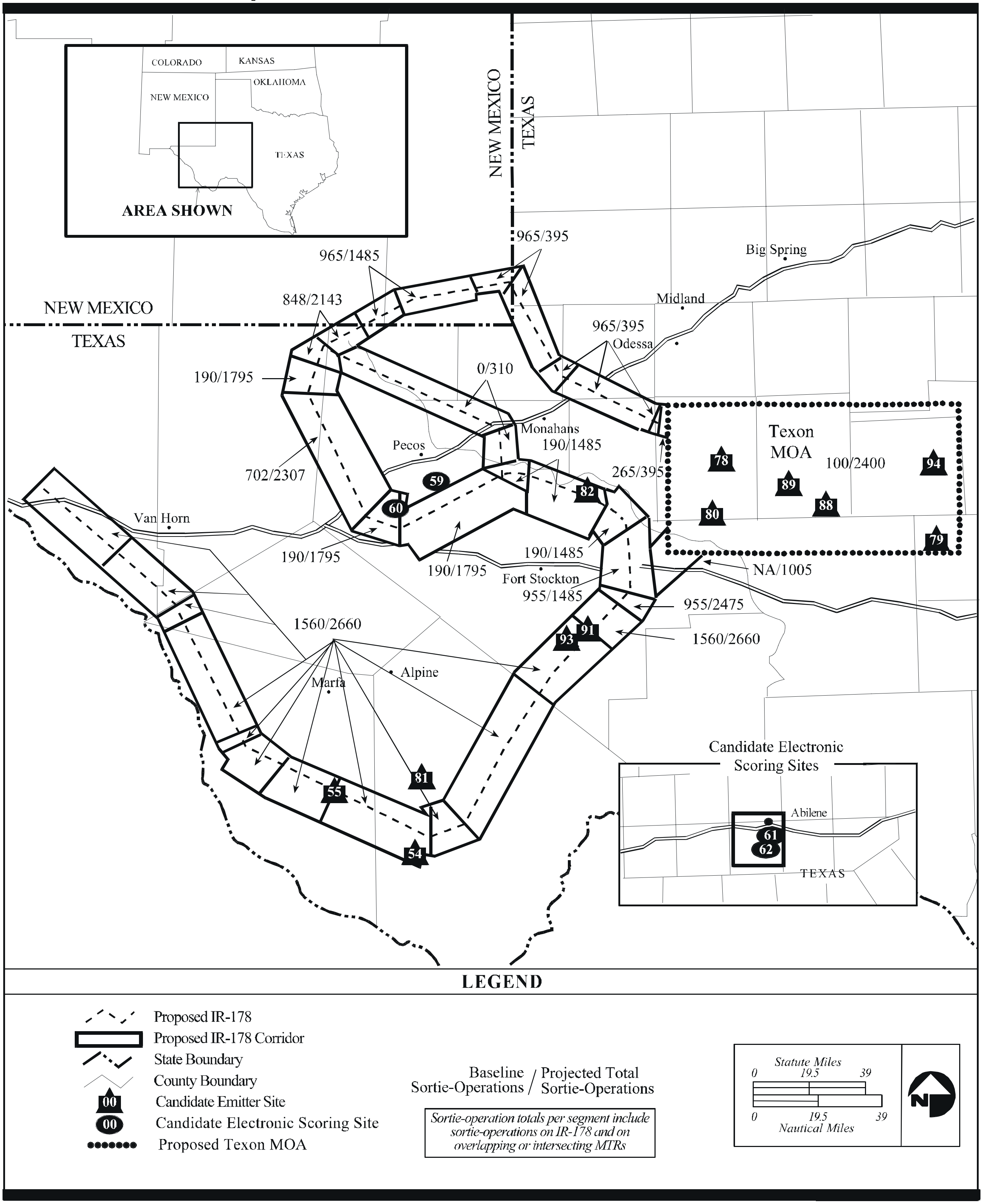
The Air Force identified more candidate emitters and Electronic Scoring Sites than would be required for Alternative C (refer to Table 2.4-2). Table 2.4-10 lists the candidate emitter and Electronic Scoring Sites for Alternative C along with their road, power, telephone, water, and wastewater requirements. The table also provides distances from the juncture of the existing paved road, telephone line, and power line to the center of each site. Candidate sites occur in several counties in western Texas (refer to Figure 2.4-8 and Appendix D).

[1]Texon MOA shifts from secondary airspace under baseline to primary in Alternative C because Barksdale and Dyess AFBs would begin to use it.

Table 2.4-8. Alternative C: IR/178/Texon MOA Projected Airspace Use

		Bomber Aircraft Annual Sortie-Operations						Other Aircraft Annual Sortie-Operations						Totals		
Airspace Units	Class	B-1s: Dyess	Change from Baseline	B-52s: Barksdale	Change from Baseline	Bombers: Other Bases	Change from Baseline	Air Force Fighter Aircraft[1]	Navy Aircraft[2]	GAF Aircraft[3]	RSAF Aircraft[4]	Trainer Aircraft[5]	Other Aircraft[6]	Alternative C Total	Baseline/ No-Action Total	Change from Baseline
MTRs																
VR-100/125	S							964	8	100	188	1	4	1,265	1,265	*0*
VR-108	S							97	25		18	3		143	143	*0*
VR-114	S							805			146	56	7	1,014	1,014	*0*
VR-143	S					100		50	400			70		620	620	*0*
VR-186	S					100		50	400			625		1,175	1,175	*0*
VR-196/197	S											512		512	512	*0*
VR-1107/1195	S							1,050						1,050	1,050	*0*
VR-1116	S					30								30	30	*0*
VR-1175/1176	S					50								50	50	*0*
IR-102/141[7]	S					49		40		900			105	1,094	1,094	*0*
IR-107	S					10		71			13	10		104	104	*0*
IR-109	S					50		188	28		33		11	310	310	*0*
IR-110	S													0	0	*0*
IR-111	S							80		9	14	18	9	130	130	*0*
IR-113	S							110	170		20			300	300	*0*
IR-123	S					1		1	35			13		50	50	*0*
IR-124	S					10		10	20			40	60	140	140	*0*
IR-128/180	**P**	**0**	***-25***	**0**	***-25***							**150**		150	**200**	***-50***
IR-150	**P**	**80**	***-120***	**25**	***-55***									105	**280**	***-175***
IR-154	S							10					60	70	70	*0*
IR-169	S											465		465	465	*0*
IR-174	**P**	**0**	***-40***	**0**	***-25***	**121**								121	**186**	***-65***
IR-177/501	**P**	**55**	***-220***	**20**	***-130***									75	**425**	***-350***
IR-178[7]	**P**	**1,330**	***525***	**905**	***350***	**375**	***225***						**50**	2,660	**1,560**	***1,100***
IR-192/194	S									637			21	658	658	*0*
IR-592	**P**			**20**	***-170***	**317**							**3**	340	**510**	***-170***
MOAs																
Reese 4	S	0	*-3*											0	3	*-3*
Reese 5	S	0	*-3*											0	3	*-3*
Roby	S	0	*-100*											0	100	*-100*
Proposed Texon	**P**	**1,850**	***1,850***	**400**	***400***	**50**		**15**	**30**			**40**	**15**	2,400	**100**	***2,300***
Mt. Dora	S	0	*-6*	0	*-5*			321	4		33		10	368	379	*-11*

Class P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
Class S = Secondary airspace unit intersects with airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale.
VR = Visual route
IR - Instrument route
[1] Consists predominantly of F-16s
[2] Consists of F-14s and F-18s
[3] German Air Force Tornados at Holloman AFB
[4] Republic of Singapore F-16s at Cannon AFB
[5] T-38 and T-1 trainers
[6] Includes primarily transport aircraft such as C-141s and C-17s
[7] Total sortie-operations represent maximum for segments of MTR; other segments used less.



Alternative C: IR-178/Texon MOA Current and Proposed Sortie-Operations **Figure 2.4-8**

Table 2.4-9
Alternative C: IR-178/Texon MOA Projected Sortie-Operations

IR-178		*Secondary MTR*		*Total* [1]	*Baseline Total* [1]	*Change from Baseline*
Segments	*Projected Sortie-Operations*	*MTR*	*Sortie-Operations*			
AB	2,660	not applicable	not applicable	2,660	1,560	1,100
BC	2,660	not applicable	not applicable	2,660	1,560	1,100
CD	2,660	not applicable	not applicable	2,660	1,560	1,100
DE	2,660	not applicable	not applicable	2,660	1,560	1,100
EF	2,660	not applicable	not applicable	2,660	1,560	1,100
FG	2,660	not applicable	not applicable	2,660	1,560	1,100
GH	2,660	not applicable	not applicable	2,660	1,560	1,100
HI	2,660	not applicable	not applicable	2,660	1,560	1,100
IJ	2,660	not applicable	not applicable	2,660	1,560	1,100
JK	2,660	not applicable	not applicable	2,660	1,560	1,100
KL	2,660	not applicable	not applicable	2,660	1,560	1,100
LM	2,660	not applicable	not applicable	2,660	1,560	1,100
MN	2,475	not applicable	not applicable	2,475	955	1,520
NO	1,485	not applicable	not applicable	1,485	955	530
OP	1,485	not applicable	not applicable	1,485	190	1,295
PQ	1,485	not applicable	not applicable	1,485	190	1,295
QR	1,485	not applicable	not applicable	1,485	190	1,295
RS	1,795	not applicable	not applicable	1,795	190	1,605
ST	1,795	not applicable	not applicable	1,795	190	1,605
TU	1,795	VR-196/197	512	2,307	702	1,605
UV	1,795	not applicable	not applicable	1,795	190	1,605
VW	1,485	IR-192/194	658	2,143	848	1,295
WX	1,485	IR-192/194	658	2,143	848	1,295
XY	1,485	not applicable	not applicable	1,485	965	520
YZ	1,485	not applicable	not applicable	1,485	965	520
ZAA	245	IR-128/180	150	395	965	-570
AAAB	245	IR-128/180	150	395	965	-570
ABAC	245	IR-128/180	150	395	965	-570
ACAD	245	IR-128/180	150	395	965	-570
ADAE[2]	245	IR-128/180	150	395	965	-570
AEAF[2]	245	IR-128/180	150	395	265	130
VVA	310	not applicable	not applicable	310	not applicable	310
VAVB	310	not applicable	not applicable	310	not applicable	310
VBR	310	not applicable	not applicable	310	not applicable	310
NNA	1,005	not applicable	not applicable	1,005	not applicable	1,005

[1] Totals represent sortie-operations flown on primary MTR (IR-178) plus those flown on overlapping or intersecting segments of other MTRs.

[2] Proposed IR-178 segments AD through AF overlap existing IR-128-180 segments AB through AD.

See Figure 2.4-6 for segment locations.

Table 2.4-10
Candidate Emitter and Electronic Scoring Sites Analyzed for Alternative C: IR-178/Texon MOA

Candidate Sites [1]	*Function* [2]	*Driveway Construction (feet)*	*Power Lines (feet)*	*Telephone Lines (feet)*	*Water*	*Wastewater Treatment*
54	MTR Emitter	300	700	700	NA	NA
55	MTR Emitter	400	1,600	1,600	NA	NA
81	MTR Emitter	600	10,600	10,600	NA	NA
82	MTR Emitter	400	1,600	700	NA	NA
91	MTR Emitter	9,500	2,000	3,200	NA	NA
93	MTR Emitter	600	Existing	1,000	NA	NA
59	MTR Electronic Scoring Site	400	525	400	Truck-in	Construct
60	MTR Electronic Scoring Site	400	470	4,200	Truck-in	Construct
78	MOA Emitter	400	900	900	NA	NA
79	MOA Emitter	400	2,600	400	NA	NA
80	MOA Emitter	2,600	1,100	8,400	NA	NA
88	MOA Emitter	400	400	500	NA	NA
89	MOA Emitter	400	600	400	NA	NA
94	MOA Emitter	1,100	Existing	1,000	NA	NA
61	En Route Electronic Scoring Site	400	Existing	Existing	Existing	Construct
62	En Route Electronic Scoring Site	400	Existing	Existing	Existing	Construct

[1] Each site was given a unique number to aid in analysis.

[2] Five MTR Emitter Sites, one MTR Electronic Scoring Site, five MOA Emitter Sites, and one En Route Electronic Scoring Site would be required and selected.

2.4.4 Alternative D: IR-153/Mt. Dora MOA

Although also a subset of the larger RBTI study area, the affected area for Alternative D differs from those associated with Alternatives B and C. Alternative D would be centered around proposed IR-153 and the proposed Mt. Dora MOA/ATCAA in northeastern New Mexico (Figure 2.4-9), but would also include the MTRs and Electronic Scoring Sites at Harrison and La Junta (refer to Figure 2.2-2). Other primary airspace, including existing IR-178 and IR-128/180 in western Texas, would continue to form part of the affected area, but its use would be minimized. The affected area also contains secondary airspace, with numerous secondary MTRs overlapping or intersecting the proposed IR-153 and Mt. Dora MOA/ATCAA.

AIRSPACE AND FLIGHT OPERATIONS

Changes to airspace would consist of establishing proposed IR-153 and reconfiguring the Mt. Dora MOA (Figure 2.4-10). No other primary or secondary airspace would be subject to structural changes. Proposed IR-153 would be a newly designated MTR within its own corridor and altitude structure. While no IR-153 exists today, the proposed MTR corridor would overlap or intersect with multiple existing MTRs used currently by fighter and bomber aircraft. Of the 38 total segments for proposed IR-153, only one complete segment (WAWB) and parts of 13 other segments would represent new airspace. This new airspace accounts for about 11 percent of the total MTR. Since IR-153 would represent a newly designated MTR, no airspace would be eliminated.

Numerous existing MTRs already cover about 89 percent of the area associated with proposed IR-153. Only 11 percent of proposed IR-153 would include new airspace.

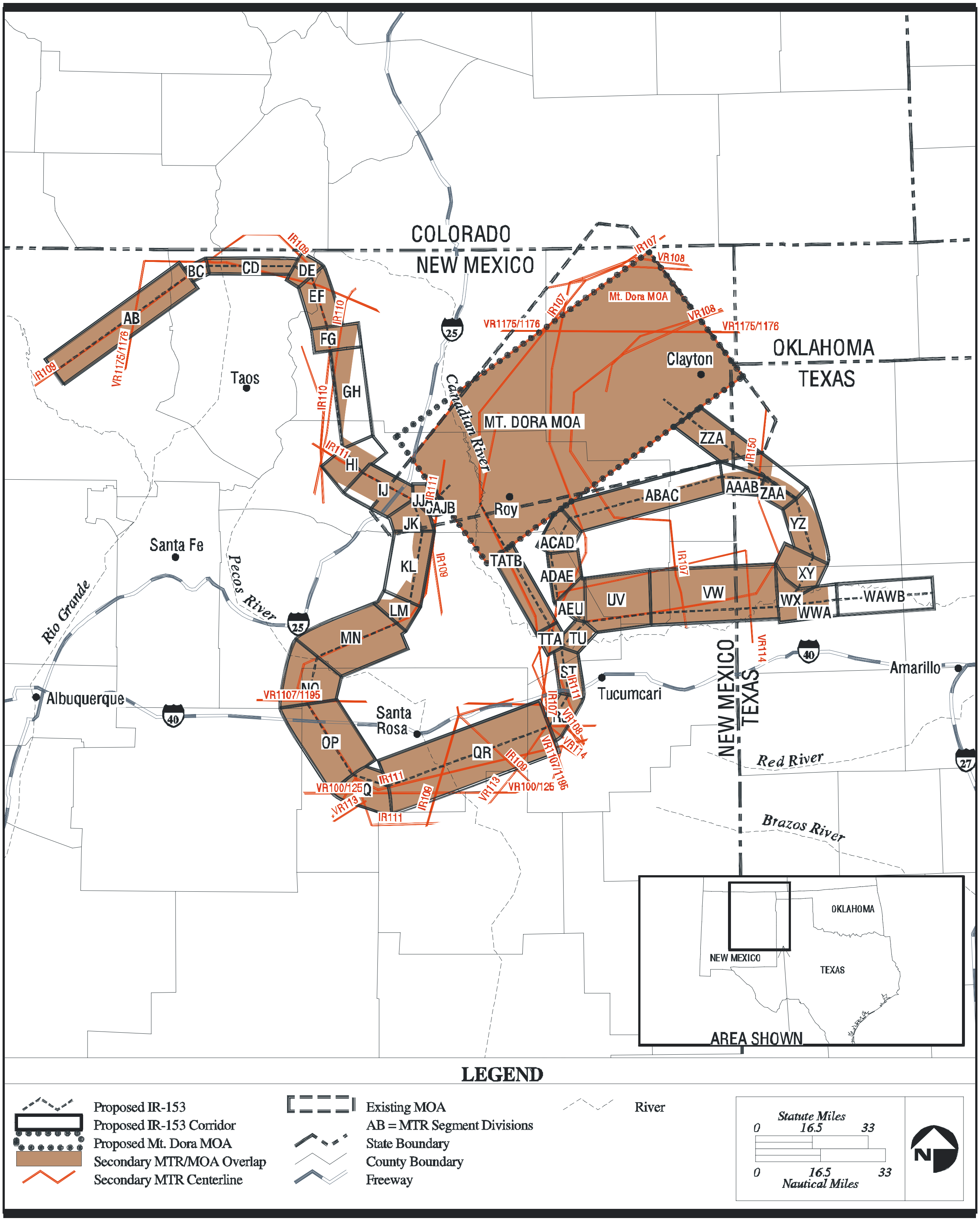
Changes to the Mt. Dora MOA would include modification to its shape, addition of a small amount of new airspace, elimination of a larger amount of existing airspace, and addition of an ATCAA atop the MOA. The current triangular shape of the Mt. Dora MOA would be modified to form a 40- by 80-nm rectangle (refer to Figure 2.4-10). This would result in addition of about 75 square nm of new airspace beyond the northwest edge of the existing MOA; a similar expansion would occur on the south side of the existing MOA, but would coincide with existing secondary MTR airspace. With existing reconfiguration, existing Mt. Dora MOA airspace on the northern and southern edges would be eliminated.

Modification to the altitude structure of the Mt. Dora MOA would consist solely of extending the ATCAA from the ceiling (18,000 feet MSL) of the reconfigured MOA up to 40,000 feet MSL. The existing floor (1,500 feet AGL) would not be changed, although the bombers would conduct flights no lower than 3,000 feet AGL. Use of the airspace between 1,500 and 3,000 feet AGL would be confined to fighter aircraft (mostly F-16s; see Appendix B) currently using this airspace in the same way.

Alternative D would result in a decrease in the total amount of land under the airspace (Table 2.4-11). Proposed IR-153 would, as noted previously, predominantly coincide with existing secondary MTR airspace; little new airspace would be added. The proposed Mt. Dora MOA/ATCAA would shrink in overall size, with almost all of the reconfigured MOA consisting of existing airspace.

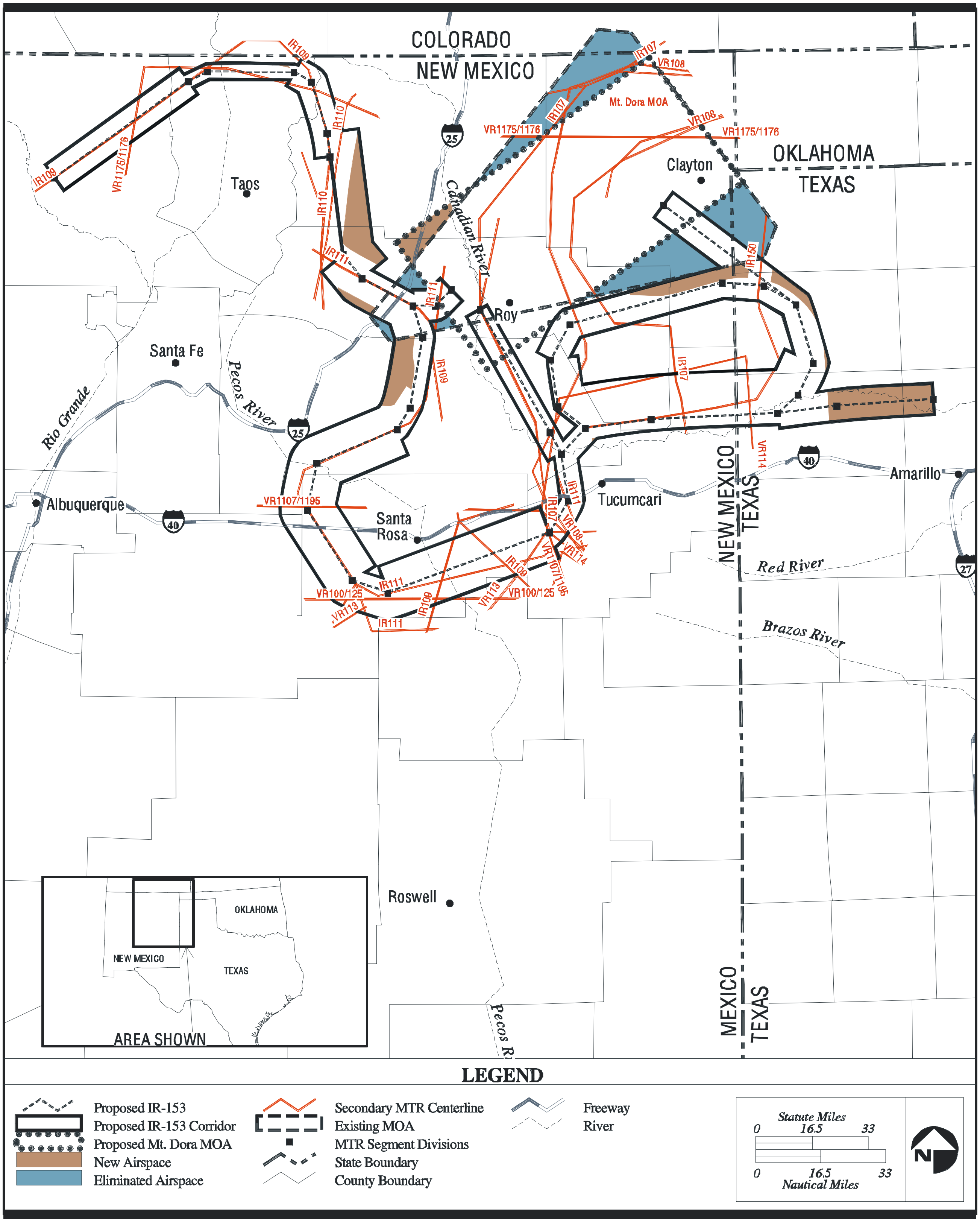
Total sortie-operations for proposed IR-153 combine those projected for IR-153 and existing sortie-operations on overlapping and intersecting MTRs.

Annual sortie-operations under Alternative D would be concentrated along proposed IR-153 and in the Mt. Dora MOA (Table 2.4-12). Use of all other primary airspace, including IR-178, would decrease; no changes to use of secondary airspace would occur. For proposed IR-153, segments AB to KJ would be used the most (2,660 annual sortie-operations). Sortie-operations along the remainder of the segments would be less (Figure 2.4-11). As shown in Table 2.4-13, the numerous secondary MTRs overlapping or intersecting with proposed IR-153 would continue to receive use for sortie-operations at baseline levels. When added to the projected use of



Affected Area for Alternative D: IR-153/Mt. Dora MOA

Figure 2.4-9



Alternative D: IR-153/Mt. Dora MOA Proposed Airspace Modifications

Figure 2.4-10

Table 2.4-11
Comparison of Existing and Proposed Area
Under Alternative D: IR-153/Mt. Dora MOA

	Area Under Airspace (square nm)				
	Existing Airspace	*Eliminated Airspace*	*Existing Airspace As Part of Proposed Airspace*	*New Airspace*	*Total Proposed Airspace*
IR-153	4,757[1]	0	4,757	612	5,369
Mt. Dora MOA	4,034	933	3,101[1]	75	3,176

[1] Includes other primary and secondary MTRs covering portions of same area.

IR-153, the combined annual maximum sortie-operations would be 6,336 for segment RS. Baseline sortie-operations for this segment total 3,876.

Baseline use of the secondary airspace that would become IR-153 ranges from zero annual sortie-operations in the single segment (WAWB) not overlapping or intersecting with existing secondary MTRs to 3,876 (combined sortie-operations for IR-107, IR-113, VR-100/125, VR-108, VR-1107/1195 and VR-114) in segment RS of proposed IR-153. Fighter aircraft such as F-16s represent the predominant users of these secondary MTRs (see Appendix B).

Use of the reconfigured Mt. Dora MOA would increase from 379 to 2,668 annual sortie-operations. B-1 and B-52 bombers would conduct 2,250 of these sortie-operations. Baseline activity in the area of the proposed Mt. Dora MOA/ATCAA includes sortie-operations along MTRs that cross over much of the same area. These four secondary MTRs (refer to Figure 2.4-9) add more than 400 low-altitude sortie-operations to the 379 currently being conducted in the area.

CONSTRUCTION

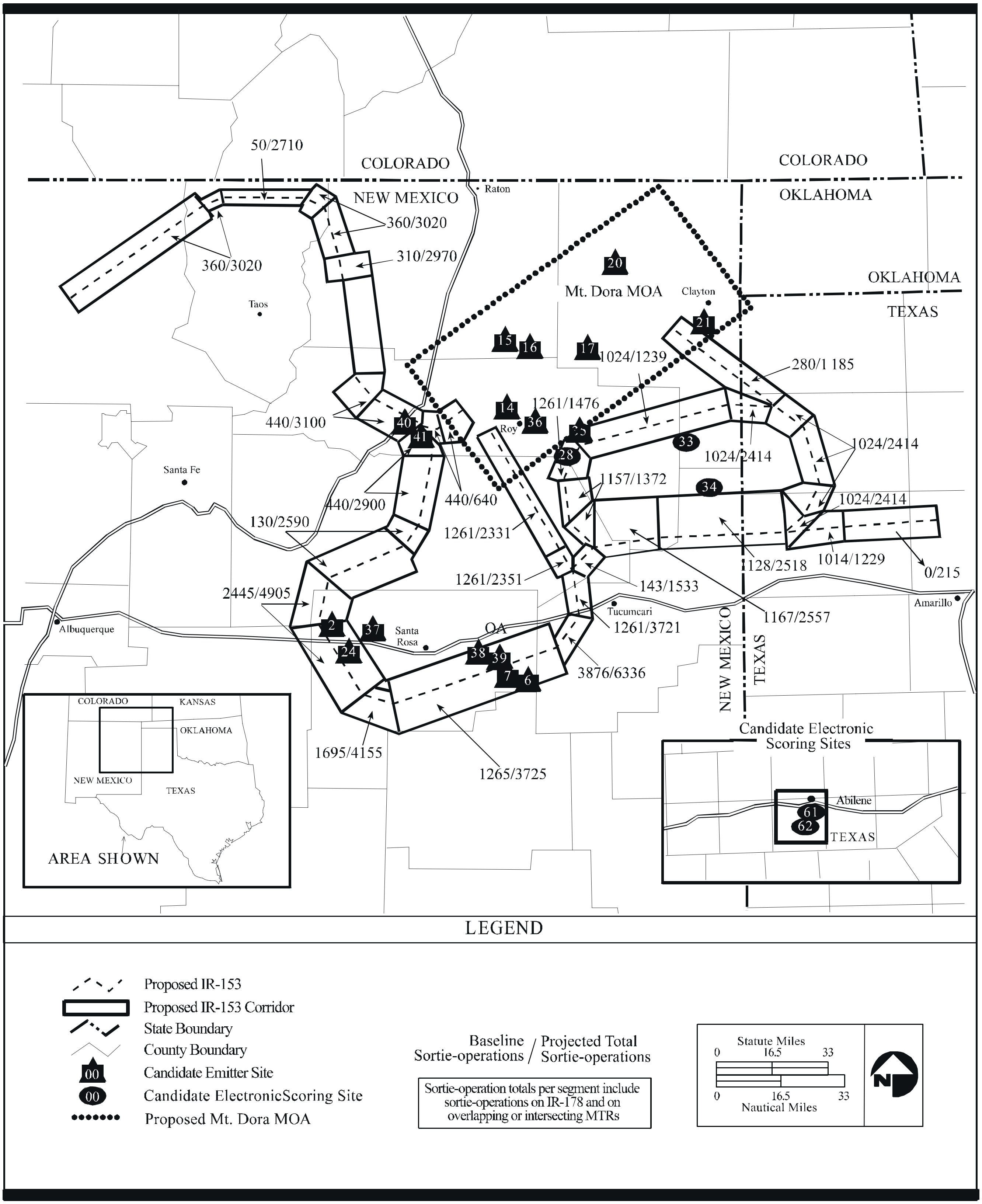
Table 2.4-14 lists candidate emitters and Electronic Scoring Sites for Alternative D along with their road, power, telephone, water, and wastewater requirements. The table also provides distances from the juncture of the existing paved road, telephone line, and power line to the center of each candidate sites. As with Alternatives B and C, the Air Force identified more candidate sites than would be required.

Table 2.4-12. Alternative D: IR-153/Mt. Dora MOA Projected Airspace Use

Table 2.4-12
Alternative D: IR-153/Mt Dora MOA Projected Airspace Use

		Bomber Aircraft Annual Sortie-Operations						Other Aircraft Annual Sortie-Operations						Total		
Airspace Units	Class	B-1s: Dyess	Change from Baseline	B-52s: Barksdale	Change from Baseline	Bombers: Other Bases	Change from Baseline	Air Force Fighter Aircraft[1]	Navy Aircraft[2]	GAF Aircraft[3]	RSAF Aircraft[4]	Trainer Aircraft[5]	Other Aircraft[6]	Alternative D Total	Baseline/ No-Action Total	Change from Baseline
MTRs																
VR-100/125	S							964	8	100	188	1	4	1,265	1,265	*0*
VR-108	S							97	25		18	3		143	143	*0*
VR-114	S							805			146	56	7	1,014	1,014	*0*
VR-143	S					100		50	400			70		620	620	*0*
VR-186	S					100		50	400			625		1,175	1,175	*0*
VR-196/197	S											512		512	512	*0*
VR-1107/1195	S							1,050						1,050	1,050	*0*
VR-1116	S					30								30	30	*0*
VR-1175/1176	S					50								50	50	*0*
IR-107	S					10		71			13	10		104	104	*0*
IR-109	S					50		188	28		33		11	310	310	*0*
IR-110	S	0												0	0	*0*
IR-111	S							80		9	14	18	9	130	130	*0*
IR-113	S							110	170		20			300	300	*0*
IR-123	S					1		1	35			13		50	50	*0*
IR-124	S					10		10	20			40	60	140	140	*0*
IR-128/180	**P**	**0**	***-25***	**0**	***-25***							**150**		150	**200**	***-50***
IR-150	**P**	**5**	***-195***	**5**	***-75***									10	**280**	***-270***
Proposed IR-153	**P**	**1,330**	***1,330***	**905**	***905***	**375**	***375***	**50**						2,660	**0**	***2,660***
IR-154	S	0						10					60	70	70	*0*
IR-169	S											465		465	465	*0*
IR-174	**P**	**0**	***-40***	**0**	***-25***	**121**								121	**186**	***-65***
IR-177/501	**P**	**5**	***-270***	**5**	***-145***									10	**425**	***-415***
IR-178[7]	**P**	**220**	***-585***	**70**	***-485***		***-150***	**50**						340	**1,560**	***-1,220***
IR-192/194	S									637			21	658	658	*0*
IR-592	**P**			**20**	***-170***	**317**							**3**	340	**510**	***-170***
MOAs																
Reese 4	S	0	*-3*											0	3	*-3*
Reese 5	S	0	*-3*											0	3	*-3*
Roby	S	0	*-100*											0	100	*-100*
Texon	S	0	*0*	0	*0*			15	30	0		40	15	100	100	*0*
Proposed Mt. Dora	**P**	**1,850**	***1,844***	**400**	***394***	**50**		**321**	**4**		**33**		**10**	2,668	**379**	***2,289***

Class P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
Class S = Secondary airspace unit intersects with airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
[1] Consists predominantly of F-16s
[2] Consists of F-14s and F-18s
[3] German Air Force Tornados at Holloman AFB
[4] Republic of Singapore F-16s at Cannon AFB
[5] T-38 and T-1 trainers
[6] Includes primarily transport aircraft such as C-141s and C-17s
[7] Total sortie-operations represent maximum for segments of MTR; other segments used less.



Alternative D: IR-153/Mt. Dora MOA
Current and Proposed Sortie-Operations

Figure 2.4-11

Table 2.4-13
Alternative D: IR-153 Projected Sortie-Operations

IR-153		*Secondary MTR*				
Segments	*Projected Sortie-Operations*	*MTR*	*Sortie-Operations*	*Total* [1]	*Baseline Total*	*Change from Baseline*
AB	2,660	IR-109, VR-1175/1176	360	3,020	360	2,660
BC	2,660	IR-109, VR-1175/1176	360	3,020	360	2,660
CD	2,660	VR-1175/1176	50	2,710	50	2,660
DE	2,660	IR-109, VR-1175/1176	360	3,020	360	2,660
EF	2,660	IR-109, VR-1175/1176	360	3,020	360	2,660
FG	2,660	IR-109, IR-110	310	2,970	310	2,660
GH	2,660	IR-109, IR-110	310	2,970	310	2,660
HI	2,660	IR-109, IR-110, IR-111	440	3,100	440	2,660
IJ	2,660	IR-109, IR-111	440	3,100	440	2,660
JK	2,660	IR-109, IR-111	440	3,100	440	2,660
KL	2,460	IR-109, IR-111	440	2,900	440	2,460
LM	2,460	IR-111	130	2,590	130	2,460
MN	2,460	IR-111	130	2,590	130	2,460
NO	2,460	IR-111, VR-100/125, VR-1107/1195	2,445	4,905	2,445	2,460
OP	2,460	IR-111, VR-100/125, VR-1107/1195	2,445	4,905	2,445	2,460
PQ	2,460	IR-111, IR-113, VR-100/125	1,695	4,155	1,695	2,460
QR[a]	2,460	VR-100/125	1,265	3,725	1,265	2,460
QR[b]	2,460	IR-107, IR-113, VR-108, VR-114, VR-100/125, VR-1107/1195	1,265	3,725	1,265	2,460
RS	2,460	IR-107, IR-113, VR-108, VR-114, VR-100/125, VR-1107/1197	3,876	6,336	3,876	2,460
ST	2,460	IR-107, VR-108, VR-114	1,261	3,721	1,261	2,460
TU	2,460	VR-108	143	2,603	143	2,460
UV	1,390	IR-150, VR-108, VR-114	1,167	2,557	1,167	1,390
VW	1,390	IR-107, IR-150, VR-114	1,128	2,518	1,128	1,390
WX	1,390	IR-150, VR-114	1,024	2,414	1,024	1,390
XY	1,390	IR-150, VR-114	1,024	2,414	1,024	1,390
YZ	1,390	IR-150, VR-114	1,024	2,414	1,024	1,390
ZAA	1,390	IR-150, VR-114	1,024	2,414	1,024	1,390
AAAB	1,390	IR-150, VR-114	1,024	2,414	1,024	1,390
ABAC	215	IR-107, IR-108, VR-114	1,261	1,476	1,261	215
ACAD	215	IR-108, VR-114	1,157	1,372	1,157	215
ADAE	215	IR-108, VR-114	1,157	1,372	1,157	215
AEU	215	IR-108, VR-114	1,157	1,372	1,157	215
TTA	215	IR-107, IR-108, VR-114	1,261	1,476	1,261	215
TATB	1,090	IR-107, IR-108, VR-114	1,261	2,351	1,261	1,090
ZZA	1,070	IR-150	10	1,080	280	800
WWA	1,175	VR-114	1,014	2,189	1,014	1,175
WAWB	215	not applicable	not applicable	215	not applicable	215
JJA	215	IR-109, IR-111	440	655	440	215
JAJB	200	IR-109, IR-111	440	640	440	200

See Figure 2.4-9 for segment locations.
[1] Totals represent sortie-operations flown on primary MTR (IR-153) plus those flown on overlapping or intersecting segments of other MTRs.
[a] Secondary MTRs overlapping western portion of the segment.
[b] Secondary MTRs overlapping eastern portion of the segment.

Table 2.4-14
Candidate Sites for Emitters and Electronic Scoring Sites Analyzed for Alternative D: IR-153/Mt. Dora MOA

Candidate Sites[1]	*Function*[2]	*Driveway Construction (feet)*	*Power Lines (feet)*	*Telephone Lines (feet)*	*Water*	*Wastewater Treatment*
2	MTR Emitter	500	10,600	5,300	NA	NA
6	MTR Emitter	400	100	400	NA	NA
7	MTR Emitter	400	100	400	NA	NA
24	MTR Emitter	2,000	1,700	1,700	NA	NA
37	MTR Emitter	800	7,400	7,400	NA	NA
38	MTR Emitter	400	7,400	8,400	NA	NA
39	MTR Emitter	8,400	12,700	8,400	NA	NA
40	MTR Emitter	7,900	7,300	7,400	NA	NA
41	MTR Emitter	500	500	500	NA	NA
28	MTR Electronic Scoring Site	600	500	500	Truck-in	Construct
33	MTR Electronic Scoring Site	500	1,300	500	Truck-in	Construct
34	MTR Electronic Scoring Site	2,600	10,600	2,600	NA	NA
14	MOA Emitter	800	100	800	NA	NA
15	MOA Emitter	400	500	400	NA	NA
16	MOA Emitter	400	500	500	NA	NA
17	MOA Emitter	400	400	400	NA	NA
20	MOA Emitter	400	400	400	NA	NA
21	MOA Emitter	400	400	400	NA	NA
35	MOA Emitter	500	3,200	3,200	NA	NA
36	MOA Emitter	500	500	500	NA	NA
61	En Route Electronic Scoring Site	400	Existing	Existing	Existing	Construct
62	En Route Electronic Scoring Site	400	Existing	Existing	Existing	Construct

[1] Each site was given a unique number to aid in analysis.
[2] Five MTR Emitter Sites, one MTR Electronic Scoring Site, five MOA Emitter Sites, and one En Route Electronic Scoring Site would be required and selected.

2.5 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

2.5.1 Scoping

To determine the issues to be addressed during the impact analysis process, NEPA requires an early and open process called scoping. The scoping process and the participation of agencies allowed the analysis to be focused on the effects of most concern and was used as a means to keep the EIS readable and useful to the decision-maker and the public. The scoping period began with the December 19, 1997, publication of the Notice of Intent in the Federal Register and concluded on April 3, 1998, with the end of the public scoping comment period. Extensive public scoping meetings were held at nine locations throughout western Texas and north-eastern New Mexico, as well as in Harrison, Arkansas, and La Junta, Colorado, from January 24 to February 6, 1998. In addition to public input, the Air Force sought the concerns of federal, state, and local agencies; technical specialists; and Native American tribes. The scoping process helped identify the issues to be analyzed in depth in the draft EIS, as well as the resources not likely to be affected by the action. The Air Force also received additional input on issues through six community meetings held in Texas and New Mexico prior to the start of scoping (December 1997). Additional meetings held in New Mexico after the conclusion of scoping provided another opportunity to hear issues from the public.

Chapter 6 summarizes RBTI public involvement to date.

Scoping revealed concerns about the effects of aircraft noise on humans, livestock, wildlife, recreation, and general quality of life were the most numerous comments received through the public scoping process. Structural damage from noise vibration on homes and historic structures due to low-altitude overflights was also of concern. Airspace issues focused on potential conflicts between military aircraft and local aviation activities, such as cloud seeding, emergency medical flights, and aerial spraying. Safety issues of primary concern were related to plane crashes from increased air traffic, bad weather, or birds, along with additional concerns relating to the effects of vortices from aircraft overflights. In terms of biological resources, many people mentioned concerns about the impact to wildlife in proposed overflight areas.

The U.S. Fish and Wildlife Service (FWS) was concerned about the effects of overflights on threatened and endangered species. State Historic Preservation Officers (SHPOs) from Texas and New Mexico were concerned about the potential effects of construction of Electronic Scoring Site facilities on archaeological sites. Other concerns mentioned during the scoping period included an increase in air pollution, contamination of waterways from soil erosion due to construction, and visual intrusion of overflights in recreation areas.

2.5.2 Public Comment on the Draft EIS

The Air Force used this input on issues to scope and prepare the draft EIS. Published on March 19, 1999, more than 900 copies of the draft EIS were distributed to agencies, the public, and repositories. Fifteen public hearings were held from April 7, 1999, through April 22, 1999 (see Section 6.0). At these meetings, the public commented on the draft EIS. By the end of the 90-day public comment period on June 16, 1999, the Air Force had received a combined total of over 1,500 oral and written comments on the draft EIS. Each comment was reviewed and responses were prepared (see Volume II). These public and agency comments also provided input for change to and clarification of this final EIS.

Comments provided during the public comment period restated concerns raised during scoping. In all instances, the core concerns presented at scoping were addressed in the draft EIS. However, commentors on the draft took issue with either the depth of treatment of the topic or the analytical conclusions reached about the topic. Additional comments on the draft EIS covered a set of broad topics about which many members of the public made similar, if not identical, comments:

Aircraft noise was the most common potential effect mentioned by the public.

- Noise Analysis Methodology--Comments questioned the validity and applicability of the noise analysis methodology and modeling used for RBTI.

- Civil Aviation Conflicts--Concerns centered around the opinion that the draft EIS did not recognize an appropriate magnitude of impacts to civil aviation activities in the affected areas.

- Overflight Effects on Livestock--Public comments yielded anecdotes concerning the effects on livestock and contended that the draft EIS underestimated those potential effects.

- Overflight Effects on the Economy and Land Use--Commentors surmised that the proposed increases in military airspace use would force changes in land use and decreases in the revenues from land, ranching, hunting, and tourism.

- Ownership of Airspace--Commentors contended that individuals own the airspace above their property and deserve compensation for its use by military aircraft.

- Effects on Philmont Scout Ranch--The most numerous comments received concerned the need to further detail the nature and magnitude of impacts to the ranch, its uses, and its activities.

- Effects on Quality of Life--A major concern expressed by the public was on the effects of overflights to their “sense of well-being,” “peacefulness,” or general lifestyle.

2.5.3 Analysis Approach

NEPA requires focused analysis on the areas and resources (e.g., wildlife) potentially affected by an action or alternative. It also indicates that an EIS should consider, but not analyze in detail, those areas or resources not potentially affected. In so doing, an EIS should not be encyclopedic; rather, it should try to be "to the point." These overarching NEPA principles guided the approach to analysis in this RBTI EIS.
To define the affected areas and resources, the analysis process first determined where the four alternatives would occur. This led to definition of the study area (refer to Section 2.2), which encompasses the No-Action Alternative and the three action alternatives. The affected area for each of these four alternatives represents a subset of the larger study area. As shown in the preceding Sections 2.4-2 through 2.4-4, Alternatives A, B, and C share a similar, although not identical, affected area in western Texas. Alternative D, in contrast, is centered in northeastern New Mexico, and mostly affects a different area. The affected areas for all four alternatives include the MTRs and Electronic Scoring Sites associated with the Harrison and La Junta facilities. The Air Force conducted the following evaluations of the areas and resources that RBTI might affect:

- Identified the types and locations of all elements involved in each alternative;
- Determined the possible interaction of these elements with the resources in potentially affected locations;
- Correlated the issues raised in scoping to the potentially affected locations and resources; and

- Assessed whether, how and to what degree the resources may be affected.

Combined, the affected areas and affected resources defined through scoping and initial analyses comprise the affected environment for each of the four alternatives. This EIS examines the specific affected environment for each alternative, considers the current conditions of the affected environment, and compares those to conditions that might occur should an alternative be implemented. Table 2.5-1 presents the results of the process of identifying the affected environment. It, along with the following discussion in this section, also identifies those issues and resources examined in this EIS and those eliminated from further detailed analysis.

2.5.4 Definition of Resource Analysis

Table 2.5-1 lists the order in which this EIS discusses the affected resources; this order reflects the degree of detail of the discussion. NEPA regulations (40 CFR Parts 1500-1508) call for this approach by requiring an EIS to discuss impacts in proportion to their significance and present only enough discussion of other than significant issues to show why more study is not warranted.

Initially, the potential effects of the alternatives were evaluated according to 15 major resource categories (refer to Table 2.5-1). Through the process described

Table 2.5-1
Resources and Issues Considered in Environmental Impact Analysis Process

		PROJECT ELEMENTS				
Resource	*Public/Agency/AF Scoping of Issues*	*Flight Operations*	*Construction*	*Ground Operations*	*Decommissioning*	*Location in EIS*
Airspace	✔	✔				Section 4.1 Airspace and Aircraft Operations
Noise	✔	✔				Section 4.1 Airspace and Aircraft Operations [1]
Safety	✔	✔				Section 4.1 Airspace and Aircraft Operations
Air Quality	✔	✔				Section 4.1 Airspace and Aircraft Operations [2]
Land Use	✔	✔	✔	✔	✔	Section 4.2 Land Management and Use
Recreation	✔	✔				Section 4.2 Land Management and Use
Visual Resources	✔	✔	✔	✔		Section 4.2 Land Management and Use
Biological Resources	✔	✔	✔	✔		Section 4.3 Biological Resources
Socioeconomics	✔	✔	✔	✔	✔	Section 4.4 Socioeconomics and Environmental Justice
Environmental Justice	✔	✔				Section 4.4 Socioeconomics and Environmental Justice
Cultural Resources	✔	✔	✔	✔	✔	Section 4.5 Cultural Resources
Earth Resources	✔		✔	✔	✔	Section 4.6 Soils and Water [3]
Water Resources	✔			✔		Section 4.6 Soils and Water
Transportation						Eliminated from Further Study (see discussion below)
Hazardous Materials and Waste						Eliminated from Further Study (see discussion below)

[1] Noise effects on humans, quality of life, and recreation are discussed in Section 4.2, Land Management and Use; on wildlife and livestock in Section 4.3, Biological Resources; on historic structures and traditional resources in Section 4.5, Cultural Resources.
[2] Air quality effects due to fugitive dust are discussed in Section 4.6, Soils and Water.
[3] Effects on Paleontological Resources (fossils) are discussed in Section 4.6, Soils and Water.

previously, it was determined that discussion of related resources and issues could be combined in the EIS, that only specific portions of some resources warranted detailed discussion, and that some resources warranted no further discussion in the EIS.

Airspace, aircraft noise, aircraft safety, and aircraft emissions (air quality), representing some of the most noted issues, were combined under Section 4.1, Airspace and Aircraft Operations. These resource areas are grouped because they deal with issues related to flight operations. Section 4.2, Land Management and Use, covers a combination of many related topics: Land Ownership, Land Management, Recreation, and Visual Resources. Section 4.3 discusses biological resources as a discrete topic. Socioeconomics and Environmental Justice, Section 4.4, combines discussion of these two linked topics. Section 4.5, Cultural Resources, is limited to a discussion of archaeological, historic architectural, and traditional resources.

The affected area for soils and water resources (Section 4.6) proved to be narrower than the overall affected environment for a given alternative. Analysis demonstrated that soils and water only had the potential to be affected by construction and operation of the proposed 15-acre emitter sites and Electronic Scoring Sites. No other elements of the proposal would impact these resources, so discussion of soils and water is focused only on the development and use of ground-based assets.

Three resource categories--hazardous waste and materials, transportation, and ground safety--were eliminated from further study. No public or agency concerns were raised during scoping, and none of the alternatives would measurably affect these resource categories. The following presents the justification for eliminating these resources from further discussion in the EIS.

Hazardous Materials and Waste. Effects from hazardous materials and waste associated with the construction and operation of the emitter sites and Electronic Scoring Sites would be negligible to nonexistent. Environmental baseline surveys were conducted at each of the proposed emitter sites and Electronic Scoring Sites and at the two existing Electronic Scoring Site sites at Harrison and La Junta. No evidence of soil contamination, PCB-containing equipment, fuel or chemical storage tanks, asbestos-containing building materials, wastewater treatment and disposal or lead-based paint was present at the candidate sites. Two of the candidate sites (60 and 61) contain aboveground storage tanks holding heating oil. Two other candidate sites (65 and 79) contain empty aboveground storage tanks. No evidence of spills or other problems was noted at these sites. The minimal quantities of hazardous materials used at the existing Electronic Scoring Sites, such as aerosol cans, paint, and oil, are collected and taken to a consolidated accumulation point for disposal. All hazardous materials handling complies with Air Force procedures.

During construction, use of hazardous substances for fueling and equipment maintenance at the emitter and Electronic Scoring Site sites would be handled using best construction practices in accordance with Air Force policy and procedures. Adherence to policy relating to hazardous storage and use during operation would be monitored under the Air Force's Environmental Compliance Assessment Management Program (ECAMP), which requires both internal audits and examination by independent reviewers. Spill plans would be prepared in accordance with Air Force regulations. Given the enforced requirement to ensure safe handling of materials and the minimal amounts of materials likely to be used at the sites, the probability for an effect on the environment would be so negligible that further analysis in this EIS is unwarranted.

Transportation. The action alternatives would involve transportation of personnel to the two scoring sites over improved roads and the monthly travel of maintenance personnel to the emitter sites on state or county roads. The amount of travel would be minimal (30 to 40 round trips per day) and dispersed over many miles of very lightly used roads. Consequently, no alternative would result in increased traffic or require modification to existing public roads. Road construction would consist of building an asphalt or gravel driveway from the edge of the site to the center or constructing new roads from existing improved roads to the driveway. Since construction would take place on private lands, it would not result in increased traffic to lightly traveled areas. Effects of any of the action alternatives on existing transportation resources would not be measurable or noticeable.

Hazardous materials and waste, transportation, and ground safety would not be issues under RBTI.

Ground Safety. Aircraft safety is discussed in Section 4.1. Effects to human safety related to construction and operation of the emitter and scoring sites would be minimal. During construction, standard industrial safety standards and best management practices would be followed. Operations and maintenance activities would be performed in accordance with all applicable safety directives. A safe separation distance of 250 feet from the emitter has been established at every emitter location. There are no specific aspects of operations or maintenance that would create any unique or extraordinary safety issues.

2.5.5 Clarifications and Changes to the EIS

Public and agency comment on the draft EIS revealed the need to clarify or enhance certain information on a few topics in the final EIS. The Air Force reviewed and considered the broad topics described above in Section 2.5.2. Each of these topics received special attention through expanded, detailed responses to comments (see Volume III) designed to comprehensively address the issues. In addition, the following comprise clarifications and additions presented in this final EIS:

- A secondary MTR, IR-102/141, was eliminated from analysis along with its associated sortie-operations, thereby reducing cumulative noise levels and other effects stemming from aircraft flight activities.
- More detail has been added to the EIS (Sections 2.4 and 4.1) regarding the nature, speed, and duration of current and proposed flight activities.
- Measures to mitigate impacts and management actions to address public and agency concerns have been added in Section 2.6.2.
- More information on past studies of the effects of overflight and noise on domestic livestock and wildlife has been incorporated into Appendix G, and clarification of those potential effects has been included in Section 4.3.
- Section 4.3 now includes a clarified description of consultation with the U.S. Fish and Wildlife Service concerning threatened and endangered species.
- Appendix E now contains enhanced descriptions of the methods used for the biological, cultural resource, and environmental baseline surveys of the candidate electronic scoring sites and emitter sites.

2.6 SUMMARY OF IMPACTS

2.6.1 Impacts Related to the Proposed Action

Table 2.6-1 presents a summary of the impacts associated with the proposed establishment of a realistic bomber training area. The table compares the effects of each action alternative (Alternatives B, C, and D) to those of the No-Action Alternative (Alternative A). For more detailed information, see the resource discussion in Chapter 4.0 and associated appendices.

Table 2.6-1
Comparison of Alternatives by Resource and Potential Impact

	No-Action Alternative	*Proposed Action*		
Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
4.1 AIRSPACE AND AIRCRAFT OPERATIONS				
Airspace Management	No change to airspace structure or management; scheduling and FAA procedures designed to prevent conflicts between military and civil aviation.	Proposed IR-178 would include about 15 percent new airspace and the proposed Lancer MOA/ATCAA would include about 10 percent new airspace. A total of 29 segments of existing IR-178 eliminated in New Mexico, but FAA would need to ensure conflicts between proposed ATCAA and intersecting jet routes are avoided.	Proposed IR-178 would include about 20 percent new airspace and the pr posed Texon MOA/ATCAA would include about 25 percent new airspace. A total of 29 segments of existing IR-178 eliminated in New Mexico. Minimal potential for conflicts with civil aviation, but VFR conflicts between proposed MOA/ATCAA and intersecting jet routes and federal airways would require rerouting and possibly airspace restructuring.	Proposed IR-153 would include about 11 percent new airspace and the proposed Mt. Dora MOA/ATCAA would include less than 5 percent new airspace. Minimal potential for conflicts with civil airfields, but the proposed Mt. Dora MOA/ATCAA would intersect jet routes and federal airways, thus requiring increased airspace management. Establishment of proposed IR-153 would affect current military users of existing secondary MTRs it overlaps or intersects.
Noise	Noise levels on existing IR-178 range from less than 45 to 61 DNL. Of a total of 71 IR-178 segments, three have noise levels of less than 45 DNL and 30 have noise levels of 55 DNL or greater. Noise levels in other primary and secondary MTRs range from less than 45 DNL to 56 DNL. Noise levels of less than 45 DNL characterize the MOAs. Average daily sortie-operations on IR-178 combined with activity on segments of overlapping or intersecting MTRs range from 1 to 6, depending upon the segment.	Noise levels on proposed IR-178 would range from 46 to 61 DNL. Of a total of 41 segments on proposed IR-178, none has noise levels of less than 45 DNL and 28 have noise levels of 55 DNL or greater. Noise levels in the proposed Lancer MOA/ATCAA would remain low, but increase to 46 DNL. Noise levels in other primary and secondary MTRs and MOAs either decrease or remain the same. Average daily sortie-operations on proposed IR-178 combined with activity on segments of overlapping or intersecting MTRs would range from 1 to 10, and would increase on all but five segments; increases would range from 1 to 6 daily sortie-operations.	Noise levels on proposed IR-178 would range from 46 to 61 DNL. Of a total of 35 segments on proposed IR-178, none have noise levels of less than 45 DNL and 25 have noise levels of 55 DNL or greater. Noise levels in the proposed Texon MOA/ATCAA would remain low, but increase to 46 DNL. Noise levels in other primary and secondary MTRs and MOAs either decrease or remain the same. Average daily sortie-operations on proposed IR-178 combined with activity on segments of overlapping or intersecting MTRs would range from 1 to 10, and would increase on all but five segments; increases would range from 1 to 6 daily sortie-operations.	Noise levels on proposed IR-153 range from less than 45 to 64 DNL. Of a total of 38 segments on proposed IR-153, 3 have noise levels of less than 45 DNL and 26 have noise levels of 55 DNL or greater. Noise levels in the proposed Mt. Dora MOA/ATCAA would remain low, but increase to 46 DNL. Noise levels in other primary and secondary MTRs and MOAs either decrease or remain the same. Average daily sortie-operations on proposed IR-153 combined with activity on segments of overlapping or intersecting MTRs would range from 1 to 24, and would increase on all but three segments; increases would range from 1 to 10 daily sortie-operations.
Aircraft Emissions	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants are fractions of federal and state standards.	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants would be fractions of federal and state standards.	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants would be fractions of federal and state standards.	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants would be fractions of federal and state standards.
Aircraft Safety	The probability of a B-1 Class A mishap on IR-178 is 0.07 percent per year and for B-52s, the probability is 0.03 percent. The probabilities of Class A mishaps in all other primary airspace are even lower.	The probability of a B-1 Class A mishap on proposed IR-178 would be 0.08 percent per year and for B-52s, the probability would be 0.03 percent. The probabilities of Class A mishaps in all other primary airspace would be even lower.	The probability of a B-1 Class A mishap on proposed IR-178 would be 0.07 percent per year and for B-52s, the probability would be 0.02 percent. The probabilities of Class A mishaps in all other primary airspace would be even lower.	The probability of a B-1 Class A mishap on proposed IR-153 would be 0.07 percent per year and for B-52s, the probability would be 0.02 percent. The probabilities of Class A mishaps in all other primary airspace would be even lower.
Construction	No Effect	No Effect	No Effect	No Effect
Ground Operations	No Effect	No Effect	No Effect	No Effect
Decommissioning	No Effect	No Effect	No Effect	No Effect

Table 2.6-1
Comparison of Alternatives by Resource and Potential Impact

	No-Action Alternative	*Proposed Action*		
Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
4.2 LAND MANAGEMENT AND USE				
Airspace and Flight Operations	A) No change to land use, recreation resources, or visual setting. B) Five communities underlie IR-178 and one is subject to noise levels of 55 DNL or greater. C) Three special use land management areas are affected by noise levels of 55 DNL or higher.	A) No likely effects to land use, recreation resources, or visual settings. B) Six communities experience increases in noise levels of 1 to 8 dB. One community newly exposed to aircraft noise. C) No Special Use Land Management Areas experience increases in noise levels of more than 3 dB.	A) No likely effects to land use, recreation resources, or visual settings. B) Five communities experience increases in noise levels of 4 to 5 dB. One community newly exposed to aircraft noise. C) No Special Use Land Management Areas experience increases in noise levels of more than 3 dB.	A) No likely effects to land use, recreation resources, or visual settings. B) Four communities experience increases in noise levels of 10 to 16 dB. C) Thirteen Special Use Land Management Areas experience increases in noise levels of 4 to 17 dB.
Construction	No change to land use, recreation resources, or visual setting.	No adverse effects to land use, recreation resources, or visual settings.	Same as Alternative B.	Same as Alternative B.
Ground Operations	No change to land use, recreation resources, or visual setting.	No adverse effects to land use, recreation resources, or visual settings.	Same as Alternative B.	Same as Alternative B.
Decommissioning	No change	No adverse effects.	Same as Alternative B.	Same as Alternative B.
4.3 BIOLOGICAL RESOURCES				
Airspace and Flight Operations	Approximately 1 to 6 low-altitude overflights per day over estimated aplomado falcon historic range.	Approximately 1 to 10 low-altitude overflights per day over estimated aplomado falcon historic range.	Approximately 1 to 10 low-altitude overflights per day over estimated aplomado falcon historic range.	Increase of 1 to 10 low-altitude overflights over wintering bald eagle areas and Mexican spotted owl and mountain plover habitat.
Construction	No Effect	Disturbance of less than 20 acres of possible wildlife habitat.	Disturbance of less than 20 acres of possible wildlife habitat.	Disturbance of less than 20 acres of possible wildlife habitat.
Ground Operations	No Effect	No Effect	No Effect	No Effect
Decommissioning	No Effect	No Effect	No Effect	No Effect
4.4 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE				
Airspace and Flight Operations	No Change	No measureable impacts to socioeconomics. No disproportionate impacts to minority and low-income populations.	Same as Alternative B.	No measureable impacts to socioeconomics. No disproportionate impacts to minority and low-income populations.
Construction	No Change	Taylor County: Increase in expenditures and revenue of $11.5 million, earnings of $3.4 million, and short-term, indirect jobs of 140. Reeves County: Increase in expenditures and revenue of $9 million, earnings of $1.9 million and short term, indirect jobs of 80.	Same as Alternative B.	Taylor County: Same as Alternative B. Tri-County Region: Increase in expenditures and revenue of $9.7 million, earnings of $2.7 million and short term, indirect jobs of 133.

Table 2.6-1
Comparison of Alternatives by Resource and Potential Impact

	No-Action Alternative	*Proposed Action*		
Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
4.4 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE (continued)				
Decommissioning	No Change	Boone County: Loss in expenditures and revenue of $1.1 million, earnings of $1.1 million, and direct (31) and indirect (14) jobs of 45. Otero County: Loss in expenditures and revenue of $1 million, earnings of $1.2 million, and direct (30) and indirect (15) jobs of 45. Lost earnings would represent approximately 1 percent of current county personnel income for each county.	Same as Alternative B.	Same as Alternative B.
4.5 CULTURAL RESOURCES				
Airspace and Flight Operations	No change to archaeological, architectural, or traditional cultural properties. 22 National Register-listed properties, including 3 National Historic Landmarks currently overflown.	A) No likely effects to archaeological, architectural, or traditional resources. B) 15 National Register-listed properties exposed to changes of 1 to 12 dB in noise levels; average daily sorties increase by between 1 and 6 in MTR and 9 in MOA but area already overflown and overflights due to alternative rare. C) No known traditional cultural properties.	A) No likely effects to archaeological, architectural, or traditional resources. B) 6 National Register-listed properties exposed to changes of 1 to 5 dB in noise levels; average daily sorties increase by between 1 and 6 in MTR and 9 in MOA but area already overflown and overflights due to alternative rare. C) No known traditional cultural properties.	A) No likely effects to archaeological, architectural, or traditional resources. B) 15 National Register-listed properties including 2 National Historic Landmarks exposed to changes of 0 to 18 dB in noise levels; average daily sorties increase by 1 to 10 in MTR and MOA but are already overflown and overflights due to alternative rare. C) No known traditional cultural properties.
Construction	No Effect	No adverse effects to archaeological, architectural, or traditional resources. Existing site to be avoided.	No adverse effects to archaeological, architectural, or traditional resources. Existing 2 archaeological sites would be avoided.	No adverse effects to archaeological, architectural, or traditional resources. Existing 5 archaeological sites to be avoided or mitigated.
Ground Operations	No Effect	No adverse effects to archaeological, architectural, or traditional resources.	Same as Alternative B.	Same as Alternative B.
Decommissioning	No Effect	Transfer of property could affect resources if present, but effects could be avoided or mitigated to insignificant levels.	Same as Alternative B.	Same as Alternative B.
4.6 SOILS AND WATER RESOURCES				
Construction	No Effect	Potential for soil erosion exists on 7 sites but effects would be avoided or mitigated to insignificant levels. Soil losses of no more than 5 tons per 15-acre site with fugitive dust at 0.4 tons for emitters and 2.0 tons for ESSs. Best Management Practices would reduce effects to negligible levels. No effect due to water use or availability.	Potential for soil erosion exists on 7 sites but effects would be avoided or mitigated to insignificant levels. Soil losses of no more than 5 tons per 15-acre site with fugitive dust at 0.4 tons for emitters and 2.0 tons for ESSs. Best Management Practices would reduce effects to negligible levels. No effect due to water use or availability.	Potential for soil erosion exists on 16 sites but effects would be avoided or mitigated to insignificant levels. Soil losses of no more than 5 tons per 15-acre site with fugitive dust at 0.4 tons for emitters and 2.0 tons for ESSs. Best Management Practices would reduce effects to negligible levels. No effect due to water use or availability.
Ground Operations	Soil and water erosion negligible.	Soil and water erosion negligible.	Soil and water erosion negligible.	Soil and water erosion negligible.
Decommissioning	No Effect	No Effect	No Effect	No Effect

2.6.2 Measures to Address Environmental Effects and Community/Agency Concerns

MITIGATION MEASURES TO ADDRESS DEFINED EFFECTS

The mitigation measures presented below reflect a specific action that could be taken to reduce the potential for particular effects to resources. Details associated with each measure include a summary of the potential effect, the action to be taken and resulting environmental outcomes, responsible agencies, and implementation time frame. None of the mitigation measures presented will result in any significant degradation of realistic bomber training.

Resource Category	***Aircraft and Airspace Operations, Land Use, Cultural Resources, Biological Resources***
Potential Effect Addressed	Number of flights on proposed IR-153.
Action	Limit annual sortie-operations to 1,560 (about 6 per day), instead of the proposed 2,660 (about 10 per day).
Alternatives	D
EIS Section	2.3.1 and 2.4.4
Outcome	- Fewer sortie-operations would be flown than projected for Alternative D. - Potential impact of low-altitude flight activities would be reduced compared to projections for Alternative D.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

Resource Category	***Biological Resources***
Potential Effect Addressed	After discussion with the FWS, the Air Force determined that aircraft flights on portions of modified IR-178 may affect, but are not likely to adversely affect, aplomado falcons, and is currently seeking FWS concurrence with that determination.
Action	- Evaluate the areas under modified IR-178 that are not currently being surveyed. - Expand the ongoing aplomado falcon survey into areas the evaluation determines may be aplomado falcon habitat.
Alternatives	B, C
EIS Section	4.3.3 and 4.3.4
Outcome	Reduce potential impact to aplomado habitat.
Agency Responsible	Air Force
Time Frame	Initiated with consultation process.

Resource Category	*Biological Resources*
Potential Effect Addressed	After discussion with the FWS, the Air Force determined that aircraft flights on portions of proposed IR-153 may affect, but are not likely to adversely affect, threatened and endangered bird species, and is currently seeking FWS concurrence with that determination.
Action	Adopt avoidance distances developed through consultation on German Air Force operations at Holloman AFB, New Mexico and force structure and foreign military sales actions at Cannon AFB, New Mexico.
Alternatives	D
EIS Section	4.3.5
Outcome	Reduce potential impact to threatened and endangered species.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

Resource Category	*Biological and Cultural Resources*
Potential Effect Addressed	Construction or modification of driveways, power lines, and telephone lines to Electronic Scoring Site or emitter sites may impact significant biological resources or eligible cultural resources.
Action	- Consultation with SHPO. - Consultation with FWS. - Cultural and biological resources surveys of rights-of-way. - Realignment, where feasible, of rights-of-way to avoid resources. - Development and implementation of site-specific mitigation measures, if required.
Alternatives	B, C, D
EIS Section	Sections 4.3 and 4.5
Outcome	Avoid or reduce impacts to biological and cultural resources.
Agency Responsible	Air Force
Time Frame	Completed with site selection and consultation, prior to construction on affected sites.

Resource Category	*Cultural Resources*
Potential Effect Addressed	- Potentially eligible prehistoric archaeological sites could be disturbed by construction of an Electronic Scoring Site or emitter sites. - Potential effect on cultural resources through decommissioning of La Junta Electronic Scoring Site and disposition of lands out of federal control.
Action	- Complete Section 106 compliance measures and employ a combination of avoidance, monitoring, testing, and data recovery (if needed). - Survey of La Junta site and completion of Section 106 process.
Alternatives	B, C, D
EIS Section	Section 4.5
Outcome	- Avoid cultural resources wherever feasible. - Protect eligible cultural resources through Section 106 process.
Agency Responsible	Air Force
Time Frame	Completed with site selection and consultation, prior to construction on affected sites and transfer of land out of federal ownership.

MANAGEMENT ACTIONS

In addition to mitigation measures designed to address impacts revealed through the analysis in this EIS, the Air Force has identified two types of management actions to address concerns:

- *Actions incorporated into the proposal:* These actions used project design, configuration, and/or component location to reduce or eliminate potential impacts to a resource or suite of resources. Such actions include the use of existing information or data collected as part of the public involvement process to avoid siting alternative components in areas or settings known to contain resources that could be significantly affected. Such avoidance is not absolute; rather it is balanced with training and operational considerations needed to perform realistic bomber training. Because of operational and fiscal requirements, not all possible actions can be incorporated into the alternative components.

- *Actions to address community/agency concerns:* These actions were developed to address concerns brought forth by the public and agencies. These concerns were gathered at public hearings and received during the public comment period.

The following lists these actions associated with the three action alternatives proposed for RBTI. Details associated with each management action include a summary of the concern, the type of action to be taken, resulting environmental outcomes, responsible agencies, and implementation time frame. Like the mitigation measures, these management actions would not significantly reduce the effectiveness of realistic bomber training.

ACTIONS INCORPORATED INTO THE PROPOSAL

Resource Category	***Airspace and Aircraft Operations***
Concern Addressed	Creation of new military airspace.
Action	Use the maximum feasible existing airspace to define alternatives as suggested by FAA.
Alternatives	B, C, D
EIS Section	2.1.2
Outcome	Alternative B used 85% existing airspace, Alternative C, 80% existing airspace; Alternative D, 90% existing airspace. This was done by linking segments of existing MTRs to form a complete MTR for each alternative and by modifying existing MOAs. By doing this, the Air Force limited creation of new airspace.
Agency Responsible	Air Force and FAA
Time Frame	Proposal implementation.

Resource Category	***Aircraft and Airspace Operations***
Concern Addressed	Structure of the proposed MTRs would result in increased aircraft noise and overflights.
Action	Raise the floor altitude on several segments of the proposed MTR.
Alternatives	B, C
EIS Section	2.4 and Appendix C
Outcome	Reduce individual overflight noise and related effects.
Agency Responsible	Air Force and FAA
Time Frame	Proposal implementation.

Resource Category	***Land Use, Cultural Resources, Biological Resources, Soils and Water***
Concern Addressed	Flexibility needed in the number and siting of emitter sites and Electronic Scoring Sites to address potential environmental impacts.
Action	- Consider more sites than would be required for the emitters and Electronic Scoring Sites to provide more flexibility. - During the Environmental Impact Analysis Process, potential sites containing known historical sites or located close to homes, large structures, and obvious bodies of water were eliminated.
Alternatives	B, C, D
EIS Section	2.4
Outcome	Candidate sites chosen based on operational functionality and least amount of associated impact.
Agency Responsible	Air Force
Time Frame	Incorporated into the proposal.

Resource Category	*Land Use, Biological Resources, Cultural Resources, Soils and Water*
Concern Addressed	Potential environmental consequences due to site and infrastructure construction associated with emitter sites and Electronic Scoring Sites.
Action	- Identify locations as close as possible to existing roads, as well as to power and telephone lines so that less area would be affected by construction. - Sought previously disturbed locations. - Conducted surveys on candidate sites to locate sensitive cultural or biological resources in order to avoid or minimize disturbance.
Alternatives	B, C, D
EIS Section	2.4
Outcome	- Use existing infrastructure to reduce impact to affected area. - Use previously disturbed areas to reduce overall environmental impact. - Avoid cultural and biological resources where feasible.
Agency Responsible	Air Force
Time Frame	Incorporated into the proposal.

Resource Category	*Safety*
Concern Addressed	Prevent radio frequency exposure to the public from emitters.
Action	An 800- by 800-foot fenced site provides 150 feet of extra safe-separation distance and prevents exposure to radio frequency energy.
Alternatives	B, C, D
EIS Section	2.4
Outcome	Increase public safety and minimize risk.
Agency Responsible	Air Force
Time Frame	Incorporated into the proposal.

Resource Category	*Soils and Water Resources, Biological Resources*
Concern Addressed	Construction and maintenance associated with emitter sites and Electronic Scoring Sites could increase erosion and affect soil and water resources.
Action	- Select candidate sites avoiding drainages, wetlands, and sloped areas where possible erosion could occur. - Employ best management practices. - Minimize potential for erosion.
Alternatives	B, C, D
EIS Section	2.4
Outcome	- Reduce erosion. - Preserve wetlands and drainages.
Agency Responsible	Air Force
Time Frame	Incorporated into the proposal.

Resource Category	*Airspace and Aircraft Operations*
Concern Addressed	Floor of MOA could conflict with local and commercial aviation as well as instrument approach procedures at several airports.
Action	Establish the floor of the MOA above the Instrument Approach Procedures minimum altitudes for all airports under or adjacent to the proposed MOAs.
Alternatives	B, C
EIS Section	2.4
Outcome	Provide safe separation between civilian and military flight activities.
Agency Responsible	Air Force
Time Frame	Incorporated into the proposal.

ACTIONS TO ADDRESS COMMUNITY/AGENCY CONCERNS

Resource Category	*Aircraft and Airspace Operations, Land Use, Cultural Resources, Biological Resources*
Concern Addressed	Increased number of flights on proposed IR-178.
Action	Limit the annual sortie-operations to 1,560 (about 6 per day), instead of the proposed 2,660 (about 10 per day).
Alternatives	B, C
EIS Section	2.3.1, 2.4.2, and 2.4.3
Outcome	- Fewer sortie-operations would be flown than projected for Alternatives B and C. - Impact of low altitude activities would be reduced compared to projections for Alternatives B and C.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

Resource Category	*Aircraft and Airspace Operations*
Concern Addressed	Floor of some MTR segments (200 feet AGL) is lower than the proposed minimum flight altitude of 300 feet AGL.
Action	Raise the floor of MTR segments to a minimum of 300 feet AGL.
Alternatives	B, C, D
EIS Section	Appendix C
Outcome	Match MTR segment altitude with minimum flight altitude.
Agency Responsible	Air Force and FAA
Time Frame	Proposal implementation.

Resource Category	***Aircraft and Airspace Operations, Land Use, Cultural Resources, Biological Resources***
Concern Addressed	Interaction between military use of MOA and underlying local airport traffic.
Action	- Establish an 800 number to Dyess AFB. - Establish a Military Radar Unit (MRU) and real-time communications.
Alternatives	B, C, D
EIS Section	2.4.2, 2.4.3, and 2.4.4
Outcome	- Increase communication opportunities with civil aviators. - Raise awareness and avoid potential conflicts between military and general aviation aircraft flying in local airspace. - Allow easier local airport access.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

Resource Category	***Aircraft and Airspace Operations***
Concern Addressed	Conflicts with local aviation (crop dusting, weather modification, and predator control).
Action	Raise the floor altitude of the proposed MTR re-entry route to 6,000 feet MSL for Alternatives B and C, 8,000 feet MSL for Alternative D.
Alternatives	B, C, D
EIS Section	2.4.2, 2.4.3, 2.4.4, and Appendix C.
Outcome	Reduce potential for conflict between military and civil aviation activities.
Agency Responsible	Air Force and FAA
Time Frame	Proposal implementation.

Resource Category	***Airspace and Aircraft Operations***
Concern Addressed	Potential for increased noise complaints and public perception that noise complaints are not handled effectively.
Action	Publicize the existing 800 number.
Alternatives	B, C, D
EIS Section	Volume II
Outcome	Improved communication between public and military public affairs offices.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

Resource Category	Aircraft and Airspace Operations, Land Use, Cultural Resources, Biological Resources
Concern Addressed	Interaction between military use of proposed MTRs and MOA/ATCAAs and civil aviation activities.
Action	- Establish an 800 number to Dyess AFB. - Establish an MRU and real-time communications.
Alternatives	B, C, D
EIS Section	2.4.2, 2.4.3, and 2.4.4
Outcome	- Increase communication opportunities between civil aviators. - Raise awareness and avoid potential interaction between military and general aviation aircraft flying in local airspace.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

Resource Category	Airspace and Aircraft Operations
Concern Addressed	Overflights and associated noise would adversely affect the use of Philmont Scout Ranch.
Action	- Establish working meetings with Philmont Scout Ranch officials to gain insight on the schedule and ways to reduce perceived effects. - Implement reasonable operational and seasonal constraints.
Alternatives	D
EIS Section	Volume II
Consequence	- Reduce noise over Philmont Scout Ranch. - Enhance ability to address seasonal concerns regarding aircraft noise consistent with operational requirements.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

Resource Category	*Aircraft and Airspace Operations*
Concern Addressed	Operational location of en route Electronic Scoring Site (ESS) near Dyess AFB.
Action	Place ESS at evaluated candidate emitter site, at a local municipal airport, or at another suitable location under proposed MOA.
Alternatives	B, C, D
EIS Section	2.4.1
Outcome	- Eliminate potential effects on identified cultural resources. - Increase operational flexibility. - Provide economic benefit to county(ies) underlying the MOA.
Agency Responsible	Air Force
Time Frame	Proposal implementation.

2.6.3 Expected Operational Outcomes

Table 2.6-3 presents the expected operational outcomes and benefits of implementing each of the three action alternatives.

Table 2.6-3
Expected Operational Outcomes of Implementing Alternatives B, C, or D

Alternative B: IR-178/Lancer MOA	*Alternative C: IR-178/Texon MOA*	*Alternative D: IR-153/Mt. Dora MOA*
67 percent reduction in B-52 low-value transit time to realistic Electronic Scoring System	67 percent reduction in B-52 low-value transit time to realistic Electronic Scoring System	75 percent reduction in B-52 low-value transit time to realistic Electronic Scoring System
71 percent reduction in B-1 low-value transit time to realistic Electronic Scoring System	71 percent reduction in B-1 low-value transit time to realistic Electronic Scoring System	45 percent reduction in B-1 low-value transit time to realistic Electronic Scoring System
20 to 26 percent increase in proportion of combat training time	26 to 29 percent increase in proportion of combat training time	18 to 26 percent increase in proportion of combat training time
Anticipated increase in ability to train replacement B-1 and B-52 aircrews	Anticipated increase in ability to train replacement B-1 and B-52 aircrews	Anticipated increase in ability to train replacement B-1 and B-52 aircrews

2.6.4 Cooperating Agency

The FAA is a cooperating agency for the RBTI EIS due to its responsibilities for the establishment and management of the nation's airspace. In accordance with 40 CFR 1501.6, a cooperating agency participates in the NEPA process, provides technical expertise for the analysis, and may adopt the lead agency's EIS to fulfill its own NEPA requirements.

2.6.5 Other Regulatory and Permit Requirements

In accordance with the Endangered Species Act and with the National Historic Preservation Act, the Air Force has initiated consultation with the FWS and the Texas, New Mexico, Colorado, and Arkansas SHPOs. Government-to-government consultation with various Native American tribes and reservations is ongoing in accordance with the Presidential Memorandum of 29 April, 1994, Executive Order

13084 (Consultation and Coordination with Indian Tribal Government), and the DoD American Indian and Alaskan Native Policy (1998).

Approximately eight candidate emitter sites in Texas and nine candidate sites in New Mexico are located on prime farmland. One purpose of the Farmland Protection Policy Act is to discourage federal agencies from building on prime farmlands. In accordance with the law, the Air Force would inform the National Resource Conservation Service and complete forms on all sites to be retired permanently from production.

Four candidate emitter sites are located on Conservation Reserve Program lands. Possible outcomes of using these lands are discussed in Section 4.2, Land Management and Use.

If RBTI is implemented, appropriate construction permit requirements may include grading permits. The need for a grading permit would be determined on a county-by-county basis once the emitter and scoring locations are chosen.

CHAPTER 3

DESCRIPTION OF REGIONAL ENVIRONMENT

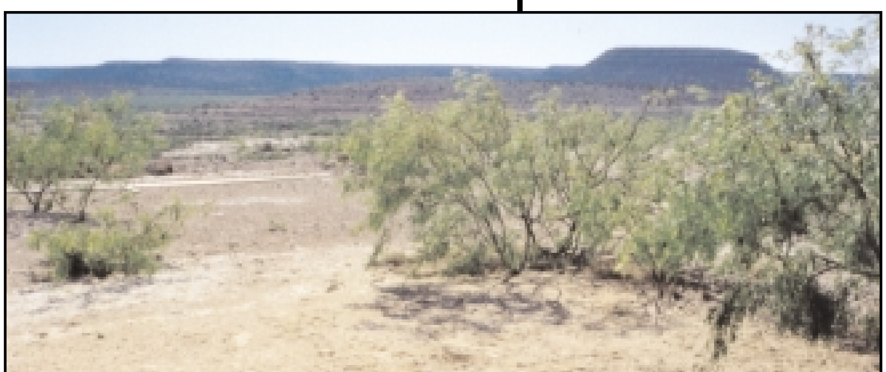
CHAPTER 3
DESCRIPTION OF REGIONAL ENVIRONMENT

This section presents the environmental context for the proposed RBTI. It describes the land, people, economy, and quality of life of northern New Mexico and western Texas and reviews military airspace use to illustrate the long history of military presence in this region. Military aircraft have coexisted with local farmers, ranchers, tourists, oil workers, and others since the early 1900s.

Proposed alternatives for RBTI cover a region of over 150,000 square miles. Given this size, it is not surprising that the people, economy, and environment are diverse. This vast area includes treeless plains and forested mountains, busy cities and isolated ranches, and cotton farms and oil fields.

3.1 PHYSIOGRAPHY AND ENVIRONMENT

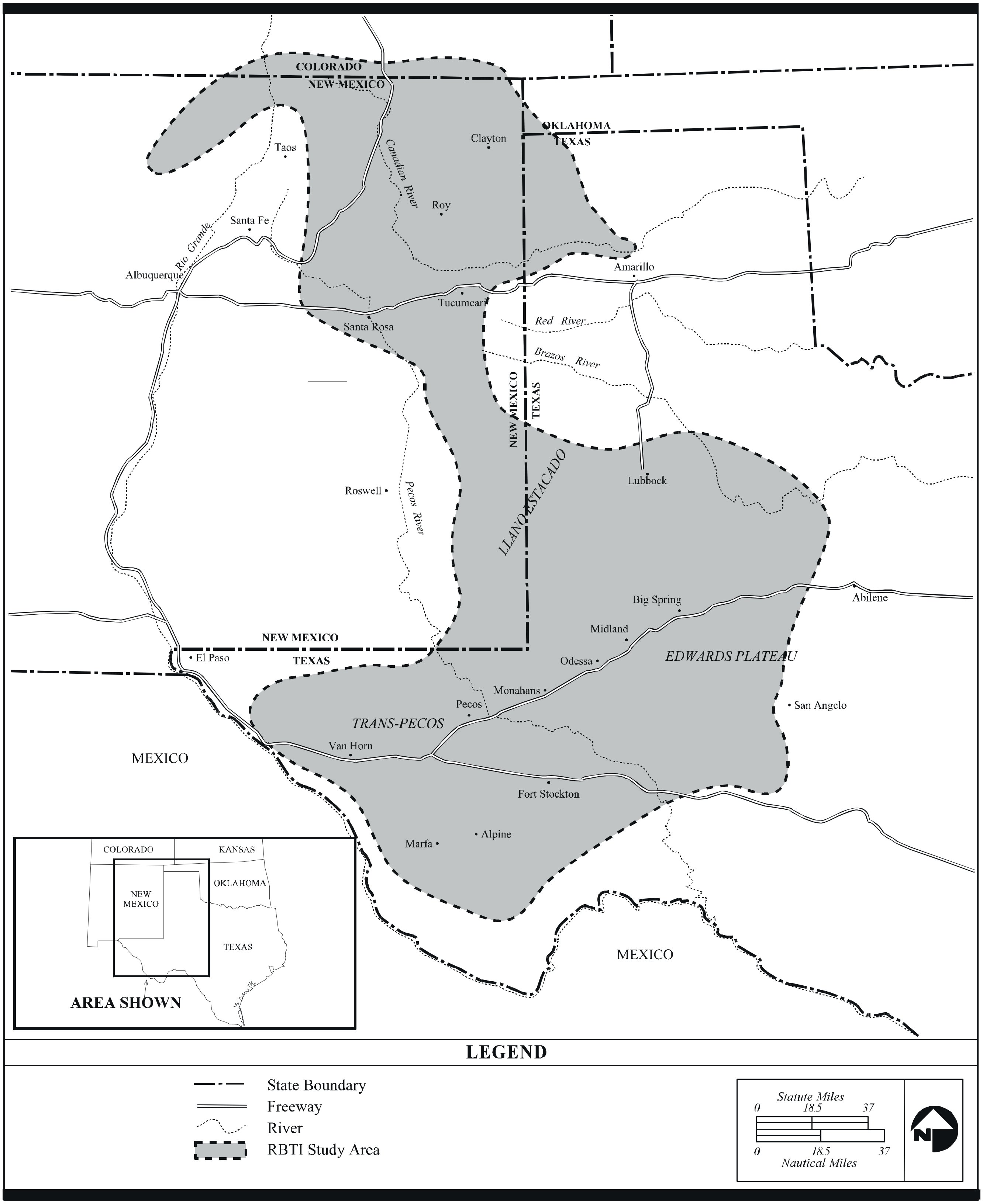
The RBTI study area extends from the Big Bend Country near Alpine to the northern edge of New Mexico near Tierra Amarilla (Figure 3.1-1). Much of the land proposed for RBTI lies within the High Plains of eastern New Mexico and northern and western Texas. This region is dry and windy. Near Amarillo, rainfall averages about 20 inches per year. At San Angelo, Texas, in the southeast part of the study area, rainfall averages 24 inches. In the High Plains, rainfall is most common in the summer, but is unpredictable. Droughts are frequent (Stephens and Holmes 1988).



The High Plains are level and nearly treeless. The land slopes gradually from about 2,700 feet above sea level in Texas to over 4,000 feet in New Mexico. There are a few rolling hills, deep canyons, and isolated extinct volcanoes. Palo Duro Canyon south of Amarillo is 1,200 feet deep from rim to bottom. Capulin Volcano in northeastern New Mexico is nearly 1,200 feet higher than the surrounding plains.

There are few rivers and streams in the plains and little other surface water except for playas. Playas are shallow basins that catch runoff during wet weather and have no outlets (Anderson and Wooster 1987). Playa lakes can be as large as 40 acres (Texas A&M 1996). Major rivers in the plains of eastern New Mexico and northwestern Texas include the Brazos, Colorado, Red, and Canadian (refer to Figure 3.1-1). The Pecos River in New Mexico flows south along the west edge of the High Plains.

The portion of the High Plains along the New Mexico/Texas border south of the Canadian River is called the Llano Estacado (or Staked Plain). This flat area has few distinguishing natural features. Vegetation was originally short-grass prairie and included blue grama, buffalograss, and other prairie grasses. Up to the late 1800s, the Llano Estacado was free of brush, but sagebrush, mesquite, and yucca invaded (Texas A&M 1996) after grazing; irrigated farming and fire suppression have also altered much of the native short-grass prairie habitat (USAF 1998b). Today, about 60 percent of the land within the Texas High Plains is devoted to cropland using deep well irrigation (Texas Parks and Wildlife Department 1996).



General Region **Figure 3.1-1**

Irrigation of the Llano Estacado is possible because much of northwestern Texas and eastern New Mexico is underlain by the Ogallala Aquifer, one of the largest aquifer systems in the world. Ranchers and farmers began pumping from the aquifer in the 1930s and 1940s. From 1950 through the 1970s, there was a rapid decline in the water tables. This decline has stabilized to some degree, but during droughts, increased pumping can lead to further drops in the water table (High Plains Underground Water Conservation District 1998).

South and east of the Llano Estacado, at the southern edge of the plains in Texas, is the Edwards Plateau. This region is in the vicinity of Big Spring and San Angelo. The Edwards Plateau is a stoney plain that has been deeply cut by streams and erosion. The soil is thin and lies on limestone bedrock. The original vegetation was grassland with cedar, live oak, post oak, mesquite, and juniper along slopes and streams. While there is some arable land along streams, the Edwards Plateau is 95 percent rangeland for cattle, sheep, and goats (Texas A&M 1996). Irrigation water can be pumped from the Edwards Aquifer.

The RBTI study area also extends into the Basin and Range Province in extreme western Texas, a region known as the Trans-Pecos or Big Bend Country. This area differs from the Llano Estacado and Edwards Plateau in having broad desert flats separated by scattered mountain ranges. The project area is close to the Davis Mountains, some of the highest terrain in Texas. Rainfall in the desert averages as little as 10 to 12 inches per year. The two major rivers in southern New Mexico and western Texas are the Rio Grande and Pecos (Texas A&M 1996).

The Chihuahuan Desert extends from northern Mexico into southern New Mexico and the Trans-Pecos. At lower elevations, the native vegetation is desert grassland and scrub. Plants include creosotebush, tarbush, whitethorn acacia, ocotillo, prickly pear, cholla, and other desert plants. At higher elevations are juniper, pinyon pine, and Mexican pinyon. On the highest mountains are ponderosa pines. Overall, the region is 95 percent rangeland, with a few irrigated farms along the Rio Grande and Pecos Rivers (Texas A&M 1996).

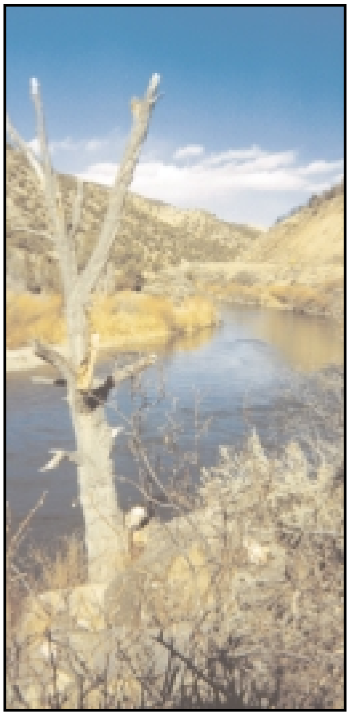
The northwest part of the study area, in the vicinity of Taos, New Mexico, has great diversity. The Sangre de Cristo Mountains include the highest point in the state, Wheeler Peak, which reaches over 13,000 feet above sea level. The San Juan Mountains west of Taos have glaciated mountains, extinct volcanoes, deep canyons, and rushing streams. The Rio Grande Valley is 25 miles wide and relatively level. The Rio Grande River gorge is itself only 2 miles across but up to 800 feet deep.

North central New Mexico receives little precipitation; rainfall averages only 14 inches per year. Despite its dryness, the dramatic changes in elevation mean that vegetation is much more varied than on the High Plains to the east. There are savannahs with mixed woodlands, coniferous forests, grasslands, and desert scrub (USAF 1998b).

3.2 THE PEOPLE

3.2.1 Prehistory and History

Native Americans have lived in northern New Mexico and western Texas for at least 15,000 years. Archaeologists call the earliest Native Americans Paleo-Indians. They were hunter-gatherers who hunted mammoth, a now-extinct species of bison, and other large game animals. Several of the most famous Paleo-Indian sites in North America, such as Clovis, Folsom, Blackwater Draw, and Lubbock Lake, are found in the region.



The Archaic period hunter-gatherers that followed the Paleo-Indian period still exploited wild game, but the animals they hunted were similar to those we see today. They also put more emphasis on gathering plants for food. This was a long period of changing climate and, at times, the already harsh conditions on the Llano Estacado became even drier (Cordell 1997).

It is likely that corn was first planted in the Southwest by 1000 B.C. By 100 B.C. corn was cultivated throughout much of the region, and squash and beans were grown as well. However, archaeological sites with evidence of early agriculture are uncommon in eastern New Mexico and even less so in Texas.

The later Native American cultures in New Mexico and Texas were very different. In much of New Mexico, including the Rio Grande Valley, Anasazi groups to the north and Mogollon groups to the south lived in adobe villages and practiced agriculture. Archaeological sites containing pueblos and evidence of agriculture can be found as far east as the Pecos River. In the grasslands of the High Plains, however, the scarcity of surface water limited how much prehistoric Native Americans could depend on farming. Instead, they continued to rely on hunting and gathering and still led a nomadic lifestyle. The grassy plains supported large herds of buffalo, which attracted Native American hunters. During the 19th century these same herds drew buffalo hunters until the herds were wiped out.

Even though the environment of the Texas High Plains could not support large groups of people living in pueblos, the hunters and gatherers who lived there still left impressive evidence of their presence. Paint Rock Pictographs, one of the largest concentrations of rock art in the country (Jensen 1998), is located east of San Angelo on a limestone bluff overlooking the Concho River. Alibates Flint Quarries National Monument on the Canadian River north of Amarillo was used as a source of stone for making tools for at least 12,000 years (National Parks Foundation 1997).

After Europeans arrived in the Southwest, some native groups were able to remain in their traditional villages. For example, Taos Pueblo has been in one location since about 1350 A.D. (Bodine 1979), and other ancient pueblos can be found to the west and along the Rio Grande to the south. However, many Native Americans moved great distances to new lands, and some tribes eventually disappeared due to war, mistreatment, and disease.

After the 1600s, native groups that lived in the High Plains included the Kiowa, Apache, and Comanche (Stephens and Holmes 1988). By the late 1600s, the Comanche, who lived close to the Arkansas River, were riding horses they obtained from the Spanish. With the horse, they quickly spread southward across the Plains, pushing out the Apache who already lived there. By the 1730s, the Apache had moved into the lower Texas Plains, taking over the traditional lands of another tribe, the Jumano. Comanche territory eventually extended from the Arkansas River south to the Balcones Escarpment at the edge of the Edwards Plateau and west to the Pecos River. Their territory included all of the Llano Estacado.

Today, the Comanche and Kiowa live in Oklahoma; the Jicarilla Apache live on a reservation northwest of Santa Fe; the Mescalero Apache have a reservation west of Roswell; and the Jumano Tribe no longer exists (Griffen 1983).

The first person of European ancestry to enter what was to become New Mexico was a Franciscan friar, Fray Marcos. In 1539, he entered New Mexico from the west and visited the Zuni Pueblo. In 1540, Francisco Vasquez de Coronado, in his long search for gold, traveled west into New Mexico, visited the Acoma, Zuni, and Rio Grande Pueblos, and then crossed the Texas High Plains by way of the Canadian River (Simmons 1977). Fray Augustin Rodriguez came up the Rio Grande Valley in 1581 with the goal of converting the Pueblo Indians to Christianity. He traveled as far north as Taos Pueblo and as far east as the Pecos River. Missionary and military activity in this remote area increased and in 1610 the Spanish founded the town of Santa Fe to serve as the colonial capital. By the 1670s the non-native population in New Mexico numbered about 3,500, although many were people of mixed ancestry (Simmons 1977).

The Spanish established missions in New Mexico and in Texas near what were to become El Paso, Fort Stockton, San Angelo, and San Antonio. The Spanish generally ignored the Texas Panhandle while they developed their New Mexico territory and other places in Texas (Stephens and Holmes 1988).

Spanish occupation was not without problems. Colonial officials often mistreated the Pueblo Indians and suppressed the native religious beliefs. Eventually, this harsh treatment led to the Pueblo Revolt of 1680. The Spanish were driven out of New Mexico, fleeing to El Paso and points south. The Pueblo's success was short-lived. By 1693, the Spanish had retaken Santa Fe and by the end of the century had reconquered the rest of New Mexico (Simmons 1977).

Shortly after the Spanish regained control, the Comanche began to harass the Apache, Spanish settlers, and local pueblos. Isolated settlements were inviting targets for Comanche raids, and conflicts between Spanish forces and the Comanche were frequent. By 1786, however, there was a negotiated peace between the Comanche and the Spanish (Simmons 1977).

During the late 1700s and early 1800s, New Mexicans began dealing with a new group moving into the territory: Anglo-Americans. In 1807, the explorer Zebulon Pike became the first U.S. citizen to visit New Mexico. He was not welcomed. Instead, he was taken into custody, questioned, and then returned to Louisiana (Simmons 1977).

Mexico gained its independence from Spain in 1821. This had little immediate affect on New Mexico because of its distance from Mexico City. However, independence opened the territory to increased trade with Americans to the east. Texas declared independence from Mexico in 1837. The U.S. annexed Texas in 1845 and war with Mexico started the following year. The Army of the West, led by General Kearny, reached Santa Fe in 1846 and gained control of New Mexico. In 1848, the Treaty of Guadeloupe-Hidalgo ended the war and Mexico ceded territory that included New Mexico to the U.S. (Simmons 1977). The New Mexico Territory was formally established in 1850 and did not become a state until 1912 (Simmons 1977).

Transportation and communication between Texas, New Mexico, and the rest of the nation improved rapidly. In 1821, William Becknell began extensive travels between Missouri and Santa Fe, eventually leading to the development of the Santa Fe Trail (Simmons 1977). The Butterfield Overland Mail Route was established in 1858 and ran from St. Louis to Fort Smith, west to El Paso, up the Rio Grande to Mesilla, and on to San Francisco. Less than a generation later, the railroad came into Texas and New Mexico, stimulating still more development.

After the Civil War, settlers from New Mexico spread eastward, crossing the Canadian River and setting up small communities in the Llano Estacado and Pecos Valley. U.S. military forts were established in the region to protect settlers and control Native Americans. In 1866, ranchers Charles Goodnight and Oliver Loving took the first longhorn cattle from Texas up the Pecos Valley into New Mexico, establishing the Goodnight-Loving Trail. In the 1870s, the Mescalero Apache were forced to relocate to a reservation in the Sacramento Mountains. The decline of the buffalo in the 1870s and pressure from settlers created conflicts with the Comanche. The Battle of Adobe Walls and the Red River War from 1874 to 1875, fought in the upper Llano Estacado, eventually led to the forced removal of the Comanche to Oklahoma.

In 1876, after the Comanche were forced to leave, Goodnight established a ranch in Palo Duro Canyon south of what was to become Amarillo. Soon thousands of families followed him into the Panhandle (Texas Monthly 1998). Another influential rancher, John Chisum, set up headquarters near Roswell. In the 1870s, he owned the largest cattle operation in the U.S.

Land speculation fueled much of the development of the Llano Estacado. When Texas joined the Union, it chose not to turn over its public lands to the federal government. Instead, the state government gave railroads vast land grants, which they then dispersed to speculators. By 1880, there were numerous small ranches in the area; many were later consolidated into large ranches.

Population centers in western and northwestern Texas developed quickly after they were first settled. In west Texas, in the area called the Permian Basin, oil and gas were discovered in 1923, only 22 years after the major oil discovery at Spindletop a few miles from Beaumont (Stephens and Holmes 1988). Odessa, Midland, and other communities appeared and turned into boom towns.

Amarillo was first settled in 1887. Initially, railroad, cattle, and merchandising stimulated the growth. At the turn of the century, rangeland was being fenced and replaced with wheat fields. Amarillo soon became the center for a major wheat belt. Later still, it became the site of the world's largest natural gas development (Amarillo College 1998).

Lubbock was established in 1890 and incorporated in 1909. Between the development of cotton farming in Texas and the introduction of the railroad in 1913, Lubbock experienced tremendous growth. Farther south, Pecos, from the 1880s to the early 1900s, was one of the roughest cattle frontier towns in the West.

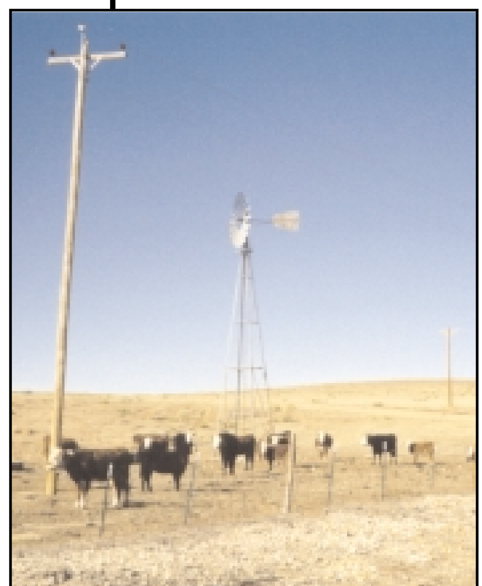
In northeastern New Mexico, Taos, near the ancient Taos Pueblo, was a center for the southwestern fur trade as early as the 1820s. Later, the town's economy was based on farming. However, as early as 1898, colonies of artists and writers had sprung up in the area.

3.2.2 Modern Population and Economy

The modern populations and economies of northeastern New Mexico and western Texas display great diversity. Amarillo is about 80 percent white, 12 percent Hispanic, and 5 percent African-American. Pecos, on the other hand, is 80 percent Hispanic. In northern New Mexico, counties range from 47 to 85 percent Hispanic, 1 to 7 percent American Indian, and up to 34 percent white.

The largest city found in the RBTI study area is Lubbock, Texas, with a population over 190,000. Other nearby population centers include Amarillo, Odessa and Midland, Texas, as well as Roswell and Clovis, New Mexico. At the other extreme are the small communities in the Big Bend Country of the Trans-Pecos and the northwestern corner of New Mexico. Brewster County, Texas, for example, has a population density of less than one person per square mile. Loving County, north of Pecos, is the least populated county in the continental U.S., and Harding County, New Mexico, north of Tucumcari, has only 913 residents.

These population differences, as well as the local economies, reflect the nature of natural and economic resources--most notably rangeland, irrigation water, oil, and recreational opportunities for residents and tourists. Santa Fe, Taos, and other communities have made northern New Mexico the nation's third largest art market after New York and Los Angeles. Pueblos, national forests, wilderness areas, and ski resorts also bring tourists and money. Many residents also commute to Santa Fe or Los Alamos to work for the state and federal governments (New Mexico EDD 1998). In contrast, Tucumcari, in northeastern New Mexico, has an economy focused on providing services to railroads and truck traffic along Interstate 40. Union County, in northeastern New Mexico (north of the town of Tucumcari), consists almost entirely of broad rolling or sloping grassland. This county has supported ranching since it was first settled. However, the Dust Bowl, the Depression, and the mechanization of the cattle industry caused a major drop in the county's population from its peak in 1920. Irrigated farming has become more important in the county since the 1950s. In 1992, most of the farms in the county grew corn, grain sorghum, wheat, alfalfa hay, and other hay (Union County 1995).



In eastern New Mexico around Clovis, cotton was once one of the most important crops, but now more wheat, corn, and grain sorghum are produced here than anywhere else in the state (Cannon AFB 1998). Peanuts are also a major crop, and feedlots are very important to the local economy because much of eastern New Mexico remains unirrigated rangeland (New Mexico EDD 1998).

The High Plains between Amarillo and Lubbock have an agricultural economy based primarily on wheat and sorghum farming, but with significant ranching and petroleum development (Ramos 1997). While much of the rangeland has been plowed into farms, cattle ranching is still important. Many large commercial feedlots have been established. In fact, nearly 75 percent of all of Texas' cattle feedyards are located in the Amarillo area (Amarillo College 1998). Natural gas fields are also found in the Panhandle, and helium is a major resource near Amarillo.

The southern High Plains in Texas are also an important sorghum-growing region. This area also supports cotton production, enough to make Texas the second largest cotton-producing state in the U.S. (Anderson and Wooster 1987). The largest oil and gas deposits in Texas are found in this area (the Permian Basin). Midland and Odessa appeared on the map almost entirely because of oil. On the other hand, Big Spring has developed a local economy based on both oil and cotton. Leasing of lands for hunting has become an important supplement, if not a replacement, for some agriculture.

On the Edwards Plateau, cattle, sheep, and goat raising are important sources of income (Ramos 1997). San Angelo, just north of the Texas Hill Country, does not have an economy based on oil. Instead, it is centered on the production of wool and mohair.

Along the Pecos River in southeast New Mexico and west Texas, both irrigated farming and oil fields are important. Today, this region's economy is focused on agriculture. Major crops harvested from the irrigated fields along the river include cantaloupes, watermelons, cotton, onions, alfalfa, and bell peppers. In recent years, the southeast corner of New Mexico has been called the breadbasket of the state and has witnessed a dairy boom (New Mexico EDD 1998). Its products include cows, cheese, wheat, and grain sorghum. Agriculture is not the sole source of income, however. Lea County, New Mexico (on the western edge of the Permian Basin), is one of the leading oil producers in the nation.

In Texas' Big Bend Country south of the Pecos River, tourism, ranching, and farming are the main sources of income (Cummings 1998). Here, rainfall is less frequent and less predictable than elsewhere in Texas. Ranches tend to be larger than to the north. Marfa has an economy based primarily on cattle, goat, and sheep ranching. Alpine, on the other hand, has a reputation as a retirement community (Cummings 1998).

The military also provides important sources of income to local communities, including Cannon AFB at Clovis, New Mexico; Dyess AFB near Abilene, Texas; and Goodfellow AFB in San Angelo, Texas. Dyess AFB has over 5,000 employees, including 300 civilians, and is the largest single employer in the surrounding 19 counties (Dyess AFB 1998). Cannon AFB also happens to be the largest employer in eastern New Mexico (Cannon AFB 1998). Goodfellow AFB employs 4,000 military personnel and civilians and attracts an additional 2,800 military retirees into the area.

3.3 TRADITIONAL LIFESTYLES AND QUALITY OF LIFE

Evaluating--or even describing--quality of life boils down to understanding whether people have what they need to be happy. Beyond this, it is not always clear what social scientists mean by "quality of life." Measuring quality of life can be very subjective. One approach has been to ask people to think about a change or development that has made life better or worse. For example, increased urban development may improve the quality of life for some people by providing access to larger stores, increased medical care, and better paying jobs. On the other hand, this same development could reduce quality of life for others if housing prices increase, traffic gets worse, and the crime rate goes up. Each individual has a different perspective on how his or her quality of life has been affected by these changes within a community. Some of the many components that play a role in defining the quality of life in a community are listed below:

- population density;
- ethnic, racial, economic, and social character;
- traffic;
- air and noise quality;
- natural beauty;
- character of the landscape;
- housing costs and property values;
- quality of architecture;
- employment and job opportunities;
- business and commercial facilities and services;
- education;
- recreation;
- public services; and
- crime level.

Also, many people would consider the ability to maintain their traditional lifestyle to be an important element in determining quality of life. They might perceive involuntary changes to their traditional lifestyle as unpleasant or even detrimental to their well-being.

There are many different lifestyles throughout the U.S. that can be considered traditional. These multiple lifestyles are sometimes a result of different occupations and migrations into an area. The evidence for these lifestyles can even be seen on the landscape--archaeological sites, changes in vegetation, modified landforms, buildings, roads, machinery, fences, and other features. For example, the lifestyle of Native Americans was modified by the needs of ranchers who moved into an area in the 19th century. In the early 20th century, improved irrigation and oil exploration led to changes in traditional ranching activities. Still later, increased urban development changed the quality of life of long-time residents who enjoyed life in an oil town.

Today, the economies in eastern New Mexico and western Texas are based on cattle and sheep ranching; growing wheat, cotton, grain sorghum, and other crops; producing oil, gas, and other mineral resources; recreation and tourism; the military; and many other sources of income. The histories of how each of the economies evolved in the area differ, but most began during the two generations between the 1860s and 1920s. Each is tied to a traditional lifestyle, and it would be difficult to decide which one is "more traditional" than another.

Native Americans. Native Americans have the oldest traditional culture in the region. Pueblos and other Native American groups have a long tradition of maintaining customs and beliefs, often using what little political power they could generate to prevent encroachment from modern American culture. Threats to their traditions may come from noise interrupting their ceremonies, from television and movies introducing unacceptable behavior, or from tourists intruding on their privacy.

Traditional sites for the Pueblos include villages hundreds of years old. There are also sacred sites in other locations that are important not only for religious reasons but also for hunting and gathering traditional foods. The Mescalero Apache consider several mountaintops in southern New Mexico and the Trans-Pecos to be sacred. Important traditional sites may have once existed in the High Plains, but the displacement of the Apache in the 18th century and of the Comanche in the 19th century from these areas may have led to a loss of traditional knowledge about specific locations.

Ranching and Farming. In western Texas and eastern New Mexico, the first Anglo-American ranches were established in the 1870s. Since that time, ranchers in this region have witnessed many changes brought about by immigration, new technology, and an evolving economy. Some ranchers consider that a critical element of their quality of life is the maintenance of their traditional way of ranching and of being able to do their jobs with minimal disturbance from intrusive noises from aircraft or industrial activities. This is not just a reflection of the low population. The scarcity of trees, the flat land, and the wind also contribute to a sense of isolation. At the same time, a threat to their quality of life may also be seen as resulting from government acquisition of private land, environmental regulations designed to protect rangeland, and increased demand by the public for recreational opportunities.

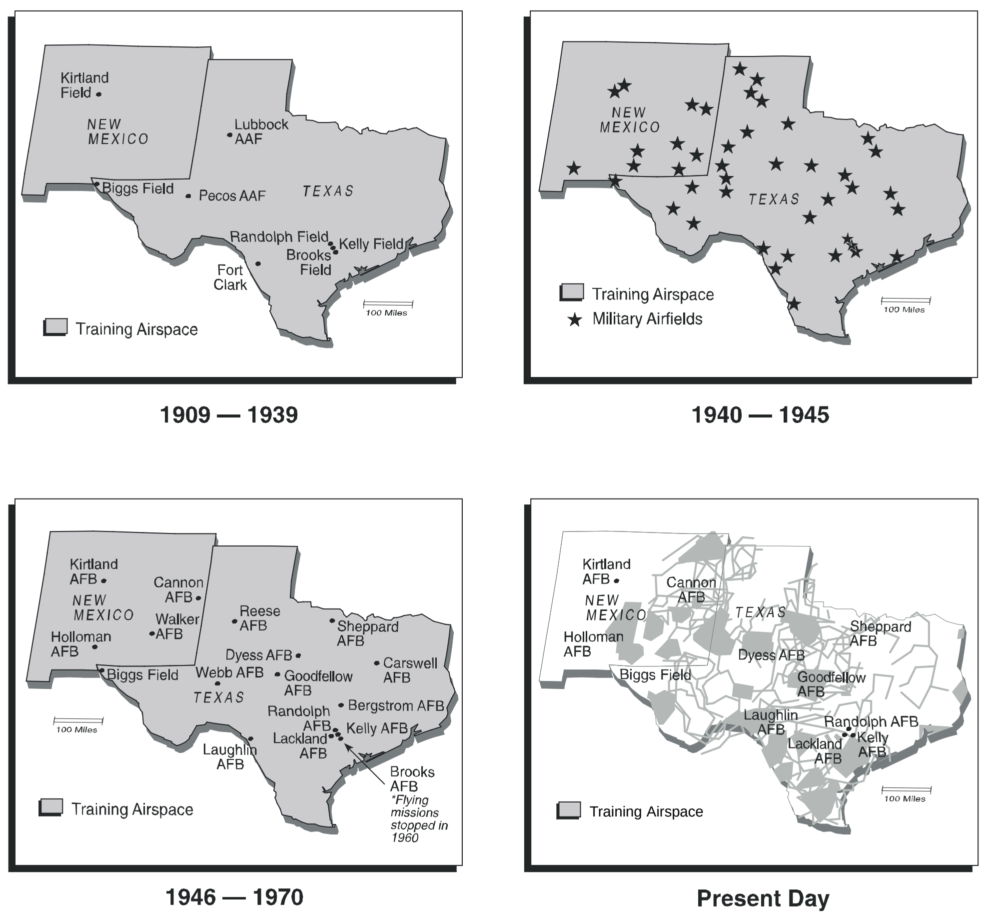
Oil and Gas. The first boom in oil exploration and production in western Texas came in the 1920s. While ranching and farming may appeal to those seeking solitude, the boom towns of Midland and Odessa drew people seeking something other than solitude--jobs, wealth, and excitement. A threat to their quality of life may come from government and environmental regulations or economic depression. Aircraft flying overhead would bother workers at a drill site far less than a drop in the price of oil. Yet these same people may resent an airplane disturbing their weekend camping trip.

Recreation and Tourism. Many people are drawn to cities to seek recreation and tourism. Yet in eastern New Mexico and parts of western Texas, those who seek isolation and natural beauty are rewarded with remote canyons, high mountains, and lonely deserts. Noise from any non-natural source as well as lights from nearby towns, power lines, roads, and other signs of modern life may be seen as unpleasant intrusions.

Military. There has long been a military presence in western Texas and eastern New Mexico, from the earliest Spanish exploration 450 years ago to the present. U.S. Army troops were posted in El Paso as early as 1846 during the Mexican War, and Fort Bliss was first constructed at its present site in 1891. By 1914, Fort Bliss had become the largest military installation in the U.S., as a result of fears about the Mexican Revolution (U.S. Army 1998). Camp Stockton was established in 1840 in the present location in the city of Fort Stockton and Fort Concho was established in 1867 at San Angelo and lasted until 1887.

3.4 MILITARY AIRSPACE USE

Military flights have taken place over Texas and New Mexico for almost 90 years. During this long time, the pilots, their crews, and their aircraft have successfully coexisted with the people and the environment within the RBTI study area.



Current and Historic Army Air Fields and Air Force Bases

Figure 3.4-1

1909 The U.S. becomes the first country to own a military airplane, a Wright Model A biplane. Fort Sam Houston in San Antonio is selected as a permanent station for Army aeronautical work.

1910 The first military flight over Texas takes place at Fort Sam Houston using the only airplane owned by the Signal Corps.

1911 The first tactical operation of Army aviation occurs along the Texas-Mexican border to observe skirmishes between Mexican government forces and revolutionaries. Fight training occurs around San Antonio, Leon Springs, and nearby areas.

1912-13 The Provisional First Aero Squadron is stationed at Texas City, near Houston.

1914 During a flight over Matamoras to observe activities of Pancho Villa, Army pilots become the first airmen to come under fire.

1915 The First Aero Squadron is permanently based at Fort Sam Houston.

1916 In response to Pancho Villa's invasion, the First Aero Squadron flies to Columbus, New Mexico, to join General Pershing's Mexican Punitive Expedition.

1917 Kelly Field No. 1 and Kelly Field No. 2 are established in San Antonio. Other airfields are established in Houston, Fort Worth, Dallas, Waco, and Wichita Falls.

1918 Brooks Field is established in San Antonio.

1922-26 Kelly Field No. 2 becomes the nation's Advanced Flying School, giving instruction in advanced flying, cross-country flying, bombing and aerial gunnery, telegraphy, maintenance, and administration.

1922-31 Brooks Field becomes the Primary Flying School for the Army.

1923 Army pilots perform the first nonstop continental flight from New York to San Diego in a Fokker F-IV (Army designation T-2). The route passes over Tucumcari.

The Army Air Corps and its predecessors had an early presence in Texas and New Mexico. The history of military flight in or near the RBTI study area is briefly highlighted in the adjacent column. Much of this information came from Mueller (1989), Freeman (1996), Haymore (1997), Holloman AFB (1998), Kirtland AFB (1998), Dyess AFB (1998), the U.S. Army Corps of Engineers (1998), and Air Force base and wing historians, including the Air Force Historic Research Agency, Maxwell AFB (Green, personal communication 1998). Current and former military installations with some role in aircrew training are shown in Figure 3.4-1.

In 1910, the only airplane owned by the U.S. Army Signal Corps was flown to Fort Sam Houston in San Antonio. Military flights have taken place over Texas and New Mexico ever since. The number of aircraft and the frequency of overflights have gone up and down as the training needs of the Army Air Corps and, later, the Air Force changed. Nevertheless, throughout this 90-year period, the pilots, their crews, and their aircraft have successfully coexisted with the people and the environment of the RBTI study area.

Many of the installations shown in Figure 3.4-1 had training missions. Training activities took place in the San Antonio areas as early as World War I. However, the nature of pilot and crew training has changed over the years as aircraft, weapons, defenses, and strategic thinking have evolved. For example, in the early 1900s the War Department believed that the primary role of aircraft in combat was to pursue enemy aircraft, then later decided that some aircraft should have bombing as their primary mission. This new mission required both specialized pilot training and the development of bombing ranges (Freeman 1996). World War II saw the establishment of new bases in New Mexico and Texas for training aircrews in B-17s, B-24s, and B-29s. Later, in the 1950s and 1960s, the threat from radar technology grew and there was an increased need for low-altitude training so pilots could learn how to avoid enemy detection.

Despite the long history of flight training in the RBTI study area, the designation of Special Use Airspace to separate military and non-military aircraft was as slow to develop in Texas and New Mexico as it was elsewhere. Safety concerns were recognized very early, and the Bureau of Air Commerce was established in 1926 to regulate air safety, establish and maintain airways, and make air traffic rules. Still, in the 1930s no single agency controlled air traffic en-route from one airport to another. Aircraft came into terminal areas randomly, often arriving at the same time to compete for their share of the congested airspace (Komons 1986). Between 1935 and 1936, commercial air carriers established air traffic control units in several cities (Komons 1986). Under the Civil Aeronautics Act of 1938, the Civil Aeronautics Authority was formed and various "airspace reservations" and "danger areas" were set up to provide for national security and to denote hazards to aircraft (Secretary of Defense, Secretary of Transportation 1988).

World War II led to a quantum leap in the Civil Aeronautics Authority's air traffic control responsibilities, in large part because better control was needed by the War Department. The situation improved after the war, as radar became the "eyes" of the air traffic control system. Despite the improvements, the skies were becoming more crowded. There was an increasing number of near midair collisions during the early 1950s (Garonzik 1986).

When the FAA was created in 1958, it was to give full consideration to the requirements of national defense as well as commercial and general aviation (Secretary of Defense, Secretary of Transportation 1988). Under a revision of Federal Aviation Regulations in 1961, the concept of Special Use Airspace was formally initiated (Secretary of Defense, Secretary of Transportation 1988). However, despite the increased efforts to gain some control over airspace use,

1925-26	Fort Bliss leases land to develop Biggs Field. A 1000-acre bombing range is developed northwest of Kelly Field.
1931	Construction is started at Randolph Field in San Antonio.
1939	Kirtland Field is established in Albuquerque for training crews for B-17 "Flying Fortresses," B-18s, AT-11s, B-24s, and B-29s.
1940	Land near Fort Bliss is leased for anti-aircraft training.
1941	Clovis Army Air Field (later renamed Cannon AFB) opens initially for a glider detachment, and later for training B-17, B-24, and B-29 heavy bomber crews. Tye AAF (later named Abilene AFB and Dyess AFB) is established for flight training. Biggs Field is used for training B-17, B-24, and B-29 bomber crews.
1942	Roswell AAF (later renamed Walker AFB) opens. Sheppard AAF opens. Alamogordo AAF, later to become Holloman AFB established for training P-47, B-17, B-24, and B-29 pilots and crews. It includes land that would later become White Sands Missile Range. Reese AAF is established near Lubbock. Laughlin AAF opens near Del Rio.
1943	Flight training ceases at Kelly Field and is moved to Randolph Field. Brooks Field becomes center for training B-25 bomber crews.
1944	Carswell AAF is established near Forth Worth.
1945	Bergstrom AAF is established in Austin.
1947	The U.S. Air Force is established.
1948	The mission of Holloman AFB is changed to emphasize testing unmanned aircraft and guided missiles.
1951	P-51 "Mustang" fighters are based at Clovis AFB.
1952	Melrose Bombing Range is developed 35 miles west of Clovis, New Mexico.

1953-54	F-86 "Sabres" and F-84s arrive at Clovis AFB. This base becomes the main center for training F-86 pilots.
1956	B-47s and KC-97s are assigned to Dyess AFB. The first F-100 "Super Sabres" arrive at Clovis AFB.
1958	Federal Aviation Act of 1958 establishes the FAA.
1958-70	F-100s are the primary base aircraft at Cannon AFB.
1963	B-52s replace B-47s at Dyess AFB.
1967	Walker AFB is closed.
1969	Cannon AFB begins transfer from F-100s to F-111s.
1975	First MOAs established.
Late 1970s	First MTRs established.
1985	The first B-1s are assigned to Dyess AFB.
1991	F-117A "Nighthawks" move to Holloman AFB.
1993	Bergstrom and Carswell AFBs closed.
1995	F-16 "Fighting Falcons" arrive at Cannon AFB.
1996	12 German AF Tornados added at Holloman AFB.
1997	Air Force retires all F-111s. Cannon AFB is assigned an F-16 squadron.
1998	Joint Royal Singapore AF/U.S. Air Force Squadron established at Cannon AFB.
1999	30 German Air Force Tornados added at Holloman AFB.
2001	Kelly AFB scheduled to close.

military flight training activity prior to the mid-1970s was relatively unconstrained (GAO 1988). Certain types of military flight training, including air combat maneuvering, were conducted across the country in free airspace. Civil aviation was unaware of either the location or the type of activities being conducted. There were increasing concerns about the potential for collisions between military and non-military aircraft. In the summer of 1975, the FAA established a new category of Special Use Airspace called the Military Operations Area, or MOA (Secretary of Defense, Secretary of Transportation 1988). MOAs were implemented to inform pilots flying under Visual Flight Rules (VFRs) and operating below 18,000 feet of military activity in the area. MOAs also allowed aircraft flying under Instrument Flight Rules (IFRs) to be segregated from military operations (Prasse 1990).

In the late 1970s, the MTR program was designed jointly by the FAA and DoD to provide the military with airspace designated for military low-altitude, high speed navigation, and tactics. MTRs replaced the previous Training Route system (Prasse 1990, FAA 1991).

After the MTR program was formally established in the 1970s, the Air Force created a number of routes in west Texas and eastern New Mexico for training. Over time, some of these routes were changed to increase the efficiency of flight plans and to meet new mission requirements. New segments of airspace were designated to link separate routes, other routes were completely or partially deleted, and air traffic on still other routes was reduced. The general trend since the 1970s has been to restrict military flights, both in terms of location and altitudes, while balancing training requirements and impacts to the environment.

At the same time, reductions in military spending led to redistribution of necessary personnel and material and to closure of military installations across the county. As a result of the Base Closure and Realignment Act of 1988 and the Commission on Base Realignment and Closure, four Air Force bases in Texas have been closed since 1991: Bergstrom AFB, Carswell AFB, Kelly AFB, and Reese AFB. The remaining installations must meet reduced funding and flying hour allocations while meeting mission readiness requirements.

CHAPTER 4

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

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AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Potential environmental impacts cannot be determined without first understanding the existing conditions in the affected environment. For this reason, the impact analysis process involves two steps. First, this EIS helps the reader develop an understanding of the existing environmental setting, or the "affected environment." Second, it uses details of the RBTI alternatives (see Chapter 2) to assess their impacts on the existing environment, or the "environmental consequences." As required by NEPA, this EIS addresses impacts associated with Alternative A: No-Action, as well as the environmental effects of implementing the action alternatives.

This chapter contains a discussion of:

- Airspace and Aircraft Operations
- Land Management and Use
- Biological Resources
- Socioeconomics and Environmental Justice
- Cultural Resources
- Soils and Water

The impact analysis process requires collecting scientifically valid and up-to-date information. Data collection involves:

- Reviewing previous studies, such as technical publications, agency databases, management plans, and other NEPA documents.
- Talking to agencies and others with information on specific resources, such as the U.S. Fish and Wildlife Service, Bureau of Land Management, Texas and New Mexico State Historic Preservation Officers, tribal resource specialists, park superintendents, and community planners.
- Reviewing public input during the scoping process.
- Conducting field studies. For this EIS, field studies at candidate emitter and Electronic Scoring Site locations were conducted for biological resources, cultural resources, and hazardous waste.

The resources analyzed in this EIS are interdependent. For example, a change in soils at a candidate emitter site might affect local vegetation, which in turn could affect wildlife that depend on the plants for food. An increase in aircraft sortie-operations might affect noise conditions in the affected area. Changes in noise could affect how the land is used or managed. These types of interrelationships are why the EIS is prepared by an interdisciplinary team.

Assessment of environmental consequences is also based on an understanding that different resources are not equally sensitive to all elements of an action. For example, cultural resources--especially archaeological sites--are most likely affected by activities that disturb the ground (such as construction at emitter sites) and are usually not affected by changes in noise (which could occur under the affected airspace). On the other hand, certain animal species may be more sensitive to aircraft noise than to short-term construction activities.

The environmental impact analysis process is designed to focus analysis on those environmental resources that could potentially be affected by the RBTI proposal. Potential effects may result from different aspects of an alternative--flying activities, construction of the emitters and Electronic Scoring Sites or decommissioning of existing Electronic Scoring Sites. For this EIS, resources have been either grouped or analyzed individually according to individual or collective resource categories. Six categories, listed below, are analyzed for each action alternative, as well as for the No-Action Alternative.

- Airspace and Aircraft Operations (Section 4.1)--This section includes discussions of airspace management and use, air safety, aircraft emissions, and air quality, as well as general aircraft noise and associated human health considerations. Additional discussion of noise impacts as applied to specific resources can be found in the associated sections as follows:

  Noise impacts on land use: Land Management and Use (Section 4.2)

  Noise impacts on wildlife and livestock: Biological Resources (Section 4.3)

  Noise impacts on archaeological sites, historic buildings, and traditional cultural properties: Cultural Resources (Section 4.5)

- Land Management and Use (Section 4.2)--Land management and use includes issues such as effects of overflights, emitter construction, and ground operations on residential use, recreation, special management areas, prime farmland, and rangeland.

- Biological Resources (Section 4.3)--Biological resources includes discussion of potential impacts from overflights and construction on wetlands, vegetation, rare plants, and wildlife. The discussion focuses on threatened, endangered, and other sensitive species.

- Socioeconomics and Environmental Justice (Section 4.4)--Socioeconomics focus on employment and income, including the effects of decommissioning on the local economy. The analysis of environmental justice considers whether minority or low-income groups experience a disproportionate share of any impacts.

- Cultural Resources (Section 4.5)--This section addresses potential impacts to archaeological sites, historic buildings and structures, and traditional cultural properties from overflights and construction.

- Soils and Water (Section 4.6)--This discussion considers the effects of RBTI and the No-Action Alternative on water availability, soil erosion, fugitive dust, and paleontological remains that may potentially occur in the areas affected by construction and operation.

4.1 AIRSPACE AND AIRCRAFT OPERATIONS

Training activities involving aircraft operations by B-52 and B-1 bombers form the focus of the RBTI proposal. These activities occur in airspace, a finite resource controlled and administered by the FAA. For RBTI, the extent and nature of the airspace and its use defines the location of the affected environment for each alternative. Within the airspace, aircraft performing training activities generate noise and emit exhaust, so they can affect the noise environment and air quality. These activities must also be performed safely and with regard for all other users of the airspace. Because these training activities have the potential to affect air safety and airspace management, the Air Force has analyzed them in this EIS.

4.1.1 Methods and Approach

AIRSPACE MANAGEMENT

FAA rules and regulations govern all civilian and military airspace use.

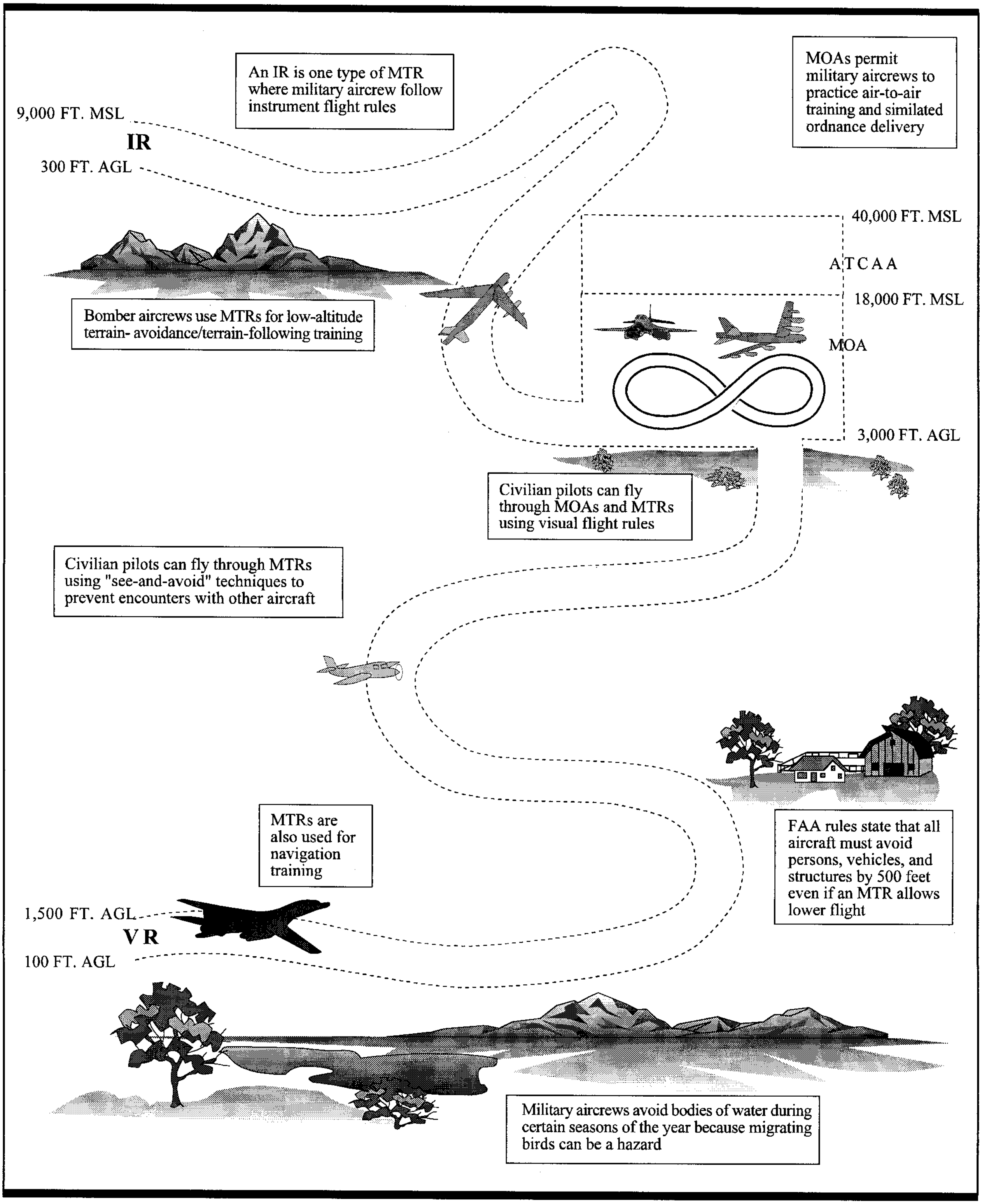
Under Title 49, U.S. Code and Public Law 103-272, the United States government has exclusive sovereignty over the nation's airspace. This sovereignty extends from the surface to above 60,000 feet MSL. The FAA has the responsibility to plan, manage, and control the structure and use of all airspace over the United States, including that associated with RBTI. Like the highway system and traffic laws, FAA rules govern the national airspace system, and regulations establish how and where aircraft may fly. Collectively, the FAA uses these rules and regulations to make airspace use as safe, effective, and compatible as possible for all types of aircraft, from private propeller-driven planes to large, high-speed commercial and military jets.

Civil, commercial, and military air traffic all use the airspace within the study area for RBTI. FAA rules, airspace management, and procedures provide for safe operations by each and all types of aviation users. As presented in Section 3.4, the military was one of, if not the first, users of the skies over Texas and New Mexico. Training with aircraft ranging from biplanes to B-29s to F-16s has occurred over these areas for 90 years. Given the vast expanses of land and the importance of ranching and farming, there is a long tradition of civil aviation as well. Today, civil aviation activities in the study area include weather modification (cloud seeding), pest (e.g., boll weevils) eradication, crop spraying, range distribution and water assessments for livestock, emergency medical flights, pipeline surveillance, predator control, wildlife management, drug interdiction, and pleasure flights. In northern New Mexico hot air ballooning is quite popular. Neither the FAA nor state aviation agencies maintain comprehensive records on visual flight rules traffic for civil aviation. Commercial aviation also uses the area. Dozens of jet routes and federal airways transit the study area, and thousands of commercial flights use them every year.

Two types of flight rules (visual flight rules [VFR] and instrument flight rules [IFR]) apply to airspace, providing a general means of managing its use. Both military and civil aviation abide by these rules to ensure safe operations. For example, private pilots flying between airports to survey oil fields or livestock within familiar territory normally operate under VFR. VFR pilots fly using visual cues along their desired route of flight, as long as appropriate visibility conditions exist, day or night. IFR pilots undergo much more training and operate under greater restrictions, but they may fly during periods of reduced visibility. Only those pilots qualified for IFR may use them in flying; commercial pilots generally have IFR ratings.

FAA rules and regulations serve to separate VFR and IFR flights from each other and from other aircraft using the same rules. These rules always recommend that VFR pilots carefully examine aeronautical charts and communicate with the nearest FAA facility to obtain information on what other aircraft are flying in the area. The rules also separate VFR air traffic by designating altitudes for flying based on the direction of flight. IFR air traffic is under more stringent flight controls and requires consistent communication with the FAA.

Aircraft use different kinds of airspace according to the specific rules and procedures defined by the FAA for each type of airspace. For RBTI, airspace used by the military consists of MTRs and MOAs/ATCAAs (Figure 4.1-1). MTRs are essentially aerial "highways" that vary in length, width, and altitude; some permit flight to 100 feet AGL or extend up to 16,000 feet MSL or higher. Under RBTI, no bombers would fly below 300 feet AGL. Aircrews use MTRs for many different types of training, including terrain masking and low-altitude navigation. Two types



How MOAs/ATCAAs and MTRs Typically Work **Figure 4.1-1**

of high-speed MTRs exist: Instrument Routes (IR) and Visual Routes (VR). The FAA requires publication of the hours of operation for any MTR so that all pilots, both military and civilian, are aware of when other aircraft could be in the airspace. Each military organization responsible for an MTR develops a daily schedule for use. Although the FAA designates MTRs for military use, other pilots may occupy the airspace. When flying VFR, the FAA urges pilots to contact the nearest flight service station for detailed information on use of the MTR at that time, and VFR pilots must use see and avoid techniques to prevent conflicts with military aircraft using the MTR. Pilots flying IFR must follow essentially the same procedures, but need to communicate with air traffic controllers consistently during their flight.

An IR, or instrument route, is used by military aircraft for low-altitude, high-speed navigation training under both instrument and visual flight conditions. A VR, or visual route, is used for the same purpose but only under visual flight conditions.

The FAA has designated MOAs as special use airspace. MOAs provide military aircrews the opportunity to perform many different training activities within a large horizontal and vertical expanse of airspace. The ceiling of all MOAs can extend to no more than 18,000 feet MSL, while the floor can be established at any altitude. Any military or civilian pilot flying VFR can enter and fly through a MOA using see and avoid techniques. Users of MOAs under VFR employ see and avoid techniques. When flying IFR, nonparticipating (those not using the MOA for training) military or civilian aircraft must obtain an air traffic control clearance to enter a MOA, if it is active.

An ATCAA commonly overlies a MOA and extends above 18,000 feet MSL. Once established, an ATCAA is activated for the time it is required in accordance with the controlling letter of agreement between the FAA and the Air Force.

Federal airways and jet routes form another type of airspace within the national airspace system controlled by the FAA. Federal airways are normally used by air traffic below 18,000 feet MSL while flying between airports. Airway traffic seldom conflicts with MTR or MOA sortie-operations for two reasons:

Commercial aircraft typically fly well above the levels military aircraft would fly in MTRs and MOAs.

- Aircraft on airways, because of fuel efficiency and flight safety related to aircraft malfunctions, commonly operate at altitudes well above most MTR ceilings and the lower altitudes used by military aircraft; and
- The FAA normally ensures that airways do not conflict with MOAs through planning.

Jet routes exist at altitudes from 18,000 to 60,000 feet MSL. Commercial aircraft fly within that structure, well above the altitudes used by military aircraft in MTRs and MOAs. Jet routes and ATCAAs can occur at the same altitudes, but FAA air traffic control prevents conflicts of use.

To avoid conflicts, MTRs and MOAs are designed to avoid busy airports entirely or establish specific avoidance procedures around small private and municipal airfields. Such avoidance procedures are maintained for each MTR and MOA, and military aircrews build them into daily flight plans.

In addition to the lower limits of charted airspace, all aircrews adhere to FAA avoidance rules. Aircraft must avoid congested areas of a city, town, settlement, or any open-air assembly of persons by 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft. Outside of congested areas, aircraft must avoid any person, vessel, vehicle, or structure by 500 feet. Bases may establish additional avoidance restrictions under MTRs and MOAs.

AIRCRAFT OPERATIONS AND THE NOISE ENVIRONMENT

Factors Influencing Annoyance

Physical Variables

- Type of neighborhood
- Time of day
- Season
- Predictability of noise
- Control over the noise source
- Length of time an individual is exposed to a noise

Emotional Variables

- Feelings about the necessity or preventability of the noise
- Judgment of the importance and value of the activity that is producing the noise
- Activity at the time an individual hears the noise (conversation, sleep, recreation)
- Attitude about the environment
- General sensitivity to noise
- Belief about the effect of noise on health
- Feeling of fear associated with the noise

Noise represents the most identifiable concern associated with aircraft operations. Although communities and even isolated areas receive more consistent noise from other sources (e.g., cars, trains, construction equipment, stereos, wind), the noise generated by aircraft overflights often receives the greatest attention. General patterns concerning the perception and effect of aircraft noise have been identified, but attitudes of individual people toward noise is subjective and depends on their situation when exposed to noise. Annoyance is the primary consequence of aircraft noise. The subjective impression of noise and the disturbance of activities are believed to contribute significantly to the general annoyance response. A number of nonnoise related factors have been identified that may influence the annoyance response of an individual. These factors include both physical and emotional variables.

Personal opinions on noise vary widely. For example, one person might consider loud rock music as pleasing but opera music as offensive. A second person may perceive just the opposite. Likewise, opinions on noise associated with military overflights vary from positive to negative.

Aircraft Noise Assessment Methods. An assessment of aircraft noise requires a general understanding of how sound is measured and how it affects people and the natural environment. Appendix G provides a detailed discussion of noise and its effects on people and the environment. The primary information needed to understand the noise analysis is summarized below.

To quantify sound levels, the Air Force uses three noise-measuring techniques, or metrics: first, a measure of the highest sound level occurring during an individual aircraft flyover (single event); a second to combine the maximum level of that single event with its duration; and a third to describe the noise environment based on the cumulative flight activity. This EIS describes single noise events with L_{max} and the Sound Exposure Level (SEL). The cumulative energy average noise metric uses the Day-Night Average Sound Level (DNL). Each metric uses A-weighted sound levels (in decibels [dBA]), which approximate how humans perceive sounds by de-emphasizing the high and low frequency portions of the noise. All noise levels discussed in this EIS reflect dBA but may simply be stated as dB.

A-weighted sound levels best approximate human hearing. Appendix G presents more information on this topic.

L_{max} comprises the highest sound level measured during a single aircraft overflight. This would be an instantaneous sound level, occurring for a fraction of a second. For an observer, the noise level starts at the ambient or background noise level, rises to the maximum level as the aircraft flies closest to the observer, and returns to the background level as the aircraft recedes into the distance. Table 4.1-1 lists the L_{max} sound levels for bomber aircraft, and Figure 4.1-2 shows examples of the rise and fall of noise levels during the short duration of an overflight. Maximum sound level is important in judging the interference caused by an aircraft noise event with conversation, sleep, or other common activities.

Table 4.1-1
Representative A-Weighted Instantaneous Maximum (L_{max}) Levels at Various Altitudes

Aircraft Type	*Airspeed (nm/hour)*	*Altitude (Feet AGL)*						
		300	*500*	*1,000*	*2,000*	*3,000*	*5,000*	*10,000*
B-1	**420**	**117**	**112**	**106**	**98**	**93**	**86**	**75**
B-1	**550**	**117**	**112**	**106**	**98**	**93**	**86**	**75**
B-52	**360**	**110**	**105**	**96**	**86**	**83**	**70**	**58**
F-16	500	106	101	94	86	83	74	63
Tornado	420	104	99	92	84	78	72	62
F-14	550	115	110	103	94	88	80	67
F-18	500	120	116	108	99	93	85	71
B-2	200	114	110	102	94	88	82	71

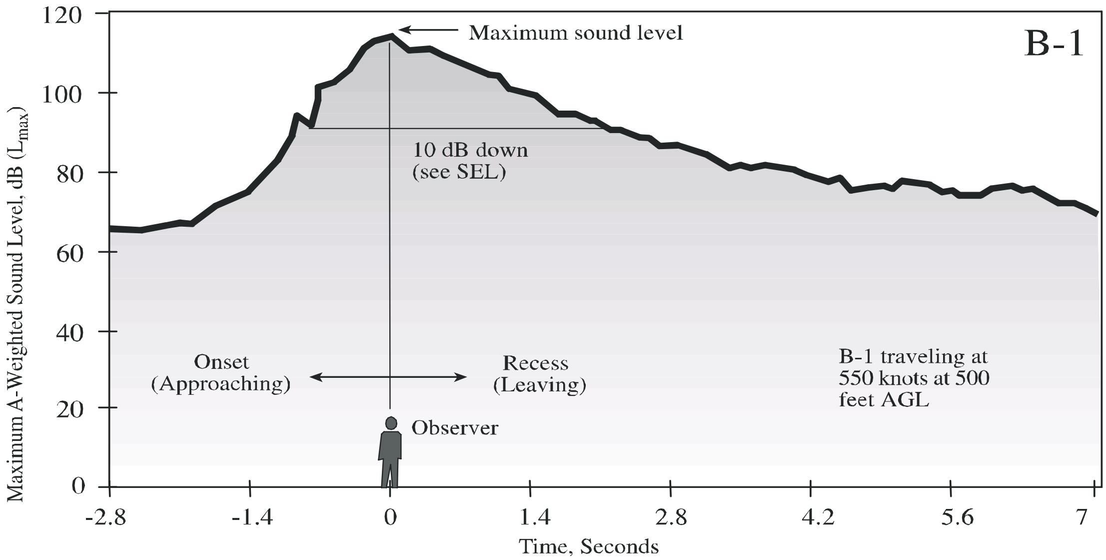
Note: Based on steedy, level flight and using Omega 108 data from actual overflight noise meaasurements.

The SEL metric is a single-number representation of a noise energy dose. This measure takes into account the effect of both the duration and intensity of a noise event. During an aircraft flyover, it would include both the maximum noise level and the 10 dB lower levels produced during onset and recess periods of the flyover (this is also known as 10 dB down; refer to Figure 4.1-2). Because an individual overflight takes seconds and the maximum sound level (L_{max}) occurs instantaneously, SEL forms the best metric to compare noise levels from overflights. SELs decrease as altitude increases and vary according to the type of aircraft, its altitude or distance from the observer, and its speed (Figure 4.1-3). As evidenced by the L_{max} and SEL data, L_{max} noise level during an overflight is typically 0 to 15 dB lower than the SEL with flights above an altitude of 500 feet AGL.

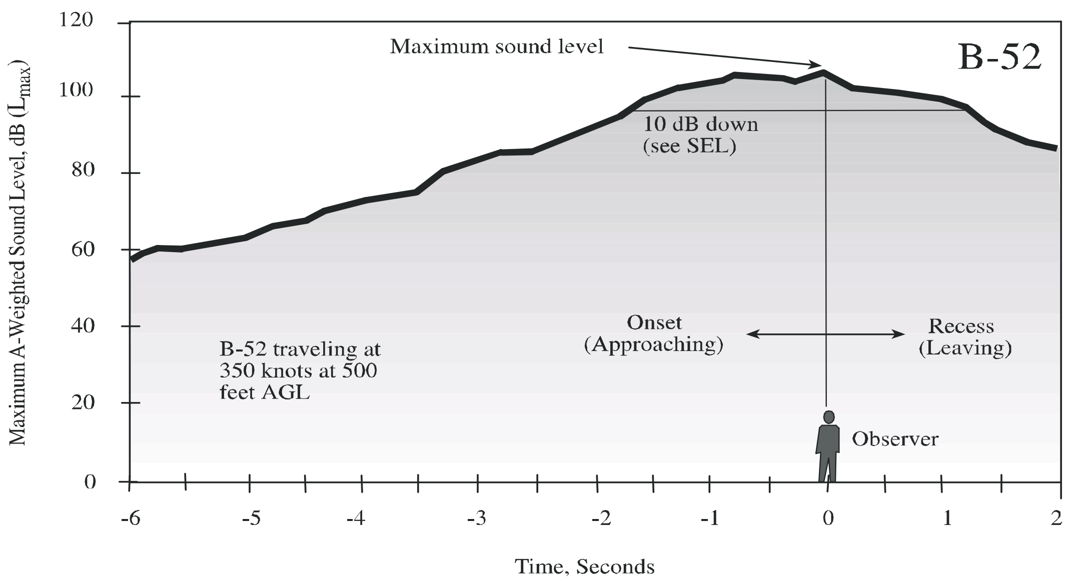
SEL values differ numerically from those expressed for the cumulative noise metric, DNL. The only reason this difference occurs is that the noise metric for SEL is expressed with respect to a one-second period and DNL uses a 24-hour period. Many different combinations of SEL values created by the noise of individual overflights can result in the same DNL value. For example, a single direct daytime overflight of a B-1 at 500 feet AGL would generate an SEL of 113 dB and a DNL of about 63 dB. An F-16 at the same altitude would generate an SEL value of 103 dB and a DNL of about 54 dB. Because of the logarithmic nature of decibel notation, the 11 dB difference in SEL value indicates that a DNL value of 63 dB could result from either a single B-1 overflight at 500 feet or eight F-16 overflights at 500 feet in a 24-hour period. The process of normalizing to a 24-hour period with DNL neither adds to nor diminishes the aircraft noise energy. It is accounted for by the DNL modeling method. Nothing is concealed or underestimated by the process of using the DNL scale.

The cumulative metric, DNL (also known as L_{dn} or by extension, L_{dnmr}), is a 24-hour average A-weighted sound level measure. DNL sums the individual noise events and averages the resulting level over a specified length of time. It is a composite metric accounting for the maximum noise levels, the duration of the events (sortie-operations), and the number of events. DNL is also adjusted to include penalties for nighttime operations--all operations occurring after 10:00 PM and before 7:00 AM are assessed a 10-dB penalty for the added intrusiveness and potential annoyance associated with nighttime flights. DNL is further adjusted up to 11 dB to account for the startle or "surprise" effect of the sudden onset of aircraft noise. This metric accounts for all of the factors shown to influence people's reaction to noise, such as how loud the sounds are, how long each sound lasts, how often they occur, and when in the day they occur. In total, DNL cumulatively incorporates all noise generated by all the different types of aircraft using the airspace, reflects both the number and duration of the flights, and recognizes the difference between noise occurring during the day and at night. An example of calculating a hypothetical DNL is presented in Figure 4.1-4.

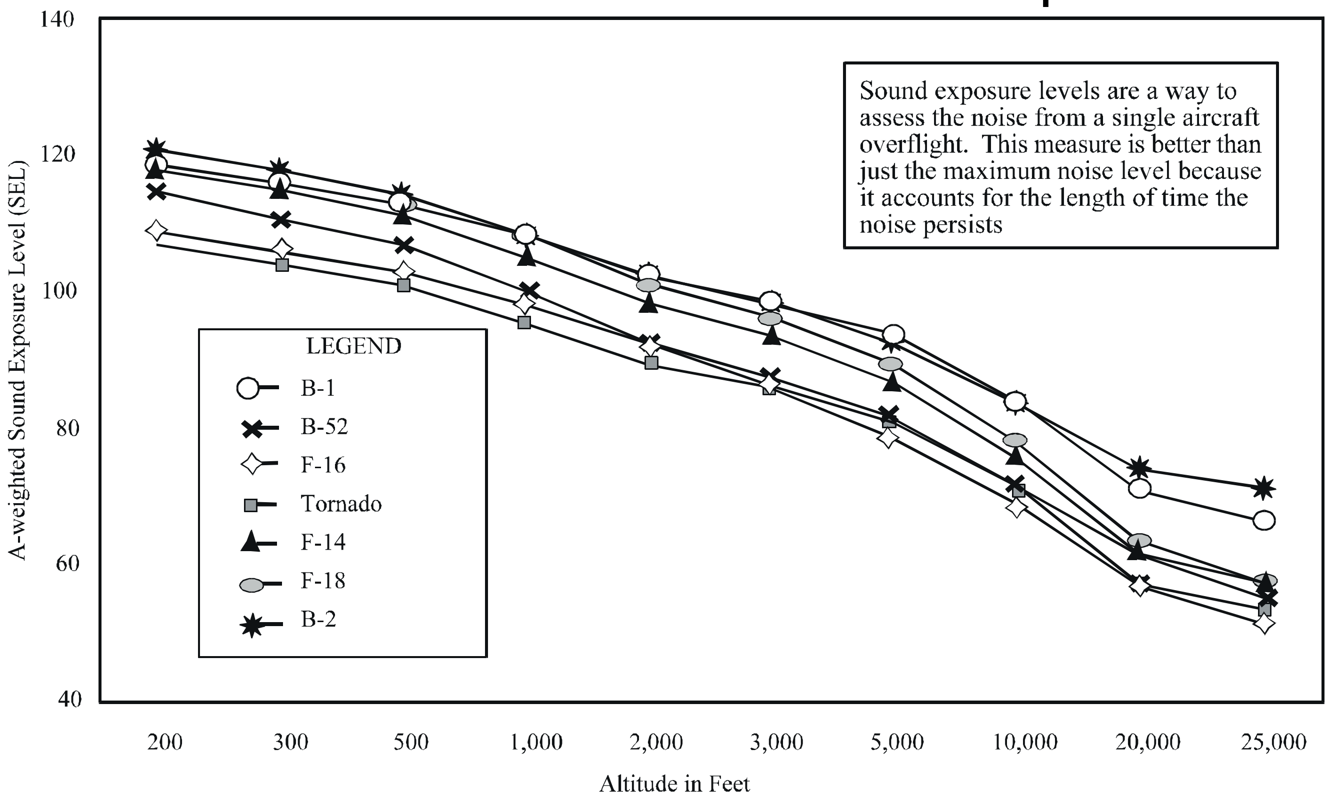
L_{dnmr} is the monthly average of the Onset-Rate Adjusted Day-Night Average Sound Level (DNL). Noise levels are calculated the same way for both DNL and L_{dnmr}. The annual sortie-operations for an MTR or MOA are divided by 12 to define the monthly average sortie-operations. For this EIS, all noise levels were calculated using L_{dnmr}. However, to enhance readability, these noise levels will be referred to as DNL throughout the document.



The onset phase occurs as the aircraft comes toward the observer and continues until the aircraft reaches the closest point to the observer. Sound levels increase rapidly during the onset phase, reaching a maximum at the instantaneous moment that the aircraft passes the observer. After that, the sound decreases to background levels as the aircraft moves away (recess phase). Actual perception of sound levels depends upon many factors, including wind speed and direction, intervening hills or mountains, air temperature, speed and altitude of flight, and the position of the observer relative to the aircraft's path.



Noise Levels from an Overflight Last Several Seconds **Figure 4.1-2**



Representative A-Weighted Sound Exposure Levels at Various Altitudes

Representative A-Weighted Sound Exposure Levels[1] at Various Altitudes[2]

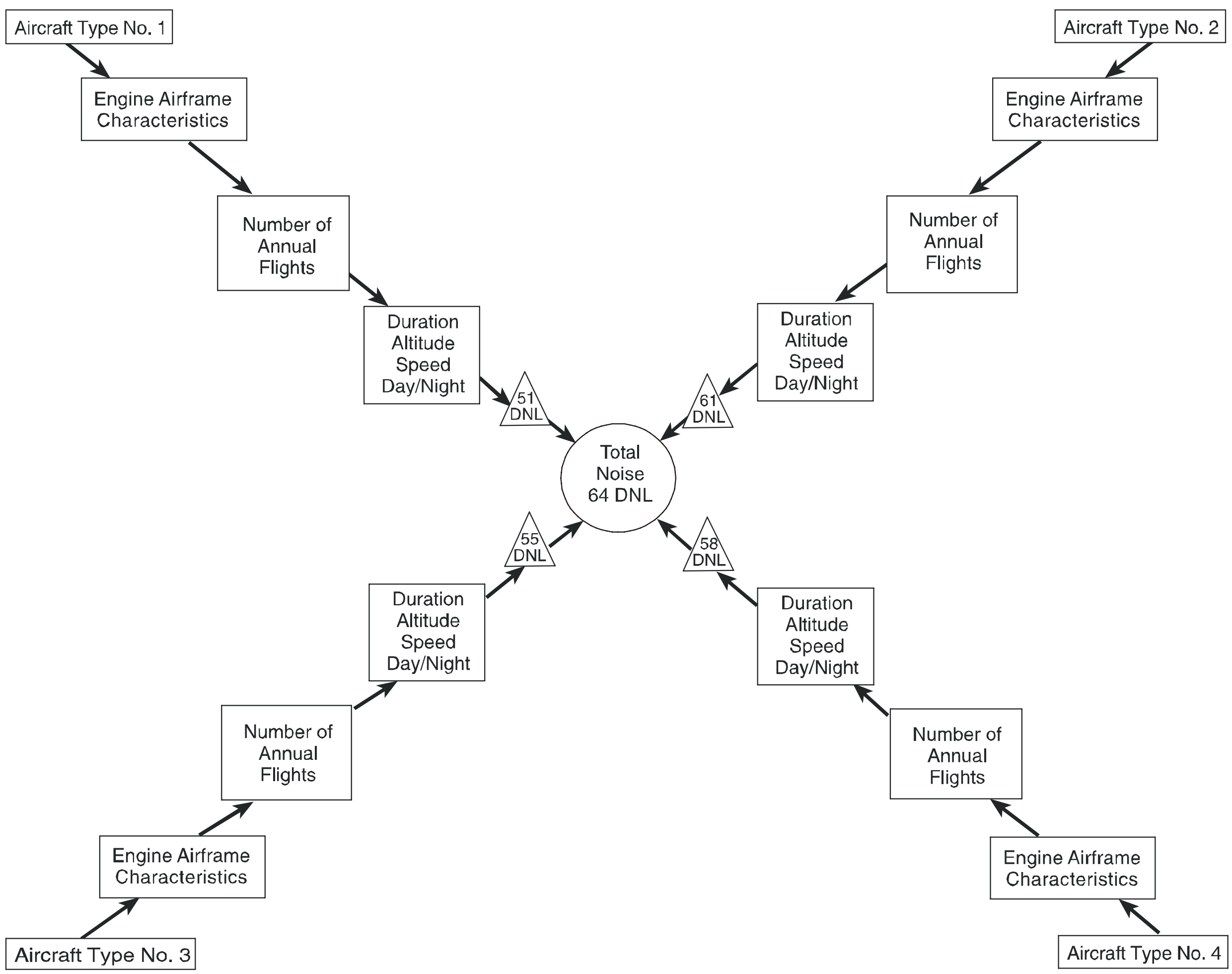
Aircraft Type	*Airspeed (nm/hour)*	*Altitude (Feet AGL)*								
		300	*500*	*1,000*	*2,000*	*3,000*	*5,000*	*10,000*	*20,000*	*25,000*
B-1	420	116	113	108	102	98	93	83	71	65
B-1	550	116	112	107	101	97	92	82	70	64
B-52	360	111	107	100	92	86	78	68	56	52
F-16	500	106	103	98	92	87	81	70	56	50
Tornado	420	104	101	95	89	85	80	71	60	56
F-14	550	115	111	105	98	93	86	75	60	54
F-18	500	118	114	108	101	96	89	77	62	56
B-2	220	118	114	108	102	98	92	83	73	70

[1] The values shown represent average sound levels. These levels may vary by 1/ 2 dB depending on the application of power and speed. SELs are based on steady, level flight and use Omega 108 data from actual overflight noise measurements.

[2] It should be noted that in accordance with U.S. Air Force regulations [AFI 11-206 (USAF 1994) and Federal Aviation Regulation Part 91-119 (FAA, 1992)], aircraft must avoid congested areas and settlements by 1,000 feet, within a horizontal radius of 2,000 feet of the aircraft, and isolated people, vessels, vehicles, or structures by 500 feet.

Sound Exposure Levels

Figure 4.1-3



DNL accounts for the cumulative noise exposure of all aircraft over a 24-hour period. Each aircraft's contribution to the noise exposure is included. DNL emphasizes louder noise events and adds penalties for certain types of operations. A 10 dB penalty is included in the nighttime events to account for the added intrusiveness and a penalty of up to 11 dB is added to account for the startle effect from the rapid onset of some military aircraft. All events are then summed according to logarithm rules. In the above example, the DNL is 64, as opposed to the arithmetic average of 56. For additional information, see Appendix G

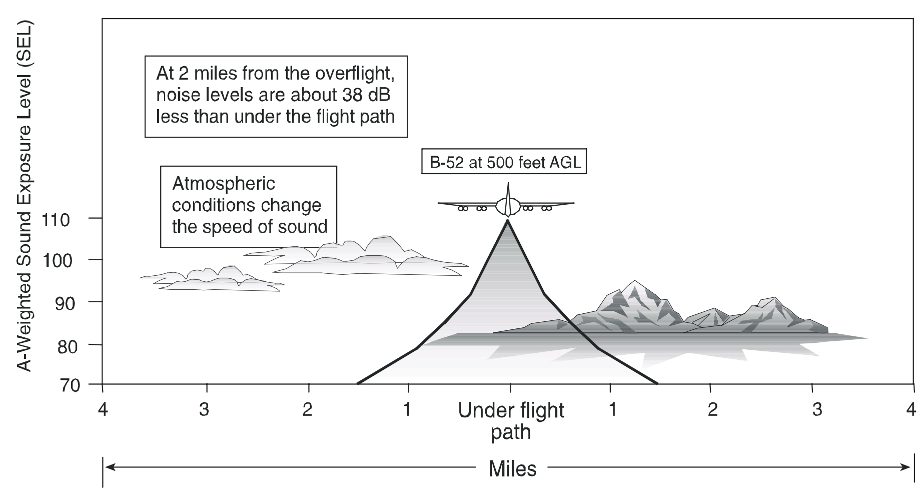
How Cumulative Noise is Modeled **Figure 4.1-4**

DNL has emerged as the most widely accepted metric for aircraft noise (USEPA 1972, FICON 1992). It correlates well with community response and is consistent with controlled laboratory studies of people's perception of noise. It was the primary metric used in the U.S. Environmental Protection Agency's (USEPA) "levels document" (USEPA 1972) and was further endorsed by the Federal Interagency Committee on Noise (FICON) (FICON 1992). DNL has been proven applicable to infrequent events (Fields and Powell 1985) and to rural populations exposed to sporadic military aircraft noise (Stusnick *et al.* 1992, 1993).

Predicting noise levels (in DNL) for this EIS involved the use of the Air Force's MR_NMAP (Lucas and Calamia 1996) noise model for activities in MTRs and MOAs. MR_NMAP calculates the noise levels based on aircraft operations data obtained from aircrews and airspace managers, as well as on patterns measured from radar data for the full inventory of aircraft flown by the U.S. military. These data include airspeed, duration of flight, altitudes of flight, distribution of aircraft in the airspace, and frequency of flight activities. Verification of these data comes from training requirements and from thousands of hours of radar data tracking aircraft operations at Nellis Air Force Range, China Lake Naval Air Warfare Center, and White Sands Missile Range.

MR_NMAP is the computer program used to model baseline and projected noise in affected MTRs and MOAs.

Noise generated by a particular aircraft type used in these models represents actual noise measurements regularly updated by the DoD for all aircraft. These measurements are made by flying aircraft under controlled conditions over a microphone array. The measurements are then incorporated into the noise model as the noise file database. Using this data set, the formulae driving the noise models account for spherical spreading, atmospheric absorption, and lateral attenuation. Spherical spreading is, in essence, the reduction in noise due to the spreading of sound energy away from its source. Sound energy decreases by approximately 6 dB every time the distance between the source and receiver is doubled (Figure 4.1-5). Daily and hourly variations in atmospheric conditions (e.g., humidity, clouds) can alter the amount of sound energy at a given location. The noise models use annual average temperature and humidity conditions to account for the influence of atmospheric conditions. Lateral attenuation, or the loss of sound energy due to reflection of sound by the ground, depends upon the altitude of the aircraft and the distance to the receiver.



Noise Levels Diminish With Distance **Figure 4.1-5**

Studies by Lucas (1995) and Page *et al.* (1994) have validated the reliability of aircraft noise models down to 55 DNL. Predicted noise from models varies +/- 2 dB relative to noise levels measured under controlled conditions. Below 55 DNL, greater variation may occur. When there is a large number of aircraft, the time average sound levels below 55 DNL will occur at relatively long distances from the aircraft, thus allowing atmospheric effects a greater opportunity to cause noise level variability at a receiver's position. When there are a few sortie-operations, the time average sound levels are generated by only a few individual aircraft noise events that may not be a statistically representative sample of a given model of aircraft.

Assessing Aircraft Noise Effects. Aircraft noise effects can be described according to two categories: annoyance and human health considerations. Annoyance, which is based on a perception, represents the primary effect associated with aircraft noise. Far less potential exists for effects on human health.

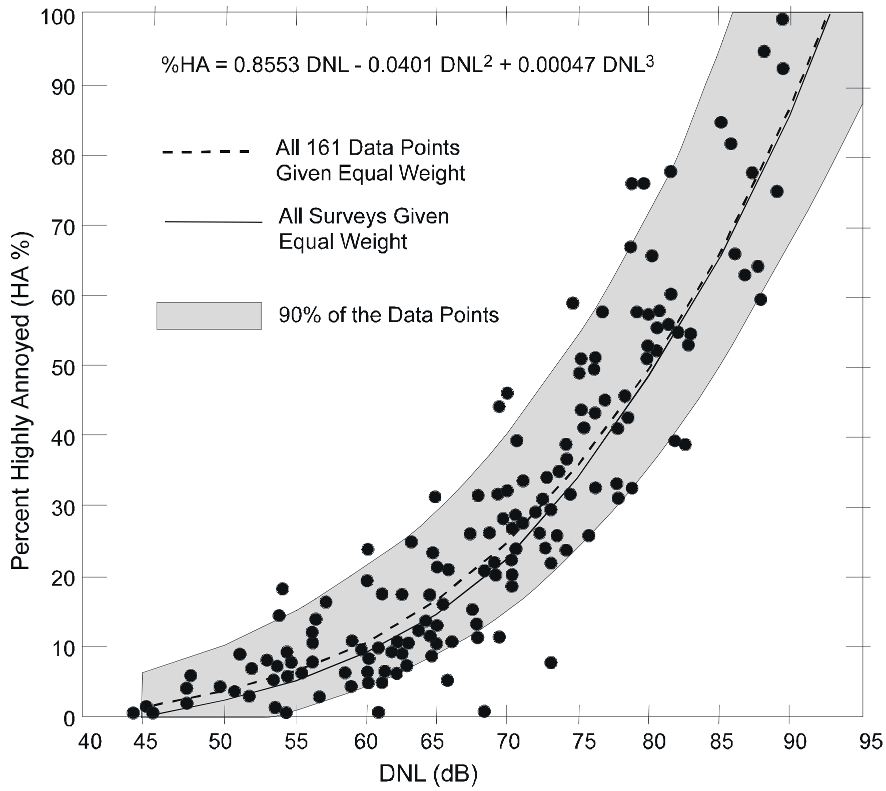
Studies of community annoyance to numerous types of environmental noise show that DNL correlates well with effects. Schultz (1978) showed a consistent relationship between noise levels and annoyance (Figure 4.1-6a). A more recent study reaffirmed this relationship (Fidell *et al.* 1991). Figure 4.1-6b shows an updated form of the curve fit (Finegold *et al.* 1994) in comparison with the original Schultz curve. The updated fit, which does not differ substantially from the original, is the current preferred form (see Appendix G, Noise).

In general, there is a high correlation between the percentages of groups of people highly annoyed and the level of average noise exposure measured in DNL. The correlation is lower for the annoyance of individuals. This is not surprising considering the varying personal factors that influence the manner in which individuals react to noise. The inherent variability between individuals makes it impossible to predict accurately how any individual will react to a given noise event. Nevertheless, findings substantiate that community annoyance to aircraft noise is represented quite reliably using DNL.

In addition to annoyance, the effect of noise on human health was raised during the public involvement process for this EIS. Other factors that can be used to evaluate a noise environment are noise-induced hearing loss, speech interference, and sleep disturbance. Effects on the speech and sleep also contribute to annoyance.

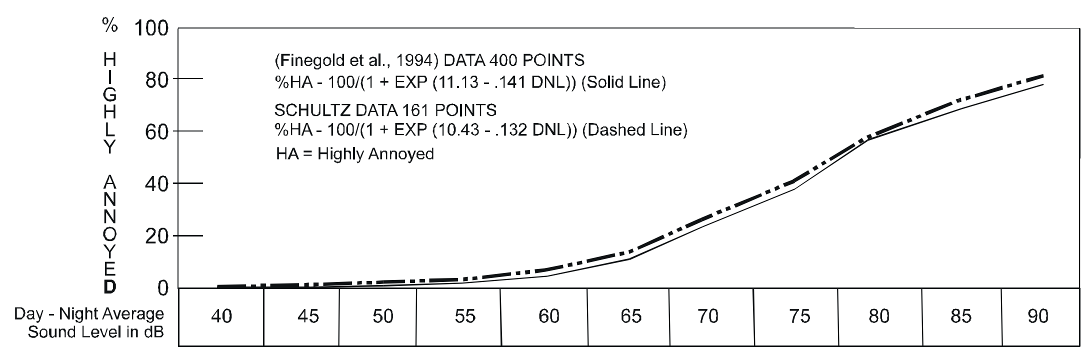
A considerable amount of data on hearing loss has been collected and analyzed. It has been well established that continuous exposure to high noise levels (like in a factory) will damage human hearing (USEPA 1978). Hearing loss is generally interpreted as the shifting to a higher sound level of the ear's sensitivity to perceive or hear sound (sound must be louder to be heard). This change can be either temporary or permanent. Federal workplace standards for protection from hearing loss allow an A-weighted time-average level of 90 dB over an 8-hour work period, or 85 dB averaged over a 16-hour period. As shown later in this section, noise levels associated with RBTI would be more than 20 dB below these standards.

Studies on community hearing loss from exposure to aircraft flyovers near airports showed that there is no danger, under normal circumstances, of hearing loss due to aircraft noise (Newman and Bettie 1985). Airport traffic is much more continuous, frequent, and commonly lower in altitude than flights in MTRs or MOAs. In MTRs and MOAs, military aircraft fly at varied altitudes, rarely fly over the same point on the ground repeatedly during a short period, and occur sporadically over a day. These factors make it unlikely that an increase in hearing loss would occur (Thompson 1997). The conclusion of no risk to hearing loss as a result of low-altitude flight noise is also supported by a recent laboratory study that measured



Source: Schultz, 1978

Community Surveys of Noise Annoyance **Figure 4.1-6a**



Calculated % HA Points											
FINEGOLD	0.41	0.831	1.66	3.31	6.48	12.29	22.1	36.47	53.74	70.16	82.64
SCHULTZ	0.576	1.11	2.12	4.03	7.52	13.59	23.32	37.05	53.25	68.78	81

Comparison of original (Schultz, 1978) and current (Finegold et al., 1994) curve fits.

Relationship Between Annoyance and Day-Night Average Sound Level **Figure 4.1-6b**

changes in human hearing from noise representative of low-flying aircraft on MTRs (Nixon *et al.* 1993). In this study, participants were first subjected to four overflight noise exposures at A-weighted levels of 115 dB to 130 dB. One-half of the subjects showed no change in hearing levels, one-fourth had a temporary 5-dB increase in sensitivity (the people could hear a 5-dB wider range of sound than before exposure) and a temporary 5-dB decrease in sensitivity (the people could hear a 5-dB narrower range of sound than before exposure) applied to one-fourth. In the next phase, participants were subjected to a single overflight at a maximum level of 130 dB for eight successive exposures separated by 90 seconds or until a temporary shift in hearing was observed. The temporary hearing threshold shifts resulted in the participants hearing a wider range of sound, but within 10 dB of their original range. For RBTI, no overflights would generate noise levels of 130 dB.

Another nonauditory effect of noise is disruption of conversations. Speech interference associated with aircraft noise is a primary cause of annoyance to individuals on the ground. Aircraft noise can also disrupt routine activities, such as radio listening or television watching and telephone use. Due to the sporadic nature of flights along MTRs and MOAs, the disruption generally lasts only a few seconds, and almost always less than 10 seconds. It is difficult to predict speech intelligibility during an individual event, such as a flyover, because people automatically raise their voices as background noise increases. A study (Pearsons *et al.* 1977) suggests that people can communicate acceptably in background A-weighted noise levels of 80 dB. The study further indicates that people begin to raise their voices when noise levels exceed 45 dB and some speech interference occurs when background noise levels exceed 65 dB. Typical home insulation reduces the noise levels experienced by 20 dB or more and decreases speech interference. However, it is recognized that some aircraft flyovers can interrupt speech communication momentarily.

Noise-related awakenings form another issue associated with aircraft noise. Sleep is not a continuous, uniform condition but a complex series of states through which the brain progresses in a cyclical pattern. Arousal from sleep is a function of a number of factors including age, gender, sleep stage, noise level, frequency of noise occurrences, noise quality, and presleep activity. Quality sleep is recognized as a factor in good health. Although considerable progress has been made in understanding and quantifying noise-induced annoyance in communities, quantitative understanding of noise-induced sleep disturbance is less advanced. A recent study of the effects of nighttime noise exposure on the in-home sleep of residents near one military airbase, near one civil airport, and in several households with negligible nighttime aircraft noise exposure, revealed SEL as the best noise metric predicting noise-related awakenings. It also determined that out of 930 subject nights, the average spontaneous (not noise-related) awakenings per night was 2.07 compared to the average number of noise-related awakenings per night of 0.24 (Fidell *et al.* 1994). Additionally, a 1995 analysis of sleep disturbance studies conducted both in the laboratory environment and in the field (in the sleeping quarters of homes) showed that when measuring awakening to noise, a 10 dB increase in SEL was associated with only an 8 percent increase in the probability of awakening in the laboratory studies, but only a 1 percent increase in the field (Pearsons *et al.* 1995). Pearsons *et al.* (1995) reports that even SEL values as high as 85 dB produced no awakenings or arousals in at least one study. This observation suggests a strong influence of habituation on susceptibility to noise-induced sleep disturbance. A 1984 study (Kryter 1984) indicates that an indoor SEL of 65 dB or lower should awaken less than 5 percent of exposed individuals.

To date, no exact quantitative dose-response relationship exists for noise-related sleep interference; yet, based on studies conducted to date and the USEPA guideline of a 45 DNL to protect sleep interference, useful ways to assess sleep interference have emerged. If homes are conservatively estimated to have a 20-dB noise insulation, an average of 65 DNL would produce an indoor level of 45 DNL and would form a reasonable guideline for evaluating sleep interference. This also corresponds well to the general guideline for assessing speech interference. Annoyance that may result from sleep disturbance is accounted for in the calculation of DNL, which includes a 10-dB penalty for each sortie occurring after 10:00 PM or before 7:00 AM. No RBTI alternative generates a noise level of 65 DNL, so all noise levels would fall below the USEPA guideline of 45 DNL. This factor, along with low amounts of night operations and the use of a varied altitude, would reasonably be assumed to limit the number of noise-related awakenings.

The potential for noise to affect physiological health, such as the cardiovascular system, has been speculated; however, no unequivocal evidence exists to support such claims (Harris 1997). Conclusions drawn from a review of health effect studies involving military low-altitude flight noise with its unusually high maximum levels and rapid rise in sound level have shown no increase in cardiovascular disease (Schwartze and Thompson 1993). Additionally, claims about flyover noise producing increased mortality rates and increases in cardiovascular death, adverse effects on the learning ability of middle- and low-aptitude students, aggravation of post-traumatic stress syndrome, increased stress, increase in admissions to mental hospitals, and adverse affects on pregnant women and the unborn fetus are similarly unsupported (Harris 1997).

Aircraft Emissions and Air Quality

Because military aircraft are mobile and cover very long distances over many different areas, they commonly contribute little to the total emissions in a region. This is especially true since they fly at altitudes where emissions would tend to be dispersed and not result in effects on human health or visibility. Despite these factors, federal actions such as RBTI must be assessed for their potential effects on air quality.

Under the Clean Air Act (CAA), the USEPA has established nationwide air quality standards, known as the National Ambient Air Quality Standards (NAAQS). Table 4.1-2 outlines the standards for "criteria" pollutants, as defined by the USEPA. These standards represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect human health and welfare. These standards are presented in terms of concentration (e.g., parts per million) averaged over periods of time ranging from 1 hour to annually according to the degree of potential health effects. States, as well as local agencies, may set their own standards as long as they are at least as stringent as the NAAQS. While Texas adopted the NAAQS as its standard, New Mexico established its own standard in 1995. Pollutants considered in this EIS analysis include volatile organic compounds, which are indicators of ozone; nitrogen oxides, which are precursors to ozone and include nitrogen dioxide and other compounds; carbon monoxide; and particulate matter. Airborne emissions of lead and sulfides of hydrogen are not addressed because the affected areas contain no significant sources of emissions of these criteria pollutants, and RBTI activities would not materially contribute to increased levels in the region.

Military aircraft exhaust consists of the criteria pollutants listed in the NAAQS and water vapor. The water vapor mixes with other water vapor in the atmosphere. With the exception of some heavier particulate matter, none of these criteria pollutants enter soils or water. The particulate matter would not be hazardous or toxic.

Table 4.1-2
National and State Ambient Air Quality Standards

Air Pollutant	*Averaging time*	*Federal NAAQS and Texas AAQS*		*New Mexico AAQS*	
		Primary	*Secondary*	*Primary*	*Secondary*
Carbon Monoxide (CO)	8-hour 1-hour	9 ppm 35 ppm	-- --	8.7 ppm 13.1 ppm	-- --
Nitrogen Dioxide (NO_2)	AAM 24-hour	0.053 ppm --	0.052 ppm --	0.05 ppm 0.10 ppm	0.053 ppm --
Sulfur Dioxide (SO_2)	AAM 24-hour 3-hour	0.03 ppm 0.14 ppm --	-- -- 0.5 ppm	0.02 ppm 0.10 ppm --	-- -- 0.5 ppm
Particulate Matter (PM_{10})	AAM 24-hour	50 $\mu g/m^3$ 150 $\mu g/m^3$	50 $\mu g/m^3$ 150 $\mu g/m^3$	-- --	50 $\mu g/m^3$ 150 $\mu g/m^3$
Total Suspended Particulates (TSP)	AGM 30-day 7-day 24-hour	-- -- -- --	-- -- -- --	60 µg/m3 90 µg/m3 110 µg/m3 150 µg/m3	-- -- -- --
Ozone (O_3)	1-hour	0.12 ppm	0.12 ppm	0.12 ppm	0.12 ppm
Lead (Pb)	Calendar Quarter	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$

Notes: AAM = Annual Arithmetic Mean; AGM = Annual Geometric Mean; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.

All areas affected by RBTI are in attainment with federal air quality standards.

Individual states are required to establish a State Implementation Plan designed to eliminate or reduce emissions exceeding the NAAQS and to ensure state air quality conditions consistently comply with the NAAQS. The CAA prohibits federal agencies from supporting any activities that do not conform to a State Implementation Plan approved by the USEPA. Regulations under the CAA, known as the General Conformity Rule, state that activities must not: (a) cause or contribute to any new violation of any standard; (b) increase the frequency or severity of an existing violation; or (c) delay timely attainment of any standards, interim emission reductions, or milestones as stated in the State Implementation Plan. This General Conformity Rule applies only to those areas in nonattainment with NAAQS. All of the affected areas under RBTI are in attainment with the NAAQS and state standards.

The CAA also establishes a national goal of preventing degradation or impairment in federally designated Class I attainment areas. As part of the Prevention of Significant Deterioration (PSD) program, mandatory Class I status was assigned by Congress to all international parks, national wilderness areas (not wilderness study areas or wild and scenic rivers), memorial (e.g., battlefield) parks larger than 5,000 acres, and national parks larger than 6,000 acres. In Class I areas, visibility impairment is defined as a reduction in regional visual range and atmospheric discoloration (such as from an industrial smokestack). This program also sets standards for a project's effect on PSD Class I areas (Table 4.1-3). Stationary sources, such as industrial areas, are typically the issue with impairment of visibility in PSD I areas. Mobile sources, including aircraft, are generally exempt from review under this regulation.

Determining the effects of existing and proposed aircraft operations on air quality and visibility involved two basic steps. First, aircraft emissions were calculated for the affected MTRs and MOAs in each alternative (in tons per year) to determine increases or decreases relative to the baseline conditions and to qualitatively assess the potential for exceedences of the NAAQS. Sortie-operations by all aircraft using or proposing to use the affected airspace were included. Second, more detailed analyses then assessed the potential change in ambient pollutant concentrations resulting from the alternatives. These analyses employed the Multiple-Aircraft Instantaneous Line Source (MAILS) dispersion model (Leibsch 1992). For each alternative, the analysis looked at the airspace unit where the highest concentrations of emissions would be expected to occur. In each alternative, the airspace used in the MAILS model consisted of segments of the proposed MTR (see Appendix F). By evaluating these conditions, projections of the emissions were made relative to the NAAQS and PSD Class I standards. If these conditions did not cause emissions to exceed the standards, then the less intensive remainder of flight operations elsewhere would not either.

Table 4.1-3
Maximum Allowable Incremental Increases Under PSD Regulations

Pollutant	*Averaging time*	*PSD Increments (µg/m³)*
		Class I
Nitrogen Dioxide (NO_2)	Annual	2.5
Particulate Matter (PM_{10})	Annual 24-hour	4 8
Sulfur Dioxide (SO_2)	Annual 24-hour 3-hour	2 5 25

Note: All particulates reported as PM_{10}

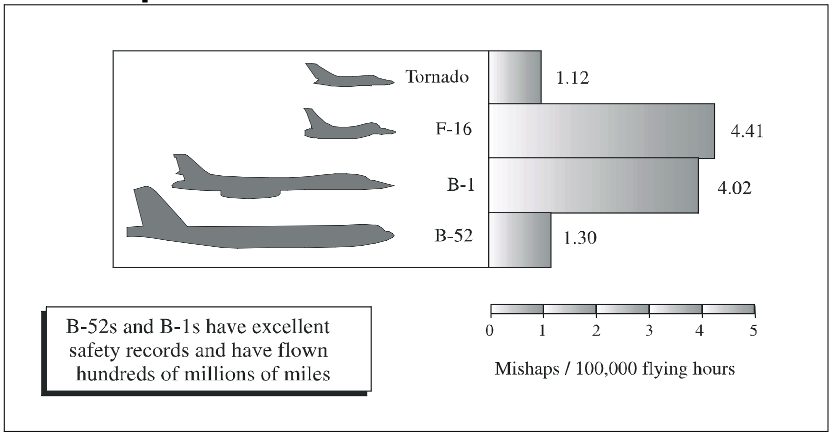
AIRCRAFT SAFETY

Flight safety is of paramount concern to the Air Force. Safe flying procedures, adherence to flight rules, and knowledge of emergency procedures form consistent and repeated aspects of training for all aircrews, including those at Barksdale and Dyess AFBs. Since the inception of the Air Force in 1947, aircraft accidents have steadily declined each year.

Starting in the early 1980s, the Air Force has averaged fewer than two major accidents (Class A mishaps) per 100,000 flying hours for all aircraft worldwide. The Air Force defines a Class A mishap as an accident that results in a loss of life, permanent total disability, total cost of more than $1 million, or destruction of the aircraft beyond repair. Class A mishaps include those accidents where aircraft crash, as well as on-the-ground incidents.

In 44 years of service, B-52s have flown 2.7 billion miles with 97 Class A mishaps. In 15 years, B-1s have flown 160 million miles with 11 Class A mishaps.

Class A mishap rates are calculated by aircraft type. For the major aircraft types using the primary and secondary airspace (B-1, B-52, F-16, and Tornado), Class A mishap rates are quite low (Figure 4.1-7). Based on the flying hours for the different major aircraft types under each alternative, these mishap rates are used to compute a projection of the estimated years between Class A mishaps in each affected MTR and MOA. These data are only statistically predictive and actual mishaps result from many factors, not merely the amount of flight time by an aircraft.



Class A Aircraft Mishap Rates **Figure 4.1-7**

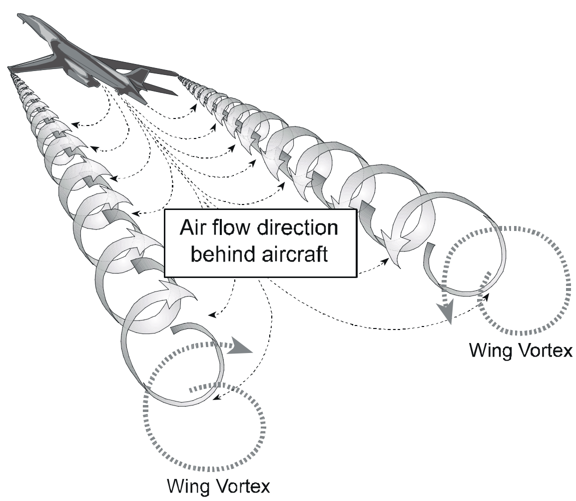
In addition to the direct effects from aircraft crashes (i.e., damage to aircraft and points of impact), there may also be secondary effects, such as fire and environmental contamination. The extent of these secondary effects is situationally dependent and difficult to quantify. For example, there would be a higher risk of fire for aircraft crashes in highly vegetated areas during a hot, dry summer than would be the case if the mishap occurred in a rocky, barren area during the winter.

Flight safety considerations also include bird-aircraft strikes. Bird-aircraft strikes can represent a hazard to aircraft and, in extreme cases, can result in accidents. Over 95 percent of bird-aircraft strikes occur below 3,000 feet AGL, although in extremely rare circumstances aircraft may encounter birds at 30,000 feet MSL or higher. Approximately 50 percent of bird strikes happen at airfields, with 25 percent occurring during low-altitude flight. Migration corridors and other areas where birds congregate (e.g., water bodies) represent the locations with the greatest hazard when birds are present.

Because of these potential effects, the Air Force devotes considerable attention to avoiding the possibility of bird-aircraft strikes. It has conducted a worldwide program for decades to study bird migrations, bird flight patterns, and past strikes to develop predictions of where and when bird-aircraft strikes might occur. This program, which consistently updates the data, also defines avoidance procedures through a Bird Avoidance Model. Each time an aircrew plans a training sortie, they use the Bird Avoidance Model to define altitudes and locations to avoid. Use of this model has minimized bird-aircraft strikes. Each base or flying unit also develops and maintains a bird-aircraft strike avoidance plan that dictates the location and timing of avoidance measures within the airspace used by the base or unit.

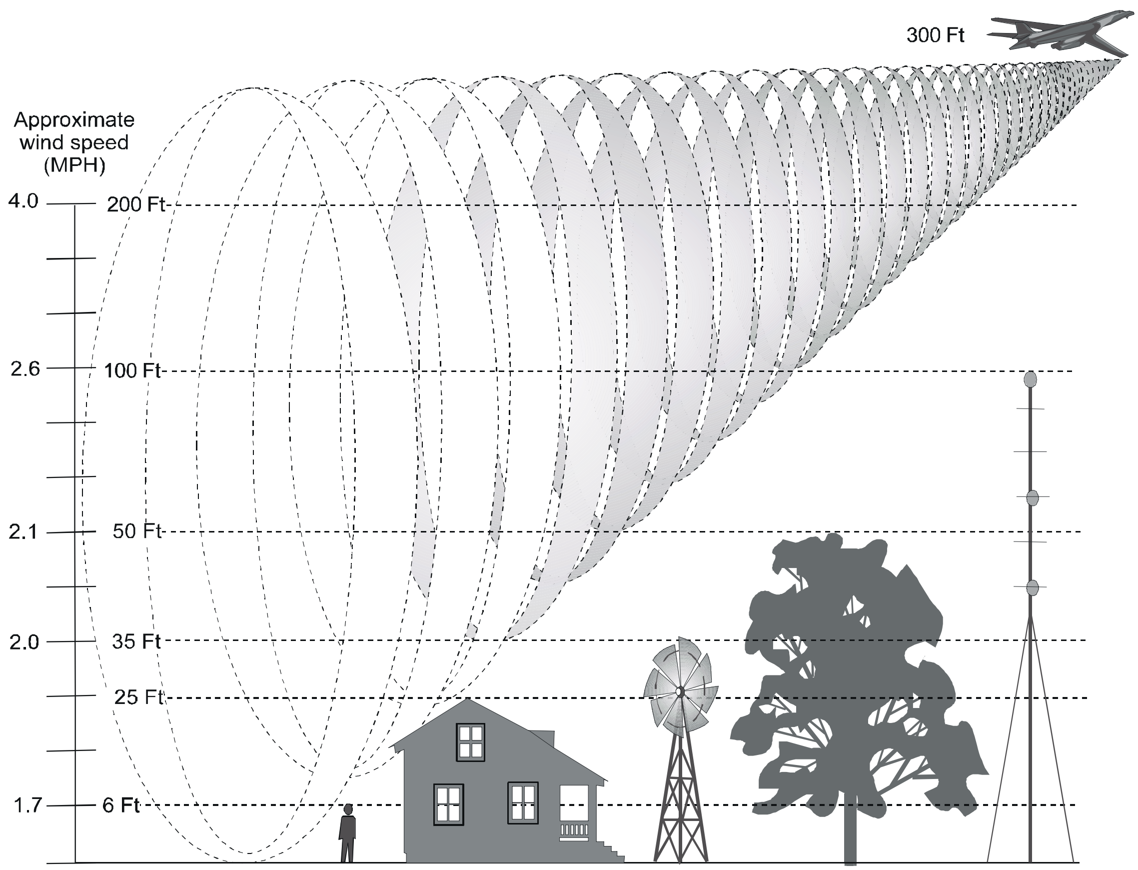
Historical bird strikes reported within an MTR or MOA also provide an indicator as to the potential for flying bird-aircraft strikes. The Air Force maintains an extensive database on all bird-aircraft strikes, where they occurred, and the aircraft involved.

Aircraft vortices represent a safety issue raised during scoping. As aircraft move through the air, they create vortices from their wing tips. These vortices, collectively called wake turbulence (Figure 4.1-8), trail immediately behind the aircraft for thousands of feet while diminishing in strength farther from the aircraft. The strength of wing tip vortices depends upon the amount of lifting force an aircraft is required to generate in order to fly. The heavier the aircraft, the more lifting force required, and, therefore the stronger the vortices. At cruising altitudes, wake turbulence directly behind the aircraft can cause handling difficulties for following aircraft, especially when a small aircraft trails a larger aircraft. FAA regulations dictate safe following distances and procedures to avoid wake turbulence, both in flight and during landing or takeoff.



Anatomy of a Vortex **Figure 4.1-8**

Aircraft flying closer to the ground also create wake turbulence, which trails behind the aircraft generally moving downward and lessening in intensity (Figure 4.1-9). By the time it reaches the ground, or the tops of structures, the turbulence causes no more than a light breeze. The actual windspeed of the wake turbulence for a B-52 flying at 300 feet AGL would be less than 4 miles per hour. B-1s, which are lighter, produce similar low windspeeds at ground level. Wake turbulence from aircraft at higher altitudes would be even less at ground level. Average daily wind speeds in the areas of Texas and New Mexico that could be affected by B-52 and B-1 overflights exceed that generated by wake turbulence. For these reasons, wake turbulence would not be expected to affect the safety of people, vehicles, or structures.



Beaufort (wind force) Scale		
Wind Force	**Wind Speed**	**Effects**
Calm	0 MPH	Smoke rises, leaves still
Light Air	1-3 MPH	Leaves move, smoke drifts
Light breeze	4-7 MPH	Leaves rustle, wind felt on face

Effect of Vortex Winds Upon Various Objects **Figure 4.1-9**

4.1.2 Alternative A: No-Action

AFFECTED ENVIRONMENT

Airspace Management. Under Alternative A: No-Action, aircrews from Barksdale and Dyess AFBs would continue to use the same MTRs and MOAs they use today at baseline levels. These include primary airspace such as IR-178 and secondary airspace. Section 2.2 details the affected airspace and the sortie-operations in that airspace. It also outlines the nature, altitudes, and pattern of operations in the airspace affected under the No-Action Alternative.

Military and civil airspace use currently occurs throughout west Texas and New Mexico. Such use has occurred for many decades.

For airspace management purposes and to inform all pilots (civil, military, and commercial), the FAA charts all MTRs and publishes the altitudes, widths, and hours of availability for each MTR. The military units manage and schedule the use of the MTRs. Use of each MTR is scheduled daily by the base responsible for its management so that conflicts among the users do not occur. Flying units from the managing base, as well as any other units wishing to fly the MTR, must schedule appropriate blocks of time for use. In this way, the one to two aircraft scheduling a specific time block are assured that no other aircraft will be in the same segment of the MTR at the same time. Coordination of scheduling among managing bases for MTRs that overlap or intersect other MTRs follows similar procedures. Through this coordination, the Air Force avoids the possibility of aircraft flying on two separate MTRs in the same place (i.e., intersection), at the same time.

Numerous federal airways, jet routes, and civil aviation airports occur within the study area, including the affected area for Alternative A. Ranchers, crop dusters, and other local VFR pilots may operate at lower altitudes equivalent to those of MTRs. FAA charts, publications, and procedures provide the means for VFR pilots to plan for and safely transit an MTR. The rarity of sortie-operations (average of fewer than 1 to 6 daily) in the primary and secondary MTRs suggests that the potential for conflicts between local VFR traffic and MTR sortie-operations is negligible.

Neither the FAA nor the states maintain records of the amount of VFR flight activity by civil aviation in the affected areas. It is known, however, that ranchers, cloud seeding pilots, and other local VFR pilots frequently fly in these areas. Air traffic control procedures, charting of MTRs and MOAs for pilot awareness, pilot compliance with FAA flight procedures, and required see-and-avoid techniques collectively make MTR and MOA use compatible with civil aviation activities.

Airfields ranging from responsible municipal airports to small airstrips on ranches are located within the affected area for Alternative A. By design, MTRs and MOAs have little effect on such airports and airfields since they avoid busier airports altogether or employ specific avoidance procedures for smaller airfields. For the affected area in western Texas and northeastern New Mexico, approximately 30 small airports and airstrips lie under or near primary MTR and MOA airspace. Traffic at these airfields ranges from under 10 to almost 8,000 operations per year. For the affected area associated with the Harrison and La Junta Electronic Scoring Sites, available data show three small airfields.

Aircraft Noise. Sortie-operations in the primary and secondary MTRs and MOAs generate noise. Baseline noise levels for all primary and secondary MTRs and MOAs in the study area range from less than 45 to 59 DNL (Table 4.1-4). These noise levels not only reflect the noise generated by the aircraft using the airspace, but also account for the additive noise from operations in overlapping or intersecting MTRs and MOAs (refer to Figure 2.3-1). In this way, these data present combined noise levels.

Currently, Barksdale and Dyess AFBs use six primary MTRs, with IR-178 receiving the most use.

Baseline noise levels on existing IR-178 range from less than 45 to 61 DNL.

Table 4.1-4
Average Daily Sortie-Operations and Noise Levels
Alternative A: No-Action

Airspace Units	*Class*	*Total Sortie-Operations*	*Average Daily Sortie-Operations*	*Baseline Noise Level (DNL)*
MTRs				
VR-100/125	S	1,265	5	49
VR-108	S	143	1	<45
VR-114	S	1,014	4	<45
VR-143	S	620	2	49
VR-186	S	1,175	5	50
VR-196/197	S	512	2	<45
VR-1107/1195	S	1,050	4	<45
VR-1116	S	30	<1	<45
VR-1175/1176	S	50	<1	46
IR-107	S	104	<1	<45
IR-109	S	310	1	<45
IR-110	S	0	0	NA
IR-111	S	130	1	<45
IR-113	S	300	1	<45
IR-123	S	50	<1	<45
IR-124	S	140	1	<45
IR-128/180	**P**	**200**	**1**	**46**
IR-150	**P**	**280**	**1**	**55**
IR-154	S	70	<1	<45
IR-169	S	465	2	<45
IR-174	**P**	**186**	**1**	**51**
IR-177/501	**P**	**425**	**2**	**56**
IR-178	**P**	**1,560**	**6**	**61**[1]
IR-192/194	S	658	3	49
IR-592	**P**	**510**	**2**	**50**
MOAs				
Reese 4	**P**	**3**	<1	**<45**
Reese 5	**P**	**3**	<1	**<45**
Roby	**P**	**100**	<1	**<45**
Texon	S	100	<1	<45
Mt. Dora	**P**	**379**	**1**	**<45**

Class P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.

Class S = Secondary airspace unit intersects with primary airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.

[1] Noise level represents the highest DNL for any segment of the route; all other segments are lower.

As the primary MTR used by the Barksdale and Dyess AFBs in the affected area, IR-178 was analyzed by segment (Table 4.1-5 and Figure 4.1-10). Due to variations in the number of sortie-operations, floor altitude, and mix of aircraft for different segments, noise levels on IR-178 range from less than 45 to 61 DNL, with 41 of 71 segments subject to combined noise levels less than 55 DNL. Combined baseline noise levels reflect a range for the segments (i.e., 47 to 49 DNL in Table 4.1-5) based on the two altitude regimes potentially used by B-52s. Lower noise levels in a

Table 4.1-5
Existing Noise Levels on IR-178
Alternative A: No-Action

IR-178 Segment	*Baseline Noise Level Range (DNL)*	*IR-178 Segment*	*Baseline Noise Level Range (DNL)*
AB	56	AKAL	49-50
BC	58	ALAM	49-50
CD	58-59	AMAN	48-50
DE	58-59	ANAO	48-50
EF	58-59	AOAP	48-51
FG	58-59	APAQ	48-51
GH	58-59	AQAR	49-50
HI	58	ARAS	50
IJ	57	ASAT	47-49
JK	57	AI1XX	46
KL	57	AE1BA	51
LM	55-56	BABB	51
MN	56	BBBC	51
NO	57	BCBD	51
OP	54-55	BDBE	51
PQ	55	BEBF	51
QR	56-57	BFBG	50
RS	56-57	BGBH	61
ST	58	BHBI	61
TU	57	BIBJ	59
UV	54	BJBK	59
VW	54	BKBG1	46
WX	57	AIXW	46
XY	58	XWXX	<45
YZ	58	OCA	49
ZAA	58	CACB	51
AAAB	52	CBCC	50
ABAC	57	CCCD	48
ACAD	57	CDCE	54
ADAE	57	CECF	51
AEAF	47-50	CFCG	51
AFAG	49-50	CGCH	53
AGAH	49-50	CHCI	50
AHAI	49-50	CICJ	<45
AIAJ	49-50	CJCK	<45
AJAK	49-50		

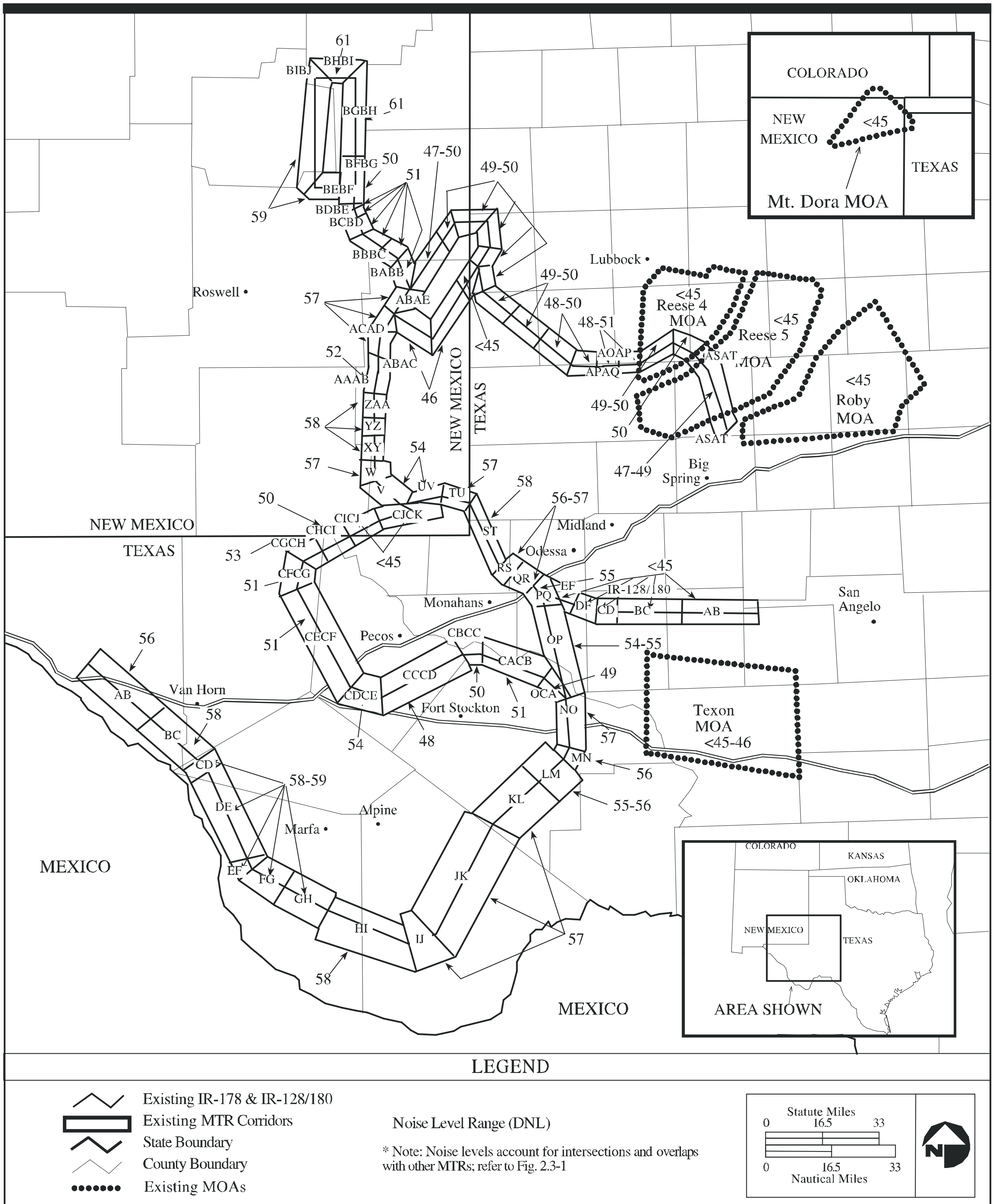
Refer to Figure 2.3-1 for segment locations.

Noise levels reflect the noise generated on IR-178 combined with the noise produced by sortie-operations on MTRs that overlap and intersect with IR-178. These noise levels account for sortie-operations by all aircraft.

Aircrews from Barksdale and Dyess AFBs fly 260 days per year, Monday through Friday, but not on holidays.

range result when the B-52s fly over 1,000 feet AGL 100 percent of the time; higher noise levels correspond to the altitude regime where B-52s fly between 300 and 1,000 feet AGL. A single DNL listed in the table indicates that the noise levels are the same for both regimes.

The highest noise levels (59-61 DNL) on IR-178 apply to segments BGBH-BJBK due to overlapping and intersecting activities on several MTRs associated with Melrose Range, not sortie-operations on IR-178 and IR-128/180. Segments CD-GH



Alternative A: No-Action Noise Level Range

Figure 4.1-10

have noise levels of 58 to 59 DNL because they support the most sortie-operations on IR-178 proper. Noise levels in segments AAAB-ASAT reflect overlaps of IR-178 with IR-128/180 (with a total of 200 sortie-operations) in this portion of the route.

Based on the annoyance factors correlated to aircraft noise (refer to Figure 4.1-6), approximately less than 1 to 7 percent of people living under IR-178 could be expected to be highly annoyed (Table 4.1-6). For the other primary MTRs, the percent of the population highly annoyed would range from less than 1 percent to about 4 percent. Noise levels at 14 of 20 secondary MTRs correlate to highly annoyed factors of less than 1 percent. Similarly, less than 1 percent of the population under all primary and secondary MOAs could be expected to be highly annoyed.

Ambient noise levels in wilderness areas can range from 20 to 60 DNL and are influenced by the sounds of nature such as thunderstorms, insects chirping, storms, and wind.

Individuals are often interested in what they might personally experience from an overflight above or in the vicinity of their location. Ambient noise levels without aircraft operations can range from 34 to 45 DNL in rural areas and 32 to 54 DNL in wilderness areas (USAF 1988, U.S. Forest Service 1992). Individual A-weighted sound levels can vary widely depending upon the location, season, and weather. Levels can range from 20 dB up to 60 dB. Background or ambient noise levels can be influenced not only by man-made sounds, but also by the sound of nature such as inclement weather conditions (e.g., thunderstorms, rain, hailstorms), animals (e.g., near continuous, such as insects; or intermittent, such as coyotes, etc.), water (e.g.,

Table 4.1-6
Percent Population Potentially Highly Annoyed Under Alternative A: IR-178 and Primary MOAs

IR-178 Segment and MOAS	*Baseline Percentage (average)*	
	Range [1]	
AB	5	5
BC	6	6
CD-GH	6	7
HI	6	6
IJ-KL	5	5
LM	3	4
MN-NO	4	4
OP-PQ	3	3
QR-RS	4	4
ST	5	5
TU	4	4
UV-VW	3	3
WX	4	4
XY-ZAA	5	5
AAAB	2	2
ABAC-ADAE	4	4
AEAF-ASAT	1	2
BABB-BFBG	2	2
BGBH-BJBK	6	7
OCA-CCCO	1	2
CDCE	4	4
CECF-GFCG	2	2
CGCH-CHCI	2	3
CICJ-CJCK	<1	<1
Reese 4, Reese 5, Roby, and Mt. Dora MOAs	1	1

[1] Based on differences associated with two altitude regimes for B-52s.

Studies of community response to various types of environmental noise show DNL correlates well with annoyance.

movement in streams, falls, or wave action), as well as wind (e.g., its interaction with foliage or irregular terrain) (NPS 1994). When aircraft operations occur in an area, either from existing or proposed operations, it is important to understand that individual aircraft noise events are typically heard for a period of only seconds. The instantaneous noise level is very low at the beginning and end of this period. As the aircraft approaches, the sound level increases to some maximum level depending on how close the aircraft comes to the receiver or individual on the ground (refer to Figure 4.1-2).

If an aircraft passes directly overhead at low altitude, the maximum instantaneous A-weighted level can exceed 100 dB. Noise would be near that maximum for only a few seconds, with most of the event being much less noisy. If an aircraft passes to the side of a person (or any receiver) at some distance, the maximum noise level experience would be lower, but the levels would be near that maximum for a longer period of time. For example, if a person were half a mile to the side, the noise level would be 10 to 15 dB lower than if the overflight were directly overhead. An aircraft 2 to 3 miles away may not be heard at all (refer to Figure 4.1-5). The potential for low-altitude sortie-operations in the primary and secondary MTRs range from an average of less than one per day to six per day (Appendix B). Less than one sortie-operation per day characterizes average activity in the MOAs. These averages reflect total annual sortie-operations divided by 260 flying days. Weather, maintenance, mission requirements, and other factors can cause variations in daily activities.

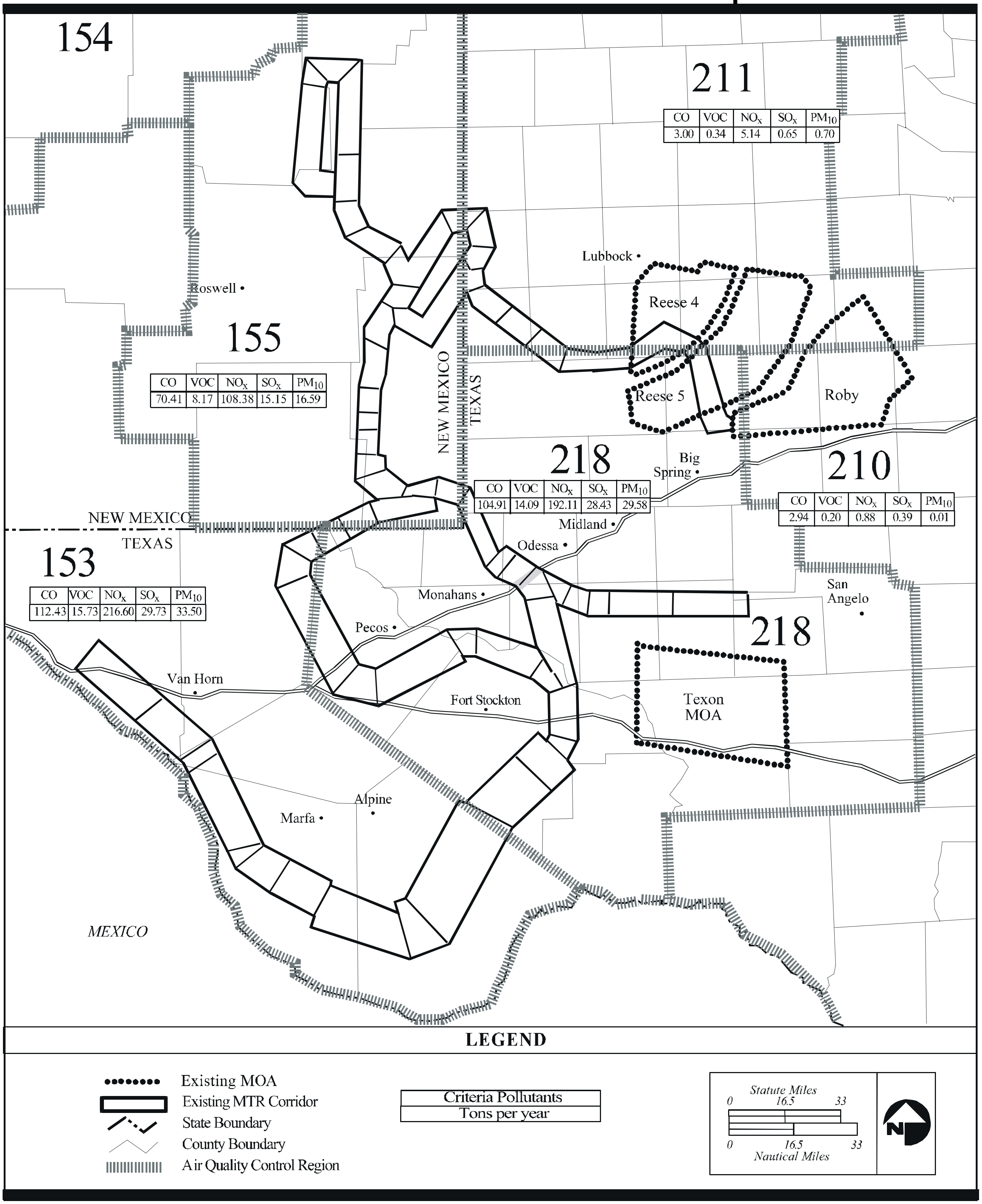
Flights and their associated noise are dispersed throughout MTR corridors ranging from 6 to 20 nm wide.

The likelihood of being overflown varies depending upon the type of airspace being flown in. In a MOA (a three-dimensional "box" of airspace), the operations are random and widely dispersed. In other words, no established tracks exist. The random nature of operations and the wide altitude structure within the MOA make it unlikely that any one location would be repeatedly overflown. Also, the higher floor activities of the primary and secondary MOAs eliminate the potential for low-altitude overflights. In MTRs, flights are dispersed within the corridor, both horizontally and vertically. Studies have shown that the horizontal dispersion of flights across an MTR varies according to the route width (Wyle 1996). The wider the corridor, the lower probability that any given spot would be overflown. Of the 71 segments in IR-178, 5 traverse through the Restricted Area for Melrose Range, 3 have widths of 6 nm, 37 are 7 to 9 nm wide, and 36 are 10 to 20 nm wide. The widest segments support the most sortie-operations, thereby reducing the probability of overflight.

Emissions from military aircraft are dispersed and low in quantity.

Aircraft Emissions. Federal regulations have defined air quality control regions (AQCRs) designated originally according to population and closely approximating air basins. Effects on air quality from aircraft emissions would typically be confined to the air basin in which the emissions occur, so aircraft emissions for the primary MTRs and MOAs were summed by AQCR rather than by individual airspace unit. Figure 4.1-11 depicts the AQCRs associated with the primary MTRs (IR-178, IR-128/180) and MOAs (Reese 4 and 5, Roby, and Texon) in the affected area in Texas and New Mexico. The Mt. Dora MOA, located well north of the area depicted in the figure, is discussed separately below, as are the areas associated with the Harrison and La Junta ESSs.

The affected area for Alternative A includes portions of six AQCRs in Texas and New Mexico: 153, 154, 155, 210, 211, and 218. All of these AQCRs are currently in attainment with the NAAQS and state standards, where applicable. Emissions generated by baseline sortie-operations in these primary MTRs and MOAs (see Appendix F) are dispersed over large areas. Because these emissions are dispersed horizontally and vertically over millions of acres, they do not measurably affect air quality. For example, emission in AQCR 218 are spread over a minimum of more than 700,000 acres.



Alternative A: No-Action Aircraft Emissions

Figure 4.1-11

. . . Alternative A: No-Action

The Mt. Dora MOA is located mostly (97 percent) over AQCR 154, with a minor (about 3 percent) portion extending into AQCR 211. For the criteria pollutants, only nitrogen oxide emissions exceed 1 ton per year (1.7 tons/year). Limited annual sortie-operations (379) and use of altitudes above 3,000 feet account for these low quantities.

Quantities of emissions under Alternative A for the four primary MTRs associated with the Harrison and La Junta ESSs (IR-150, IR-174, IR-177/501, and IR-592) are low (Appendix F) and dispersed along hundreds of miles of MTRs. The areas overlain by these four MTRs are in attainment for the NAAQS.

A MAILS model, run for the most used segments of IR-178 (Appendix F), demonstrates that aircraft emissions in the primary airspace units do not result in ground-level concentrations of pollutants sufficient to affect potential exceedences of the NAAQS or PSD Class I standards. This analysis established that baseline activities on IR-178 generate only fractions of the NAAQS concentrations and PSD Class I increments (Table 4.1-7) and do not impact air quality. With such low concentrations, these emissions do not affect visibility in the one PSD Class I area overlain by any of the airspace units: a corner of Big Bend National Park which underlies the margin of IR-178's corridor near the Texas/Mexico border. No other primary airspace supports as many sortie-operations as IR-178, so it can be inferred that pollutant concentrations in those other routes are less than negligible amounts noted for IR-178.

Aircraft Safety. Many different aircraft fly in the primary airspace, but with the exception of the Mt. Dora MOA, B-52s and B-1s fly the most sortie-operations.

Table 4.1-7
Criteria Pollutant Concentrations for IR-178 Alternative A: No-Action

		Concentration (µg/m³)				
Criteria Pollutant	*Averaging Period*	*PSD Class I Increments*[1]	*NAAQS*	*Affected Airspace*	*Percentage of PSD Class I Increment (%)*	*Percentage of the NAAQS (%)*
Nitrogen Dioxide (NO_2)	Annual	2.5	100	0.0614	2.456	0.061
Particulate Matter (PM_{10})[2]	24-hour	10 [3]	150 [3]	0.0407	0.407	0.027
	Annual	5	50	0.009	0.182	0.018
Sulfur Dioxide (SO_2)	3-hour	25 [3]	1,300 [3]	0.1907	0.763	0.015
	24-hour	5 [3]	365 [3]	0.0372	0.744	0.01
	Annual	2	80	0.0085	0.425	0.011
Carbon Monoxide (CO)	1-hour	--	40,000 [3]	3.7747	0.009 [4]	0.009
	8-hour	--	10,000 [3]	0.2547	0.0003 [4]	0.003

[1] The PSD Class I increments for particulates are for TSP.
[2] The NAAQS for particulates is for PM_{10}.
[3] Not to be exceeded more than once per year.
[4] As a percentage of NAAQS.

4.0 Affected Environment and Environmental Consequences: Airspace and Aircraft Operations

Table 4.1-8 presents the statistically estimated time between Class A mishaps for B-52s and B-1s. As these data show, the potential for such mishaps is low in all the primary airspace units. The fewest estimated years between Class A mishaps applies to IR-178, with 39 years for B-52s and 14 years for B-1s. These estimated years

Table 4.1-8
Estimated Class A Mishaps for Primary Airspace for Alternative A: No-Action

Airspace Unit	*Estimated Years Between Class A Mishaps*	
	B-1	*B-52*
IR-128/180	938	1,847
IR-150	177	879
IR 174	194	2,454
IR-177/501	96	345
IR-178	14	39
IR-592	532	103
Reese 4/5 MOAs	NA[1]	NA[2]
Roby MOA	497	NA[2]
Mt. Dora MOA	8,292	22,900

[1] Only three annual sortie-operations in each MOA.

[2] B-52s do not use MOAs.

equate to a probability of 0.03 percent that a B-52 Class A mishap would occur per year; for B-1s, the probability is 0.07 percent.

Although bird-aircraft strike potential is greater in the MTRs than in the MOAs due to the emphasis on flying at lower altitudes, bird-aircraft strikes are relatively infrequent. Databases maintained by the Air Force and Barksdale and Dyess AFBs themselves indicate an average of about 8 to 10 bird-aircraft strikes per year by B-52s and B-1s on all primary MTRs. Over the 11 years of these records, more than 14 million miles have been flown on these routes. Use of the Bird Avoidance Model for planning and executing each training sortie contributes to this low rate of bird-aircraft strikes.

No bird-aircraft strikes have been recorded during the past 11 years in the primary MOAs. This low rate may be the result of two factors. First, aircraft in MOAs predominantly operate at altitudes above which most bird-strikes occur (e.g., 3,000 feet AGL). Second, the lands underlying the MOAs lack areas that attract large concentrations of birds.

ENVIRONMENTAL CONSEQUENCES

Selection of Alternative A: No-Action would not alter airspace management or use, noise levels, air quality, or risks to aircraft from baseline conditions. As a result, no additional effects on these resources would be expected.

4.1.3 Alternative B: IR-178/Lancer MOA

AFFECTED ENVIRONMENT

Proposed airspace modifications would not adversely affect airspace management.

The affected environment for airspace and air operations in Alternative B (refer to Figure 2.4-3) would closely mirror that described for Alternative A: No-Action. It would include the same six primary MTRs, and would involve the four primary or redesignated MOAs (refer to Section 2.4.2). Changes to airspace structure would affect IR-178 and the Reese 4, Reese 5, and Roby MOAs; changes in airspace use would occur on IR-178 and the other five primary MTRs, as well as the Mt. Dora MOA and the abovementioned MOAs. Since no structural or operational changes would apply to the other secondary airspace and airspace management, noise, air quality, and safety conditions would not vary from baseline, these airspace units are not discussed further under Alternative B.

With the exception of the re-entry route and a portion of one exit route to the MOA, the corridor for IR-178 would correspond to existing primary or secondary airspace. About 85 percent of the route would coincide with the existing IR-178 corridor or other overlapping or intersecting MTRs, such as IR 128/180 and VR-1116. Under Alternative A: No-Action, VR-1116 is simply a secondary MTR not associated with bomber training. For Alternative B, the portion of VR-1116 overlapped by the proposed IR-178 becomes part of the affected area. The affected environment also includes the area covered by the proposed Lancer MOA/ATCAA. This area encompasses most of the existing Reese 4, Reese 5, and Roby MOAs.
Baseline conditions for airspace management, noise, aircraft safety, and air quality in the affected area for Alternative B have been presented in the discussion of Alternative A: No-Action. These conditions are compared below to the changes potentially resulting from implementing Alternative B.

ENVIRONMENTAL CONSEQUENCES

Airspace Management. Modification of IR-178 and establishment of the proposed Lancer MOA/ATCAA would have little effect on airspace management. Proposed IR-178 segments VAVB-VBR, the re-entry route, would comprise new low-altitude airspace. However, existing IR-178 airspace surrounds the re-entry route. It would not overlie any airfields nor would it interfere with any federal airways or jet routes. Management of this airspace would follow the same FAA and Air Force procedures that apply to existing IR-178. Scheduling of use would ensure no conflicts between military aircraft in the main IR-178 corridor and aircraft using the re-entry route. Although a change to IR-178, the proposed exit to the Lancer MOA/ATCAA overlaps with portions of existing IR-128/180 and VR-1116. Additional scheduling coordination by the Air Force to avoid conflicts between users of the three MTRs may be needed, but no other changes to current airspace management would occur. Elimination of existing IR-178 segments VW-ASAT would represent a formal airspace change on FAA charts. To the public, no difference in the airspace structure would be noticeable, although annual sortie-operations would decrease. Segments of IR-128/180 would still occupy the same corridor, and military aircraft would still fly in the corridor.

Because the proposed Lancer MOA/ATCAA would overlie an area mostly (90 percent) covered by existing airspace, management of the airspace would not be expected to change noticeably. Elimination of existing Reese 4, Reese 5, and Roby MOA airspace would have a similar lack of effect. From a civil aviation perspective, the boundaries of the charted airspace would fall within the outer limits of the three existing MOAs. The proposed MOA/ATCAA would not overlie additional airfields. Six airfields, with annual use ranging from less than 50 to 2,500 operations, underlie the current MOAs and would underlie the proposed Lancer

MOA/ATCAA. Lowering the floor of the MOA to 3,000 feet AGL would not interfere with operations at these airfields, although additional avoidance procedures may be implemented to accommodate civil aviation activities like cloud seeding and crop dusting.

The area of the proposed MOA/ATCAA includes two jet routes and three federal airways. The FAA would control the airspace when the MOA/ATCAA is activated, ensuring that there are no conflicts with the use of the jet routes and airways. Minor rerouting of flights along these routes and/or scheduling of specific portions of the MOA/ATCAA could alleviate potential conflicts.

Aircraft Noise. Table 4.1-9 presents noise levels resulting from aircraft operations in the primary and secondary MTRs and MOAs under Alternative B. Compared with baseline conditions, noise levels would change only in the six primary MTRs and in the proposed Lancer MOA/ATCAA. No secondary MTRs or other MOAs would experience a change in noise conditions.

Proposed reductions in bomber sortie-operations would result in a decrease in noise levels for IR-128/180 to below 45 DNL. For the MTRs associated with the Harrison and La Junta Electronic Scoring Sites, decreases of 2 to 7 dB would occur.

Noise levels on proposed IR-178 would not increase along four segments but would increase by 2 to 13 dB on the others.

Noise levels on IR-178 would change under Alternative B. A segment-by-segment analysis of proposed IR-178 revealed variations in noise levels (Figure 4.1-12 and Table 4.1-10) based on variations in the number of sortie-operations, the floor altitude, and mix of aircraft for different segments (refer to Figure 2.4-3 for segment locations). Noise levels on IR-178 would range from 46 to 61 DNL. Baseline conditions in the affected area of proposed IR-178 generate noise levels ranging from less than 45 to 61 DNL. Existing segments VW-ASAT for IR-178 would be eliminated, but decreased aircraft noise would still occur along IR-128/180, which follows the same corridor. Of the 41 segments in proposed IR-178, noise levels would increase in 37 and decrease in 4. The highest noise levels (60-61 DNL) would occur in segments AB-KL at the start of the MTR where the number of sortie-operations would be greatest. The amount of change (2 to 5 dB) in noise would be less than in other segments such as XY-YZ (13 dB) and AE-AF (12 dB). Segments VAVB-VBR, as new airspace not currently exposed to aircraft noise, would be subject to 53 DNL. A 5 to 12 dB decrease in noise levels would occur in segments ZAA-ACAD. In the more than 20 segments where a greater than 3 dB increase in noise would occur, the change would be noticeable. Noise levels in the proposed Lancer MOA/ATCAA would increase from less than 45 to 46 DNL in response to added sortie-operations. Small areas would be newly exposed to aircraft noise, while airspace (and aircraft noise) would be eliminated over a larger area due to the change in MOA shape. With flight activities restricted to above 3,000 feet AGL, cumulative and single overflight noise levels would remain low.

The percentage of people who may be highly annoyed by aircraft noise could increase under most segments of IR-178 and decrease under a few (Table 4.1-11). Percentages of people who could be highly annoyed would vary from 1 to 8 percent. Increases of 1 to 2 percent in potential numbers of people annoyed would characterize most of the segments. Due to added sortie-operations, segments WX-YZ and AEAF-AFAG would have the largest increase (4 percent). These segments account for less than 5 percent of the entire route corridor. Another 5 percent of the route (segments ZAA-ADAE) would show decreases in the percentage of people who could be highly annoyed. Under the proposed Lancer MOA/ATCAA, the percentage of highly annoyed people would remain very close to that for the existing Reese 4, Reese 5, and Roby MOAs (less than 1 percent).

With the exception of IR-178, noise levels in the six primary MTRs decrease under Alternative B.

Table 4.1-9
Projected Average Daily Sortie-Operations and Noise Levels Alternative B: IR-178/Lancer MOA

Airspace Units	*Class*	Alternative B			*Baseline Noise Level (DNL)*	*Change from Baseline*
		Total Sortie-Operations	*Average Daily Sortie Operations*	*Noise Level (DNL)*		
MTRs						
VR-100/125	S	1,265	5	49	49	0
VR-108	S	143	1	<45	<45	0
VR-114	S	1,014	4	<45	<45	0
VR-143	S	620	2	49	49	0
VR-186	S	1,175	5	50	50	0
VR-196/197	S	512	2	<45	<45	0
VR-1107/1195	S	1,050	4	<45	<45	0
VR-1116	S	30	<1	<45	<45	0
VR-1175/1176	S	50	<1	46	46	0
IR-107	S	104	<1	<45	<45	0
IR-109	S	310	1	<45	<45	0
IR-110	S	0	0	NA	NA	0
IR-111	S	130	1	<45	<45	0
IR-113	S	300	1	<45	<45	0
IR-123	S	50	<1	<45	<45	0
IR-124	S	140	1	<45	<45	0
IR-128/180	**P**	**150**	**1**	**<45**	**46**	-1
IR-150	**P**	**100**	**<1**	**51**	**55**	-4
IR-154	S	70	<1	<45	<45	0
IR-169	S	465	2	<45	<45	0
IR-174	**P**	**121**	**<1**	**48**	**51**	-3
IR-177/501	**P**	**75**	**<1**	**49**	**56**	-7
IR-178	**P**	**2,660**	**10**	**62**[1]	**61**[1]	10
IR-192/194	S	658	3	49	49	0
IR-592	**P**	**340**	**1**	**48**	**50**	-2
MOAs						0
Reese 4	R	0	0	NA[2]	<45	0
Reese 5	R	0	0	NA[2]	<45	0
Roby	R	0	0	NA[2]	<45	0
Proposed Lancer	**P**	**2,350**	**9**	**46**	**<45**[2]	1
Texon	S	100	<1	<45	<45	0
Mt. Dora	S	368	1	<45	<45	0

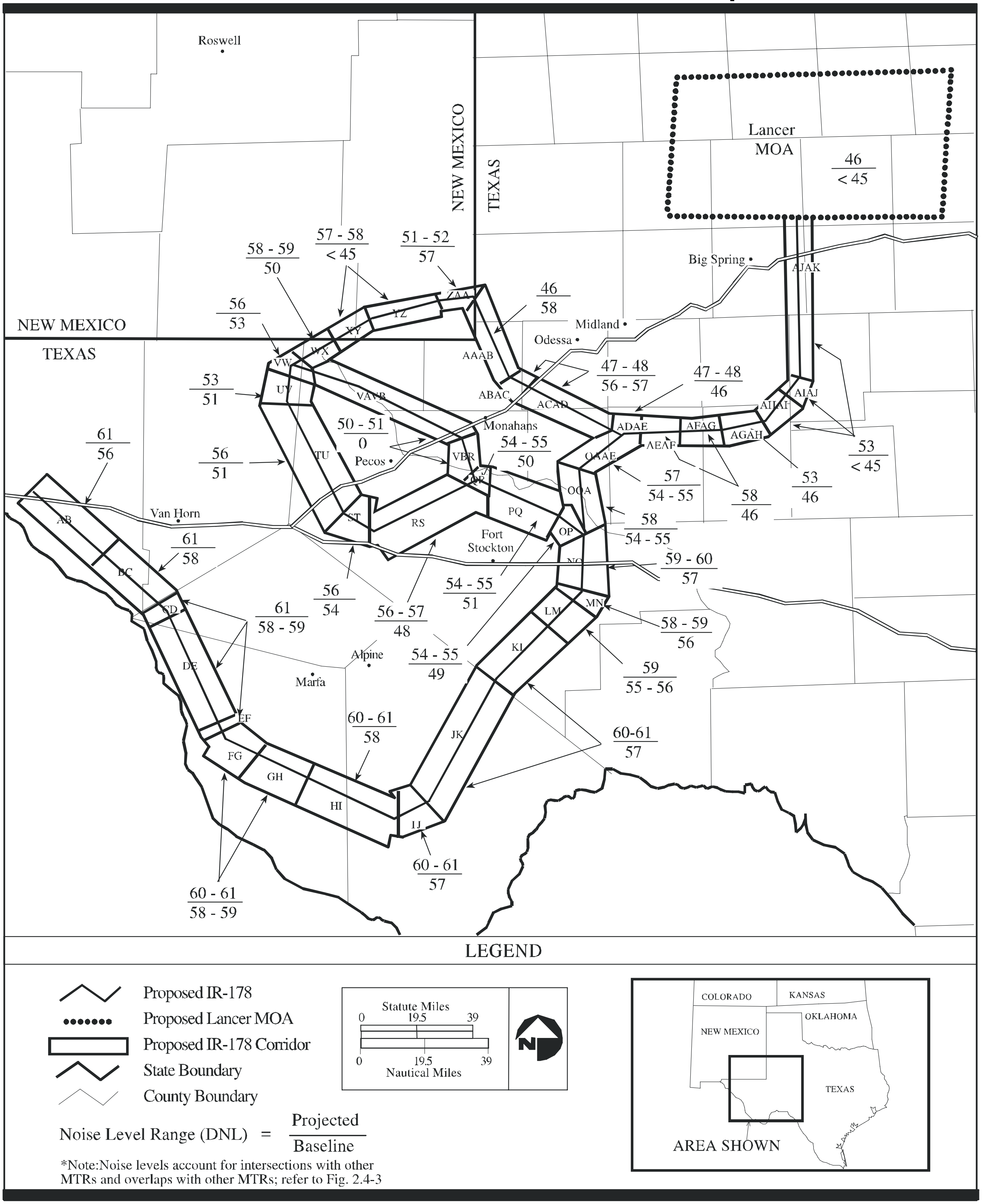
Class P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.

Class S = Secondary airspace unit intersects with primary airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.

Class R = Redesignated airspace to form the Proposed Lancer MOA.

[1] Noise level represents the highest DNL for any segment of the route; all other segments are equal to or lower.

[2] Based on existing noise levels for Reese 4/5 and Roby MOAs.



Alternative B: IR-178/Lancer MOA Noise Level Range

Figure 4.1-12

Noise levels on segments of proposed IR-178 include aircraft noise generated by use of IR-178 itself, combined with noise from sortie-operations on MTRs that overlap or intersect with IR-178. Noise levels account for sortie-operations by all aircraft.

Table 4.1-10
Projected Noise Levels for Alternative B: IR-178

Proposed IR-178 Segment	*Projected Noise Level Range (DNL)*	*Existing IR-178 Segment*	*Baseline Noise Level Range (DNL)*
AB	61	AB	56
BC	61	BC	58
CD	61	CD	58-59
DE	61	DE	58-59
EF	61	EF	58-59
FG	60-61	FG	58-59
GH	60-61	GH	58-59
HI	60-61	HI	58
IJ	60-61	IJ	57
JK	60-61	JK	57
KL	60-61	KL	57
LM	59	LM	55-56
MN	58-59	MN	56
NO	59-60	NO	57
OP	54-55	OCA	49
PQ	54-55	CACB	51
QR	54-55	CBCC	50
RS	56-57	CCCD	48
ST	56	CDCE	54
TU	56	CECF	51
UV	53	CFCG	51
VW	56	CGCH	53
WX	58-59	CHCI	50
XY	57-58	CICJ	<45
YZ	57-58	CJCK	<45
ZAA	51-52	TU	57
AAAB	46	ST	58
ABAC	47-48	RS	56-57
ACAD	47-48	QR	56-57
ADAE	47-48	not applicable*	46
AEAF	58	not applicable*	46
AFAG	58	not applicable*	46
AGAH	53	not applicable*	46
AHAI	53	not applicable*	<45
AIAJ	53	not applicable*	<45
AJAK	53	not applicable*	<45
VVA	50-51	not applicable	
VAVB	50-51	not applicable	
VBR	50-51	not applicable	
OOA	58	OP	54-55
OAAE	57	OP	54-55

Refer to Figures 2.3-1 and 2.4-3 for segment locations.
* Proposed IR-178 segments overlap with existing segments of IR-128/180 or VR-1116.

. . . Alternative B: IR-178/Lancer MOA

Table 4.1-11
Percent Population Potentially Highly Annoyed Under Alternative B: IR-178 and Proposed Lancer MOA/ATCAA

IR-178 Segment and MOA	*Projected Percentage (Average)*		*Percentage Change from Baseline*	
	Range [1]		*Range* [1]	
AB	8	8	3	3
BC	8	8	2	2
CD-EF	8	8	1	2
FG-GH	8	8	1	2
HI	8	8	2	2
IJ-KL	8	8	3	3
LM-NO	6	6	2	2
OP-QR	3	3	1	1
RS	4	4	1	1
TU	5	5	1	1
UV-VW	3	3	1	1
WX-YZ	5	5	4	4
ZAA	2	2	-2	-2
AAAB-ADAE	1	1	-3	-2
AEAF-AFAG	5	5	4	4
AGAH-AJAK	3	3	2	2
VAVB-VBR[2]	2	2	2	2
OOA	5	5	2	2
OAAE	4	4	1	1
Lancer MOA/ATCAA[3]	1	1	<1	<1

1 Based on differences associated with two altitude regimes for B-52s.
2 Currently not overflown by military aircraft; new airspace.
3 Existing Reese 4, Reese 5, and Roby MOAs. (Refer to discussion in 4.1.3)

Studies of community response to various types of environmental noise show DNL correlates well with annoyance.

For the other five primary MTRs affected under Alternative B, decreased sortie-operations would mean a lower potential for annoyance. The percentage of people who could be highly annoyed would range from less than 1 percent to 2 percent, in comparison with a range of 1 to 4 percent under baseline conditions.

The likelihood of being overflown varies depending upon the type of airspace. In the proposed Lancer MOA/ATCAA, the random nature of operations and the wide span of altitudes in which to fly make it unlikely that any one location would be repeatedly overflown. Sortie-operations in the proposed Lancer MOA/ATCAA would average nine per day as compared with less than one per day under baseline conditions (based on 260 flying days/year). These operations would be dispersed randomly throughout the almost 18,000 cubic nm of the proposed MOA/ATCAA, with most activity occurring above 20,000 feet AGL. At that altitude, the noise for an individual bomber overflight would be low (refer to Figure 4.1-3).

Dispersal of additional overflights on IR-178 would be aided by the fact that the segments of IR-178 with the most projected sortie-operations are also the widest.

Average daily sortie-operations would increase on all but five segments of proposed IR-178 (Appendix B). Increases would range from one to six more bomber sortie-operations per day, on average, compared with baseline. These sortie-operations could generate noise levels (SELs) ranging from 86 dB at 3,000 feet AGL to 116 dB at 300 feet AGL, the same as under baseline conditions. Such events could last from 7 to 10 seconds for a person directly under the flight path.

Proposed IR-178 flights are dispersed both horizontally and vertically within the corridor. They would also be spread throughout the day. Research has shown that the dispersion of flights across an MTR like IR-178 increases with route width (Wyle 1996). Proposed IR-178 segments would vary in width from 6 to 14 miles with 40 (out of a total of 41 segments) being 8 to 14 miles wide, respectively (Appendix C, Table C-2). Dispersal of the additional overflights would be aided by the fact that the segments of proposed IR-178 with the most daily sortie-operations are also the widest segments.

Required avoidance procedures would help reduce noise levels in some areas. FAA Regulation Part 91.119 (FAA 1992) and Air Force Instruction 11-202 (USAF 1998) require aircraft to avoid congested areas by 1,000 feet AGL above the highest obstacle within 2,000 feet of the aircraft. Outside congested areas, aircraft must avoid isolated persons, structures, or vessels by 500 feet. Noise levels in such avoidance areas would likely be lower than those presented above.

Aircraft Emissions. Figure 4.1-13 presents the amounts of emissions projected to occur in the affected AQCRs with implementation of Alternative B. Total annual emissions of criteria pollutants would increase in AQCR 153, 210, 211, and 218, with the greatest amount of change in AQCR 218. Decreases in all criteria pollutant emissions would take place in AQCR 155. Both the increases and decreases would result from the proposed airspace modifications and associated shifts in sortie-operations. All of those AQCRs are in attainment for federal and state air quality standards. Added emissions in AQCR 153, 210, 211, and 218 would be dispersed over hundreds of miles and thousands of feet of altitude. For example, in AQCR 153 alone, emissions would be dispersed within more than 3,800 cubic nm. Such dispersal would likely preclude ground-level concentration of criteria pollutants leading to exceedences of the NAAQS.

Emissions from military aircraft would increase, but would not noticeably degrade air quality.

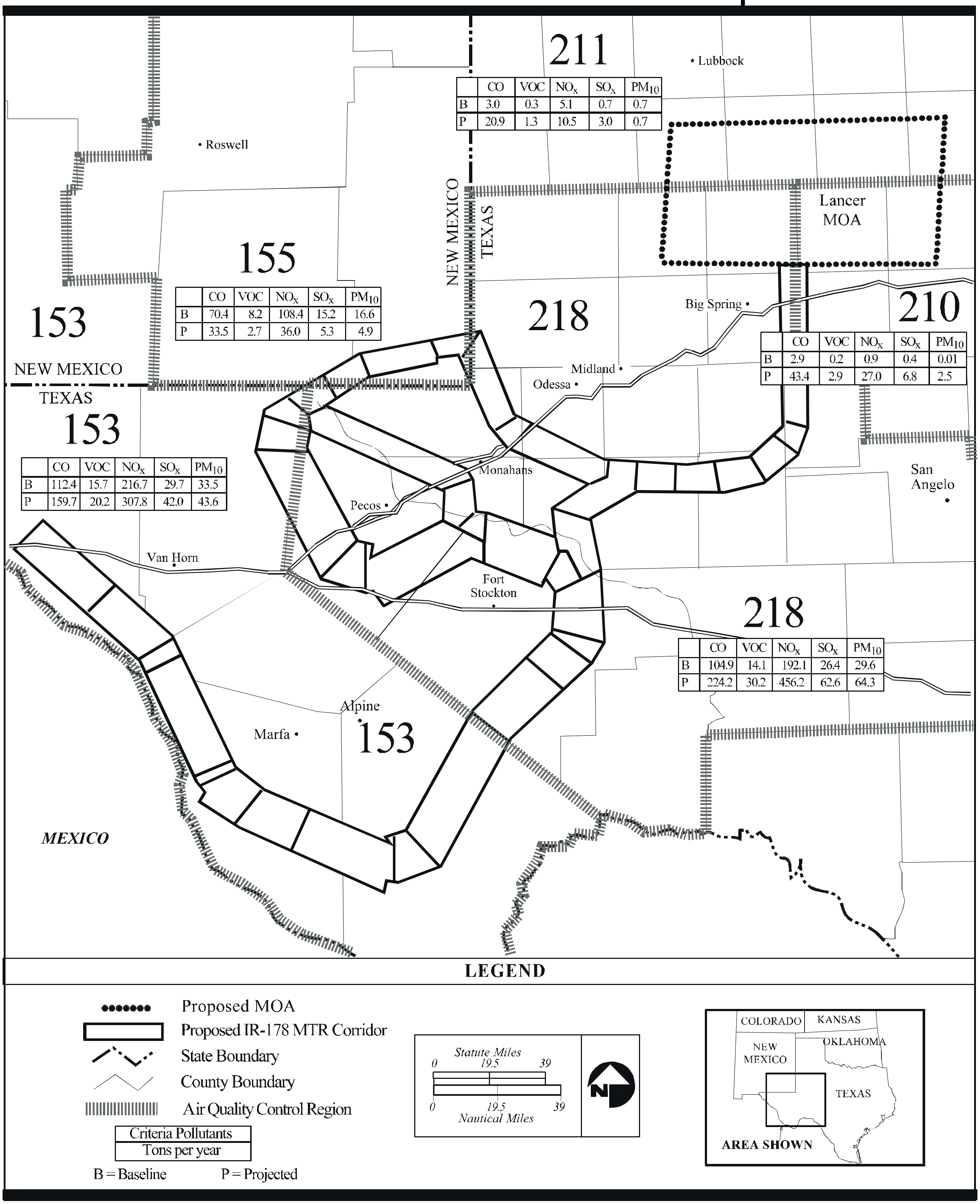
MAILS modeling confirms that Alternative B aircraft operations would not cause potential exceedences of the NAAQS or PSD Class I standards (Table 4.1-12).

Table 4.1-12
Criteria Pollutant Concentrations for Alternative B: IR-178 and Lancer MOA/ATCAA

		Concentration ($\mu g/m^3$)				
Criteria Pollutant	*Averaging Period*	*PSD Class I Increments* [1]	*NAAQS*	*Affected Airspace*	*Percentage of PSD Class I Increment (%)*	*Percentage of the NAAQS (%)*
Nitrogen Dioxide (NO_2)	Annual	2.5	100	0.059	2.36	0.059
Particulate Matter (PM_{10})[2]	24-hour	10 [3]	150 [3]	0.032	0.320	0.021
	Annual	5	50	0.008	0.160	0.016
Sulfur Dioxide (SO_2)	3-hour	25 [3]	1,300 [3]	0.158	0.632	0.012
	24-hour	5 [3]	365 [3]	0.031	0.618	0.008
	Annual	2	80 [3]	0.008	0.400	0.010
Carbon Monoxide (CO)	1-hour	--	40,000 [3]	2.26	0.006 [4]	0.006
	8-hour	--	10,000 [3]	0.0173	0.002 [4]	0.002

[1] The PSD Class I increments for particulates are for TSP.
[2] The NAAQS for particulates is for PM_{10}.
[3] Not to be exceeded more than once per year.
[4] As a percentage of the NAAQS.

Projected sortie-operations under Alternative B would generate only fractions of the NAAQS concentrations and PSD Class I increments and would not adversely impact air quality. Since the AQCRs are in attainment and the emissions from Alternative B would not change this situation, no conformity determination is needed. Due to



Alternative B: IR-178/Lancer MOA Aircraft Emissions **Figure 4.1-13**

. . . Alternative B: IR-178/Lancer MOA

proposed shifts in the IR-178 corridor away from Big Bend National Park, no PSD Class I areas would be affected under this alternative.

No other segment of a primary or secondary MTR would support as many sortie-operations as IR-178, so concentrations of criteria pollutants would necessarily be less in these airspace units. In addition, quantities of emissions in the six other primary MTRs and the Mt. Dora MOA would decrease in response to reductions in sortie-operations (Appendix F). No changes to emissions associated with secondary MTRs would result from Alternative B.

Since the results of analysis show that emissions from the projected sortie-operations represent a fraction of regulatory standards and all affected areas are in attainment, Alternative B would not lead to nonconformance for any criteria pollutants. Consequently, a conformity analysis is not required.

Aircraft Safety. Under Alternative B, use of primary airspace by B-1s and B-52s would change, and the risks of Class A mishaps would increase and decrease accordingly (Table 4.1-13). In all primary airspace, except for proposed IR-178, the proposed Lancer MOA/ATCAA and IR-592, the estimated years between Class A mishaps would increase. This would further decrease the already miniscule risk of a Class A mishap. A change of only one year between Class A mishaps for B-52s and B-1s would apply to proposed IR-178. The estimated years equate to a probability of 0.03 percent that a B-52 Class A mishap would occur per year and 0.08 percent for B-1s. The probability of a bomber Class A mishap in the Lancer MOA/ATCAA and on IR-592 would be even more insignificant than for IR-178.

Table 4.1-13
Estimated Class A Mishaps for Primary Airspace for Alternative B

Airspace	*Estimated Years Between Mishaps*			
	B-1		*B-52*	
	Baseline	*Alternative B*	*Baseline*	*Alternative B*
IR-128/180	938	NA[2]	1,847	NA[2]
IR-150	177	444	879	3,516
IR 174	194	258	2,454	NA[2]
IR-177/501	96	478	345	2,584
IR-178	14	13	39	38
IR-592	532	532	103	163
Lancer MOA/ATCAA	497 [1]	27	NA[2]	583

[1] Represents B-1 activities from Roby MOA that would be incorportated into Lancer MOA/ATCAA.
[2] No sortie-operations in airspace unit.

Aircraft safety risks would remain low in Alternative B.

Neither the existing nor proposed airspace in Alternative B overlie or intersect any major migration flyways or water bodies where birds congregate. Despite the changes in numbers of sortie-operations, the potential for bird-aircraft strikes in IR-178 and proposed Lancer MOA/ATCAA would remain negligible. Documentation maintained by the Air Force and individual bases indicates that B-52s and B-1s experience 8 to 10 bird-aircraft strikes per year on the six primary MTRs. Continued use of the Bird Avoidance Model to plan and execute training sorties would likely prevent measurable increases in average bird-aircraft strikes. For the other affected MTRs and MOAs, the potential for bird-aircraft strikes would either remain at its current low level or decrease commensurate with projected sortie-operations.

4.1.4 Alternative C: IR-178/Proposed Texon MOA

AFFECTED ENVIRONMENT

The affected environment for airspace and air operations in Alternative C (refer to Figure 2.4-6) would match closely with that of Alternative A: No-Action. It would include the same six primary MTRs (refer to Section 2.4-3). In addition, the Texon MOA would become primary airspace in this alternative. Changes to airspace structure would affect IR-178 and the existing Texon MOA. More than 80 percent of the proposed route matches with existing IR-178 or overlaps with existing IR-128/180. Almost all of the existing Texon MOA would be incorporated into the proposed Texon MOA/ATCAA. Existing secondary MTRs also cover much of the same area as the proposed Texon MOA/ATCAA, so about 75 percent of the area under the proposed MOA/ATCAA is already overlain by existing airspace. Changes in airspace use (i.e., sortie-operations) are projected for IR-178 and IR-128/180 in Texas and New Mexico, as well as for IR-174 and IR-592 (associated with Harrison Electronic Scoring Site) and IR-150 and IR-177/501 (associated with La Junta ESS). Projected use of the proposed Texon MOA/ATCAA would increase, while bomber sortie-operations in the Reese 4, Reese 5, Roby, and Mt. Dora MOAs would decrease to zero. None of the 19 secondary MTRs would be subject to structural or operational changes under Alternative C.

For airspace management, aircraft noise, air quality, and aircraft safety, baseline conditions for the affected environment have been presented in Alternative A: No-Action (refer to Section 4.1.2). These conditions are compared below with changes potentially resulting from implementing Alternative C.

ENVIRONMENTAL CONSEQUENCES

Airspace Management. Modification of IR-178 and expansion of the proposed Texon MOA/ATCAA would affect airspace. Although proposed IR-178 segments VAVB-VBR, the re-entry route, represent new low-altitude airspace, they are surrounded by existing IR-178. This new MTR airspace neither overlies airfields nor intersects any federal airways or jet routes. Management of this airspace would follow FAA and Air Force procedures identical to those used for existing IR-178. To ensure no conflicts between military aircraft in the main IR-178 corridor and aircraft using the re-entry route, the Air Force would employ the strict scheduling process described previously (refer to Section 4.1.1).

The proposed changes to the existing MOA could require changes to airspace management by the FAA.

The short (less than 20 nm) exit route (segment NNA) from IR-178 to the proposed Texon MOA/ATCAA is also new airspace, but it would not noticeably alter civil aviation in the area or require additional airspace management procedures. No airway, jet route, or airfield is affected by this segment. Given its short length and its position right next to IR-178, this new airspace would affect local VFR traffic no more than the current airspace structure.

Elimination of existing IR-178 segments UV-AT would not be noticeable to the public or to local VFR aviation. Segments of IR-128/180 would still occupy the same corridor and military aircraft, albeit fewer would fly on the route.

Expansion of the Texon MOA could result in a change to current airspace management. The proposed MOA/ATCAA is situated in an area currently covered, to a large degree, by existing MOA and MTR airspace. This area, however, includes arrival and departure traffic associated with Abilene, Midland, San Angelo, Houston, and Dallas-Fort Worth airport terminal areas. Normal routes to and from the Houston airport terminal area would cross through the proposed MOA. Approaches and approach procedures at Midland and San Angelo airports could also be affected. Proposed additions to the Texon MOA/ATCAA would also affect two jet routes and a federal airway. Use of the MOA/ATCAA would require substantial rerouting and possibly restructuring for these jet routes and airways. For local VFR aviation, operating conditions would be similar to today. Local VFR traffic would, however, have to become aware of new airspace in the northeast and west portions of the proposed Texon MOA/ATCAA. See-and-avoid techniques for both military and civil aviation VFR traffic would apply in these areas and the rest of the MOA, so the potential for conflicts should be negligible.

A total of seven airfields would underlie the proposed MOA/ATCAA, as compared to four under the current Texon MOA. Flight operations at these airfields commonly support crop dusting, cloud seeding, ranching, and other short VFR flights. Lowering the floor of the proposed Texon MOA/ATCAA could require development of special operating or avoidance procedures for military aircraft flying over the vicinity of these airfields.

Aircraft Noise. Compared with baseline conditions (Table 4.1-14), noise levels would change only in the six primary MTRs and in the proposed Texon MOA/ATCAA. Proposed reductions in bomber sortie-operations would result in a decrease in noise levels for IR-128/180 to below 45 DNL. For the MTRs associated with the Harrison and La Junta Electronic Scoring Sites, decreases of 2 to 7 dB would occur. No secondary MTRs or other MOAs would not experience a change in noise conditions.

Additional sortie-operations projected for proposed IR-178 would increase noise levels on 30 of 35 segments.

For proposed IR-178, a segment-by-segment analysis shows that noise levels would vary (Figure 4.1-14 and Table 4.1-15) based on variations in the number of sortie-operations, the floor altitude, and mix of aircraft for different segments. Noise levels on IR-178 would range from 46 to 61 DNL. Baseline conditions in the affected area of proposed IR-178 generate noise levels ranging from less than 45 to 61 DNL. Existing segments VW-ASAT for IR-178 would be eliminated, but decreased aircraft noise would still occur along IR-128/180, which follows the same corridor. Of the 35 segments in proposed IR-178, noise levels would increase in 30 and decrease in 5. Segments AB-KL, which would support the most sortie-operations, would have the highest noise levels (60-61 DNL). The amount of increase (2 to 5 dB) in these segments would be less than in others, such as XY-YZ (13 dB) and WX (8 dB). Segments VAVB-VBR, as new airspace not currently exposed to aircraft noise, would be subject to 49 to 50 DNL. A 5 to 11 dB decrease in noise levels would occur in segments ZAA-ACAD. In the 17 segments where a greater than 3 dB increase in noise would occur, the change would be noticeable.

Noise levels in the proposed Texon MOA/ATCAA would increase from less than 45 to 46 DNL, in response to the added sortie-operations. New areas would be exposed to aircraft noise; they would comprise about 25 percent of the area of the proposed MOA/ATCAA. With flight activities restricted to above 3,000 feet AGL, cumulative and single overflight noise would remain low.

The percentage of people who may be highly annoyed by aircraft noise could increase under most segments of IR-178 and would decrease under a few (Table 4.1-16). Under the proposed Texon MOA/ATCAA, the percent highly annoyed would remain very close to that under the existing Texon MOA (less than 1 percent). Percentages of people that could be highly annoyed would vary from 1 to 8 percent. Increases of 1 to 2 percent in annoyance would characterize most of the segments. As new airspace, segment NNA would have the largest increase (4 percent). This segment accounts for less than 5 percent of the entire route corridor. Another 5 percent of the route would show decreases in the percent of the people who could be highly annoyed.

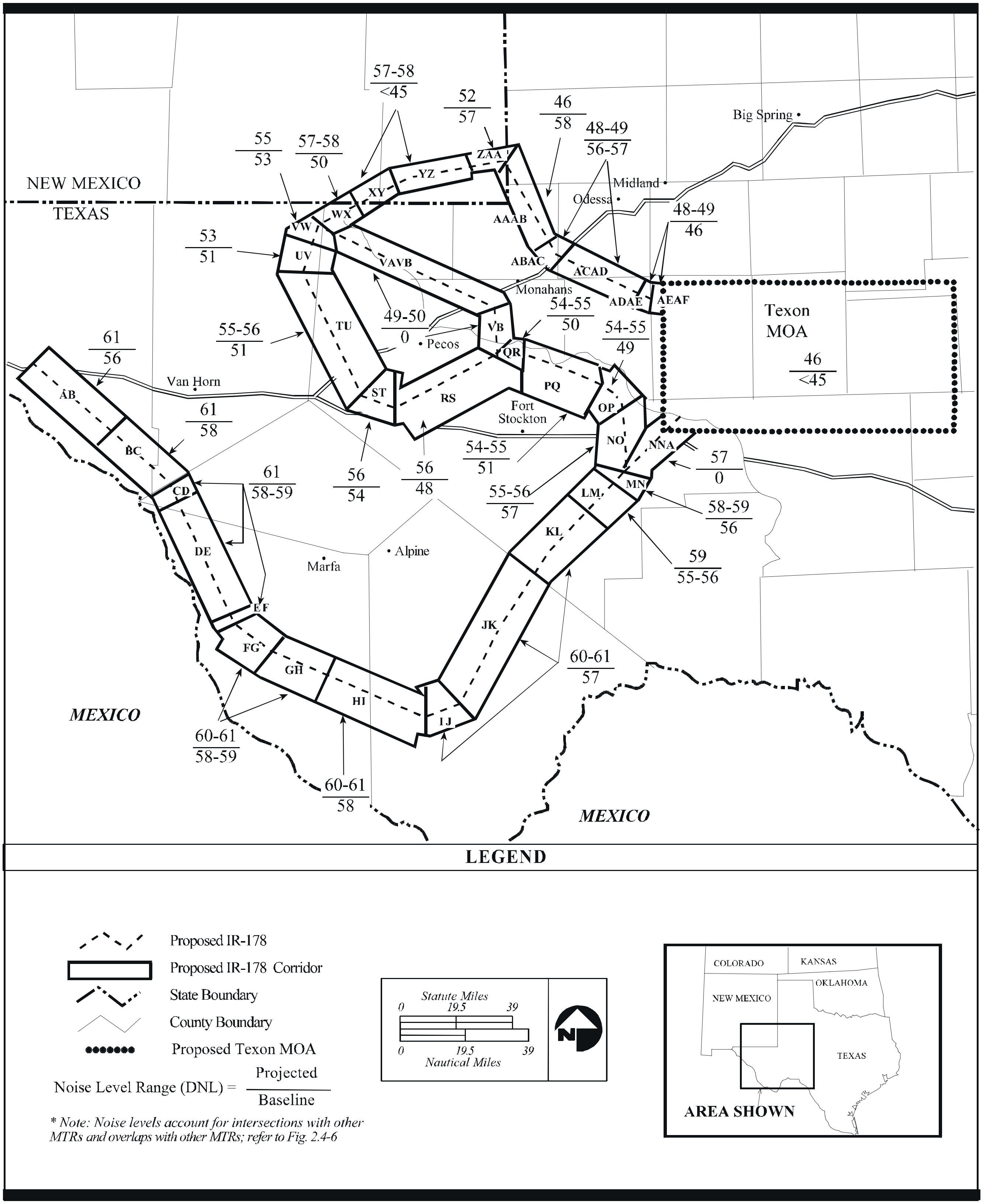
Table 4.1-14
Projected Average Daily Sortie-Operations and Noise Levels Alternative C: IR-178/Texon MOA

Airspace Units	*Class*	Alternative C			*Baseline Noise Level (DNL)*	*Change from Baseline*
		Total Sortie-Operations	*Average Daily Sortie-Operations*	*Noise Level (DNL)*		
MTRs						
VR-100/125	S	1,265	5	49	49	0
VR-108	S	143	1	<45	<45	0
VR-114	S	1,014	4	<45	<45	0
VR-143	S	620	2	49	49	0
VR-186	S	1,175	5	50	50	0
VR-196/197	S	512	2	<45	<45	0
VR-1107/1195	S	1,050	4	<45	<45	0
VR-1116	S	30	<1	<45	<45	0
VR-1175/1176	S	50	<1	46	46	0
IR-107	S	104	<1	<45	<45	0
IR-109	S	310	1	<45	<45	0
IR-110	S	0	0	NA	NA	0
IR-111	S	130	1	<45	<45	0
IR-113	S	300	1	<45	<45	0
IR-123	S	50	<1	<45	<45	0
IR-124	S	140	1	<45	<45	0
IR-128/180	**P**	**150**	**1**	**<45**	**46**	-1
IR-150	**P**	**105**	**<1**	**51**	**55**	-4
IR-154	S	70	<1	<45	<45	0
IR-169	S	465	2	<45	<45	0
IR-174	**P**	**121**	**<1**	**48**	**51**	-3
IR-177/501	**P**	**75**	**<1**	**49**	**56**	-7
IR-178	**P**	**2,660**	**10**	**62**[1]	**61**[1]	10
IR-192/194	S	658	3	49	49	0
IR-592	**P**	**340**	**1**	**48**	**50**	-2
MOAs						0
Reese 4	S	0	0	NA	<45	0
Reese 5	S	0	0	NA	<45	0
Roby	S	0	0	NA	<45	0
Proposed Texon	**P**	**2,400**	**9**	**46**	**<45**	1
Mt. Dora	S	368	1	<45	<45	0

Class P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
Class S = Secondary airspace unit intersects with primary airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.
[1] Noise level represents the highest DNL for any segment of the route; all other segments are equal to or lower.

Noise levels for five of the six primary MTRs decrease under Alternative C.

4.0 Affected Environment and Environmental Consequences: Airspace and Aircraft Operations



Alternative C: IR-178/Texon MOA Noise Level Range **Figure 4.1-14**

Table 4.1-15
Projected Noise Levels for Alternative C: IR-178

Proposed IR-178 Segment	*Projected Noise Level Range (DNL)*	*Existing IR-178 Segment*	*Baseline Noise Level Range (DNL)*
AB	61	AB	56
BC	61	BC	58
CD	61	CD	58-59
DE	61	DE	58-59
EF	61	EF	58-59
FG	60-61	FG	58-59
GH	60-61	GH	58-59
HI	60-61	HI	58
IJ	60-61	IJ	57
JK	60-61	JK	57
KL	60-61	KL	57
LM	59	LM	55-56
MN	58-59	MN	56
NO	55-56	NO	57
OP	54-55	OCA	49
PQ	54-55	CACB	51
QR	54-55	CBCC	50
RS	56	CCCD	48
ST	56	CDCE	54
TU	55-56	CECF	51
UV	53	CFCG	51
VW	55	CGCH	53
WX	57-58	CHCI	50
XY	57-58	CICJ	<45
YZ	57-58	CJCK	<45
ZAA	52	TU	57
AAAB	46	ST	58
ABAC	48-49	RS	56-57
ACAD	48-49	QR	56-57
ADAE	48-49	not applicable*	46
AEAF	48-49	not applicable*	46
VVA	49-50	not applicable	not applicable
VAVB	49-50	not applicable	not applicable
VBR	49-50	not applicable	not applicable
NNA	57	not applicable	not applicable

Refer to Figures 2.3-1 and 2.4-6 for segment locations.
* Proposed IR-178 segments overlap with existing IR-128/180

Noise levels on segments of IR-178 include aircraft noise generated by use of IR-178 itself, combined with noise from sortie-operations on MTRs that overlap or intersect with IR-178. Noise levels account for sortie-operations by all aircraft.

For the other five primary MTRs affected under Alternative C, decreased sortie-operations would mean a lower potential for annoyance. The percentage of people who could be highly annoyed would range from less than 1 to 2 percent, in comparison with a range of 1 to 4 percent under baseline conditions.

The likelihood of experiencing overflights in the proposed Texon MOA/ATCAA is similar to that described for the proposed Lancer MOA/ATCAA in Alternative B. Randomness of operations and the varied altitude structure preclude the potential for intensive, repetitive flights over the same location. Daily sortie-operations in the proposed Texon MOA/ATCAA would average about nine per day (compared with

Studies of community response to various types of environmental noise show DNL correlates well with annoyance.

Table 4.1-16
Percent Population Potentially Highly Annoyed Under Alternative C: IR-178 and Proposed Texon MOA/ATCAA

IR-178 Segment and MOA	*Projected Percentage (Average)*		*Percentage Change from Baseline*	
	Range [1]		*Range* [1]	
AB	8	8	3	3
BC	8	8	2	2
CD-EF	8	8	1	2
FG-GH	8	8	1	2
HI	8	8	2	2
IJ-KL	8	8	3	3
LM-MN	5	6	1	2
NO-QR	3	3	1	1
RS	4	4	1	1
ST	5	5	1	1
TU-UV	3	3	1	1
VW	4	4	1	2
WX-YZ	5	6	1	2
YZ-ZAA	2	4	-2	0
AAAB-ACAD	1	1	-4	-3
ADAE-AEAF	1	1	0	0
VAVB-VBR[2]	1	2	1	2
NNA[2]	4	4	4	4
Texon MOA/ATCAA	<1	<1	<1	<1

[1] Based on differences associated with two altitude regimes for B-52s.
[2] Currently not overflown by military aircraft; new airspace.

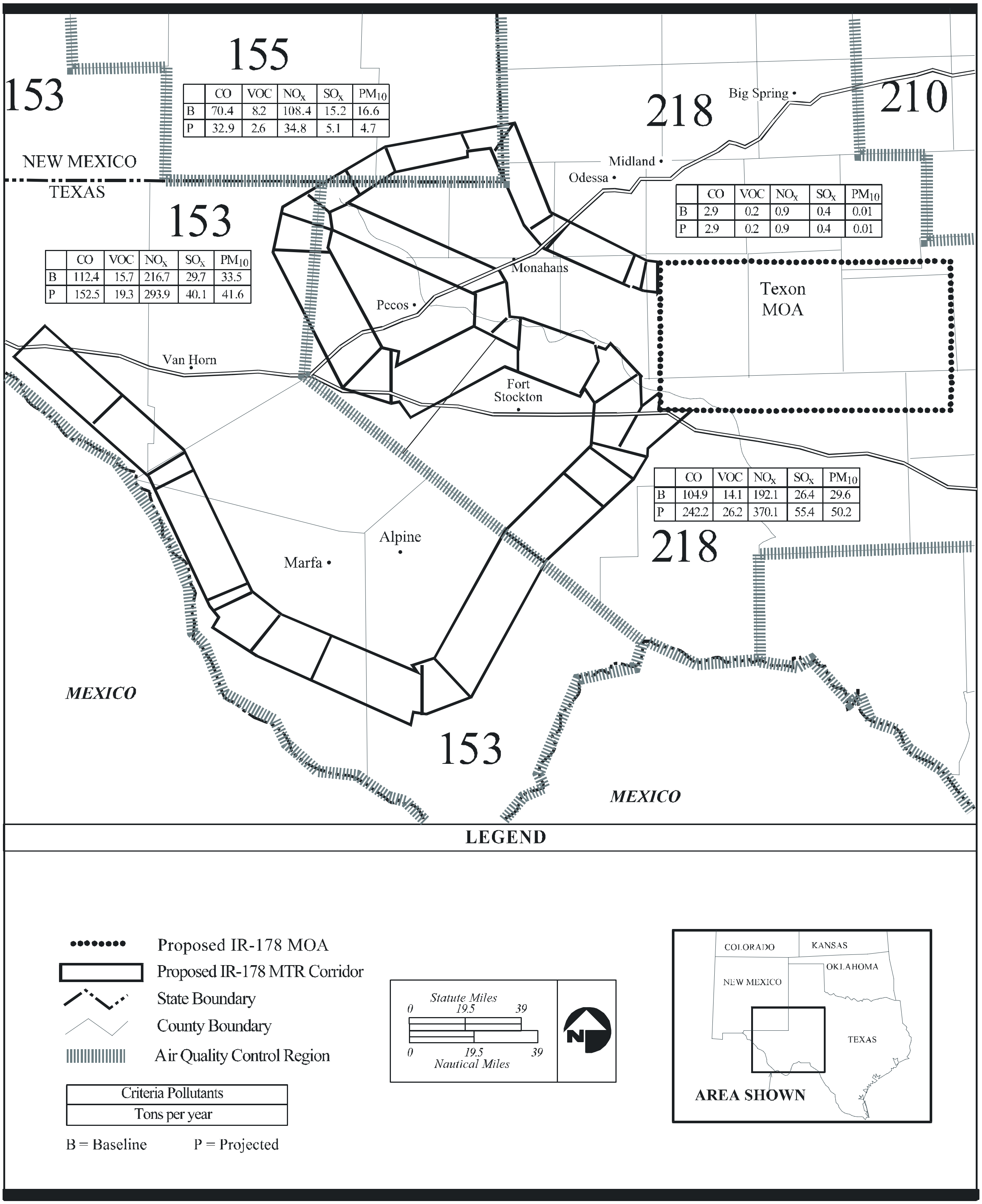
less than one under baseline). These sortie-operations would be dispersed randomly throughout the almost 18,000 cubic nm of the proposed MOA/ATCAA, with most activity occurring above 20,000 feet AGL. At that altitude, the noise from an individual bomber overflight would be low (refer to Figure 4.1-3).

Dispersal of overflights and noise would be enhanced because the segments of proposed IR-178 with the most sortie-operations would also be the widest.

Average daily sortie-operations would increase on all but five segments of proposed IR-178 (Appendix B). Increases would range from one to six more sortie-operations per day, on average. While these sortie-operations could generate noise levels (SELs) ranging from 86 to 116 dB, such events would last from 7 to 10 seconds for a person directly under the flight path. The likelihood of being overflown would vary with the widths of the MTR corridor. In Alternative C, IR-178 contains 35 segments with widths varying from 6 to 14 miles. Dispersal of overflights would be enhanced because the segments of IR-178 with the most sortie-operations would also be the widest (Appendix C, Table C-2).

AIRCRAFT EMISSIONS

Figure 4.1-15 presents the amounts of emissions projected to occur in the affected AQCRs with implementation of Alternative C. Unlike Alternative A: No-Action, AQCR 210 would not be affected in Alternative C. Total annual emissions of criteria pollutants would increase in AQCRs 153 and 218, with the greatest amount of change in the AQCR 218. Decreases in all criteria pollutant emissions would take place in AQCR 155 and 211. All of these AQCRs are in attainment for federal and state standards, and the added emissions in AQCRs 153 and 210 would be dispersed over hundreds of miles and thousands of feet of altitude. In the case of AQCR 153, emissions would be dispersed over more than 3,800 cubic nm. Such dispersal would minimize ground-level concentrations of criteria pollutants.



Alternative C: IR-178/Texon MOA Aircraft Emissions **Figure 4.1-15**

. . . Alternative C: IR-178/Texon MOA

MAILS modeling further demonstrates that Alternative C aircraft operations would not cause potential exceedences of the NAAQS or PSD Class I standards. The same analysis (refer to Table 4.1-13) used for the MAILS model for Alternative B applies to Alternative C. The segments of IR-178 with the greatest number of sortie-operations in the shortest time period and at the lowest altitude would be identical in both alternatives. Projected sortie-operations would generate only fractions of the NAAQS concentrations and PSD Class I increments and would not adversely impact air quality. No conformity determination is needed. Due to proposed shifting of the IR-178 corridor, no PSD Class I areas would be affected under this alternative.

Emissions from military aircraft would be dispersed and low in quantity.

Emissions from projected aircraft operations in the MTRs associated with the Harrison and La Junta Electronic Scoring Sites would decrease relative to current levels. All of the affected AQCRs are in attainment and these decreases in emissions would not alter those conditions. Similarly, emissions in all other primary MTRs would decrease.

The results of analysis show that emissions from the proposed sortie-operations represent a minimal percentage of the regulatory standards and all affected areas are in attainment. Consequently, Alternative C would not lead to nonconformance for any criteria pollutants and a conformity analysis is not required.

Aircraft Safety. Under Alternative C, the risks of Class A mishaps would increase and decrease in relation to changes in the numbers of sortie-operations (Table 4.1-17). In all airspace except the proposed Lancer MOA/ATCAA and IR-592, the estimated years between Class A mishaps would increase and risk would decrease. A slight increase (relative to baseline conditions) in years between Class A mishaps for B-52s and B-1s would apply to IR-178 due to the shorter total length of the MTR. The estimated years equate to 0.02 percent probability of a B-52 Class A mishap per year and a 0.07 percent probability for B-1s. The probability of a bomber Class A mishap in the Texon MOA/ATCAA and on IR-592 would be even more insignificant than for IR-178.

Aircraft safety risks would remain low in Alternative C.

Neither the existing nor proposed airspace in Alternative C overlies or intersects any major migration flyways or water bodies where birds congregate. Although sortie-operations would increase, the potential for bird-aircraft strikes in IR-178 and expanded Texon MOA/ATCAA would remain negligible. Documentation maintained by the Air Force and individual bases indicated that B-52s and B-1s experience one to two bird-aircraft strikes per year on IR-178 MTR and none within the Texon MOA. Continued use of the Bird Avoidance Model to plan and execute training sorties would likely prevent measurable increases in average bird-aircraft strikes. For the other affected MTRs and MOAs, the potential for bird-aircraft strikes would either remain at its current low level or decrease commensurate with projected sortie-operations.

Table 4.1-17
Estimated Class A Mishaps for Primary Airspace for Alternative C

Airspace	*Estimated Years Between Mishaps*			
	B-1		*B-52*	
	Baseline	*Alternative C*	*Baseline*	*Alternative C*
IR-128/180	938	NA[1]	1,847	NA[1]
IR-150	177	444	879	3,516
IR 174	194	258	2,454	NA[1]
IR-177/501	96	478	345	2,584
IR-178	14	15	39	45
IR-592	532	532	103	163
Texon MOA/ATCAA	NA[1]	27	NA[1]	583

[1] No sortie-operations in airspace unit.

4.1.5 Alternative D: IR-153/Mt. Dora MOA

AFFECTED ENVIRONMENT

The affected environment for airspace and air operations in Alternative D differs from that described for Alternatives A, B, and C. Alternative D is centered in northeastern New Mexico and interacts with numerous airspace units in that region. At the heart of this alternative is the establishment of a new MTR, IR-153, which extensively overlaps or intersects portions of 11 existing primary and secondary MTRs, including IR-109, IR-111, IR-113, VR-1175/1176, and VR-100/125 (refer to Figure 2.4-9). Collectively, these overlaps and intersections account for 89 percent of the corridor proposed for IR-153. But unlike Alternatives B and C, there is no existing IR-153 to serve as the baseline and compare with the proposed IR-153. Rather, the portions of the overlapping and intersecting MTRs coinciding with proposed IR-153 form the affected area and reflect baseline conditions. Creation of proposed IR-153 would not result in the elimination of any overlapping or intersecting MTRs. These would continue as today, and scheduling would provide the means to avoid airspace conflicts.

The affected environment for airspace and air operations is focused on northeastern New Mexico for Alternative D.

The affected environment also includes areas under new airspace not coinciding with any existing airspace. Only one complete segment (WAWB) represents wholly new airspace, although some parts of 13 other segments would be new.

The Mt. Dora MOA forms another part of the existing affected environment. Under Alternative D, the existing MOA would be reduced in size to form the proposed MOA/ATCAA. The proposed Mt. Dora MOA/ATCAA comprises 95 percent of existing airspace. As such, baseline environmental conditions for the existing Mt. Dora MOA are compared against the changes resulting from establishing the proposed MOA/ATCAA.

The affected environment includes the same six primary MTRs as in Alternatives B and C. In Alternative D, however, the structure of IR-178 does not change from baseline (refer to Figure 2.3-1). None of the secondary MTRs would be subject to structural or operational changes and warrant no detailed discussion here.

Analysis of the other alternatives in this section, including previous discussions, tables, and figures, has presented baseline information on the secondary MTRs and Mt. Dora MOA that form the focus of the affected area for Alternative D. Examples of this include Tables 4.1-4, 4.1-9, and 4.1-14, which each present data on sortie-operations and noise levels in these secondary MTRs and the Mt. Dora MOA. For these reasons, additional description of the affected environment will be presented only as comparison to the potential changes resulting from Alternative D.

ENVIRONMENTAL CONSEQUENCES

Airspace Management. Creation of IR-153 and modification of the Mt. Dora MOA/ATCAA would have little effect on airspace management. The airspace involved in this alternative consists of predominantly existing airspace and is surrounded by military airspace. Established flight procedures would still apply, and since the changes would be few, civil aviation pilots would be able to learn the new airspace quickly. The reconfigured Mt. Dora MOA and its overlying ATCAA would interact with some jet routes. Scheduling of the ATCAA by the FAA would prevent conflicts in use with that of the jet routes. The proposed Mt. Dora MOA/ATCAA would also affect two federal airways. To prevent conflicts, the FAA and Air Force would need to work on procedures to avoid conflicts when charting the MOA/ATCAA. Modification to the Mt. Dora MOA would not change its relationship to the two airfields it overlies. Existing routing and avoidance procedures would be sufficient to avoid conflicts between civil and military aviation at these airfields. Due to the changes in the airspace structure, special effort may be needed to ensure all civil aviation pilots are aware of the location of the airspace and its schedule for use. With the intersections and overlaps of multiple secondary MTRs, scheduling to prevent conflicts would be complex and challenging. This would represent a change to the current military users of the existing secondary MTRs.

Noise levels on proposed IR-153 include aircraft noise generated by use of IR-153 itself, combined with noise from sortie-operations on MTRs that overlap or intersect with IR-153. Noise levels account for sortie-operations by all aircraft.

Aircraft Noise. Table 4.1-18 shows the noise levels for all primary and secondary airspace under Alternative D. With the exception of proposed IR-153, noise levels in the other primary MTRs would decrease by 1 to 10 dB. Because proposed IR-153, not IR-178, would receive the bulk of bomber sortie-operations, noise levels in existing IR-178 would decrease by as much as 6 dB below baseline levels. Secondary MTRs would not experience any change in noise outside of where they coincide with proposed IR-153.

Noise levels on the 38 segments of IR-153 would range from less than 45 to 64 DNL (Figure 4.1-16 and Table 4.1-19) but would increase by more that 10 dB in 22 segments. Sortie-operations in the secondary MTRs forming most of the affected area for proposed IR-153 currently generate baseline noise levels ranging from less than 45 to 51 DNL. All but two segments of proposed IR-153, which remain below 45 DNL, show an increase in noise compared to current conditions, and the increases range from 1 to 18 dB. The highest noise levels and greatest degree of change would occur in the start of the route (segments AB to GH). The change in noise would be readily noticeable in the segments where a greater than 3 dB increase would occur.

Noise levels in the proposed Mt. Dora MOA/ATCAA would increase from less than 45 to 46 DNL. Minimal (less than 2 percent) new area would be exposed to aircraft noise, while airspace and its associated noise would be eliminated over a much larger area due to the change in MOA shape. With flight activities restricted to above 3,000 feet AGL, cumulative and single overflight noise would remain low.

Dispersal of overflight and noise would be limited on many segments of proposed IR-153 with the most sortie-operations since these segments would often be the narrowest.

The percentage of people who may be highly annoyed by aircraft noise could increase under all segments of proposed IR-153, in some areas substantially (Table 4.1-20). The western half of the MTR could experience 4 to 10 percent increases in the percentage of people who may be highly annoyed. Under the proposed Mt. Dora MOA/ATCAA, the percentage of highly annoyed people would remain similar to the existing Mt. Dora MOA (about 1 percent), but the total area and population overflown would be less due to the reduced total acres overlain by proposed airspace as a result of the reconfiguration. New areas would, however, be exposed to noise. Under these new sections, approximately 1 to 8 percent of the population could be highly annoyed.

The likelihood of being overflown varies depending upon the type of airspace. In the proposed Mt. Dora MOA/ATCAA, the random nature of operations and the wide span of altitudes to fly in make it unlikely that any one location would be repeatedly overflown. Daily sortie-operations in the proposed Mt. Dora MOA/ATCAA would average 10 per day as compared to just more than one per day under baseline conditions. These operations would be dispersed randomly throughout the almost 18,000 cubic nm of the proposed MOA/ATCAA, with most activity occurring above 20,000 feet AGL. At that altitude, the noise from an individual bomber overflight would be low (refer to Figure 4.1-3).

Average daily sortie-operations would increase on all but three segments of proposed IR-153 (Appendix B). Increases would range from one to ten more sortie-operations per day, on average, compared with baseline. These sortie-operations could generate

Table 4.1-18
Projected Average Daily Sortie-Operations and Noise Levels Alternative D: IR-153/Mt. Dora MOA

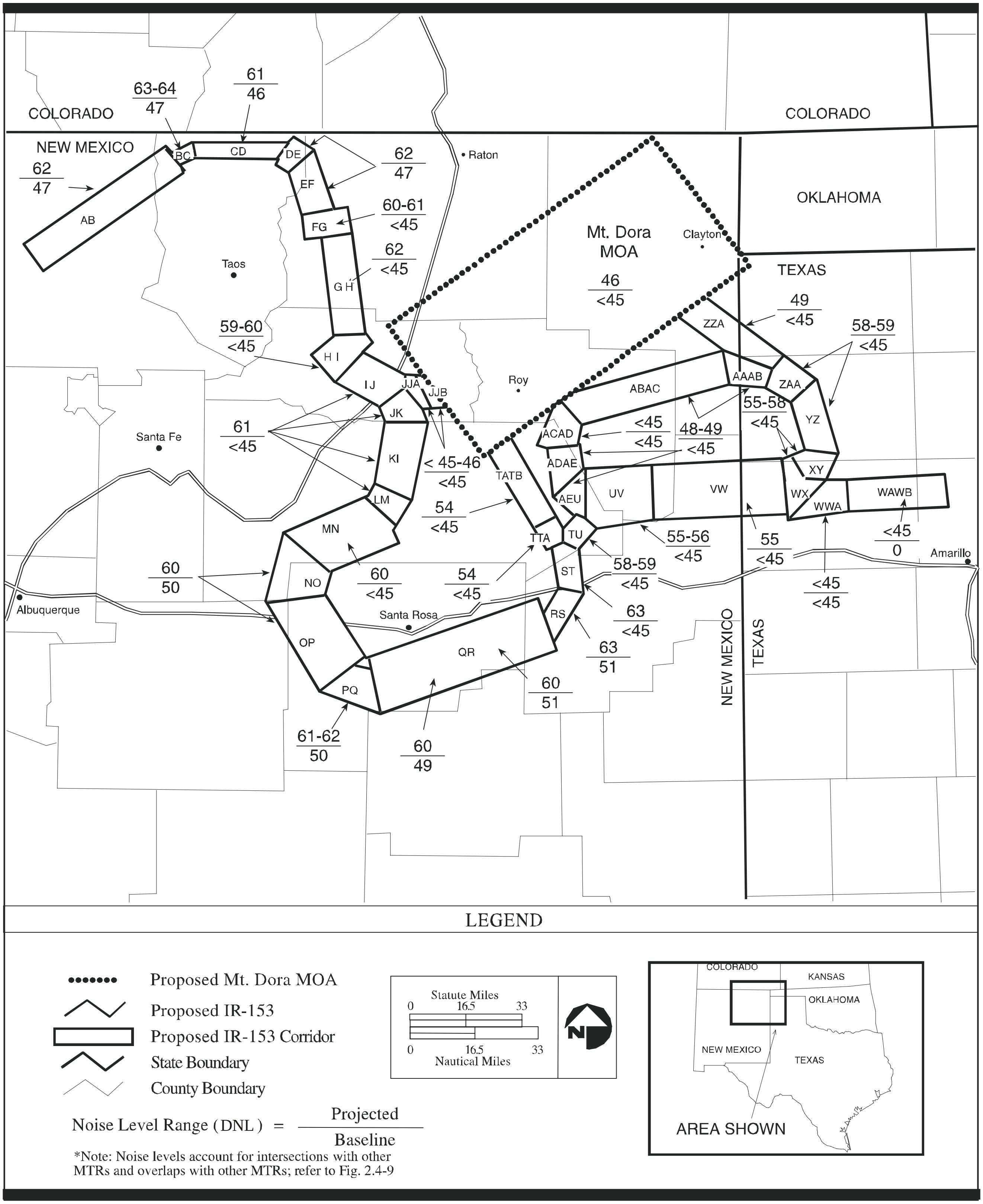
Airspace Units	*Class*	Alternative D			*Baseline Noise Level (DNL)*	*Change from Baseline*
		Annual Sortie-Operations	*Average Daily Sortie-Operations*	*Noise Level (DNL)*		
MTRs						
VR-100/125	S	1,265	5	49	49	0
VR-108	S	143	1	<45	<45	0
VR-114	S	1,014	4	<45	<45	0
VR-143	S	620	2	49	49	0
VR-186	S	1,175	5	50	50	0
VR-196/197	S	512	2	<45	<45	0
VR-1107/1195	S	1,050	4	<45	<45	0
VR-1116	S	30	0	<45	<45	0
VR-1175/1176	S	50	0	46	46	0
IR-107	S	104	0	<45	<45	0
IR-109	S	310	1	<45	<45	0
IR-110	S	0	0	NA	NA	0
IR-111	S	130	1	<45	<45	0
IR-113	S	300	1	<45	<45	0
IR-123	S	50	<1	<45	<45	0
IR-124	S	140	1	<45	<45	0
IR-128/180	**P**	**150**	**1**	**<45**	**46**	-1
IR-150	**P**	**10**	**<1**	**<45**	**55**	-10
Proposed IR-153	**P**	**2,660**	**10**	**64**[1]	**NA**	0
IR-154	S	70	<1	<45	<45	0
IR-169	S	465	2	<45	<45	0
IR-174	**P**	**121**	<1	**48**	**51**	-3
IR-177/501	**P**	**10**	<1	**<45**	**56**	-11
IR-178	**P**	**205**	1	**55**	**61**	-6
IR-192/194	S	658	3	49	49	0
IR-592	**P**	**340**	1	**48**	**50**	-2
MOAs						0
Reese 4	S	0	0	NA	<45	0
Reese 5	S	0	0	NA	<45	0
Roby	S	0	0	<45	<45	0
Texon	S	100	<1	<45	<45	0
Proposed Mt. Dora	**P**	**2,668**	**10**	**46**	**<45**	1

Class P = Primary airspace used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.

Class S = Secondary airspace unit intersects with primary airspace unit used by B-1s from Dyess AFB and/or B-52s from Barksdale AFB.

[1] Noise level represents the highest DNL for any segment of the route; all other segments are equal to or lower.

Noise levels on all six existing primary MTRs would decrease under Alternative D.



Alternative D: IR-153/Mt. Dora MOA Noise Level Range **Figure 4.1-16**

Table 4.1-19
Projected Noise Levels for Alternative D: IR-153

Proposed IR-153 Segment	*Projected Noise Level Range (DNL)*	*Baseline Noise Level (DNL)*	*Proposed IR-153 Segment*	*Projected Noise Level Range (DNL)*	*Baseline Noise Level (DNL)*
AB	62	47	TU	58-59	<45
BC	63-64	47	UV	55-56	<45
CD	61	46	VW	55	<45
DE	62	47	WX	55-58	<45
EF	62	47	XY	55-58	<45
FG	60-61	<45	YZ	58-59	<45
GH	62	<45	ZAA	58-59	<45
HI	59-60	<45	AAAB	48-49	<45
IJ	61	<45	ABAC	48-49	<45
JK	61	<45	ACAD	<45	<45
KL	61	<45	ADAE	48-49	<45
LM	61	<45	AEU	48-49	<45
MN	60	<45	TTA	54	<45
NO	60	50	TATB	54	<45
OP	60	50	ZZA	49	<45
PQ	61-62	50	WWA	<45	<45
QR_a	60	49	WAWB	<45	not applicable
QR_b	60	51	JJA	<45-46	<45
RS	63	51	JAJB	<45-46	<45
ST	63	<45			

Refer to Figure 2.4-9 for segment locations. a & b = multiple intersections within the segment

Table 4.1-20
Percent Population Potentially Highly Annoyed Under Alternative D: IR-153 and Proposed Mt. Dora MOA/ATCAA

IR-153 Segment and MOA	*Projected Percentage (Average)*		*Percentage Change from Baseline*	
	Range[2]		*Range*[2]	
AB	8	8	7	7
BC	10	11	9	10
CD	7	7	6	6
DE-EF	8	8	7	7
FG	7	7	6	6
GH	8	8	8	8
HI	6	7	5	6
IJ-QR	7	7	5	6
RS-ST	10	10	8	9
TU	5	6	4	5
UV-XY	3	4	2	3
YZ-ZAA	5	6	4	5
AAAB-AEU	1	1	0	0
TTA-TATB	3	3	2	2
WWA	<1	1	0	0
WWA-WAWB[1]	1	1	1	1
JAJB	<1	<1	0	0
Mt. Dora MOA/ATCAA	<1	1	0	0

1 Currently not overflown by military aircraft; new airspace.
2 Based on differences associated with two altitude regimes for B-52s.

Studies of community response to various types of environmental noise show DNL correlates well with annoyance.

noise levels (SELs) ranging from 86 to 116 dB, the same as under baseline conditions. Such events could last from 7 to 10 seconds for a person directly under the flight path.

Proposed IR-153 flights would be dispersed within the MTR corridor, and dispersion of flights across an MTR increases with route width (Wyle 1996). Proposed IR-153 segments would vary in width from 4 to 5 miles with 31 (of 38 segments) being 8 nm wide or wider. Dispersal of the overflights would be limited in many of the segments of proposed IR-153 with the most daily sortie-operations. For example, segments BC to CD would be 4 nm wide and support 2,660 sortie-operations.

Emissions from military aircraft would contribute only fractions of allowable amounts under federal standards.

Aircraft Emissions. Figure 4.1-17 presents the amounts of emissions projected to occur in the affected AQCRs with implementation of Alternative D. Total annual emissions would increase in AQCRs 153, 154, 155, 157, and 210, with the greatest amount of change in AQCR 154. All of these AQCRs are in attainment, and the added emissions, as demonstrated through MAILS modeling, would not alter those conditions.

MAILS modeling demonstrates that Alternative D aircraft operations would not cause potential exceedences of the NAAQS or PSD Class I areas. Rather, the concentrations of pollutants would be negligible to minimal. Segments E-H, with 2,660 B-52 and B-1 sortie-operations was used to model. Although some sortie-operations fly at much higher altitudes, it was assumed that all would fly at 300 feet AGL to yield a conservative estimate. As shown in Table 4.1-21, projected sortie-operations would generate only fractions of the NAAQS concentrations and PSD Class I increments and would not adversely impact air quality. All of the affected AQCRs are in attainment for the NAAQS, and emissions under Alternative D would not change this status. As such, no conformity determination is required. No PSD Class I areas underlie or abut IR-153 or the Mt. Dora MOA, so air emissions from the sortie-operations would not affect visibility in these areas.

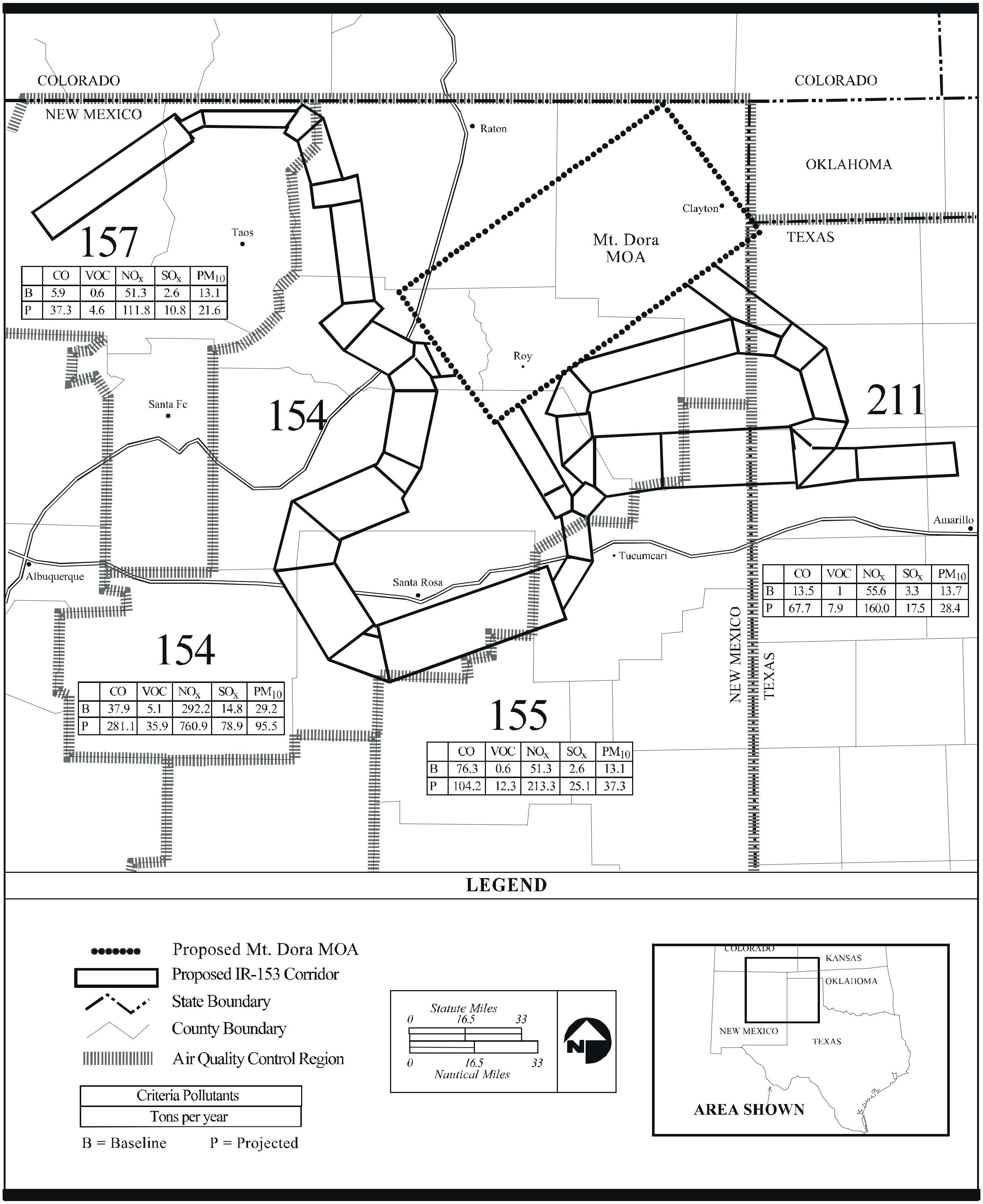
Emissions from projected aircraft operations in the other MTRs and MOAs, including the MTRs associated with the Harrison and La Junta Electronic Scoring Sites, would decrease relative to current levels. Since these MTRs overlie areas that are in attainment, the decrease in emissions would not change that condition.

The results of analysis show that emissions from the proposed operations represent a fraction of the NAAQS and all affected areas are in attainment. Consequently, Alternative D would not lead to nonconformance for any criteria pollutants, and a conformity analysis is not required.

Aircraft safety risks would remain low under Alternative D.

Aircraft Safety. Under Alternative D, the potential for Class A mishaps would remain low (Table 4.1-22). Since proposed IR-153 does not currently exist, it is difficult to draw direct comparisons of baseline and projected mishap potential. Secondary MTRs that overlap or intersect segments of proposed IR-153 do provide a rough comparison. Estimated years between Class A mishaps on these routes range from 22 to 2,800. For proposed IR-153, estimated years between Class A mishaps for B-52s would fall into this range, whereas the potential for B-1s would be slightly greater. However, when considered as probabilities, the estimated years equate to a 0.02 probability of a B-52 Class A mishap per year and a 0.07 probability for B-1s. Probabilities in the Mt. Dora MOA and other affected airspace units would be even less.

Airspace in Alternative D overlies or intersects a migration flyway that follows the Rio Grande River where birds could congregate. But even with increases in sortie-operations, the potential for bird-aircraft strikes in IR-153 and modified Mt. Dora MOA would be negligible. Historical trends for the secondary MTRs that overlap and intersect proposed IR-153 reveal that few bird-aircraft strikes occur. Use of Bird



157

	CO	VOC	NO_x	SO_x	PM_{10}
B	5.9	0.6	51.3	2.6	13.1
P	37.3	4.6	111.8	10.8	21.6

211

	CO	VOC	NO_x	SO_x	PM_{10}
B	13.5	1	55.6	3.3	13.7
P	67.7	7.9	160.0	17.5	28.4

154

	CO	VOC	NO_x	SO_x	PM_{10}
B	37.9	5.1	292.2	14.8	29.2
P	281.1	35.9	760.9	78.9	95.5

155

	CO	VOC	NO_x	SO_x	PM_{10}
B	76.3	0.6	51.3	2.6	13.1
P	104.2	12.3	213.3	25.1	37.3

Alternative D: IR-153/Mt. Dora MOA Aircraft Emissions **Figure 4.1-17**

Table 4.1-21
Criteria Pollutant Concentrations for IR-153 Alternative D: IR-153 and Mt. Dora MOA/ATCAA

		Concentration (µg/m³)				
Criteria Pollutant	*Averaging Period*	*PSD Class I Increments*[1]	*NAAQS*	*Affected Airspace*	*Percentage of PSD Class I Increment (%)*	*Percentage of the NAAQS (%)*
Nitrogen Dioxide (NO_2)	Annual	2.5	100	0.059	2.36	0.059
Particulate Matter (PM_{10})[2]	24-hour	10[3]	150[3]	0.032	0.320	0.021
	Annual	5	50	0.008	0.160	0.016
Sulfur Dioxide (SO_2)	3-hour	25[3]	1,300[3]	0.158	0.632	0.012
	24-hour	5[3]	365[3]	0.031	0.618	0.008
	Annual	2	80[3]	0.008	0.400	0.010
Carbon Monoxide (CO)	1-hour	--	40,000[3]	2.26	0.006[4]	0.006
	8-hour	--	10,000[3]	0.173	0.002[4]	0.002

[1] The PSD Class I increments for particulates are for TSP.
[2] The NAAQS for particulates is for PM_{10}.
[3] Not to be exceeded more than once per year.
[4] As a percentage of the NAAQS.

. . .Alternative D: IR-153/Mt. Dora MOA

Table 4.1-22
Estimated Class A Mishaps for Primary Airspace for Alternative D

Airspace	*Estimated Years Between Mishaps*			
	B-1		*B-52*	
	Baseline	*Alternative D*	*Baseline*	*Alternative D*
IR-128/180	938	NA[1]	1,847	NA[1]
IR-150	177	7,100	879	14,000
Proposed IR-153	NA	15	NA	44
IR 174	194	258	2,454	NA[1]
IR-177/501	96	5,250	345	10,800
IR-178	14	93	39	960
IR-592	532	532	103	190
Mt. Dora MOA/ATCAA	8,292	27	22,900	583

[1] No sortie-operations in airspace unit.

Avoidance Model for planning and flying training sorties is expected to keep strikes to a minimum. For the other affected MTRs and MOAs, the potential for bird-aircraft strikes would either remain at its current low level or decrease commensurate with projected sortie-operations.

4.1.6 Summary Comparison of Impacts

Table 4.1-23 compares the impacts for all four alternatives with regard to airspace management, noise, aircraft emissions, and aircraft safety. None of the alternatives would have more than minimal effects on airspace management, air quality, and aircraft safety. Alternative D would result in the greatest amount of change from baseline conditions.

Table 4.1-23
Airspace and Aircraft Operations Comparison of Alternatives

Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
Airspace Management	No change to airspace structure or management; scheduling and FAA procedures designed to prevent conflicts between military and civil aviation.	Proposed IR-178 would include about 15 percent new airspace and the proposed Lancer MOA/ATCAA would include about 10 percent new airspace. A total of 29 segments of existing IR-178 eliminated in New Mexico, but FAA would need to ensure conflicts between proposed ATCAA and intersecting jet routes are avoided.	Proposed IR-178 would include about 20 percent new airspace and the proposed Texon MOA/ATCAA would include about 25 percent new airspace. A total of 29 segments of existing IR-178 eliminated in New Mexico. Minimal potential for conflicts with VFR civil aviation, but conflicts between proposed MOA/ATCAA and intersecting jet routes and federal airways would require rerouting and possibly airspace restructuring.	Proposed IR-153 would include about 10 percent new airspace and the proposed Mt. Dora MOA/ATCAA would include less than 5 percent new airspace. Minimal potential for conflicts with civil airfields, but the proposed Mt. Dora MOA/ATCAA would intersect jet routes and federal airways, thus requiring increased airspace management. Establishment of proposed IR-153 would affect current military users of existing secondary MTRs it overlaps or intersects.
Noise	Noise levels on existing IR-178 range from less than 45 to 61 DNL. Of a total of 71 IR-178 segments, three have noise levels of less than 45 DNL and 30 have noise levels of 55 DNL or greater. Noise levels in other primary and secondary MTRs range from less than 45 DNL to 56 DNL. Noise levels of less than 45 DNL characterize the MOAs. Average daily sortie-operations on IR-178 combined with activity on segments of overlapping or intersecting MTRs range from 1 to 6, depending upon the segment.	Noise levels on proposed IR-178 would range from 46 to 61 DNL. Of a total of 41 segments on proposed IR-178, none has noise levels of less than 45 DNL and 28 have noise levels of 55 DNL or greater. Noise levels in the proposed Lancer MOA/ATCAA would remain low, but increase to 46 DNL. Noise levels in other primary and secondary MTRs and MOAs either decrease or remain the same. Average daily sortie-operations on proposed IR-178 combined with activity on segments of overlapping or intersecting MTRs would range from 1 to 10, and would increase on all but five segments; increases would range from 1 to 6 daily sortie-operations.	Noise levels on proposed IR-178 would range from 46 to 61 DNL. Of a total of 35 segments on proposed IR-178, none has noise levels of less than 45 DNL and 25 have noise levels of 55 DNL or greater. Noise levels in the proposed Texon MOA/ATCAA would remain low, but increase to 46 DNL. Noise levels in other primary and secondary MTRs and MOAs either decrease or remain the same. Average daily sortie-operations on proposed IR-178 combined with activity on segments of overlapping or intersecting MTRs would range from 1 to 10, and would increase on all but five segments; increases would range from 1 to 6 daily sortie-operations.	Noise levels on proposed IR-153 range from less than 45 to 64 DNL. Of a total of 38 segments on proposed IR-153, 3 have noise levels of less than 45 DNL and 26 have noise levels of 55 DNL or greater. Noise levels in the proposed Mt. Dora MOA/ATCAA would remain low, but increase to 46 DNL. Noise levels in other primary and secondary MTRs and MOAs either decrease or remain the same. Average daily sortie-operations on proposed IR-153 combined with activity on segments of overlapping or intersecting MTRs would range from 1 to 24, and would increase on all but three segments; increases would range from 1 to 10 daily sortie-operations.

Table 4.1-23 (continued)
Airspace and Aircraft Operations Comparison of Alternatives

Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
Aircraft Emissions	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants are fractions of federal and state standards.	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants would be fractions of federal and state standards.	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants would be fractions of federal and state standards.	Aircraft emissions produce minimal quantities of criteria pollutants, and ground-level concentrations of pollutants would be fractions of federal and state standards.
Aircraft Safety	The probability of a B-1 Class A mishap on IR-178 is 0.07 percent per year and for B-52s, the probability is 0.03 percent. The probabilities of Class A mishaps in all other primary airspace are even lower.	The probability of a B-1 Class A mishap on proposed IR-178 would be 0.08 percent per year and for B-52s, the probability would be 0.03 percent. The probabilities of Class A mishaps in all other primary airspace would be even lower.	The probability of a B-1 Class A mishap on proposed IR-178 would be 0.07 percent per year and for B-52s, the probability would be 0.02 percent. The probabilities of Class A mishaps in all other primary airspace would be even lower.	The probability of a B-1 Class A mishap on proposed IR-153 would be 0.07 percent per year and for B-52s, the probability would be 0.02 percent. The probabilities of Class A mishaps in all other primary airspace would be even lower.
Construction	No Effect	No Effect	No Effect	No Effect
Ground Operations	No Effect	No Effect	No Effect	No Effect
Decommissioning	No Effect	No Effect	No Effect	No Effect

4.2 LAND MANAGEMENT AND USE

Land management and use considers a spectrum of linked characteristics of the land, both actual and perceived. Lands have different values for different people. To some, lands and the resources they contain have an economic value; to others, lands have spiritual or psychological value. When considering long-term traditional lifestyles, people ascribe both types of values to lands. Because different people have different opinions on the values of the same lands, it is not possible to capture, describe, and analyze all of these different viewpoints in this EIS. Rather, it considers available standard definitions of land uses to permit comparison among alternatives.

4.2.1 Methods and Approach

Land use generally refers to human modification of land, often for residential or economic purposes. It also refers to use of land for preservation or protection of natural resources such as wildlife habitat, vegetation, unique features, or for recreational pursuits. The attributes of land use include general land use and ownership, special use land areas, and land management plans. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of uses that are allowable or protect specially designated or environmentally sensitive uses. Special use land management areas require greater protection (e.g., wild and scenic rivers, wilderness areas).

Another aspect of the land is its visual setting. Visual resources are defined as the natural and manufactured features that make up the aesthetic qualities of an area. These features form the overall impressions that an observer receives of an area or its landscape character. Landforms, water surfaces, vegetation, and man-made features are considered characteristic of an area if they are inherent to the structure and function of the landscape. What a change in visual character means is influenced by social considerations, including public value placed on the resource, public awareness of the area, and general community concern for visual resources in the area. These social considerations equate to visual sensitivity, which is defined as the degree of public interest in a visual resource and concern over potential adverse changes in the quality of that resource.

The affected area for land use, recreation, and visual resources for the four alternatives consists of the vicinity of the candidate emitters and Electronic Scoring Sites, as well as the land under affected airspace. For the candidate emitters and Electronic Scoring Sites, analysis focuses on land ownership, human-modified land use, and the visual environment. The primary potential effects of aircraft overflights on adjacent or underlying land uses are the noise and visual presence associated with aircraft operations. For the areas under affected airspace, the effects on communities and special use land management areas are examined.

An adverse impact on land use, including recreation, occurs when a proposed action precludes an existing land use activity; preempts a recreational use; precludes continued use or occupation of an area; is incompatible with adjacent or vicinity land use to the extent that public health or safety is threatened; or is inconsistent or in noncompliance with applicable land use plans or policies. An adverse visual impact occurs when an action perceptibly changes features of the physical environment so that they no longer appear characteristic of the region or an action blocks or removes aesthetic features of the landscape from view. The visual resource impact analysis focuses on identifying changes to the visual qualities of the landscape as a result of construction of the emitters and Electronic Scoring Sites and determining alteration of the visual setting under the airspace resulting from aircraft overflight.

Proposed increases in bomber flight activities represent the primary element of the three action alternatives (Alternatives B, C, and D) for RBTI. Increased aircraft noise would accompany the changes in flight activities. For this reason, a brief discussion of ways to evaluate the effects of noise on land use is presented below.

Noise Effects on Communities and Land Use

The effects of noise on people result from a complex interrelationship among numerous factors, including social/cultural effects; heath effects; and economic effects. As more fully discussed in Section 4.1 and Appendix G, the primary effect of aircraft noise on exposed communities is one of annoyance.

The Federal Interagency Committee on Noise (FICON) offers recommendations regarding noise and land use.

In June 1980, the Federal Interagency Committee on Urban Noise published guidelines (FICUN 1980) relating DNL values to compatible land uses. This committee was composed of representatives from the U.S. Departments of Defense, Transportation, and Housing and Urban Development; the USEPA; and the Veterans Administration. Since their issuance, federal agencies have generally adopted these guidelines for noise analyses. Most agencies have identified 65 DNL as a criterion that protects those most affected by noise and that can often be achieved on a practical basis. At this noise level, about 12 percent of the exposed population could be highly annoyed by noise. In general, noise exposure greater than 65 DNL over residential, recreational, cultural, and entertainment areas, as well as public services, is considered unacceptable (FICON 1992). While these FICON recommendations are most often applied to areas around airports, they can be helpful in understanding the potential effects of aircraft noise in MTRs and MOAs.

Another way to evaluate noise effects on land use is to assess the amount of change in noise levels that would occur as a result of an action. As explained in Section 4.1 and Appendix G, human perception of noise can vary greatly. However, in general, most people can clearly notice a change of 3 dB. Changes of 3 dB or more, even below 65 DNL, can be perceived by people as a degradation of their noise environment (FICON 1992) or negatively affecting their quality of life.

Noise Effects on Recreation

A Forest Service study found that visitors to wilderness areas generally did not notice aircraft noise.

Individuals experience aircraft-generated noise interference with recreational activities (including camping, hiking, and hunting) in many ways. Reactions vary depending upon individual expectations and the context in which the overflight occurs. A study conducted by the U.S. Forest Service (USFS 1992) indicates that aircraft noise intrusions were not generally noticed by wilderness area visitors. However, if noticed, low-altitude, high-speed aircraft were reported as the most annoying types of aircraft to hear or see. This finding was largely attributable to the "startle effect." The startle effect occurs when a very loud noise is experienced in a setting where it is not expected and when there is no visual or audible warning. In primitive back-country areas, the startle effect can negatively affect wilderness and solitude experiences. Conversely, observation of aircraft overflights can appeal to some members of the public and be considered a positive experience.

There is little evidence that hunting leases and the hunting experience would be negatively impacted by military overflights (Trail and Rollins, personal communication 1999; USAF 1980). While individual game animals may be startled by aircraft noise, especially those unaccustomed to the overflights, results of numerous studies suggest (see section 4.3 and Appendix G) that populations of animals would not be significantly affected. The behavior of game animals would not be expected to change in a way that hunting would be affected. While individual hunters may be startled and annoyed by intermittent aircraft overflights, there is little evidence to suggest that hunters as a group would modify or cease their hunting activities as a result of the RBTI alternatives.

For example, a MOA and several MTRs overfly Sutton County. Laughlin MOA had over 9,500 sortie-operations in 1997 and over 4,000 sortie-operations in 1998. The MTRs include portions of IR-123, VR-143, and SR-282 and account for 1,002 sortie-operations in 1997 and 2,226 sortie-operations in 1998. The MOA and MTRs overlie most of Sutton County; a county that has historically received revenues from hunting leases (Ward 1985). Hunting, therefore, has existed at the same time as thousands of sortie-operations have occurred, and these operations have neither frightened wildlife away nor dissuaded hunters from visiting the area.

4.2.2 Alternative A: No-Action

AFFECTED ENVIRONMENT

The affected environment includes the primary MTR and MOA airspace used by bombers from Barksdale and Dyess AFBs (see section 2.3.1). The analysis of Alternative A focuses on existing IR-178 and to a lesser degree, IR-128/180, which overlaps substantially with IR-178. MOAs considered include the Reese 4, Reese 5, Roby, and Mt. Dora. Secondary airspace is considered only to the extent it overlaps or intersects primary airspace. The affected environment also includes the existing Harrison and La Junta Electronic Scoring Sites.

Airspace and Flight Operations. Airspace primarily used by bombers from Barksdale and Dyess AFBs is located in western Texas and southeastern and east central New Mexico. The existing airspace is discussed in detail and shown in Sections 2.2 and 4.1. The land under the affected airspace is characterized by large, sparsely inhabited areas with scattered, isolated towns, small communities, and ranches. Land in the area is owned and managed by a variety of entities, including private owners, the states of Texas and New Mexico, and federal agencies. In Texas, private ownership predominates. The primary land uses outside population centers are livestock grazing and crop production.

Airspace associated with Alternative A overlies portions of western Texas and southeastern and east central New Mexico. This area encompasses parts of four visually related regions: High Plains; Llano Estacado; Edwards Plateau; Trans-Pecos; and Big Bend Country that are described in detail in Chapter 3. Alternative A airspace overlies the scenic Davis Mountains and portions of the Texas Mountain Trail, a designated State Scenic Route through western Texas. The trail follows portions of Interstate 10, U.S. Highways 54, 90, 67, and State Route 118. Alternative A airspace also overlies the five special use land management areas mentioned above.

Approximately 77 percent of the land under the affected primary airspace in Texas and New Mexico is privately owned rangeland used for livestock grazing (Figure 4.2-1). Agricultural crop production makes up about 22 percent of land use. Forest, surface water/wetland, and urban/built-up areas make up less than 1 percent each.

Communities included in this analysis consist of incorporated towns and cities, county seats, or towns as large as county seats.

The majority of the area under the airspace is in private ownership with a variety of state and federal interests overseeing the remainder. Table 4.2-1 lists the communities underlying existing IR-178 and the primary MOAs. Communities included in this analysis consist of those denoted as incorporated or as county seats and those as large as a county seat. For Sierra Blanca, baseline noise levels are 56 DNL. All other communities under IR-178 are subject to noise levels of less than 55 DNL. Under the MOAs, noise levels are less than 45 DNL. FAA regulations and Air Force instructions require all aircraft to avoid congested areas such as these by 1,000 feet above the obstruction and within 2,000 feet horizontal radius of the aircraft. These avoidance procedures reduce the noise levels from overflights (refer to Section 4.1).

. . . Alternative A: No-Action

Minimum flight altitude for B-52s and B-1s is 300 feet AGL.

Table 4.2-1
Communities Under Alternative A: IR-178 and Primary MOAs

MTR/MOA	*Community*
IR-178	Texas: Sierra Blanca, Grandfalls, Balmorhea, Plains, Imperial
Reese 4 MOA	Texas: Post, Slaton, Tahoka, O'Donnell, Wilson
Reese 5 and Roby MOAs	Texas: Gail, Roby, Rotan, Lamesa, Hermleigh
Texon MOA	Texas: Big Lake, Texon, Best, Rankin
Mt. Dora MOA	New Mexico: Clayton, Roy, Wagon Mound, Capulin, Mt. Dora, Abbott

Three special use land management areas underlie IR-178 and the MOAs in Texas under Alternative A (Table 4.2-2 and Figure 4.2-2). These areas offer a wide range of recreational opportunities including hiking, camping, boating, picnicking, wildlife viewing, and others. Recreational use tends to be greatest from the spring to fall months. Two special use land management areas underlie the existing Mt. Dora MOA: Capulin Volcano National Monument and segments of the Santa Fe National Historic Trail.

Table 4.2-2
Special Use Land Management Areas Under Alternative A: IR-178 and Primary MOAs

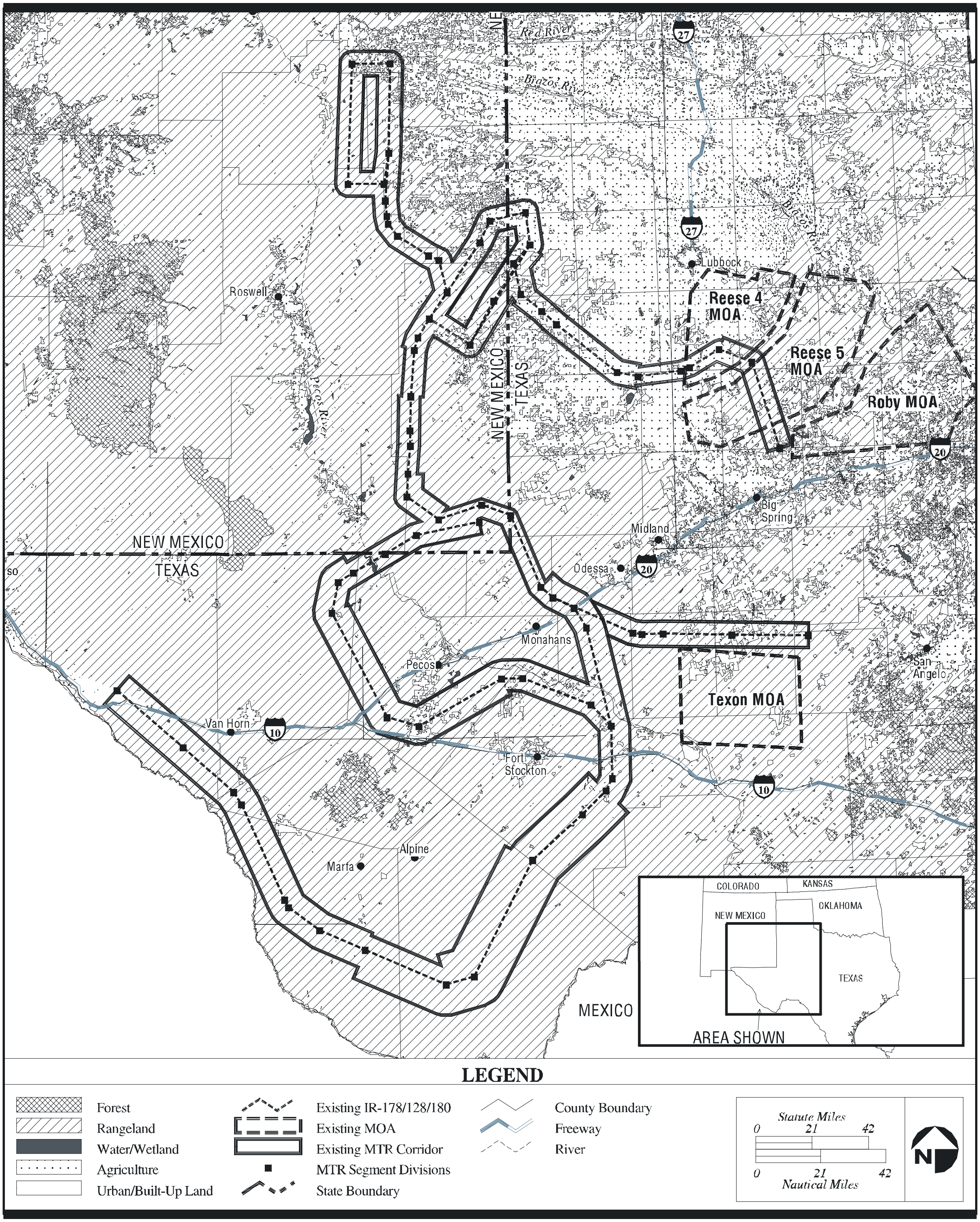
MTR Segment	*Minimum Flight (feet AGL)*	*Minimum Flight Altitude Area*	*Acreage Under Airspace*	*Noise Levels (DNL)*
IR-178, FG	300	Chinati Mountains Property[1]	795	58-59
IR-178, HI	300	Big Bend Ranch State Park	39	58
IR-178, JK	300	Big Bend National Park	3,702	57
		Total	4,536	

Refer to Figure 2.3-1 for segment locations.
[1]Currently not accessible to the public.
Source: UCSB 1996.

MTRs associated with the Harrison (IR-174, IR-592) and La Junta (IR-150, IR-177/501) Electronic Scoring Sites predominantly overlie rural lands. As mentioned in Section 4.1, military jet aircraft have been flying in the affected area for more than four decades. Low-level, high speed aircraft are part of the existing environment. Over the years, the Air Force has established special operating procedures to avoid overflight of specific locations considered to be sensitive to aircraft noise. These procedures are published in *AP/1B, Area Planning for Military Training Routes, North and South America*.

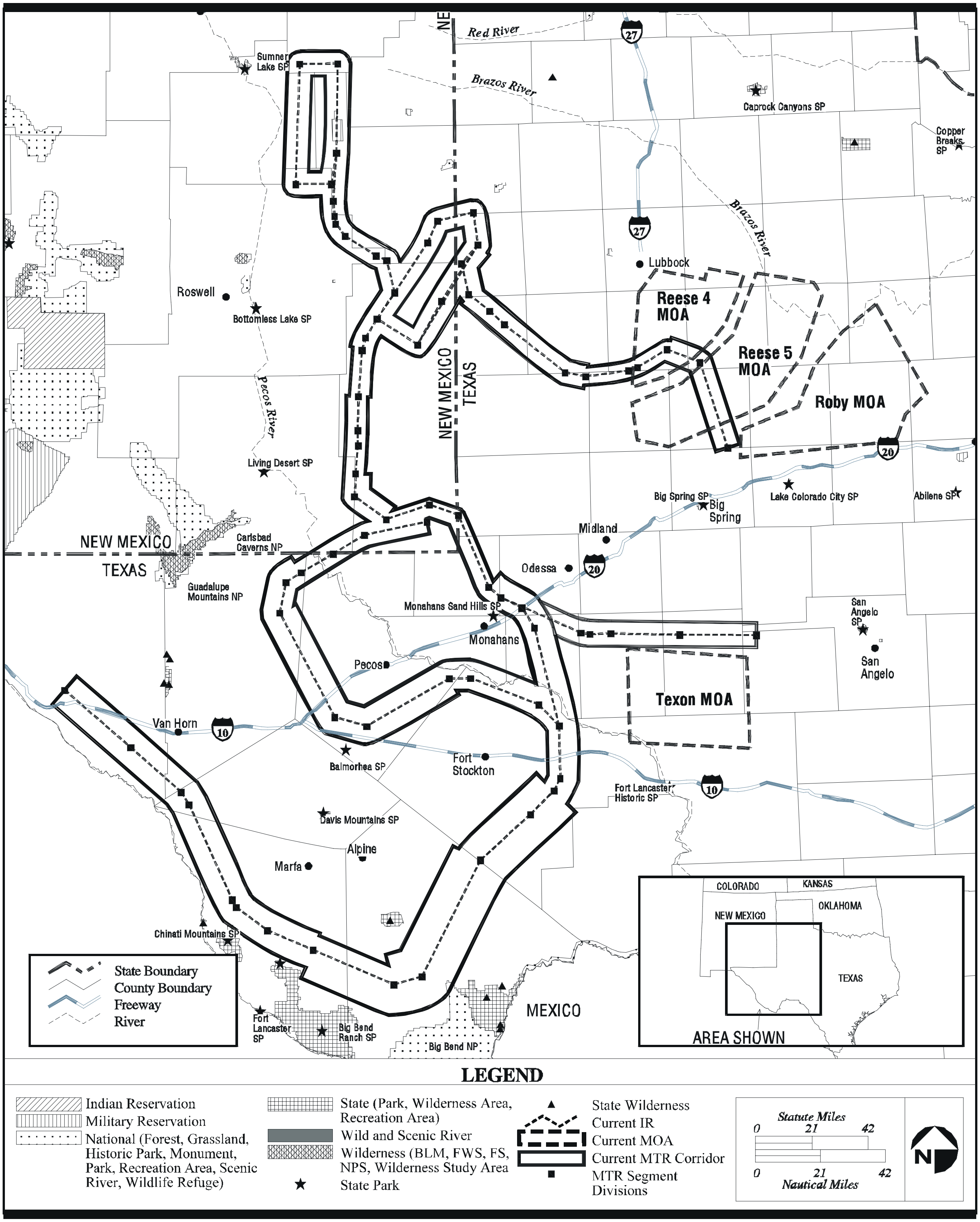
Noise levels vary from 46 DNL for IR-128/180 to 61 DNL for IR-178. Current average daily sortie-operations in the most heavily used MTR, IR-178, range from 1 to 6 (refer to Appendix B, Table B-5). Analysis of existing aircraft-related noise indicates that current noise levels along IR-178 range from less than 45 to 61 DNL (refer to Figure 4.1-10), depending on the number of sortie-operations, segment width, and altitude regimes flown. Noise levels below the primary MOAs associated with this alternative are less than 45 DNL. Based on the analysis presented in Section 4.1, noise levels under existing IR-178 could result in approximately 1 to 7 percent of the population being highly annoyed, and about 1 percent of the population under the MOAs being highly annoyed.

The effect of aircraft overflights on the visual environment of an area is difficult to quantify. In most instances, aircraft are not noticed because of visual cues, rather, they are noticed after being heard. The nature of the impact depends on the sensitivity of the resource affected, the distance from which it is viewed, and the



Existing Land Use Under Alternative A: No-Action

Figure 4.2-1



Special Use Land Management Areas Under Alternative A: No-Action

Figure 4.2-2

length of time it is visible. Altitude and screening relative to the viewer also play a key role in determining impacts from aircraft overflights. For example, in the level plains characterizing some of the land under Alternative A airspace, aircraft are more visible than in heavily wooded or mountainous areas. However, it should be noted that observations of aircraft are not exclusively considered negative regardless of an individual's location and/or activity.

Electronic Scoring Sites. Two existing Electronic Scoring Sites would continue to be used under the No-Action Alternative: Harrison, Arkansas and La Junta, Colorado. The Harrison site is located in Boone County, outside the city limits of Harrison, Arkansas. This privately owned site is leased and managed by the Air Force. The site contains a one-story facility and radar equipment trailers. The facility is located on a small hill in an area of gently rolling hills. Adjacent land use is primarily agricultural and consists of small farms used for the production of forage crops and cattle. Grasslands make up the dominant vegetation in the area. Associated with this facility are four emitter sites located in Baxter and Marion Counties, Arkansas, and Howell and Taney Counties, Missouri. These sites are located in rural rangeland, agricultural, and residential areas. No recreational activities take place at any of the sites since they are fenced and not accessible to the public.

The La Junta site is located in Otero County, Colorado, owned by DoD, and managed by the Air Force. The site contains a one-story brick building and radar equipment trailers. The site is located adjacent to an airport in an area of light industrial uses. Land uses beyond the light industrial area are primarily agricultural. The topography surrounding the La Junta site is primarily flat, and the visual environment is typical of light industrial areas, including warehouses and office buildings. Associated with this facility are four emitter sites located on private land leased by the Air Force in Bent and Las Animas Counties, Colorado. These sites are located in rural rangeland, agricultural, and residential areas. No recreational activities take place at any of the sites since they are fenced and not accessible to the public.

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Under the No-Action Alternative, the existing aircraft operations would continue at current levels in the affected airspace. There would be no change in existing land ownership or use underlying the airspace. Therefore, no new impacts to land use, recreation resources, or visual settings would occur.

Alternative A: No-Action would not result in changes to current conditions for land use.

Electronic Scoring Sites. Under the No-Action Alternative, the existing operations at the Harrison and La Junta Electronic Scoring Sites would continue at current levels. There would be no new construction or changes to existing activities. Therefore, no changes to land use, recreation resources, or visual settings would occur.

4.2.3 Alternative B: IR-178/Lancer MOA

AFFECTED ENVIRONMENT

The affected environment includes the primary MTRs and MOAs, especially IR-178 and the Reese 4, Reese 5, and Roby MOAs. These airspace units form the focus of this analysis. The candidate sites for emitters and Electronic Scoring Sites, as well as the Harrison and La Junta Electronic Scoring Sites, make up the ground-based affected environment.

Airspace and Flight Operations. In Alternative B, proposed IR-178 and the proposed Lancer MOA/ATCAA form the focus of the affected area and analysis. The other primary MTRs and MOAs would not be structurally altered and use would decrease. As such, the effects of Alternative B on the other primary airspace would be less than under baseline conditions. They receive no further discussion below.

The area underlying the airspace associated with Alternative B is located almost wholly in western Texas with the exception of a small portion that extends into southeastern New Mexico. The area is characterized by large, sparsely inhabited areas with scattered, isolated towns, small communities, and homesteads. Land in the area is owned and managed by a variety of private and public entities. The primary land use outside population centers is livestock grazing.

Incorporated communities or those serving as county seats or equivalent in size are included in the analysis.

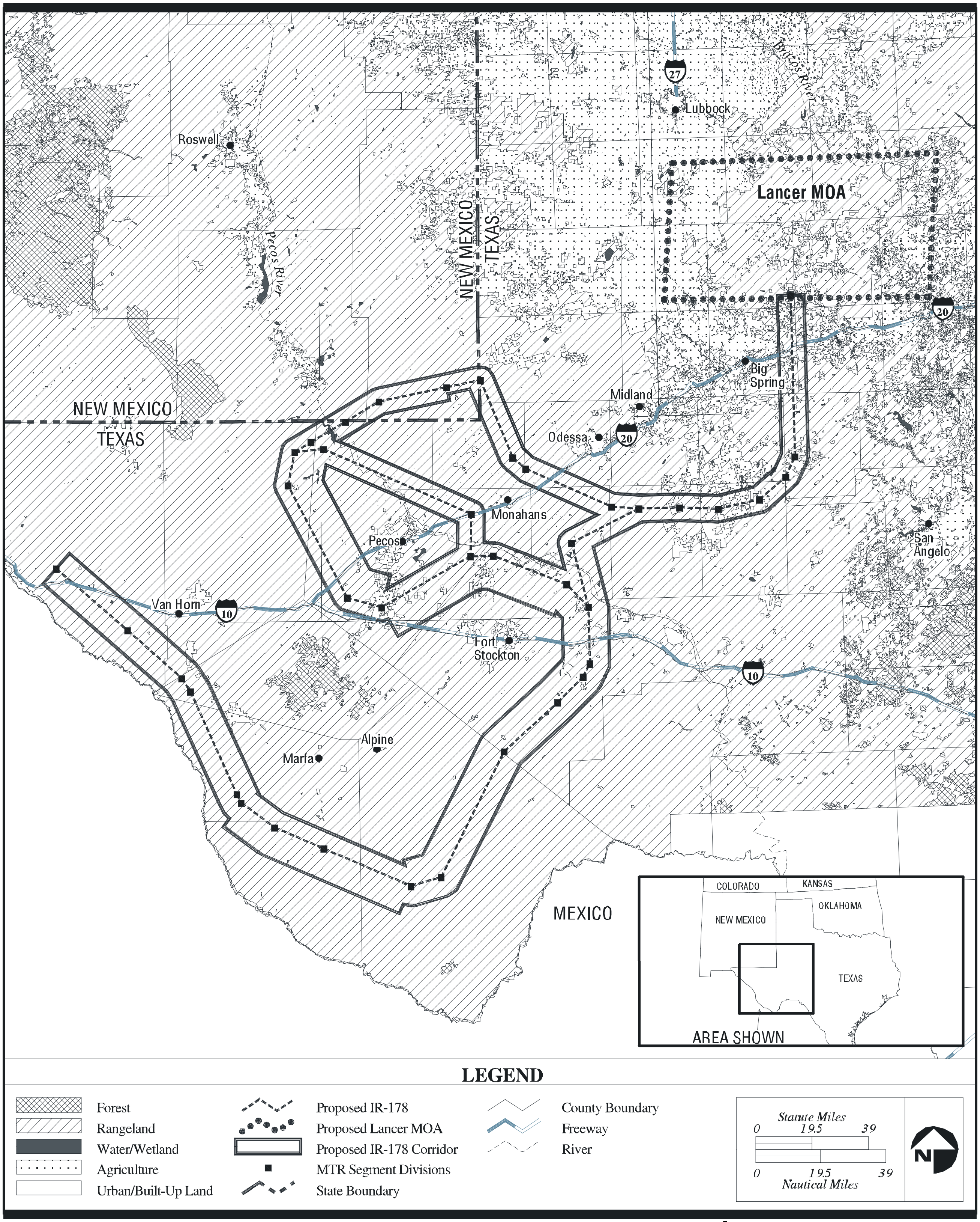
Approximately 86 percent of the land under the airspace associated with this alternative is privately owned rangeland used for grazing livestock (Figure 4.2-3). Approximately 11 percent of the remaining land is used for agricultural production. Urban/built-up areas make up about 2 percent and surface water/wetland and forest areas make up less than 1 percent each. The majority of the land under the airspace is in private ownership with a variety of state and federal interests overseeing the remainder. Table 4.2-3 presents the communities underlying proposed IR-178 and the Lancer MOA/ATCAA. As noted in Alternative A, FAA regulations require aircraft to avoid congested areas by 1,000 feet above the highest obstacle and by a horizontal radius of 2,000 feet of the aircraft. Such avoidance reduces noise levels. Based on the 1990 census, an estimated 50,300 people live under the proposed IR-178 and the Lancer MOA. Most of this population underlies the proposed MOA.

Table 4.2-3
Communities Under Alternative B:
IR-178 and Lancer MOA/ATCAA

MTR/MOA	*Texas Communities*
Proposed IR-178	Sierra Blanca, Grandfalls, Pyote, Toyah, Crane, Imperial
Proposed Lancer MOA/ATCAA	Jayton, Post, Rotan, Snyder, Roby, Tahoka, O'Donnell, Gail, Hermleigh, Lamesa

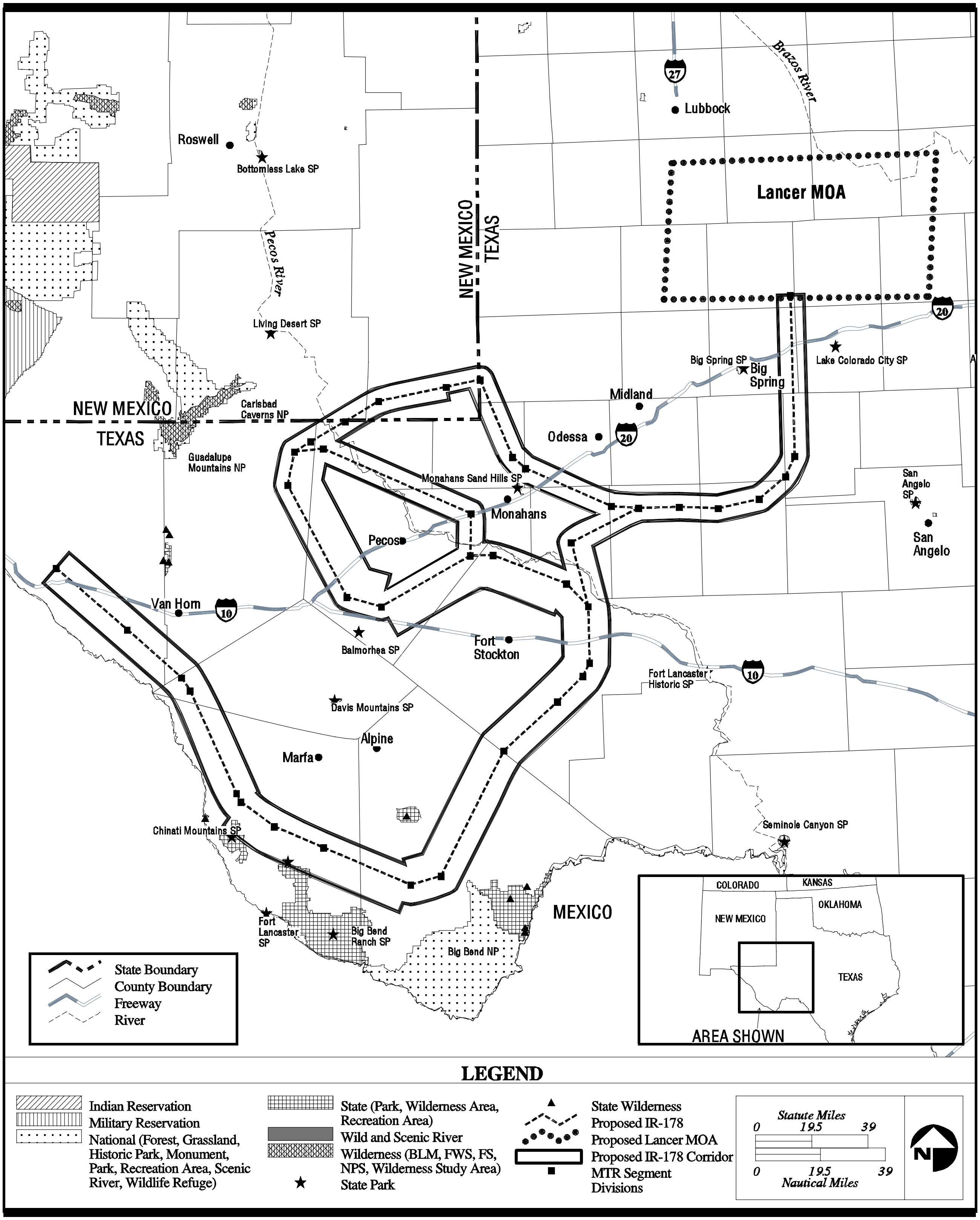
Two special use land management areas underlie Alternative B airspace (Table 4.2-4 and Figure 4.2-4). The Chinati Mountains property is owned by the State of Texas and Wildlife Department and not open to the public at this time. Future plans for the property include wildlife management and public recreation. Big Bend Ranch State Park offers a wide range of recreational opportunities, including hiking, camping, boating, picnicking, and wildlife viewing. Recreational use tends to be greatest from the spring to fall months. The Air Force purposely modified the IR-178 corridor to eliminate airspace over Big Bend National Park.

The visual environment of the area under Alternative B airspace is the same as that described for Alternative A, with the exception that Alternative B airspace overlies fewer special use land management areas.



Existing Land Use Under Alternative B: IR-178/Lancer MOA

Figure 4.2-3



Special Use Land Management Areas Under Alternative B: IR-178/Lancer MOA Figure 4.2-4

Table 4.2-4
Special Use Land Management Areas Under Alternative B

IR-178 Segment	*Minimum Flight Altitude (Feet AGL)*	*Area*	*Acreage Under Airspace*	*Noise Levels*	
				Projected (DNL)	*Change from Baseline (dB)*
FG	300	Chinati Mountains Property[1]	10,104	60-61	2-3
HI	300	Big Bend Ranch State Park	5,553	60-61	2-3
		Total	15,657		

Refer to Figure 2.4-3 for segment locations.

[1] Currently not accessible to the public.

Source: UCSB 1996.

IR-178 under Alternative B was designed to avoid Big Bend National Park.

Emitters and Electronic Scoring Sites. All candidate sites are located in Texas and are privately owned with the exception of sites 61 and 62 (for en route Electronic Scoring Site) that are owned by DoD (Table 4.2-5). Sites 61 and 62 consist of existing, unused Air Force facilities. All the emitter sites are located in remote, rural areas and the majority are part of larger acreages used for grazing livestock.

Table 4.2-5
Emitter and Electronic Scoring Site Land Use Under Alternative B

Site Number	*Site Type*	*Texas County*	*Ownership*	*Current Land Use*	*Distance to Nearest Occupied Land Use Category (Approximate)*	*Current Visual Environment*
54	MTR Emitter	Brewster	Private	Grazing	5 miles to residential	Flat/gently rolling, rural grassland/scrub
55	MTR Emitter	Presidio	Private	Grazing	1 mile to residential	Flat, rural grassland
59	MTR Electronic Scoring Site	Reeves	Private	Grazing	5 miles to commercial	Flat/gently rolling, rural grassland/scrub
60	MTR Electronic Scoring Site	Reeves	Private	Fallow field[1]	0.5 mile to residential	Flat, rural hard-baked scrub
61	En Route Electronic Scoring Site	Taylor	DoD	Existing unused Air Force facility	0.5 mile to City of Abilene	Existing one-story building; flat, rural grassland
62	En Route Electronic Scoring Site	Taylor	DoD	Existing unused Air Force facility	0.5 mile to City of Abilene	Existing one-story building; flat, rural grassland
64	MOA Emitter	Scurry	Private	Fallow field[1,2]	0.5 mile to residential	Flat, rural grassland
65	MOA Emitter	Borden	Private	Fallow field[2]	1 mile to residential	Existing oil well; flat, rural grassland
66	MOA Emitter	Borden	Private	Grazing[1]	0.5 mile to residential	Flat, rural grassland
67	MOA Emitter	Borden	Private	Grazing	1 mile to residential	Flat/gently rolling, rural grassland/scrub
72	MOA Emitter	Garza	Private	Grazing	5 miles to residential	Flat/gently rolling, rural grassland/scrub
81	MTR Emitter	Brewster	Private	Grazing	5 miles to commercial	Flat, gently rolling, rural grassland/scrub
82	MTR Emitter	Pecos	Private	Cropland	0.5 mile to residential	Flat, rural grassland
91	MTR Emitter	Pecos	Private	Grazing	5 miles to residential	Gently rolling, rural grassland/scrub
93	MTR Emitter	Pecos	Private	Grazing	5 miles to residential	Gently rolling, rural grassland/scrub
95	MOA Emitter	Scurry	Private	Cropland[1]	0.5 mile to Town of Camp Springs	Gently rolling, rural grassland

[1] Prime farmland.

[2] Conservation Reserve Program.

Four of the candidate sites (60, 64, 66, and 95) are considered prime farmland. Prime farmland is defined as land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Under the Farmland Protection Policy Act, federal programs that contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses should be minimized (USGS 1998).

Two of the candidate sites (64 and 65) are currently enrolled in the Conservation Reserve Program (CRP). CRP is a national program administered by the U.S. Department of Agriculture to reduce soil erosion on highly erodible cropland, improve water quality, foster wildlife habitat, curb the production of surplus commodities, and provide income support for farmers. As a voluntary long-term cropland retirement program, CRP provides participants with an annual per-acre rent plus half the cost of establishing a permanent land cover. In exchange, the participant retires highly erodible or environmentally sensitive cropland from production for 10 to 15 years. If the participant wishes to withdraw a parcel from CRP before the end of the agreement, any prior payments, interest, and damages would have to be repaid (USDA 1998).

Ten of the candidate sites are located within 1 mile of a residence (refer to Table 4.2-5). None of the sites are located in or adjacent to identified recreation areas. While recreational uses, such as horseback riding, may occur on the parcels, the sites are privately owned and not generally available for public use.

The visual environment of the areas surrounding the candidate sites is typical of the western Texas region. The sites are located in remote, rural areas used primarily for livestock grazing. The topography is generally flat or gently rolling and the predominant vegetative cover is grassland and desert scrub. There are no identified scenic resources or vistas within visual range of any site. All of the sites are within approximately 5 miles of residential or commercial use areas and would be compatible with views from surrounding occupied land uses, depending on topography and intervening structures (refer to Table 4.2-5).

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Flight operations would not likely affect land use, recreation resources, or visual settings in the areas under the airspace. Flight operations would not be expected to preclude existing land uses or continued use or occupation of an area, preempt recreational uses, threaten public health and safety, or be inconsistent with applicable regulations. Flight operations would not change features of the physical environment or block aesthetic landscape features from view. Flight operations could, however, be perceived by the affected public as negatively affecting their quality of life.

As detailed in Chapter 2, proposed changes to IR-178 and proposed Lancer MOA/ATCAA would reduce the total amount of land under the airspace in comparison to current conditions (refer to Table 2.4-3). A reduction of about 2,300 square nm would result from changes to IR-178. Consolidation of the Reese 4, Reese 5, and Roby MOAs would expose about 300 square nm of land to new airspace.

The current one to six average daily sortie-operations on existing IR-178 generate noise levels ranging from less than 45 to 61 DNL. The additional one to six average (for a maximum total of ten) daily sortie-operations associated with proposed IR-178 would result in noise levels of 46 to 61 DNL (Appendix B, Table B-6), depending on the number or sortie-operations, segment width, and altitude regimes flown. Noise levels below the proposed Lancer MOA/ATCAA would be 46 DNL. Alternative B would not generate levels of 65 DNL or higher in any airspace unit.

Six communities in Texas underlie proposed IR-178. Three of these communities, Sierra Blanca, Imperial, and Grandfalls, occur under existing IR-178; Sierra Blanca would experience noise levels of 61 DNL and Imperial and Grandfalls a noise level of 55 DNL. These represent 5-dB increases above baseline levels. Two other Texas communities, Toyah and Crane, would underlie proposed IR-178, and currently underlie other existing secondary MTRs that overlap or intersect with proposed IR-178. Noise levels on the segments over these communities would increase between 1 to more than 8 dB. The community of Pyote would fall under new airspace (Segment VBR) and would experience noise levels of 50 to 51 DNL. For comparison, levels of 50 to 51 DNL would be typical of small towns and quiet suburban areas (FICON 1992). Given that these changes would be greater than 3 dB, the population of these communities could be expected to notice the change in noise levels due to aircraft. The communities underlying the proposed Lancer MOA/ATCAA (refer to Table 4.2-3) would experience noise levels of 46 DNL, 1 dB greater than baseline. FAA avoidance procedures would make noise levels affecting these communities less than those reported above. Required FAA avoidance procedures (i.e., 1,000 feet above the highest obstacle and within a horizontal radius of 2,000 feet of the aircraft) would still apply under Alternative B.

Required FAA avoidance procedures reduce noise levels over communities.

The two special use land management areas underlying Alternative B airspace would experience noise levels of 60 to 61 DNL, about 2 to 3 dB greater than existing conditions. At these projected noise levels, most people would not notice the change from baseline conditions. The startle effect of sudden aircraft noise could also affect people under Alternative B airspace. The startle effect would be more likely to occur under MTR airspace than MOA/ATCAA airspace due to the lower altitudes flown. However, FAA avoidance regulations described previously would minimize the potential for this to occur over communities.

Impacts of aircraft overflights on the visual environment of an area are difficult to quantify. In most instances, aircraft are not noticed because of visual cues; rather they are noticed after being heard. The nature of the impact depends on the sensitivity of the resource affected, the distance from which it is viewed, and the length of time it is visible. Altitude and screening relative to the viewer also play a key role in determining impacts from aircraft overflights. People's eyes are typically drawn to the horizon more than overhead and they are, therefore, less likely to notice aircraft at higher altitudes. In addition, military aircraft are painted a muted gray and are often difficult to pick out against a blue or gray sky.

Visual intrusion of military aircraft could adversely affect the recreational experiences of visitors to the areas of Big Bend Ranch State Park underlying the airspace. While the public is not currently allowed at the Chinati Mountains property, future plans provide for public recreation. The estimated time it would take for the aircraft to pass these areas located under low-altitude segments of the MTR ranges from about 0.7 to 1.6 minutes (Table 4.2-6). Where the terrain is hilly or mountainous, as in the northernmost area of Big Bend Ranch State Park, views of aircraft would be of shorter duration. In areas of flat terrain, the views would be more expansive and aircraft could remain in sight longer. The visual intrusion of military aircraft in these areas could negatively affect the solitude expected by some recreational users. Others may view the occasional overflight as a unique and positive experience. Overall, as discussed above, it would be the noise generated by aircraft that would most affect recreational use in the area.

Table 4.2-6
Visual Intrusion of Aircraft on Special Use Land Management Areas Under Alternative B

Area	*Minimum Flight Altitude (feet AGL)*	*Approximate Horizontal Distance Overflown (nm)*	*Estimated Time For B-1 Aircraft To Pass (minutes)* [1]	*Estimated Time For B-52 Aircraft To Pass (minutes)* [1]
Big Bend Ranch State Park	300	9.6	1.1	1.6
Chinati Mountains Property	300	6.5	0.7	1.1

[1] Based on an average speed of 550 nautical miles per hour for B-1 aircraft and 360 nautical miles per hour for B-52 aircraft.

Land under most of the affected airspace has been subject to military jet overflights for more than 40 years. Low-level military aircraft are part of the existing environment. The Air Force's special operating procedures avoid overflight of specific locations considered to be sensitive to aircraft noise. These avoidance procedures form part of the information used by military aircrews to plan missions. Noise levels in these defined avoidance areas would likely be less than those presented in this EIS.

The likelihood of being overflown varies depending upon the type of airspace (refer to section 4.1). In MTRs, flights are dispersed within the corridor both horizontally and vertically. The wider the MTR, the less likely that a person or specific location would be repeatedly overflown. The special use land management areas both lie on the outside edge of the widest segments of IR-178. In addition, avoidance procedures for populated areas and sensitive locations reduce noise exposure to the greatest degree possible. In a MOA, the operations are random and widely dispersed. The random nature of operations and the wide altitude structure within the MOA make it unlikely that any one location would be repeatedly overflown over a short duration.

The effects of noise generated by military overflights on quality of life and traditional lifestyles were frequently raised during the public scoping meetings. Both of these issues are hard to define and extremely subjective, meaning different things to different individuals. However, noise levels of 65 DNL have been identified by various public agencies as a guideline above which significant negative impacts may occur in residential areas (FICUN 1980, FICON 1992). At 65 DNL, approximately 12 percent of people would be highly annoyed by noise. Alternative B operations would not result in noise levels of 65 DNL or higher in any airspace unit. The highest levels would be approximately 61 DNL in portions of IR-178; other portions would be subject to noise levels ranging down to 46 DNL. The noise associated with Alternative B could detract from the quality of life for some individuals but barely disturb that of others. Since traditional lifestyles in the region can be interpreted to include wilderness and solitary experiences, as well as petroleum exploration, noise associated with Alternative B would be expected to negatively affect some traditional lifestyles and not affect others. Further, some people may enjoy watching military aircraft train and may consider the noise associated with aircraft overflights part of the experience.

Neither construction nor operation of emitter sites and Electronic Scoring Sites would preclude or alter surrounding land uses.

Construction. There would be no adverse impacts to land use, recreation resources, or visual settings due to construction under Alternative B. While the presence of construction crews and activities may disrupt the usual setting of the areas, short-duration construction activities would not preclude existing surrounding land uses or continued use or occupation of an area, preempt recreational uses, threaten public health and safety, or be inconsistent with applicable regulations. Nor would construction activities change the terrain or block aesthetic landscape features from view. Further, any impacts generated by construction activities would be short-term and would cease once construction is complete.

Ground Operations. Operation of the emitter sites would not adversely affect land use or recreational resources in the vicinity of the sites. Selected emitter sites would be leased or purchased from private landowners. The lease or purchase arrangements would address any payments needed to remove a parcel from CRP for the duration of the lease or as required to purchase the site. The emitter sites would no longer be available for their previous uses, primarily livestock grazing. While three of the candidate emitter sites are considered prime farmland, the change in land use would not be irreversible and would last only as long as the emitters were needed. Land use change of the parcels would not be expected to generate an adverse impact to ranching lands due to the abundance of this type of land use in the area, nor would it affect the overall land use patterns in the vicinity of the sites.

Operation of the emitter sites would generate noise associated with the electrical equipment and the warning horn. The horn would sound like the warning buzzer before the airport baggage carousel moves. The noise from the warning horn would not adversely affect surrounding land uses since the sound would be of short duration and would not be expected to carry over the distance to the nearest residences (about 0.5 mile).

The change in land use associated with the emitter sites would not be expected to preclude other, ongoing uses on surrounding parcels, be incompatible with adjacent or vicinity land use, or be inconsistent with local zoning or ordinances. As mentioned above, there are no identified public recreation areas in the vicinity of the sites. No adverse impacts to land use or recreation would be associated with operation of the emitter sites.

Operation of the scoring site near Abilene in Taylor County would not affect land use or recreational resources since both candidate sites are owned by DoD and have existing facilities. Operation of the scoring site near Pecos in Reeves County would not be inconsistent with local ordinances or expected to preclude other, ongoing uses on surrounding parcels (Reeves County 1998). One candidate parcel in Reeves County is considered prime farmland and its use for a scoring facility would likely constitute a long-term, but not irreversible, use of the land for nonagricultural purposes. The change to a nonagricultural use, while not of great magnitude compared to the abundance of this type of land use in the area, could be considered an adverse impact on traditional ranching and agricultural lifestyles. Since there are no recreational areas in the vicinity of these sites, operation of the scoring facility in Reeves County would not affect recreational resources.

The presence of the electronic equipment at the emitter sites and the building and equipment associated with the scoring facilities would not result in adverse visual impacts due to the existing structures in the vicinity (e.g., houses, barns, windmills, fences, telephone poles, power lines, etc.). While long-term additions to the visual environment, the equipment and facilities would not introduce features to the environment that are perceptibly uncharacteristic of the region or that would block aesthetic landscape features from view.

Decommissioning. Under Alternative B, the Harrison and La Junta Electronic Scoring Sites and associated emitter sites would be decommissioned. All equipment would be removed from the Electronic Scoring Sites, leaving the buildings intact. At Harrison, where the Air Force leases the land, the Air force would end its lease through agreement with the property owner. At La Junta, where the property is owned by DoD, the site would be disposed of through standard procedures for excess property. For each of the emitter sites, if the land is leased, it would be returned to the owner through ending the lease agreement. If the emitter site is owned by the Air Force, it would be disposed of through standard procedures for excess property.

4.2.4 Alternative C: IR-178/Texon MOA

AFFECTED ENVIRONMENT

The affected environment includes the primary MTRs and MOAs, especially IR-178 and the Texon MOA. The candidate sites for emitters and Electronic Scoring Sites, as well as the Harrison and La Junta Electronic Scoring Sites, make up the ground-based affected environment.

Airspace and Flight Operations. In Alternative C, proposed IR-178 and the proposed Texon MOA/ATCAA form the focus of the affected area. The other primary MTRs and MOAs would not be structurally altered but would be used less. As such, the effects of Alternative C on the other primary airspace would be less than under baseline conditions. They receive no further discussion below. Airspace associated with Alternative C is located almost wholly in west Texas. Only a small portion of airspace extends into New Mexico. The area potentially affected by this alternative is similar to that for Alternative B.

Land use under the airspace is very similar to that described for Alternative B (Figure 4.2-5). Approximately 95 percent of the land under the MTR and MOA airspace associated with this alternative is mostly privately owned rangeland used for grazing livestock. Agriculture and urban/built-up areas make up about 2 percent each. Forest and surface water/wetland areas are less than 1 percent each. Land ownership patterns are the same as for Alternative B.

Eleven communities occur under proposed IR-178 and the Texon MOA/ATCAA (Table 4.2-7). With the exception of Pyote and Toyah, Texas, the other three communities under proposed IR-178 currently underlie an existing MTR. Four (Big Lake, Texon, Best, and Rankin) of the six communities under the proposed Texon MOA/ATCAA are under the existing Texon MOA. In total, approximately 22,800 people (based on 1990 census) live under proposed IR-178 and the Texon MOA.

Table 4.2-7
Communities Under Alternative C:
IR-178 and Proposed Texon MOA/ATCAA

MTR/MOA	*Texas Communities*
Proposed IR-178	Grandfalls, Sierra Blanca, Pyote, Toyah, Imperial
Proposed Texon MOA/ATCAA	Big Lake, McCamey, Mertzon, Rankin, Texon, Best

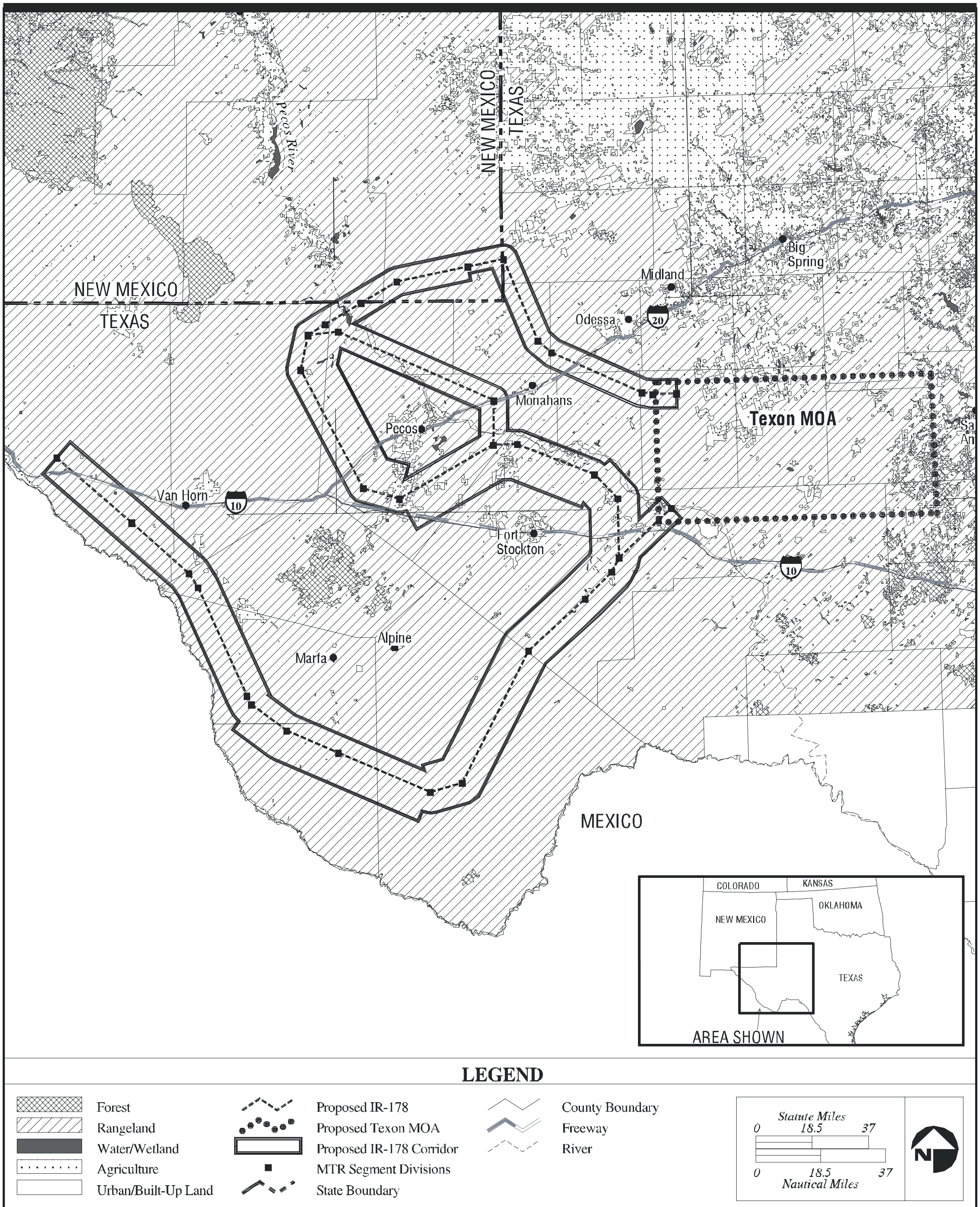
As with Alternative B, Alternative C airspace overlies Big Bend Ranch State Park and Chinati Mountains property (Figure 4.2-6 and refer to Table 4.2-4). The visual environment for land overflown by Alternative C airspace is the same as that described for Alternative B.

Emitter and Electronic Scoring Sites. All candidate sites are located in Texas and privately owned, with the exception of sites 61 and 62, which are owned by DoD (Table 4.2-8). The sites are located in remote, rural areas and the majority are part of larger acreages used for grazing livestock. Three candidate sites (60, 88, and 89) are considered prime farmland. None of the sites are currently enrolled in the CRP.

Impacts of Alternative C on land use would match those identified for Alternative B.

Five of the candidate sites (55, 60, 61, 62, and 82) are located within 1 mile of residences. None of the sites are located in or adjacent to identified recreation areas. While recreational uses such as horseback riding may occur on the parcels, the sites are privately owned and not generally available for public use.

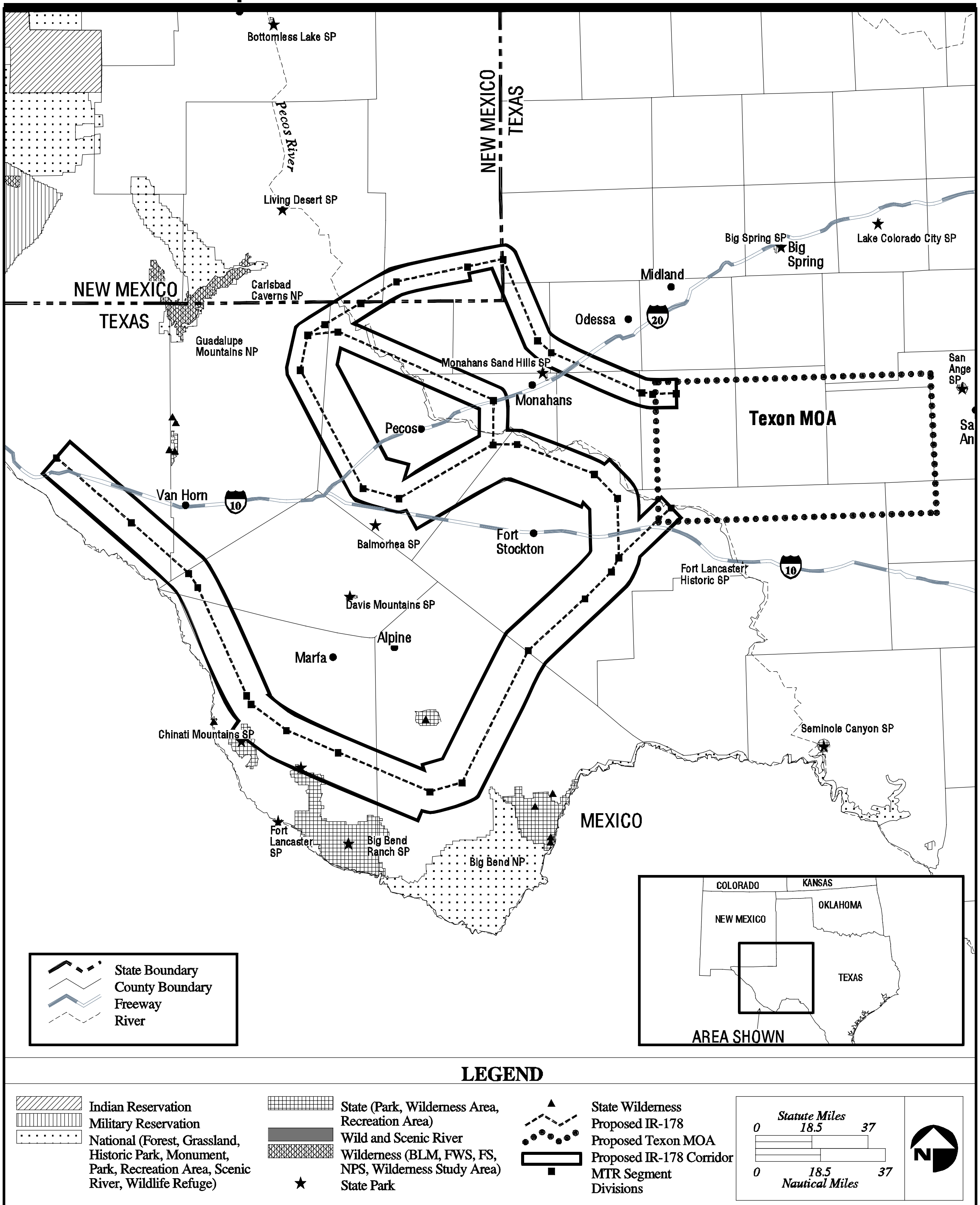
The visual environment of the areas surrounding the candidate sites is typical of the western Texas region and similar to that described in Alternative B. All of the sites



Existing Land Use Under Alternative C: IR-178/Texon MOA

Figure 4.2-5

4.0 Affected Environment and Environmental Consequences: Land Management and Use



Special Use Land Management Areas Under Alternative C: IR-178/Texon MOA **Figure 4.2-6**

Table 4.2-8
Emitter and Electronic Scoring Site Land Use Under Alternative C

Site Number	*Site Type*	*Texas County*	*Ownership*	*Current Land Use*	*Distance to Nearest Occupied Land Use Category (Approximate)*	*Current Visual Environment*
54	MTR Emitter	Brewster	Private	Grazing	5 miles to residential	Flat/gently rolling, rural grassland/scrub
55	MTR Emitter	Presidio	Private	Grazing	1 mile to residential	Flat, rural grassland
59	MTR Electronic Scoring Site	Reeves	Private	Grazing	5 miles to commercial	Flat/gently rolling, rural grassland/scrub
60	MTR Electronic Scoring Site	Reeves	Private	Fallow field[1]	0.5 mile to residential	Flat, rural hard-baked scrub
61	En Route Electronic Scoring Site	Taylor	DoD	Existing unused Air Force facility	0.5 mile to City of Abilene	Existing one-story building; flat, rural grassland
62	En Route Electronic Scoring Site	Taylor	DoD	Existing unused Air Force facility	0.5 mile to City of Abilene	Existing one-story building; flat, rural grassland
78	MOA Emitter	Upton	Private	Grazing	5 miles to residential	Flat, rural hard-baked scrub
79	MOA Emitter	Schleicher	Private	Grazing	5 miles to residential	Flat, rural grassland/scrub
80	MOA Emitter	Upton	Private	Grazing	5 miles to residential	Flat/gently rolling, rural, hard-baked scrub, rocky outcropping
81	MTR Emitter	Brewster	Private	Grazing	5 miles to residential	Flat, gently rolling, rural grassland/scrub
82	MTR Emitter	Pecos	Private	Cropland	0.5 mile to residential	Flat, rural grassland
88	MOA Emitter	Regan	Private	Grazing[1]	5 miles to Town of Big Lake	Flat, rural grassland/scrub
89	MOA Emitter	Regan	Private	Grazing[1]	5 miles to Town of Big Lake	Flat, rural grassland/scrub
91	MTR Emitter	Pecos	Private	Grazing	5 miles to residential	Gently rolling, rural grassland/scrub
93	MTR Emitter	Pecos	Private	Grazing	5 miles to residential	Gently rolling, rural grassland/scrub
94	MOA Emitter	Irion	Private	Grazing	5 miles to residential	Gently rolling, rural grassland/scrub

[1] Prime farmland.

are within approximately 5 miles of residential or commercial use areas and would be considered to be generally compatible with views from surrounding occupied land uses, depending on topography and intervening structures (refer to Table 4.2-8).

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Impacts related to flight operations would be similar to those described for Alternative B. Flight operations would not likely affect land use, recreation resources, or visual settings in the areas under the airspace. Flight operations would not be expected to preclude existing land uses or continued use or occupation of an area, preempt recreational uses, threaten public health and safety, or be inconsistent with applicable regulations. Nor would flight operations change features of the physical environment or block aesthetic landscape features from view. Flight operations could, however, be perceived by the public as negatively affecting their quality of life.

Proposed changes to IR-178 would reduce the total amount of land underlying this MTR by about 3,000 square nm (refer to Table 2.4-7). Expansion of the proposed Texon MOA/ATCAA would increase the affected area by more than 2,000 square nm, including about 800 square nm of new airspace.

Baseline average daily sortie-operations on existing IR-178 generate noise levels ranging from less than 45 to 61 DNL. The additional one to six (with a maximum total of ten) sortie-operations associated with proposed IR-178 would generate noise levels from 46 to 61 DNL (Appendix B, Table B-7, and Table 4.1-15), depending on the number of sortie-operations, segment width, and altitude regimes flown. Noise levels below the proposed Texon MOA/ATCAA would be 46 DNL.

Proposed IR-178 would overlie five communities in Texas: Grandfalls, Sierra Blanca, Toyah, Imperial, and Pyote. Aircraft noise levels in the first four listed communities would increase by 4 to 5 dB. Pyote would be under new airspace where noise levels would range from 50 to 51 DNL. Required FAA avoidance procedures would be used for these communities, and noise levels would be less than projected. Given that these changes would be greater than 3 dB, the population of these communities would be expected to notice the change in noise levels due to aircraft. The six communities underlying the proposed Texon MOA/ATCAA (refer to Table 4.2-7) would experience noise levels of 46 DNL. This would represent an increase of 1 dB greater than baseline in Big Lake, Rankin, Texon, and Best. McCamey and Merzton would experience increased noise levels to 46 DNL.

The two special use land management areas affected by Alternative C lie on the edge of IR-178 where noise levels would generally be reduced.

The two special use land management areas underlying Alternative C airspace would experience noise levels of 60 to 61 DNL, about 2 to 3 dB greater than existing conditions (Table 4.2-9). At these projected noise levels, most people would not notice the change from baseline conditions.

Table 4.2-9
Special Use Land Management Areas Under Alternative C

IR-178 Segment	*Minimum Flight Altitude (Feet AGL)*	*Area*	*Acreage Under Airspace*	*Noise Levels: Projected (DNL)*	*Noise Levels: Change from Baseline (dB)*
FG	300	Chinati Mountains Property[1]	10,104	60-61	2-3
HI	300	Big Bend Ranch State Park	5,553	60-61	2-3
		Total	15,657		

Refer to Figure 2.4-6 for segment locations.
[1] Currently not accessible to the public.
Source: UCSB 1996.

. . . Alternative C: IR-178/Texon MOA

As described previously, the startle effect of sudden aircraft noise could also affect people under Alternative C airspace. The startle effect would be more likely to occur under MTR airspace than under MOA/ATCAA airspace due to the lower altitudes flown. However, the FAA and Air Force avoidance regulations described previously would minimize the potential for this to occur over communities.

Visual intrusion of military aircraft could adversely affect the recreational experiences of visitors to the areas of Big Bend Ranch State Park underlying the airspace. While the public is not currently allowed at the Chinati Mountains property, future plans provide for public recreation. The estimated time it would take for the aircraft to pass these areas located under low-altitude segments of the MTR ranges from about 0.7 to 1.6 minutes (Table 4.2-10). Where the terrain is hilly or mountainous, as in the northernmost area of Big Bend Ranch State Park, views of aircraft would be of shorter duration. In areas of flat terrain, the views would be more expansive and aircraft could remain in sight longer. The visual intrusion of military aircraft in these areas could negatively affect the solitude expected by some recreational users. Others may view the occasional overflight as a unique and positive experience. Overall, as discussed above, it would be the noise generated by aircraft that would most affect recreational use in the area.

Table 4.2-10
Visual Intrusion of Aircraft on Special Use Land Management Areas Under Alternative C

Area	*Minimum Flight Altitude (feet AGL)*	*Approximate Horizontal Distance Overflown (nm)*	*Estimated Time For B-1 Aircraft To Pass (minutes)* [1]	*Estimated Time For B-52 Aircraft To Pass (minutes)* [1]
Big Bend Ranch State Park	300	9.6	1.1	1.6
Chinati Mountains Property	300	6.5	0.7	1.1

[1] Based on an average speed of 550 nautical miles per hour for B-1 aircraft and 360 nautical miles per hour for B-52 aircraft.

The likelihood of being overflown varies depending upon the type of airspace (refer to Section 4.1). In MTRs, flights are dispersed within the corridor both horizontally and vertically. The wider the MTR, the less likely that a person or specific location would be repeatedly overflown. The special use land management areas both lie on the outside edge of the widest segments of IR-178. In addition, avoidance procedures for populated areas and sensitive locations reduce noise exposure to the degree possible. In a MOA, the operations are random and widely dispersed. The random nature of operations and the wide altitude structure within the MOA make it unlikely that any one location would be repeatedly overflown over a short duration.

Construction. Impacts related to construction of emitter and Electronic Scoring Sites under this alternative would be similar to those described for Alternative B. There would be no adverse impacts to land use, recreation resources, or visual settings under Alternative C.

Ground Operations. Impacts related to operation of the Electronic Scoring Sites under this alternative would be similar to those described for Alternative B. Operation of the Electronic Scoring Sites would not adversely affect land use, recreation resources, or visual settings.

Decommissioning. Impacts related to decommissioning the Electronic Scoring Sites under this alternative would be similar to those described for Alternative B. Decommissioning the Electronic Scoring Sites would not adversely affect land use, recreation resources, or visual setting.

4.2.5 Alternative D: IR-153/Mt. Dora MOA

AFFECTED ENVIRONMENT

The affected environment focuses on the proposed IR-153 and the Mt. Dora MOA/ATCAA. The candidate sites for emitters and Electronic Scoring Sites, as well as the Harrison and La Junta Electronic Scoring Sites, make up the ground-based affected environment.

Airspace and Flight Operations. In Alternative D, proposed IR-153 and the proposed Mt. Dora MOA/ATCAA form the focus of the affected area. The other primary MTRs and MOAs would not be structurally altered but would be used less. As such, the effects of Alternative D on the other primary airspace would be less than under baseline conditions. They receive no further discussion below.

The area underlying the airspace associated with Alternative D is located almost wholly in New Mexico with a small portion extending into northwestern Texas. In general, this area is characterized by large, sparsely inhabited areas with scattered, isolated towns, small communities, and homesteads. Land in the area is owned and managed by a variety of entities, including private owners, the states of New Mexico and Texas, and various federal agencies. The primary land use outside population centers is livestock grazing.

Proposed IR-153 overlies 17 special use land management areas like the Rio Grande Wild and Scenic River.

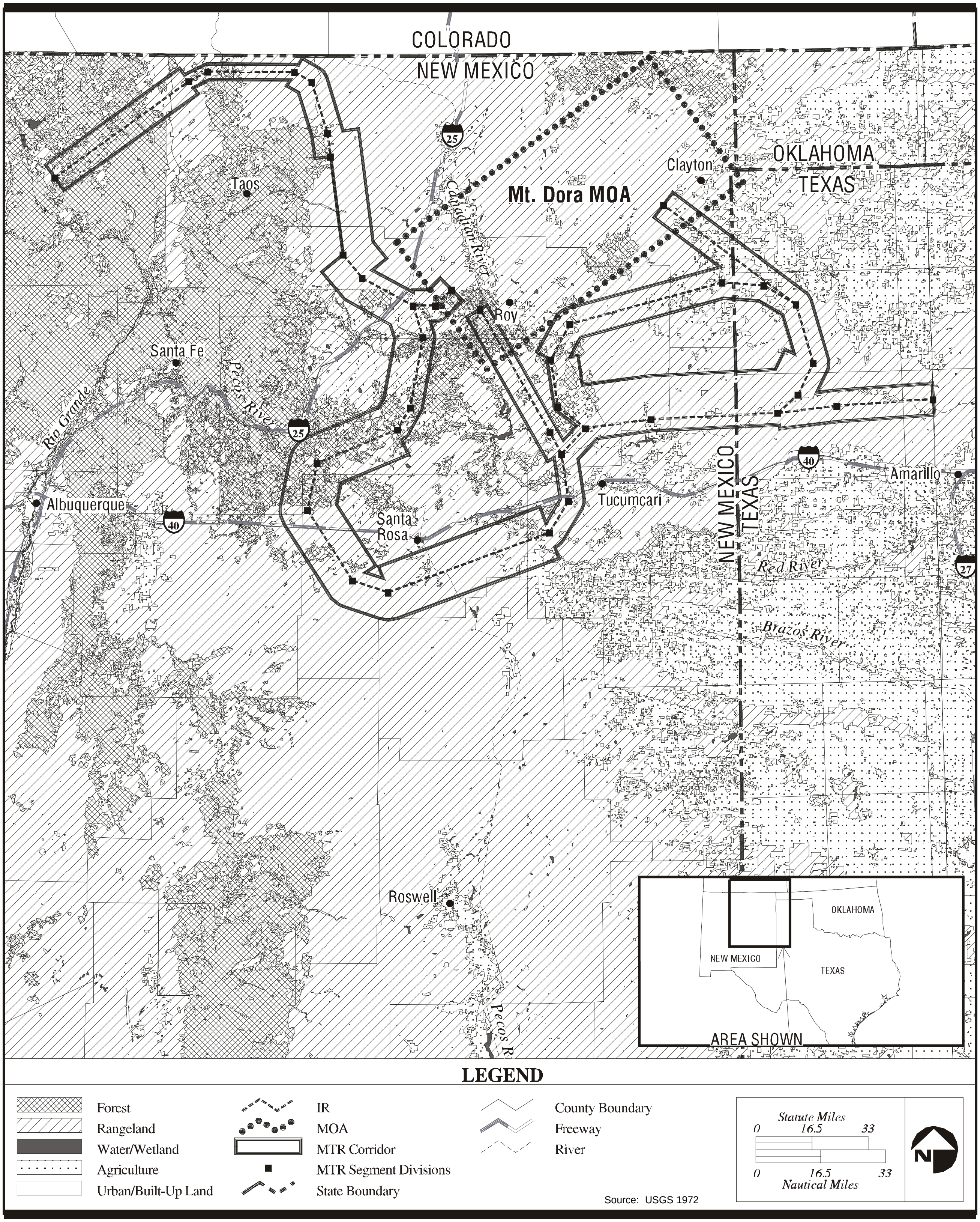
Approximately 84 percent of the land under the MTR and MOA airspace associated with this alternative is public and privately owned rangeland used for livestock grazing (Figure 4.2-7). Approximately 12 percent of the remaining land is forested. Agricultural uses make up approximately 4 percent; surface water/wetland and urban/built-up areas make up less than 1 percent each. Private ownership accounts for approximately 78 percent of the land underlying the affected airspace with a variety of state, U.S. Forest Service, and other federal interests overseeing the remainder of the land below the airspace (New Mexico Cooperative Fish and Wildlife Research Unit 1997).

Alternative D airspace overlies the communities shown in Table 4.2-11. Of the four communities under proposed IR-153, all currently underlie secondary MTRs. The existing Mt. Dora MOA overlies Clayton, Roy, Abbott, and Mt. Dora. Using 1990 census data, it is estimated that about 11,900 people live under proposed IR-153 and Mt. Dora MOA. Almost 90 percent of the affected area underlies existing airspace.

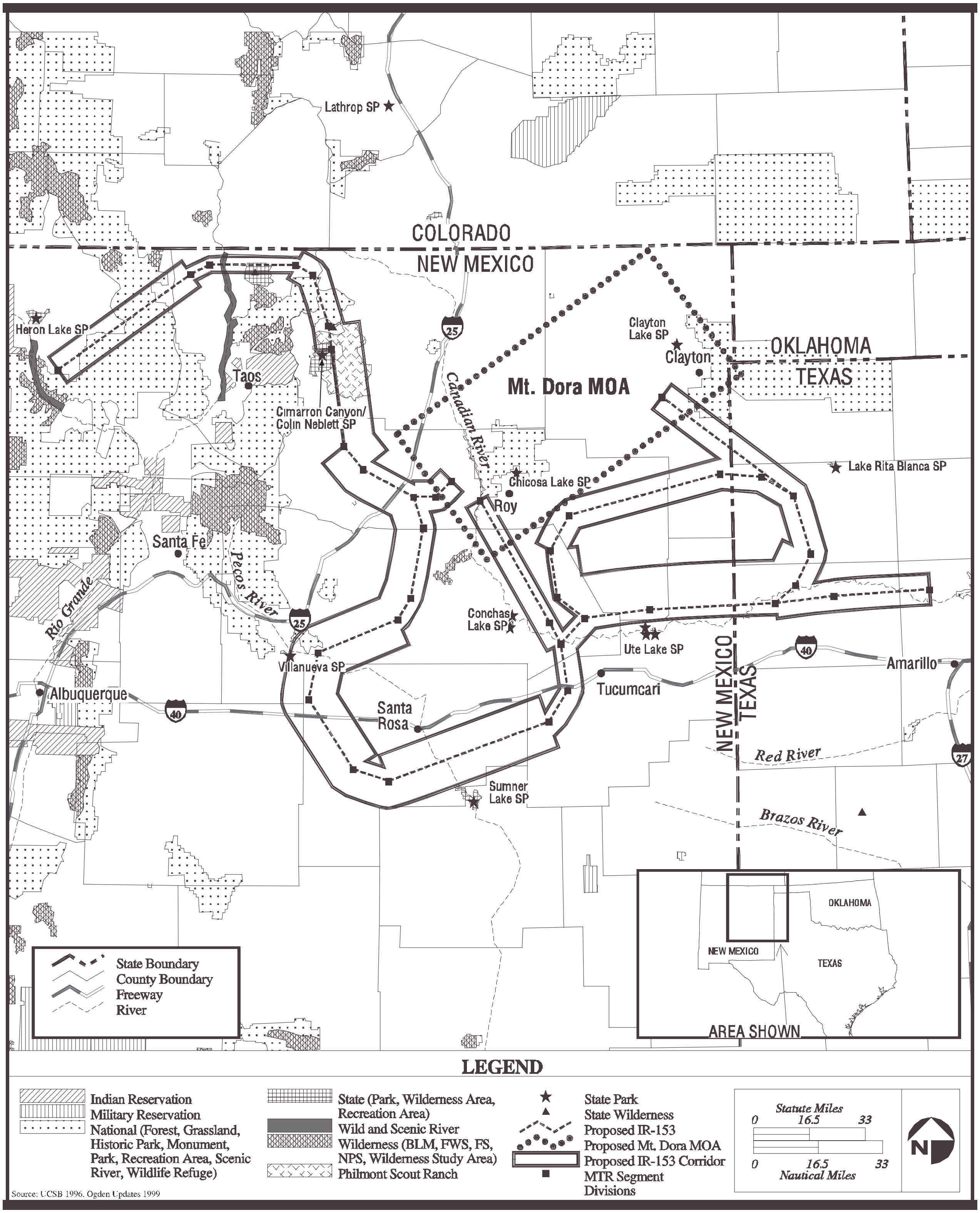
Table 4.2-11
Communities Under Alternative D:
IR-153 and Proposed Mt. Dora MOA/ATCAA

MTR/MOA	*New Mexico Communities*
Proposed IR-153	Ocate, Anton Chico, Mosquero, Wagon Mound
Proposed Mt. Dora MOA/ATCAA	Clayton, Roy, Abbott, Mt. Dora

Thirteen special use land management areas underlie Alternative D airspace (Figure 4.2-8 and Table 4.2-12). These recreational areas provide a wide range of recreational opportunities, including hiking, camping, fishing, hunting, picnicking, wildlife viewing, boating, and winter sports. Recreational use tends to be greatest from the spring to fall months. Philmont Scout Ranch is located under proposed IR-153 segments EF to GH. The ranch has about 5,000 visitors per day during the summer months in an area that includes trails, established campgrounds, and assembly areas of more than 137,000 acres. Capulin Volcano National Monument, which underlies the existing Mt. Dora MOA, would lie outside the proposed Mt.



Existing Land Use Under Alternative D: IR-153/Mt. Dora MOA **Figure 4.2-7**



Special Use Land Management Areas Under Alternative D: IR-153/Mt. Dora MOA **Figure 4.2-8**

Dora MOA. The MOA border would be approximately 4 nm southeast of the monument.

Table 4.2-12
Special Use Land Management Areas Under Alternative D

IR-153 Segment, MOA	Minimum Flight Altitude (feet AGL)	Area	Acreage Under Airspace	Noise Level: Projected (DNL)	Noise Level: Change from Baseline (dB)
AB	400	Carson National Forest	138,928	62	15
CD	800	Rio Grande Wild and Scenic River Urraca Wildlife Area	4,743 12,020	61	15
EF	400	Carson National Forest Elliott Barker Wildlife Area Philmont Scout Ranch[1]	67,880 200 489	62	15
FG	400	Elliott Barker Wildlife Area Colin Neblett Wildlife Area/ Cimarron Canyon State Park Philmont Scout Ranch[1] Carson National Forest	1,053 5,079 37,180 86	60 - 61	15 - 16
GH	400	Colin Neblett Wildlife Area/ Cimarron Canyon State Park Philmont Scout Ranch[1]	1,387 77,004	62	17
MN	300	Santa Fe National Forest	12,267	60	15
NO	300	Santa Fe National Forest Villanueva State Park	5,213 708	60	10
QR	300	Sumner Lake State Park	13	60	11
ZZA	2,000	Kiowa National Grassland	7,313	49	4
Mt. Dora MOA	3,000	Kiowa National Grassland Rita Blanca National Grassland Chicosa Lake State Park Clayton Lake State Park	259,921 8,016 473 178	46	1
		Total	640,151		

Refer to Figure 2.4-9 for segment locations.
[1] Philmont Scout Ranch privately owned by Boy Scouts of America.
Source: UCSB 1996.

The airspace associated with Alternative D covers an area located in northeastern New Mexico and the northwest corner of the Texas panhandle. It overlies land characterized by high plains and grasslands with sparse vegetation and few permanent bodies of water. The visual environment of the High Plains area is described above for Alternative A. Portions of the airspace cross mountainous areas near Taos, New Mexico, where the topographic features are more varied. Chapter 3 describes this area in detail.

The mountainous areas are quite scenic, with numerous river valleys, mesas, and plateaus; many scenic overlooks and vistas exist in this region. The visual environment of this region plays a large part in the attraction and popularity of its recreational resources. Various public recreation resources underlie Alternative D airspace.

Emitter and Electronic Scoring Sites. Candidate sites are located in New Mexico and privately owned, with the exception of sites 61 and 62, which are located in Texas and owned by DoD (Table 4.2-13). All the emitter sites are located in remote, rural areas and the majority are part of larger acreages used for grazing livestock. Two of the candidate sites (35 and 41) are prime farmland. Two sites (14 and 28) are currently enrolled in the CRP. Twelve of the parcels are located within 1 mile of residences (refer to Table 4.2-13). None of the candidate sites are located in or adjacent to identified recreation areas. While recreational uses such as horseback riding may occur on the parcels, the sites are privately owned and not generally available for public use.

Table 4.2-13
Emitter and Electronic Scoring Site Land Use Under Alternative D

Site Number	*Site Type*	*County and State*	*Current Land Use*	*Distance to Nearest Occupied Land Use Category (Approximate)*	*Current Visual Environment*
2	MTR Emitter	Guadalupe, NM	Grazing	5 miles to residential	Flat, rural grassland
6	MTR Emitter	Guadalupe, NM	Grazing	5 miles to residential	Flat, rural grassland
7	MTR Emitter	Guadalupe, NM	Grazing	5 miles to residential	Flat, rural grassland
14	MOA	Harding, NM	Grazing, 20% fallow field[1]	5 miles to Town of Roy	Flat, rural grassland
15	MOA	Colfax, NM	Grazing	0.45 mile to roadside rest stop; 5 miles to residential	Flat, rural grassland
16	MOA	Colfax, NM	Grazing	0.6 mile to roadside rest stop; 0.5 mile to residential	Flat, rural grassland
17	MOA	Union, NM	Grazing	0.5 mile to residential	Flat, rural grassland
20	MOA	Union, NM	Grazing	5 miles to residential	Flat, rural grassland
21	MOA	Union, NM	Grazing	0.5 mile to residential; 5 miles to Town of Clayton	Flat, rural grassland
24	MTR Emitter	Guadalupe, NM	Grazing	0.4 mile to residential	Flat, rural grassland
28	Electronic Scoring Site	Harding, NM	Fallow field[1]	0.5 mile to residential	Flat, rural grassland
33	Electronic Scoring Site	Union, NM	Grazing	5 miles to residential	Flat, rural grassland
34	Electronic Scoring Site	Quay, NM	Grazing	0.5 mile to residential	Flat, rural grassland
35	MOA	Harding, NM	Grazing[2]	0.5 mile to residential	Flat, rural grassland
36	MOA	Harding, NM	Grazing	1 mile to residential	Flat, rural grassland
37	MTR Emitter	Guadalupe, NM	Grazing	5 miles to residential	Flat, rural grassland
38	MTR Emitter	Guadalupe, NM	Grazing	5 miles to residential	Flat, rural grassland
39	MTR Emitter	Guadalupe, NM	Grazing	5 miles to residential	Flat, rural grassland
40	MTR Emitter	Mora, NM	Grazing	5 miles to residential	Flat, rural grassland
41	MTR Emitter	Mora, NM	Grazing[2]	0.5 mile to residential	Flat, rural grassland
61	Electronic Scoring Site	Taylor, TX	Existing unused AF facility	0.5 mile to City of Abilene	Existing one-story building; flat, rural grassland
62	Electronic Scoring Site	Taylor, TX	Existing unused Air Force facility	0.5 mile to City of Abilene	Existing one-story building; flat, rural grassland

[1] Conservation Reserve Program.
[2] Prime farmland.

The visual environment of the areas surrounding the candidate sites is typical of the High Plains area of northeastern New Mexico. The sites are located in remote, rural areas used primarily for livestock grazing. The topography is generally flat, and the predominant vegetative cover is grassland. There are no identified scenic resources or vistas within visual range of each site. All of the sites are within approximately 5 miles of residential or commercial use areas and would be considered to be compatible with views from surrounding occupied land uses, depending on topography and intervening structures (refer to Table 4.2-13).

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Flight operations would not likely affect designated land use, recreation resources, or visual settings under the airspace. However, impacts would likely be perceived as adverse by the public merely due to the change. Flight operations would not be expected to preclude existing land uses or continued use or occupation of an area, preempt recreational uses, threaten public health and safety, or be inconsistent with applicable regulations. Nor would flight operations change features of the physical environment or block aesthetic landscape features from view. Flight operations could, however, be perceived by the public as negatively affecting their quality of life.

Noise levels under proposed IR-153 for Alternative D would increase in some areas by more than 10 dB. A change of 3 dB (DNL) is readily noticeable to people.

As detailed in Chapter 2, Alternative D would result in a decrease in the total amount of land under the airspace (refer to Table 2.4-11). Proposed IR-153 would predominantly coincide with existing secondary MTR airspace; little new airspace would be added. The proposed Mt. Dora MOA/ATCAA would shrink in overall size in comparison to existing Mt. Dora MOA.

As discussed in Section 4.1, the existing sortie-operations generate noise levels ranging from less than 45 to 51 DNL. The additional one to ten average daily sortie-operations associated with proposed IR-153 would generate noise levels from less than 45 to 64 DNL (Appendix B, Table B-8, and Table 4.1-19), depending on the number of sortie-operations, segment width, and altitude regimes flown. Noise levels under the proposed Mt. Dora MOA/ATCAA would be 46 DNL.

Noise levels under most of proposed IR-153 would range from less than 45 to 64 DNL, increases of up to 18 dB over baseline conditions. Four communities under IR-153 would experience changes in noise levels of 10 dB or greater. The population of these communities could be expected to notice the change in noise levels even with aircraft using FAA avoidance procedures. The communities underlying the proposed Mt. Dora MOA/ATCAA (refer to Table 4.2-11) would experience noise levels of 46 DNL, 1 dB greater than baseline. This increase would not be noticeable.

Annoyance can be used as a measure of noise effects.

All the special use land management areas under proposed IR-153 would experience changes in noise levels greater than 10 dB (refer to Table 4.2-12). Most visitors to these areas would notice the change in noise level due to aircraft. Special use land management areas under the proposed Mt. Dora MOA/ATCAA would experience noise levels of 46 DNL, 1 dB greater than baseline. Such a change would not be readily noticed.

The startle effect of sudden aircraft noise could also affect people under Alternative D airspace. Given that the startle effect would be more likely to occur under MTR airspace than MOA/ATCAA airspace due to the lower altitudes flown, people in the communities and special use land management areas below proposed IR-153 could be startled by aircraft noise.

Visual intrusion of military aircraft could adversely affect the recreational experiences of visitors to public recreation areas underlying the airspace. The estimated time it would take for the aircraft to pass the recreation areas located under

FAA regulations and Air Force special operations procedures help reduce noise over specific locations considered sensitive to aircraft noise.

the low-altitude segments of the MTR ranges from about 0.1 to 3.3 minutes (Table 4.2-14). Where the terrain is hilly or mountainous (for example, in the Carson and Santa Fe National Forests and Philmont Scout Ranch), views of aircraft would be of shorter duration. However, in areas of flat terrain (for example, Sumner Lake State Park), the views would be more expansive and aircraft could remain in sight longer. The visual intrusion of military aircraft in these recreation areas could negatively affect the solitude expected by some recreational users. However, observations of aircraft may be viewed as a positive and unique experience. Overall, as discussed above, it would be the noise generated by aircraft that would most affect recreational use in the area.

Table 4.2-14
Visual Intrusion of Aircraft on Special Use Land Management Areas Under Alternative D

Area	*Minimum Flight Altitude (feet AGL)*	*Approximate Horizontal Distance Overflown (nm)*	*Estimated Time For B-1 Aircraft To Pass (minutes)* [1]	*Estimated Time For B-52 Aircraft To Pass (minutes)* [1]
Carson National Forest	400	18.9	2.1	3.2
Rio Grande Wild and Scenic River	800	1.6	0.2	0.3
Urraca Wildlife Area	800	6.3	0.7	1.1
Colin Neblett Wildlife Area/ Cimarron Canyon State Park	400	4.7	0.5	0.8
Elliott Barker Wildlife Area	400	1.0	0.1	0.2
Philmont Scout Ranch	400	19.5	2.1	3.3
Santa Fe National Forest	300	5.0	0.6	0.8
Villanueva State Park	300	0.8	0.1	0.1
Sumner Lake State Park	300	0.3	0.1	0.1

[1] Based on an average speed of 540 nm per hour for B-1 aircraft and 360 nm per hour for B-52 aircraft.

[2] Applies to largest section of Carson National Forest under IR-153; another smaller segment overflown.

Lands under most of the affected airspace have been subject to military jet overflights for more than 40 years. Low-altitude military aircraft are part of the existing environment. The Air Force has established special operating procedures to avoid overflight of specific locations considered to be sensitive to aircraft noise. These avoidance procedures form part of the information used by military aircrews to plan missions. Noise levels in these defined avoidance areas would likely be less than those presented in this EIS.

As explained in Section 4.1, the likelihood of being overflown varies depending upon the type of airspace. In MTRs, flights are dispersed within the corridor both horizontally and vertically. The wider the MTR, the less likely that a person or specific location would be repeatedly overflown. For Alternative D, the narrowest segments would receive the most use. In addition, avoidance procedures for populated areas and sensitive locations minimize noise exposure as much as possible. In a MOA, the operations are random and widely dispersed. The random nature of operations and the wide altitude structure within the MOA make it unlikely that any one location would be repeatedly overflown.

Lands under Alternative D airspace would be subject to the greatest amount of change in noise levels from baseline conditions.

The effects of noise generated by military overflights on quality of life and traditional lifestyles were frequently raised during the public scoping meetings. Both of these issues are hard to define and extremely subjective; meaning different things to different individuals. However, noise levels of 65 DNL have been identified by various public agencies as a guideline above which significant negative impacts may occur in residential areas (FICUN 1980, FICON 1992). At 65 DNL, approximately 12 percent of people would be highly annoyed by noise. Alternative D operations would not result in noise levels of 65 DNL or higher in any airspace unit. The highest level experienced under Alternative D airspace would be approximately 64

DNL for one portion of IR-153; other portions would be subject to noise levels ranging down to less than 45 DNL. The noise associated with Alternative D could detract from the quality of life for some individuals but barely disturb that of others. Since traditional lifestyles in the region can be interpreted to include wilderness and solitary experiences, as well as petroleum exploration, noise associated with Alternative D would be expected to negatively affect some traditional lifestyles and not affect others. However, some people may enjoy watching military aircraft train and may consider the noise associated with aircraft overflights part of the experience.

Construction. Impacts associated with construction of emitter and scoring sites would be similar to those described for Alternative B. There would be no adverse impacts to land use, recreation resources, or visual settings under Alternative D.

Ground Operations. Impacts related to operation of the Electronic Scoring Sites under this alternative would be similar to those described for Alternative B. Operations would not adversely affect land use, recreation resources, or visual settings. Operation of the Electronic Scoring Site near Tucumcari, New Mexico, would not be inconsistent with local ordinances or expected to preclude other, ongoing uses on surrounding parcels (Harding County 1998, Quay County 1998, Union County 1998).

Decommissioning. Impacts related to decommissioning the Electronic Scoring Sites under this alternative would be similar to those described for Alternative B. Decommissioning the Electronic Scoring Sites would not adversely affect land use, recreation resources, or visual setting.

4.2.6 Summary of Comparison of Impacts

Table 4.2-15 compares the impacts for all four alternatives with regard to airspace and flight operations. None of the alternatives would have more than minimal effects on land use, recreation resources, or visual settings. Alternative D would result in the greatest amount of change from baseline.

Table 4.2-15
Land Management and Use Comparison of Alternatives

Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
Airspace and Flight Operations	A) No change to land use, recreation resources, or visual setting. B) Five communities underlie IR-178 and one is subject to noise levels of 55 DNL or greater. C) Three special land use management areas are affected by noise levels of 55 DNL or higher.	A) No likely effects to land use, recreation resources, or visual settings. B) Six communities experience increases in noise levels of 1 to 8 dB. One community newly exposed to aircraft noise. C) No Special Use Land Management Areas experience increases in noise levels of more than 3 dB.	A) No likely effects to land use, recreation resources, or visual settings. B) Five communities experience increases in noise levels of 4 to 5 dB. One community newly exposed to aircraft noise. C) No Special Use Land Management Areas experience increases in noise levels of more than 3 dB.	A) No likely effects to land use, recreation resources, or visual settings. B) Four communities experience increases in noise levels of 10 to 16 dB. C) Thirteen Special Use Land Management Areas experience increases in noise levels of 1 to 17 dB.
Construction	No change to land use, recreation resources, or visual setting.	No adverse effects to land use, recreation resources, or visual settings.	Same as Alternative B.	Same as Alternative B.
Ground Operations	No change to land use, recreation resources, or visual setting.	No adverse effects to land use, recreation resources, or visual settings.	Same as Alternative B.	Same as Alternative B.
Decommissioning	No change.	No adverse effects.	Same as Alternative B.	Same as Alternative B.

4.3 BIOLOGICAL RESOURCES

Biological resources incorporate living, native or naturalized, plant and animal species and the habitats within which they occur. Plant species are referred to as vegetation and animal species are referred to as wildlife. Habitat can be defined as the resources and conditions present in an area that cause or allow a plant or animal to live there (Hall *et al.* 1997).

4.3.1 Methods and Approach

Although the existence and preservation of biological resources are intrinsically valuable, these resources also provide aesthetic, recreational, and socioeconomic values to society. This analysis focuses on species or vegetation types that are important to the function of the ecosystem, are of special societal importance, or are protected under federal or state law or statute. For purposes of the EIS, these resources are divided into three major categories: 1) vegetation; 2) wildlife; and 3) threatened, endangered, or sensitive species.

1. *Vegetation* includes all existing terrestrial plant communities, with the exception of wetlands or threatened, endangered, or sensitive species. The three action alternatives (B, C, and D) are predominantly airspace-related actions, and any ground disturbance would be localized to the proposed Electronic Scoring Sites and emitter sites. Potential impacts to wetlands or sensitive plant species would be localized within the confines of the disturbed area of those sites. Biological surveys of each candidate site revealed no wetlands within or adjacent to the site. Since wetlands would not be affected, they receive no further discussion in this section.

Biological surveys of candidate emitter sites and Electronic Scoring Sites observed no wetlands or threatened or endangered species or their habitat.

2. *Wildlife* includes all animals (i.e., fish, amphibians, reptiles, birds, and mammals) with the exception of those identified as domesticated livestock or listed as threatened, endangered, and sensitive. Many wildlife species have habitats that extend throughout much, if not all, of the areas affected by the alternatives. These habitats both underlie the affected airspace and may occur within the locations for proposed emitter sites and Electronic Scoring Sites.

3. *Threatened, endangered, or sensitive species* are defined as those plant and animal species listed or proposed as such, by the FWS, New Mexico Department of Game and Fish (NMGF), or Texas Parks and Wildlife Department (TPWD). Preservation of sensitive biological resources is accomplished through many means, most notably the Endangered Species Act which protects federally listed threatened and endangered plant and animal species. Federal species of concern, formerly Category 2 candidate species, are not protected by law. However, these species could become listed, and therefore protected, at any time. Their consideration early in the planning process may avoid future conflicts that could occur. The states of New Mexico and Texas also protect state-listed plant and animal species through their respective state fish and wildlife and administrative codes. Additionally, the Natural Heritage Programs of New Mexico and Texas maintain databases of state species of concern, many of which are not afforded legal protection. Discussion of threatened, endangered, and sensitive species focuses on those species with the potential to be affected by aircraft overflights and associated noise. These species consist primarily of birds. Although present within the study area (see Appendix H), neither fish nor plant species would be affected by any element of the proposal. Surveys of the candidate sites for emitters and Electronic Scoring Sites found no watercourses capable of supporting fish and

observed no sensitive plant species or suitable habitat. Construction and operation of these sites, therefore, would not disturb these types of resources.

The Air Force has consulted with the FWS on the Endangered Species Act issues associated with RBTI. In recent years, the Air Force consulted on the expansion of German Air Force operations at Holloman AFB, New Mexico (USAF 1998a) and force structure and foreign military sales actions at Cannon AFB, New Mexico (USAF 1998b). RBTI was considered within the context of these two consultations because RBTI's study area includes much of the same territory.

The Air Force and FWS have and will continue to consult regarding the Endangered Species Act.

Although the airspace units addressed in the German Air Force/Holloman AFB action are not identical to those in RBTI, many comprise secondary MTRs associated with RBTI or otherwise encompassed a similar region in western Texas and part of the same region in eastern New Mexico. This consultation program considered the effects of military aircraft overflights on threatened and endangered species under several airspace units in the region. The Air Force prepared a Biological Assessment (USAF 1998c) and the FWS provided a Biological Opinion (USFWS 1998).

Informal consultation for the Cannon AFB action covered seven of the secondary MTRs overlapped or intersected by proposed IR-153 in RBTI Alternative D. The Mt. Dora MOA was also addressed. For these specific secondary MTRs (IR-107, IR-109, IR-111, IR-113, VR-100/125, VR-108, and VR-114), the Air Force, in consultation with the FWS, devised and implemented a set of special operating procedures designed to reduce what the FWS considered potential effects on specific threatened and endangered bird species (peregrine falcon, Mexican spotted owl, bald eagles, and willow fly catchers). The Air Force submitted a Biological Evaluation of the proposed action to the FWS (USAF 1998d). Subsequently, the FWS provided written concurrence with the Air Force's determination that the action may affect, but is not likely to adversely affect listed species.

Compliance with the Endangered Species Act for RBTI has been and will continue to be part of the broader consultation effort between the Air Force and FWS. Specific efforts for RBTI have included (to date) discussions of the proposal in Air Force-FWS meetings, notification of the FWS concerning the RBTI proposal, requests for data and species lists from the FWS, and receipt of these data from the FWS (Appendix H). The Air Force will continue consultation with the FWS to resolve issues and comply with the Endangered Species Act before implementation (if it occurs) of any RBTI action alternative.

The region of analysis for biological resources includes lands under existing airspace and proposed primary and candidate sites for emitters and Electronic Scoring Sites. Analysis of impacts considered whether the elements of the alternative resulted in loss of habitat, direct mortality of wildlife, and indirect effects on wildlife, such as disturbance from noise. Although Alternative A: No-Action would involve continued use of the Harrison and La Junta Electronic Scoring Sites, and these facilities would be decommissioned in Alternatives B through D, this section does not address biological resources at those sites. Both Electronic Scoring Sites and their associated emitters consist of developed, disturbed lands attractive to species habituated to human activities and disturbance. Previous environmental documentation for these sites (USAF 1993a, b) revealed no issues or impacts for biological resources.

Information used in developing this section includes soil surveys, topographic maps, National Wetland Inventory maps, vegetation maps, published references, personal communication with species experts and agencies, site visits in April, May, and September 1998, internet searches, other relevant NEPA documents, and biological opinions for similar projects. Agencies contacted include the U.S. Fish and Wildlife Service in Albuquerque, NM, Arlington and Austin, TX; Texas Parks and Wildlife Department; New Mexico Department of Game and Fish; and the New Mexico Natural Heritage Program.

4.3.2 Alternative A: No-Action

AFFECTED ENVIRONMENT

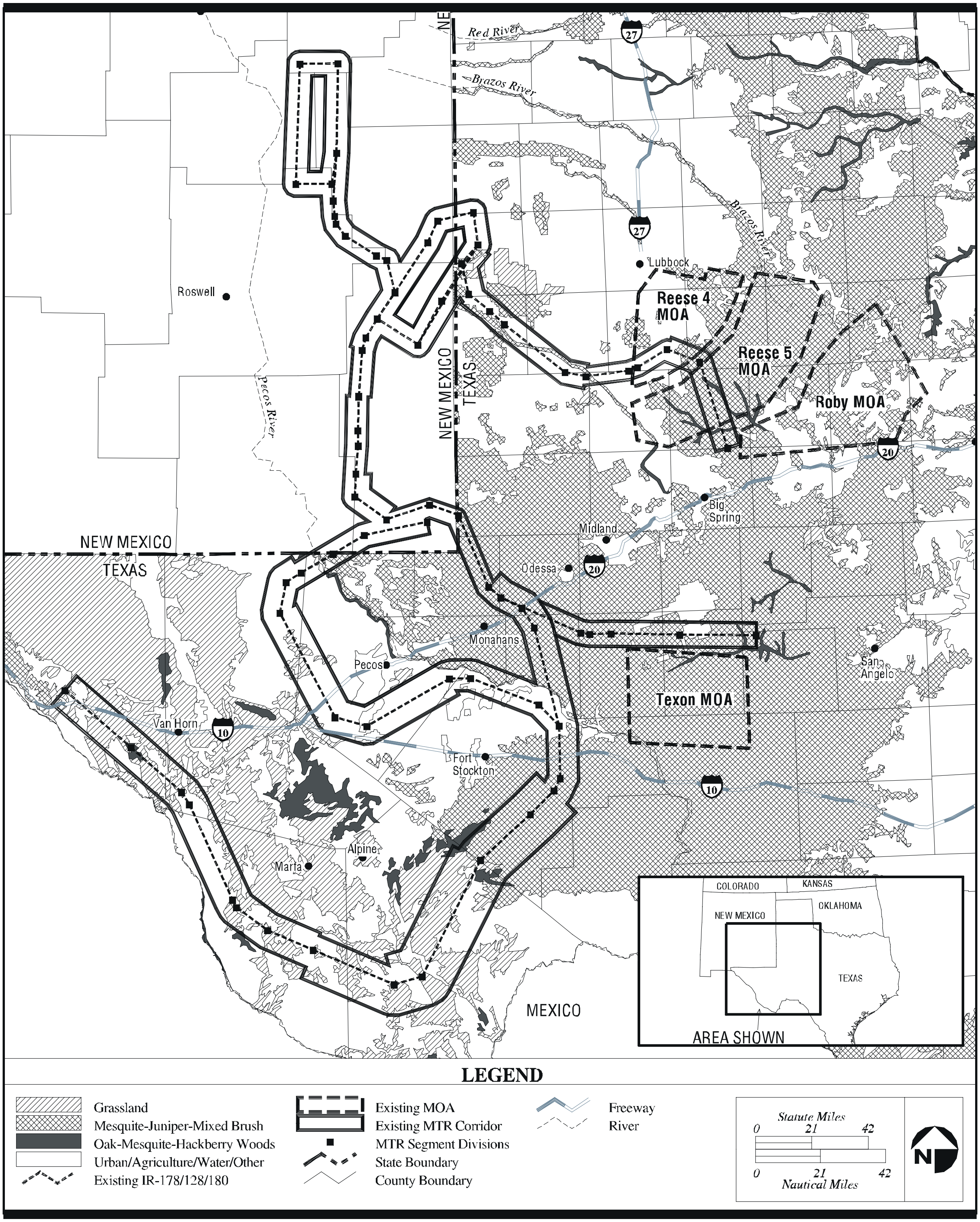
The affected environment encompasses the lands and resources under the primary MTRs and MOA and emphasizes IR-178. This large area, stretching from western Texas to northern New Mexico, includes diverse habitats. These habitats extend beyond the affected area and cover extensive regions. Description of these habitats and the wildlife they support is presented in overview below. Photographs of various parts of the region occur throughout this EIS (refer also to Chapter 3).

Vegetation. Vegetation in the affected region of western Texas and eastern New Mexico is diverse (Figure 4.3-1). In west central Texas, on the lands under IR-178, the Edwards Plateau (refer to Figure 3.1-1) is a deeply dissected, rapidly drained stony plain having broad, flat to undulating divides. The original vegetation was grassland or open savannah plains, with tree or brushy species along stream bottoms and rocky slopes. Most of the tallgrasses, such as cane bluestem, little bluestem, and switchgrass have been replaced by mid- and shortgrasses such as sideoats grama, buffalograss, and Texas grama. The western part of the Plateau is more arid and supports short- to midgrass mixed vegetation. The Edwards Plateau is 98 percent rangeland used primarily for mixed livestock and exotic wildlife production (Brown 1994a, b; Hatch *et al.* 1996).

The Reese 4, Reese 5, and Roby MOAs overlie the southern part of the High Plains area. The area was once dominated by mixed prairie habitats consisting of mid- and tallgrass communities, with scattered sand sage and scrub oaks. However, due to continued grazing and fire suppression, the vegetation is now dominated by shortgrasses, mesquite, yucca, shrubs, and annuals (Hatch *et al.* 1996, Wauer and Elwonger 1998).

Portions of the affected airspace cross over the Trans-Pecos Region (refer to Figure 3.1-1). The original vegetation of the Trans-Pecos ranged from Chihuahuan desert grassland and desertscrub on lower slopes and elevations through juniper, pinyon pine, and Mexican pinyon at mid-elevations. The Guadalupe, Davis, and Chisos mountains are extensions of the Rocky Mountain/Sierra Madre Oriental of North America and support ponderosa pine, oaks, pinyon-juniper, and associated forest vegetation on the higher elevations (Brown 1994a, b; Hatch *et al.* 1996).

The Chihuahuan desert, present in the southern part of the affected area, is the largest of the three creosotebush-dominated deserts in North America. Shrub dominate the vegetation, with cacti only locally dominant and not conspicuous. The basins support a variety of other vegetation types including tarbush, and juniper savannahs with tobosa flats (Brown 1994a, b; Hatch *et al.* 1996).

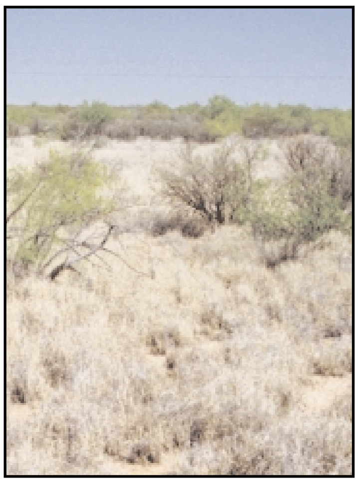


Texas Vegetation Under Alternative A: No-Action

Figure 4.3-1

Grassland vegetation, especially on the higher mountain slopes, includes southwestern and Rocky Mountain species not present elsewhere in Texas (including Arizona fescue and mountain muhly). Along the desert flats, tobosa, and black grama have mostly been replaced by burrograss and fluffgrass. At higher elevations, little and Texas bluestem, pinyon ricegrass, and several species of needlegrass are common (Brown 1994a, b; Hatch *et al.* 1996). However, cattle grazing occurs on approximately 90 percent of the lands. Rangeland has reverted from perennial grassland to desert shrub and annual forbs and grasses. Creosotebush and tarbush now cover over 15 million acres of former desert grassland (McNab and Avers 1994, Hatch *et al.* 1996).

Northeastern New Mexico and northwestern Texas are known as the Plains-Mesa Grassland (Dick-Peddie 1993, Brown 1994c). Plains-Mesa Grassland is the most extensive grassland in New Mexico and historically was dominated by mixed or short-grass communities. While grazing and its effects (fire suppression followed by shrub invasion) have considerably altered these grassland communities, much of the grassland remains. Dominant species include perennial short grasses, such as blue grama and other gramas; scrubs scattered throughout include sagebrush, mesquite, and rabbitbrush. In northeastern New Mexico and the Texas panhandle, dryland and irrigated farming have greatly reduced the amount of this native shortgrass prairie (Dick-Peddie 1993, Brown 1994c).



The Mt. Dora MOA overlies predominantly Plains-Mesa Grassland with small areas of coniferous and mixed woodland found at its higher, wetter boundaries. These areas are predominantly pinyon-juniper woodlands dominated by pinyon pine and various juniper species. A number of oak species are also found in the woodland areas (Dick-Peddie 1993).

Wildlife. Common wildlife species in the affected areas are listed in Appendix H, so the following discussion summarizes the types of wildlife according to regional vegetation communities. Many of the wildlife species occur throughout the area. The wildlife community of the Edwards Plateau and the High Plains consists of species suited to semi-arid environments. Representative species include coyote, desert cottontail, cactus wren, Couch's spadefoot toad, and Texas spotted whiptail lizard (Davis and Schmidly 1994, McNab and Avers 1994, Wauer and Elwonger 1998).

Many of the same species occur in the desert scrub and grasslands of the Trans-Pecos. Other wildlife in the Trans-Pecos include the Sonoran Desert pocket mouse, kangaroo rats, and desert mule deer (Brown 1994a, b; Davis and Schmidly 1994). The bird life of the Trans-Pecos includes many desert species (e.g., greater roadrunner) (Brown 1994a, b; Wauer and Elwonger 1998). Due to the arid nature of the region, reptile species are prevalent. Common species include Texas banded gecko, Trans-Pecos ratsnake, and the western diamondback. Amphibians can be locally and temporally abundant, especially in ephemeral playas and similar areas after summer thunderstorms.

Three Wildlife Management Areas (WMAs) managed by the TPWD are found in the Trans-Pecos region: Elephant Mountain WMA, located 26 miles south of Alpine; Black Gap WMA, just east of Big Bend National Park; and Sierra Diablo WMA, approximately 25 miles north of Van Horn, Texas. Wildlife management areas were established to develop, manage, and protect habitats and populations of wildlife species; and to provide areas for use by educational groups, naturalists, outdoorsmen, and professional biological investigators (TPWD 1998).

Although not wildlife, livestock (especially cattle and horses) can be found within this area. Range cattle, dairy cattle, and horses are the main agricultural livestock found.

The area under the affected airspace in eastern New Mexico contains many wildlife species typical of the High Plains, although species diversity is low in most habitats due to the low vegetational diversity. Many of the wildlife species are widely distributed throughout the western United States. The most widespread habitat in this region is mixed-species grassland, which, in addition to broadly distributed species, supports a number of species linked directly to grassland habitat. Representative grassland species range from the plains black-headed snake to the burrowing owl to the black-tailed prairie dog.

The lowest species diversities are found in the sand hills and agricultural habitats. Common species found here are prairie lizard, mourning dove, cactus wren, brown-headed cowbird, and vesper sparrow (Brown 1994c, McNab and Avers 1994). Although not wildlife, livestock (especially cattle and horses) can be found within the affected area; range cattle, dairy cattle, and horses are the main livestock found in these areas.

Threatened, Endangered, and Sensitive Species. Within the counties encompassed by the study area for Texas and New Mexico, the FWS lists a total of 35 threatened or endangered species known to occur or potentially occurring. Data on threatened, endangered, and sensitive species were obtained through consultation with the FWS (Appendix H). Additional data were collected from the Natural Heritage Programs of New Mexico and Texas. These data include 14 plant species, 7 fish species, and 1 water snake. Surveys of the candidate emitter sites and Electronic Scoring Sites demonstrate that none of these species or their habitat would be affected by RBTI. As such, they warrant no further discussion. The remaining 13 threatened and endangered species, consisting of 10 bird and 3 mammal species, have the potential to occur in counties underlying affected airspace. However, as described below, this potential is low to negligible.

Data on threatened, endangered, and other sensitive species were obtained as part of Air Force consultation with the FWS.

Three federally listed species of mammals are potentially found in this region: black-footed ferret (endangered), Mexican (greater) long-nosed bat (endangered), and ocelot (endangered). The black-footed ferret is almost totally dependent on the presence of the black-tailed prairie dog, preying on it as a preferred food source and utilizing its burrows for dens and shelter (NMGF 1997a). However, the black-footed ferret has not been observed in Texas since 1963 and in New Mexico since 1934; as of 1988, it was presumed extirpated (eliminated) in New Mexico. The primary causes of extirpation were habitat alteration, predator control, and prairie dog eradication (Campbell 1995, NMGF 1997a).

The Mexican long-nosed bat is found in the higher, cooler mountains of the southern Trans-Pecos along the Texas-Mexico border and into Mexico. They prefer desert scrub vegetation dotted with agaves, mesquite, creosotebush, and a variety of cacti. The bats use caves, crevices, abandoned mines, tunnels, and old buildings as day roosts. Reasons for the decline include loss of roost areas and their primary food source, blooming agaves. The only known roosting site in the U.S. is in Big Bend National Park (Davis and Schmidly 1994, Campbell 1995).

Aplomado falcon, are an endangered species, unlikely to occur except as rare visitors under the affected area for Alternative A.

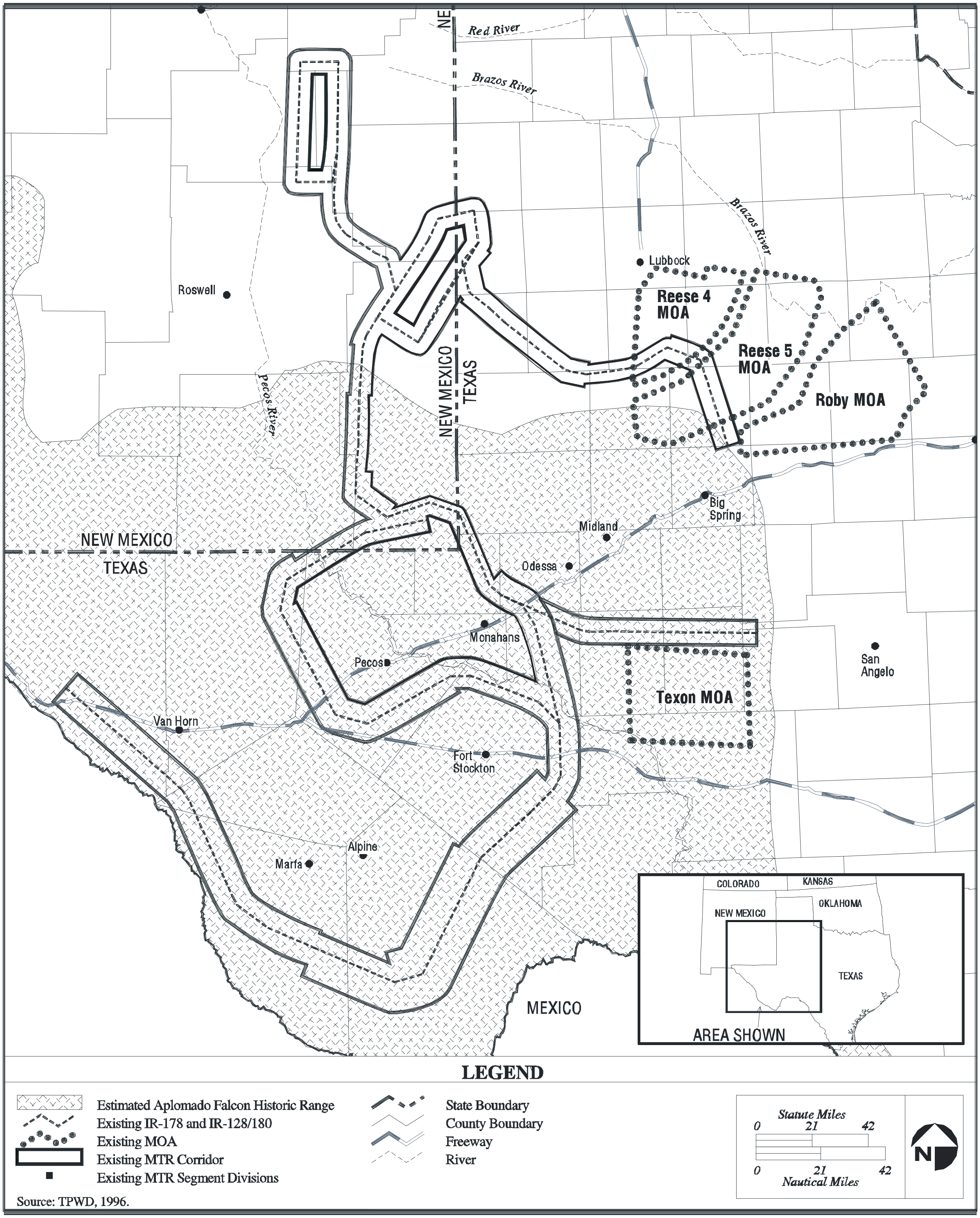
The ocelot once occurred throughout south Texas along the Rio Grande, the southern Edwards Plateau Region, and along the Coastal Plain. Due to the loss of its primary habitat of dense thorny shrublands along the Rio Grande and predator control activities, the ocelot is restricted to three or four counties in the southern Rio Grande Plains (not under any airspace affected by the proposed alternatives) (Davis and Schmidly 1994, Campbell 1995). Only the outer margin of existing IR-178 crosses over the northern tip of Big Bend National Park. Little chance of direct overflights exists.

Out of the ten federally listed species of birds that have the potential to occur in counties within the affected area, five depend on major water bodies (i.e., lakes, rivers) and would only occur within the affected environment as rare transient (e.g., migrating) visitors: bald eagle (threatened), interior least tern (endangered), whooping crane (endangered), piping plover (threatened), and brown pelican (endangered). Three species--Mexican spotted owl (threatened), southwestern willow flycatcher (endangered), and golden-cheeked warbler (endangered)--have specific habitat requirements that are not commonly found under the affected airspace. The closest populations of spotted owls are found in the Guadalupe mountains along the New Mexico/Texas border west of IR-178, and golden-cheeked warblers are found along the eastern Edwards Plateau in Kinney, Edwards, and Kimble counties. These counties lie east of the affected airspace. Spotted owl habitat occurs under some portions of secondary MTRs (i.e., IR-109, IR-111) in northeastern New Mexico, but does not extend to areas overflown by primary MTRs. The eastern edge of the southwestern willow flycatcher's range is in western Texas, with collections having been made in the Guadalupe and Davis mountains and from unspecified locales in Brewster County. The flycatcher is considered a rare summer resident in Big Bend National Park. None of these locations for the flycatcher fall under or directly adjacent to the affected airspace in Texas. Data are lacking on current population levels and trends in Texas (NMGF 1997b, Sogge *et al.* 1997, USFWS 1998).

Another endangered bird, the black-capped vireo, historically bred from southwestern Kansas, southward through Oklahoma, Texas, and into Coahuila, Mexico. Currently black-capped vireos breed locally in central Texas, a few counties in central Oklahoma, and central Coahuila, Mexico. Reasons for the reduction in the vireo's geographic extent include habitat loss due to urbanization, brush clearing, grazing, brown-headed cowbird parasitism, and human disturbance (Campbell 1995).

On the western edge of the black-capped vireo's range in the western Edwards Plateau and Trans-Pecos regions, the birds are often found in canyon bottoms and slopes where sufficient moisture is available to support diverse shrub vegetation. In the Trans-Pecos, vireos are known to nest in southern Brewster County at Big Bend National Park and Black Gap WMA (Campbell 1995). According to the TPWD Biological and Conservation Database and the Element Occurrence Records, vireos are not known to occur in any county under Alternative A. Vireos are known to occur within the counties adjacent to, but not underlying the existing Texon MOA (Campbell 1995).

The federally endangered northern aplomado falcon was considered extirpated from the United States in the late 1950s, with the last documented nesting occurring in 1952 in New Mexico. In the eastern portion of its historic range (east of the Pecos River [Figure 4.3-2]), the aplomado was found in mesquite and yucca desert grasslands, which extended into the southern portion of Lea County, New Mexico, and throughout the Trans-Pecos region of Texas. Combinations of heavy grazing, encroachment of mesquite, and proliferation of weedy species (such as snakeweed) have substantially reduced the amount of suitable habitat in eastern and southeastern New Mexico and Trans-Pecos Texas for aplomado falcons (Leal *et al.* 1996). Recent confirmed observations of adult aplomados in Otero and Socorro counties, New Mexico, and the discovery of two breeding populations 25 miles south of the New Mexico border in Chihuahua, Mexico (west of the affected airspace), have increased the potential for natural colonization of the species' former breeding range in southern New Mexico and Trans-Pecos Texas (Richardson 1996, Montoya *et al.* 1997). Of the total 11 sightings since 1991, there have been two confirmed sightings of aplomados within the affected environment: one sighting in 1992 in Jeff Davis County and one sighting in Culberson County in 1996 (Perez, personal communication 1999). Nine other sightings have occurred during this period outside



Estimated Aplomado Falcon Historic Range and Affected Airspace for Alternative A: No-Action

Figure 4.3-2

of the affected area in southern New Mexico and western Texas. The FWS considers the aplomado falcon to be a potential resident along the Texas/Mexico border. The mountain plover, a proposed threatened species, is uncommon in the area and could be a possible migrant between its winter home in southern Texas and Mexico and the common breeding area in northern New Mexico (Peterson 1990).

Over 290 species considered sensitive by federal or state agencies also occur within the affected area. These sensitive species receive no protection under law, but are worthy of note. Most (240) of these species consist of plants, fish, insects, and amphibians that would not be affected by any aspect of RBTI. Of the remainder, which primarily consist of birds and mammals, several species have habitat in the region potentially affected by RBTI. These include the ferruginous hawk, loggerhead shrike, burrowing owl, white-faced ibis, swift fox, and Texas horned-lizard.

ENVIRONMENTAL CONSEQUENCES

Under Alternative A: No-Action, there would be no change to current baseline conditions. No new construction or training operations would occur; therefore, baseline conditions applicable to biological resources would continue to apply. None of these conditions have resulted in significant impacts to vegetation, wildlife, or threatened, endangered, or sensitive species.

Most of the federally listed threatened or endangered species are not known to occur directly under the affected airspace. For most species, past studies (Manci *et al.* 1988; Krausman *et al.* 1993, 1998; USFS 1992; Workman *et al.* 1992; Ellis *et al.* 1991) show that wildlife habituates to the sporadic intrusion of low-altitude jet aircraft without negative effects on populations (see Appendix G).

Although the aplomado falcon's estimated historic range covers the affected area, its presence as a migrant visitor is rare. Some concerns, however, were raised by the public regarding the potential effects of overflights on aplomado falcons. The rarity of the species in the huge region makes an overflight of an aplomado falcon improbable, but not impossible.

There have been no studies on the responses of aplomado falcons to aircraft overflights, but there have been studies on the closely related peregrine and prairie falcons and other raptors (e.g., Ellis *et al.* 1991). These studies suggest that falcons will nest within areas overflown by low-altitude jet aircraft. Although birds do at times flush from nests, they soon return, and nest success is not affected. Peregrine falcons and other raptor species are known to nest in the immediate vicinity of airports, under the flight patterns where aircraft land and take off. Although reactions of the aplomado falcon may differ from other raptors studied for aircraft overflight, those species studied did not show a great concern for aircraft overflight. Aplomado falcons show little response to human activity and noise from ground-based activity. In Mexico, populations nested in close proximity to agricultural activities and ground-based human activities (Montoya *et al.* 1997). Studies of raptors (such as the bald eagle, peregrine falcon, and Swainson's hawk) suggest that raptors respond more consistently and noticeably to ground-based human activities (pedestrians, hunters) than to aircraft. Therefore, if the aplomado falcon is similar to other raptors, then it is unlikely that it is adversely affected by current aircraft operations.

4.3.3 Alternative B: IR-178/Lancer MOA

AFFECTED ENVIRONMENT

The affected environment for proposed IR-178 and the proposed Lancer MOA/ATCAA is a subset of the area in Texas associated with Alternative A: No-Action. Most of the proposed airspace coincides with existing primary or secondary airspace, so little new habitat would be exposed to overflights. Candidate sites for emitters and Electronic Scoring Sites are also included in the affected environment.

Construction and operation of emitters would not significantly affect biological resources under Alternative B.

Alternative B is located predominantly in the Trans-Pecos region of west Texas with a small portion extending into the Edwards Plateau and north into the southern Texas Panhandle or High Plains (refer to Figure 3.1-1). A portion of proposed IR-178 overlies a small area of extreme southeastern New Mexico.

Vegetation. Vegetation in the affected area (Figure 4.3-3) under the airspace is typical of the Trans-Pecos region, as described under Alternative A: No-Action. All candidate sites for emitters and Electronic Scoring Sites lie within this region. All have undergone disturbance to vegetation as a result of agriculture, grazing, or other uses (Appendix D).

Wildlife. Wildlife under the affected primary airspace matches that described for western Texas under Alternative A: No-Action. Field surveys of the candidate sites for Electronic Scoring Sites and emitters observed common wildlife species generally distributed throughout the region.

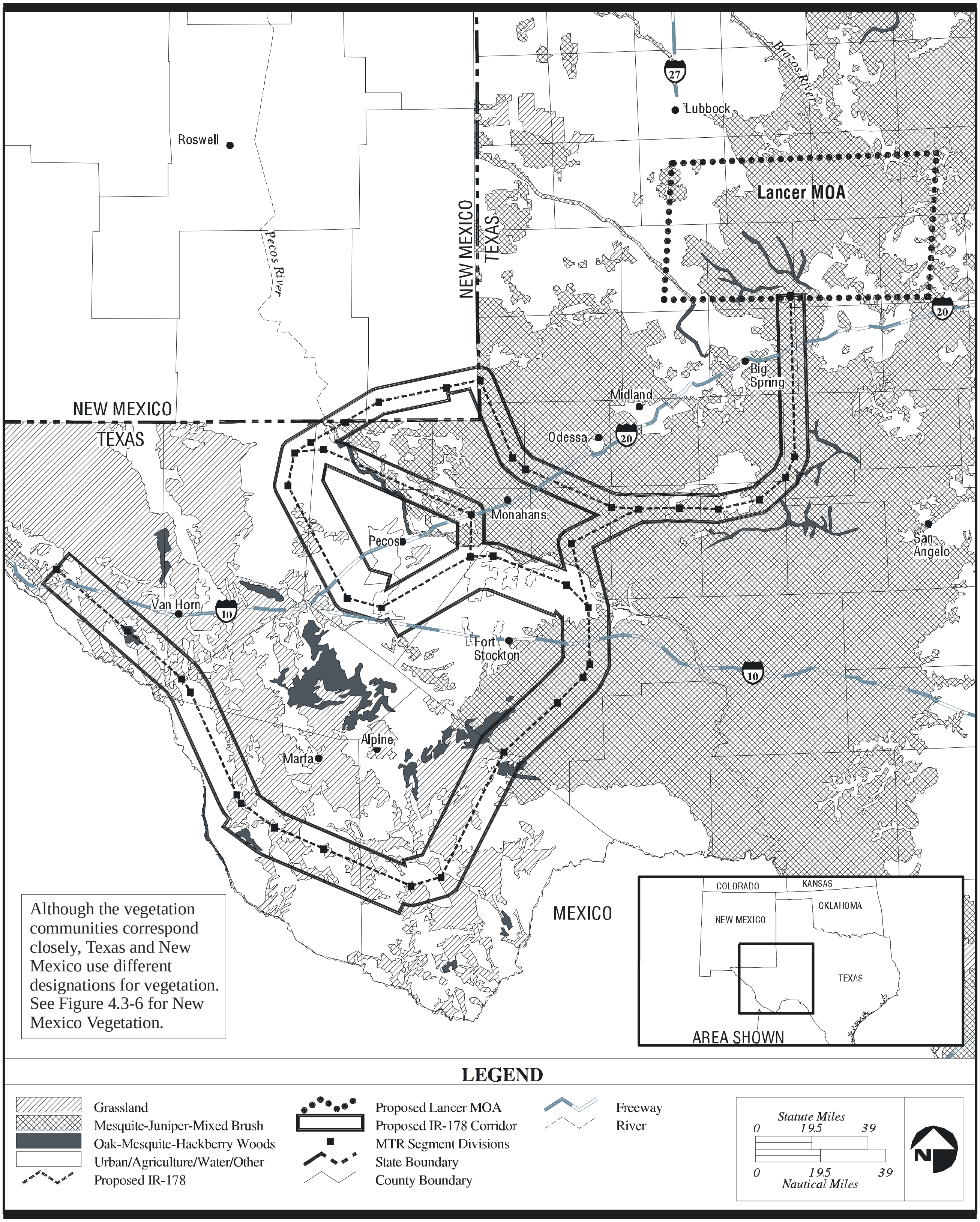
Threatened, Endangered, and Sensitive Species. The threatened, endangered, and sensitive species for Alternative B consist of the same species as described for Alternative A: No-Action. Figure 4.3-4 shows the historic range of the aplomado falcon in relation to this alternative. There is little difference in the affected area of the estimated aplomado falcon historic range among Alternatives A, B, or C.

ENVIRONMENTAL CONSEQUENCES

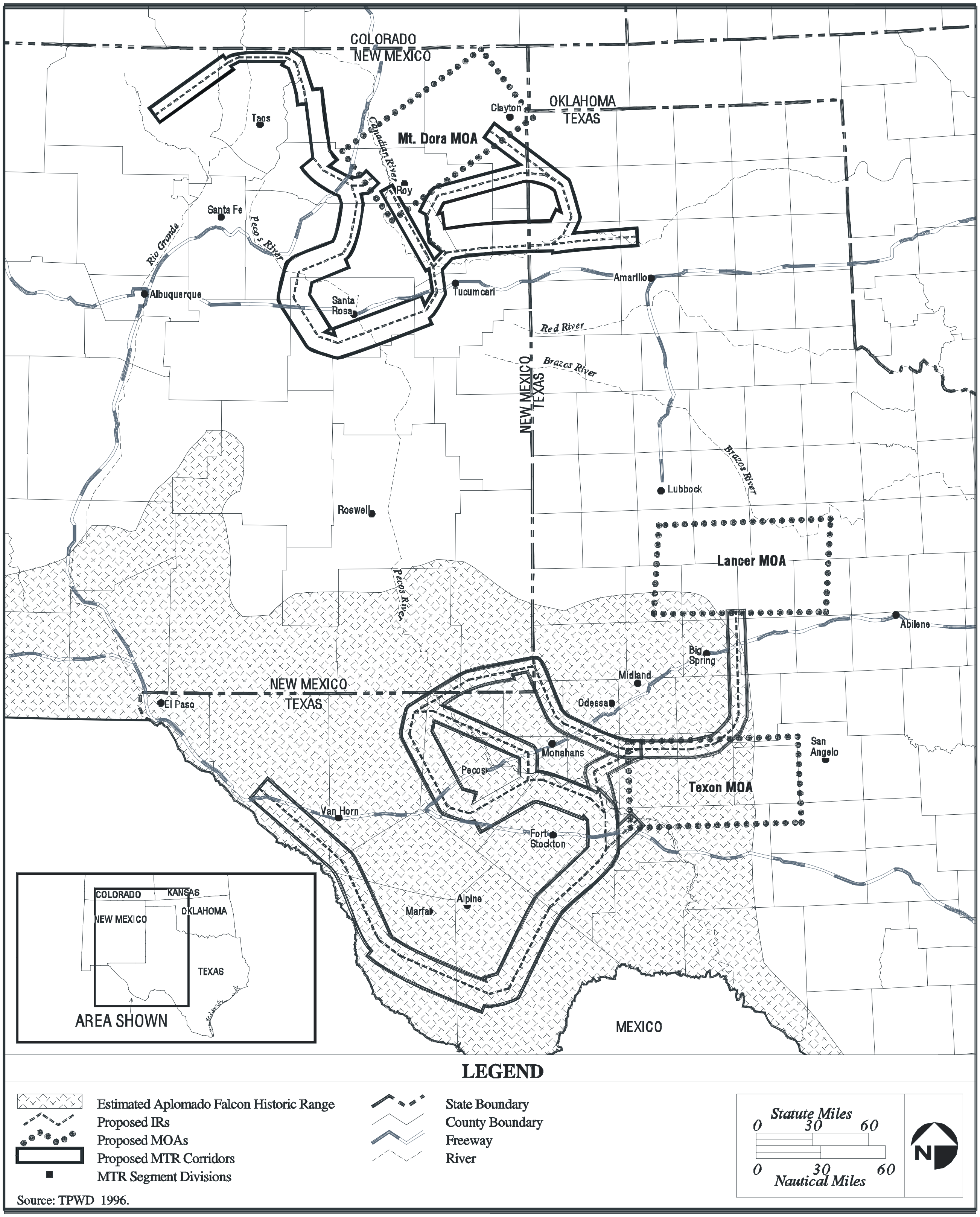
The results of analysis, as presented below, demonstrate that neither airspace operations, construction, nor emitter and Electronic Scoring Site operations would significantly impact biological resources.

Airspace and Flight Operations. The potential sources of impacts to wildlife from aircraft overflights are discussed in detail in Appendix G, but include the visual effect of the approaching aircraft and the associated subsonic noise. Any visual impacts would be most likely to occur along those portions of MTRs that are below 1,000 feet AGL, the altitude accounting for most reactions to visual stimuli by wildlife (Lamp 1989, Bowles 1995).

Studies on the effects of noise on wildlife have been predominantly conducted on mammals and birds. Studies of subsonic aircraft disturbances on ungulates (e.g., pronghorn, bighorn sheep, elk, and mule deer), in both laboratory and field conditions, have shown that effects are transient and of short duration, and suggest that the animals habituate to the sounds (Workman *et al.* 1992, Krausman *et al.* 1993, 1998; Weisenberger *et al.* 1996). Similarly, the impacts to raptors and other birds from aircraft low-level flights were found to be brief and insignificant and not detrimental to reproductive success (Smith *et al.* 1988, Lamp 1989, Ellis *et al.* 1991, Grubb and Bowerman 1997).



Texas Vegetation Under Alternative B: IR-178/Lancer MOA **Figure 4.3-3**



Estimated Aplomado Falcon Historic Range and Affected Airspace for Alternatives B/C/D

Figure 4.3-4

Under Alternative B, the increase in sortie-operations over lands underlying the proposed Lancer MOA/ATCAA would result in negligible impacts to exposed wildlife, since all flight activity would occur above 3,000 feet AGL.

For proposed IR-178, most segments would experience an increase, over current levels, of one to six sortie-operations per day. The potential for more than one to six overflights of a wildlife receptor would be low, and exposure to noise would be short in duration. These overflights would be dispersed across the MTR corridor, and the widest segments would support the greatest number of sortie-operations. Although this increase in flight activity is not great, the potential for impacts to wildlife may be greater since most of IR-178 would be flown at altitudes less than 1,000 feet AGL, with many segments flown at altitudes less than 500 feet AGL but greater than 300 feet AGL (refer to Section 4.1-3). Overall, only 5 percent of flight activity would occur between 300-500 feet AGL and 75 percent of flight activity would occur between 500-1,000 feet AGL. As previous research has shown (see above and Appendix G), wildlife response would also be short-term and would not result in significant effects.

Bird-aircraft strikes would continue to be rare in MOAs and MTRs. As established in Section 4.1, aircrews would employ the Bird Avoidance Model when planning and executing training sorties. Use of this model has proven to minimize the potential for bird-aircraft strikes.

The potential impacts from aircraft overflights in MOAs and MTRs on federally threatened and endangered species are expected to be similar to those described for wildlife. The three threatened or endangered mammal species do not have habitat under the affected airspace, and most of the 10 bird species represent rare transient visitors or lack habitat under the affected airspace. Two bird species and their habitats are found on lands underlying the affected airspace addressed in Alternative B.

Black-capped vireos (federally listed-endangered) are not currently known to nest on lands underlying any MTR or MOA proposed airspace. Due to the nature of the area (i.e., predominantly private), extensive surveys have not been conducted to accurately establish presence/absence of this species throughout the RBTI study area. As discussed previously, studies on an array of mammal and bird species indicate that sporadic noise from military jet overflights does not negatively affect reproduction or habitat use. Although no specific studies have been conducted for black-capped vireos, a similar lack of response would be expected under Alternative B, especially since any habitat has already been exposed to aircraft noise for more than a decade.

Although aplomado falcons (federally listed-endangered) are not currently known to nest within the affected airspace, desert grassland that might be potential habitat does exist, primarily along the Texas/Mexico border. The FWS considers the aplomado falcon to be a potential resident along the Texas/New Mexico border. Over 1.3 million acres of grassland that the FWS considers within the estimated aplomado historic range occur under IR-178 (segments AB-JK). Recent studies in Chihuahua, Mexico, have found aplomados nesting as close as 34 miles from the Texas border near Ruidosa, Mexico. It is possible that aplomados are more common in the southern Trans-Pecos of Texas than is normally believed based on sighting records of amateur and professional ornithologists (USFWS 1998). Even so, they are still visitors. This ecosystem historically constituted nesting habitat for the aplomado falcon in the desert southwest. Because of its proximity to breeding aplomado populations in nearby Mexico, this area is considered by the FWS to be a high priority recovery area for this endangered species (Perez and Torrez, personal communication 1999). Habitat loss is a concern for affecting the recovery of this species. It is unknown if low aircraft overflight in parts of the historic habitat would contribute to the loss of habitat by rendering the habitat unsuitable for the aplomado falcon's return. This area is currently being overflown by existing actions. As part of the RBTI action, the Air Force, in cooperation with the FWS, has committed to studying the aplomado falcon population trends in the area along the Texas/Mexico border to learn if aircraft actions in the area have an affect on this species. The proposed increase of four sortie-operations along parts of IR-178 (segments AB-JK) that overfly potential aplomado habitat may result in disturbance to individual aplomado falcons. However, the potential for this effect is negligible due to the rarity of aplomados within their historic range (11 sightings since 1991) and the probability that aplomado responses would be minimal like those of other, similar raptors.

Under Alternative B, the mountain plover is classified by the New Mexico Department of Game and Fish as uncommon in Lea county, New Mexico. Lea county was once thought to be important to the mountain plover (Ligon 1961), but there are no records of mountain plover in this country for 25 years (the 1970s through 1995) (Sager 1996). The mountain plover has also been reported in Eddy County, New Mexico, and Jeff Davis, Brewster, Dawson, and Lynn counties in Texas. Dawson and Lynn counties are underneath the MOA, so no low overflighs would occur. The other three counties have not had confirmed nesting activity and are likely to be visited by migrants as they fly between their winter home in southern Texas and Mexico and the common breeding area in northern New Mexico (Peterson 1990). Therefore, no adverse effect from RBTI aircraft overflight on the mountain plover is expected from this alternative.

Although not wildlife, some public scoping concerns focused on the effects of overflights on domestic livestock including cattle, horses, and bison (see Appendix G). The effects of aircraft overflights and their accompanying noise on domestic livestock have been the subject of numerous studies since the late 1950s (Gladwin *et al.* 1988, USFS 1992, USAF 1993c). These studies have examined the effects on a wide range of livestock including poultry, cattle, sheep, pigs, goats, and mink. Exposure to multiple overflights at all altitudes provided the basis for testing the animal's response. Several general conclusions are drawn from these studies:

- Overflights do not increase death rates and abortion rates, or reduce productivity rates (e.g., birth rates and weights), and do not lower milk production among domestic livestock.
- Animals take care not to damage themselves and do not run into obstructions, unless confined or traversing dangerous ground at a high rate if overflown by aircraft 50 to 100 m (163 to 325 feet) AGL (USFS 1992).
- Domestic livestock habituate to overflights and other noise. Although they may look or startle at a sudden onset of aircraft noise, they resume normal behavior within 2 minutes after the disturbance.

Inconclusive results have been obtained in some cases because the effect observed is no different than any other disturbance livestock experience on a daily basis, such as from tractors or blowing paper. Historical interactions between the cattle and numerous overflights have not indicated a problem. For example, cattle have grazed under heavily used military airspace at Avon Park Range in Florida, Saylor Creek Range in Idaho, and Smoky Hill Air National Guard Range in Kansas for decades. At these training ranges, grazing cattle have been subject to upwards of 100 overflights per day, many as low as 100 feet AGL. No evidence exists that the health or well being of the cattle has been threatened. The animals, including calves, show all indications of habituating to the noise and overflights.

Some horses with riders have been reported to startle when surprised by a low aircraft overflight, but response varies with the horse, the rider, the terrain, and other conditions; sometimes a horse reacts dramatically, but sometimes no reaction occurs. Several studies noted that horses gallop, more randomly or exhibit biting and kicking behavior in response to low-altitude aircraft overflights. However, no injuries or abortions were reported, and there was evidence that horses adapted to the flyovers.

Construction. Biological surveys of all Alternative B candidate emitter sites and Electronic Scoring Sites revealed no water-dependent species, and no critical habitat for said species were observed or identified. Therefore, the construction of these sites would have no impacts to water or wetland dependent species including fish, reptiles, birds, or vegetation.

No federally listed threatened and endangered species or potential habitat were observed during biological surveys of each of the candidate Electronic Scoring Sites and emitter sites in Texas. However, the sites overlap with the general range for several sensitive bird, mammal, and reptile species. These species, like the Texas horned lizard and burrowing owl, have widespread ranges and habitats throughout much of the region encompassing the candidate sites. Construction would disturb less than 20 acres (including roads), and some portion of this area potentially includes habitat for these widespread sensitive species. Two factors, however, indicate that construction would not result in significant impacts to sensitive species: (1) the amount of affected habitat (less than 20 acres) is negligible compared to the total habitat available within the region; and (2) the candidate sites have been subject to varying degrees of previous disturbance (e.g., agriculture, grazing, oil and gas development) that has altered habitat.

Ground Operations. Ground operations would have the potential to affect biological resources only in the localized areas within the emitter and Electronic Scoring Sites. Since existing data and surveys establish that these sites contain neither threatened nor endangered species, and do not represent important habitat for sensitive species, impacts to biological resources due to ground operations would be unlikely.

4.3.4 Alternative C: IR-178/Texon MOA

The affected environment represents a subset of the area in Texas associated with Alternative A: No-Action. Most of the proposed airspace coincides with existing primary or secondary airspace. It is focused on proposed IR-178 and the Texon MOA/ATCAA, and includes the candidate sites for emitters and Electronic Scoring Sites.

Vegetation. Vegetation for the affected area under the airspace matches that described for Alternative A: No-Action (Figure 4.3-5). With the proposed Texon MOA/ATCAA, more grasslands would be included in the affected area. For the candidate Electronic Scoring Sites and emitter sites, the vegetation is generally grassland, but many of the sites have been disturbed by grazing or agriculture.

Wildlife. The wildlife in the affected area is the same as described for Alternative A: No-Action.

Threatened, Endangered, and Sensitive Species. The threatened, endangered, and sensitive species within the affected area match those already described in Alternative B. The same basic areas are affected, so the habitats would also be similar.

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. As in Alternative B, the potential effects of overflights on wildlife and threatened and endangered species would be negligible.

Studies on an array of bird and mammal species indicate that intermittent short-duration noise from military jet overflights does not result in significant adverse effects. While not all individual species have been studied, data on similar species support this conclusion.

As in Alternative B, airspace associated with Alternative C (IR-178) would overlie historic aplomado falcon range. In this area, proposed average daily sortie-operations would increase by four. Due to the rarity of aplomado falcons within this historic range (e.g., 11 sightings since 1991), the probability that the additional sortie-operations would overfly an aplomado would be negligible. If such an event occurred, data on similar birds suggest that an aplomado would not be deleteriously affected. Bird-aircraft strike potential would increase slightly (refer to Section 4.1), but is expected to remain low. No measurable effects on bird populations are anticipated.

Effects to the mountain plover are the same as for Alternative B. Mountain plover are uncommon residents or occassional visitors in the area under the affected airspace for Alternative C. Therefore, no adverse effect from RBTI aircraft overflight on the mountain plover is expected from this alternative.

Construction. During biological surveys of all candidate emitter sites and Electronic Scoring Sites, no water dependent species (or critical habitat for such species) or wetlands were observed or identified at any of the sites. Construction of these sites would have no impacts to water or wetland-dependent species, including fish, reptiles, birds, or vegetation. No federally listed threatened and endangered species or potential habitat were observed during biological surveys of each of the candidate sites under Alternative C. No impacts to these biological resources would occur.

Potential effects of construction on sensitive species would be minimal, as described for Alternative B. None of the candidate sites contain crucial habitat for such species, and the total amount of area affected would be less than 20 acres.

Ground Operations. For the same reasons discussed under ***Construction***, no impacts to biological resources would be expected.

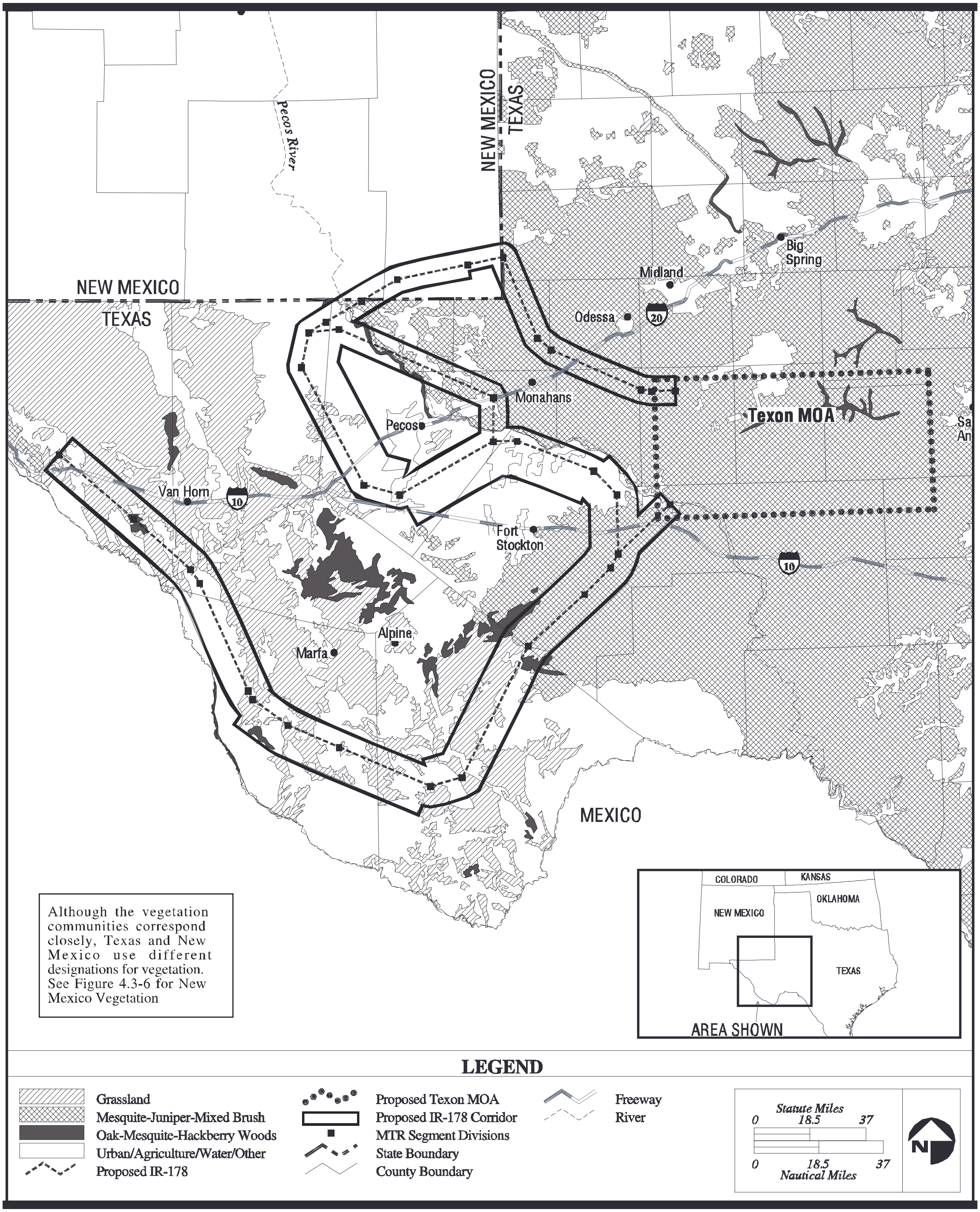
4.3.5 Alternative D: IR-153/Mt. Dora MOA

AFFECTED ENVIRONMENT

The affected environment for Alternative D includes the primary MTRs and MOAs, particularly proposed IR-153 and the secondary MTRs it intersects or overlaps, as well as the Mt. Dora MOA. These airspace units predominantly coincide with existing airspace in northeastern New Mexico. Candidate emitter sites and Electronic Scoring Sites are also part of the affected environment.

Vegetation. Proposed IR-153 overlies a variety of vegetation communities (Figure 4.3-6). Much of the proposed route, especially its southern half, is over Plains-Mesa Grasslands. In its northern extent, IR-153 would overlie areas at higher elevations dominated by ponderosa pine, mixed-conifer, and spruce-fir forests (Figure 4.3-6). Interspersed juniper savanna and montane grasslands dominate lower elevations. In some areas, mesa tops dominated by ponderosa pine and juniper are dissected by steep canyons. Vegetation on canyon slopes and bottoms includes a variety of coniferous and deciduous trees. Plains-Mesa Grasslands dominate the lands under the Mt. Dora MOA, but montane coniferous forest also occurs in this area.

Wildlife. Most of the wildlife occurring under Alternative D airspace consists of those species generally associated with mixed grasslands, although montane,



Texas Vegetation Under Alternative C: IR-178/Texon MOA

Figure 4.3-5

lacustrine, riverine, and riparian habitats also exist within the grasslands. As described previously under Alternative A: No-Action, many of these wildlife species are habitat generalists able to adapt to a range of habitats, but most are adapted to aquatic, wetland, or riparian habitats. Appendix H lists common, representative species in the area. The abundance and diversity of resident and migratory wildlife are greatest around riparian areas, lakes, reservoirs, and ephemeral playas. These areas provide important resident and migratory waterfowl habitat, in addition to habitat for amphibians, reptiles, and mammals.

In the portions of IR-153 overlying areas of coniferous forests, common wildlife include skink, kingsnake, Cooper's hawk, great-horned owl, dark-eyed junco, American dipper, mountain chickadee, northern flicker, elk, mule deer, and chipmunk. Sand hills and scrub communities under proposed IR-153 possess the least species diversity for wildlife.

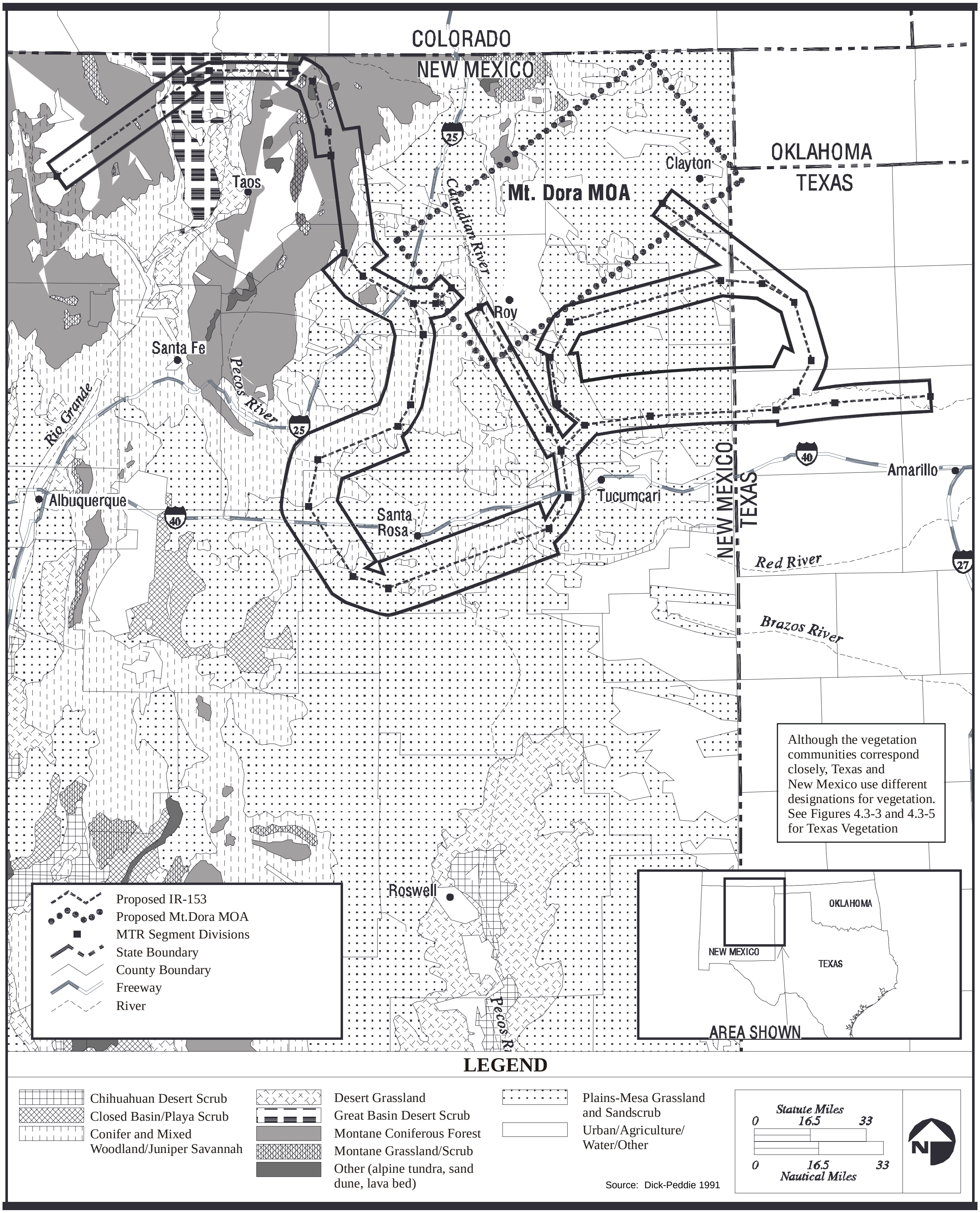
The Valle Vidal Management Unit underlies the portion of the MTR directly adjacent to the Colorado-New Mexico border (segments BC-CD). This is a critical elk calving and wintering habitat that supports a substantial number of resident and migratory elk, which generally occupy the area in December and stay until April (Stephenson, personal communication 1999).

Threatened, Endangered, and Sensitive Species. A total of 12 federal endangered or threatened species occur within northeastern New Mexico under and around the affected area for Alternative D. Appendix H (Table H-12) lists these species. Of this total, one is a plant and three are fish. Surveys of the candidate emitter sites and Electronic Scoring Sites demonstrate that none of these species or their habitat occur on or near the sites. Since aircraft overflights do not affect these species, and construction would not affect their habitat, these species warrant no further analysis.

Eight federally listed amphibian, bird, and mammal species have the potential to occur in this part of New Mexico: bald eagle, Mexican spotted owl, southwestern willow flycatcher, interior least tern, piping plover, whooping crane, brown pelican, and black-footed ferret. Four of these species are considered to occur only rarely, if at all, in the region: piping plover, whooping crane, brown pelican, and black-footed ferret. One species, the mountain plover, is a federal candidate species for listing as threatened or endangered.

The piping plover inhabits open beaches, alkali flats, and sandflats of North America. The piping plover breeds primarily along the Atlantic coast from southern Canada to North Carolina, along portions of the Great Lakes, and along rivers and wetlands of the northern Great Plains from southern Canada, south along major prairie rivers (Yellowstone, Missouri, Platte), and into alkali wetlands in northeastern Montana, the Dakotas, Nebraska, and Iowa. During the winter, the bird is found along coastal beaches and mudflats from the Carolinas and Gulf States to Yucatan, Mexico (Haig 1992). In New Mexico, piping plover are considered very rare migrants at wetlands in Colfax, Eddy, Guadalupe, and Socorro counties. They have been reported in the state on only six occasions (Santa Rosa, Brantley, and Springer lakes, Bosque del Apache National Wildlife Refuge [NWR] and Maxwell NWR; and Avalon Reservoir), including twice in April 1995 (NMGF 1997c).

The whooping crane is the rarest of the world's 15 crane species. A combination of habitat preservation, legal protection, and international cooperation between Canada and the U.S. has allowed the only self-sustaining natural wild population, the Aransas/Wood Buffalo population, to increase from a low of 16 known individuals in 1941 to 165 in 1997. This population breeds in Wood Buffalo National Park in northern Alberta and winters at Arkansas NWR on the south coast of Texas, hundreds of miles from the RBTI study area. The whooping crane currently exists in



New Mexico Vegetation Under Alternative D: IR-153/Mt. Dora MOA **Figure 4.3-6**

two other wild populations and four captive locations, totaling 185 birds (Meine and Archibald 1996, USFWS 1997).

In 1975, experimental efforts to establish a migratory wild flock through cross-fostering of whooping crane eggs with sandhill crane adults began at Grays Lake NWR in southeastern Idaho. Sandhill crane "foster parents" raised the whooping cranes and taught them their traditional migration route to wintering grounds along the Rio Grande Valley at Bosque del Apache NWR, New Mexico. They winter here from approximately November through February. However, due to high mortality rates, a prolonged drought in the summer range, and the failure of the birds to pair and breed with conspecifics, it was decided to end the cross-fostering program. In 1996 an alternative technique, using ultralight aircraft to teach captive-reared whooping cranes an appropriate migration route and wintering area, was attempted with limited success (Meine and Archibald 1996, USFWS 1997).

Currently only four adult whooping cranes survive from the experimental population: two from the cross-fostered experiments and two from the ultralight technique. Since the only indication of prior occurrence of whooping cranes in New Mexico is in the form of unverified reports from the 1850s, 1938, and the 1960s, NMGF suggested that with the expected extirpation of the experimental flock, procedures of the Wildlife Conservation Act should be initiated to delist the whooping crane from the state list (NMGF 1997d).

The only area where aircraft may potentially affect the four whooping cranes is beneath IR-153, along the Rio Grande, during the fall and spring migration to Bosque del Apache NWR and from Grays Lake NWR, respectively. Although the whooping crane is listed as potentially occurring in that portion of the airspace that overlies the Texas Panhandle, due to the absence of suitable habitat, cranes would be considered rare transients migrating through the area.

Since the publication of the RBTI Draft EIS, the U.S. Fish and Wildlife Service removed the peregrine falcon from the threatened and endangered species list.

The brown pelican was once found in large numbers along the Atlantic, Pacific, and Gulf coasts of the U.S. Today, the bird occurs throughout its historic range, but its numbers are reduced. Brown pelicans are considered rare visitors to New Mexico (and the Texas Panhandle), occurring primarily as immature wanderers during the summer and fall seasons and presumed to be storm-driven birds (NMGF 1997e).

The black-footed ferret has not been observed in Texas since 1963 and in New Mexico since 1934 and as of 1988, it was presumed extirpated in New Mexico. The primary causes of extirpation were habitat alteration, predator control, and prairie dog eradication (Campbell 1995, NMGF 1997a).

The southwestern willow flycatcher requires dense riparian vegetation associated with rivers, streams, springs, lakes, and other watercourses and wetlands for nesting (Tibbitts *et al.* 1994, Sogge *et al.* 1997). As of 1997, there were an estimated 200 breeding pairs in New Mexico, occurring in widely scattered, small populations in less than 25 general locales, predominantly in the southwestern portion of the state along the Gila River (Williams 1997). Critical habitat in New Mexico is restricted to portions of the Gila, San Francisco, and Tularosa rivers in the southwestern corner of the state and is not found under the affected airspace.

The interior least tern nests along coastal beaches and major interior rivers and reservoirs of North America on barren sand kept free of vegetation by natural scouring from tidal or river action. The New Mexico Department of Game and Fish considers the least tern a migratory transient along the Pecos River in Eddy County and a rare vagrant in Catron, De Baca, Rio Arriba, Dona Ana, Socorro, and Otero counties (NMGF 1997g). Interior least terns are regular vagrants at Bosque del

Apache NWR on the Rio Grande. Since 1949, the bird has nested in New Mexico only at or in the vicinity of Bitter Lake NWR, near Roswell, and not under any airspace proposed for RBTI (BLM 1997). In Texas, interior least terns are not found in any counties underlying proposed RBTI airspace for Alternative B.

The bald eagle is a bird of aquatic ecosystems and frequents estuaries, large lakes, reservoirs, major rivers, and some seacoast habitats. However, to support bald eagles such areas must have an adequate prey base, perching areas, and nesting sites. In winter, bald eagles often congregate at specific wintering areas that are generally close to open water and that offer good perch trees and night roosts (Stalmaster 1987). These eagles move frequently and roost singly or in small groups throughout the winter in apparent response to the variable or marginal conditions of weather, prey, and habitat associated with peripheral range (Grubb and Kennedy 1982). Although New Mexico is on the edge of the winter range of bald eagles (Millsap 1986), the state supported an estimated 545 wintering bald eagles in 1996 and 1997 (NMGF 1998). They migrate and winter from the northern border along the San Juan, upper Rio Grande, and upper Pecos, southward regularly to the Gila, lower Rio Grande, middle Pecos, and Canadian valleys. Key winter roost and concentration areas include Navajo Lake, the Chama Valley, Cochiti Lake, the northeastern lakes from Raton to Las Vegas, the lower Canadian valley, Sumner Lake, Elephant Butte Lake, and the upper Gila Basin. The species is occasional elsewhere in summer, and only four nests are known for the state: Caballo Reservoir along the Rio Grande, the Maxwell-Springer area in the northeast, and two nests in the vicinity of Eagle Nest Lake (Williams 1995, 1996; NMGF 1997h).

In Texas, breeding populations of bald eagles occur primarily in the eastern half of the state and along coastal counties. Wintering populations occur primarily in the Panhandle, Central, and East Texas, and in other areas of suitable habitat throughout the state. Wintering populations of eagles occur at Lake Rita Blanca in northern Hartley County, Lake Meredith in the northeastern corner of Potter County, and Buffalo Lake NWR in Randall County (Campbell 1995).

Although the Mexican spotted owl's entire range covers a large area of the southwestern U.S. and Mexico, its distribution within this range is largely unknown. The owl does not occur uniformly throughout its range but rather occupies a fragmented distribution corresponding to the availability of forested mountains and canyons. Between 1990 and 1993, 91 percent of Mexican spotted owls known to exist in the U.S. occurred on land administered by the U.S. Forest Service. The majority of owls occur within 11 national forests in New Mexico and Arizona (USFWS 1995).

The Mexican spotted owl occupies a variety of vegetative habitats but these contain certain common characteristics including: high canopy closure, a multi-layered canopy, uneven-aged stands, downed woody matter, and numerous snags, all of which are indicative of old growth forests (usually greater than 200 years old) and the absence of active management. The mixed-conifer community is the most frequently used vegetative community. Common species of overstory trees are white fir, Douglas fir, and ponderosa pine. In the northern portion of their range, including southern Utah and Colorado, and northern Arizona and New Mexico, much of the owl habitat is characterized by steep slopes and canyons with rocky cliffs. Along the Mogollon Rim in central Arizona and New Mexico, habitat use is less restricted, and owls occur in mixed-conifer forests, ponderosa pine-Gambel oak forests, rocky canyons, and associated riparian forests (USFWS 1993, 1995).

The recovery plan for the Mexican spotted owl divides the owl's range into 11 Recovery Units, six in the U.S. and five in Mexico. Currently affected airspace encompasses a portion of the Southern Rocky Mountains, the New Mexico Recovery

Unit. This unit is the smallest of the six and contains the second lowest concentration of owl sites (4.5 percent). Owl occurrences within the affected area are disjunct and correspond to the mountain ranges where steep sloped and canyon habitats are available. Owls generally inhabit steep terrain and canyons of the Sangre de Cristo Mountains, and occupy canyons incised into volcanic rock in the Jemez Mountains. Patches of mixed-conifer forest which appear to contain attributes of owl habitat exist throughout northern New Mexico (USFWS 1995).

Portions of the Southern Rocky Mountains-New Mexico Recovery Unit underlie proposed IR-153. In general, owls inhabit steep terrain and canyons in this unit and typically occur in mixed-conifer forests on steep slopes in the Sangre de Cristo Mountains. Although privately owned lands comprise almost half the total land within this unit, owls have been found primarily on USFS lands which account for about 27 percent of the land within the unit (USFWS 1995). The Carson and Santa Fe national forests are found within this unit and have an estimated 1 (Carson) and 37 (Santa Fe) protected activity centers (PACs [an area established around a known owl nest or roost site for the purpose of protecting the area]).

Mountain plovers, recently proposed for federal listing as threatened, utilize shortgrass prairies and dry playas dominated by blue grama, buffalo grass, and scattered taller vegetation during the breeding season (Sager 1996). They appear to require some degree of bare ground which is compatible with livestock grazing, prairie dog towns, barren playas, or other disturbed areas (Graul 1975). In late summer and fall, the birds are occassionally observed on agricultural fields. The species does not require a free water source (Sager 1996). Other vegetation includes western wheat grass, four-wing saltbrush, rabbitbrush, snakeweek, cholla, prickly pear, yucca, and occassionally juniper. In north-central and northwestern New Mexico, they occur in basin sagebrush (Sager 1996). The mountain plover migrates to Mexico and the southern point of Texas during the winter which is not underneath any RBTI proposed airspace (Peterson 1990).

Of the 15 counties affected by Alternative D, the mountain plover is considered to potentially occur in all of them. The four Texas counties, Dallum, Hartley, Oldham, and Potter, have a low relative abundance; Dallum has the highest abundance of those four but it is underneath the MOA and would not experience low overflight (USGS PWRC 1999). Flights in Potter county and half of Oldham would be over 2,000 feet AGL, so any occurance of mountain plovers in these areas would not be disturbed by low overflight. Of the remaining New Mexico counties, the mountain plover is considered common in only three of them: Union, Colfax, and Torrance. Union and Colfax, the two counties identified by FWS as of high concern, are underneath the MOA and would not experience low overflight. Torrance is crossed by an MTR in the northeast corner, leaving most of the county undisturbed. The remaining eight counties only have uncommon to rare breeding populations (NMGF 1997i), but these popultaions might experience some disturbance during the breeding season. However, many populations in the state are not expected to suffer adverse effects, including those areas with the highest abundance of mountain plover.

Over 60 species considered sensitive by federal or state agencies occur within counties overlain by elements of Alternative D. These species range from federal candidate species to state species of concern. Most (46) of these species consist of plants, fish, insects, amphibians, and small mammals whose habitat would remain unaffected by construction or operation of ground-based assets in Alternative D. The remainder are primarily birds and mammals that are distributed throughout many portions of the region. The most commonly noted sensitive species match those also associated with Alternatives A, B, and C: ferruginous hawk, loggerhead shrike, burrowing owl, white-face ibis, and Texas horned-lizard.

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Potential sources of impacts to wildlife from aircraft overflights are the visual effect of the approaching aircraft and the associated subsonic noise. Any visual impacts would be most likely to occur along those portions of IR-153 that are below 1,000 feet AGL (e.g., segments AB-IJ), the altitude accounting for most reactions to visual stimuli by wildlife (Lamp 1989, Bowles 1995).

The lands under proposed IR-153 would experience an increase of approximately one to ten sortie-operations per day, depending upon the segments flown. The potential for impacts to wildlife and birds would be greatest where the segments permit flight at altitudes below 1,000 feet AGL but above 300 feet AGL. Of the 38 segments on proposed IR-153, 30 would permit overflights below 1,000 feet AGL (Appendix C, Table C-3). It is estimated that approximately 80 percent of the flight activity along these segments would occur below 1,000 feet AGL. The FWS raised concerns regarding the effects of low-altitude overflights on threatened or endangered bird species. None of the flight activity in the proposed Mt. Dora MOA/ATCAA would be below 3,000 feet AGL, and it should not affect wildlife.

The FWS, based on consultations, has indicated that low-altitude flights could result in adverse impacts to sensitive bird species such as the Mexican spotted owl and mountain plover.

Studies on the effects of noise on wildlife have been predominantly conducted on mammals and birds. Studies of subsonic aircraft disturbances on ungulates, in both laboratory and field conditions, have shown that effects are transient and of short duration, and suggest that the animals habituate to the sounds (Workman *et al.* 1992; Krausman *et al.* 1993, 1998; Weisenberger *et al.* 1996). Animals begin to show startle and avoidance behaviors when an intruding noise exceeds the ambient level by 10 to 30 dB (Bowles *et al.* 1991). A sound that is 50 dB over ambient conditions can cause animals to panic and leave a preferred habitat (Bowles *et al.* 1991). These animals habituate relatively rapidly to the noise disturbance, however. Although startle responses may never disappear completely, a continued disturbance that can be habituated to does not force abandonment of young or critical habitat (Bowles *et al.* 1991).

Similarly, the impacts to raptors and other birds from aircraft low-level flights were found to be brief, insignificant, and not detrimental to reproductive success (Smith *et al.* 1988, Lamp 1989, Ellis *et al.* 1991, Grubb and Bowerman 1997). The majority of the MTR will experience an average increase of 10 to 15 dB over the current condition under Alternative D. One section is 18 dB, and the MOA and higher MTR segment near the MOA increased in noise by 3 dB. At no time does the ambient noise range over 63 DNL. A summary of the aircraft overflight effects on wildlife studies reviewed for this analysis is discussed in detail in Appendix G. Based on these studies, the evidence would suggest that Alternative D flight operations would not result in significant, adverse impacts to wildlife or threatened, endangered, or sensitive species. Historically, and at present, most (about 90 percent) of the area and wildlife under proposed IR-153 has been subject to low-altitude military overflights.

However, the FWS considers that a greater potential for adverse impacts to threatened or endangered bird species may result from implementing Alternative D. The Carson and Santa Fe National Forests underlie parts of proposed IR-153 (segments AB and EF) and contain large areas of unsurveyed but potential Mexican spotted owl habitat. Recent studies (Malakoff 1997, Wasser *et al.* 1997) suggest that spotted owls may be susceptible to disturbance-induced stress, which could contribute to population declines. Under Alternative D, these areas could be overflown at an altitude of as low as 400 feet AGL approximately 12 times per day (an increase of roughly 10 per day). These areas overlap or intersect secondary MTRs, particularly IR-109. As part of the consultations associated with the Cannon

AFB action described previously, the FWS stipulated the Air Force would survey these areas to determine the locations of owl populations (if any) and avoid overflights by 1,600 feet AGL from March 1 through August 31 annually.

Concentrations of wintering bald eagles occur under the proposed IR-153 (segments HI and QR) and Mt. Dora MOA (Pecos and Canadian rivers, respectively). These segments currently underlie multiple secondary MTRs and have supported low-altitude flight activities for more than a decade. The FWS, however, indicated as part of consultations associated with the Cannon AFB action that flights at or below 2,000 feet AGL from October 1 through March 1 could result in significant adverse impacts to wintering bald eagles (USFWS 1998). On average, 12 to 14 sortie-operations would occur 260 days per year along these segments, with roughly 60 to 80 percent below 1,000 feet AGL. Since overflights associated with the Canadian River under the Mt. Dora MOA/ATCAA would occur at altitudes greater than 3,000 feet AGL, no significant impacts to bald eagles would be expected under the MOA.

Concentrations of bald eagles occur under segments of proposed IR-153.

Bird-aircraft strikes would be expected to remain minimal in the MTR and MOA/ATCAA. Aircrews would employ the Bird Avoidance Model when planning and conducting sorties. Use of this model has minimized the potential for bird-aircraft strikes.

Construction. During biological surveys, no water dependent species, critical habitat for said species, or wetlands were observed or identified at any of the candidate sites for Alternative D. Therefore, the construction of emitters or Electronic Scoring Sites would not impact water or wetland-dependent species.

No federally listed threatened or endangered species, or potential habitat, were observed during biological surveys of each of the candidate Electronic Scoring Sites and emitter sites in New Mexico. Construction would disturb a total of less than 20 acres. While this may cause a reduction in habitat for some wildlife, it would represent a minimal impact. The amount of habitat affected compared to the amount of similar habitat in the region would be miniscule. Additionally, all of the candidate sites have been subject to varying degrees of previous habitat-altering disturbance.

Ground Operations. Since ground operations would occur only at the candidate emitters and Electronic Scoring Sites, and no sensitive biological resources have been identified there, no impacts to biological resources due to ground operations under Alternative D would be expected.

4.3.6 Summary Comparison of Impacts

Table 4.3-1 compares the impacts for all four alternatives with regard to airspace and flight operations, construction, and ground operations. None of the alternatives would have more than moderate effects on natural resources.

The Air Force, in consultation with the FWS, has determined that none of the identified alternatives for the proposed action is likely to adversely affect any listed species or critical habitat. The FWS has concurred with this determination.

Table 4.3-1
Biological Resources Summary Comparison of Impacts

Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
Airspace and Flight Operations	Approximately 6 low-altitude overflights per day over estimated aplomado falcon historic range.	Approximately 10 low-altitude overflights per day over estimated aplomado falcon historic range.	Approximately 10 low-altitude overflights per day over estimated aplomado falcon historic range.	Increase of 10 low-altitude overflights over wintering bald eagle areas and Mexican spotted owl and mountain plover habitat.
Construction	No Effect	Disturbance of less than 20 acres of possible wildlife habitat.	Disturbance of less than 20 acres of possible wildlife habitat.	Disturbance of less than 20 acres of possible wildlife habitat.
Ground Operations	No Effect	No Effect	No Effect	No Effect
Decommissioning	No Effect	No Effect	No Effect	No Effect

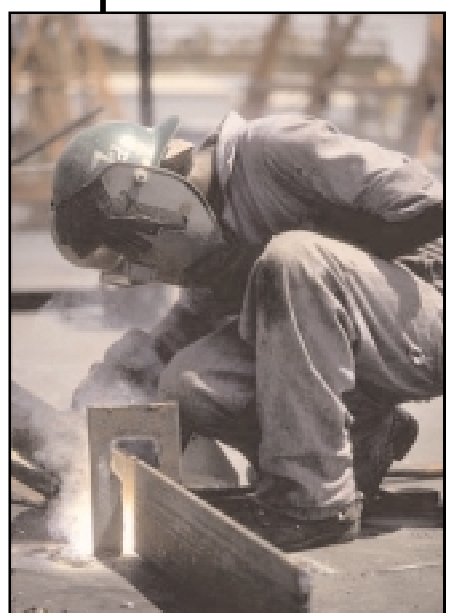
4.4 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

This section describes and analyzes the general features of the economy--including employment, population, and income--that could be affected by the proposed alternatives. It also addresses environmental justice. Environmental justice, as defined in Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, looks at whether an action disproportionately affects these types of populations.

4.4.1 Methods and Approach

Most direct and indirect socioeconomic effects associated with implementation of any of the action alternatives (Alternative B, C, or D) would occur in the immediate vicinity of where Electronic Scoring Sites and emitter sites would be constructed and operated. Socioeconomics would also be affected in the vicinity of the Electronic Scoring Sites proposed for decommissioning in Harrison, Arkansas, and La Junta, Colorado. Therefore, the primary focus of this analysis is on these communities and the counties in which existing and proposed sites are located (Figure 4.4-1).

Impacts to the local economies would be generated by the one-time cost of construction and the yearly expenditures on operations and maintenance of the emitter and scoring sites, as well as by the decommissioning of existing Electronic Scoring Sites and the loss of jobs. The primary measures by which socioeconomic impacts were identified include changes to employment, population, and earnings associated with the proposed alternatives. The details of the methodology, assumptions, and calculations are discussed in Appendix I, Socioeconomics.

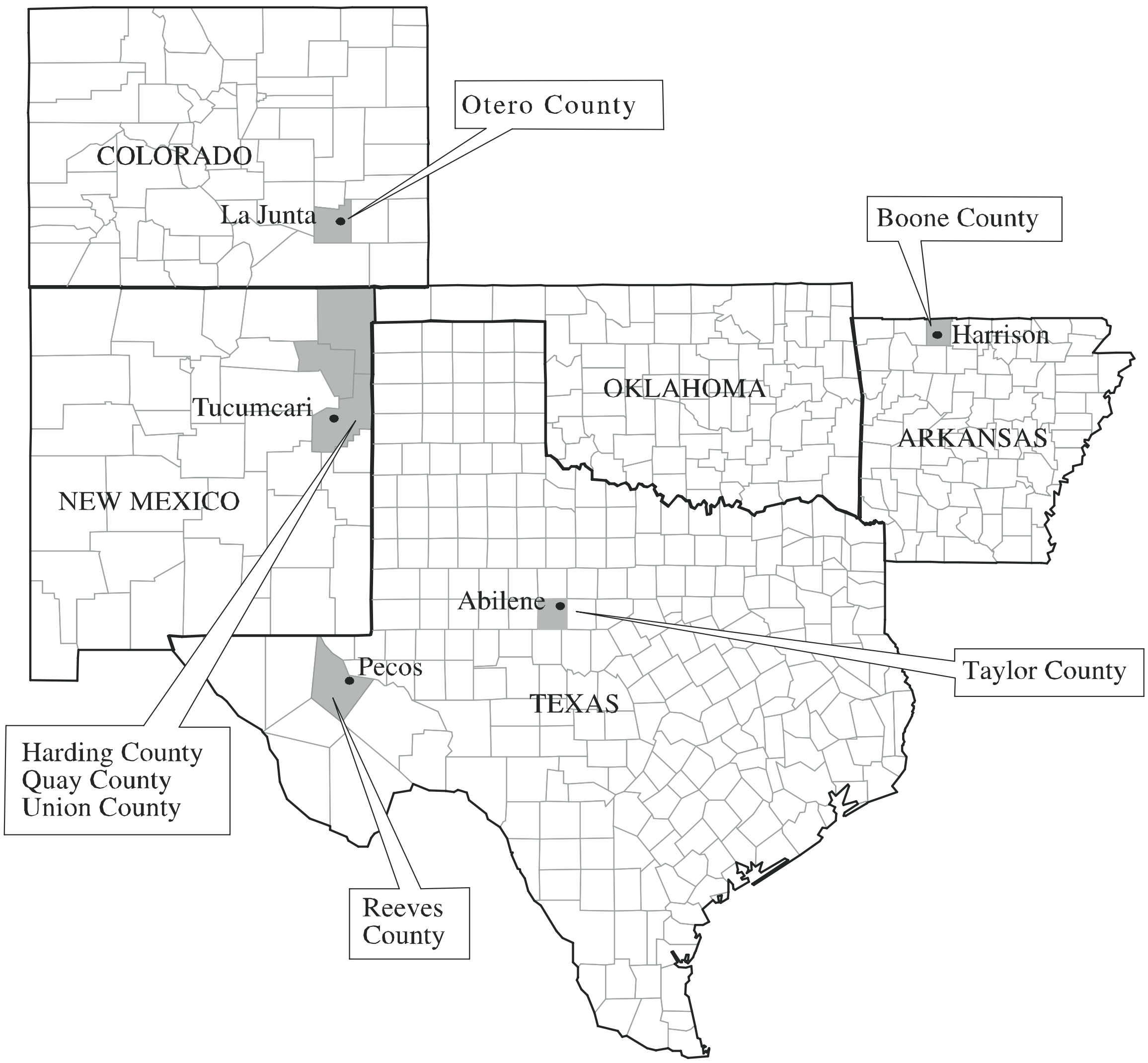


Other factors related to socioeconomics were identified throughout the public involvement process. Concerns were expressed that aircraft overflights could affect economic pursuits and land values. While these perceptions are recognized, there is little data to support these suppositions.

In 1980, the Air Force prepared an Environmental Impact Report (USAF 1980) analyzing communities in western Texas, southern New Mexico, and parts of Arizona and Nevada. The research focused on the potential impacts supersonic and increased subsonic flight would have on local economies. Factors examined included property values, employment opportunities, environmental amenities (such as hunting), and housing features, as well as community education and health-care services. It concluded that national and regional economic trends had substantially more impact than supersonic or subsonic overflights. While the study is almost 20 years old, the general economies of these communities (e.g., ranching, tourism, and hunting) have changed little. Therefore, drawing similar conclusions for RBTI proposed aircraft overflights are valid.

There is little to suggest that the sporadic and dispersed nature of RBTI overflights would impact land values. Land value studies have been conducted around urban airports and Air Force bases (Fidell *et al*. 1996) and measures of change in value (e.g., Noise Depreciation Sensitivity Index) have been defined. However, these are not applicable to the dispersed, higher altitude, episodic noise under an MTR or MOA. The variability of land values due to the diversity of land uses, locations, and improvements make it difficult to quantify potential impacts, if any, that might be associated with aircraft overflights.

Under an MTR or MOA, changes in conditions from daily overflights may or may not be readily discernable. In MOAs, no standard flight paths exist; in MTRs, overflights are dispersed across the width of the corridor. Both situations indicate



Communities Potentially Affected by RBTI Actions

Figure 4.4-1

that any single location would not likely be subject to consistent, direct overflights and the associated noise. In the present instance, given the rural nature of the region and the history of military use of the associated airspace (see Section 3.4), changes in numbers or types of overflights are not expected to produce measurable impacts on the economic value of the underlying land.

The likelihood of being overflown under the affected airspace varies depending upon the type of airspace unit the aircraft is using. In MTRs, flights are dispersed within the corridor both horizontally and vertically. The width of the MTRs proposed under the alternatives varies from 4 to 16 nm. In the narrower corridors, the potential for a person or a parcel of land to be overflown is greater than in the wider corridors. It is possible, however, that a recreationalist or rancher could be startled if an overflight took place at a specific point of time, but such an event is difficult to predict. In a MOA, the operations are random and widely dispersed. The random nature of operations and the wide altitude structure within the MOA make it unlikely that any one location would be repeatedly overflown. Therefore, no significant adverse consequences to economic activities are expected.

The region of analysis for environmental justice includes the geographic areas underlying the existing and proposed airspace for the alternatives in western Texas and northeastern New Mexico. These areas are located in block numbering areas (BNAs) or census tracts. The analysis examined the anticipated impacts associated with noise levels that communities underlying the affected airspace would experience. The analysis then determined whether these impacts would be disproportionately high and adverse for minority or low-income populations.

Comments received during the public involvement process revealed concerns about the potential effect of increased overflights on ranching and tourism due to increased annoyance of overflown population.

Environmental justice analysis examines disproportionately high or adverse impacts to low income and minority populations as a result of implementation of any of the alternatives. Information contained in the 1990 Census of Population and Housing (U.S. Census Bureau 1990) was used to identify these populations. Although these census data are more than 8 years old, there are no indications that regional trends since 1990 have significantly altered these population characteristics in this region of the U.S. Minority and low-income populations are defined as:

- *Minority Populations:* Persons of Hispanic origin of any race, Blacks, American Indians, Eskimos, Aleuts, Asians, or Pacific Islanders.

- *Low-Income Populations:* Persons living below the poverty level, based on a total annual income of $12,674 for a family of four persons as reported in the 1990 census.

Environmental justice concerns are measured using census tracts and BNAs. BNAs are the rough equivalent of census tracts in rural areas. Because of the rural nature of the region of comparison, BNAs were the predominant unit of measurement.

Socioeconomic effects on a community include the addition of both direct jobs associated with construction and indirect employment of service, retail, and wholesale industry workers.

In 1990, the number of persons living in the portion of each BNA/census tract that falls under MTR corridors and MOAs associated with all alternatives was calculated by dividing the area under the affected airspace within the BNA/census tract by the area of the BNA/census tract, then applying that proportion to the minority and low-income populations. The lands under the affected airspace currently support higher proportions of these groups than is found, on average, nationwide.

In accordance with the *Interim Guide for Environmental Justice with the Environmental Impact Analysis Process* (USAF 1997c), noise levels under the affected airspace were examined. The review of the area established that no populations of any kind, including minority or low-income populations, would be subject to noise levels of 65 DNL or higher under any alternative. Use of this 65 DNL guideline for the evaluation of environmental justice issues in relation to sporadic military training flights is consistent with the intent of E.O. 12898. Other components of RBTI, including construction, decommissioning of facilities, and operation of new facilities in new areas, are also relevant to evaluating environmental justice. Individually and collectively, these various factors indicate minority and low-income populations would not be adversely affected. For this action, no further assessment of environmental justice is warranted.

Under the Alternative A: No-Action, current socioeconomic activities would remain unchanged. For Alternatives B, C, and D, an approximate 1 to 2 percent increase in the affected county revenues is anticipated and about 45 new jobs would be created. These jobs would be derived from direct employment of construction workers and facility operators and indirect employment of additional service workers in the community. Decommissioning of the two Electronic Scoring Sites in Harrison, Arkansas, and La Junta, Colorado, would decrease county revenues by approximately 1 percent and about 15 indirect jobs would be lost. Under all three action alternatives, minority and low-income populations would not be disproportionately affected by noise generated by aircraft overflights.

4.4.2 Alternative A: No-Action

AFFECTED ENVIRONMENT

For Alternative A: No-Action, the current economic activities associated with the Harrison and La Junta Electronic Scoring Sites would continue unchanged.

The Harrison Electronic Scoring Site, near the city of Harrison, is located in north-central Arkansas in Boone County. The population is approximately 11,500 and represents about 40 percent of Boone county's population (28,297) (U.S. Census 1990). Total employment for the county is about 12,500, primarily employed in wholesale and retail trade, manufacturing, as well as educational and health services industries (U.S. Census 1990). The unemployment rate in the county is 5.9 percent (Arkansas Employment Security Division 1998), and total personal income is $398 million (Geostat 1990). The Harrison Electronic Scoring Site, which began operation in the mid-1990s, employs 30 personnel whose annual salaries contribute $900,000 per year to the local economy (average $30,000 salary) (USAF 1993a). The Air Force contracts a private corporation to manage and maintain this facility and the four associated emitter sites.

The city of La Junta, Colorado, is located in Otero County. City population is approximately 11,300 and represents approximately 56 percent of county population (20,185) (U.S. Census 1990). County employment is 7,656, primarily employed in health and educational services, wholesale and retail trade, manufacturing, and

agriculture (U.S. Census 1990). The unemployment rate is 4.7 percent (Colorado Department of Labor 1998). Total personal income is $274 million (Geostat 1990). The La Junta Electronic Scoring Site began operation in the late 1980s and employs 31 civilian personnel. The annual salaries contribute $930,000 per year to the local economy (average $30,000 salary) (USAF 1993b). Similar to the Harrison site, a private corporation is contracted by the Air Force to manage and maintain this facility and its four associated emitter sites.

ENVIRONMENTAL CONSEQUENCES

No change in socioeconomic conditions would result from implementation of the No-Action Alternative. The Electronic Scoring Sites and associated emitter sites would continue their current operations. Revenues generated from the operation of these sites would continue to accrue to the local communities.

4.4.3 Alternative B: IR-178/Lancer MOA

AFFECTED ENVIRONMENT

For Alternative B, the en route Electronic Scoring Site (with operations and maintenance facilities) would be constructed on one of two sites owned by DoD and currently managed by the Air Force. Located near Dyess AFB in Abilene, Texas, the Electronic Scoring Site would employ 31 civilian personnel.

The city of Abilene, in Taylor County, supports a population of around 110,000 and accounts for approximately 92 percent of the county population (119,655) (U.S. Census 1990). Total county employment is 50,278 and the largest employment sectors are professional services, government, wholesale and retail trade, and manufacturing (U.S. Census 1990). The county unemployment rate averages 4 percent (Texas Labor Market Information 1998). Total personal income is $2.1 billion (Geostat 1990).

For the MTR Electronic Scoring Site, the two candidate sites are located near the town of Pecos, Texas, on private land. The site chosen would be leased by the Air Force. This scoring site would employ 30 civilian personnel.

The city of Pecos is located in Reeves County. Pecos population is 12,000 and represents 76 percent of the county population (15,852) (U.S. Census 1990). Total employment in the county is 5,906 and the largest employment sectors are professional services, wholesale and retail trade, and government (Geostat 1990). The county unemployment rate averages 9 percent (Texas Labor Market Information 1998). Total personal income is $162 million (Geostat 1990).

Construction would create 8 direct short term jobs and 220 indirect, short-term jobs, 140 in Taylor County and 80 in Reeves County.

The candidate emitter sites associated with this alternative would be located in the rural counties of Borden, Brewster, Garza, Pecos, Presidio, Scurry, and Upton, Texas. Since these sites are unmanned and would be managed from the Abilene and Pecos Electronic Scoring Site facilities, the socioeconomic conditions for each county would not be measurably affected and are not described further.

ENVIRONMENTAL CONSEQUENCES

Construction. Under Alternative B, construction costs are estimated to range from $3.6 million to $5 million for each site at Abilene and Pecos. Construction costs for the associated emitter sites would range from $300,000 to $680,000 per site. Construction would take place in the year 2001 and last for 12 to 18 months for each Electronic Scoring Site and about 2 months for each emitter site.

Construction expenditures for the Abilene and Pecos sites would generate temporary, increased revenues of $11,500,000 and $9,000,000 within Taylor and Reeves counties, respectively (for details, see Appendix I, Socioeconomics). Construction of the ten emitter sites would also generate temporary, but lower amounts of revenue in the seven other counties.

Construction activities would employ an average of eight workers at any one time. The required construction force would be drawn from the local labor supply, and no changes to population would occur from construction activities. Indirect short-term jobs associated with construction expenditures would be approximately 140 in Taylor County and 80 in Reeves County. Typically, most indirect jobs are created in the services, wholesale, and retail trade industries. This would represent about 1 percent of current employment in both counties. No one would be expected to move into the area as a result of indirect job growth. Increased earnings as a result of construction activities would total $3,400,000 for Taylor County and $1,900,000 for Reeves County and would represent approximately 1 percent of current county personal income. This 1 percent temporary increase of revenue from construction would be easily absorbed by the local economies.

Ground operations at the Electronic Scoring Sites would create 61 direct jobs and 29 indirect jobs, 17 in Taylor County and 12 in Reeves County.

Ground Operations. The facilities in Abilene and Pecos would employ 31 and 30 people, respectively, at an average salary of $30,000. It is assumed that these personnel would move into the area for employment. Annual maintenance costs for each scoring site would be approximately $150,000. The emitter sites would be unmanned; annual maintenance costs would be less than $50,000.

Ground operations would result in a minor increase of revenues to local economies of $1,300,000 for Taylor County and $900,000 for Reeves County (Appendix I). Given an average household size of 2.8 in Taylor County and 3.3 in Reeves County (U.S. Census 1990), estimated direct population change as a result of operations would be 87 in Taylor County and 99 in Reeves County. This would represent less than 1 percent of either county population. No impacts would be expected to population-affected resources such as schools, libraries, fire and police protection, and housing.

Indirect jobs created as a result of facility operations are estimated to be 17 in Taylor County and 12 in Reeves County. Indirect job growth would represent less than 1 percent of county employment. The local labor pool would be expected to absorb this additional demand; no significant change in the unemployment rates and no in-migration of labor would be expected. Increased earnings of $1,200,000 and $1,100,000 for Taylor and Reeves Counties, respectively, as a result of operations would represent approximately 1 percent of current county personal income. The local communities would easily absorb these additional revenues into their economies.

Lost earnings as a result of decommissioning would represent approximately 1 percent of current county personal income for both Boone and Otero Counties.

Decommissioning. Under Alternative B, the existing Harrison Electronic Scoring Site in Boone County, Arkansas, and the La Junta Electronic Scoring Site in Otero County, Colorado, would be decommissioned, and all current employees would move from the area. The equipment from the Electronic Scoring Site facilities and their associated emitter sites would be removed. The building would be offered for sale to other federal and local governmental agencies, and the leased emitter site properties would be returned to the landowners.

Decommissioning would result in decreases in revenue of $1,100,000 and $1,000,000 for the economies of Boone (Harrison site) and Otero (La Junta site) Counties (Appendix I). Given an average household size of 2.5 in Boone and 2.7 in Otero (U.S. Census 1990), direct population loss as a result of decommissioning would be approximately 75 in Boone County and 84 in Otero County. This would represent less than 1 percent of the total county population. No impacts would be expected to population-affected resources such as schools, libraries, fire and police protection, and housing.

As a result of decommissioning, indirect jobs lost are anticipated to be 15 in Boone County and 14 Otero County. Typically, most indirect job loss occurs in the services, wholesale, and retail trade industries. Indirect job loss would represent less than 1 percent of total county employment. The county economies would be expected to absorb this additional capacity of labor; no significant change in the unemployment rates or out-migration of labor would be expected. Lost earnings of $1,100,000 for Boone County and $1,200,000 for Otero County as a result of decommissioning would represent approximately 1 percent of current county personal income. These 1 percent decreases to the local economies from decommissioning would not represent a significant loss of revenue to the local communities.

4.4.4 Alternative C: IR-178/Texon MOA

AFFECTED ENVIRONMENT

The affected environments for the Abilene and Pecos, Texas, en route and MTR Electronic Scoring Sites are the same as described for Alternative B. The ten candidate emitter sites would also be located in the rural counties of Brewster, Irion, Pecos, Presidio, Reagan, Schleicher, and Upton, Texas. Since these emitter sites would be unmanned and managed from the Abilene and Pecos facilities, the socioeconomic environment for each of these rural counties is not described. Also included in the affected environment would be the communities associated with the Harrison and La Junta Electronic Scoring Sites, as described under Alternative B.

ENVIRONMENTAL CONSEQUENCES

With regard to socioeconomics, the effects of proposed construction, decommissioning, and ground operations under Alternative C would match those described for Alternative B. Changes in population, employment, and earnings would represent only a small fraction of the local economies. It is expected that the changes, both increases and decreases of revenue, population, and jobs, would be easily absorbed by the local communities.

4.4.5 Alternative D: IR-153/Mt. Dora MOA

AFFECTED ENVIRONMENT

Under Alternative D, the proposed Abilene en route Electronic Scoring Site would be developed, and the affected environment would be the same as described for Alternative B. This alternative would also include an MTR Electronic Scoring Site, with operations and maintenance facilities on private land leased by the Air Force near Tucumcari, New Mexico. The facility would be located at one of the three candidate Electronic Scoring Sites and would employ 30 people. These candidate sites are located in Quay, Union, and Harding counties; one would be chosen.

Tucumcari is located in Quay County. The greater Tucumcari population is 8,644 and represents about 80 percent of the county population (10,823) (U.S. Census 1990). Total county employment is 4,359 and the largest employment sectors are professional services, wholesale and retail trade, transportation, and agriculture (U.S. Census 1990). The county unemployment rate is 4.4 percent (New Mexico Department of Labor 1998). Total personal income is $142 million (Geostat 1990).

The population of Union County is 4,124, about half that of Quay County. Agriculture, retail trade, and construction dominate the employment sectors; total employment is 1,671 (U.S. Census 1990). The county unemployment rate averages 3 percent (New Mexico Department of Labor 1998). Total personal income is approximately $24.6 million (U.S. Census 1990).

Harding County's population is 987 and total employment is approximately 400 (U.S. Census 1990). The largest employment sectors are agriculture, retail trade, and construction (U.S. Census 1990). The county unemployment rate averages 4.8 percent (New Mexico Department of Labor 1998). Total personal income is approximately $4.9 million (U.S. Census 1990).

The ten emitter sites associated with Alternative D are located in the rural counties of Colfax, Guadalupe, Harding, Mora, and Union, New Mexico. Since these sites would be unmanned and managed from the Abilene and Tucumcari facilities, the socioeconomic environment for each county is not described.

ENVIRONMENTAL CONSEQUENCES

Construction. For the proposed Abilene site, construction impacts would be the same as described under Alternative B. Construction costs for the proposed Tucumcari scoring site would range from $3.6 million to $5 million. Construction costs for the associated emitter sites would range from $300,000 to $680,000 per site. Construction would take place in the year 2001 and last for 12 to 18 months for the Electronic Scoring Site and less than 2 months for each emitter site.

Construction would create 8 direct short-term jobs and 133 indirect short-term jobs.

Construction expenditures of $9,700,000 would generate temporary, beneficial impacts in the regional economy of either Quay, Union, or Harding Counties depending on the site chosen (Appendix I). Construction of the emitter sites would also generate temporary, minor revenue increases in the local economies.

Construction activities would employ an average of eight workers at any one time. The required construction force would be drawn from the local labor supply. No changes to population would occur from construction activities. Short-term indirect jobs associated with construction expenditures would be approximately 133. Typically, most indirect jobs are created in the services, wholesale, and retail trade industries. This would represent about 2 percent of current regional employment. No in-migration would be expected as a result of new indirect job growth. Increased earnings of $2,700,000 as a result of construction activities would represent approximately 2 percent of current regional personal income. These relatively small revenue and job increases from construction would be absorbed by the local economy.

Ground Operations. For the proposed Abilene site, ground operations impacts would be the same as described for Alternative B. The facility near Tucumcari would employ 30 people at an average salary of $30,000. It is assumed that all personnel would move to the area for employment. Annual maintenance costs for the Tucumcari site would be approximately $150,000. The emitter sites would be unmanned; annual maintenance costs would be less than $50,000.

Ground operations would result in revenue increases of $1,000,000 for the regional economy (Appendix I). Given an average household size of 2.6 in the tri-county region (U.S. Census 1990), direct population change as a result of operations would be 78. This would represent less than 1 percent of regional population. No impacts would be expected to population-affected resources, such as schools, libraries, fire and police protection, and housing.

Ground operations near Tucumcari would employ 30 people directly and create 14 indirect jobs.

Indirect jobs created as a result of operations would be 14, less than 1 percent of regional employment. The local labor pool would be able to absorb this additional demand; no significant change in the unemployment rates and no in-migration of labor would be expected. Increased earnings of $1,100,000 as a result of operations would represent approximately 1 percent of current regional personal income. These relatively small increases in revenues and job opportunities from operations would be absorbed by the local economies.

Decommissioning. Impacts from decommissioning the La Junta and Harrison Electronic Scoring Sites would be the same as those described under Alternative B. Both Electronic Scoring Sites represent only a 1 percent contribution to the local economies of Harrison and La Junta; therefore, it is not anticipated to noticeably impact economic activities in these communities.

4.4.6 Summary Comparison of Impacts

Table 4.4-1 compares the socioeconomic and environmental justice impacts associated with all four alternatives. Only slight increases and decreases of revenue and job gain or loss would result from Alternatives B, C, or D.

Table 4.4-1.
Socioeconomics and Environmental Justice Summary Comparison of Impacts

Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
Airspace and Flight Operations	No Change	No measureable impacts to socioeconomics. No disproportionate impacts to minority and low-income populations.	Same as Alternative B	No measureable impacts to socioeconomics. No disproportionate impacts to minority and low-income populations.
Construction	No Change	Taylor County: Increase in expenditures and revenue of $11.5 million, earnings of $3.4 million, and short-term, indirect jobs of 140. Reeves County: Increase in expenditures and revenue of $9 million, earnings of $1.9 million and short-term, indirect jobs of 80.	Same as Alternative B	Taylor County: Same as Alternative B. Tri-County Region: Increase in expenditures and revenue of $9.7 million, earnings of $2.7 million and short-term, indirect jobs of 133.
Ground Operations	No Change	Taylor County: Increase in expenditures and revenue of $1.3 million, earnings of $1.2 million and direct (31) and indirect (17) jobs of 48. Reeves County: Increase in expenditures and revenue of $0.9 million, earnings of $1.1 million and direct (30) and indirect (12) jobs of 42.	Same as Alternative B	Taylor County: Same as Alternative B. Tri-County Region: Increase in expenditures and revenue of $1 million, earnings of $1.1 million, and direct (30) and indirect (14) jobs of 44.
Decommissioning	No Change	Boone County: Loss in expenditures and revenue of $1.1 million, earnings of $1.1 million, and direct (31) and indirect (14) jobs of 45. Otero County: Loss in expenditures and revenue of $1 million, earnings of $1.2 million, and direct (30) and indirect (15) jobs of 45. Lost earnings would represent approximately 1 percent of current county personal income for each county.	Same as Alternative B	Same as Alternative B

4.5 CULTURAL RESOURCES

4.5.1 Methods and Approach

Cultural resources are prehistoric and historic sites, buildings, districts, or objects that are important to a culture or community. Cultural resources are divided into three categories: archaeological resources, architectural resources, and traditional cultural resources.

- *Archaeological resources* are places where people changed the ground surface or left artifacts or other physical remains (e.g., arrowheads, bottles). Archaeological resources can be classified as either sites or isolates. Isolates often contain only one or two artifacts, while sites are usually larger and contain more artifacts.

- *Architectural resources* are standing buildings, dams, canals, bridges, windmills, oil wells, and other structures.

- *Traditional cultural properties* are resources associated with the cultural practices and beliefs of a living community that link the community to its past and help maintain its cultural identity. Most traditional cultural properties in New Mexico and Texas are associated with Native Americans. Traditional cultural properties can include archaeological resources, locations of historic events, sacred areas, sources of raw material for making tools and sacred objects, or traditional hunting and gathering areas.

Under the National Historic Preservation Act and various federal regulations, only significant cultural resources are considered when assessing the possible impacts of a federal action. Significant archaeological, architectural, and traditional resources include those that are eligible or recommended as eligible for inclusion in the National Register of Historic Places (National Register). The significance of archaeological and architectural resources is usually determined by using the specific criteria (listed in 36 CFR 60.4), including association with a famous individual, ability to contribute to scientific research, and ability to add to an understanding of history and prehistory. Cultural resources must usually be at least 50 years old to be considered eligible for listing. However, more recent structures such as Cold War-era resources may warrant protection if they manifest "exceptional significance." Traditional cultural resources can be evaluated for National Register eligibility, as well. However, even if a traditional cultural resource is determined to be not eligible for the National Register, it may still be significant to a particular Native American tribe. In this case, such resources may be protected under the Native American Graves Protection and Repatriation Act, the American Indian Religious Freedom Act, and Executive Order 13007, which addresses Indian sacred sites. The significance of a Native American traditional cultural property is determined by consulting with the appropriate Native American tribes.

Under federal laws and regulations, significant cultural resources are considered when assessing the impacts of a federal action.

For this EIS, impacts to cultural resources are evaluated for lands beneath the primary airspace (MTRs and MOAs) and for the locations of the candidate emitter sites and Electronic Scoring Sites and present Electronic Scoring Site locations at Harrison, Arkansas, and La Junta, Colorado.

Information on archaeological and architectural resources within the affected environment was derived by:

- Conducting background research to identify previously recorded National Register properties underneath the affected airspace, and archaeological sites within 1 mile of each candidate emitter, candidate or existing Electronic Scoring Sites.

- Conducting on-the-ground surveys of all candidate emitter sites and Electronic Scoring Sites.

As part of the background research, records searches of the following data sources were carried out:

- The Archaeological Records Management Section of the New Mexico Historic Preservation Division;

- The Texas Archaeological Research Laboratory;

- The database of the National Register of Historic Places; and

- The Colorado Historical Society.

For areas under the affected airspace, only cultural resources listed in the National Register were considered. The Air Force recognizes that hundreds of other cultural resources--some documented and some not yet discovered--exist under the airspace. However, aircraft operations are most likely to affect historic structures and districts where setting is an important criterion for significance. These resources are ones typically found on the National Register. Conversely, if National Register listed properties are not affected by the project elements, then nonlisted resources are unlikely to be affected.

All candidate emitter and Electronic Scoring Sites were examined for cultural resources.

For the candidate emitter sites and Electronic Scoring Sites, all cultural resources were identified. Twenty 15-acre sites in New Mexico and 22 sites in Texas were intensively surveyed for cultural resources. The survey involved close inspection of the ground surface at intervals spaced no more than 25 meters apart. All archaeological resources were identified--even isolated artifacts were recorded. No subsurface excavation of any sort was conducted during the survey and no artifacts were removed.

The results of the field investigations and the Air Force's determinations of National Register eligibility were submitted to the New Mexico and Texas SHPOs for review as part of Section 106 consultation. All archaeological sites recorded during the survey are eligible for the National Register. No archaeological isolates are eligible for the National Register based upon the policies of both the New Mexico and Texas SHPOs. No architectural resources or traditional cultural properties were found during the field survey. The Texas and New Mexico SHPOs are reviewing the Air Force's findings and the Air Force anticipates concurrence with those findings and eligibility determinations. The selected alternative will not be undertaken before measures, if any, are taken to reduce, avoid, or mitigate any adverse effects the action may have on historic properties.

In an ongoing effort to identify traditional cultural properties, the Air Force is in the process of consulting with Native American groups according to the *Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments, Executive Order 13084,* and *DoD Policy on Indian and Native Alaskan Consultation*. Table 4.5-1 lists the 32 Native American pueblos, tribes, and other organizations contacted by the Air Force regarding RBTI. Groups contacted included those who live in the vicinity of the study area today and those who lived there in the past.

Table 4.5-1
Native American Groups Contacted by the U.S. Air Force

Pueblo of Acoma	Pueblo of San Felipe	Jicarilla Apache Tribe
Pueblo of Cochiti	Pueblo of Santa Ana	Mescalero Apache Tribe
Pueblo of Isleta	Pueblo of Santo Domingo	Navajo Nation
Pueblo of Picuris	Pueblo of Santa Clara	Navajo Nation Council
Pueblo of Pojoaque	Pueblo of Taos	Apache Tribe of Oklahoma
Pueblo of San Ildefonso	Pueblo of Tesuque	Cheyenne-Arapaho Tribes of Oklahoma
Pueblo of Jemez	Zia Pueblo	Caddo Tribe of Oklahoma
Pueblo of Laguna	Pueblo of Zuni	Comanche Tribe of Oklahoma
Pueblo of Sandia	Pueblo of Nambe	Kiowa Tribe of Oklahoma
Pueblo of San Juan	Eight Northern Indian Pueblo Council	Wichita and Affiliated Tribes
All Indian Pueblo Council	Five Sandoval Indian Pueblo, Inc.	

The Air Force contacted 32 Native American pueblos, tribes, and other organizations regarding RBTI.

Procedures for assessing adverse effects to cultural resources are discussed in regulations for 36 CFR 800, National Historic Preservation Act. An action results in adverse effects to a cultural resource eligible to the National Register when it alters the resource characteristics that qualify it for inclusion in the register. Adverse effects are most often a result of physical destruction, damage, or alteration of a resource; alteration of the character of the surrounding environment that contributes to the resource's significance; introduction of visual, audible, or atmospheric intrusions out of character with the resource or its setting; and neglect of the resource resulting in its deterioration or destruction; or transfer, lease, or sale of the property.

Possible sources of adverse effects can include ground disturbance, vandalism, noise, vibrations, visual intrusions, and change in land status that reduces legal protection to the resource. Ground disturbance and vandalism can damage or destroy all types of cultural resources. However, the ground disturbance would be restricted to between 0.25 and 3.0 acres of the 15-acre site, and avoidance of the resources may be possible.

Previous studies have indicated that subsonic noise-related damage to structures is unlikely.

Vandalism is usually associated with increased public access to a resource, and impacts due to visual intrusion or to noise may occur when the setting is altered, either through overflights or construction in an area not primarily exposed to these elements. Changes in land status can adversely affect a significant resource if, under the new owner, the resource is protected by less stringent historic preservation laws or not protected at all. If significant resources are found on federal lands that would be transferred to nonfederal sources, this loss of legal protection is considered to be an adverse effect to the resource. The damage potentially caused by noise, vibrations, and visual intrusion is more difficult to evaluate.

Experimental data and models (Battis 1988, Sutherland 1990, King 1985, King *et al.* 1988) show that damage to architectural resources, including adobe buildings, is unlikely to be caused by subsonic noise and vibrations from aircraft overflights. Subsonic, noise-related vibration damage to structures requires high decibel levels generated at close proximity to the structures and in a low frequency range (USFS 1992, cf. Battis 1983, 1988). Aircraft must generate a maximum sound level (L_{max}) of at least 120 dB at a distance of no more than 150 feet to potentially result in structural damage (Battis 1988) and, even at 130 dB, structural damage is unlikely (Appendix G). Sutherland (1990) found that the probability of damage to a poorly

constructed or poorly maintained wood frame building is less than 0.3 percent even when the building is directly under a large, high-speed aircraft flying only a few hundred feet above the ground. In other words, the probability of an aircraft, such as a B-1, operating at 300 feet AGL and generating a maximum sound of 117 dB directly over such a structure is extremely unlikely to cause damage. Operations at higher altitudes would have a lower potential for causing damage, and structures offset from the flight track have an even lower probability of being affected by low-flying aircraft. Since many archaeological resources consist of buried deposits or artifacts lying on the ground surface, noise, vibration, or visual impacts to archaeological sites and isolates are also considered extremely unlikely.

The effects of noise on cultural resources may also be related to setting. Noise impacts to Native American traditional cultural properties may be related to interference with ceremonies and other traditional activities at sacred sites. Undisturbed habitats, resources, and settings are considered to be critical to religious practices (NPS 1994). Potential impacts can be identified only through consultation with the affected groups.

For RBTI, impacts to cultural resources beneath the affected airspace were assessed by using noise analysis data and sortie-operations numbers to determine whether there would be an increase in noise or visual intrusion from overflights sufficient to affect cultural resources known to exist underneath the airspace. Impacts to cultural resources at the Electronic Scoring Site and emitter locations focused on ground disturbance, land ownership transfers, and increased access to resources.

4.5.2 Alternative A: No-Action

AFFECTED ENVIRONMENT

The affected environment for cultural resources includes the land under the affected airspace and the ESSs at Harrison, Arkansas, and La Junta, Colorado. The affected airspace involves the primary MTRs and MOAs currently used by bombers from Barksdale and Dyess AFBs.

Airspace. As part of the background research, cultural resources currently listed in the National Register near or directly underneath existing primary MTRs and MOAs were identified. Twenty-two properties are currently listed in the National Register (Table 4.5-2). They consist of historical districts, petroglyphs, prehistoric pueblos, houses, courthouses, hotels, and roads. The Santa Fe Trail, the Folsom site, Rabbit Ears, and Wagon Mound (the latter three are National Historic Landmarks) are included in these historic properties.

Table 4.5-2
National Register-Listed Cultural Resources Under Alternative A: No-Action Affected Airspace

Resource Type	*Number of Resources*
Petroglyph sites	2
Pueblos, ruins and other archaeological sites	3
Historic districts	6
Courthouses, schools, and other government and public buildings	5
Houses, mansions, and cabins	1
Farms, ranches, barns, windmills, and other agricultural features	0
Hotels, stores, mills, and other commercial buildings	2
Roads, trails, bridges, dams, ditches, etc.	2
Other cultural resources	1
Total	**22**

There are no Native American reservations beneath the existing MTRs and MOAs (Figure 4.5-1). The Mescalero Apache Reservation is 80 to 115 miles from segments of IR-178 and IR-128/180. Taos Pueblo is less than 10 miles from IR-109 and portions of IR-109 overlie the Jicarilla Apache Reservation. In addition to these two communities, groups within 30 miles of IR-109 and VR-1175/1176 include Santa Clara, San Juan, and Picuris Pueblos. However, these MTRs are secondary routes not used by the bombers. Consultation with Native American groups and organizations did not reveal any information about traditional cultural properties under the existing airspace.

Electronic Scoring Sites. Two existing Electronic Scoring Sites would continue to be used under the No-Action Alternative. Harrison Electronic Scoring Site was constructed in 1994 and surveyed for archaeological sites at that time. The land was leased from a private landowner. No sites were recorded on the property. Since the building is less than 50 years old, it is not considered to be significant. The La Junta Electronic Scoring Site was constructed in 1990. It has not been surveyed for archaeological or architectural resources. The La Junta Electronic Scoring Site is currently located on Federal property.

ENVIRONMENTAL CONSEQUENCES

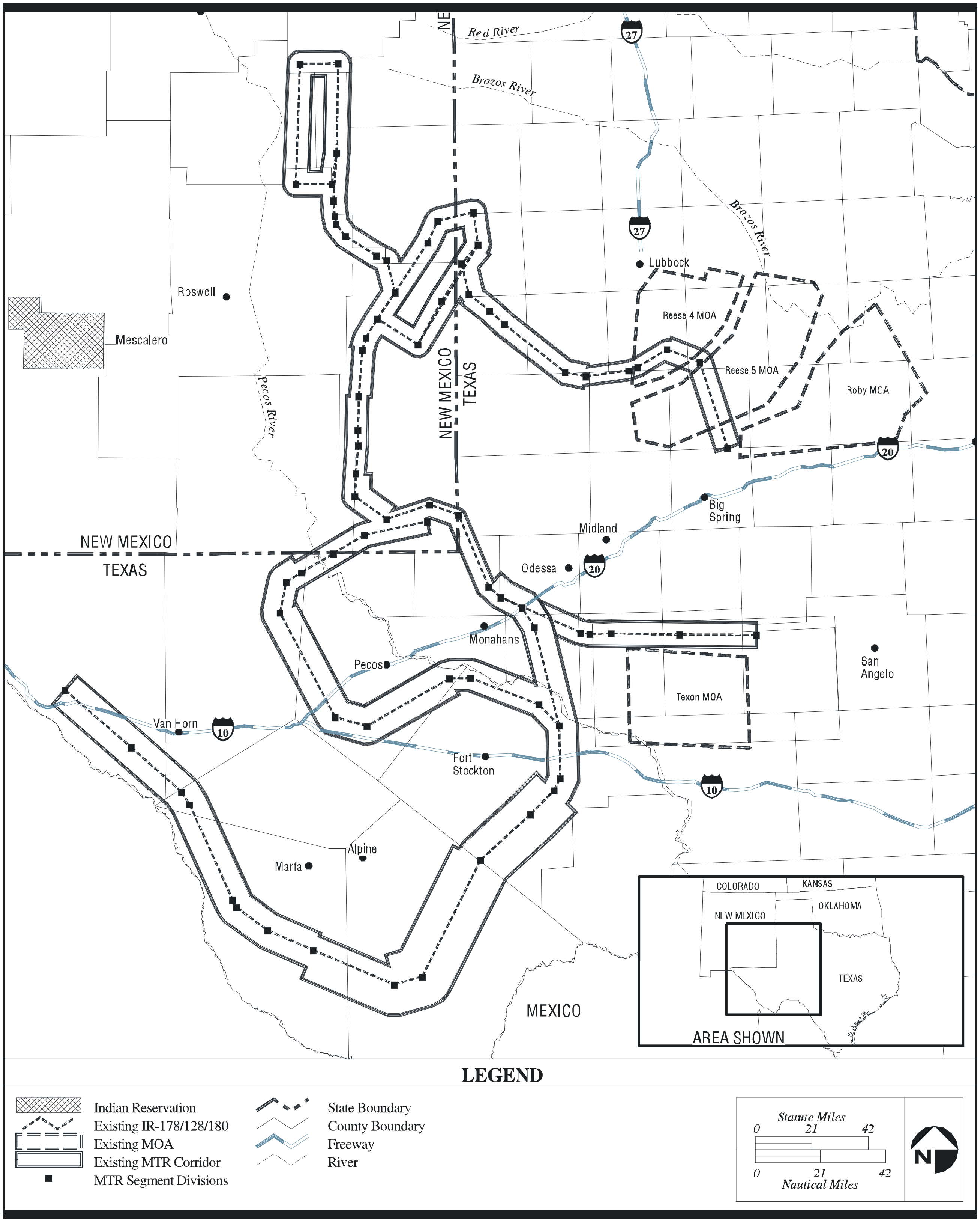
Airspace and Flight Operation. In Alternative A: No-Action there would be no changes to airspace structure, altitude, numbers of sorties, or noise levels (Table 4.5-3). The existing noise levels beneath the airspace do not exceed 59 DNL. Sound exposure levels range from 86 to 116 dB; however, these levels are not expected to cause physical damage to architectural resources. The No-Action Alternative would result in no impact to archaeological sites, historic buildings, traditional cultural properties, or other cultural resources.

Table 4.5-3
Location of National Register-Listed Properties Under Alternative A Affected Airspace

Airspace	*Segment*	*Number of Properties*	*Property Type*	*Affected Environment Noise Level (DNL)*	*Average Daily Sortie-Operations*
IR-178	AB	1	Other	56	6
IR-178	AFAG	1	Courthouse	49-50	1
IR-178	GH	4	Historic District	58-59	6
Mt. Dora MOA		2	Courthouse	<45	1
Mt. Dora MOA		1	Historic District	<45	1
Mt. Dora MOA		1	House	<45	1
Mt. Dora MOA		1	Hotel	<45	1
Mt. Dora MOA		1	Pueblo	<45	1
Mt. Dora MOA		2	Roads	<45	<1
Reese 4 MOA		2	Petroglyph	<45	<1
Reese 4 MOA		1	Hotel	<45	<1
Reese 4 MOA		2	Courthouse	<45	<1
Reese 4 MOA		2	Pueblo	<45	<1
Reese 5 MOA		1	Historic District	<45	<1

Refer to Figure 2.3-1 for segment locations.

Electronic Scoring Sites. Under the No-Action Alternative, the existing operations at the Harrison and La Junta Electronic Scoring Sites would continue at current levels. There would be no construction associated with Alternative A: No-Action or changes to existing operations. Therefore, no changes to cultural resources would occur.



Reservations Within the Region of Alternative A: No-Action

Figure 4.5-1

4.5.3 Alternative B: IR-178/Lancer MOA

AFFECTED ENVIRONMENT

The affected environment includes the lands under the affected airspace and the locations for the candidate emitters, candidate Electronic Scoring Sites, and existing Electronic Scoring Sites at Harrison and La Junta. The affected airspace includes the primary MTRs and MOAs, especially IR-178, as well as Reese 4, Reese 5, and Roby MOAs.

Airspace. As part of the background research, cultural resources currently listed in the National Register underneath the proposed MTRs and MOAs for Alternative B were identified. Fifteen properties are currently listed on the National Register. Among these 15 properties are historic districts, archaeological sites, courthouses, hotels, and other structures (Table 4.5-4). No National Historic Landmarks are located within 20 miles of the affected airspace.

Table 4.5-4
National Register-Listed Cultural Resources
Under Alternative B Affected Airspace

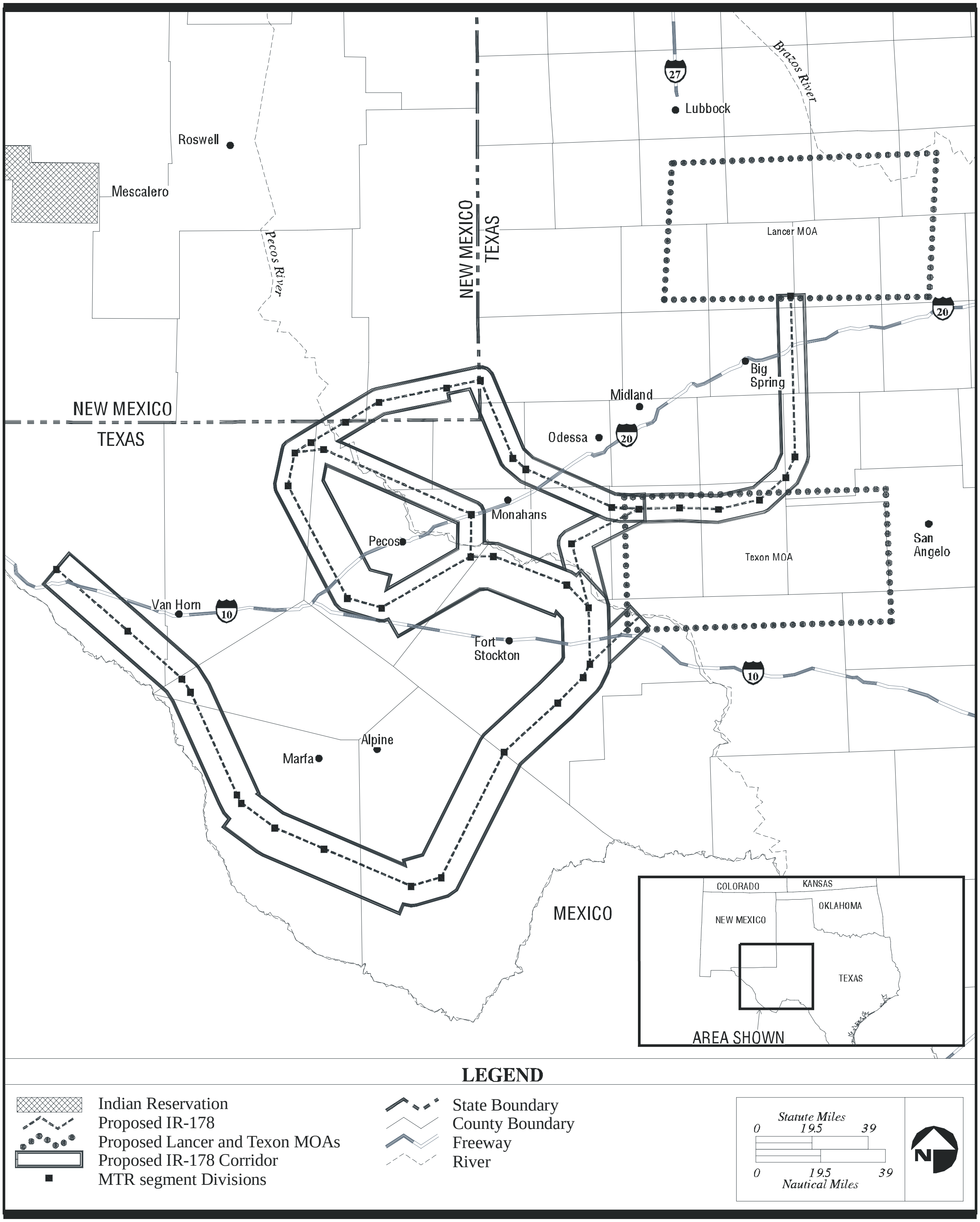
Resource Type	*Number of Resources*
Petroglyph sites	2
Pueblos, ruins, and other archaeological sites	2
Historic districts	5
Courthouses, schools, and other government and public buildings	3
Houses, mansions, and cabins	2
Farms, ranches, barns, windmills, and other agricultural features	0
Hotels, stores, mills, and other commercial buildings	0
Roads, trails, bridges, dams, ditches, etc.	0
Other cultural resources	1
Total	**15**

There are no Native American pueblos or reservations underneath IR-178 or the proposed Lancer MOA. The Mescalero Apache Reservation is about 100 miles from the nearest segment of IR-178 (Figure 4.5-2). No traditional cultural properties have been identified under the affected airspace.

Table 4.5-5
Cultural Resources Associated with Emitter and Scoring Site Locations Under Alternative B

Resource Type	*Number of Resources*
Sites	
Prehistoric	1
Historic	0
Subtotal	**1**
Isolates	
Prehistoric	11
Historic	0
Subtotal	**11**
High Probability Locations	0
Subtotal	**0**
Total	**12**

Emitters and Electronic Scoring Sites. Of the 16 emitter and scoring site locations in Alternative B inspected for cultural resources, 11 contained no prehistoric or historic resources. Of the remaining 5, the survey recorded a prehistoric quarry at 1 site and 11 prehistoric isolated artifacts on 5 emitter/Electronic Scoring Site locations (Table 4.5-5). All of the isolates are stone flakes or tools. The quarry site is considered eligible for listing in the National Register; none of the isolates are considered eligible. The SHPO is reviewing the survey and eligibility determinations; the Air Force anticipates concurrence with the findings and determinations.



Reservations Within the Region of Alternatives B and C **Figure 4.5-2**

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Fifteen National Register properties are located underneath the airspace; however, all of these sites are currently overflown by the military. Properties listed on the National Register would be exposed to noise levels from 46 to 61 DNL, with a 1 to 2 dB change in most segments (Table 4.5-6). In segment AB of proposed IR-178, there would be a 5 dB increase and a 12 dB increase in segment AFAG. The property type in segment AB is a multiple property district and in AFAG, a courthouse. Although subject to a 5 dB and 12 dB increase, noise levels would not exceed 61 DNL and the area is already exposed to overflights from military aircraft. For GH, the historic district, noise levels would increase 2 to 3 dB. The increases in noise levels are unlikely to adversely affect resource significance.

Table 4.5-6
National Register Properties Under Alternative B: Proposed IR-178/Lancer MOA

Airspace	*Segment*	*Number of Properties*	*Property Type*	*RBTI Minimum Flight Altitude*	*Baseline Noise Level (DNL)*	*Projected Noise Level*	*Change in Noise level (dB)*	*Increase in Average Daily Sortie-Operations*
IR-178	AB	1	Other	400	56	61	5	4
IR-178	GH	4	Historic District	300	58-59	60-61	2	4
IR-178	AFAG	1	Courthouse	800	46	58	12	4
Lancer MOA		2	Petroglyphs	3,000	<45	46	1	9
Lancer MOA		2	House	3,000	<45	46	1	9
Lancer MOA		2	Courthouse	3,000	<45	46	1	9
Lancer MOA		1	Historic District	3,000	<45	46	1	9
Lancer MOA		2	Pueblos	3,000	<45	46	1	9

Refer to Figure 2.4-3 for segment locations.

Overflights on the MTR segments would increase by four, on average, per day with an increase in nine overflights per day in the MOA. However, MTR segments are 8 to 14 nm wide and the MOA/ATCAA is over 3,200 square nm in size. National Register properties are unlikely to be overflown in the MOA and would only occasionally be overflown on MTRs. Visual intrusions are unlikely to occur.

Sound exposure levels would range from less than 86 to 116 dB. Studies indicate that low altitude overflights, even with noise levels above 120 dB, do not usually cause damage to buildings. It is extremely unlikely that architectural or archaeological resources would be physically damaged by overflights under this alternative.

Because no traditional cultural properties have been identified and because there are no nearby Native American groups, impacts to traditional cultural resources are considered unlikely.

Construction. Construction associated with this alternative could impact one archaeological site eligible for listing in the National Register. However, this site is located on a portion of an existing Air Force facility and may be avoided during construction. Therefore, no adverse impacts to archaeological sites would occur. No architectural resources or traditional cultural properties would be affected by construction.

Ground Operations. One archaeological site could be affected by ground operations if materials were disturbed or collected by personnel. Established procedures for

. . . Alternative B: IR-178/Lancer MOA

informing personnel of federal protection of significant resources will be enforced and no impacts to cultural resources would result from operations or maintenance.

Decommissioning. Decommissioning of La Junta Electronic Scoring Site could result in the transfer of land out of federal ownership. No sites or significant structures are known, but the area has not been surveyed and the Colorado SHPO has expressed concern about the significance of the structure. However, since it was constructed in 1990, it is unlikely to be significant. Nevertheless, if the lands were transferred out of federal ownership, then an archaeological and architectural survey would be conducted to record resources and assess their significance. No sites occur at the Harrison Electronic Scoring Site, and no impact from decommissioning would result.

4.5.4 Alternative C: IR-178/Texon MOA

AFFECTED ENVIRONMENT

The affected environment includes the lands under the affected airspace and the locations for the candidate emitters, candidate Electronic Scoring Sites, and existing Electronic Scoring Sites at Harrison and La Junta. The affected airspace includes the primary MTRs and MOAs, especially IR-178 and the proposed Texon MOA/ATCAA.

Airspace. As part of the background research, cultural resources currently listed in the National Register near or directly underneath the proposed MTRs and MOAs for Alternative C were identified. Six properties are currently listed on the National Register. These six properties include historic districts, multiple property listings, and a courthouse (Table 4.5-7). No National Historic Landmarks are located within 20 miles of the affected airspace.

Table 4.5-7
National Register-Listed Cultural Resources
Under Alternative C Affected Airspace

Resource Type	*Number of Resources*
Petroglyph sites	0
Pueblos, ruins, and other archaeological sites	0
Historic districts	4
Courthouses, schools, and other government and public buildings	1
Houses, mansions, and cabins	0
Farms, ranches, barns, windmills, and other agricultural features	0
Hotels, stores, mills, and other commercial buildings	0
Roads, trails, bridges, dams, ditches, etc.	0
Other cultural resources	1
Total	**6**

There are no Native American reservations or pueblos underneath IR-178 or the proposed Texon MOA (refer to Figure 4.5-2). The Mescalero Apache Reservation is about 100 miles from the nearest segment of IR-178. No traditional cultural properties have been identified under the affected airspace. Background research on the Harrison and La Junta Electronic Scoring Sites is discussed under Alternative B.

Table 4.5-8
Cultural Resources Associated with Emitter and Scoring Site Locations Under Alternative C

Resource Type	*Number of Resources*
Sites	
Prehistoric	1
Historic	1
Subtotal	**2**
Isolates	
Prehistoric	10
Historic	0
Subtotal	**10**
High Probability Locations	0
Subtotal	**0**
Total	**12**

Emitter and Electronic Scoring Sites. Of the 16 emitter and Electronic Scoring Site locations inspected for cultural resources for Alternative C, 12 contained no prehistoric or historic resources. Of the remaining four, the survey recorded one prehistoric quarry site, one historic trash scatter used from 1910 to 1930, and ten prehistoric isolates (Table 4.5-8), all of which were stone flakes or tools. The two sites are eligible for listing in the National Register; none of the isolates is considered eligible. The SHPO is reviewing the Air Force survey and eligibility determinations, and the Air Force anticipates concurrence.

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Six National Register properties are located underneath the airspace; however, all of these sites are currently overflown by the military. Properties listed on the National Register would be exposed to noise levels from 45 to 61 DNL, with a 1 to 2 dB change in most segments (Table 4.5-9). In segment AB of IR-178, there would be a 5 dB increase. The property type in segment AB is a multiple property district. Although subject to a 5 dB increase, noise levels would not exceed 61 DNL and the area is already exposed to overflights from military aircraft. The increases in noise levels are unlikely to adversely affect resource significance.

Table 4.5-9
National Register Properties Under Alternative C: Proposed IR-178/Texon MOA

Airspace	*Segment*	*Number of Properties*	*Property Type*	*RBTI Minimum Flight Altitude*	*Baseline Noise Level (DNL)*	*Projected Noise Level*	*Change in Noise level (dB)*	*Increase in Average Daily Sortie-Operations*
IR-178	AB	1	Other	400	56	61	5	4
IR-178	GH	4	Historic District	300	58-59	60-61	2	4
Texon MOA		1	Courthouse	6,000	<45	46	1	9

Refer to Figure 2.4-6 for segment locations.

Overflights on the MTR segments would increase by 4, on average, per day with an increase in 9 overflights per day in the MOA. However, MTR segments are 12 to 14 nm wide and the MOA/ATCAA is over 3,200 square nm in size. National Register properties are unlikely to be overflown in the MOA and would only occasionally be overflown on MTRs. Visual intrusions are unlikely to occur.

Sound exposure levels would range from less than 86 to 116 dB. Studies indicate that low-altitude overflights, even with noise levels above 120 dB, do not usually cause damage to buildings. It is extremely unlikely that architectural or archaeological resources would be physically damaged by overflights under this alternative.

Because no traditional cultural properties have been identified and because there are no nearby Native American groups, impacts to traditional cultural resources are considered unlikely.

Construction. Construction associated with Alternative C could impact two archaeological sites eligible for listing in the National Register. However, one of the sites is located on a portion of Air Force property and may be avoided during construction. The remaining site is located at the edge of the emitter location and can also be avoided. No impact is expected to archaeological resources. No architectural resources or traditional cultural properties would be affected by construction.

Ground Operations. Two significant sites could be affected by operations. Impacts would be the same as those for Alternative B and could be avoided.

Decommissioning. Impacts due to decommissioning the La Junta Electronic Scoring Site are the same as in Alternative B. No impacts would result from decommissioning Harrison Electronic Scoring Site.

4.5.5 Alternative D: IR-153/Mt. Dora MOA

AFFECTED ENVIRONMENT

The affected environment includes the lands under the affected airspace, the locations for the candidate emitters and Electronic Scoring Sites, and existing Electronic Scoring Sites at Harrison and La Junta. The affected airspace includes the primary MTRs and MOAs, especially proposed IR-153 and the proposed Mt. Dora MOA/ATCAA.

Fifteen National Register-listed properties underlie the affected airspace for Alternative D.

Airspace. As part of the background research, cultural resources currently listed in the National Register near or directly below the proposed MTRs and MOAs for Alternative D were identified. Fifteen properties are currently listed on the National Register (Table 4.5-10). These 15 properties include historic districts; Wagon Mound and Rabbit Ears, both National Historic Landmarks; part of the Santa Fe Trail; courthouses; a store; a hotel; and houses. The Clayton Complex, four sites associated with early settlements, is partially within the area underlying the MOA.

Table 4.5-10
National Register-Listed Cultural Resources
Under Alternative D Affected Airspace

Resource Type	*Number of Resources*
Pueblos, ruins, and other archaeological sites	2[1]
Historic districts	4[2]
Courthouses, schools, and other government and public buildings	3
Houses, mansions, and cabins	4[2]
Hotels, stores, mills, and other commercial buildings	1
Roads, trails, bridges, dams, ditches, etc.	1
Total	**15**

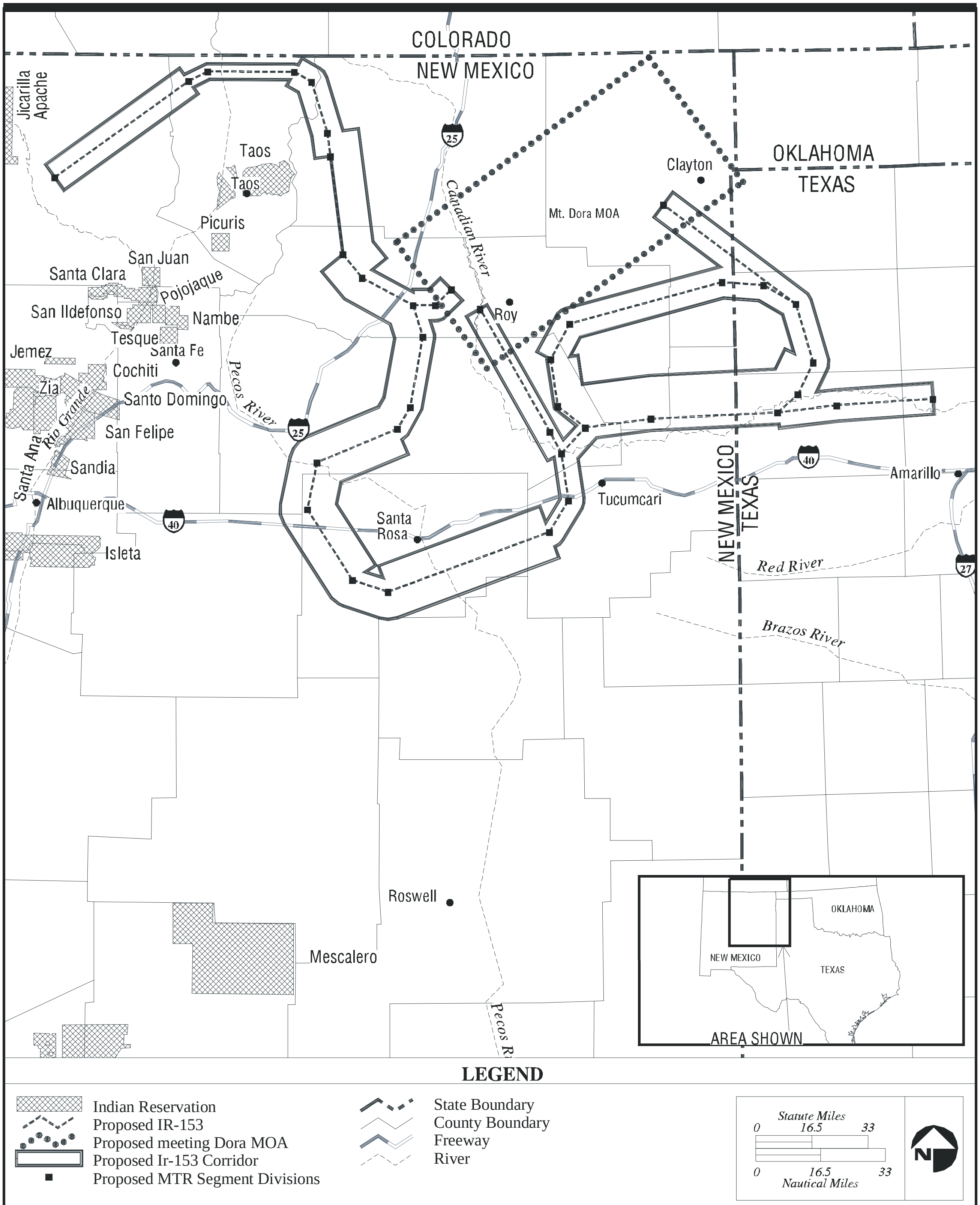
[1] Two historic properties under the airspace are also National Historic Landmarks (Wagon Mound, Rabbit Ears).
[2] Includes Villa Philmonte Historic District and Maxwell-Abreu House.

There are no Native American reservations or pueblos underneath proposed IR-153 or the proposed Mt. Dora MOA/ATCAA (Figure 4.5-3). Taos Pueblo and the Jicarilla Apache Reservation are each less than 10 miles from different segments of proposed IR-153. In addition to these two communities, Santa Clara, San Juan, and Picuris pueblos are within 30 miles of proposed IR-153. Concern about traditional resources was expressed for areas more than 5 miles from the proposed MTR corridor; however, no traditional cultural properties have been identified under the affected airspace. Background research on the Harrison and La Junta Electronic Scoring Sites are discussed under Alternative B.

Table 4.5-11
Cultural Resources Associated with Emitter and Scoring Site Locations Under Alternative D

Resource Type	*Number of Resources*
Sites	
Prehistoric	4
Historic	1
Subtotal	**5**
Isolates	
Prehistoric	4
Historic	0
Subtotal	**4**
High Probability Locations	1
Subtotal	**1**
Total	**10**

Emitter and Electronic Scoring Sites. Of the 22 emitter and scoring site locations inspected for cultural resources for Alternative D, 14 contained no prehistoric or historic resources. Of the remaining eight, the survey recorded one prehistoric quarry, one historic homestead, three lithic scatters, and four prehistoric isolates (Table 4.5-11). Each of the isolates is a stone tool fragment or flake. The five sites are eligible for listing in the National Register; none of the isolates are eligible. Also, one emitter location did not contain surface evidence of cultural resources, but is believed to have a high potential for buried cultural resources. The New Mexico SHPO is reviewing the Air Force findings and eligibility determinations; the Air Force anticipates concurrence with these findings.



Reservations Within the Region of Alternative D: IR-153/Mt. Dora MOA **Figure 4.5-3**

A summary of the cultural resource investigations for Harrison and La Junta Electronic Scoring Sites is found under Alternative B.

ENVIRONMENTAL CONSEQUENCES

Airspace and Flight Operations. Fifteen National Register properties are located underneath the airspace; however, all of these sites are currently overflown by the military. Properties listed on the National Register would be exposed to noise levels from 45 to 62 DNL, with a 0 to 18 dB change in affected segments (Table 4.5-12). In segments NO and QR of proposed IR-153, there would be a 9 to 10 dB increase, a 17 dB increase in segment IJ, and an 18 dB increase in segment GH. The property types in segments NO and QR are a house and historic district and in GH are the Santa Fe Trail, hotel, houses, and two historic districts. Although subject to an 18 dB increase, noise levels would not exceed 62 DNL, and the area is already exposed to overflights from military aircraft. The increase in noise levels is unlikely to adversely affect the resource significance since these sites are not within a traditional setting. There would be a noticeable change in noise levels for portions of the Santa Fe Trail and Wagon Mound, National Historic Landmarks. The increase in noise could distract from visitors' appreciation of the area, although it would not alter the cultural significance of the resource.

Table 4.5-12
National Register Properties Under Alternative D: Proposed IR-153/Mt. Dora MOA

Airspace	*Segment*	*Number of Properties*	*Property Type*	*RBTI Minimum Flight Altitude*	*Baseline Noise Level (DNL)*	*Projected Noise Level*	*Change in Noise level (dB)*	*Increase in Average Daily Sortie-Operations*
IR-153	GH	2	Historic District[2]	400	<45	62	18	10
IR-153	GH	1	Road	400	<45	62	18	10
IR-153	GH	1	Hotel	400	<45	62	18	10
IR-153	GH	2	House[2]	400	<45	62	18	10
IR-153	IJ	1	Site[1]	400	<45	61	17	10
IR-153	NO	1	Historic District	300	50	60	10	10
IR-153	QR	1	House	300	51	60	9	9
IR-153	ACAD	1	Courthouse	2,000	<45	<45	0	1
Mt. Dora MOA	not applicable	1	Site[1]	1,500	<45	46	1	9
Mt. Dora MOA	not applicable	1	Courthouse	1,500	<45	46	1	9
Mt. Dora MOA	not applicable	1	House	1,500	<45	46	1	9
Mt. Dora MOA	not applicable	1	Historic District	1,500	<45	46	1	9
Mt. Dora MOA	not applicable	1	School	1,500	<45	46	1	9

[1] Two historic properties under the airspace are also National Historic Landmarks (Wagon Mound, Rabbit Ears)
[2] Includes Villa Philmonte Historic District and Kit Carson/Maxwell-Abreu House

Overflights on the MTR segments would increase by 9 to 10, on average, per day. However, MTR segments are 8 to 14 nm wide and the MOA/ATCAA is over 3,200 square nm in size. National Register properties are unlikely to be overflown in the MOA and would only occasionally be overflown on MTRs. Visual intrusions are unlikely to occur.

Sound exposure levels would range from less than 86 to 116 dB. Studies indicate that low-altitude overflights, even with noise levels above 120 dB, do not usually cause damage to buildings. It is extremely unlikely that architectural or archaeological resources would be physically damaged by overflights under this alternative.

No traditional cultural properties have been identified underneath the affected airspace. Reservations and pueblos are found less than 10 miles from portions of the affected airspace. The Air Force will continue its ongoing dialogue with Native American groups to solicit their input about traditional cultural properties and the effects of overflights on their traditional lifestyles.

Construction. Construction associated with Alternative D could impact five archaeological sites eligible for listing in the National Register. However, two of the sites are located at the edge of the parcel or in an area that could be avoided. Three sites were located in the center of the 15-acre parcels and cannot be avoided. If these parcels are selected, then data recovery would be conducted to reduce impacts. Specific mitigation measures are presented in section 2.6.2. No architectural resources or traditional cultural properties would be affected by construction.

Ground Operations. Three significant sites could be affected by operations. Impacts would be the same as Alternative B and could be avoided.

Decommissioning. Impacts due to decommissioning the La Junta Electronic Scoring Site are the same as in Alternative B. No impacts would result from decommissioning the Harrison Electronic Scoring Site.

4.5.6 Summary Comparison of Impacts

Table 4.5-13 compares the impacts for all four alternatives with regard to airspace and flight operations, construction, ground operations, and decommissioning. None of the alternatives would have more than minimal effects on cultural resources.

Table 4.5-13
Cultural Resources Summary Comparison of Impacts

Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
Airspace and Flight Operations	No change to archaeological, architectural, or traditional cultural resources. 22 National Register-listed properties, including 3 National Historic Landmarks currently overflown.	A) No likely effects to archaeological, architectural, or traditional cultural resources. B) 15 National Register-listed properties exposed to changes of 1 to 12 dB in noise levels; average daily sorties increase by 5 in MTR and 9 in MOA but area already overflown.	A) No likely effects to archaeological, architectural, or traditional cultural resources. B) 6 National Register-listed properties exposed to changes of 1 to 5 dB in noise levels; average daily sorties increase by 4 in MTR and 9 in MOA but area already overflown.	A) No likely effects to archaeological, architectural, or traditional cultural resources. B) 15 National Register-listed properties including 2 National Historic Landmarks exposed to changes of 0 to 18 dB in noise levels; average daily sorties increase by 10 in MTR and MOA but area already overflown.
Construction	No Effect	No adverse effects to archaeological, architectural, or traditional resources. Existing site would be avoided.	No adverse effects to archaeological, architectural, or traditional resources. Two existing archaeological sites would be avoided.	No adverse effects to archaeological, architectural, or traditional resources. Five existing archaeological sites would be avoided or mitigated.
Ground Operations	No Effect	No adverse effects to archaeological, architectural, or traditional resources.	Same as Alternative B.	Same as Alternative B.
Decommissioning	No Effect	Transfer of property could affect resources if present, but effects could be avoided or mitigated to insignificant levels.	Same as Alternative B.	Same as Alternative B.

4.6 SOILS AND WATER RESOURCES

4.6.1 Methods and Approach

For this EIS, earth resources--soil (unconsolidated) and bedrock (consolidated) materials--have been narrowed by the scoping process to an analysis of soil. In particular, the EIS focused on soil erosion and loss. Water resources--the occurrence, circulation, and distribution of surface water and groundwater--have been narrowed to water availability and use issues. Surface waters such as rivers, perennial streams, ponds, or lakes, are not examined because none of the candidate emitter and Electronic Scoring Sites would be located within 1 mile of these natural resources. The potential for impacts to paleontological (fossil) resources and groundwater contamination were reviewed at each of the sites but neither was present; therefore, further analysis was not carried forward. Any mineral or water development rights would be retained by the landowner and are not analyzed. Potential adverse effects to soils could result from ground disturbance leading to soil erosion, fugitive dust propagation, and sedimentation. Adverse effects to water resources could result from erosion, runoff, and surface contamination of groundwater.

At the two Electronic Scoring Sites, construction would disturb 3.3 acres; 0.6 acres would be disturbed at each of the ten emitter sites.

Soils and water resources can be affected by ground-disturbing activities, such as construction or grading. Therefore, this analysis focuses on construction and ground operations at the candidate emitter sites and Electronic Scoring Sites that could potentially impact these resources. Aircraft operations in airspace are not considered to be a source of impact to either soil or water resources and are not evaluated.

The Air Force chose level candidate sites with existing access to the maximum extent possible to reduce erosion and soil loss during construction.

Potential erosion losses were predicted for every candidate site using the Universal Soil Loss Equation (Fuller 1984). Estimated gully losses through water erosion were also assessed. Likewise, potential wind erosion losses were predicted using a similar equation (Fuller 1987) and Natural Resource Conservation Service methodologies. Losses attributable to fugitive dust generated during construction activities were estimated using an accepted USEPA relationship. Overall, no significant impacts to soil and water resources are anticipated at any of the proposed emitter and electronic scoring sites. One ton of soil spread over 1 acre is less than the thickness of a dime. When identifying sites, the Air Force looked for level sites with pre-existing access to the maximum extent possible. Existing gravel roads would be graded and/or improved. Best management practices would be followed to minimize any erosion possibilities when constructing emitter and electronic scoring sites or improving any access roads.

4.6.2 Alternative A: No-Action

AFFECTED ENVIRONMENT

The affected environment for the No-Action Alternative includes the La Junta, Colorado, and Harrison, Arkansas, Electronic Scoring Site facilities. Access and parking areas at the La Junta site are paved. At the Harrison location, both the driveway and parking area are graveled. Access roads and parking areas at both locations are regularly maintained and procedures followed to minimize any soil or water erosion.

General water use averages about 5,000 gallons per month at either Electronic Scoring Site. Harrison draws water from the Valley Springs Municipal water supply and La Junta, from the City of La Junta. Wastewater at La Junta is disposed of through city sewer lines; the Harrison site has a 1,800-gallon septic tank on site.

ENVIRONMENTAL CONSEQUENCES

Under the No-Action Alternative, no changes to the current conditions at the Harrison and La Junta Electronic Scoring Sites would occur. Therefore, no changes in the soil and water resources are anticipated.

4.6.3 Alternative B: IR-178/Lancer MOA

AFFECTED ENVIRONMENT

Under Alternative B, two Electronic Scoring Sites and ten emitter sites would be constructed in western Texas. These proposed facilities would be located primarily in the Trans-Pecos, Edwards Plateau, and southern High Plains (Llano Estacado) physiographic provinces. Erosion (the action of particle removal) and sedimentation (the action of particle deposition) forces are responsible for much of the landscape found today. Gradual uplifting of the Rocky Mountains to the northwest, combined with erosional forces of wind and water, reworked the geologic materials, forming layered deposits of varied textures and thickness across eastern New Mexico and western Texas.

Six of the candidate emitter sites and one Electronic Scoring Site have the potential for loss or impact to soil and water resources due to erosion and/or steepness of terrain. Five candidate sites (54, 59, 65, 67, 81) have a moderate to high potential for erosion. Three (59, 91, 93) candidate sites are partially covered with slopes from 5 to 45 percent near their margins; however, no construction or road development would occur on these steeper areas. The access road leading to site 91 has portions that slope about 20 percent.

The proposed Electronic Scoring Sites, 61 and 62, are located at previously disturbed locations. There are pre-existing facilities at both sites; however, the wells supplying potable water and septic tanks have been closed.

ENVIRONMENTAL CONSEQUENCES

Long-term erosion losses due to construction under Alternative B would be negligible.

Construction. The soil erosion hazard from both wind and water for all construction activities is generally slight to moderate. Potential wind and water erosion losses are expected to be less than 5 tons per site during a 1-month construction period at any one of the candidate emitter sites, including fugitive dust emissions of about 0.4 tons. Because all sites would be graveled or paved (or protected by other best management practices in the case of disturbed road rights-of-way), long-term erosion losses would be negligible. Erosion loss calculations for these sites are found in Appendix J. Potential wind and water erosion losses at the Electronic Scoring Sites are expected to be less than 5 tons per site during a 1-month construction period at any one of the proposed sites, including fugitive dust emissions of about 2.0 tons per site. Because all sites would be graveled or paved (or protected by other best management practices in the case of disturbed road rights-of-way), long-term erosion losses would be negligible.

One site (65) has a moderate to high potential for wind erosion. However, this site has been historically farmed, and wind erosion potential could be minimized by application of vegetation cover. Soils at other sites (54, 59) have shrink-swell potentials with ratings that range from slight to severe. In those areas rated as severe, soils may have reduced load-bearing strengths when wet, and may swell or shrink (depending on soil moisture levels), causing damage to foundations, underground pipes, and other structures. Appropriate road and building design methods would be used to minimize these hazards. Because the majority of these sites are located on relatively flat terrain and receive low levels of precipitation, the potential for water erosion would be minimal. While the ground would be disturbed during site preparation and road construction, best management practices for proper grading and stabilizing the site would be undertaken. The potential for erosion from construction in these areas, therefore, is expected to be minimal.

. . . Alternative B
IR-178/Lancer MOA

While some candidate emitter sites have erosive soils (54, 81) and steep slopes (91, 93), the potential for runoff and erosion problems occurring are low because these sites would incur little surface disturbance in the long term. Storm runoff management practices would be used to minimize any potential erosion impacts on or off site. To reduce erosion hazard on steep sites, appropriate management practices will be used to direct potential storm runoff from road or pad surfaces into safe outlets.

No significant impacts are anticipated due to ground operations activities under Alternative B.

Ground Operations. Soil and water erosion along access routes and sites would be minimal due to road grading and gravel or paved site pads; therefore, impacts would not be significant. Potable water at any of the proposed Electronic Scoring Sites would come from existing groundwater supplies; either stored in a water tank, or delivered by pipeline. No long-term environmental consequences are expected for groundwater supplies since water consumption is estimated to be approximately 5,000 gallons per month at any of the proposed scoring site facilities.

Because the emitter sites are unmanned, and require only short weekly visits by personnel, no permanent water supply or wastewater treatment would be installed. All standard Air Force precautions would be taken to prevent contaminants (e.g., motor oils, pesticides, septic drainfield discharge, etc.) from reaching old well heads, waterways (intermittent or perennial), and aquifers. No significant impacts are anticipated due to ground operations activities.

4.6.4 Alternative C: IR-178/Texon MOA

AFFECTED ENVIRONMENT

The candidate Electronic Scoring Sites are the same for this alternative as in Alternative B, and the candidate emitter sites are in the same general vicinity as that found in Alternative B. All candidate MOA and MTR emitter sites have a low to moderate potential for erosion. Please refer to section 4.6.3 for an additional discussion of the affected environment.

Under Alternative C, the candidate Electronic Scoring Sites and the six MTR emitter sites are the same. The MOA candidate emitter sites have low to moderate wind and water erosion potential.

ENVIRONMENTAL CONSEQUENCES

The concerns expressed in Alternative B are the same for Alternative C. No significant long-term impacts to soil and water resources are anticipated due to construction or ground operations activities. Erosion losses are expected to be less than 5 tons per site during a 1-month construction period at any one of the proposed sites, including fugitive dust emissions of about 0.4 to 2.0 tons per site. Sites would be treated in a manner similar to that described for Alternative B, and long-term erosion losses would be negligible. Erosion loss calculations for these sites are found in Appendix J.

No significant long-term impacts to soil and water resources are anticipated for Alternative C.

4.6.5 Alternative D: IR-153/Mt. Dora MOA

AFFECTED ENVIRONMENT

Construction activities proposed for Alternative D would be located in northeastern New Mexico and within the High Plains (Llano Estacado) physiographic province, extending from the Texas panhandle westward to the southern Rocky Mountains (Chronic 1987, Sheldon 1979). Geologic processes described in Alternative B are similar for Alternative D (refer to section 4.6.3, Alternative B).

With the exception of the Electronic Scoring Site in Abilene, Texas, all other proposed sites under Alternative D would be located in northeastern New Mexico. The other Electronic Scoring Site would be located in New Mexico.

Fourteen of the seventeen candidate emitter and two Electronic Scoring Site locations have potential for loss or impact to soil and water resources due to erosion and/or steepness of terrain (6, 7, 14, 15, 16, 17, 20, 21, 28, 33, 35, 36, 37, 39, 40, 41). Sites with erosion potential generally occur with steeper slopes; however, none of these sites are located on areas with more than a 5 percent slope.

Currently, no permanent potable water supplies or wastewater disposal systems exist at candidate Electronic Scoring Sites 28, 33, and 34. Sites 28 and 33 have restrictive soil layers and may require specific engineering solutions for septic drainfield construction.

ENVIRONMENTAL CONSEQUENCES

Construction. Several emitter sites (16, 20, 28, 33, 36, 37, 40, and 41) have road and building construction limitations due to soils exhibiting high shrink-swell properties (see section 4.6.3). However, best management practices would be followed to minimize any hazards for newly constructed roads and existing roads would be improved and routinely maintained. To reduce erosion hazard, appropriate management practices would be used to direct potential storm runoff from road or pad surfaces into safe outlets. Wind erosion could occur at six sites (6, 7, 15, 34, 37, and 39).

Potential wind and water erosion losses are expected to be less than 5 tons per site during a 1-month construction period at any one of the proposed sites, including fugitive dust emissions of about 0.4 to 2.0 tons per site. Because all sites would be graveled or paved (or protected by other best management practices in the case of disturbed road rights-of-way), long-term erosion losses would be minimal. Erosion loss calculations for these sites are found in Appendix J.

Ground operations and construction are not expected to cause significant impacts to soil or water resources.

Ground Operations. Potable water at any of the proposed Electronic Scoring Sites would come from existing groundwater supplies; either stored in a water tank or attached to a pipeline where possible. No long-term environmental consequences are expected for groundwater supplies since water consumption is estimated to be approximately 5,000 gallons per month at any of the proposed scoring site facilities in New Mexico or Texas.

Because the proposed scoring facilities would have septic systems installed to support personnel, chances for surface water and groundwater contamination are unlikely. As with Alternatives B and C, the emitter sites are unmanned, and would not require any permanent water supply or wastewater treatment. All Air Force precautions would be taken to prevent contaminants (e.g., motor oils, pesticides, septic drainfield discharge, etc.) from reaching old well heads, waterways (intermittent or perennial), and aquifers. No significant impacts are anticipated due to ground operations activities on either surface or groundwater resources.

4.6.6 Summary of Comparison Impacts

Table 4.6-1 summarizes impacts to soil and water resources for all four alternatives. Overall, no significant long-term impacts to soil or water would occur due to any alternative. Best management practices would reduce potential impacts to negligible levels.

Table 4.6-1.
Soils and Water Resources Summary Comparison of Impacts

Project Elements	*Alternative A*	*Alternative B*	*Alternative C*	*Alternative D*
Airspace and Flight Operations	No Effect	No Effect	No Effect	No Effect
Construction	No Effect	Potential for soil erosion exists on 7 sites but effects would be avoided or mitigated to insignificant levels. Soil losses of no more than 5 tons per 15-acre site with fugitive dust at 0.4 tons for emitters and 0.6 tons for Electronic Scoring Sites. Best Management Practices would reduce effects to negligible levels. No effect due to water use or availability.	Potential for soil erosion exists on 6 sites but effects would be avoided or mitigated to insignificant levels. Soil losses of no more than 5 tons per 15-acre site with fugitive dust at 0.4 tons for emitters and 0.6 tons for Electronic Scoring Sites. Best Management Practices would reduce effects to negligible levels. No effect due to water use or availability.	Potential for soil erosion exists on 16 sites but effects would be avoided or mitigated to insignificant levels. Soil losses of no more than 5 tons per 15-acre site with fugitive dust at 0.4 tons for emitters and 0.6 tons for Electronic Scoring Sites. Best Management Practices would reduce effects to negligible levels. No effect due to water use or availability.
Ground Operations	Soil and water erosion negligible.	Soil and water erosion negligible.	Soil and water erosion negligible.	Soil and water erosion negligible.
Decommissioning	No Effect	No Effect	No Effect	No Effect

CHAPTER 5

CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

CHAPTER 5
CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

5.1 CUMULATIVE EFFECTS

A cumulative effects analysis within an EIS should consider the potential environmental impacts resulting from "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions" (40 CFR 1508.7). Assessing cumulative effects involves defining the scope of the other actions and their interrelationship with the proposed action (and alternatives) if they overlap in space and time (CEQ 1997). Cumulative effects are most likely to arise when a proposed action is related to other actions that could occur in the same location or at a similar time. Actions geographically overlapping or close to the proposed action would likely have more potential for a relationship than those farther away. Similarly, actions coinciding in time with a proposed action would have a higher potential for cumulative effects.

To identify cumulative effects, the analysis needs to address three questions:

1. Could affected resource areas of the proposed action interact with the affected resource areas of past, present, or reasonably foreseeable actions?

2. If one or more of the affected resource areas of the proposed action and another action could interact, would the proposed action affect or be affected by impacts of the other action?

3. If such a relationship exists, are there any potentially significant impacts not identified when the proposed action is considered alone?

5.1.1 Scope of Cumulative Effects Analysis

The scope of the cumulative effects analysis involves both the geographic extent of the effects and the time in which the effects could occur. This cumulative effects analysis includes the boundaries of the affected areas for the action alternatives (Alternatives B, C, and D). Actions not occurring within or near these are not considered in the analysis. The time frame for cumulative effects starts in early 2000 when airspace changes proposed under RBTI would most likely be implemented and would continue into the foreseeable future. Construction activities would not likely start until 2001. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies were the primary sources of information for identifying reasonably foreseeable actions.

This analysis considers the cumulative effects of Alternatives B, C, and D. Alternative A: No Action represents status quo conditions, and would form part of the existing environment. As evidenced by the analysis of environmental consequences in Chapter 4 of this EIS, Alternatives B and C are very similar; for this reason, they are treated in a combined fashion in this cumulative analysis.

Cumulative effects analysis also needs to consider the combined additive, or interactive impacts of the accumulation of all elements (refer to section 2.4.1) associated with a single action alternative (e.g., construction plus aircraft operations). In Chapter 4, each resource not only assesses the specific environmental consequences of individual elements, it also accounts for the combined effects of all elements. Since this aspect of cumulative effects was presented in Chapter 4, it will not be discussed further in this section.

5.1.2 Past and Present Actions

Known past and present actions that might result in cumulative effects are all Air Force activities. These past and present actions involve use of primary airspace, or secondary (intersecting) airspace included in one of the RBTI action alternatives (Table 5.1-1). The flight operations of each of these actions have been incorporated into the analysis in this EIS as part of the baseline conditions in the affected airspace environment for the No-Action Alternative and the action alternatives, then incorporated into the analysis for each of the alternatives. Sortie-operations of

Table 5.1-1
Past and Present Actions Already Considered in No-Action and Action Alternatives

Action	Year Implemented	Relationship to RBTI
Stationing of 60 F-16s at Cannon AFB; removal of 99 F/EF-111s[1]	1995	◆ F-16s use Pecos, Mt. Dora, and Bronco MOAs ◆ F-16s fly on eight MTRs that intersect or overlap with proposed IR-153 in Alternative D
Establish the Bronco MOA by consolidating Reese 1, 2, and 3 MOAs[2]	1998	◆ Dyess and Barksdale AFBs aircrews fly 1 percent of the sortie-operations in the Bronco MOA in all alternatives
Relocation and revision of MTR VR-1174/1574 to VR-1175/1176 in northern New Mexico	1998	◆ VR-1175/1176 intersects and overlaps with portions of proposed IR-153 in Alternative D
Changes in type of F-16s at Cannon AFB and training by the Republic of Singapore Air Force[3]	1998	◆ Cannon and RSAF F-16s fly in Pecos and Bronco MOAs associated with Alternatives B, C, and D ◆ Cannon and RSAF F-16s fly in Mt. Dora MOA associated with Alternative D ◆ F-16s fly on eight MTRs that intersect or overlap with proposed IR-153 in Alternative D
Expand German Air Force Operations at Holloman AFB, New Mexico[4]	1999-2000	◆ GAF Tornado aircraft fly in Pecos and Mt. Dora MOAs ◆ GAF Tornado aircraft fly on an MTR that intersects or overlaps with proposed IR-178 in Alternatives B and C, with five MTRs that intersect or overlap with proposed IR-153 in Alternative D
Establishment of 13th Bomb Squadron (B-1s) at Dyess AFB[5]	1997-2000	◆ B-1s from 13th Bomb Squadron use airspace as do other Dyess AFB B-1s in Alternatives B, C, and D

[1]Source: USAF 1995
[2]Source: USAF 1997b
[3]Source: USAF 1998b
[4]Source: USAF 1998a
[5]Source: USAF 1996

overlapping or intersecting airspace units with RBTI alternatives were added to obtain a combined total number of sortie-operations. Past and present actions affecting the RBTI primary airspace were also included within the total use. In each relevant instance, the aircraft noise, air emissions, and aircraft safety rates were integrated with those generated by the RBTI components. This approach applied to all resource categories, so the analysis of impacts presented in Chapter 4 also includes the cumulative effects of these past and present Air Force actions.

5.1.3 Future Proposed Actions

Three proposed actions warrant examination for cumulative effects. Two of the three proposed actions do not directly interact with aspects of any RBTI alternative. The third involves only some additional activities on MTRs associated with the RBTI alternatives. A fourth possible, but not proposed, action could involve flight activities on secondary MTRs within the RBTI study area.

NEW DROP ZONE, DYESS AFB

In addition to bombers, Dyess AFB also supports two squadrons of C-130 transport aircraft. A substantial portion of this squadron's mission involves accurately dropping equipment, food, and other supplies to support ground troops. To train for this mission, C-130 aircrews need to practice a variety of parachute and other drops. The Air Force is proposing to establish a new drop zone training area about 50 miles southwest of Dyess AFB to assist with training. The Air Force has prepared a Draft Environmental Assessment (USAF 1999) and preliminarily determined that the proposed drop zone would not result in any significant impacts. The proposed drop zone would not involve use of any of the same airspace associated with the RBTI alternatives, but would lie northeast of the Texon MOA. The C-130 would fly at 300 feet AGL to accomplish drop zone training, whereas the bombers using the proposed RBTI en route Electronic Scoring Site near Dyess AFB would fly at higher altitudes. The presence of the drop zone at or near the base would not alter the way in which bomber aircrews use the RBTI alternatives. No interaction would occur between the drop zone training and RBTI activities.

PROPOSED IR-323 IN UTAH

To improve low-altitude access to the Utah Test and Training Range (west of Salt Lake City), especially for bomber aircraft, the Air Force is proposing to establish a new MTR linked to the range. This proposal, while well outside the RBTI study area, would involve bombers from Barksdale and Dyess AFBs. Approximately 400 annual sortie-operations on the proposed MTR are projected for the bombers from these two bases. Other bomber units from Minot AFB, Ellsworth AFB, Mt. Home AFB, McConnell AFB, Robins AFB, and Whiteman AFB would also fly on the proposed MTR.

However, no interaction exists between the location of proposed IR-323 and the proposed RBTI action alternatives. The sortie-operations conducted by Barksdale and Dyess AFBs' bombers on proposed IR-323 would not be subtracted from the sortie-operations projected under any RBTI action alternative. Rather, use of proposed IR-323 would represent a continuation of training activities by Barksdale and Dyess AFBs' bombers in remote airspace units outside the RBTI study area. For the same reason, RBTI sortie-operations would not increase if proposed IR-323 were not established. No part of the proposed IR-323 activities would involve any airspace in the RBTI study area, nor would they alter the training operations of other (not from Barksdale and Dyess AFBs) users of RBTI primary and secondary airspace. Based on those factors, no cumulative effects would occur.

Defense Training Initiative, Cannon AFB, New Mexico

The Air Force is preparing environmental documentation for increasing the defensive training capability for combat aircrews. This initiative includes the proposed use of chaff and flares by F-16 aircraft from Cannon AFB in New Mexico and Texas in the Pecos/Taiban and Bronco MOAs with associated ATCAAs and the use of chaff on VR-100/125. Chaff consists of hair-thin strands of aluminum-coated silicon ejected by aircraft in order to counter enemy radar and electronic tracking systems. Defensive countermeasure flares (not like those used for light) are pellets of teflon and magnesium designed to burn for about 4 seconds after ejection from an aircraft. Flares "trick" heat seeking missiles by providing an alternative heat source to the targeted aircraft.

The Pecos/Taiban and Bronco MOAs and associated ATCAAs represent neither primary nor secondary airspace for RBTI, and VR-100/125 represents secondary airspace under RBTI alternatives.

Proposed chaff use on VR-100/125 would not increase the number of sortie-operations above that analyzed under RBTI Alternative D. Chaff use would not alter the altitudes used by aircraft in VR-100/125. For these reasons, no additive or cumulative effects would result from the interaction of the proposal and RBTI; environmental conditions in VR-100/125 would not differ from those associated with RBTI Alternative D alone.

German Air Force (GAF) Aircraft Operations, Holloman AFB, New Mexico

The GAF has been conducting sortie-operations within airspace in the RBTI study area since 1992. In 1997, the Air Force proposed to establish a new MTR (IR-102/141) that would support the GAF need for low-altitude training. An Environmental Assessment (USAF 1997a) was completed in June 1997 for this new MTR, along with altitude and boundary expansion of the existing Talon MOA and establishment of an air refueling route. In 1999, the Air Force rescinded its decision to establish the low-altitude route; however, the Talon MOA and air refueling route proposals have proceeded.

Although the proposal to establish a low-altitude route was withdrawn, the need for GAF Tornados to conduct low-altitude training on an MTR may still exist. To meet this training need, the Air Force may, at some time, present a new MTR proposal that could include alternatives consisting of new routes, existing routes, or modifications to the original IR-102/141 proposal. The Air Force would prepare appropriate NEPA documentation for any proposal of this nature.

If one or more alternative MTRs fall within the RBTI study and interact with RBTI primary airspace, the potential for cumulative effects would exist. At this time, no proposal has been advanced and no specific MTRs are being considered, so assessment of potential cumulative effects under RBTI would be highly speculative and unwarranted. Should the Air Force at some time in the future consider a proposal for an MTR to support GAF training, the NEPA documentation related to that action will evaluate the cumulative effects (if any) between the MTR proposal and RBTI.

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA requires that environmental analysis include identification of "…any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects this use could have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural resource).

For the RBTI action alternatives (Alternatives B, C, and D), most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary, or longer lasting, but negligible. Those limited resources that may involve a possible irreversible or irretrievable commitment are discussed below.

Implementing an RBTI alternative would require fuels used by aircraft and surface vehicles. The flight activities would result in fuel use for as long as the program continued. Flight activities and surface vehicles supporting aircraft maintenance and operations would use similar amounts of fuels, oils, and lubricants as at present.

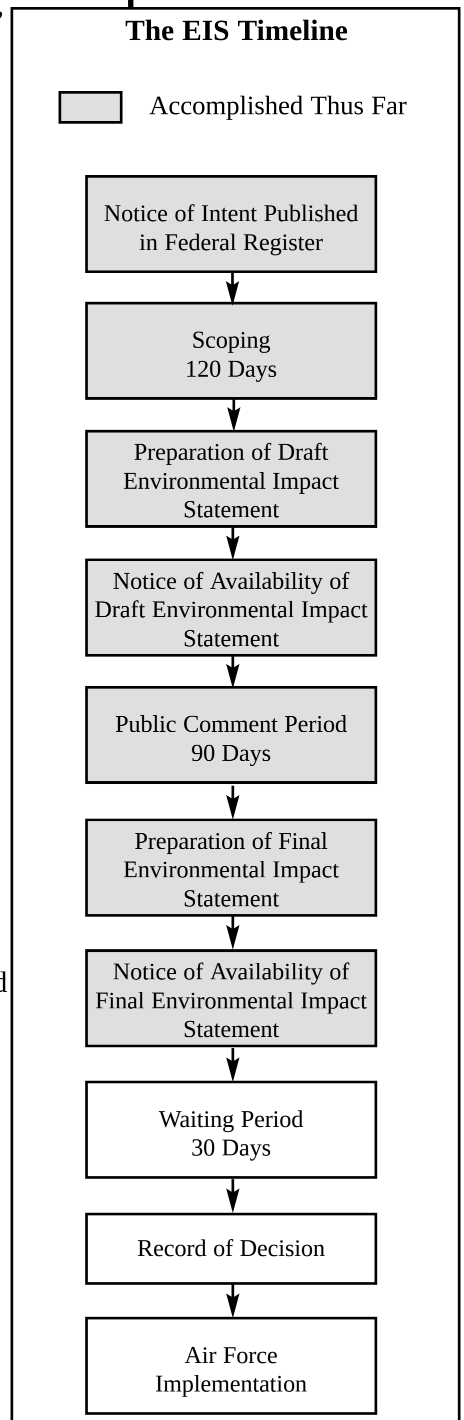
Personal vehicles used by the additional personnel proposed to support the action would consume fuel, oil, and lubricants. The amount of these materials used would not likely exceed that currently used by these same individuals and their families. As such, the proposed action would not increase consumption of these resources. In addition, quantities of steel and other materials used in construction would be committed under the proposed action. The increase in the use of these materials would be minimal.

CHAPTER 6

PUBLIC INVOLVEMENT

CHAPTER 6
PUBLIC INVOLVEMENT PROCESS

The Air Force's environmental impact analysis process (AFI 32-7061) outlines the necessary requirements for public involvement as well as agency and government-to-government consultation when preparing an EIS. For RBTI, public involvement, agency consultation, and government-to-government relations have been conducted in accordance with AFI 32-7061, NEPA and its associated CEQ regulations, and other applicable laws and regulations.



PUBLIC INVOLVEMENT

AFI 32-7061 and CEQ regulations require an early and open process for identifying significant issues related to a proposed action and obtaining input from the public prior to making a decision that could significantly affect the environment. These regulations specify public involvement at various times during the development of an EIS. The public involvement process followed by the Air Force for RBTI has included:

- Community meetings prior to issuing a Notice of Intent (NOI) to prepare the RBTI EIS;
- Scoping comment period and meetings;
- Intergovernmental/ Interagency Coordination of Environmental Planning (IICEP) and agency consultation;
- Newsletters;
- Additional attendance at public meetings following the official scoping period; and
- Public comment period and hearings.

Community Meetings. Efforts for early public involvement began in December 1997, prior to issuance of the NOI to prepare the RBTI EIS. These efforts consisted of six informal community meetings in Texas and New Mexico. Representatives from Dyess and Barksdale AFBs met with community members in Texas (Monahans, Crane, and Ft. Davis) and New Mexico (Roy, Santa Rosa, and Santa Fe) to gain input on the RBTI alternative identification process. These meetings were announced, in advance, in local newspapers and through other media sources. At the meetings, the Air Force described the ideas behind RBTI and then discussed them with the attendees. Input from these community meetings helped shape the RBTI proposal and alternatives.

Scoping Comment Period and Meetings. Official notification of the Air Force RBTI proposal began with publication of the NOI on December 19, 1997, in the Federal Register. This started the scoping period during which the Air Force solicited comments from the public, interest groups, and agencies to help define the scope of analysis for the EIS and to aid in identification of additional alternatives. Press releases announcing the NOI publication were sent that same day to 50 newspapers covering the potentially affected areas in Texas, New Mexico, Arkansas, and Colorado.

In the week that followed, approximately 100 letters were sent to local, state, and federal government agencies and organizations outlining the Air Force proposal and announcing scoping meetings. This notification was performed as part of IICEP (described below). Then, during the first week of January 1998, another set of press releases was faxed to the same 50 newspapers to announce the locations and schedule for scoping meetings. Advertisements were also placed in local newspapers a week before the meetings. They included in Texas, Alpine Avalanche, Pecos Enterprise, Snyder Daily News, The Big Lake Wildcat, and The Van Horn Advocate; in New Mexico, Quay County Sun (Tucumcari), The Taos News, Union County Leader (Clayton), and Harding County Leader (Roy); in Arkansas, Boone County Headlight (Harrison); and in Colorado, La Junta Tribune-Democrat. The press releases and notices described the proposal and alternatives. They also provided the time, dates, and locations of the meetings.

In late January and early February 1998, scoping meetings were held in the following communities:

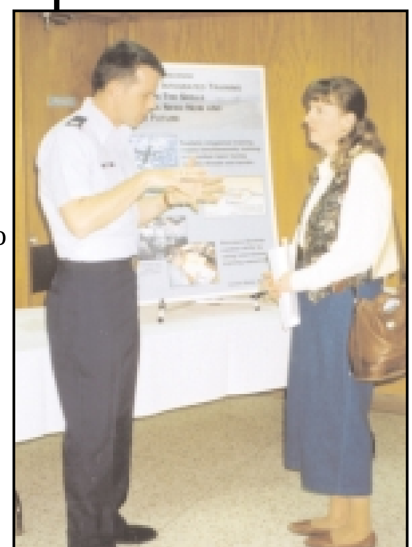
- New Mexico: Clayton, Roy, Tucumcari, and Taos
- Texas: Snyder, Pecos, Van Horn, Alpine, and Big Lake

Meetings were also held in Harrison, Arkansas, and La Junta, Colorado, due to the proposed decommissioning of Air Force Electronic Scoring Site facilities at both locations. The official scoping comment period continued from the NOI publication (December 19, 1997) until February 17, 1998. However, this period was extended to April 3, 1998, in response to public interest. About 530 people attended these 11 scoping meetings and almost 250 provided comments. In addition, the public and agencies submitted about 300 comment letters during the scoping period. All comments and letters were reviewed and used to help develop the scope of analysis for the draft EIS (refer to section 2.5).

IICEP and Agency Consultation. IICEP is a federally mandated process for informing and coordinating with other governmental agencies regarding proposed actions. Both NEPA and CEQ regulations require intergovernmental notification prior to making any detailed statement of environmental impacts. Through the IICEP process, concerned federal, state, and local agencies must be notified and allowed sufficient time to evaluate potential environmental impacts of a proposed action. In total, over 100 IICEP letters were sent to agencies and officials including (but not limited to) the FWS, Texas Parks and Wildlife Department, New Mexico Game and Fish, Governors' offices, as well as the State Historic Preservation Officers (SHPOs) in Texas, New Mexico, Colorado, and Arkansas. The FAA, although a cooperating agency for the RBTI EIS, was also included in the IICEP letter distribution. In addition, elected officials from New Mexico, Texas, Colorado, Arkansas, and Louisiana were notified of the proposal. Comments from these agencies and officials were reviewed for incorporation into the environmental analysis.

The IICEP process, which began in January 1998, also offered the Air Force the opportunity to seek data on resources under the jurisdiction of the agency or organization, and to gather information on issues with the RBTI proposal. In particular, the SHPOs from New Mexico and Texas, as well as the regional offices of the FWS, provided important data used in the EIS analysis. Meetings with several agencies have been conducted, including those with the FWS as part of consultation for Section 7 of the Endangered Species Act (refer to section 4.3 for further discussion of this consultation).

Newsletters. To provide additional information on the proposal and the environmental impact analysis process, the Air Force has, to date, sent out three newsletters to interested members of the public and agencies. Newsletter One was mailed to those agencies and individuals that had received IICEP letters. Sent two weeks prior to the scoping meetings, this newsletter described the proposal and alternatives, provided maps illustrating project elements, solicited public comments, and identified an Air Force point-of-contact for those wishing to gather more information. Newsletter Two, sent out following completion of the scoping period, was distributed to all those who received Newsletter One as well as to people who attended scoping meetings or submitted scoping comment letters. This newsletter, sent to over 900 individuals or agencies, described the results of scoping and previewed the next steps in the environmental impact analysis process. Newsletter Three announced the public comment period and the times and locations for public hearings. This newsletter was sent out prior to public distribution of the draft EIS to over 1,000 recipients.



Post-Scoping Public Meetings. Further public involvement came in April 1998 (following the formal scoping period), when Air Force representatives were invited to participate in two meetings held in Taos and Angel Fire by New Mexico Senators Domenici and Bingaman. As invited speakers, the Air Force presented the RBTI proposal. After the presentation, interest groups and the public had the opportunity to present their views and comments. While not part of the formal scoping process, the Air Force considered the comments raised at these meetings in the preparation of the draft EIS. Over 370 people attended in Taos and about 180 in Angel Fire; approximately 50 commentors spoke at each location.

Public Comment Period. The public comment period provided opportunities for government agencies, interest groups, and the public to express concerns regarding analyses conducted for the draft EIS. The official public comment period began with the publication of the Notice of Availability (NOA) on March 19, 1999, in the Federal Register. Over 900 copies of the draft EIS were sent out for public and agency review, including copies to approximately 50 public libraries. In addition, an electronic copy of the draft EIS and appendices was available via the Air Force web site. A six-page newsletter summarizing the proposal and alternatives and soliciting public comments was also distributed to over 900 individuals.

To further inform the public of the draft EIS availability, press releases were sent to approximately 50 newspapers in Texas, New Mexico, Arkansas, and Colorado. All press releases, newspaper advertisements, and newsletters invited the public to express their concerns. In response to the public, a 45-day extension was granted; therefore, the official comment period ended on June 16, 1999.

During the 90-day comment period, public hearings were conducted in communities potentially affected by the proposed action. Fifteen meetings were held in 11 locations in New Mexico (Roy, Angel Fire, Dulce, and Taos), Texas (Abilene, Snyder, Pecos, Alpine, and Big Lake), Harrison, Arkansas and La Junta, Colorado. Meetings in Arkansas and Colorado were held due to the proposed closure of the Air Force Electronic Scoring Site facilities. To ensure proper public notification of the public hearings, notices were placed, at least one week prior to the meetings, in 14 local newspapers advertising the time, dates and location of the meetings. During the hearing meetings, the public was given three means for comment: verbal testimony, written comment sheets, and computerized comment forms.

The public hearings were divided into three sessions. The first session was an "open house" format where displays were presented and Air Force personnel were available for individual questions. The second session was a formal presentation of the proposal and alternatives by the Air Force. The third session allowed the public to provide verbal comments on the draft EIS. The verbal testimony was presided over by a judge and everyone was allowed a three-minute chance to speak. If time allowed, speakers were allowed additional time to testify. A court reporter recorded all testimony verbatim. The total attendance for all meetings was 1,576 people, with 387 oral and 246 written comments received. In addition, over 1,110 letters were received.

While RBTI public participation opportunities were designed to meet the requirements of NEPA, it was the Air Force's intent to provide the highest level-of-effort and go beyond these basic requirements. The goal was to provide everyone interested in RBTI an ample opportunity to review the information, ask questions, discuss concerns, and provide comments.

Government-to-Government Consultation

Several laws and regulations require federal agencies to notify or consult with Native American groups or otherwise consider their interests when planning and implementing federal undertakings. In particular, the *Memorandum on Government-to-Government Relations with Native American Tribal Governments, Executive Order 13084*, and *DoD Policy on Indian and Native Alaskan Consultation* specifies the commitment to develop more effective day-to-day working relationships with sovereign tribal governments. As part of Government-to-Government Consultation for RBTI, 32 tribes and/or tribal-affiliated organizations that historically resided in the affected area were notified. At their request, ongoing discussions and consultations have continued throughout the NEPA process with the Jicarilla Apache Tribe and the Taos Pueblo in New Mexico.

CHAPTER 7

REFERENCES AND PERSONS AND AGENCIES CONTACTED

CHAPTER 7
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CHAPTER 8

LIST OF PREPARERS

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CHAPTER 9

GLOSSARY

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GLOSSARY

Above Ground Level (AGL). The altitude expressed in feet measured above the ground's surface.

Aerial Refueling (AR). The act of receiving fuel efficiently and safely while in flight. Refueling operations are performed in designated aerial refueling tracks or FAA approved airspace.

Aerospace Power. The projection of military force by or from aircraft operating above the earth's surface.

Air Combat Command (ACC). The Air Force Command that operates combat aircraft assigned to bases within the contiguous 48 states, except those assigned to the Air National Guard and the Air Force Reserve Command.

Aircrew. The military personnel whose primary duty is to fly the unit's aircraft. Aircrews must work as an integrated team, with each person performing his or her particular skill as part of a combat team. B-1 aircrews consist of four individuals: the pilot (aircraft commander), copilot, offensive systems officer, and defensive systems officer. B-52 aircrews consist of five individuals: the pilot (aircraft commander), copilot, radar navigator, navigator, and electronic warfare officer.

> *Pilot.* The aircraft commander is responsible for the aircraft and crew. The pilot is primarily responsible for maneuvering the aircraft, avoiding terrain, responding to calls by the defensive system officer and electronic warfare officer, and visual acquisition of threats. The successful accomplishment of the mission is of major importance.
>
> *Copilot.* Assists the pilot in proper flight of the aircraft and shares the responsibilities for the safe, successful completion of the mission. During all critical phases of flight, the copilot monitors aircraft configuration, flight and engine instruments, and terrain clearance to ensure immediate recognition of potentially dangerous conditions. The copilot visually searches for threats as well as supporting the defensive systems officer or electronic warfare officer. More importantly, the copilot is the person integrating offensive and defensive inputs as well as aircraft systems and visual cues. The copilot maintains the situational awareness for the aircrew.
>
> *Offensive Systems Officer (OSO).* Operates and manages the B-1's Offensive Avionics Systems and is directly responsible for all navigation and ordnance delivery. The offensive systems officer also coordinates routing for optimum terrain masking and concentrates on safely accomplishing defensive maneuvers.
>
> *Defensive Systems Officer (DSO).* Operates and manages the defensive avionics to provide electronic and physical defense against ground-based or airborne radar and missile systems that pose a threat to the B-1. The defensive systems officer's primary role is defending the aircraft. The defensive systems officer is responsible for not only management of the defensive systems, but integration of defensive aspects of other aircrew members' duties.

Radar Navigator (RN). This navigator is directly responsible for B-52 ordnance delivery and shares navigational responsibilities with the navigator.

Navigator. Primarily responsible for B-52 navigation from take-off to landing; the navigator shares ordnance delivery responsibilities with the radar navigator. The navigator coordinates routing for optimum terrain masking and avoidance. In case of avionics failures, the navigator is responsible for alternate forms of navigation.

Electronic Warfare Officer (EWO). Operates and manages the B-52 defensive avionics to provide threat detection and countermeasures against all ground and airborne threats.

Air Intercept Training. Air intercept training generally consists of multiple aircraft engaged in air-to-air training. The “friendly” aircraft use visual and electronic techniques to locate and intercept “enemy” aircraft.

Air-to-Air Defensive Maneuvering. These maneuvers are designed to counter attacks by enemy fighter aircraft and consist of air combat maneuvers, basic fighter maneuvers, defensive maneuvers, and dissimilar air combat training.

Air-to-Air Training. Air-to-air training prepares aircrews to achieve and maintain air superiority over the battlefield and defeat enemy aircraft. Air-to-air training often includes some aircraft playing the role of adversaries, or enemy forces. Air-to-air training activities include advanced handling characteristics, air combat training, low-altitude air-to-air training, and air intercept training. This training also requires the use of defensive countermeasures.

Air-to-Ground Training. Air-to-ground training employs all the techniques and maneuvers associated with weapons use and includes low- and high-altitude tactics, navigation, formation flying, target acquisition, and defensive reaction. Training activities include surface attack tactics, different modes of weapons delivery, electronic combat training, and the use of defensive countermeasures.

Air Support of Ground Forces. Air operations supporting ground forces.

Air Traffic Control (ATC). The system used to safely direct aircraft in flight, using controllers from both the FAA and the military.

Air Traffic Control Assigned Airspace (ATCAA). Airspace of defined vertical and lateral limits, assigned by ATC, for the purpose of providing air traffic separation between the specified activities being conducted within the assigned airspace and other instrument flight rules air traffic.

Alternate Exit. Segment of a military training route that permits aircrews to exit without flying to the primary exit point. This procedure optimizes training by allowing aircraft to leave the military training route at a point that best fits the desired training profile.

Anti-Aircraft-Artillery (AAA). Guns used by air defense forces against aircraft.

Average Sortie Duration (ASD). A Bomb Wing’s total number of flying hours divided by the number of sorties that must be flown.

Combat Maneuvering. Training designed to achieve proficiency in formation maneuvering and the coordinated application of skills to achieve desired mission results or effectively defend against one or more aircraft or threat systems.

Contingency Operations. An emergency involving military forces caused by natural disasters, terrorists, subversives, or by other military operations.

Conventional Weapons Delivery Training. Training that involves practice ordnance deliveries in a structured, repetitive learning environment. Aircrews fly predetermined flight tracks against visible targets and receive feedback from an on-site range control officer.

Council on Environmental Quality (CEQ). An Executive Office of the President composed of three members appointed by the President, subject to approval by the Senate. Members are to be conscious of and responsive to the scientific, economic, social, esthetic, and cultural needs of the nation; and to formulate and recommend national policies to promote the improvement of the quality of the environment.

Defensive Countermeasures. Coordination of maneuvers and use of aircraft defensive systems designed to negate enemy threats. Those maneuvers (which include climbing, descending, and turning) requiring sufficient airspace to avoid being targeted by threat systems. Aircraft use sophisticated electronic equipment to jam air and ground radar-tracking systems.

Defensive Maneuvers. Maneuvers designed to negate the attack or ordnance of an adversary, either surface-based or airborne.

Electronic Combat. Electronic combat training requires aircrews to interpret radar warning receiver displays, activate electronic countermeasure equipment, and perform evasive maneuvering. This training also includes recognition of the effects of jamming in aircraft systems as well as operating and employing effective electronic counter-countermeasures. Electronic emitters provide the signals that aircrews require for electronic combat training. Electronic combat training is conducted on military training routes, military operation areas, and restricted airspace at a variety of altitudes.

Electronic Countermeasures (ECM). The electronic response to enemy threat radar and associated weapons. Most military aircraft are equipped with sophisticated equipment that can jam or otherwise negate the enemy’s equipment that is designed to destroy friendly aircraft.

Electronic Combat Range (ECR). An ECR is a training range that provides capabilities for simulating enemy radar signals. The type of equipment, the ability to simulate a variety of electronic threats, and the flexibility provided varies depending upon the mission of the host unit.

Electronic Scoring Site. The real estate, equipment, and personnel that provide simulation of enemy threat radar and scoring capability for training bomber aircrews. The equipment is specifically designed to provide the realism and flexibility required for integrated aircrew training when the equipment is located in conjunction with other training assets.

Electronic Scoring Site (ESS) System. Electronic emitters that simulate threats, when combined with an Electronic Scoring Site, provide an opportunity for aircrews to conduct realistic training. Arrays of emitters linked with Electronic Scoring Sites and appropriate airspace assets and ground conditions form an ESS system.

Emitter. An electronic device that simulates enemy radar threats used to train aircrews to defend themselves and their aircraft from destruction by enemy air defense forces.

Emitter Site. The piece of land (for RBTI, 15 acres) where an emitter is located.

Environmental Justice. As defined in Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, review must be made as to whether an action disproportionately impacts minority and/or low-income populations.

Formation Training. Two or more aircraft which operate as a single aircraft with regard to navigation and position reporting.

Geographic Information System (GIS). A geographic information system is a computer system that compiles, analyzes, and models information relevant to proposals that require environmental analysis. It is also a tool that assists decision-making by providing a visual depiction of complex data, customized for the situation and circumstances associated with the decision.

Inert Ordnance. Ordnance without the explosive or incendiary material that is found in live ordnance. This inert (non-explosive) ordnance is used by training aircrews authorized to verify that aircraft systems are functioning properly, without the use of live ordnance. Inert ordnance is only used at authorized air-to-ground training ranges.

Instrument Flight Rules (IFR). A standard set of rules that all pilots, both civilian and military, must follow when operating under flight conditions that are more stringent than visual flight rules. These conditions include operating an aircraft in clouds, operating above certain altitudes prescribed by FAA regulations, and operating in some locations like major civilian airports. Air traffic control agencies ensure separation of all aircraft operating under IFR. See Visual Flight Rules.

Instrument Routes (IR). Routes used by military aircraft for conducting low-altitude, high-speed navigation, and tactical training under both Instrument and Visual Flight Rules.

Integrated Aircrew Training. Integrated aircrew training is achieved when all members of an aircrew conduct combat training including the simultaneous accomplishment of weapons employment and defensive actions in reaction to realistic air-to-air or surface-to-air threats.

Interdiction. Interdiction missions are conducted to destroy, disrupt, or delay enemy military potential before this potential can be used against friendly forces. Interdiction is intended to affect the enemy's ability to sustain combat operations by attacking targets like: mass transportation systems, troop staging/concentration points, communications systems, industrial facilities, and material stockpiles. These targets are generally located inside enemy territory, beyond the range of most fighter-bomber assets.

Jet Routes. A route designed to serve aircraft operations from 18,000 feet MSL up to 45,000 feet MSL.

Low-Altitude Navigation. This type of navigation is an activity that aircrews use to find their way to and from a target while flying at low altitudes. Aircrews develop these skills on military training routes and in military operations areas.

Low-Altitude Operations. These operations ensure proficiency in low-altitude navigation, electronic combat training, and low-altitude maneuvering. Low-altitude operations include navigation, formation flying, development of situational awareness of aircrews, and aircraft handling performance characteristics. Low-altitude operations are conducted on military training routes and in military operations areas at or below 5,000 feet AGL.

Maritime Operations. Maritime operations are conducted against enemy naval forces, primarily in international and enemy territorial waters. The primary objective is to hinder or destroy enemy naval forces before they can be employed against friendly forces.

Mean Sea Level (MSL). Altitude expressed in feet measured above average sea level.

Military Operations Area (MOA). Airspace below 18,000 feet MSL established to separate military activities from Instrument Flight Rule traffic and to identify to the pilots of Visual Flight Rule traffic where these activities are conducted.

Military Training Route (MTR). A military training route is a corridor of airspace with defined vertical and lateral dimensions established for conducting military flight training at airspeeds in excess of 250 nm per hour.

Multiple Threat Emitter System (MUTES). Equipment used to mimic over 100 enemy signals located at the electronic scoring sites.

Nautical Mile (nm). Equal to 1.14 statute miles.

No-Drop Ordnance Delivery. This type of delivery allows aircrews to simulate the normal operations of all weapons delivery operations without actually dropping any ordnance. This includes all normal display indications and functions associated with a release.

Nuclear Strategic Attack. Strategic attacks carried out using nuclear weapons as directed by the National Command Authority.

Offensive Counter Air (OCA). Offensive counter air is conducted in the enemy's airspace to attain and maintain air superiority by destroying, neutralizing, or disrupting enemy air power capabilities. The objective is to destroy targets such as aircraft on the ground; air defense facilities; command, control, and communication facilities; airfields and supporting facilities; munitions storage sites; and petroleum, oil, and lubricant storage sites. These targets can significantly impact the enemy's ability to influence the air war.

Offensive Maneuvering. Maneuvers performed by an aircraft to negate the enemy threat.

Ordnance. Any item carried by an aircraft for dropping or firing, including but not limited to, live or inert bombs, ammunition, air-to-air missiles, chaff, and flares. All ordnance delivery associated with RBTI would be electronically simulated.

Re-Entry Route. A re-entry route is an MTR segment designed to re-establish aircraft on a specific route segment for repeating training events, (i.e., multiple passes at an electronic scoring site).

Scoring Site. See Electronic Scoring Site.

See and Avoid. When weather conditions permit, pilots operating under instrument and visual flight routes are required to observe and maneuver to avoid other aircraft.
Surface-to-Air Missile (SAM). A surface-to-air missile is launched from the ground and is designed to destroy aircraft. These missiles can be guided by ground-based radar, visual equipment, or heat-seeking sensors. Aircrews prevent their aircraft from being destroyed by performing defensive countermeasures.

Sortie. A sortie is a single flight, by one aircraft, from takeoff to landing.

Sortie-Operation. The use of one airspace unit (military operations area, military training route, aerial refueling, or restricted area) by one aircraft. The number of sortie-operations is used to quantify the number of uses by aircraft and to accurately measure potential impacts; e.g., noise, air quality, and safety impacts. A sortie-operation is not a measure of how long an aircraft uses an airspace unit, nor does it indicate the number of aircraft in an airspace unit during a given period; it is a measurement of the number of times a single aircraft uses a particular airspace unit.

Special Use Land Management Areas (SULMA). Land areas, designated by federal or state governments, requiring consideration for protection of the values associated with the land.

Strike Package. A strike package is a group of aircraft working together to accomplish an attack intended to inflict damage, seize, or destroy an objective. This package could involve differing types of aircraft.

Suppression of Enemy Air Defenses. This operation is conducted to neutralize, destroy, or temporarily degrade enemy air defensive systems in a specific area by physical attack, deception, and/or electronic warfare.

Tactics. Maneuvers and/or actions designed to effectively defeat enemy threats and deliver ordnance.

Tactical Ordnance Delivery. Tactical ordnance delivery involves using various patterns and techniques to minimize flight path predictability while allowing sufficient time for accurate ordnance delivery. Tactical ranges provide a greater array of targets, configured and spaced to simulate conditions like those expected in combat. Aircrews must acquire the target and accurately deliver ordnance while simultaneously avoiding detection and targeting by air defenses.

Terminal Airspace. A general term used to describe the airspace near a commercial airport, in which approach control service or airport traffic control service is provided.

Terrain Avoidance. The use of B-52 aircraft radar and visual cues to fly a consistent clearance above the terrain at very low altitudes. Successful terrain avoidance will utilize terrain masking and minimize aircraft exposure to enemy threats when flying over mountainous terrain.

Terrain Following. Aircrews use an electronic system to maintain the lowest possible altitude above the ground while following a straight flight path. The system maintains a relative constant altitude above the ground by climbing and descending over terrain features. Navigation is easier, but the aircraft may be exposed to threats when climbing over high terrain. Aircrews plan their flight route to minimize the degree and length of this exposure.

Terrain Masking. Terrain masking blocks visual and electronic detection of the aircraft. The best way is to fly with terrain, such as a mountain or ridgeline, between the aircraft and the threat. To destroy an aircraft with a surface-to-air weapon, a threat system operator must be able to see it, either visually or electronically.
Terrain Variability. Terrain variability is a combination of slope differences and elevation differences. The greater the slope and the higher the elevation, the more terrain variability is found. Or in other words variable terrain has peaks and troughs so that aircraft can fly up and down or around the terrain. Aircraft use this variability to practice terrain avoidance and terrain following maneuvers.

Transient Aircraft. For RBTI, all other military aircraft, other than B-1s stationed at Dyess AFB or B-52s stationed at Barksdale AFB.

Visual Flight Rules (VFR). A standard set of rules that all pilots, both civilian and military, must follow when not operating under Instrument Flight Rules. These rules require that pilots remain clear of clouds and avoid other aircraft. See Instrument Flight Rules.

Visual Routes (VR). Routes used by military aircraft for conducting low-altitude, high speed navigation, and tactical training. These routes are flown under Visual Flight Rules.

Weapons System Officer (WSO). A dual qualified aircrew member that is trained as both an offensive systems officer and defensive systems officer.

CHAPTER 10

LIST OF REPOSITORIES

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RBTI FINAL ENVIRONMENTAL IMPACT STATEMENT REPOSITORIES

Library	*Address*	*City*	*State*	*Zip Code*
New Mexico				
Zimmerman Library	University of New Mexico	Albuquerque	NM	87131
Angel Fire Library	P.O. Box 298	Angel Fire	NM	87710
Cannon AFB Public Affairs Office	100 S. DL Ingram Blvd.	Cannon AFB	NM	88103
Carlsbad Municipal Library	101 S. Halagueno St.	Carlsbad	NM	88220
Eleanor Daggett Library	299 4th	Chama	NM	87520
New Mexico State Library	356 E. 9th St.	Cimarron	NM	87714
Clayton Public Library	17 Chestnut St.	Clayton	NM	88415
Clovis-Carver Library	701 N Main St	Clovis	NM	88101
Jicarilla Apache Reservation Library	Jicarilla Apache Reservation	Dulce	NM	87528
Fort Sumner Public Library	300 E. Sumner Ave.	Ft. Sumner	NM	88119
Las Vegas Carnegie Library	500 National Ave	Las Vegas	NM	87701
David Cargo Public Library	Main St.	Mora	NM	87732
Portales Public Library	218 S. Ave. B	Portales	NM	88130
Raton City Library	244 E. Cook Ave	Raton	NM	87740
Santa Fe Public Library	145 Washington	Santa Fe	NM	87501
Springer Library	600 Colbert Ave	Springer	NM	87747
Taos Public Library	402 Camino De La Placita	Taos	NM	87571
New Mexico State Library	105 W. Main St.	Tucumcari	NM	88401
Texas				
Abilene Public Library	202 Cedar St.	Abilene	TX	79601
Alpine Public Library	203 N. 7th St.	Alpine	TX	79830
Amarillo Public Library	P.O. Box 2171	Amarillo	TX	79189
Stonewall County Library	P.O. Box H	Aspermont	TX	79502
Reagan County	County Courthouse	Big Lake	TX	76932
Howard County	312 Scurry St.	Big Spring	TX	79720
Crane County Library	701 S. Alford St.	Crane	TX	79731
Dallam County Library	420 Denrock Ave.	Dalhart	TX	79022
Dyess AFB Public Affairs Office	466 5th St.	Dyess AFB	TX	79607
Jeff Davis County Library	Court and Main Streets	Ft. Davis	TX	79734
Ft. Stockton Public Library	400 N. Water	Ft. Stockton	TX	79735
Kent County Library	P.O. Box 28	Jayton	TX	79528
Winkler County Library	307 South Poplar	Kermit	TX	79745
Dawson County Public Library	P.O. Box 1264	Lamesa	TX	79331
Lubbock Library	1306 9th St.	Lubbock	TX	79401
Marfa City Municipal Library	P.O. Drawer U	Marfa	TX	79845
Irion County Library	P.O. Box 766	Merzton	TX	76941
Ward County Library	409 S. Dwight St.	Monahans	TX	79756
Ector County Library	321 W. 5th St.	Odessa	TX	79761
Reeves County Library	505 S. Park St.	Pecos	TX	79772
Post Public Library	105 East Main Street	Post	TX	79356
City of Presidio Library	P.O. Box K	Presidio	TX	79845
Rankin Public Library	P.O. Box 6	Rankin	TX	79778
Rotan Public Library	404 E. Snyder Ave.	Rotan	TX	79546
Tom Green County System	113 W. Beauregard Ave.	San Angelo	TX	76903
Sierra Blanca Public Library	Sierra Blanca	Sierra Blanca	TX	79851
Scurry County Public	1916 23rd St.	Snyder	TX	79549
Sterling County Public	P.O. Box 1130	Sterling City	TX	76951
City-County Library	Box 1018	Tahoka	TX	79373
Van Horn Library	P.O. Box 129	Van Horn	TX	79855
Arkansas, Colorado, Louisiana				
North Arkansas Regional Library	3749 Antique Ct.	Harrison	AR	72601
Woodruff Memorial Library	522 Colorado Ave.	La Junta	CO	81050
Barksdale AFB Public Affairs Office	841 Fairchild Ave. Ste.103	Barksdale AFB	LA	71110

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