TC 25 -1

TRAINING LAND

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HEADQUARTERS, DEPARTMENT OF THE ARMY

Training Circular 25-1

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TRAINING LAND

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PREFACE

This training circular builds on the lessons learned since publication of the last edition. It provides the following information:

- How to obtain automated data on available training land.
- A method for calculating training land requirements using validated criteria.
- The planning and environmental factors to follow in developing land acquisition and use programs and projects.

It is a primary source of guidance for installation and major command (MACOM) land development and exercise planning. The circular also provides guidance for assessing training land and for developing consistent, supportable land acquisition proposals. It is a working guide for installation training and mobilization planners, engineers, and land acquisition project review boards at all levels of the active Army, Army National Guard, and Army Reserve.

Training land requirements for light infantry divisions are based on the requirements of the light infantry battalion (LIB). The training land requirements in Appendix A, Table A-2, were derived from a study scenario (Panther) with the LIB employed on a low-intensity-conflict battlefield; in particular, a counterinsurgency operation. There is no validated LIB scenario for a mid- to high-intensity conflict. Because this model is scenario-specific and terrain-peculiar, its utility in defining light infantry training land requirements for acquisition is limited. The primary utility of these requirements is in planning for light infantry unit training in similar scenarios. Headquarters, Department of the Army will publish implementing instructions for light infantry missions approved as bases for land acquisition actions. The heavy division requirements have a solid doctrinal base and have been validated over time at the Combat Training Centers. The heavy division requirements are in Appendix A, Table A-1.

The proponent for this publication is the US Army Combined Arms Command, Fort Leavenworth, Kansas. Submit comments and recommendations on DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to Commander, US Army Combined Arms Command - Training, ATTN: ATZL-CTT, Fort Leavenworth, Kansas 66027.

Unless this publication states otherwise, masculine nouns and pronouns refer to men and women.

The Army has initiated the combined arms training strategy (CATS) to assure a force training system that provides the best opportunity to train the force to standard. Training resources required by CATS proponent strategies, such as training land, will be managed through the CATS Training Resource Master and Modernization Plans. TC 25-1 may well become the baseline for the Range and Maneuver Area Master and Modernization Plan. Complete integration of CATS will be included in the next version of this training circular.

INTRODUCTION

The basic mission of the US Army is to fight and win in combat. The training of soldiers, leaders, and units is the vital ingredient that assures the readiness of the force to accomplish this mission. Training must be derived from unit mission-essential task lists (METLs). To be effective, it should provide soldiers and leaders with the opportunity to practice battle-focused missions and tasks in the field. Conditions should be tough, realistic, and challenging. Recently the Army has developed combined arms training centers and a family of training ranges designed to increase individual skills and unit tactical and technical proficiency in sophisticated weapon systems and equipment. The combination of battle-focused training management, multiechelon training, training devices, simulators and simulations, and the combat training centers program makes the Army better able to meet its training and readiness challenge.

Though efforts to upgrade training land to support the modernizing force have been largely successful, there still remains much to do. The Army is developing more lethal weapons capable of delivering greater firepower over greater distances. AirLand Battle doctrine, which applies to both heavy and light forces, requires fire and maneuver to support the deep, main, and rear battles over increasingly extended frontages. Reliance on the Reserve Component increases training land requirements at home stations and mobilization bases. In an era of intense resource competition, each defense dollar spent on acquisition and use of training land must deliver the maximum return in effective training and increase the combat readiness of the force.

The challenges are great. Available training land will decrease as congressionally mandated base closures reduce land resources and relocate Army units, commands, and activities to other bases. Increasing public concern about the environment, including noise abatement and protection of endangered species and archaeological sites, has generated new legal and regulatory restrictions on training land acquisition and use. Other environmental factors such as soil erosion, wetlands and forest preservation, and land and water contamination increase the concern.

Innovative approaches using training devices, simulators, and simulations may reduce the need for additional land for construction of separate ranges, maneuver areas, and training facilities. Training land acquisition and use programs and projects require careful and deliberate planning and coordination by a team of trainers, engineers, public regulatory agencies, and natural resource managers. Each step of the land acquisition process and each major change in the use of available training land require command involvement to ensure that resource expenditures provide optimum return.

CHAPTER 1

THE NEED FOR TRAINING LAND

The whole of military activity must relate directly or indirectly to the engagement. The end for which a soldier is recruited, ...armed, and trained...is simply that he should fight at the right place and the right time.

Clausewitz

INTRODUCTION

Army Regulation 350-41 establishes the goals of Army training: to produce a force trained to mobilize, deploy, fight, and win anywhere in the world. The major portion of soldier training is conducted in units. It is here that training in basic tasks is built on to attain skills not taught in initial entry training. Training in units develops effective combined arms teams consisting of fully integrated combat, combat support, combat service support, and close air support elements. An essential ingredient in meeting the training goal is the land needed to train the AirLand Battle. The modernization of the Army's combat force that began in the early 1980s incorporated technological advances that increased the firepower available to combat units and the lethality of weapon systems. It also increased the speed, range, and mobility of land and air vehicles, which comprise the main striking force of the Army. Along with the advances in weaponry came new developments in doctrine. These developments aimed at winning the AirLand Battle and supporting tactics to maximize the effectiveness of combat power. Particularly relevant to this training circular are the spatial ramifications of maneuver, firepower, and battle area depth on the Army's current and future requirements for training land.

AIRLAND BATTLE DOCTRINE

AirLand Battle is the US Army's basic fighting doctrine. Due to the inherently three-dimensional nature of modern warfare, this doctrine reflects the dynamics of combat power and the classical principles of war applied to contemporary battlefield requirements. All ground actions above the smallest engagements will be strongly affected by supporting air operations. AirLand Battle doctrine is the Army's approach to generating and applying combat power at operational and tactical levels. This doctrine is based on securing or retaining the initiative and exercising it aggressively to accomplish the mission.

AirLand Battle doctrine requires combined arms and joint forces to extend the battlefield and, thus, hold at risk all enemy forces. It uses advanced technologies to provide –

- Synchronized reconnaissance.
- Real-time intelligence fusion.
- Fire.
- Maneuver.

While respecting the increased complexity and lethality of modern weapons, AirLand Battle doctrine also recognizes that these weapons are no better than the skill with which they are applied. Properly understood and instilled through effective training, the principles of AirLand Battle doctrine will produce the skill to match the Army's will to win.

Soldiers receive most of their training in their units. There they can best train as individuals and as members of teams under conditions approximating battle. Unit training aims at developing maximum effectiveness with combined and supporting arms in specific, mission-essential tasks. This means using standardized procedures and battle drills regularly to gain the greatest possible coordination and speed. Once basic standards have been achieved, commanders should attempt to perform the same tasks under more difficult conditions. Unit training should simulate as closely as possible the battlefield's tempo, scope, and uncertainty. Units and headquarters that will fight together in teams, task forces, or larger organizations should train together routinely. This combined training is far more effective and realistic than training individual units isolated from their routine attachments and support.

Unit readiness cannot be achieved without unit wartime mission training on adequate terrain. Rigorous training of both tactical and support units requires

enough training land to apply AirLand Battle doctrine.

HISTORICAL PERSPECTIVE

Since the Civil War, increases in the range and lethality of weaponry have significantly affected the way the Army organizes for battle and how it employs its tactical units on the battlefield. Historically, improvements in firepower have been accompanied by corresponding decreases in the number of personnel and weapon systems physically occupying frontal positions. The major trend in ground warfare has shifted away from masses of individually armed soldiers attacking or defending over a clearly defined battleground; it has moved toward a highly mobile air and ground force supported by massive firepower and capable of attacking over much wider and deeper areas. In a mid- to high-intensity conflict, the modern battlefield is extremely lethal. Participating armies can expect to incur high casualty rates in both men and material, quickly exhausting available resources. The outcome of the first battle may well determine the final outcome of the conflict itself. The key to success is to train to win that first battle.

REALISM IN TRAINING

Changes in the concept of warfare have had significant impact on both training concepts and the space required to conduct training. The initial battle has become critical to ultimate success. The Army cannot afford to rely on combat to provide the experience necessary for leaders and soldiers to master a war of movement and concentrated combat power. Leaders also need the ability to manage a three-dimensional battlefield that includes artillery, missiles, and attack and assault helicopters combined with Air Force close air support. This experience can only be gained through training in an environment and under conditions that are as similar to actual combat as possible. Maneuver units need as much space to fire and maneuver in training as they would in combat. The minimum area needed to fire weapons at optimum range and to deploy and maneuver forces over realistic distances requires significant amounts of contiguous training land. The brigade is the lowest level where all battlefield operating systems can be integrated and synchronized. Ideally, installations would have enough land to conduct brigade-level operations at their home stations. The extensive area required for training compared to the limited land available limits this type of training at many installations; therefore, maneuver training at battalion task force level becomes the minimum essential requirement. These installations must use simulation and other techniques to develop expertise in brigade and higher-level operations. Recognizing that simulation cannot fully replace experience gained in field training, brigade-level maneuver operations is a requirement for tactical combat training centers.

The battalion is the lowest echelon at which all elements of the combined arms team effectively fight together. In peacetime the battalion is the focal point for managing and supporting training for lower echelons. It is also the focus of the battle in combat. The battalion commander formulates the plan of action, organizes combat power by forming combined arms teams, and communicates with maneuver and supporting elements over wide areas to deploy them to meet the enemy's main thrust and fight the battle.

The actual battlefield area occupied by a battalion is based on a number of variables:

- The mission assigned.
- The enemy situation.
- Available troops and equipment.
- Terrain conditions.
- Visibility.
- The general nature of the conflict.

Battalion commanders must deploy their units to maneuver and survive while effectively employing weapon systems. Commanders must control a large area in which they have deployed their forces. They must anticipate enemy actions, mobilize maneuver elements, and mass firepower at the decisive time and place to block and defeat the opponent. Army Training and Evaluation Program (ARTEP) mission training plans (MTPs) define tasks, conditions, and standards that enable battalion commanders to create training environments that emulate battlefield conditions.

While the primary training emphasis is focused on the battalion level, brigade-sized units (brigades, regiments, and groups) should exercise independently or as part of the division to practice performing major tactical missions in division battles. The brigade needs sufficient terrain to realistically deploy its maneuver battalion task forces and to position brigade combat support and combat service

support elements. Enough acreage should be available to represent the modern battlefield; however, the acreage available for certain units and missions may be limited due to constraints in the use or configuration of existing training land. Training to fight the division battle may be conducted under these constraints by reducing the frontage and the number of brigades aligned along the front. Depth requirements may be reduced by decreasing the distance between maneuver brigades and their support. Or the support command can be located in an area that is not contiguous to the maneuver brigades. While not ideal for battlefield realism, these measures will allow divisions to use available terrain to exercise both maneuver brigades and support units.

CONFLICTING DEMANDS FOR SPACE

Military installations were designed and constructed to house, administer, and maintain the units assigned to them. Training needs were to be met with space for ranges, impact areas, and terrain designated for tactical maneuver training. Historically, the Army has been able to meet its needs for land to establish new installations or to create extensive training areas in times of war and other national emergencies. Today, the Army controls more than 12.6 million acres worldwide, including land in the public domain, leased land, easements, and land available through license or permit. However, less than one-half of this land is available for maneuver training. The remainder consists of –

- Cantonment areas.
- Ranges and impact areas.
- Lakes and streams.
- Historical and archaeological areas.
- Untrafficable terrain.
- Small isolated areas.

Other constraints on land use for training result from the capacity of the land to physically sustain military training. In addition, management and stewardship of Army-controlled land involves such measures as –

- Controlling erosion.
- Rehabilitating heavily used training areas.
- Protecting wildlife habitats and endangered species.
- Preventing contamination of ground water due to harmful chemicals such as lead and petroleum products entering water sources.

These and other actions are required to comply with the National Environmental Policy Act (NEPA), the Endangered Species Act, the National Historic Preservation Act, the Clean Water Act, and ARs 200-1 and 200-2, the implementing regulations for NEPA. Further constraints on land use result from the extensive safety fans that apply to direct and indirect fire weapons ranges and explosives and munitions storage. Frequently, these fans deny access to contiguous land areas when the weapons are being used. In recent years noise has become a significant constraint on land use as populated areas are built closer to previously isolated training sites. Noise sources include weapons firing, tracked vehicles, and low-flying aircraft. As training land acreage requirements increase to provide battlefield realism, conflicting demands and constraints diminish the ability of currently available land to satisfy these needs. Consequently, the Army often finds it necessary to initiate real estate acquisition actions.

LAND USE PLANNING

Resolution of conflicting demands and constraints on the use of available land requires coherent planning to provide for efficient, effective land use. The installation Directorate of Plans, Training, and Mobilization (DPTM) training staff and the Directorate of Engineering and Housing (DEH) staff of master planners, environmental coordinators, and natural and cultural resource managers must work closely together to develop land use plans. These plans must meet the needs of the training community while assuring responsible stewardship and minimal impact on surrounding civilian communities. Chapter 4 of this circular discusses resources available to installation land use planners for natural resources information. Information can be provided by natural resource managers on terrain characteristics, land conditions and trends, and on implementation of the Integrated Training Area Management (ITAM) program. Where available training land is inadequate to meet minimum training area requirements, guidelines are provided for developing a land use requirements study (LURS) to quantify training land requirements and document shortfalls or deficiencies.

ALTERNATIVE TRAINING OPTIONS

Regardless of how well the Army manages its real estate, land is a limited resource. Opportunities to

correct deficiencies in training land by acquiring new real estate are diminishing. Consequently, alternative solutions must be found to support required training. One approach that is being explored is the Army Combined Arms Training Strategy (CATS). It involves the increased use of high-technology training aids, devices, simulators, and simulations (TADSS) to help sustain maneuver proficiency. Where feasible, this approach can be applied to both weapon system proficiency training and tactical maneuver exercises.

FAMILY OF SIMULATIONS

The expanded use of simulators and simulations in institutional and unit training programs reduces the impact of constraints such as time, funding, safety, space, and environmental concerns. Development of the Army's family of simulations (FAMSIM) includes tactical laser engagement systems, battle staff simulations, and embedded training systems. An objective of large-scale simulator/simulation networking is to provide a capability to conduct simulated combined arms maneuver exercises similar to those currently conducted at combat training centers (CTCs). Large units will collectively fight in a realistic air-land combat world of networked simulators. Other technologies that offer great potential for improving training realism while reducing reliance on traditional training resources include –

- Artificial intelligence-based training simulators.
- Robotics.
- Holographic projection systems.
- Voice recognition systems.
- Interactive display screens.

MANEUVER TRAINING ALTERNATIVES

The CTC program helps fill the gap in training opportunities for maneuver battalions and brigades available at home stations. The CTCs create combined arms battlefields for intense, stressful training and for developing and testing changes in doctrine and tactics. However, CTCs are themselves limited resources. Because of schedule demands, individual units rotate to CTCs only once every 18-24 months. Consequently, the CTC experience is the culmination of training conducted at home station. Due to the time lapse between rotations to CTCs, the individual unit training focus normally peaks immediately before and after the CTC rotation and falls off during the period between rotations. Sustaining an acceptable level of maneuver proficiency requires at least minimally acceptable local resources.

In the near future many of the features of CTC training may be adapted for use in home station training programs. Examples include –

- Instrumented players.
- Position location.
- Hit/miss discrimination.
- Telemetric data transmission.
- Real-time event recording.
- Detailed after-action reviews.

Equipment may be superimposed on existing ranges or maneuver areas and used to focus training on platoon-level maneuver exercises while simultaneously evaluating crew and unit proficiency. Free-play exercises may be conducted using laser tactical engagement systems. This approach could permit 360° firing and – once precision gunnery is supported – can lessen the need for impact areas required by some of today's live-fire maneuver ranges. The use of nonpermanently installed targetry could permit the equipment to be relocated, thereby allowing land maintenance and rehabilitation programs to take place with minimum impact on training.

CHAPTER 2

TRAINING LAND UTILIZATION

INTRODUCTION

TC 25-8 describes a hierarchy of training ranges and areas that support the Army approach to soldier and collective training. The three types of training land are –

- Local training areas (LTAs).
- Major training areas (MTAs).
- Combat training centers.

Home-station training is training conducted on facilities under the installation's direct purview and usually limited by contiguous boundaries. LTA and MTA training conducted on the same piece of real estate is considered home-station training. In addition, overseas locations frequently arrange for maneuver rights areas (MRAs) with local jurisdictions and landowners providing opportunities for periodic maneuver training on land not directly controlled by the Army.

LOCAL TRAINING AREAS

Active Component (AC), Continental United States (CONUS)

Typically, home-station training for individual weapons proficiency and battalion-level unit collective training is conducted in the LTA. LTA training facilities permit familiarization, qualification, and sustainment training with minimum impact on operating tempo (OPTEMPO) resources for travel to and from the training locations. Training facilities are focused on individual through platoon weapons proficiency and battalion ARTEP maneuver requirements. LTAs provide the capability to apply lessons learned from CTC training rotations to sustain combat readiness.

AC, Outside Continental United States (OCONUS) and Reserve Component (RC)

Training land and range availability at overseas installations and communities usually precludes training on an LTA as described for the CONUS AC. RC centers, armories, and weekend training sites (WETS) typically face the same constraints. Nonetheless, these installations, communities, centers, armories, and WETS are LTAs. Training is conducted to the extent available resources will support (normally, individual and limited collective weapons proficiency and small unit maneuver training).

MAJOR TRAINING AREAS

Typically, an MTA has enough range and training land resources to support collective live-fire proficiency, combined arms live-fire exercises (CALFEX), and annual battalion ARTEP evaluations. MTAs are usually geographically separate from LTAs. They support a wide number of units (for example, CONUS – Yakima Firing Center, Washington, and Hunter-Liggett Military Installation, California; OCONUS – Grafenwoehr and Wildflecken Training Areas, Federal Republic of Germany and Pohakuloa Training Area, Hawaii). Units conducting training at MTAs concentrate on large unit collective fire (platoon through battalion) and maneuver training (battalion and brigade). An MTA allows for training which sustains lessons learned at LTAs; an MTA allows for training which cannot be tactically or doctrinally accommodated at LTAs. At some installations, the physical size of their contiguous boundaries support individual weapons proficiency and both small- and large-unit collective training simultaneously for tenant activities (for example, Fort Hood, Texas).

COMBAT TRAINING CENTERS

The Army has designated four CTCs as premier training sites for large-unit fire and maneuver training:

- National Training Center (NTC), Fort Irwin, California.
- Combat Maneuver Training Center (CMTC), Hohenfels Training Area (HTA), Federal Republic of Germany.
- Joint Readiness Training Center-Provisional (JRTC),Fort Chaffee and Little Rock Air Force Base, Arkansas.

- Battle Command Training Program (BCTP), Fort Leavenworth, Kansas.

Tactical CTCs focus on brigade task force training using a combination of live-fire ranges and maneuver training land. The Army's training goal is for every AC and round-out RC battalion to experience the rigorous, realistic training environment at the tactical CTCs once during the commander's tour. Organic to tactical CTCs are a dedicated opposing force unit, assigned observers/controllers, and state-of-the-art instrumentation not available at MTA and LTA sites. CTCs must have enough land to doctrinally accommodate fire and maneuver training with multiple scenarios over varied terrain. This allows for potential rehabilitation of the land. It precludes overfamiliarization with the terrain, which detracts from training realism.

RANGE COMPLEXES

The land required for a range complex can be most effectively used by grouping ranges so that surface danger zones (SDZs) for weapons overlap and extend toward a common center and adjoining ranges share common facilities. The most common arrangement for live-fire ranges is around a common impact area. This not only reduces the amount of land required for impact but also minimizes land contaminated by dud ammunition. Impact areas and land required to encompass SDZs may be reduced by placing target areas in front of hill masses. Ranges used for firing exercises with high-speed moving vehicles require several kilometers of depth for forward travel. Where training involves tactical movement and firing on the move, additional width is required for SDZs resulting from varying gun-to-target lines.

Further economies in land use are achieved by using range areas for both gunnery and maneuver exercises. For example, multipurpose range complexes (MPRCs) may be used for tank and Bradley Fighting Vehicle (BFV) gunnery tables. Since dud-producing ammunition is not used on MPRCs, associated impact areas are not contaminated with dud ammunition. They may be used for force-on-force maneuver training with simulation devices when the MRPC is not scheduled for live firing.

MANEUVER LAND

The most difficult problem faced by Army training planners and training complex managers is the lack of adequate land area to conduct realistic training with combined arms tactical maneuver units. Maneuver land available at the majority of Army installations has not significantly increased since the end of World War II. However, the need for maneuver acreage has increased since the late 1970s when Army doctrine changed from the Active Defense to the AirLand Battle. The increased range, speed, and firepower inherent in combat units equipped with modern weapon systems such as the AH-64 attack helicopter also influenced doctrine. In addition, the maneuverability and lethality of the weapons and the intensity of the training cause stress to the land itself to the point where it cannot continually support recurring exercises. As a result, maneuver land must be rehabilitated. Periodically ceasing training for erosion control, reseeding, and other environmental activities is required. These land maintenance activities create additional requirements for maneuver acreage to allow the land to rotate from periods of training to periods of rehabilitation. An integrated program of land management is the only means of ensuring continued land use. This program must comply with national policies developed for protection of the environment.

TRAINING LAND FOR RESERVE COMP ONENTS

Training land requirements for the Total Army include not only requirements for the AC but also for the RC. Members and units of typical RC battalions are geographically dispersed over areas 150-300 miles in radius. RC soldiers must travel an average of 40 miles to reach the nearest local training area, which might be an armory, reserve center, or ARNG camp. Units must move an average of 150 miles to the nearest MTA. The Army can expect to continue to rely heavily on the RC to help meet its global mission. Continuous political changes worldwide combined with fluctuating budget expenditures will result in major redeployments and force structure changes. The United States will continue to meet its treaty and worldwide commitments. To ensure the credibility of these commitments, the Army must be ready to rapidly deploy its forces from CONUS and project combat power worldwide. The RC represents a substantial portion of this combat power. A continued need will exist to equip RC units with the latest weapon systems. Individual and collective training will be crucial to maintaining a constant state

of readiness to deploy forces rapidly and to win in battle.

With the continuing reliance on RC forces, increased requirements for both TADSS and training space to support them must be anticipated. Some requirements may be satisfied by turning excess AC installations and training areas over to the RC. Shared use of training land by AC and RC units will also help to meet some requirements. However, new sources of land may be needed to meet heavier demands for usable space to accomplish mission training requirements.

MOBILIZATION REQUIREMENTS FOR TRAINING LAND

Mobilization is the process that brings the armed forces to a state of readiness for war or other national emergency. It includes –

- Assembling and organizing personnel, supplies, and material for active military service.
- Activating or federalizing the RC.
- Extending terms of service.
- Taking other actions to convert to a wartime posture.

Full mobilization occurs when Congress passes a public law or joint resolution declaring war or a national emergency. It involves mobilizing all units in the existing approved force structure, all individual reservists, and the material resources needed for these units. Total mobilization involves expanding the armed forces beyond the existing approved force structure as well as mobilizing all national resources, including production facilities, to round out and sustain the forces.

Installations plan mobilizations to prepare to deploy peacetime forces and to carry out assigned wartime missions. The impact of full, or total, mobilization on training land requirements depends on the assigned mission. Installations designated as mobilization stations must receive, support, and train Reserve Component units (RCUs) and prepare forces to deploy. Support and coordinating installations may have to serve as staging and embarkation ports to aid in processing and moving deploying units or to support off-post facilities involved in these activities. Installations designated as Army training centers will expand the training base. They will provide –

- Basic training.
- Advanced individual training.
- One-station unit training.
- Leadership training (Officer Candidate School or Basic Noncommissioned Officer Candidate Course).
- Other training required by the current Mobilization Army Program for individual training and Army mobilization plans.

The departure of active units and arrival of RCUs will occur as scheduled in mobilization troop basis stationing plans. The Director of Engineering and Housing normally prepares the installation master mobilization plan (MMP). The plan projects the surge, peak, and sustained personnel and unit populations that will occur during postmobilization. The MMP identifies facilities required to support assigned missions and populations and any shortfalls in existing facilities.

Training facility requirements are a major element of the MMP. The Director of Plans, Training, and Mobilization normally develops this portion of the MMP. It includes requirements for –

- Classroom and other training buildings.
- Ranges.
- Impact areas.
- Physical training.
- Bivouac.
- Maneuver training.

Mobilization requirements for training land are based on type of training, frequency of training, and projected throughput requirements. To determine if existing land meets projected requirements, planners –

- Survey existing real estate use according to AR 405-70.
- Calculate throughput requirements and capacities of existing facilities using methods described in TC 25-8.
- Determine military maneuver area acreage requirements using Appendix A of this training circular.
- Calculate capacity of natural resources to support mission objectives.
- Develop a land use requirements study to document any shortfalls or deficiencies.

Tools and techniques described in Chapter 5 will aid in calculating the vehicle-carrying capacity of natural resources. Analyses to determine requirements for

training facilities and land should consider alternative uses of existing ranges and training areas for postmobilization training as opposed to premobilization training. In some cases, upgrading existing or inactive facilities may meet these requirements. The transition period immediately following mobilization day (M-day) deserves careful attention when both active units and RCUs are on the installation. This will cause a surge in training requirements that may dictate acquiring additional training space on a short-term basis. Using other federal- or state-owned land or executing standing maneuver rights agreements and leasing arrangements may satisfy these requirements. Careful scheduling of existing facilities by the DPTM or expanding the training support work force and extending the availability of training facilities may also satisfy conflicting requirements.

The installation MMP should include a tabulation of all facilities required to conduct mobilization missions. It should include –

- A complete inventory of all existing facilities.
- The number of each type of facility or training land acreage required for mobilization.
- Any shortfalls. It should also identify specific actions required to satisfy shortfalls:
- Alternate uses of facilities.
- Upgrading or constructing new facilities.
- Temporary or permanent acquisition of new training land.

Chapter 3 of this training circular describes the process for calculating training acreage requirements and documenting shortfalls. Chapter 4 provides sources of information on training facilities and land available on Army installations. This information may aid installation planners in identifying existing resources to use to satisfy shortfalls in mobilization resources.

CHAPTER 3

TRAINING LAND REQUIREMENTS ANALYSIS

INTRODUCTION

Installation requirements for training land depend on the types of units using the land, their missions, and the type of terrain available. AR 210-21, Chapter 3, establishes procedures for acquiring real property including training land. A three-phase process for land acquisition is in Appendix E of that regulation. The process begins with a land use requirements study. A LURS quantifies training land requirements and documents shortfalls or deficiencies. If a deficiency exists, the second phase is an analysis of alternatives study (AAS). An AAS addresses all alternatives identified in the LURS. Alternatives include improving existing internal land management practices to reduce or eliminate the deficiency. Major environmental factors should be considered. If after considering all alternatives a command decision is made to acquire land, appropriate requests and justification are sent through channels to Headquarters, Department of the Army. After HQDA approval, the third phase is an environmental assessment (EA) to determine the level of environmental impact. Depending on this level, one or more types of further environmental documentation are required (see Chapter 5). The most time-consuming type is an environmental impact statement (EIS).

Appendix C of this circular contains sample formats for LURS and AASs based on AR 210-21 guidelines. AR 200-2 prescribes procedures for conducting EAs and EISs. Chapter 5 of this training circular summarizes these procedures. The primary purpose of the LURS is to determine if a deficiency in training land exists. To make this determination, the amount of training and maneuver land required for MTP training events must be computed and compared to the actual land available. This computation is made using the methodology of the Army Training Land Analysis Model.

ARMY TRAINING LAND ANALYSIS MODEL (ATLAM)

ATLAM methodology uses an acre-day approach for calculating maneuver area requirements. Appendix A of this training circular displays area requirements for MTP tasks performed by units from squad through battalion level. These requirements are expressed in kilometers squared (km2). Area requirements are multiplied by unit densities, the number of iterations of training required to maintain proficiency, and the number of days per iteration. This yields the gross km2 days required to accomplish the MTP task by all units required to perform it. Km2 days are converted to acre days, and total acreage requirements are computed using the ATLAM methodology. Examples of the calculations follow:

- MTP gross km^2 days:
  - MTP 71-2, Mechanized Infantry Company, movement to contact.
  - Density of units (per division): 20 companies (J-Series Mechanized Division).
  - Area requirements: 8 km X 2 km = 16 km^2.
  - Iterations to maintain proficiency: 2 iterations.
  - Days per iteration: 1 day.
  - Gross land required: 20 X 16 km^2 X 2 X 1 = 640 km^2 days.
- Acres required to accomplish training:
  - Total km^2 days = 640 km^2 days.
  - Annual training days required: 40 days (20 companies X 2 iterations X 1 day each).
  - Acres per 1 km^2 = 247.1 acres.
  - Acre days: 640 X 247.1 = 158,144 acre days.
  - Acres required:
    $$\frac{\text{acre days}}{\text{training days}} = \frac{158{,}144}{40} = 3954 \text{ acres}$$

The MTP area requirements combine both maximum effective weapon ranges and maneuver frontage and depth requirements. Because of this, the terrain at some installations may allow for slight reductions in maneuver acreage if rising terrain or hill masses contain projectiles fired by direct-fire weapons.

NOTE: To compute the total installation acres required to accomplish all MTP training tasks, the gross acre days for all tasks is divided by the annual training days available (rather than the number of days required to accomplish a single task as shown in the example). Annual training days are classified as baseline, moderate, or intensive. Baseline training days represent the Army's goal. Moderate training days include weekends as training days. The number of intensive training days assumes full or total mobilization under national emergency conditions. Annual training days are shown in Table 3-1.

ATLAM METHODOLOGY

ATLAM methodology consists of the 13 steps illustrated in Figure 3-1. The chart shows how the steps relate to each other. Procedures for completing the ATLAM follow:

- **Step 1.** Initiate the ATLAM.
- **Step 2.** Identify the MTP training event to be accomplished at home station that has the largest maneuver acreage requirement. Using Appendix A, determine the dimensions of the maneuver area required for that event. For example, a mechanized infantry/tank battalion task force conducting a retrograde is the largest area requirement listed in ARTEP 71-2. The area required is 12 km X 29 km = 348 km^2 or 85,991 acres.
- **Step 2a.** Determine the type and number of ranges needed to conduct individual and collective training at home station. Refer to TC 25-8 for guidelines in determining range requirements.
- **Step 3.** Compute the number of acres needed to conduct all home-station maneuver training required in the time available. Use Appendix A to determine the gross km^2 days. Convert the gross number to acre days as shown in the example above.
- **Step 3a.** Calculate the total acres needed for ranges and impact areas. Refer to TC 25-8 for the dimensions of standard Army ranges. Refer to DA Pam 385-63 for guidance on computing surface danger zones and impact areas for Army weapon systems.
- **Step 4.** Compute the number of acres that are both suitable and available for maneuver training. Acreage information may be obtained from surveys of real property conducted according to AR 405-70. Terrain models developed using the Geographic Resources Analysis Support System (GRASS), described in Chapter 5 of this training circular, may be helpful in computing available maneuver acreage. Information developed under a land condition trend analysis, also described in Chapter 5, may be helpful in computing the suitability of maneuver acreage. Multiply the available maneuver acres by the annual available maneuver training days to determine the number of maneuver acre days.
- **Step 4a.** Compute the number of acres available for ranges and impact areas.
- **Step 5.** Compare the largest maneuver event acreage requirement (Step 2) with the available maneuver acreage (Step 4).
- **Step 5a.** Compare the range and impact acreage requirements (Step 3a) with the acres available for ranges and impact areas (Step 4a).

Table 3-1. Annual training days

	Intensive	Moderate	Baseline
Start	365	365	365
Christmas/New Year		(15)	(15)
Five legal 3-day weekends		(15)	(15)
Independence Day		(1)	(1)
Thanksgiving weekend		(4)	(4)
Remaining weekends			(88)
TOTAL	365	330	242

- **Step 6.** Determine if the available maneuver area is adequately configured to conduct the largest training event.
- **Step 7.** Compare the maneuver acre days required (Step 3) with the available maneuver acre days (Step 4).
- **Step 8.** If the analysis conducted in Steps 5, 5a, 6, and 7 indicates that there is adequate training land available at the installation, stop the ATLAM process at this point. If there is a deficiency, continue to Step 9.
- **Step 9.** Identify alternative actions that may be taken locally to reduce or eliminate the deficiency. Some possible local initiatives include –
  - Reducing the size of impact areas contaminated with unexploded (dud) ordnance.
  - Increasing the number of annual training days to reduce the required acre days.
  - Redesigning or exchanging maneuver and impact areas.
  - Incorporating TADSS into unit training strategies.
- **Step 10.** Compare the revised total acreage requirements (Step 9) with the available training land (Steps 4 and 4a). If the deficiency is eliminated, stop the ATLAM here. If not, calculate the training land shortfall and proceed to Step 11.
- **Step 11.** Evaluate the effect of the training land shortfall on unit readiness.
- **Step 12.** Identify alternative actions that may be initiated by the MACOM or DA to mitigate or resolve the training land shortfall. All alternatives identified are considered during the analysis of alternatives study that is performed after completion of the LURS.
- **Step 13.** Incorporate the results of the ATLAM into the LURS.

MANEUVER AREA REQUIREMENTS

As a minimum, installations need contiguous maneuver areas large enough to support the largest training event conducted at home station. Appendix A provides maneuver area requirements for MTP training events. Calculate space requirements as shown in the previous paragraph.

When planning maneuver area requirements, consider airspace requirements. Airspace is a critical element in combined arms training for the AirLand Battle. Provisions must be made to designate airspace for close air support, artillery, and mortar firing as part of the combined arms team. AR 95-2, AR 385-63, and DA Pam 385-63 provide information on designating, using, and managing special-use airspace. Federal Aviation Administration Handbook 7400.2 provides specific stipulations and requirements.

RANGE AND IMPACT AREA REQUIREMENTS

Range and impact area requirements depend on the type and mission of units assigned to or supported by the installation and the weapon systems used. TC 25-8 describes Army standard ranges. It provides guidelines for selecting ranges to support soldier and collective training requirements at divisional installations and training centers. It also provides information for calculating training throughput requirements and range throughput capacities. DA Pam 350-38 provides –

- Weapon system qualification standards.
- Training readiness condition (TRC) levels.
- The number of iterations of training required.
- Ammunition allocations for each weapon system.

DA Pam 385-63 provides instructions for developing surface danger zones and computing impact area requirements for each weapon system used by the Army. SDZs must be determined for each firing point. They are a major factor in calculating the total area requirements for ranges and impact areas.

AR 210-21 and TC 25-8 describe the range development process followed by installation range planning teams. To develop range and impact area requirements, the planning team must –

- Establish the number and type of ranges required at the home station based on mission-essential task list training requirements, training events, and TC 25-8 guidelines.
- Determine the SDZ for each type of weapon and each firing point using DA Pam 385-63 instructions. Include vertical danger zone and airspace requirements when appropriate.
- Establish an impact area for each type of weapon system.

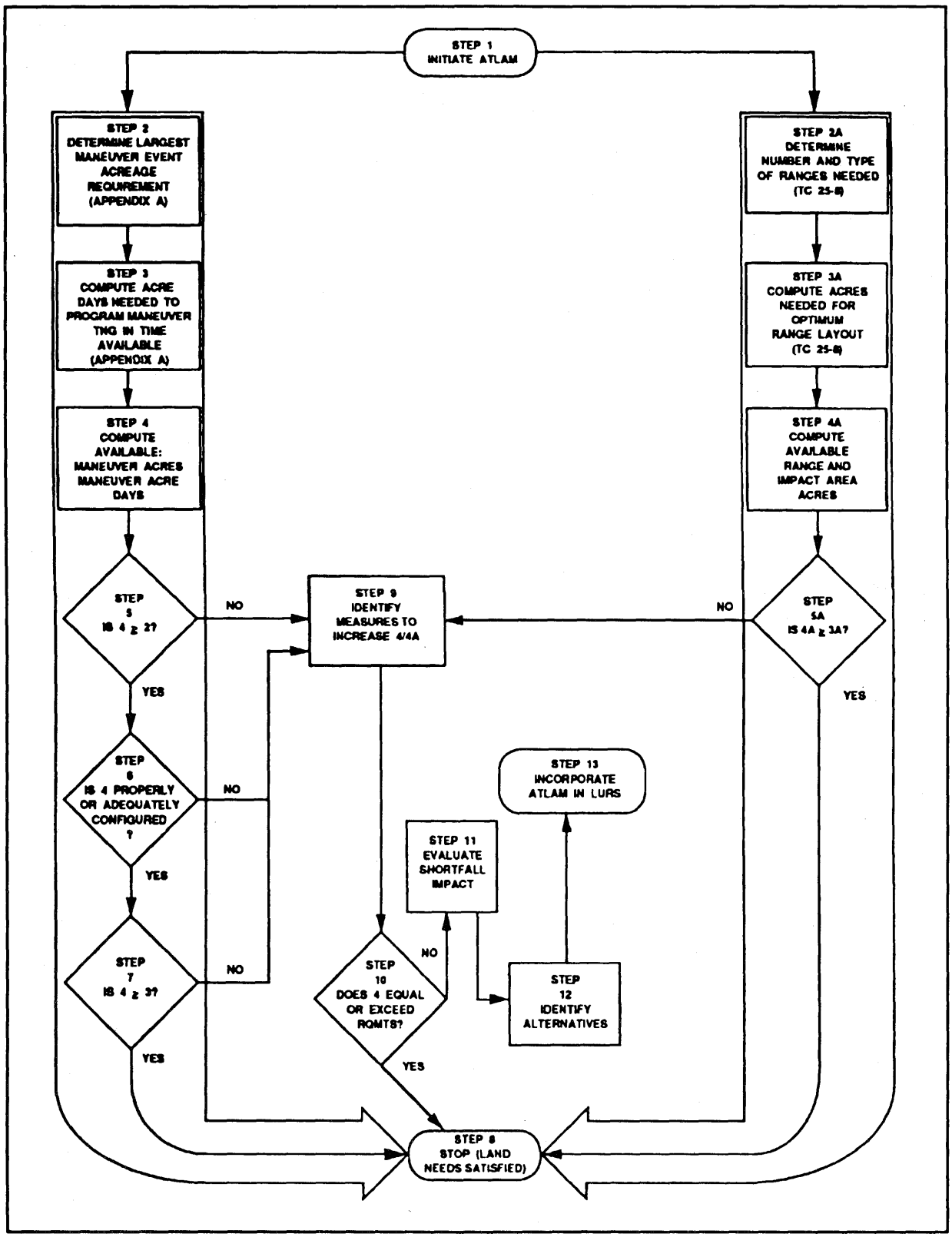


Figure 3-1. Army training land analysis model (ATLAM)

- Design multipurpose and multiuse ranges and common impact areas whenever possible.
- Avoid establishing more than one contaminated impact area (that is, an impact area used for firing dud-producing ammunition).
- Position ranges and impact areas so that they do not restrict maneuver area use.

UNUSABLE INSTALLATION LAND

To assess the quality of installation training areas, planners must subtract unusable land from gross acreage figures. Natural resource managers can provide planners with information on the acreage of sensitive and unusable land. Unusable land includes a number of items as shown in Table 3-2. The MTP acreage figures used in Appendix A to calculate maneuver area requirements include some provision for unusable land. Maneuver units may achieve effective training on smaller areas if ideal terrain is available. This especially applies to installations with extremes in terrain relief and ground cover. The LCTA data referenced in Chapter 5 can provide a measure of the suitability of land not within the constraints of Table 3-2. However, given all considerations, installations may still be unable to meet MTP land requirements without large parcels of terrain. In other words, some land may have to be eliminated from consideration as maneuver acreage and subtracted from the gross acreage available. Land declared unusable for training must be identified in the LURS with supporting rationale or justification. Planners should also deduct maneuver training areas outgranted (lease, permit, license, or easement) to other agencies from gross acreage figures. The LURS must clearly state why this land was subtracted from the gross acreage available.

EFFECT OF LAND SHORTFALLS

Determining how land shortfalls affect training at an installation is the critical element in deciding if additional training land is required. Commanders and training land planners must assess the total influence of land deficiencies on overall training capabilities and on mission readiness. This assessment is conducted in Step 11 of the ATLAM process. It is included in the conclusions of the LURS as the basis for recommending alternate solutions.

MANEUVER AREA DEFICIENCIES

The effect of land shortfalls on maneuver training is difficult to define. For example, what are the implications if a battalion has 10 percent less land available than that prescribed for an MTP event? The degree to which land deficiencies constrain training and those training constraints, in turn, affect combat readiness is a subjective judgment. Commanders and training planners must weigh the cost of satisfying land shortfalls against the assessed reduction in combat readiness. The tradeoff eventually comes down to the edge in experience and knowledge gained through realistic training versus the combat losses that may result from an inability to fully accomplish all training requirements.

RANGE AND IMPACT AREA DEFICIENCIES

The effect of shortfalls in available land for ranges and impact areas can be determined by analyzing—

Table 3-2. Potential constraints on usable training land

Areas for Consideration	Remarks
Water sites	Post utilities, recreation areas, and large bodies of water that exceed water training requirements.
Environmental restrictions	Erosion control, pollution prevention, noise avoidance, wildlife management, deadfall, endangered species protection, forestation, historical and archaeological sites protection, and wetlands.
Encroachment	Growing cities and competing projects.
Shape	Irregular post outlines and noncontiguous parcels that prevent movement or channelize forces.
Access and availability	Airfields, ammunition storage sites, national parks, and national forests.
Other facilities	Highways, easements, historic sites, cemeteries, and Indian reservations.

- Deficiencies in unit training readiness condition (TRC) levels resulting from weapons qualification events not conducted due to range and impact area shortfalls.
- The availability of alternate ranges at home station or within reasonable distances from home station.
- The availability of training devices such as weapon simulators, subcaliber devices, non-live-fire substitutions, and scaled ranges.
- The firing frequency needed to maintain weapon proficiency.

In some cases, soldier proficiency with weapon systems can be assessed by comparing the proficiency at the installation to data provided for that weapon system by the Army Materiel Systems Analysis Agency (AMSAA), Aberdeen Proving Ground, MD 21005. AMSAA data shows the potential capability of a weapon. This data may be compared to data that reflects actual performance and capabilities attained by soldiers at an installation. Differences between the two sets of data are usually caused by training deficiencies. Further analysis can pinpoint those deficiencies that are the direct result of shortfalls in ranges to conduct training and, where appropriate, in land to build ranges or establish required impact areas.

REQUIREMENTS REVIEW AND PRIORITIZATION

AR 210-21 describes the review process for training land acquisition projects. Appendix B of AR 210-21 provides quantifiable criteria for establishing relative priorities of approved projects Armywide. Only projects receiving top Army priority will be permitted to proceed to the purchase or lease of new lands.

A LURS should be initiated only after a front-end analysis indicates that a training land deficiency affecting battalion or higher-level units may exist. LURSs that confirm deficiencies are submitted concurrently to the MACOM and HQ TRADOC (DCST) to validate the LURS findings and forward recommendations for approval or disapproval to HQDA (DAMO-TR). DAMO-TR coordinates Army staff review of the LURS and submits the findings and recommendations to the Assistant Secretary of the Army (Installations, Logistics, and Environment) (ASA (IL&E)) for concept approval. ASA (IL&E) submits the approved LURS concept to the Secretary of the Army to certify the land shortfall and authorize an AAS.

When an AAS is authorized, DAMO-TR in coordination with HQDA (DAEN-ZC) designates the appropriate agency to conduct an objective analysis of all reasonable alternatives and recommend a course of action. If land acquisition is recommended, the AAS is submitted to the MACOM and HQ TRADOC (DCST) for review and concurrence. The AAS is forwarded to DAMO-TR, DAEN-ZC, and HQUSACE (CEMP-EA). The installation provides documentation to accompany the AAS and support a notice of intent (NOI) to prepare an EIS. DAMO-TR and DAEN-ZC submit the AAS to ASA (IL&E) for approval and release of the NOI to initiate the EIS process described in Chapter 5 of this training circular.

CHAPTER 4

THE LAND AVAILABLE

INTRODUCTION

Real estate on typical Army installations serves many uses. Major land use areas include the garrison cantonment area, range and impact areas, and maneuver areas. Refer back to Table 3-2 for terrain constraints that reduce the land available for training. Trainers, master planners, and commanders require accurate knowledge of the land available at an installation to meet training requirements. The Integrated Training Area Management (ITAM) Program described in Chapter 5 provides the land manager with accurate information on the condition of usable land and on the area and extent of sensitive lands. Where shortfalls exist either at home station or in supporting training areas, planners conducting LURSs and AASs require information on resources available at other installations. This chapter identifies sources of information to use in planning training events or identifying alternative solutions to shortfalls in local training land.

RANGE MAPS AND CATALOGS

AR 210-21, Chapter 5, requires installation range control organizations to prepare topographic maps showing –

- Installation boundaries.
- Composite SDZs.
- Impact areas contaminated with unexploded ordnance (UXO).
- Garrison cantonment areas.
- Recreational hunting and fishing areas.
- Restricted areas.
- Environmentally sensitive areas.

Range control also maintains a catalog that gives –

- Descriptions of ranges, firing points, and weapons training facilities.
- Eight-digit UTM grid coordinates of ranges, facilities, and training areas.
- Detailed survey information on locations of firing points, firing lines, and targets.
- Types and quantities of ammunition fired into impact areas.
- Location of past UXO impact areas.
- Training and firing events at each location.
- Type and caliber of weapons, weapon systems, and ammunition.
- Left and right limits-of-fire.
- Minimum and maximum ranges of fire.
- Minimum and maximum quadrant elevations, when applicable.
- Maximum vertical danger zones permitted.

AR 210-20, Chapter 4, requires the installation Master Planning Office to prepare maps of existing conditions on the installation. These maps are readily available from the installation master planner. They include –

- A regional map showing the relationship of the installation to the surrounding region.
- An airfield map.
- An installation land-use map that displays the entire reservation and adjacent land use.
- A noise contour map that display compatible use zones.
- A building area land-use map.
- A site map that covers future building construction areas.
- A transportation map.
- Utility and storm drainage maps.

AR 210-20 sets out a long-range planning process for all facets of installation land use and development. It is important that training range officers incorporate existing and estimated future training needs in the process. This encourages efficient land development and compatibility between training areas, the garrison, and surrounding communities.

RANGES AND TRAINING FACILITIES REPORT

AR 210-21, Appendix C, describes the installation ranges and training facilities report that installations submit through their respective MACOM, to the US Army Training Support Center (USATSC), ATTN: ATIC-RTS, annually. Information from these reports is subsequently provided to the Training and

Performance Data Center for inclusion in the Defense Installations, Ranges, and Training Areas data base. This data base is described later in this chapter. Land acreage and range-related data is included in this report. Specific land data provided includes –

- Total acres within the installation boundary.
- Acres available for all types of maneuver training.
- Total acres dedicated as impact and dud areas.
- Total acres determined by competent authority as excess or short via a land use requirements study conducted according to AR 210-21.

NATIONAL GUARD BUREAU TRAINING LAND INFORMATION

National Guard Bureau Pamphlet (NGB Pam) 25-1 lists all major and local training areas used by the Army National Guard for inactive duty and annual training. NGB Pam 25-1 is organized by states and territories in each Army area. The pamphlet provides –

- Installation location.
- Type of property control (federal, state, or private ownership).
- Types and numbers of ranges.
- Administrative facilities.
- Level of state support.
- Aviation facilities.
- Applicable firing and maneuver restrictions.

It provides an installation point of contact and phone number to coordinate and schedule the use of the training areas and facilities.

The proponent agency for this pamphlet is the Organization and Training Division, Training Support Branch, National Guard Bureau, NGB-ARO-M, Washington, DC 20310-2500.

TRAINING AND PERFORMANCE DATA CENTER TRAINING LAND INFORMATION

The Training and Performance Data Center (TPDC) develops and maintains training and performance-related data bases in support of the DOD training community. TPDC maintains the defense installations, ranges, and training areas (DIRT) data base. The DIRT database includes data on the total spectrum of installations, weapons training ranges, training areas, and training facilities owned or used by the armed forces.

TPDC has completed range and training area surveys for all FORSCOM and TRADOC installations and selected National Guard and Army Reserve installations, training areas, and unit armories. From this accumulated data TPDC generates specific reports tailored for installation range planners, trainers, and other agencies involved in land management. Training facilities reports have four major sections. Section 1 contains general installation information such as the location, overall size, support facilities, and installation points of contact. Section 2 summarizes the installation's primary weapons training ranges and includes a detailed inventory for each individual range. Section 3 describes unit training areas. Information in this section includes the type and size of units that can be accommodated on the terrain and specific terrain characteristics, that is, type of soil and amount and type of vegetation. Section 4 lists typical training facilities; for example, gas chambers, aircraft loading mockups, confidence course, and rapelling towers. Installations and units can request data on training land and range characteristics for other installations. TPDC provides this information free to all DOD agencies. The address is Defense Training Performance and Data Center, ATTN: Collective and Joint Training Division, Orlando, FL, 32826-3229.

In accordance with AR 210-21, TPDC distributes annual extracts from the DIRT data base of installation training facilities through US Army Training Support Center, ATTN: ATIC-RTS, and MACOMs to installations for review and validation. Installations should update the summaries to reflect changes in maneuver acreage. They should indicate any valid shortfall of land needed to accomplish wartime mission training based on a completed LURS. They should also indicate construction of new ranges and other types of unit training facilities. Installations send changes through the MACOM to USATSC (ATIC-RTS). USATSC forwards all changes to TPDC for integration into the DIRT data base.

USA CONSTRUCTION ENGINEERING RESEARCH LABORATORY INFORMATION

The US Army Construction Engineering Research Laboratory (USACERL), P.O. Box 9005, Champaign, IL 61826-9005, has developed the

Geographic Resources Analysis Support System, which is a part of the Integrated Training Area Management Program.

The GRASS data base incorporates multispectral satellite imagery that is registered with maps of installation land and land use, such as training areas, cantonment areas, impact areas, excluded areas, leased land, and range and recreational areas. Examples of GRASS-based maps are at Figure 4-1 and Figure 4-2.

GRASS data bases are currently under development and are planned for every major Army installation. The point of contact for GRASS information is the DEH natural resources office at each installation, or the GRASS Information Center at USACERL (telephone 1-800-USA-CERL).

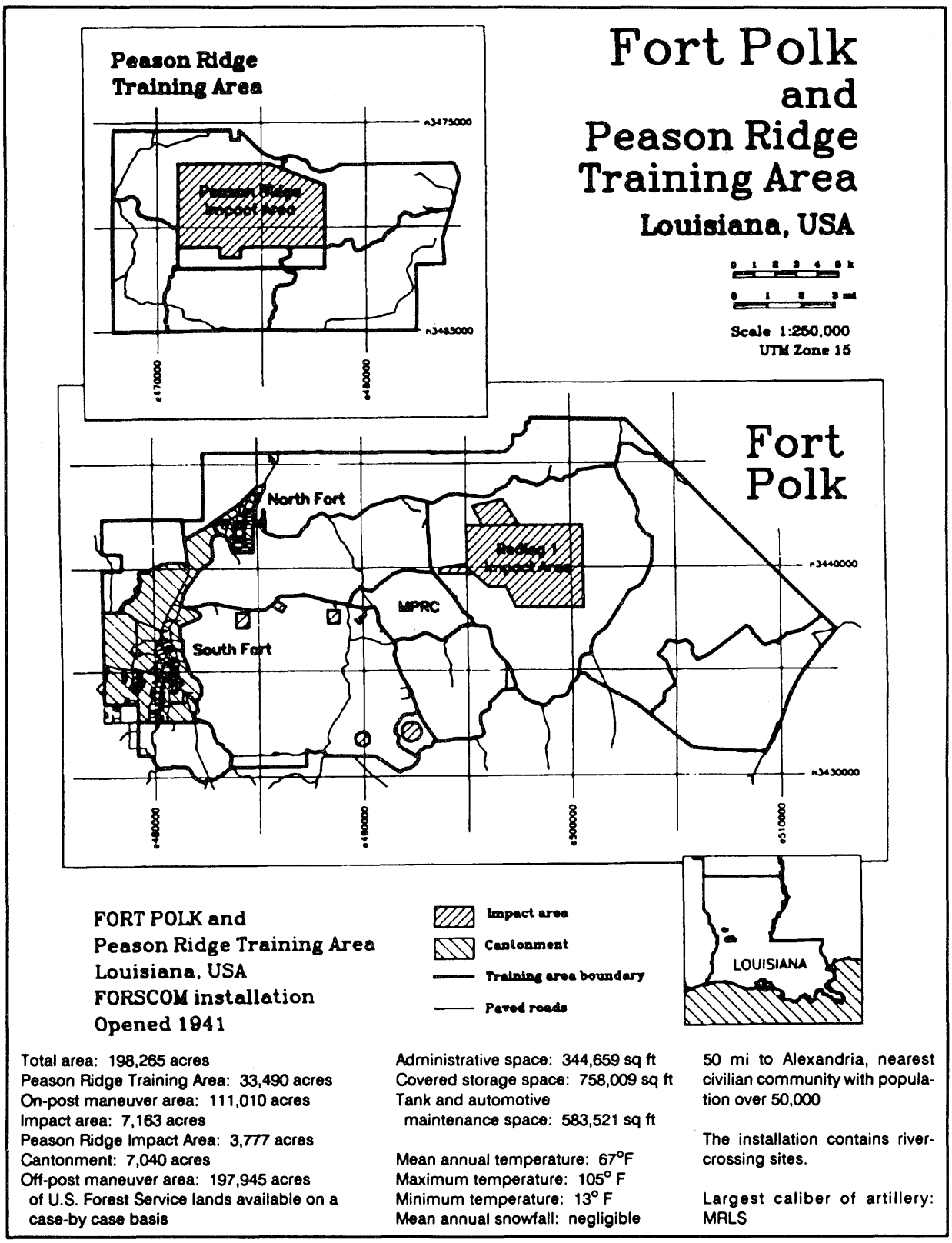
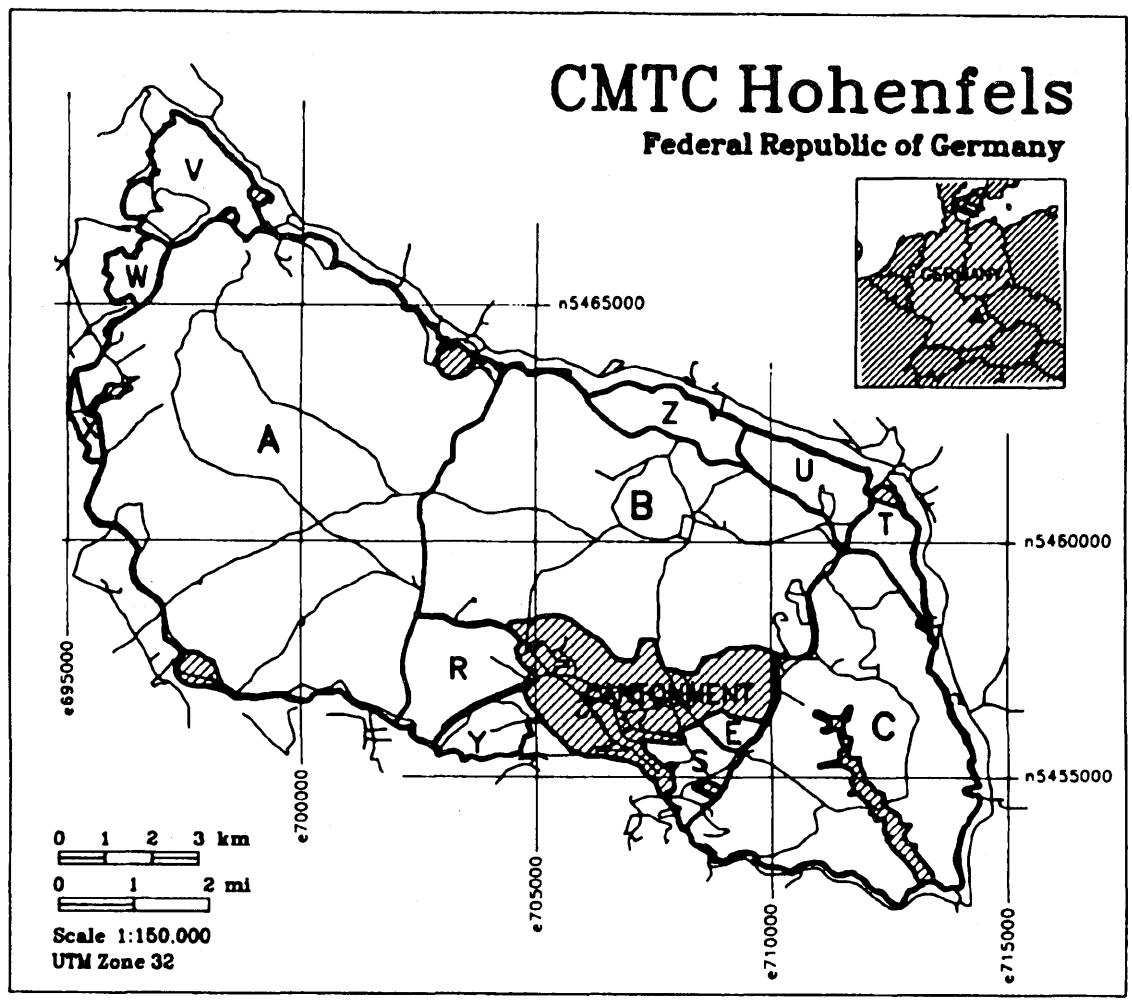


Figure 4-1. GRASS-based installation map (Fort Polk)



COMBAT MANEUVER TRAINING CENTER, HOHENFELS
Federal Republic of Germany
USAREUR Training Center
Opened 1951

— Training area boundary
— Primary road
▨ Restricted area

Total area: 40,017 acres
On-post maneuver area: 39,007 acres
Cantonment: 1010 acres
Impact area: 0 acres

Administrative space: 46,776 sq ft
Covered storage space: 132,716 sq ft
Tank and automotive maintenance space: 177,312 sq ft

Mean annual temperature (1951-80): 7.4° C
Maximum temperature: 35.2° C
Minimum temperature: -26.1° C
Mean annual snowfall: 14 inches

About 45 km to Regensburg, nearest civilian community with population over 50,000

Figure 4-2. GRASS-based installation map (CMTC Hohenfels)

CHAPTER 5

ENVIRONMENTAL CONSIDERATIONS

INTRODUCTION

In most expected scenarios war would lead to significant disturbance or complete destruction of selected regional natural resources. War is inherently the antithesis of environmental protection. By extension, the lesser but still significantly adverse impact of combat training can affect the environment profoundly. During realistic training for war the effect of training on the environment and the effect of the environment on training must be carefully considered. Federal law requires that Army activities comply with all federal, state, and local environmental and pollution abatement requirements and standards. Environmental pollution standards cover pollutants in the air, water, and terrain, while other legal requirements cover resources such as endangered species and wetlands.

Federal agencies must comply with procedural as well as substantive pollution abatement regulations for air, water, and noise pollution control and for solid waste management. Requirements may include filing for construction or operation permits with federal, state, or local regulatory agencies. Procedural requirements of NEPA may also require EA or EIS documentation.

Federal agencies responsible for constructing or operating facilities outside the United States must follow the environmental pollution control standards of the host country. Accordingly, requests for new facilities or for changes to existing ones must comply with all applicable pollution control regulations.

TRAINING LAND AND THE ENVIRONMENT

Training land comprises large areas of land, water, and airspace that contain many kinds of natural resources. The Army must ensure that military activities are ecologically compatible with training land and natural resources in order to conduct realistic training with minimum adverse impact on the human and natural environment. Decision makers must know and take responsibility for the impact of their decisions on cultural resources, soil, forests, wetlands, water and air quality, and fish and wildlife.

Many range and training area construction projects are in environmentally sensitive areas. This requires the construction contractor to use protective measures for erosion control, dust control, conservation of natural vegetation, and tree-clearing operations.

Archaeological and historical sites on training land may also affect construction of training facilities. Discovery of any artifacts during construction must be reported to the installation environmental specialist immediately. The discovery may also affect siting and construction. Archeological surveys must be completed before construction begins. However, unexpected discovery of artifacts may require appropriate action to preserve or document the site. Likewise, many endangered plant and wildlife species inhabit training areas and must be considered when planning the location of new training facilities. Normally, a buffer zone surrounds these habitats within which any construction or training is prohibited.

The Army must guarantee the continuing usefulness of its current land holdings through proper stewardship. Land managers must mitigate the adverse environmental effects of current and future weapon systems. They must periodically review training methods and techniques to assess their impact on the environment and recommend improved methods, when appropriate.

TRAINING LAND MANAGEMENT AND ENVIRONMENTAL MODELS

Increased training requirements, new weapon systems, and range maintenance activities have magnified the problems of training facility management. Heavier, faster vehicles, longer combat engagement distances, and increased use of combined arms exercises have made environmental and resource considerations, and the need to maintain realistic training scenarios, crucial land management issues on most Army installations. These issues must be dealt with to ensure the Army maintains effective combat readiness while practicing good stewardship of the land.

While factors such as archaeological and historical sites, endangered species habitats, wetlands, and highly erodible soils limit military land use, the environment should be treated as a training resource rather than as a constraint. Realistic conditions for training can be achieved through management of vegetation used for cover and concealment and through planning and siting activities. Consideration must be given to line-of-sight, movement corridors, and proximity analysis. Much of this planning and management can be accomplished with environmental models, procedures, and technologies available through the Integrated Training Area Management Program.

INTEGRATED TRAINING AREA MANAGEMENT

USACERL has developed a comprehensive training area management program to assist trainers, range control staffs, and installation land managers. The program will help them mitigate land management problems and maintain effective training land resources. The ITAM Program is currently being implemented at installations throughout the Army and is incorporated in AR 420-74.

ITAM includes seven integrated elements to provide the Army with a comprehensive approach to land management:

- A standardized long-term land condition trend analysis program to inventory and monitor Army land soils, vegetation, and wildlife.
- Computerized decision support systems that include analysis and color graphics capabilities for planning and scheduling land maintenance.
- Training land design support systems.
- An automated range scheduling system.
- A computer-based noise-monitoring system.
- Land rehabilitation and maintenance, including biological and physical erosion control technologies for soil containment and runoff control under training conditions.
- A comprehensive, multimedia environmental awareness program targeted to the land user.

The long-term value of the ITAM Program at an installation is that it provides –

- More realistic training experiences to enhance Army readiness.
- Reduced costs of land management and training.
- A proactive approach to compliance with environmental requirements.
- Increased potential to acquire or lease new lands due to a demonstrated reputation for good land management.
- Assistance in informed, objective analysis in environmental assessments and land acquisition studies as a result of factual environmental data.

LAND CONDITION TREND ANALYSIS PROGRAM

The LCTA Program is based on sustained yield and multiple use of military land resources. Primary objectives of the program are –

- To evaluate the capability of land to meet multiple-use demands on a sustained basis; to monitor changes in land resources; to evaluate these changes in terms of current land uses; to amend land management plans to ensure long-term resource availability.
- To implement a standard data collection, analysis, and reporting method that will enable the compilation of relevant data Armywide.

The LCTA Program provides land managers and administrators with accurate long-term assessments of the status of vegetation, botanical composition, and wildlife as well as associated soil loss on Army lands under varying uses. The LCTA land resource data base provides guidance –

- To better distribute training loads on the land.
- To reduce the need for major land restoration programs.
- To remove subjectivity from land management decisions.
- To serve as a basis for use and nonuse decisions on specific parcels of land.
- To help ensure the sustained availability and productivity of Army land.
- To characterize and monitor endangered species habitats.

The LCTA Program provides a personal-computer-based relational data base which allows

users to assess cause and effect relationships among soils, vegetation, wildlife, and land use, including the impact of disturbance. The system is designed to analyze current conditions and temporal trends. It can interface with GRASS (see below) for further spatial analysis and data display. Outputs include –

- Soil perspective.
- Plant community classification.
- Evaluation of tactical concealment resources.
- Land use and surface disturbance summaries.

The LCTA Program will have Armywide implementation. Contact your DEH office or MACOM to determine its status at your installation.

GEOGRAPHIC RESOURCES ANALYSIS SUPPORT SYSTEM

GRASS was developed for use by land managers and training planners –

- To optimize the use of available range and maneuver areas.
- To help site training and range facilities.
- To help maintain current real estate in a condition suitable for long-term training

GRASS is a computer-based geographic information system (GIS) that allows users to create application and demonstration models. Outputs include statistical tables, data files, or maps that can be printed or displayed on a color monitor.

GRASS allows environmental planners and land managers to analyze, store, update, model, and display landscape information such as earth resources data. Data bases are developed from satellite imagery or mapped information. Data files can be developed for large or small geographic regions at any scale desired. The data is available in layers. Standard data layers include –

- Soils.
- Roads.
- Surface hydrography.
- Military land use.
- Elevation.
- Slope.
- Aspect.
- Land cover.

Other common data elements are historic and prehistoric sites, endangered species habitats, forest management area, and vegetation.

GRASS is installed or in the process of being installed at several Army installations. GRASS data bases have been developed for many other installations with plans for eventual development of data bases for every Army installation. Contact your DEH office to determine its status at your installation.

TRAINING LAND DESIGN

Tactical training activities by soldiers maneuvering in tracked vehicles can extensively damage vegetation and soil. In addition to environmental impact, vegetation loss results in reduced training realism.

A solution to these problems is to design training areas using tactical concealment islands (TCIs) and tactical concealment corridors (TCCs). This involves the planting of trees and shrubs in areas that are –

- Stripped of vegetation by training or land management activities.
- In open tracts of land where such planting would be useful to the training scenarios.
- In wildlife habitats.
- Adjacent to environmentally sensitive areas to act as a buffer and encourage training traffic to stay away from those areas.

TCIs and TCCs can be constructed to protect vegetation, improve vehicle trails and access roads by controlling water runoff, or to return land to a more natural condition.

The Training Land Design Program benefits the training mission by providing more realistic terrain and reducing long-term land maintenance costs. The design of an effective training area and environmental conservation measures require mutual planning and scheduling efforts by both the installation training and land management staffs.

TOTAL INSTALLATION NOISE MANAGEMENT (FIRE-SYSTEM)

Noise levels of Army activities are a continuing concern to installation commanders and training managers. The major sources of noise problems are large weapon blasts and helicopter training activities. Noise created by small arms and 25mm weapons can also be a problem. Noise impact problems created

by these sources threaten the operational capability of military installations located near civilian communities.

The FIRE-System helps Army managers monitor and reduce noise impact. The microcomputer-based FIRE-System includes –

- A local capability to produce noise zone maps for blast noise, helicopters, fixed-wing aircraft, small arms, and vehicles.
- A local capability to collect real-time data on airfield operations at the control tower and range operations at the range control master radio station.
- An integrated blast noise monitoring system.
- A capability for comparing long-term noise measurements with noise zone maps.
- A capability to develop noise zone maps based on projections of new weapons, ranges, and firing points.

The FIRE-System allows managers to develop plans, implement procedures, and verify community complaints about noise. Public awareness of proactive efforts to reduce persistent noise are an effective public relations tool to enhance community acceptance of Army training activities.

EROSION CONTROL

Increased, intensive use of mobile weapon systems operating over large areas subjects training lands to much physical damage. Loss of training land to severe physical degradation occurs at some installations. This highlights the need for effective erosion control maintenance programs. An erosion control management plan outlines steps to identify problems and select technology. The plan aids in development of erosion project inventories, site prioritization, and funding projections.

ENVIRONMENTAL AWARENESS PROGRAM

Significant degradation of an installation's natural resources can occur through –

- Improperly placed or refilled tactical positions.
- Vehicle, petroleum, and other chemical damage to ground cover, shrubs, trees, and soil.
- Field maintenance on vehicles and weapons.

Frequently, damage to natural resources, roads, trails, ditches, and off-limits areas occurs during administrative time and is not directly related to the training mission. Much of this type of damage can be avoided through greater awareness of the impact of various activities on the environment.

The Environmental Awareness Program involves developing and evaluating materials and curricula on excessive and avoidable damage to the environment. The program is designed to inform soldiers and leaders of ways to more effectively conserve and use training resources. Educational media include –

- Videotapes.
- Narrated slide shows.
- Posters.
- Buttons.
- Stickers.
- Soldier's and leader's handbooks.

Media can be developed to address installation-specific environmental concerns. The Environmental Awareness Program is an integral part of the ITAM Program. For further information on the ITAM and Environmental Awareness Programs, contact USACERL.

LEGAL AND REGULATORY REQUIREMENTS FOR LAND USE

The National Environmental Policy Act of 1969 established broad policies for protection of the natural environment. The Assistant Secretary of the Army (Installations, Logistics, and Environment) is the Army's official responsible for NEPA matters. The NEPA process includes systematic examination of reasonably foreseeable environmental consequences of proposed actions and alternatives. If the process discovers potentially adverse environmental impacts, the Army must examine alternatives to mitigate it. The NEPA process must be integrated into range and training area development projects at the earliest practical time. This ensures that planning reflects environmental values and minimizes delays and conflicts late in the process.

NEPA requires the proponent agency initiating a project to describe all reasonable alternatives to it. To help identify alternatives, the proponent must consult appropriate federal, state, and local agencies and the general public. The proponent must also fund mitigation commitments made during the NEPA process (AR 200-2, paragraph 2-76).

In accordance with NEPA procedures, the proponent involves the public in environmental decision making. It provides public notice of NEPA-related hearings and public meetings and makes documents available to the public. This keeps persons and agencies who may be interested or affected informed. Notices must be mailed to those who have requested them. In the case of actions of nationwide interest, notice must be mailed to national organizations reasonably expected to be interested in the matter. Lists of such organizations are maintained by the ASA (IL&E) and by the Assistant Chief of Engineers (DAEN-ZC), Army Environmental Office.

In addition to special mailings, the proponent publishes notices in local newspapers and in newsletters expected to reach potentially interested persons.

ACTIONS IN FLOODPLAINS OR WETLANDS

Executive Orders 11988 and 11990 restrict federal activities in floodplains and wetlands. The purpose of these restrictions is to preserve the natural beneficial value of wetlands and reduce the risk of loss due to flooding.

Floodplains are the lowlands and flat areas next to inland and coastal waterways which have historically been flooded. Wetlands are areas generally flooded by surface, ground, or tidal waters; they are not necessarily located in floodplains. Wetlands are also areas with wetland hydrology and soils and vegetation related to wetland hydrology, but which are not necessarily flooded.

Before initiating a project, the proponent agency must determine whether it will be located in a floodplain or wetland. If so, it must evaluate alternative sites, considering pertinent economic and environmental factors. A public notice must be circulated explaining why the proposed project is to be located in a floodplain. This will allow public comment to be considered in the decision-making process. The announcement must appear in the *Federal Register* as well as local advertising to inform the general public in areas most affected. If, after review, the decision is to proceed with the project in the floodplain or wetland, the proponent publishes another notice stating the decision and the reasons for it.

PRESERVATION OF HISTORIC PLACES AND ARCHAEOLOGICAL SITES

The National Historic Preservation Act (NHPA) of 1966 established a national policy for preserving historic districts, sites, buildings, structures, objects, and archaeological sites. The act also established a National Register of Historic Places (NRHP) that is maintained by the Secretary of the Interior. The act includes procedures for protecting properties listed in the NRHP.

All phases of Military Construction, Army (MCA) must be reviewed according to procedures published in the Federal Register to determine if any property listed in the NRHP is affected by the proposed construction. AR 420-40 and TMs 5-801-1 and -2 contain detailed instructions for compliance with historic preservation requirements.

ENVIRONMENTAL CONSIDERATIONS IN FOREIGN NATIONS

When a proposed action could affect the natural resources or ecology of a foreign nation, treaty obligations and the nation's sovereignty must be respected. Army policy is restraint when applying US laws inside foreign nations. It must consult the State Department regarding formal communications with foreign governments on environmental agreements and other formal arrangements.

REQUIRED NEPA RECORDS AND DOCUMENTS

The NEPA requires proponents to prepare relevant environmental documents for principal programs and proposals likely to have an impact on the quality of the human environment. The proponent is responsible for the content and conclusions in the environmental documentation. AR 200-2 describes NEPA documentation requirements. Major requirements are summarized in the following paragraphs.

RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

The REC describes the proposed action, identifies the proponent agency, and explains why further environmental documentation is not required. It is used when the proposed action is exempt from NEPA requirements. The project must clearly meet the

environmental screening criteria in AR 200-2 (A-31a-j) before the appropriate categorical exclusion is selected in Appendix A, Section I, A-1 to A-29, AR 200-2.

NOTE: Use the AR 200-2 dated 23 December 1988; earlier versions are not valid.

The REC is also used if the action has been adequately addressed in existing documents and determined to be not environmentally significant. The proponent signs the REC and submits it with documentation to the installation environmental coordinator.

ENVIRONMENTAL ASSESSMENT (EA)

The EA is part of the third phase of land acquisition projects. An EA determines the extent of a project's environmental impact and whether or not the impact is significant. It provides the decision maker with enough evidence to determine whether an environmental impact statement should be prepared. The following are among many actions that require an EA:

- Military construction, including contracts for off-post construction.
- Changes to installation land use that impact on the environment.
- Repair or alteration affecting historically significant structures, archaeological sites, or places meeting criteria for nomination to the National Register of Historic Places.
- Actions that could cause soil erosion or affect prime or unique farmland, wetlands, floodplains, coastal zones, wilderness areas, or wild and scenic rivers.
- New weapon systems development and acquisition programs.
- Actions that take place in, or adversely affect, wildlife refuges.
- An activity that affects any species included on, or proposed for inclusion on, the US Fish and Wildlife Service List of Threatened and Endangered Plant and Wildlife Species.
- Field activities on land not controlled by the military, including the firing of weapons, missiles, or lasers over navigable waters of the United States or into the national airspace extending 45 meters or more above ground level.

Preparation and funding of the EA is the responsibility of the proponent agency (normally the agency responsible for initiating or carrying out the proposed action) with assistance from the installation environmental office. The EA includes –

- The purpose and need for the proposed action.
- All reasonable alternatives considered.
- Environmental consequences.
- A list of persons and agencies consulted.
- Any mitigation plans.
- A conclusion or finding of whether environmental impacts are significant.

FINDING OF NO SIGNIFICANT IMPACT (FNSI)

Every EA results in either an FNSI or a notice of intent to prepare an environmental impact statement.

The FNSI is a separate document that gives reasons why an action will not significantly affect the environment and, therefore, not require an EIS. The FNSI references the EA and any other relevant environmental documents. It contains a summary of the EA and the facts and conclusions that led to the FNSI.

The proponent ensures the FNSI is available to the public through the installation PAO early in the project planning process and before irretrievably committing resources to the proposed action. FNSIs that have national interest are published in the *Federal Register.* For actions of only local or regional interest, the FNSI is publicized in local newspapers, other local media, and direct mailings to interested parties.

ENVIRONMENTAL IMPACT STATEMENT

An EIS is a public document whose primary purpose is ensuring that NEPA policies and goals are incorporated into federal programs. An EIS provides a full and final discussion of environmental impacts and forms the basis for informed decision making. It also allows the public to review and comment on the proposal.

Before preparing an EIS, an NOI must be prepared. The NOI is approved by the ASA (IL&E), Deputy of Environment, Safety, and Occupational Health (DESOH). It is published in the Federal Register and in newspapers with circulation in the areas generally affected by the proposed action. Copies of

the notice may also be distributed to specific agencies, organizations, and individuals, as appropriate. AR 210-70 can help identify interested agencies. The NOI initiates the scoping process and allows the public to participate in decision making through public meetings, hearings, and distribution of documents.

Based on information obtained during the scoping process, the proponent agency prepares a preliminary draft EIS (PDEIS). The PDEIS is forwarded through command channels to ASA (IL&E) for review by the Army staff; it is not made available for public review. After review and comment by HQDA, the proponent revises the PDEIS and prepares a draft EIS (DEIS). The DEIS is forwarded to the designated HQDA agency for final HQDA review. The DEIS is approved by the DESOH and filed with the Environmental Protection Agency (EPA). The EPA publishes a notice of availability (NOA) in the Federal Register indicating that the DEIS is available for review during a 45-day public comment period commencing on the date of publication.

The preparer incorporates responses to comments from the DEIS into the final EIS (FEIS). Processing the FEIS essentially follows the same procedures as those used for the DEIS. The EPA publishes the NOA in the *Federal Register* and initiates a 30-day post-filing waiting period. At the end of the 30 days, the decision-maker prepares a record of decision (ROD), which becomes part of the environmental documentation forwarded to the Assistant Chief of Engineers, Army Environmental Office.

The ROD –

- States the decision.
- Identifies alternatives considered.
- Discusses all factors that weighed in the final decision.
- States whether all practical means to avoid or lessen hazards were adopted and, if not, why not.
- Identifies the mitigation/monitoring plan.

INTERAGENCY COORDINATION

The entire EIS process may take more than a year to complete. It is important that the process begin as soon as possible after the project is conceived. The proponent agency should coordinate with all staff elements that may have a role in the NEPA process. Preparation of the DEIS and coordination, revision, and preparation of the FEIS require the most time. Next to the project itself, a properly prepared EIS may take the longest time to complete.

Environmental officers, natural resource managers, and planners should establish good working relationships with local and state agency staffs. This promotes cooperation and resolution of mutual land-use and environment-related problems. Coordination and consultation among agencies before the EIS is prepared greatly reduces coordination time and minimizes revisions produced during the review. Again, information in AR 210-70 is useful in establishing lines of coordination.

The Chief of Engineers (COE) is responsible overall for coordinating and monitoring Army environmental activities. The COE Army Environmental Office is the Army Staff (ARSTAF) point of contact for environmental matters.

The Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health) (DASA (ES&OH)) files each EIS with the EPA Federal Activities Office. Additional copies are sent to the applicable EPA regional office and state EPA office for review of the proposed action.

The best research sources at the installation level for environmental matters related to training lands are –

- The land manager.
- The environmental specialist.
- The master planner in the DEH.
- The safety officer.
- The forester.
- The agronomist.
- The range conservationist.
- The natural resource specialist.
- The wildlife officer.

Lists of appropriate state agency points of contact may be obtained from the installation environmental officer. In addition to coordination with State and local agencies, national environmental organizations such as the Sierra Club, Audubon Society, and National Wildlife Federation are frequently involved in planning and coordinating environmental matters.

Within the DA, key agencies include –

- Assistant Chief of Engineers, Army Environmental Office.

- Army Environmental Hygiene Agency (AEHA), Aberdeen Proving Ground, MD 21005.
- Major Army command environmental officer.
- US Army Construction Engineering Research Laboratory.
- US Army Engineering and Housing Support Center (CEHSC-FN), Fort Belvoir, VA 22060-5580.
- Corps of Engineers, District Engineers.

Environmental considerations and requirements for preparation, content, and distribution of environmental documents must be determined on a case-by-case basis.

APPENDIX A

MANEUVER AREA REQUIREMENTS

Army training strategy is based on platoon through battalion Army Training and Evaluation Program training exercises both at home station and at combat training centers. ARTEP mission training plans (MTPs) identify critical wartime missions and, in some cases, the maneuver area needed to train the exercises. For the battalion task force, ARTEP 71-2-MTP identifies the following missions:

- Movement to contact.
- Offensive operations.
- Defensive operations.
- Retrograde.
- Reconnaissance and security.

Operations designed to accomplish reconnaissance and security missions at the mechanized infantry/armor battalion task force level are normally executed as an integral part of a movement to contact, offense, defense, or retrograde mission. This training circular will not identify separate maneuver area requirements for the battalion task force reconnaissance and security operations.

Recommended maneuver area boxes for movement-to-contact, offense, defense, and retrograde missions, based on an analysis of current doctrinal publications, are shown in Figure A-1.

> **NOTE:** As generic models, the maneuver boxes in Figure A-1 identify in geometric form the acreage recommended for layout of a maneuver box to support a specific task-force-level training event. The actual nature of specific terrain may argue in favor of using more or less land. The information

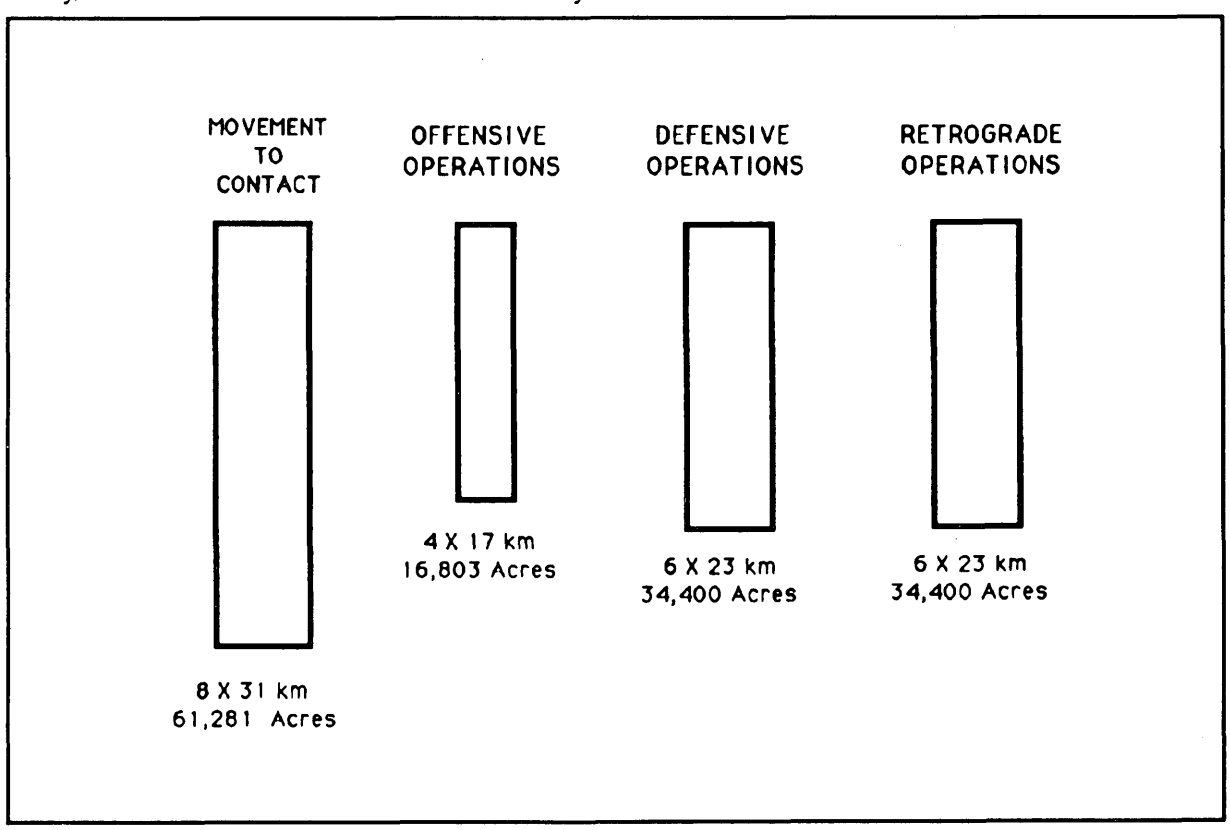


Figure A-1. Maneuver requirements of the Mechanized Infantry/Armor Battalion Task Force

provided in Figure A-1 is intended only as a guide. With these figures as a guide, it is up to the trainer to evaluate actual land requirements to support training at a specific location.

COMPUTATIONS OF GROSS MANEUVER LAND REQUIREMENTS (KM^2 DAYS)

ARTEP MTPs and doctrinal publications form a basis for computing consolidated maneuver area requirements for units (including Reserve Component) assigned to or training at an installation. Platoon-through-battalion calculations for a heavy (mechanized infantry/armor) division and a light (infantry) division are shown in Tables A-1 and A-2.

Land Requirements for selected types of units are identified by MTP and doctrinal publications from platoon through battalion, squadron, and task force level. Land-use managers must modify unit density figures, iterations, and days per iteration to meet the local situation.

Use Tables A-1 and A-2 to determine gross maneuver land requirements for training facilities from small local areas to division-size or larger installations:

- Column 1 lists division units and their MTP training missions and operations. Unit figures identified by Footnote 1 (Table A-1) were derived using TRADOC Common Teaching Scenario dated August 1985, OPLAN 6. Unit figures identified by Footnote 1 (Table A-2) were derived using a counterinsurgency (nonlinear battlefield) study scenario, Panther, dated December 1989, and Puerto Rico map sheets 1222IV, 1122I, 1122II, and 1122III of series E375, edition 1-AMS at 1:50,000 scale.
- Column 2 lists the number of units by type and level of organization in the division. Analysts can derive these calculations from the unit troop list. TOE 87-L (MECH) was used for the heavy division and TOE 77-L for the light division.
- Column 3 lists the land requirements for the type unit by mission and operation.
- Column 4 lists the recommended frequency for the mission or operation during the training year to maintain the required level of performance in the task or event. The number of iterations required to maintain proficiency are taken from the Battalion-Level Training Model (BLTM), August 1990 edition, and DA Pam 350-38.
- Column 5 lists the recommended number of days per training iteration.
- Column 6 lists gross requirements for each MTP task. Calculate the gross requirement as follows: density of units X land requirement (km^2) X iterations X day(s) required per iteration = gross requirement per task (km^2 days).
- Add column 6 figures for all mission tasks listed for a specific unit to determine gross km^2 days for that unit.
- Convert gross km^2 days to acres required for training as described in Chapter 3 of this circular.

Table A-1. Heavy (Mechanized Infantry/Armor) Division maneuver area requirements

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Mech IN/AR Bn TF (ARTEP 71-2-MTP)	5				
o Movement to Contact	5	8 x 31 = 248 km^2	4	1	4,960
o Offensive Op	5	4 x 17 = 68 km^2	4	1	1,360
o Defensive Op	5	6 x 23 = 138 km^2	4	1	2,760
o Retrograde	5	6 x 23 = 138 km^2	4	1	2,760
Mech IN Co[1] (ARTEP 71-1-MTP)	20				
o Movement to Contact	20	6 x 14 = 84 km^2	3	1	5,040
o Attack	20	5 x 10 = 50 km^2	3	1	3,000
o Raid	20	5 x 10 = 50 km^2	3	2	6,000
o Ambush	20	5 x 10 = 50 km^2	3	2	6,000
o Defend	20	3 x 8 = 24 km^2	3	2	2,840
o Retrograde	20	6 x 17 = 102 km^2	3	2	2,240
o Recon & Security	20	13 x 6 = 78 km^2	3	2	9,360
Mech IN Rifle Plt[1] (ARTEP 7-8-MTP)	60				
o Movement to Contact	60	4 x 6 = 24 km^2	4	2	11,520
o Attack	60	3 x 6 = 18 km^2	4	2	8,640
o Defend	60	3 x 6 = 18 km^2	4	2	8,640
o Retrograde	60	3 x 10 = 30 km^2	4	2	14,400
o Raid	60	3 x 10 = 30 km^2	4	2	14,400
o Ambush	60	5 x 10 = 50 km^2	4	2	1,800
o Recon & Security	60	7 x 3 = 21 km^2	4	2	10,800
TF Mortar Plt (ARTEP 7-90-MTP)	10				
o Provide IND FS (Off)	10	15 x 4 = 60 km^2	2	1	1,200
o Provide IND FS (Def)	10	7 x 4 = 28 km^2	2	1	560
Antiarmor Company/Plt (ARTEP 7-91-MTP)	5				
o Provide Direct Antiarmor Fire	5	15 x 4 = 60 km^2	3	1	800
TF Scout Plt (ARTEP 17-57-10-MTP)					
o Security Op	10	4.5 x 30 = 135 km^2	4	1	5,400
o Recon Op	10	4.5 x 30 = 135 km^2	4	1	5,400

Table A-1. Heavy (Mechanized Infantry/Armor) Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Support Plt (ARTEP 17-236-11-MTP)	10				
o Provide Log Spt	10	20 x 1 = 20 km^2	3	1	600
Medical Plt (ARTEP 17-236-12-MTP)	10				
o Provide Health Svc Spt	10	8 x 1 = 8 km^2	3	1	240
Maintenance Plt (ARTEP 17-236-10-MTP)	10				
o Provide Maint Spt	10	3 x 1.5 = 4.5 km^2	3	1	135
o Conduct Recovery Op	10	3 x 1.5 = 4.5 km^2	3	1	135
Communications Plt MTP (ARTEP 11-037-30-MTP)	10				
o Provide Comm to TF CP	10	1 x 1 = 1 km^2	3	1	30
Tank Company[1] (ARTEP 71-1-MTP)	20				
o Movement to Contact	20	2.5 x 12 = 30 km^2	3	1	1,800
o Offense	20	2.25 x 7 = 15.75 km^2	3	1	945
o Raid	20	2.25 x 7 = 15.75 km^2	3	1	945
o Defend	20	2 x 1.5 = 3 km^2	3	1	1,800
o Retrograde	20	2.6 x 9 = 24 km^2	3	1	1,440
o Recon & Security	20	4 x 4 = 16 km^2	3	1	960
Tank Platoon[1] (ARTEP 17-237-10-MTP)	60				
o Attack	60	1 x 3 = 3 km^2	3	1	540
o Defend	60	.8 x .4 = .32 km^2	3	1	57.6
Armored Cav Sqdn[1] (ARTEP 17-485-MTP)	1				
o Recon Op	1	20 x 30 = 600 km^2	2	1	1,200
o Screening Op	1	20 x 30 = 600 km^2	2	1	1,200

Table A-1. Heavy (Mechanized Infantry/Armor) Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Armored Cav Troop[1] (ARTEP 17-485-MTP)	2				
o Recon Op	2	12 x 30 = 360 km^2	3	1	2,160
o Screening Op	2	12 x 30 = 360 km^2	3	1	2,160
Scout Plt[1] (ARTEP 17-57-10-MTP)	6				
o Security Op	6	135 km^2	2	1	1,620
o Recon Op	6	135 km^2	2	1	1,620
Air Cav Troop (ARTEP 1-108-30)	2				
o Recon Op	2	20 x 15 = 300 km^2	2	1	1,200
o Screening Op	2	10 x 20 = 200 km^2	2	1	800
Attack Helicopter Co (ARTEP 1-187-30-MTP)	6				
o Conduct Cbt Op	6	30 x 20 = 600 km^2	3	1	10,800
Long-Range Surv Det (ARTEP 7-93-MTP)	1				
o Recon	1				
o Surveillance	1	10 x 15 = 150 km^2	4	1	600
o TGT Acquisition	1				
o Damage Assessment	1				
Vulcan Plt SP[1] (ARTEP 44-167-12-MTP)	9				
o AD for Static Asset Against Low-Altitude Hostile Targets	9	5 x 5 = 25 km^2	2	1	450
o AD for Mobile Asset Against Low-Altitude Hostile Targets	9	1 x 8 = 8 km^2	2	1	144
o AD for Maneuver Unit Against Low-Altitude Hostile Targets	9	5 x 5 = 25 km^2	2	1	450

Table A-1. Heavy (Mechanized Infantry/Armor) Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Stinger Plt[1] **(ARTEP 44-117-11-MTP)**	4				
o AD for Static Asset	4	5 x 5 = 25 km^2	2	1	200
o AD for Mobile Asset	4	1 x 8 = 8 km^2	2	1	64
o AD for Maneuvering Element	4	5 x 5 = 25 km^2	2	1	200
FA Bn, 155mm SP[1] **(ARTEP 6-115-MTP)**	3				
o Fire Spt Op	3	15 x 18 = 270 km^2	4	2	6,480
FA Btry, 155mm SP (3x6)[1] **(ARTEP 6-37-30-MTP)**	9				
o Provide Fire Spt	9	3 x 16 = 48 km^2	4	2	3,456
FA Btry, 155mm SP (3x8)[1] **(ARTEP 6-367-30-MTP)**	9				
o Provide Fire Spt	9	4 x 16 = 64 km^2	4	2	4,608
HHB, 155mm SP[1]	3				
o Tac Op	3	3 x 2 = 6 km^2	4	2	144
Svc Btry, 155mm SP[1]					
o Tac Op	3	3 x 2 = 6 km^2	4	2	144
FA Bn, 203mm SP[1] **(ARTEP 06-115-MTP)**	1				
o Tac Op	1	15 x 18 = 270 km^2	4	2	2,160
FA Btry, 203mm SP[1] **(ARTEP 06-447-20-MTP)**	3				
o Tac Op	3	3 x 16 = 48 km^2	4	2	1,152
FA Btry, MLRS[1] **(ARTEP 6-398-30-MTP)**	1				
o Tac Op	1	16 x 20 = 320 km^2	4	2	2,560
FA Plt, MLRS	3				
o Provide Fire Spt	3	3 x 3 = 9 km^2	4	2	216

Table A-1. Heavy (Mechanized Infantry/Armor) Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
HHB, 203mm SP[1] (ARTEP 06-115-MTP)	1				
o Tac Op	1	3 x 2 = 6 km^2	4	2	48
Svc Btry, 203mm SP[1] (ARTEP 06-115-MTP)	1				
o Tac Op	1	3 x 2 = 6 km^2	4	2	48
Combat MP Co (ARTEP 19-17-30-MTP)	1				
o Area Security	1	12 x 12 = 144 km^2	2	1	288
o Battlefield Circulation Control	1	12 x 12 = 144 km^2	2	1	288
o Enemy Prisoner/ Civ Internee Op	1	2 x 2 = 4 km^2	2	1	8
Maint Spt Bn (ARTEP 63-125-MTP)	1				
o Tac Op	1	7 x 7 = 49 km^2	4	1	196
Fwd Spt Bn (ARTEP 63-005-MTP)	3				
o Tac Op	3	6 x 20 = 120 km^2	4	1	480
MI Bn (HHSC) HVY (ARTEP 34-145-MTP)	1				
o Est Bn Trains	1	4 x 4 = 16 km^2	4	1	56
o Est Tac Op	1	1.5 x 1 = 1.5 km^2	4	1	6
Collection & Jamming Co (ARTEP 34-145-MTP)	1				
o Provide SIGINT/EW Spt to the Div	1	3 x 11 = 33 km^2	4	1	132
Electronic Warfare Co (ARTEP 34-145-MTP)	1				
o Provide SIGINT/EW Spt to the Div	1	10 x 5 = 50 km^2	4	1	200

Table A-1. Heavy (Mechanized Infantry/Armor) Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Int & Surveillance Co (ARTEP 34-145-MTP)	1				
o Provide Div GSR Spt	1	3 x 10 = 30 km^2	4	1	120
o Conduct Interrog Op	1	1 x 1 = 1 km^2	4	1	4
o Conduct Ci Op	1	1 x 1 = 1 km^2	4	1	4
Long-Range Surveillance Det (ARTEP 34-145-MTP)	1				
o Provide Surv Spt to the Div	1	1 x 6 = 6 km^2	4	1	24
Div Signal, Bn (MSE) (ARTEP 11-037-30-MTP)	1	.36 X .36 = .147 km^2	5	5	1.47
Engr Co, Combat[1] **(ARTEP 5-145-31-MTP)**	4				
o Mobility	4	8 x 12 = 96 km^2	2	1	768
o Countermobility	4	8 x 12 = 96 km^2	2	1	768
o Survivability	4	8 x 12 = 96 km^2	2	1	768
o Sustainment Engineering	4	8 x 12 = 96 km^2	2	1	768
o Fight as Infantry	4	8 x 12 = 96 km^2	2	1	768
Engr Co, Bridge[1] **(ARTEP 5-145-32-MTP)**	1				
o Conduct Fixed-Bridge Op	1	8 x 12 = 96 km^2	2	1	192
o Conduct Float-Bridge Op	1	8 x 12 = 96 km^2	2	1	192
Engr Plt, Combat[1] **(ARTEP 5-145-11-MTP)**	12				
o Mobility	12	8 x 12 = 96 km^2	2	1	2,304
o Countermobility	12	8 x 12 = 96 km^2	2	1	2,304
o Survivability	12	8 x 12 = 96 km^2	2	1	2,304
o Sustainment Engineering	12	8 x 12 = 96 km^2	2	1	2,304
o Fight as Infantry	12	8 x 12 = 96 km^2	2	1	2,304

Table A-1. Heavy (Mechanized Infantry/Armor) Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Engr Plt, Bridge[1] **(ARTEP 5-145-12-MTP)**	3				
o Conduct Fixed-Bridge Op	3	8 x 12 = 96 km^2	2	1	576
o Conduct Float-Bridge Op	3	8 x 12 = 96 km^2	2	1	576
NBC Recon Plt (ARTEP 3-207-10-MTP)	1				
o Conduct NBC Recon	1	10 x 1 = 10 km^2	4	1	40
o Conduct NBC Survey	1	10 x 2 = 20 km^2	4	1	80
o Conduct Conventional Recon	1	5 x 5 = 25 km^2	4	1	100
Decon Plt (ARTEP 3-17-10-MTP)	4				
o Operate a Perm Decon	4	3 x 1 = 3 km^2	4	1	12
o Operate Concurrently 3 Hasty Decon/12 Hr	4	3 x 3 = 9 km^2	4	1	36
o Operate a Hasty Decon Site/24 Hr	4	3 x 1 = 3 km^2	4	1	12
o Decon Fixed Site	4	(NA)	4	1	(NA)
Smoke Generator Plt (ARTEP 3-67-10-MTP)	1				
o Provide Long-Duration Smoke Screen	1	10 x 10 = 100 km^2	4	1	400
o Conceal a River Crossing	1	5 x 5 = 25 km^2	4	1	100
o Conceal a Maneuver-ing Force	1	18 x 7 = 126 km^2	4	1	502
o Conceal a Breaching Op	1	5 x 5 = 25 km^2	4	1	100

[1]Figures derived using TRADOC Common Teaching Scenario, August 1985, OPLAN 6.

Table A-2. Light Infantry Division maneuver area requirements

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Light Infantry Bn[1] (ARTEP 7-20-MTP)	9				
o Attack	9	13 x 16 = 208 km^2	4	1	7,488
o Defend	9	8 x 8 = 64 km^2	4	1	6,912
o Movement to Contact	9	19 x 14 = 266 km^2	4	1	11,076
o Recon & Security	9	20 x 20 = 400 km^2	4	1	14,400
Light Infantry Rifle Co[1] (ARTEP 7-10-MTP)	27				
o Movement to Contact	27	7 x 10 = 70 km^2	4	2	15,120
o Attack	27	6 x 8 = 48 km^2	4	2	10,368
o Defend	27	4 x 4 = 16 km^2	4	2	3,456
o Recon & Security	27	6 x 8 = 48 km^2	4	2	5,184
o Raid	27	6 x 8 = 48 km^2	4	2	10,368
o Ambush	27	6 x 8 = 48 km^2	4	2	10,368
Light Infantry Rifle Plt[1] (ARTEP 7-8-MTP)	81				
o Movement to Contact	81	3 x 7 = 21 km^2	4	2	13,608
o Defense	81	2 x 3 = 6 km^2	4	2	3,888
o Attack	81	3 x 5.5 = 16.5 km^2	4	2	10,692
o Raid	81	3 x 5.5 = 16.5 km^2	4	2	10,692
o Ambush	81	3 x 5.5 = 16.5 km^2	4	2	10,692
o Retrograde	81	4 x 3 = 12 km^2	4	1	3,888
o Recon & Security	81	4 x 4 = 16 km^2	4	1	5,184
Mortar Plt (107mm) (ARTEP 7-90-MTP)	9				
o Provide Indirect Fire Spt (Offense)	9	4 x 15 = 60 km^2	2	1	1,200
o Provide Indirect FS (DEF)	9	4 x 7 = 28 km^2	2	1	560
Antiarmor Plt (TOW) (ARTEP 7-91-MTP)	9				
o Provide Direct Anti-armor	9	15 x 4 = 60 km^2	3	1	1,620

Table A-2. Light Infantry Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Scout Plt (ARTEP 7-92-MTP)	9				
o Area Reconnaissance	9	2 x 10 = 20 km^2	4	1	720
o Screen	9	2 x 10 = 20 km^2	4	1	720
o Long-Range Precision Fire	9	Range	2	NA	
Air Cav Troop (ARTEP 1-108-30-MTP)	2				
o Recon Op	2	15 x 20 = 300 km^2	2	1	1,200
o Screen Op	2	20 x 10 = 200 km^2	2	1	800
Long-Range Surv Det (ARTEP 7-93-MTP)	1				
o Surv Op	1	10 x 15 = 150 km^2	4	1	600
Vulcan Plt[1] (ARTEP 44-117-12)	6				
o AD of Critical Asset	6	5 x 5 = 25 km^2	2	1	300
o AD of Maneuver Force	6	5 x 5 = 25 km^2	2	1	300
o AD of March Column	6	1 x 8 = 8 km^2	2	1	96
Stinger Plt[1] (ARTEP 44-117-11)	2				
o AD of Static Asset	2	5 x 5 = 25 km^2	2	1	100
o AD of Mobile Asset	2	1 x8 = 8 km^2	2	1	32
o AD of Maneuvering Asset	2	5 x 2 = 10 km^2	2	1	40
FA Bn, 155mm (Towed) (ARTEP 06-115-MTP)	1	15 x 18 = 270 km^2	4	2	2,160
o HHB, 155mm (Towed)	1	3 x 2 = 6 km^2	4	2	48
o Svc Btry, 155mm (Towed)	1	3 x 2 = 6 km^2	4	2	48
FA Btry, 155mm (Towed) (3x6) (ARTEP 06-167-30-MTP)	3	3 x 16 = 48 km^2	4	2	1,152
FA Btry, 155mm (Towed) (3x8) (ARTEP 06-367-30-MTP)	3	4 x 16 = 64 km^2	4	2	1,536

Table A-2. Light Infantry Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
FA Plt, 155mm (Towed) (ARTEP 06-367-20-MTP)	6	2 x 16 = 32 km^2	4	2	1,536
FA Bn, 105mm (Towed) (ARTEP 06-115-20 MTP)	3				
o Conduct Fire Support Op	3	15 x 18 = 270 km^2	4	2	6,480
HHB, 105mm (Towed) (ARTEP 06-115-MTP)	3				
o Fire Spt Op	3	3 x 2 = 6 km^2	4	2	144
Svc Btry, 105mm (Towed) (ARTEP 06-115-MTP)	3				
o Tac Op	3	3 x 2 = 6 km^2	4	2	144
FA Btry, 105mm (Towed) (ARTEP 06-115-MTP)	9				
o Provide Fire Support	9	3 x 16 = 48 km2	4	2	3,456
Combat MP Co (ARTEP 19-17-10-MTP)	1				
o Area Security	1	12 x 12 = 144 km^2	2	1	288
o Battlefield Circulation Control	1	12 x 12 = 144 km^2	2	1	288
o Enemy Prisoner of War/Civilian Internee Op	1	2 x 2 = 4 km^2	2	1	8
Maint Bn	1				
o Tac Op	1	4 x 4 = 16 km^2	4	1	64
S&T Bn (ARTEP 29-6)	1				
o Tac Op	1	4 x 4 = 16 km^2	4	1	64
Fwd Spt Medical Co (ARTEP 8-27-30-MTP)	1				
o Tac Op	1	.1 x .1 = .1 km^2	4	1	.4

Table A-2. Light Infantry Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
MI Bn (HHSC) Lt (ARTEP 34-145-MTP)	1				
o Bn Trains	1	4 x 4 = 16 km^2	4	1	56
o Tac Op	1	1.5 x 1 = 1.5 km^2	4	1	5
Collection Co (ARTEP 34-145-MTP)	1				
o Provide SIGINT/EW	1	3 x 11 = 33 km^2	4	1	132
IN & Surveillance Co (ARTEP 34-145-MTP)	1				
o Provide Div GSR Spt	1	3 x 10 = 30 km^2	4	1	120
o Provide Interrogation Op	1	1 x 1 = 1 km^2	4	1	4
o Conduct Ci Op	1	1 x 1 = 1km^2	4	1	4
Long-Range Surveillance Det (ARTEP 34-145-MTP)	1				
o Provide Surveillance to Div Spt	1	1 x 4 = 4 km^2	4	1	16
Div Sig Bn (MSE) (ARTEP 11-37-30-MTP)	1				
o Tac Op	1	.376 x .376 = .147 km^2	4	1	.988
Engr Bn Lt/Abn AA Motor[1] **(ARTEP 5-25-31-MTP)**	1				
o Mobility	1	7 x 10 = 70 km^2	2	1	140
o Countermobility	1	7 x 10 = 70 km^2	2	1	140
o Survivability	1	7 x 10 = 70 km^2	2	1	140
o Sustainment Engineering	1	7 x 10 = 70 km^2	2	1	140
o Fight as Infantry	1	7 x 10 = 70 km^2	2	1	140

Table A-2. Light Infantry Division maneuver area requirements (cont)

UNIT/TASK	DENSITY OF UNITS	LAND REQUIREMENTS	ITERATIONS TO MAINTAIN PROFICIENCY	DAYS REQUIRED PER ITERATION	GROSS LAND REQUIRED PER TASK KM^2 DAYS
Engr Co LI/Abn AA Motor[1] (ARTEP 5-25-31-MTP)	3				
o Mobility	3	7 x 10 = 70 km^2	2	1	420
o Countermobility	3	7 x 10 = 70 km^2	2	1	420
o Survivability	3	7 x 10 = 70 km^2	2	1	420
o Sustainment Engineering	3	7 x 10 = 70 km^2	2	1	420
o Fight as Infantry	3	7 x 10 = 70 km^2	2	1	420
Engr Plt, Combat (Lt)[1] (ARTEP 5-25-11-MTP)	2				
o Mobility	2	7 x 10 = 70 km^2	2	1	280
o Countermobility	2	7 x 10 = 70 km^2	2	1	280
o Survivability	2	7 x 10 = 70 km^2	2	1	280
o Sustainment Engineering	2	7 x 10 = 70 km^2	2	1	280
o Fight as Infantry	2	7 x 10 = 70 km^2	2	1	280
Attack Helicopter Bn (ARTEP 17-385)	1	31 x 14 = 434 km^2	2	1	868

[1]Figures derived using counterinsurgency (nonlinear battlefield) study scenario, Panther, December 1989, and Puerto Rico map sheets 1222IV, 1122I, 1122II, and 1122III, series E375, edition 1-AMS, 1:50,000 scale.

APPENDIX B

METHODOLOGY FOR BRIGADE AND HIGHER SCENARIOS

Training for modern warfare requires large areas to conduct free-flowing exercises over varying terrain. A training environment that restricts employment of a brigade-size unit does not reflect battlefield conditions and fails to prepare subordinate units for combat. It is possible to train for each of the prescribed missions in Appendix A in isolation. However, for realistic training the brigade should undertake an extended field exercise. The exercise should incorporate all critical missions in a logical sequence against an opposing force (OPFOR).

Figure B-1 shows the principal maneuver area requirements of the mechanized infantry/armor battalion task force from ARTEP 71-2. It illustrates the land required for a scenario incorporating missions from Figure A-1 into a free-flowing exercise.

Using the battalion maneuver boxes as building blocks, trainers can construct the requirements for brigade scenarios. A careful analysis of the composition of the brigade slice and the nature of each maneuver exercise is needed. Trainers must place maneuver exercises in logical sequence without duplicating land requirements for the OPFOR or training units. According to this process, the brigade illustrated in Figure B-2 requires 160,121 acres of training land.

When developing land requirements, remember that –

- The example in Figure B-2 is a heavy brigade (mechanized infantry and armor) composed of three battalions tailored to two battalion task forces and a battalion (-) in reserve.
- This brigade uses an appropriate OPFOR (according to AR 350-2) and a four-mission scenario of at least three days' duration.

Figure B-3 shows the area required by the same brigade to train movement to contact, offense, defense, or retrograde (delay) operations. These operations may require training as isolated events, not as a free-flowing multievent training scenario. Figure B-3 illustrates the minimum amount of land necessary to accommodate brigade-level training of these events.

In the case illustrated in Figure B-3, the land requirement is 126,515 acres. The brigade may practice all of its missions within this area. However, it must stop after each maneuver exercise to reposition forces for the next mission. By exercising all missions over the

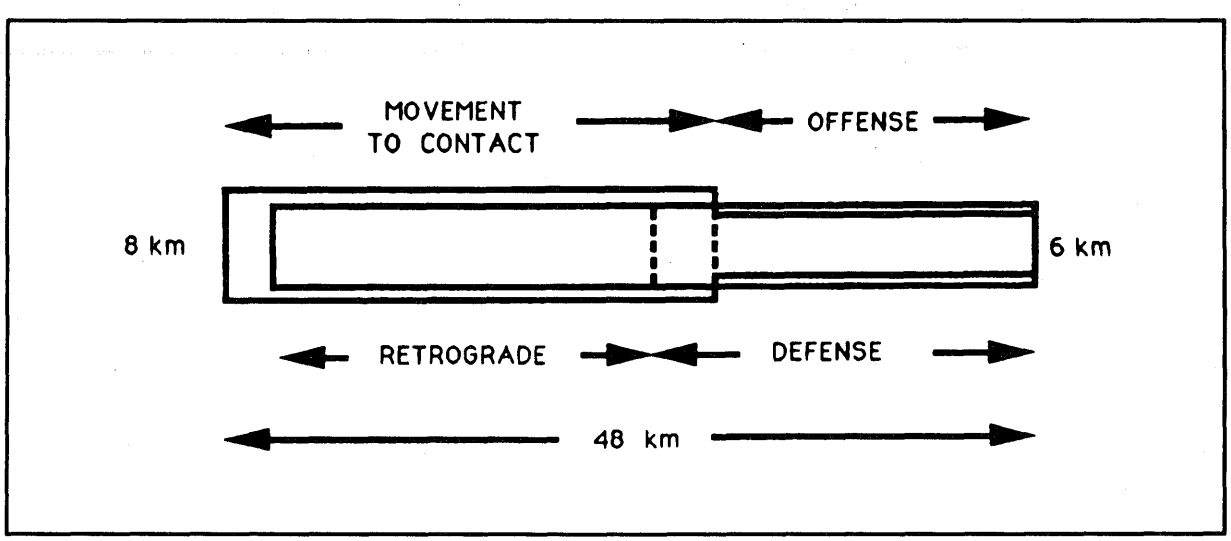


Figure B-1. Battalion task force maneuver area requirements (flowing scenario)

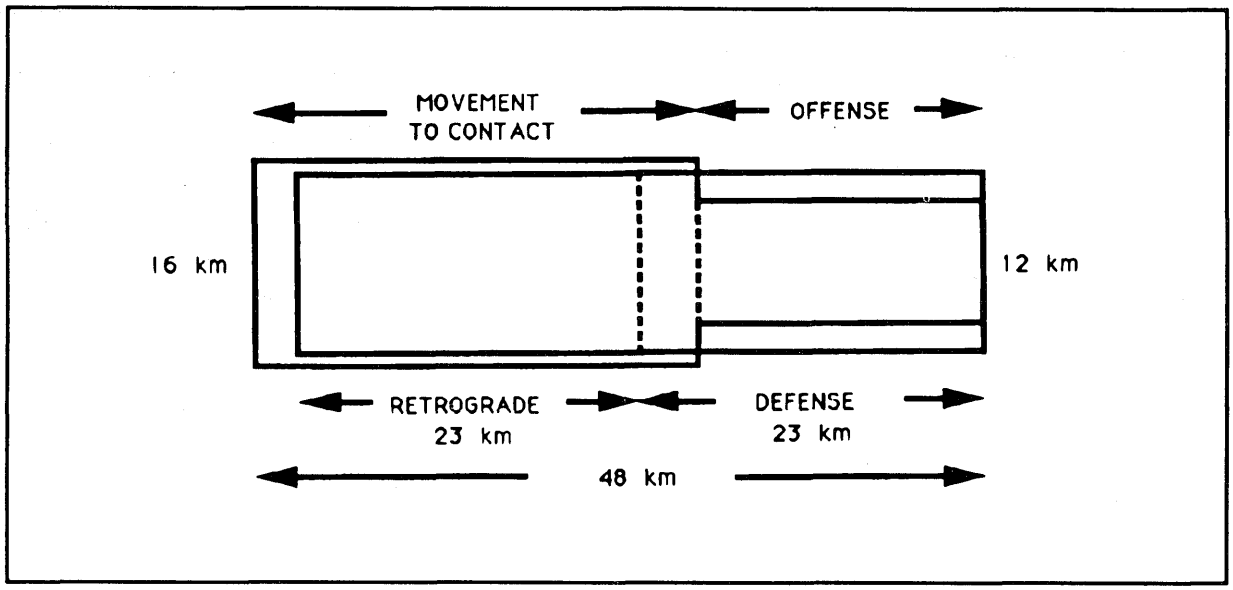


Figure B-2. Brigade maneuver requirements (flowing scenario)

same terrain, training of some essential skills, such as map reading, is not optimal.

Division-level maneuver training exercises are usually limited to command post exercises (CPXs), fire control exercises (FCXs), and tactical exercises without troops (TEWT). Compute annual usage requirements by extracting specific troop list unit densities from the appropriate heavy or light division maneuver area requirements tables (see Tables A-1 and A-2).

Expansion of existing posts to provide larger maneuver areas is often not a viable option. Because of this, units may have to undertake ARTEP missions as separate events. Periodic access to a large maneuver area at a combat training center partially offsets the disadvantages of training repeatedly over

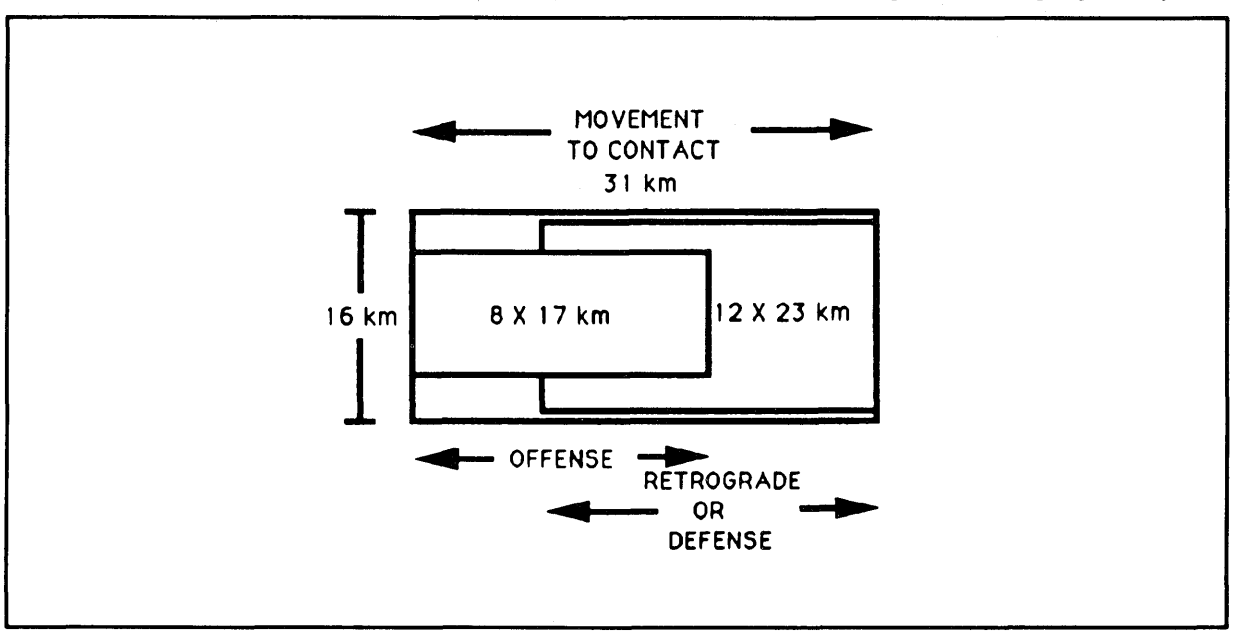


Figure B-3. Brigade maneuver requirements (isolated events)

the same terrain. Lack of frequent access to combat training centers forces commanders to schedule most unit training at home stations despite unavoidable limitations.

The use of available maneuver land may be constrained by—

- Types and extent of maneuver.
- Number and size of subordinate organizations within maneuver forces.
- Surrogate or notional organizations used to provide simulations, obtain cues, or create situations to initiate activities.
- Limits on the duration of exercises or maneuver scenarios to conserve resources.
- Environmental considerations.
- Other land-use requirements, such as simultaneous live-fire training.
- Safety requirements.

APPENDIX C

ESTABLISHING REQUIREMENTS FOR ACQUISITION OF TRAINING LAND

The process for determining whether current land holdings at an installation are enough to support training is divided into three phases:

- Land-use requirements study.
- Analysis of alternatives study.
- Environmental assessment/impact study.

When planning and developing requests for additional land at an established installation –

- Key decisions to a clearly defined study process.
- Make sure the study process integrates mission and environmental considerations.
- Address all alternatives, including improvement of existing internal land management practices.
- Make sure justification is complete, well documented, and analytical. Requirements cannot be based on judgmental factors alone.
- Record all training maneuver area constraints in unit readiness reports.
- Define and encourage public participation early in the planning process.
- Complete annual real property utilization surveys of installations required by AR 405-70 and keep them current.

The following documentation is required for all three phases:

LURS. The installation prepares the LURS to determine whether a training land shortfall exists. The LURS format is shown in Figure C-1. Training and maneuver area requirements are identified and compared to available areas. Chapter 3 provides a step-by-step methodology to determine if a land shortfall exists. Steps 6 and 11 are the most difficult to address because they demand highly judgmental answers. Any significant deficiencies in size or configuration of maneuver areas should be expressed in terms of the ARTEP events that are affected by the shortfall. Internal management actions already taken to provide additional training areas are addressed to show that there is, in fact, a shortfall. The MACOM should identify alternatives beyond the purview of the installation commander and the MACOM to be addressed in the LURS. The MACOM and the DA Program Coordinator for Army training land validate the LURS and submit their findings and recommendations to HQDA (DAMO-TR) for Army Staff review. The ARSTAF forwards the LURS and any recommendations to the ASA(IL&E) for concept approval.

AAS. HQDA will designate the appropriate agency (for example, MACOM and/or external agency) and assign responsibility to conduct a thorough, objective analysis of all reasonable alternatives. It provides general guidance for conducting the AAS in coordination with the installation. The AAS format is shown in Figure C-2. The AAS –

- Restates the training land shortfall identified in the LURS.
- Identifies alternatives.
- Analyzes and compares alternatives.
- Presents recommendations.

The MACOM and HQDA will identify other alternatives for consideration and analysis. If land acquisition is determined to be the preferred means of satisfying the land shortfall and is approved by the ASA(IL&E), the results of the AAS will be included in the EIS.

EA/EIS. In coordination with the designated Corps of Engineers geographical division or district, the installation will prepare the EA/EIS. The EA/EIS must meet requirements and follow the format in AR 200-1. If the proposed action will alter a draft or final EIS that is on file with the EPA, a draft supplement may be filed. The supplement is preceded by a summary with the same format used in the draft or final EIS. The summary should address changes to the basic document in a logical manner. A copy of the supplement should be sent to each addressee of the draft or final EIS and to each individual or organization who submitted substantiative comments on it. If the supplement is to a draft EIS already circulated for public comment, the coordination and consideration of comments appendix should be part of the

supplement. Addressees will then know how their comments have been considered.

HQDA (DAEN-ZC) and HQUSACE (CERE-AM) will direct an appropriate Corps of Engineers geographical division or district commander to prepare a real estate planning report (REPR) or lease planning report (LPR) only when the preferred alternative is to acquire additional land and the land area has been identified.

After the AAS has been approved by the ASA(IL&E), the Congress and the public will be informed that the Army is initiating an EIS to acquire land as the preferred alternative to meet a training land shortfall. The notice of intent will inform the public of projected hearings on the proposed action according to AR 200-1 after the appropriate documents have been filed with the EPA.

LAND-USE REQUIREMENTS STUDY
(Name of installation), (state)

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  - a. Unit-Level Training Acreage
    - (1) Maneuver Areas
      - (a) Requirements
      - (b) Actual Experience
      - (c) Reconciliation of Differences

Figure C-1. Sample LURS format

(2) (Live-Fire) Ranges
(a) Requirements
(b) Actual Experience
(c) Reconciliation of Differences

b. Unit-Level Training Days
(1) Maneuver Areas
(a) Requirements
(b) Actual Experience
(c) Reconciliation of Differences
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(b) Actual Experience
(c) Reconciliation of Differences

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7.01 Conclusions
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APPENDICES

Appendix A - (*Installation Name*) Facilities
(*Other information as necessary to supplement basic study*)

Note: Some candidate actions include: use 7-day training week; centralize training management; redesign range complex; dedud part or all of impact area; use maneuver agreements.

Figure C-1. Sample LURS format (cont)

ANALYSIS OF ALTERNATIVES STUDY
TRAINING AREA NEEDS, (*Name of installation*), (*state*)

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Section III - Identification of Potential Alternatives to Meet Shortfall
(Subparagraphs are only representative alternatives to be considered. All feasible alternatives need to be discussed, including a combination or combinations of alternatives considered.)
- 3.01 Alternative A - No Action
  - a Impacts on the Human and Natural Environment
  - b. Impacts on Mission and Resource Requirements
- 3.02 Alternative B - Dedud Part of Impact Area
  - a. Impacts on the Human and Natural Environment
  - b. Impacts on Mission and Resource Requirements
- 3.03 Alternative C - Redesign Range Complex
  - a. Impacts on the Human and Natural Environment
  - b. Impacts on Mission and Resource Requirements
- 3.04 Alternative D - Reliance on ManeuverAgreements
  - a. Impacts on the Human and Natural Environment
  - b. Impacts on Mission and Resource Requirements
- 3.05 Alternative E - Transfer Units or Mission Changes
  - a. Impacts on the Human and Natural Environment
  - b. Impacts on Mission and Resource Requirements
- 3.06 Alternative F - Use of Other Military Training Locations for Fire/Maneuver Training
  - a. Impacts on the Human and Natural Environment
  - b. Impacts on Mission and Resource Requirements

Figure C-2. Sample AAS format

3.07 Alternative G - Acquire Land Contiguous to Installation
(A separate alternative for each parcel under consideration)
a. Impacts on the Human and Natural Environment
b. Impacts on Mission and Resource Requirements
3.08 Alternative H - Acquire Land Not Contiguous to Installation
a. Impacts on the Human and Natural Environment
b. Impacts on Mission and Resource Requirements
3.09 Alternative I - Use of Training Devices or Simulations
a. Impacts on the Human and Natural Environment
b. Impacts on Mission and Resource Requirements

Section IV - Analysis of Alternatives
4.01 Alternative A - No Action
(Conduct an analysis on all alternatives or combinations identified in Section III above)

Section V - Conclusions and Recommendations
5.01 Conclusions
5.02 Recommendations

APPENDICES

(*Information necessary to supplement basic study*)

Figure C-2. Sample AAS format (cont)

GLOSSARY

AA	air assault
AAS	analysis of alternatives study
abn	airborne
AC	Active Component
AD	air defense
AEHA	Army Environmental Hygiene Agency
AMSAA	Army Materiel Systems Analysis Agency
AR	Army regulation; armor
ARNG	Army National Guard
ARSTAF	Army Staff
ARTEP	Army Training and Evaluation Program
ASA (IL&E)	Assistant Secretary of the Army (Installations, Logistics, and Environment)
ATLAM	Army training land analysis model
BCTP	Battle Command Training Program
BFV	Bradley Fighting Vehicle
BLTM	battalion-level training model
bn	battalion
btry	battery
C	Celsius
CALFEX	combined arms live-fire exercise
CATS	combined arms training strategy
cav	cavalry
cbt	combat
ci	counterintelligence
civ	civilian
CMTC	combat maneuver training center
co	company
COE	Chief of Engineers
comm	communication
cont	continued
CONUS	continental United States
CP	command post
CPX	command post exercise
CTC	combat training center
DA	Department of the Army
DASA (ES&OH)	Deputy Assistant Secretary of the Army (Environment, Safety, and Occupational Health)

decon	decontamination
DEH	Directorate of Engineering and Housing
DEIS	draft environmental impact statement
DESOH	Deputy of Environment, Safety, and Occupational Health
det	detachment
DIRT	defense installations, ranges, and training areas (data base)
div	division
DOD	Department of Defense
DPTM	Directorate of Plans, Training, and Mobilization
EA	environmental assessment
EIS	environmental impact statement
engr	engineer
EPA	Environmental Protection Agency
est	establish
EW	electronic warfare
F	Fahrenheit
FA	field artillery
FAMSIM	family of simulations
FCX	fire control exercise
FEIS	final environmental impact statement
FIRE	firing information and range execution
FLOT	forward line of own troops
FNSI	finding of no significant impact
FORSCOM	US Army Forces Command
FS	fire support
fwd	forward
GIS	geographic information system
GRASS	Geographic Resources Analysis Support System
GSR	ground surveillance radar
HHB	headquarters and headquarters battery
HHSC	headquarters and headquarters service company
HQDA	Headquarters, Department of the Army
hr	hour
HTA	Hohenfels Training Area
hvy	heavy
IN	infantry
ind	indirect
int	intelligence

interrog	interrogation
ITAM	Integrated Training Area Management (Program)
JRTC	joint readiness training center
km	kilometer
LCTA	land condition trend analysis
LIB	light infantry battalion
log	logistics
LPR	lease planning report
lt	light
LTA	local training area
LURS	land use requirements study
MACOM	major Army command
maint	maintenance
MCA	Military Construction, Army
M-day	mobilization day
mech	mechanized
METL	mission-essential task list
mi	mile
MI	military intelligence
MILES	Multiple Integrated Laser Engagement System
mm	millimeter
MMP	master mobilization plan
MPRC	multipurpose range complex
MP	military police
MRA	maneuver rights area
MRLS	multiple rocket launcher system
MSE	mobile subscriber equipment
MTA	major training area
MTP	mission training plan
NBC	nuclear, biological, chemical
NEPA	National Environmental Policy Act (of 1969)
NGB	National Guard Bureau
NHPA	National Historic Preservation Act
NOA	notice of availability
NOI	notice of intent
NRHP	National Register of Historic Places
NTC	national training center

OCONUS	outside continental United States
off	offense
op	operation
OPFOR	opposing force
OPTEMPO	operating tempo
pam	pamphlet
PAO	public affairs office
PDEIS	preliminary draft environmental impact statement
perm	permanent
plt	platoon
RC	Reserve Component
RCU	Reserve Component unit
REC	record of environmental consideration
REPR	real estate planning report
ROD	record of decision
rqmts	requirements
S&T	supply and transport
SDZ	surface danger zone
sig	signal
SIGINT	signals intelligence
SP	self-propelled
spt	support
sqdn	squadron
sq ft	square foot
surv	surveillance
svc	service
tac	tactical
TADSS	training aids, devices, simulators, and simulations
TCC	tactical concealment corridor
TCI	tactical concealment island
temp	temperature
TEWT	tactical exercise without troops
TF	task force
tgt	target
tng	training
TOW	tube-launched, optically tracked, wire-guided
TPDC	training and performance data center
TRADOC	US Army Training and Doctrine Command
TRC	training readiness condition

USACE	US Army Corps of Engineers
USACERL	US Army Construction Engineering Research Laboratory
USATSC	US Army Training Support Center
UTM	Universal Transverse Mercator
UXO	unexploded ordnance
WETS	weekend training sites

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