

## CHAPTER 1

### INTRODUCTION

*If I always appear prepared, it is because before entering on an undertaking, I have meditated for long and foreseen what may occur.*

— Napoleon Bonaparte, 1831

IPB is the best process we have for understanding the battlefield and the options it presents to friendly and threat forces.

#### **What is IPB?**

IPB is a systematic, continuous process of analyzing the threat and environment in a specific geographic area. It is designed to support staff estimates and military decision making. Applying the IPB process helps the commander selectively apply and maximize his combat power at critical points in time and space on the battlefield by—

- Determining the threat's likely COA.
- Describing the environment your unit is operating within and the effects of the environment on your unit.

IPB is a continuous process which consists of four steps which you perform each time you conduct IPB:

- Define the battlefield environment.
- Describe the battlefield's effects.
- Evaluate the threat.
- Determine threat COAs.

The IPB process is continuous. You conduct IPB prior to and during the command's initial planning for an operation, but you also continue to perform IPB during the conduct of the operation. Each function in the process is performed continuously to ensure that—

- The products of IPB remain complete and valid.
- You provide support to the commander and direction to the intelligence system throughout the current mission and into preparation for the next.

A brief overview of each function is presented below. For a thorough discussion, see Chapter 2.

#### **Step 1. Define the Battlefield Environment**

In step 1 of the IPB process, the G2/S2—

- Identifies characteristics of the battlefield which will influence friendly and threat operations.
- Establishes the limits of the area of interest (AI).
- Identifies gaps in current intelligence holdings.

This focuses the command's initial intelligence collection efforts and the remaining steps of the IPB process.

To focus the remainder of the IPB process, the G2/S2 identifies characteristics of the battlefield which require in-depth evaluation of their effects on friendly and threat operations, such as terrain, weather, logistical infrastructure, and demographics. Generally, these are analyzed in more detail for areas within the command's area of operations (AO) and battle space than for other areas in the AI.

The G2/S2 establishes the limits of the AI to focus analytical and intelligence collection efforts on the geographic areas of significance to the command's mission. He bases the AI's limits on the amount of time estimated to complete the command's mission and the location and nature of the characteristics of the battlefield which will influence the operation. If the command has not been assigned an AO, the G2/S2 coordinates with the G3/S3 to develop a joint recommendation on its limits for the commander's approval. Similarly, the G2/S2 confers with the G3/S3 on recommendations for the command's battle space during development of friendly COAs.

Defining the significant characteristics of the battlefield environment also aids in identifying gaps in current intelligence holdings and the specific intelligence required to fill them. Similarly, the G2/S2 identifies gaps in the command's knowledge of the threat and the current threat situation.

Once approved by the commander, the specific intelligence required to fill gaps in the command's knowledge of the battlefield environment and threat situation becomes the command's initial intelligence requirements.

## Step 2. Describe the Battlefield's Effects

Step 2 evaluates the effects of the environment with which both sides must contend. The G2/S2 identifies the limitations and opportunities the environment offers on the potential operations of friendly and threat forces. This evaluation focuses on the general capabilities of each force until COAs are developed in later steps of the IPB process.

This assessment of the environment always includes an examination of terrain and weather but may also include discussions of the characteristics of geography and infrastructure and their effects on friendly and threat operations.

Characteristics of geography include general characteristics of the terrain and weather, as well as such factors as politics, civilian press, local population, and demographics. An area's infrastructure consists of the facilities, equipment, and framework needed for the functioning of systems, cities, or regions. Products developed in this step might include, but are not limited to—

- Population status overlay.
- Overlays that depict the military aspects and effects of terrain.
- Weather analysis matrix.
- Integrated products such as modified combined obstacle overlays (MCOOs).

Regardless of the subject or means of presentation, the G2/S2 ensures that these products focus on the *effects* of the battlefield environment.

## Step 3. Evaluate the Threat

In step 3, the G2/S2 and his staff analyze the command's intelligence holdings to determine how the threat normally organizes for combat and conducts operations under similar

circumstances. When facing a well-known threat, the G2/S2 can rely on his historical data bases and well developed threat models. When operating against a new or less well-known threat, he may need to develop his intelligence data bases and threat models concurrently.

The G2/S2's evaluation is portrayed in a threat model that includes doctrinal templates which depict how the threat operates when unconstrained by the effects of the battlefield environment. Although they usually emphasize graphic depictions (doctrinal templates), threat models sometimes emphasize matrices or simple narratives.

#### Step 4. Determine Threat COAs

Step 4 integrates the results of the previous steps into a meaningful conclusion. Given what the threat normally prefers to do, and the effects of the specific environment in which he is operating now, what are his likely objectives and the COAs available to him? In step 4, the G2/S2 develops enemy COA models that depict the threat's available COAs. He also prepares event templates and matrices that focus intelligence collection on identifying which COA the threat will execute.

The enemy COA models developed in step 4 are the products that the staff will use to portray the threat in the decision making and targeting processes. The G2/S2 cannot produce these models, effectively predicting the threat COAs, unless he has—

- Adequately analyzed the friendly mission throughout the time duration of the operation; identified the physical limits of the AO and AI; and identified every characteristic of the battlefield environment that might affect the operation (step 1).
- Identified the opportunities and constraints the battlefield environment offers to threat and friendly forces (step 2).
- Thoroughly considered what the threat is capable of and what he prefers to do in like situations if unconstrained by the battlefield environment (step 3).

In short, the enemy COA models which drive the decision making process are valid only if the G2/S2 establishes a good foundation during the first three steps of the IPB process.

#### **Who Conducts IPB?**

Everyone in the US Army conducts some form of IPB. For example:

- A rifleman in an infantry fire team considers the possible actions of the enemy soldier he is about to engage. He also considers how the local terrain and weather affect both himself and his adversary.
- An armor company commander considers the possible actions of the enemy battalion that he is about to engage. He also considers how terrain affects the enemy's COAs and the accomplishment of his own mission.

Both of these examples illustrate an informal application of IPB; that is, describe the effects of the battlefield and determine the threat's COAs. It is the application of battlefield common sense. At this level it requires little formal education beyond realistic field training exercises (FTXs) against a "savvy" enemy.

As the size of the unit increases, the level of detail required in the IPB effort increases significantly. An armored company commander's informal IPB produces little more than an appreciation of what the threat is most likely to do during their engagement. A division staffs IPB can produce—

- Detailed terrain analysis products.
- Climatic summaries.
- Detailed studies of the threat, his equipment, and his doctrine.
- A comprehensive set of enemy COA models depicting a broad range of possible threat COAs.

Any unit large enough to have a staff (S1, S2, S3, and S4) develops at least some of the formal IPB products described in this manual. The G2/S2 has staff responsibility for the command's IPB--that IPB which directly supports the decision making process. The G2/S2, however, is not the only one who conducts or needs to understand and use IPB.

**Every commander and every member of the staff needs to understand and apply IPB during the staff planning process.** IPB identifies the facts and assumptions about the battlefield and the threat that allow effective staff planning. IPB forms the basis for defining the COAs available to the friendly command and drives the wargaming process that selects and refines them.

The G2/S2 is responsible for facilitating the unit IPB effort, but he and his staff cannot provide all the IPB the unit requires. Every commander and staff officer needs to think through the effects the environment has on both threat and friendly operations.

Furthermore, every staff officer should prepare detailed IPB products tailored for his own functional area. For example:

- A division electronic warfare (EW) officer will expand and refine the division all-source production section's (ASPS) IPB products to include electronic preparation of the battlefield.
- The engineer liaison for a brigade staff refines and customizes the S2's enemy COA models to show threat options for the employment of obstacles or breaching equipment.
- The counterintelligence analysis section (CIAS) refines the ASPS's IPB products to focus on the threat's intelligence system and its collection capabilities.
- A division air defense artillery (ADA) officer uses the ASPS's IPB products as the basis for developing enemy air COA models and supporting event templates and matrices.
- Staff officers in the support operations section refine the ASPS's IPB products to focus on the logistics support mission and prepare IPB products for their specific functional areas.
- The chemical staff officer refines the ASPS's enemy COA models to show the enemy's options for employing nuclear, biological, and chemical (NBC) weapons. This allows refinement of the NBC reconnaissance support plan and enhances contamination avoidance tactics and techniques.

The bottom line is that every soldier conducts IPB. Every soldier thinks through an informal IPB procedure, but commanders and staff officers undertake a more formal process.

### **Doctrine Versus Tactics, Techniques, and Procedures**

The doctrinal principles of IPB are sound and can be applied to all situations at all levels. The tactics, techniques, and procedures (TTP) of applying IPB may vary according to the mission, enemy, terrain, troops, and time available (METT-T) situation.

The doctrinal principles of IPB call for—

- Evaluating the battlefield's effects on friendly and threat operations.
- Determining the threat's possible COAs and arranging them in order of probability of adoption.
- Identifying assets the threat needs to make each COA successful (high value targets [HVTs]) and where they can be expected to appear on the battlefield (target areas of interest [TAIs]).
- Identifying the activities, or lack of, and the locations where they will occur that will identify which COA the threat has adopted.

The decision to use a sketch instead of an overlay to depict the battlefield's effects or the threat's available COAs is a matter of TTP. Such decisions can only be made within the context of a given situation. Similarly, the amount of detail that goes into each step of the IPB process, the techniques for depicting areas of RESTRICTED terrain, and other such decisions are also driven by factors of METT-T and local policies and procedures.

### What IPB Accomplishes

IPB identifies facts and assumptions about the battlefield environment and the threat. This enables staff planning and the development of friendly COAs.

IPB provides the basis for intelligence direction and synchronization that supports the command's chosen COA.

IPB contributes to complete staff synchronization and the successful completion of several other staff processes, which are described below.

### IPB and the Intelligence Estimate

In order to facilitate staff planning, the G2/S2 prepares the intelligence estimate before the remainder of the staff complete their own estimates if at all possible. The intelligence estimate forms the basis for the facts and assumptions of the decision making process, driving the other staff estimates and the remaining steps in the decision making process. The products of IPB are the basis of the intelligence estimate. In fact, if the G2/S2 lacks the time required to prepare a written estimate, he can usually substitute graphics that depict the results of his IPB evaluations and analysis.

Paragraph 1, **MISSION**, of the intelligence estimate restates the command's mission.

Paragraph 2, **AREA OF OPERATIONS**, which is derived from step 2 of the IPB process, describes the battlefield's effects. The most important subparagraphs of paragraph 2 are the "effects on enemy COAs" and "effects on own COAs." These sections describe the battlefield's impact on operations.

Paragraph 3, **ENEMY SITUATION**, is derived from step 3 of the IPB process, **evaluate the threat**. This is primarily a discussion of what is known about the threat (facts) and the results of analysis of those facts (assumptions).

Paragraph 4, **ENEMY CAPABILITIES**, is derived from step 4 of the IPB process, **determine threat COAs**. This is a listing and discussion of the COAs available to the threat. These COAs should exactly correspond with the enemy COA models developed in step 4 of the IPB process.

Paragraph 5, **CONCLUSIONS**, is derived from the evaluations made during the IPB process. Here you summarize the effects of the battlefield environment on friendly and enemy COAs, list the set of probable threat COAs (in order of probability of adoption), and list the threat's exploitable vulnerabilities.

### **IPB and the Decision Making Process**

Commanders and staffs use the decision making process to select a COA and develop an operations plan (OPLAN), operations order (OPORD), or fragmentary order (FRAGO) that implements it. The results and products of IPB, conveyed in the intelligence estimate, are essential elements of the decision making process. Accordingly, the major IPB effort occurs before and during the first of five steps in the decision making process.

The decision making process is a dynamic and continuous process. The staff continues to estimate the situation as the operation progresses, adapting the command's COA to unforeseen changes in the situation. The IPB which supports the decision making process must also remain dynamic, constantly integrating new information into the initial set of facts and assumptions.

The relationship of the IPB process to each step in the decision making process is discussed below (see Figure 1-1).

#### **Mission Analysis:**

In this step IPB products enable the commander to assess facts about the battlefield and make assumptions about how friendly and threat forces will interact on the battlefield.

The description of the battlefield's effects identifies constraints on potential friendly COAs and may reveal implied missions. It also identifies opportunities the battlefield environment presents, such as avenues of approach, engagement areas, and zones of entry, which the staff integrates into potential friendly COAs and their staff estimates.

Enemy capabilities and vulnerabilities identified during evaluation of the threat allow the commander and staff to make assumptions about the relative capabilities of the friendly command. Threat evaluation also provides the detailed information on the threat's current dispositions, recent activities, equipment, and organizational capabilities the staff needs to complete their own staff estimates and planning.

Enemy COA models developed in step 4 of the IPB process, **Determine Threat COAs**, provide a basis for formulating potential friendly COAs and complete the intelligence estimate.

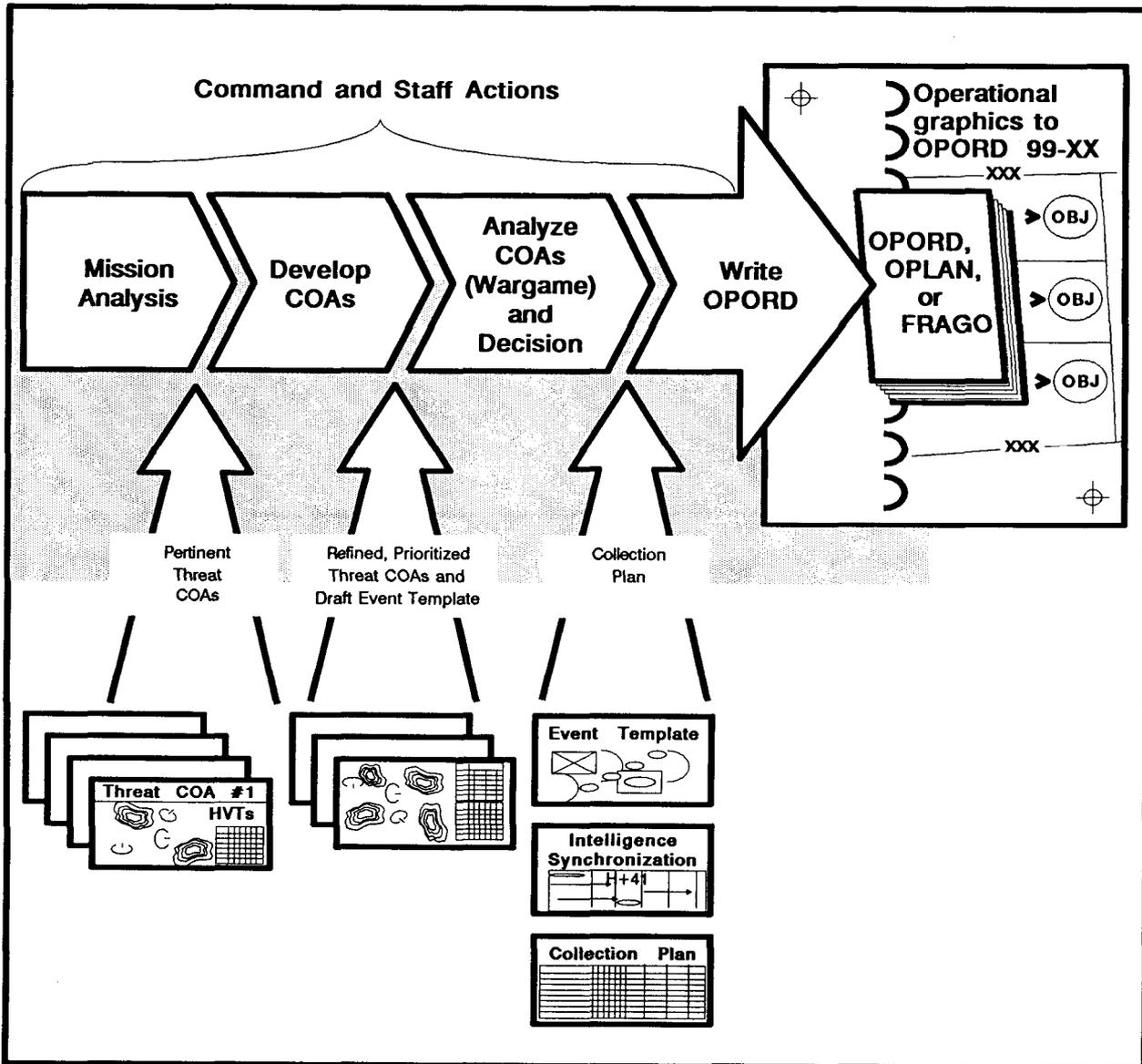
The IPB process identifies any critical gaps in the command's knowledge of the battlefield environment or threat situation. As part of his initial planning guidance, the commander uses these gaps as a guide to establish his initial intelligence requirements.

#### **Develop Courses of Action:**

The staff develops friendly COAs based on the facts and assumptions identified during IPB and mission analysis. Incorporating the results of IPB into COA development ensures that each friendly COA takes advantage of the opportunities the environment and threat situation offer and is valid in terms of what they will allow.

#### **Analyze and Compare COAs:**

During the wargaming session the staff "fights" the set of threat COAs, developed in step 4 of the IPB process, against each potential friendly COA. Targeting conferences follow or

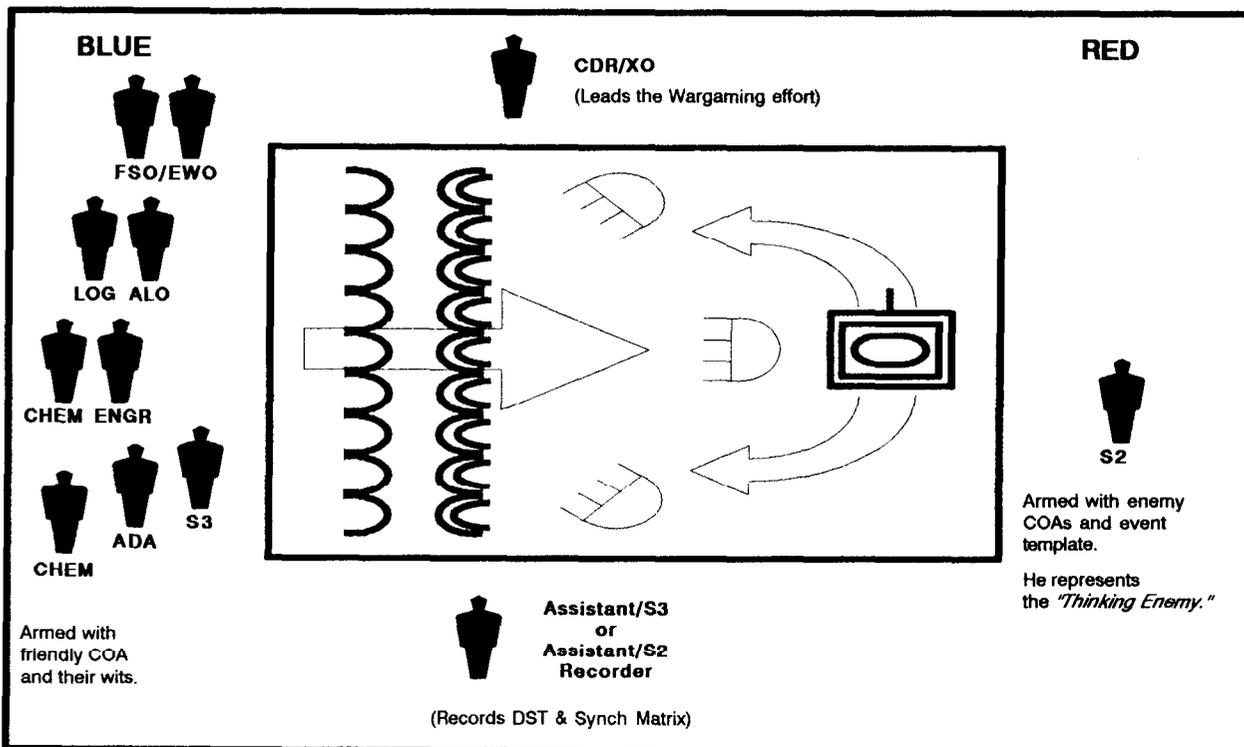


**Figure 1-1. The S2 or G2 must support the tactical decision making process with specific products.**

accompany the wargaming session to refine selected HVTs from the enemy COA models into high-payoff targets (HPTs) that support the friendly COA. Figure 1-2 shows this wargaming.

Based on the results of wargaming, for each potential friendly COA, the staff—

- Constructs a decision support template (DST) and its associated synchronization matrix.
- Identifies supporting intelligence requirements.
- Refines the enemy COA models and event templates and matrices, focusing on the intelligence required to execute the friendly COA.
- Arranges the threat COAs in order of probability of adoption. (There may be a different order of probability for each potential friendly COA.)
- Identifies the most dangerous threat COA.



**Figure 1-2. Wargaming.**

- Refines the friendly COA, to include identifying the need for branches and sequels.
- Determines the probability of success of the friendly COA.

The results of wargaming each potential friendly COA against the set of enemy COA models allows the staff to make a recommendation on the best friendly COA. The G2/S2's recommendation includes an evaluation of the intelligence system's ability to provide the intelligence needed to support each COA.

Appendix A discusses in more detail the relationship between IPB and wargaming.

**Decision:**

Following staff recommendations, the commander decides upon a COA and issues implementing orders. He also approves the list of intelligence requirements associated with that COA and identifies the most important as priority intelligence requirements (PIR). The command's collection manager uses the results of IPB to develop and implement a collection plan that will satisfy these requirements (see **IPB and the Collection Management Process**).

**Execution:**

As intelligence confirms or denies planning assumptions on the battlefield environment or the threat's COA, a continuous IPB process identifies new intelligence requirements. As the battle progresses, IPB is used to continuously evaluate the situation facing the command, driving new iterations of the decision making process and the directing step of the intelligence cycle.

For a complete discussion of the decision making process, see FM 101-5.

## IPB and the Targeting Process

The targeting process results in targeting guidance that supports the command's COA. This guidance generates additional intelligence requirements in support of each potential friendly COA the targeting process supports.

### Decide:

As part of COA analysis and comparison, or immediately after, the staff generally starts the targeting process with a targeting conference. Using the results of staff wargaming and IPB as a guide, they decide—

- What targets to acquire and attack (HPTs).
- What target selection standards (accuracy and timeliness) to use.
- Where and when these targets will likely be found (named area of interest [NAI] and TAI).
- How to attack the targets, based on the commander's targeting concept.
- Whether battle damage assessment (BDA) on each target is required to support the commander's intent or the command's COA, and how detailed it must be.

The targeting team further refines the event templates and matrices to include the information required to support targeting. Figure 1-3 shows an example attack guidance matrix.

### Detect:

During this step the command's collection manager develops collection strategies that will satisfy specific information requirements which support the targeting process. He plans for synchronized collection, focusing on the proper HPT at each phase in the command's COA. If BDA is required to support the command's COA, the collection manager plans collection to satisfy that set of requirements as well. Whenever possible, he plans and arranges direct dissemination of targeting intelligence from the collector to the targeting cell or appropriate tire support element (FSE).

### Deliver:

IPB structures the analysis that enables the G2/S2 to advise the commander and fire support officer (FSO) on the execution of the tire support plan.

For a complete discussion of the targeting process, see FM 6-20-10.

## IPB and the Collection Management Process

Collection management synchronizes the activities of organizations and systems to provide intelligence the commander needs to accomplish his COA and targeting efforts. IPB helps the commander identify his intelligence requirements and provides the focus and direction needed to satisfy them.

The commander bases his initial intelligence requirements on the critical gaps identified during IPB in the mission analysis step of the decision making process. Refined and updated requirements result from staff wargaming and selection of a particular friendly COA.

During staff wargaming, the G2/S2 uses the enemy COA models developed in step 4 of the IPB process to portray the enemy. The remainder of the staff "fights" each potential friendly COA and notes where and when in its execution decisions are required to make the COA successful. They also determine the specific intelligence required to support each decision

TARGET CATEGORY	HPTs <sup>1</sup>	WHEN	HOW	RESTRICTIONS
1. C <sup>3</sup>	46, 48	I	N and EW	Coordinate attack with EW
2. FS	1, 2, 7	A	N	Do not execute MRL older than 10 minutes
3. MANEUVER	25, 28	A	S	Last volley RAAMS/ADAM
4. ADA	58	P	S2 or G2	SEAD program 120800A
5. ENGR	58	P	N	Counter-mobility program O/O
6. RISTA	103, 105	P	EW	
7. REC	111, 112	P	N	
8. NUCLEAR/CHEMICAL		I	D	Accuracy 0 to 200 meters BDA required
9. BULK FUELS		A	D	
10. AMMO		A	D	
11. MAINTENANCE		P	N	Not HVT nor HPT
12. LIFT		P	N	Not HVT nor HPT
13. LOC		P	N and G3	Not HVT nor HPT - no FASCAM

<sup>1</sup> Numbers refer to target spread sheets (FM 6-20-10). This is only a type attack guidance matrix. The G3 or S3 and the FSE develop actual matrices on the basis of the tactical situation.

LEGEND:	I = Immediate	A = As acquired	S = Suppress
	P = Planned	N = Neutralize	D = Destroy

**Figure 1-3. IPB supports development of the attack guidance matrix.**

and record it onto the list of proposed intelligence requirements. When the commander selects a particular friendly COA, he also approves and prioritizes the supporting intelligence requirements.

IPB supports further development of requirements by identifying the activity which will satisfy each requirement and where and when the activity is expected to occur. The event template identifies the NAI where the activity will occur. The event matrix describes the indicators associated with the activity. Both the event template and event matrix depict the times during which the activity is expected to occur. The details these tools provide are the basis of an effective intelligence collection plan.

IPB products also contribute to the development of staff synchronization tools such as the DST and battlefield operating system (BOS) synchronization matrix, shown in Figure 1-4. The collection manager uses these additional tools to ensure that the collection plan stays synchronized with the command's operations. The resulting intelligence synchronization matrix (ISM), as shown in Figure 1-5, depicts the collection strategies which support the command's COA.

Intelligence synchronization is more than simply ensuring that collection systems of various sorts are operating 24 hours a day. The G2/S2 must direct the intelligence system, receive the information it produces, process it and then produce and disseminate intelligence of value to the commander in time to support his decisions. The coordination of this entire cycle is *intelligence synchronization*.

FM 34-2 discusses intelligence synchronization and the collection management process in detail.

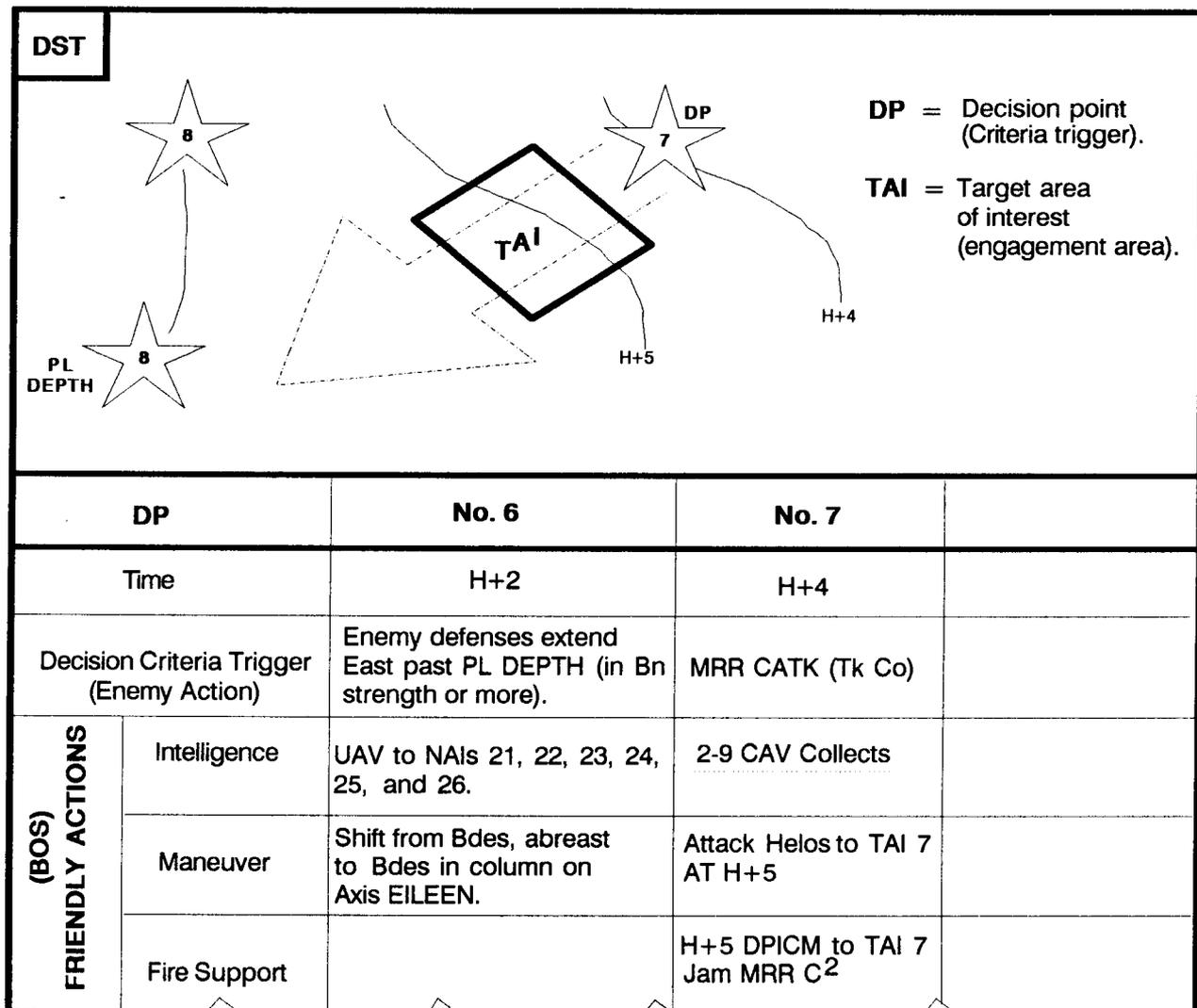


Figure 1-4. The DST and BOS synchronization matrix record the results of wargaming.

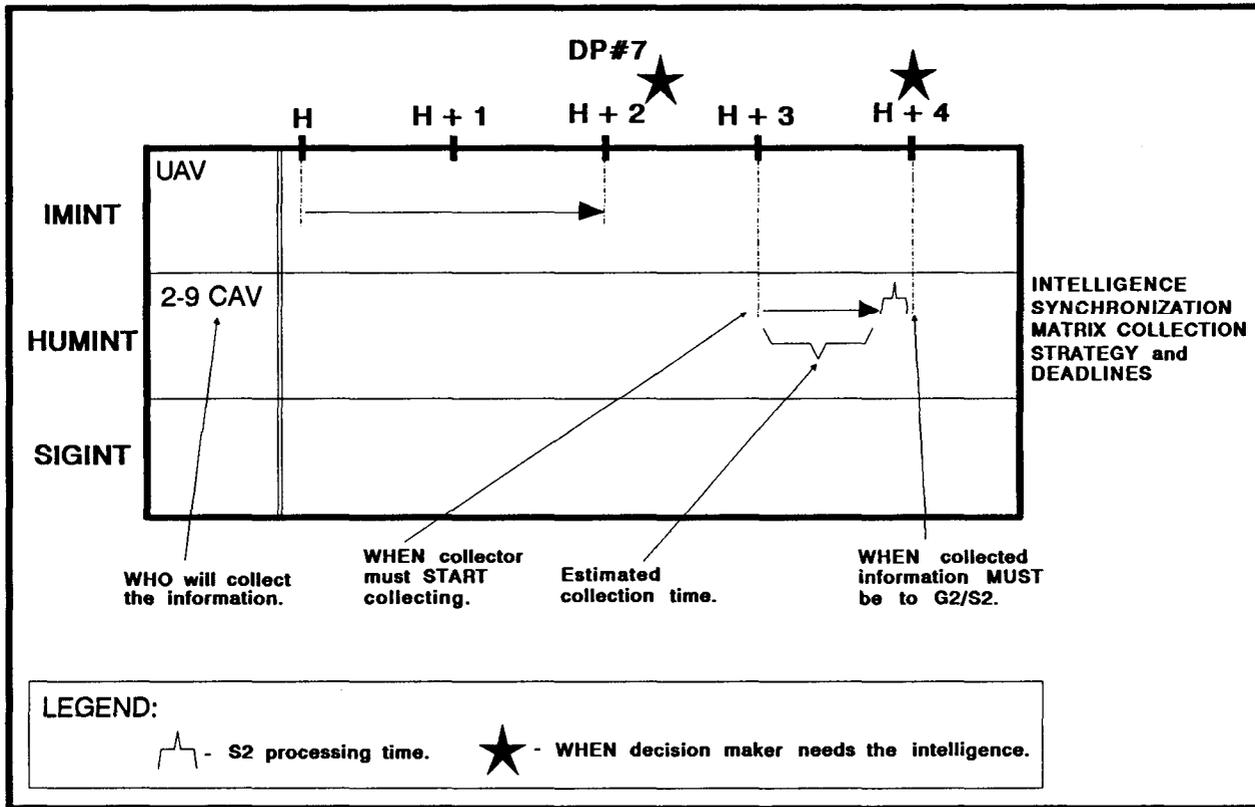


Figure 1-5. The Intelligence synchronization matrix.

**IPB and the Command and Staff Execution of Battle**

IPB provides the G2/S2 the tools he needs to quickly evaluate incoming information and intelligence as it relates to the command’s ISM and DST. This supports the commander’s decisions during COA execution and helps him to quickly confirm or deny the assumptions used during COA development.

During battle, the commander and staff track the DST and the ISM against incoming reports. As the staff nears each decision point (DP), they look to the G2/S2 for the intelligence that supports that decision.

Sometimes the battle will progress in a direction unanticipated during the initial IPB and wargaming. The enemy is following his own plans and timelines; those determined during staff wargaming are only estimates. Therefore, staffs should ensure they use IPB, wargaming, and intelligence synchronization as dynamic tools rather than as one-time events. As the operation unfolds and the enemy’s intentions become more clear, reinitiate the IPB and decision making processes as needed. This requires key members of the staff to “huddle” or conduct “mini-wargaming.” During these sessions, the G2/S2 reviews and modifies the initial IPB. The battle staff then wargames the best friendly response or preemptive action based on the updated set of IPB predictions. New decisions and COAs lead to updating and refining the collection plan, intelligence synchronization, and new decision support tools.

## How IPB Relates to Everything Else

IPB is an essential element of the intelligence cycle. The products developed during IPB are so critical to this cycle and the staff planning effort that it is a distinct function. There are six intelligence and electronic warfare (IEW) tasks described in FM 34-1, the Army's intelligence principles manual. They are to develop—

- IPB products.
- Situation development products.
- Indications and warnings (I&W) products.
- Target development and target acquisition products.
- BDA products.
- Force protection products.

These IEW functions are accomplished within the Intelligence System of Systems (ISOS) to respond to the commander's intelligence needs. The ISOS is the flexible architecture of procedures, organizations, and equipment that collect, process, store, and disseminate intelligence. The G2/S2 uses IPB products to process volumes of information provided by the ISOS and the intelligence cycle.

IPB products also enable staffs to exploit the modern technology of the ISOS by focusing collection systems that now provide near-red-time (NRT) information in sufficient accuracy to conduct direct targeting. IPB not only enables a staff to put steel on target but also helps prioritize and maximize the effects of targeting. IPB plays a critical role in the decision making process. Finally, the commander leads the IPB effort. The entire staff executes the IPB process.

The military intelligence (MI) unit commander is not responsible for the supported command's IPB. However, the MI unit commander will use the IPB process to support his own unique planning requirements. Some of these involve employment of the ISOS assets under his control.

## CHAPTER 2

## CONDUCTING INTELLIGENCE PREPARATION OF THE BATTLEFIELD

*When I took a decision or adopted an alternative, it was after studying every relevant—and many an irrelevant—factor. Geography, tribal structure, religion, social customs, language, appetites, standards—all were at my finger-ends. The enemy I knew almost like my own side.*

—T.E. Lawrence (Lawrence of Arabia), 1933

As discussed in Chapter 1, IPB consists of four steps which you perform each time you conduct IPB:

- Define the battlefield environment.
- Describe the battlefield's effects.
- Evaluate the threat.
- Determine threat COAs.

**How To Conduct IPB**

Each step of the IPB process consists of several principal judgment decisions and evaluations which together form the basic “how to” of IPB. These are presented in outline form below:

**Define the battlefield environment**

- Identify significant characteristics of the environment.
- Identify the limits of the command's AO and battle space.
- Establish the limits of the AI.
- Identify the amount of detail required and feasible within the time available for IPB.
- Evaluate existing data bases and identify intelligence gaps.
- Collect the material and intelligence required to conduct the remainder of IPB.

**Describe the battlefield's effects**

- Analyze the battlefield environment:
  - Terrain analysis.
  - Weather analysis.
  - Analysis of other characteristics of the battlefield.
- Describe the battlefield's effects on threat and friendly capabilities and broad COAs.

**Evaluate the threat**

- Update or create threat models:
  - Convert threat doctrine or patterns of operation to graphics (doctrinal templates).
  - Describe in words the threat's tactics and options.
  - Identify HVTs.

- Identify threat capabilities.

### Determine threat COAs

- Identify the threat's likely objectives and desired end state.
- Identify the full set of COAs available to the threat.
- Evaluate and prioritize each COA.
- Develop each COA in the amount of detail time allows.
- Identify initial collection requirements.

The principles and steps of the IPB process remain constant regardless of the type of mission, unit, staff section, or echelon conducting IPB. The application of the principles, however, varies with each specific situation. The situation template prepared by an air defense battery, for example, is very different from the one prepared by an EW section or a CIAS.

Similarly, a given unit or staff section does not always prepare all IPB products in every situation. Determining which products to prepare and identifying their relative priority depends on the factors of METT-T and command guidance. Chapters 3 through 6 give examples of IPB applied in specific situations, illustrating modification of the basic process to particular needs. The remainder of this chapter describes each step of the IPB process in detail.

## Define the Battlefield Environment

### *What Is It?*

#### **Definition:**

Identifying for further analysis specific features of the environment or activities within it, and the physical space where they exist, that may influence available COAs or the commander's decisions.

#### **Two Examples:**

During planning for a humanitarian assistance operation, the J2 identifies the activity of local armed factions as a feature influencing available COAs and his commander's decisions. The J2 expands the AI to encompass the area within the neighboring country where these groups have established safe havens. He examines the data bases and determines that they do not contain the information he needs to estimate the different COAs each faction might adopt. He identifies for collection information he needs about the areas where they are located and their past operations. Realizing that the information will probably arrive too late to support initial planning, the J2 discusses with the commander reasonable assumptions for use during planning. As the intelligence arrives, he confirms his initial assumptions and incorporates the new information into his ongoing IPB process.

During planning for a mounted attack, the S2 identifies the enemy's divisional attack helicopters as a major threat to accomplishment of the brigade's mission. The S2 expands the brigade's AI to encompass the reported location of the enemy's attack helicopter battalion and the zone where it will probably establish forward operating bases and forward area arming and refueling sites. He reviews his intelligence holdings to determine the types of intelligence he will need about the terrain, weather, and enemy helicopter operations to identify potential helicopter locations and COAs. He builds an initial reconnaissance and surveillance (R&S) plan to provide the intelligence he needs to complete his IPB. As the

reports come in, he uses them to update or validate the results of his initial IPB. If necessary, he reinitiates the IPB process to account for intelligence that denies assumptions made during the IPB and decision making process.

**Desired End Effect:**

Focus the IPB effort on the areas and characteristics of the battlefield which will influence the command's mission. Acquire the intelligence needed to complete the IPB process in the degree of detail required to support the decision making process.

**So What?**

**Success Results In:**

Saving time and effort by focusing only on those areas and features which will influence COAs and command decisions.

**Consequences of Failure:**

Failure to focus on only the relevant characteristics leads to wasted time and effort collecting and evaluating intelligence on features of the battlefield environment that will not influence success of the command's mission.

On the other hand, failure to identify all the relevant characteristics may lead to the command's surprise and unpreparedness when some overlooked feature of the battlefield exerts an influence on success of the command's mission.

**How To Do It:**

- Identify significant characteristics of the environment.
- Identify the limits of the command's AO and battle space.
- Establish the limits of the AI.
- Identify the amount of detail required and feasible within the time available for IPB.
- Evaluate existing data bases and identify intelligence gaps.
- Collect the material and intelligence required to conduct the remainder of IPB.

**IDENTIFY SIGNIFICANT CHARACTERISTICS OF THE ENVIRONMENT**

Characteristics of the battlefield environment that will influence the commander's decisions or affect the COAs available to your own force or the threat are of special significance in the IPB process.

During a humanitarian assistance operation, for example, the location and activities of civilian relief organizations might be a significant characteristic of the battlefield. During support to counter-drug operations, significant characteristics might include the production of narcotics or the trading of weapons. During war, characteristics such as the location and activities of enemy reserves, reinforcements, and long range fire support assets are typical significant characteristics. At some levels of command they might also include characteristics such as economic trade activity between a neutral country and our enemy.

When identifying significant characteristics of the battlefield, consider threat forces and all other aspects of the environment that may have an effect on accomplishing the unit's mission. Depending on the situation, these might include—

- Geography, terrain, and weather of the area.

- Population demographics (ethnic groups, religious groups, age distribution, income groups).
- Political or socio-economic factors, including the role of clans, tribes, gangs, etc.
- Infrastructures, such as transportation or telecommunications.
- Rules of engagement (ROE) or legal restrictions such as international treaties or agreements.
- Threat forces and their capabilities, in general terms. Consider para-military forces as well.

Initially, examine each characteristic only in general terms to identify those of significance to the command and its mission. Further evaluation of the effects of each characteristic takes place during later steps of the IPB process. For example, at this step the evaluation of threat forces is limited to an identification of forces that have the ability to influence the command's mission based on their location, mobility, general capabilities, and weapons ranges. During later steps of the IPB process, you will actually evaluate each threat force's specific capabilities and probable COAs.

Identifying the significant characteristics of the battlefield environment helps establish the geographical limits of the AI and directs analytical efforts in steps 2 and 3 of the IPB process. It also helps identify gaps in the common understanding of the battlefield, serving as a guide to the type of intelligence and information required to complete the IPB process (see Figure 2-1).

#### **IDENTIFY THE LIMITS OF THE COMMAND'S AO AND BATTLE SPACE**

The AO is the geographical area where the commander is assigned the responsibility and authority to conduct military operations. A thorough knowledge of the characteristics of this area leads to its effective use. Generally, because this is the area where the command will conduct its operations, the evaluation of the battlefield's effects is more thorough and detailed within the AO than it is within the AI. Identify the limits of the AO in order to provide the focus you need. The limits of the AO are normally the boundaries specified in the OPORD or contingency plan (CONPLAN) from higher headquarters that define the command's mission.

The limits of the command's battle space are determined by the maximum capabilities of a unit to acquire targets and physically dominate the threat. The command's capabilities in this regard include the target acquisition and long-range assets of supporting and higher commands as well as its own organic systems. A command's battle space generally includes all or most of the AO, as well as areas outside of the AO. The evaluation of the area within the command's battle space may be as detailed as the evaluation of the AO if the commander's guidance or intent requires the command to request, conduct, plan, or synchronize operations there. This is true even if the operations are to be conducted by some other command. In other cases the command's battle space may receive the same treatment as its AI (see Figure 2-2).

#### **ESTABLISH THE LIMITS OF THE AI**

The AI is the geographical area from which information and intelligence are required to permit planning or successful conduct of the command's operation. Because the commander and staff need time to process information and to plan and synchronize operations, the command's AI is generally larger than its AO and battle space. The limits of the AI include

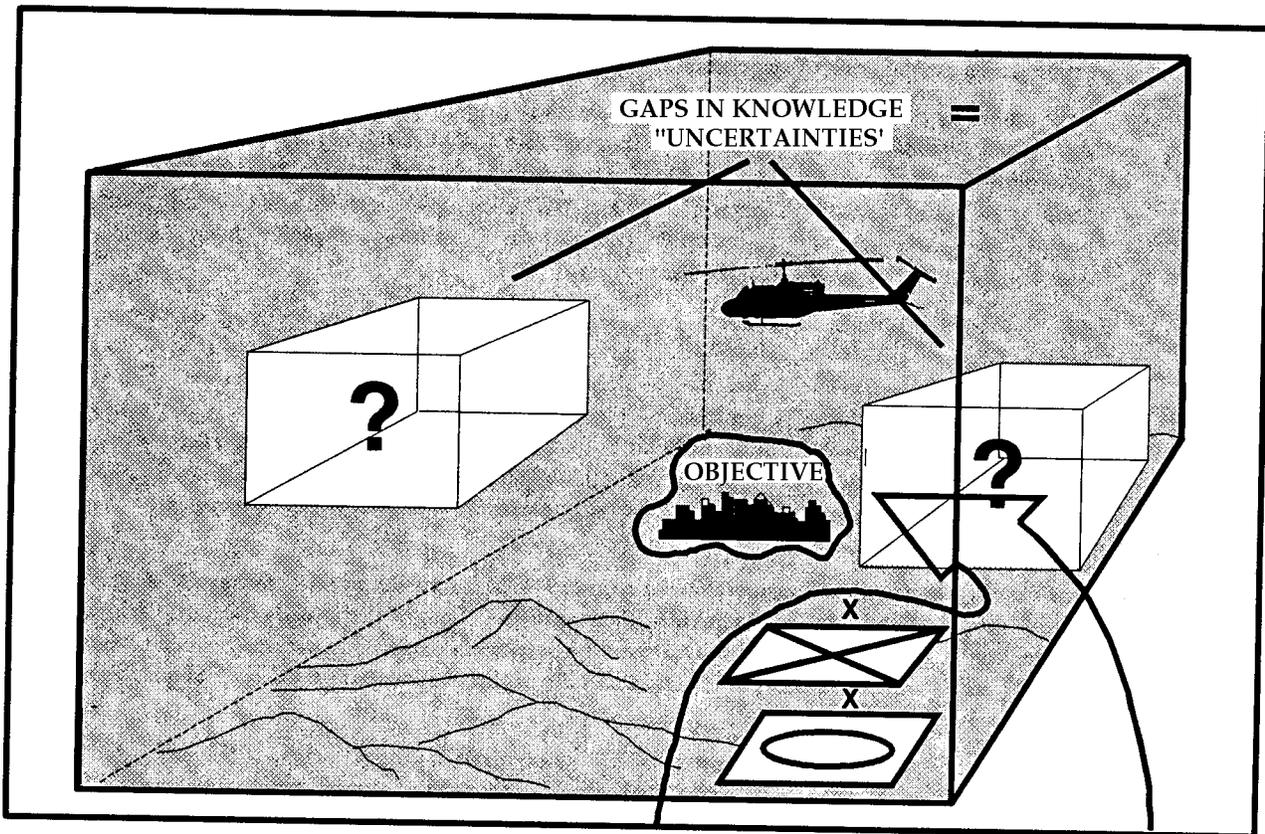


Figure 2-1. Examine the common understanding of the battlefield.

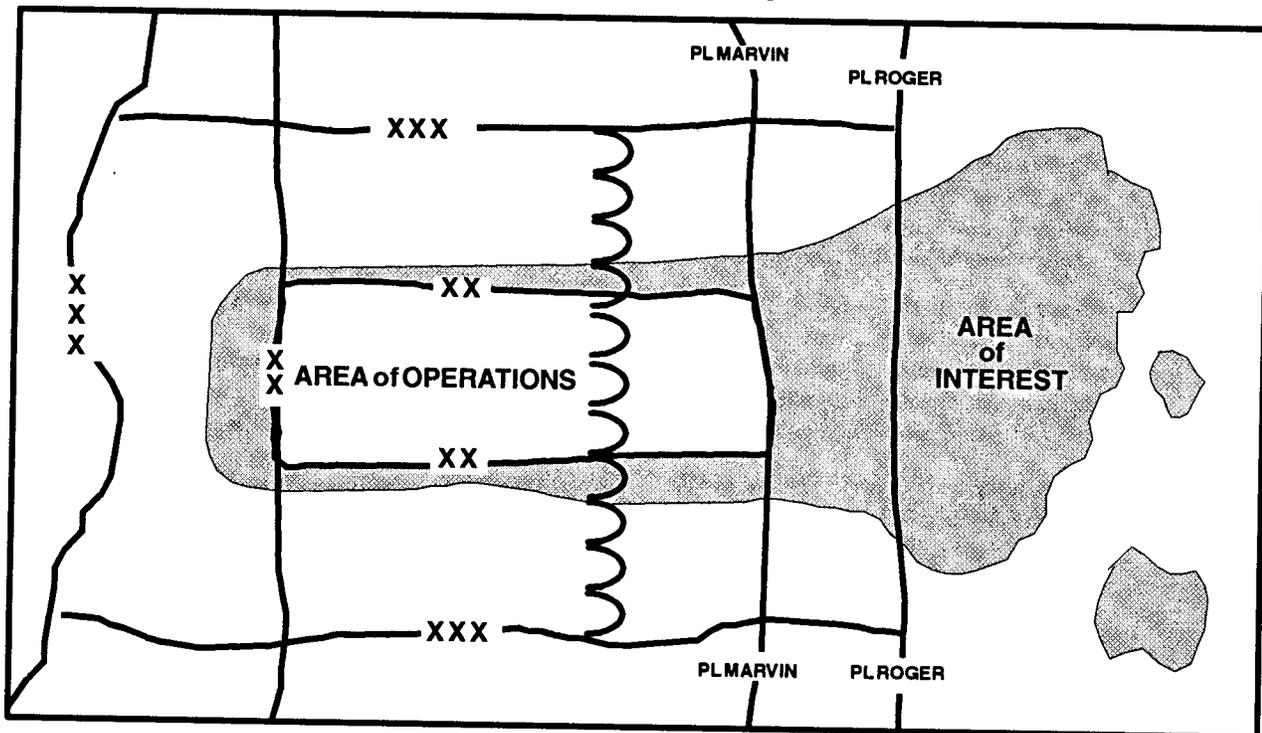


Figure 2-2. Battlefield areas.

each of the characteristics of the battlefield environment you identified as exerting an influence on available COAs or command decisions.

Base the limits of the AI on the ability of the threat to project power or move forces into the AO. Also consider the geographical locations of other activities or characteristics of the environment which might influence COAs or the commander's decisions. Consider also any anticipated future mission or "be prepared" and "on order" missions identified during mission analysis, and determine their effect on the limits of the AI. Finally, consider changes in the command's battle space as a result of maneuver.

An additional consideration would be to divide the AI into several components, such as a ground AI, an air AI, or a political AI. Such a division accommodates the types of information relevant in each AI as well as their usually different geographical limits. The air AI, for example, is usually larger than the ground AI. Within this extensive area, however, only activity related to the projection of air power is of interest. Although you might develop and consider the various AIs separately, at some point you must consider them as an integrated whole to ensure that you present the commander with a complete, integrated description of the battlefield.

For the air AI, include a consideration of altitude. When conducting air defense related IPB, the AI should extend upwards to the maximum service ceiling of the threat's aircraft. When conducting aviation related IPB, the AI should extend to the maximum service ceiling of the friendly aircraft or the maximum effective altitude of threat air defense systems, whichever is greater.

One of the primary considerations in establishing the limits of the AI is time. Base the time limit not only on the threat's mobility, both ground and air, but also on the amount of time needed to accomplish the friendly mission. For example, if a command estimates that it will take two days to complete an operation, the AI must encompass all forces or activities that could influence accomplishment of the command's mission within two days.

For missions that are of relatively short duration, such as the evacuation of non-combatants or raids, the AI usually includes only immediate, direct threats to mission accomplishment and may be relatively small. A helicopter raid on a battlefield where we enjoy air superiority might have an AI that includes only the air defense systems within range of the engagement area and the air routes to and from. Some long-term missions, such as nation building, will result in an extensive AI that considers many political and economic factors as well as the more conventional military factors.

Since the limits of the AI are based on threats to mission accomplishment rather than strictly terrain considerations, they might cross into neutral countries. For example, if political developments in a neutral country might influence the accomplishment of the unit's mission, include that country within the AI. Likewise, if the population of a neutral country provides a base of support for forces opposing the command's operations, include it within the AI.

#### **IDENTIFY THE AMOUNT OF DETAIL REQUIRED AND FEASIBLE WITHIN THE TIME AVAILABLE**

The time available for completion of the IPB process may not permit the luxury of conducting each step in detail. Overcoming time limitations requires a focus on the parts of IPB that are most important to the commander in planning and executing his mission. Identifying the amount of detail required avoids time wasted on developing more detail than necessary in each step of the process.

For example, the situation may not require an analysis of all threat forces within the AI. Perhaps only selected areas within the command's AO require detailed analysis due to the assigned mission or other factors of METT-T. Some geographical areas or threat forces within the AO may require only a summary type evaluation of their effects or capabilities.

Identify the amount of detail required on each area of the battlefield or each threat force to support planning by consulting with the commander and the remainder of the staff. Prioritize your efforts to produce the amount of detail required within the available time. Backwards plan the IPB process and determine how much time you can reasonably devote to each step to meet the commander's timelines. See scenario 3 in Chapter 3 for an example.

#### **EVALUATE EXISTING DATA BASES AND IDENTIFY INTELLIGENCE GAPS**

Not all the intelligence and information required to evaluate the effects of each characteristic of the battlefield and each threat force will be in the current data base. Identifying the gaps early allows you to initiate action to collect the intelligence required to fill them.

Identify and prioritize the gaps in the current holdings, using the commander's initial intelligence requirements and intent to set the priorities. You should also identify any gaps which cannot be filled within the time allowed for IPB. Discuss with the commander and the remainder of the staff the gaps you do not expect to be filled and formulate reasonable assumptions to fill them.

#### **COLLECT THE REQUIRED INTELLIGENCE AND MATERIALS**

Initiate collection or requests for intelligence to fill intelligence gaps to the level of detail required to conduct IPB. Include collection against all identified significant characteristics of the battlefield, not just threat forces, in priority order.

Continuously update the IPB products as you receive additional intelligence. Inform the commander if you confirm assumptions made during the initial mission analysis and IPB process. If any assumptions are denied, re-examine the evaluations and decisions on which they were based.

Ideally, intelligence operations enable you to develop the perception of the battlefield and the threat to completely match the actual situation on the battlefield. In reality, intelligence will never eliminate all of the unknown aspects or uncertainties which concern a commander and his staff. Be prepared to fill gaps with reasonable assumptions.

### **Describe the Battlefield's Effects**

#### ***What Is It?***

##### **Definition:**

The determination of how the battlefield environment affects both threat and friendly operations.

##### **Example:**

"General Eisenhower, after the Pas de Calais area, the best available landing sites are along the coast of Normandy. Our best chances of a favorable combination of moonlight, tides, and weather is in late May and early June."

An S2 tells his commander, "Sir, terrain and weather best accommodate offensive operations in the western part of the region. The best avenue of approach (AA) is number 3, but AAs 1 and 4 are also good. AA 2 is unsuitable since it requires use of terrain within the neutral

province. The region's best defensive terrain is along PL TOM, but suitable terrain is also available near PL JONELL and PL GARY."

**Desired End Effect:**

Identify how the battlefield environment influences the operations and COAs of threat and friendly forces.

**So What?**

**Success Results in:**

Allowing the commander to quickly choose and exploit the terrain (and associated weather, politics, economics) that best supports the friendly mission.

or

Knowingly picking the second or third best terrain for operations supported by a deception in the first best terrain.

Identifying the set of threat COAs available within a given geographic area.

**Consequences of Failure:**

The commander will fail to exploit the opportunities that the environment provides.

The threat will find and exploit opportunities in a manner the command did not anticipate.

**How To Do It:**

Evaluate and integrate the various factors of the battlefield environment that affect both friendly and threat operations. Begin the evaluation with an analysis of the existing and projected conditions of the battlefield environment, then determine their effects on friendly and threat operations and broad COAs. The specific steps are—

- Analyze the battlefield environment:
  - Terrain analysis.
  - Weather analysis.
  - Analysis of other characteristics of the battlefield.
- Describe the battlefield's effects on threat and friendly capabilities and broad COAs.

**ANALYZE THE BATTLEFIELD ENVIRONMENT**

The degree of detail in the analysis will vary depending on the area of the battlefield environment you are evaluating. Generally, the evaluation of the AO is more detailed than the AI. Additionally, the focus will vary throughout each area. For example, rear areas within the AO may require a different focus than areas near the main battle area (MBA).

Also bear in mind that the battlefield is not homogeneous. Certain areas, or sub-sectors, will affect various types of operations to varying degrees. During the evaluation, identify areas that favor each type of operation. Include the traditional operations (such as defense and offense) as well as the operations associated with any METT-T specific factors (such as counterterrorism and peace enforcement).

**Terrain Analysis**

The best terrain analysis is based on a reconnaissance of the AO and AI. Identify gaps in knowledge of the terrain which a map analysis cannot satisfy. Use the gaps you identify as a guide for reconnaissance planning. Because of time constraints, focus reconnaissance on the

areas of most importance to the commander and his mission. For example, when conducting terrain analysis for a signal unit you might focus on identifying locations from which the unit's assets can best support the force commander while also identifying the best locations for the threat's EW assets that might target friendly signal systems.

Similarly, a CIAS might focus on locations that best support employment of threat intelligence collection systems and locations that best protect friendly elements from their collection activities. See Chapter 4 for additional considerations for tailoring terrain analysis.

The engineer (terrain) detachment that supports divisions, corps, and echelons above corps (EAC) usually conducts the major portion of the terrain analysis, combining extensive data base information with the results of reconnaissance. The engineers work closely with the US Air Force (USAF) weather detachment or staff weather officer to ensure that their terrain analysis incorporates the effects of current and projected weather phenomena.

The engineer (terrain) detachment has access to special terrain data bases compiled by the Defense Mapping Agency (DMA), allowing automated support of the terrain analysis process. TERRABASE, if available, also offers automated terrain analysis capabilities. While unequaled in conducting pre-hostility and pre-deployment terrain analysis, you should supplement these data bases with reconnaissance of the terrain in question whenever feasible.

If engineer terrain support is unavailable, evaluate the terrain through a map analysis supplemented by reconnaissance. DMA produces specialized maps, overlays, and data bases to aid in map based evaluations. Specialized DMA products address such factors as—

- Cross-country mobility.
- Transportation systems (road and bridge information).
- Vegetation type and distribution.
- Surface drainage and configuration.
- Surface materials (soils).
- Ground water.
- Obstacles.

Ensure that the terrain analysis includes the effects of weather on the military aspects of the terrain. Consider the existing situation as well as conditions forecasted to occur during mission execution.

Also consider that terrain analysis is a continuous process. Changes in the battlefield environment may change the evaluations of its effects that result from terrain analysis. For example:

If built-up areas are reduced to rubble or lines of communication (LOCs) are destroyed by battle, you must reevaluate the mobility characteristics of the AO.

Similarly, if weather conditions change you must reevaluate the terrain's effect on military operations. Terrain analysis must always consider the effects of weather.

Express the results of evaluating the terrain's effects by identifying areas of the battlefield that favor, disfavor, or do not affect each broad COA. Examples of conclusions about the terrain that help you make evaluations of the terrain's effects are identification of the places best suited for use as—

- Engagement areas.

- Battle positions.
- Infiltration lanes.
- Avenues of approach.
- Specific system or asset locations.

You reach conclusions about the effects of terrain through two sub-steps: (1) Analyze the military aspects of the terrain; and (2) Evaluate the terrain's effects on military operations.

**(1) ANALYZE THE MILITARY ASPECTS OF THE TERRAIN.**

Terrain analysis consists of an evaluation of the military aspects of the battlefield's terrain to determine its effects on military operations. The military aspects of terrain are—

- Observation and fields of fire.
- Concealment and cover.
- Obstacles.
- Key terrain.
- Avenues of approach.

Consider all of these factors when analyzing terrain, but always focus on the ones of most relevance to the specific situation at hand and the needs of the commander. Evaluate them in any order that best supports your analysis.

Remember that the terrain analysis is not the end product of the IPB process. Rather, it is the means to determine which friendly COAs can best exploit the opportunities the terrain provides and how the terrain affects the threat's available COAs.

**Observation and Fields of Fire:**

Observation is the ability to see the threat either visually or through the use of surveillance devices. Factors that limit or deny observation include concealment and cover.

A field of fire is the area that a weapon or group of weapons may effectively cover with fire from a given position. Terrain that offers cover limits fields of fire.

Terrain that offers good observation and fields of fire generally favors defensive COAs.

The evaluation of observation and fields of fire allows you to—

- Identify potential engagement areas, or “fire sacks” and “kill zones.”
- Identify defensible terrain and specific system or equipment positions.
- Identify where maneuvering forces are most vulnerable to observation and fires.

Evaluate observation from the perspective of electronic and optical line-of-sight (LOS) systems as well as unaided visual observation. Consider systems such as weapon sights, laser range finders, radars, radios, and jammers.

While ground based systems usually require horizontal LOS, airborne systems use oblique and vertical LOS. The same is true of air defense systems (see Figures 2-3 through 2-5).

An evaluation of oblique LOS aids in planning ADA system locations, selecting landing zones (LZs) and drop zones (DZs), planning helicopter forward area arming and refueling point (FAARP) locations, identifying areas vulnerable to aerial intelligence collection systems, and selecting low-level flight routes and aerial battle positions.

Evaluate fields of fire for all flat trajectory and indirect fire weapons the unit owns:

An ideal field of fire for flat trajectory weapons is an open area in which the threat can be seen and on which he has no protection from fire from those weapons, out to the weapon's maximum effective range. Although observation is essential to effective control of fire, the best observation does not guarantee the best field of fire; you must also consider the availability of cover.

For indirect fire weapons, consider only the nature of the terrain in the target area and the amount of protection it provides from those weapons.

Combine the analysis of each factor limiting observation and fields of fire into a single product. This is usually an overlay with areas of poor observation and fields of fire marked by parallel diagonal lines or cross-hatching. It identifies the areas where a unit is vulnerable to observation by intelligence collection systems or engagement by threat forces. Use these products to help you identify potential engagement areas and evaluate AAs.

To complete the analysis, identify areas that offer positions overmatching areas of vulnerability. This helps you to identify defensible terrain, potential battle positions, and possible locations for intelligence collectors.

If time and resources permit, prepare terrain factor overlays to aid in evaluating observation and fields of fire. Consider the following:

- Vegetation or building height and density.
- Canopy or roof closure.
- Relief features, including micro-relief features such as defiles (elevation tinting techniques are helpful).
- Friendly and threat target acquisition and sensor capabilities.
- Specific LOSs.

Another technique which aids an evaluation of observation and fields of fire is to conductor request LOS studies. Some commands (such as signal units, MI units, and ADA units) have a great need for LOS analysis (see Figure 2-6).

LOS studies aid in site selection for specific systems requiring direct LOS. Normally, you request or conduct LOS studies after the evaluation of the terrain's effects on observation have identified areas for likely employment of these systems.

### **Concealment and Cover:**

Concealment is protection from observation. It can be provided by woods, underbrush, snowdrifts, tall grass, and cultivated vegetation.

Cover is protection from the effects of direct and indirect fires. It can be provided by ditches, caves, river banks, folds in the ground, shell craters, buildings, walls, and embankments.

The evaluation of concealment and cover aids in identifying defensible terrain, possible approach routes, assembly areas, and deployment and dispersal areas. Evaluate concealment and cover in the same manner as for observation and fields of fire. Combine the analysis of each factor into a single product such as an overlay cross-hatched to depict areas that offer concealment and cover. You can usually use the products developed during the evaluation of observation and fields of fire as a start point. Use the results of the evaluation to—

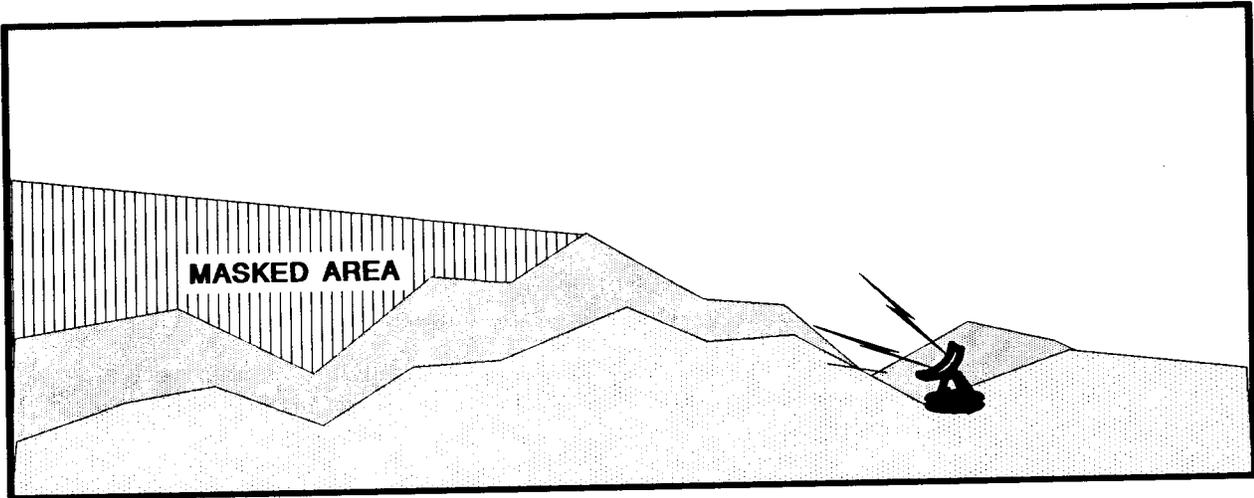


Figure 2-3. Oblique LOS (ground).

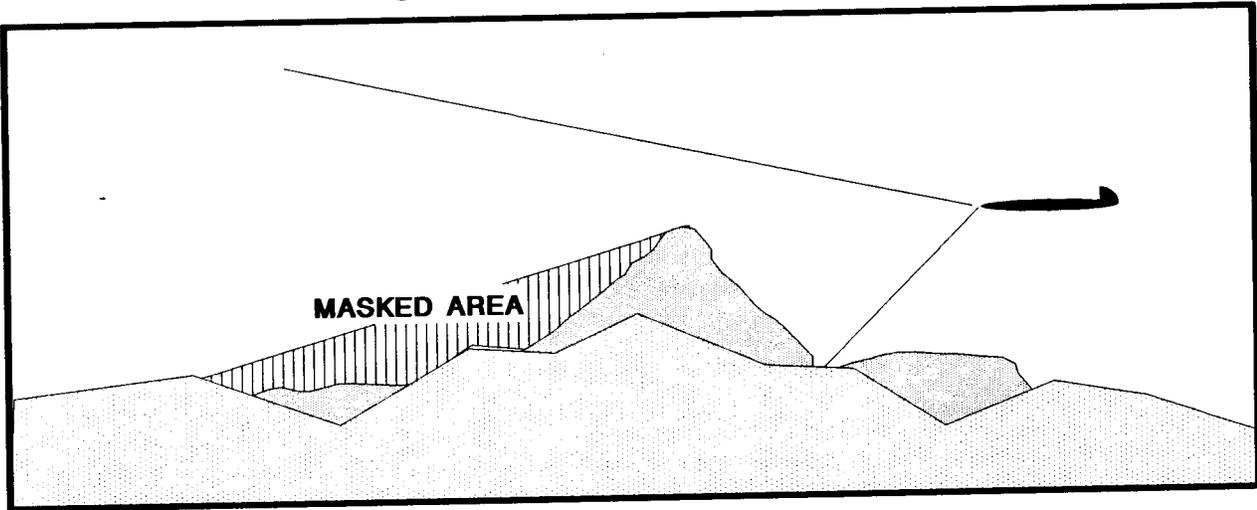


Figure 2-4. Oblique LOS (air).

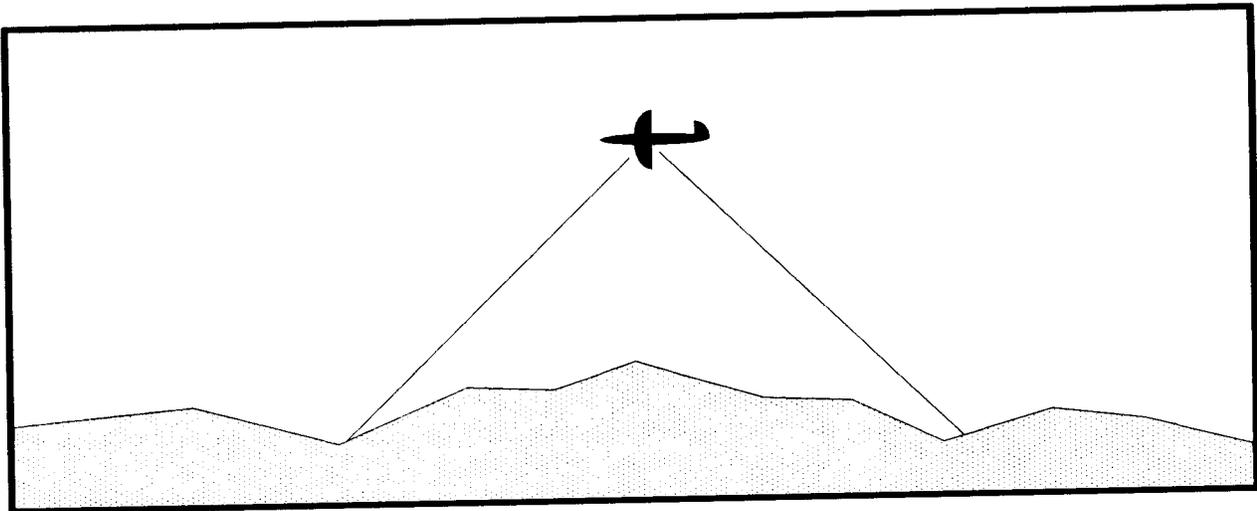
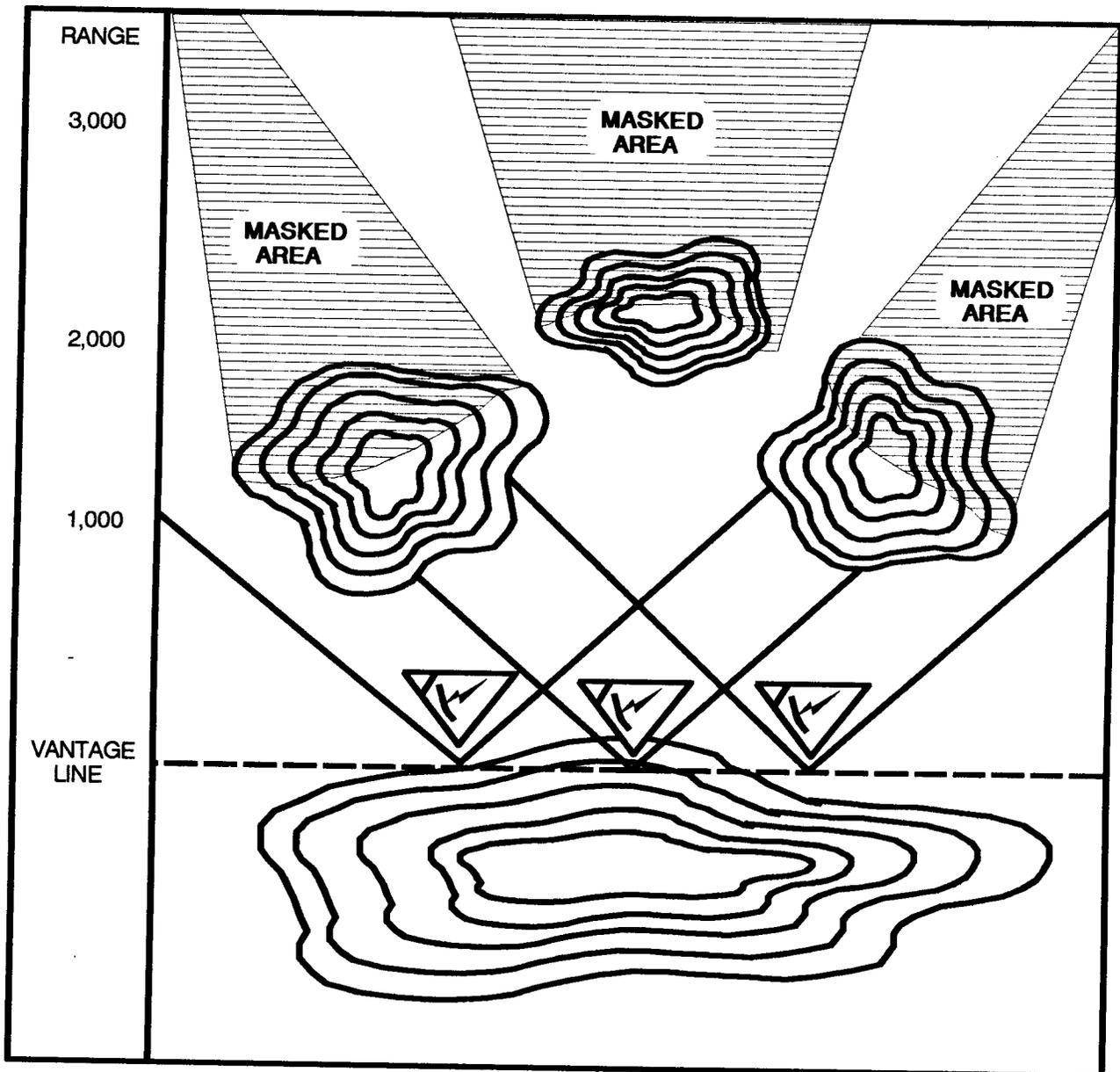


Figure 2-5. Vertical LOS.



**Figure 2-6. Evaluating observation may require LOS analysis.**

- Identify and evaluate AAs.
- Identify defensible terrain and potential battle positions.
- Identify potential assembly and dispersal areas.

Concealment and cover are desirable for both the attack and the defense:

- If an attacking force can move forward under concealment, the chances of achieving surprise increase. If a force can move protected from the threat's fire, the attack will be more effective. Concealed and covered approach routes are important to reconnaissance units, dismounted infantry, and insurgent or terrorist forces.

- Defending forces seek to defend in an area which offers both concealment and cover to themselves but which does not provide covered approaches for the threat.

Rear area units seek deployment areas and movement routes that are concealed from threat intelligence collection systems and provide cover from deep attack systems, including Levels I, II, and III rear area threats. Concealment and cover are desirable during force movements by any means. Units always seek to maximize—

- The concealment and cover of their own forces.
- Their observation and fields of fire into potential threat positions or threat AAs.

**Obstacles:**

Obstacles are any natural or manmade terrain features that stop, impede, or divert military movement.

Some examples of obstacles to ground mobility are buildings, steep slopes, rivers, lakes, forests, deserts, swamps, jungles, cities, minefield, trenches, and military wire obstacles.

Obstacles to air mobility include features that exceed the aircraft's service ceiling, restrict nap-of-the-earth (NOE) flight or that force the aircraft to employ a particular flight profile. Examples are tall (greater than 75 feet) trees, towers, buildings, rapidly rising terrain features, mountains, and smoke or other obscurants.

An evaluation of obstacles leads to the identification of mobility corridors. This in turn helps identify defensible terrain and AAs. To evaluate obstacles—

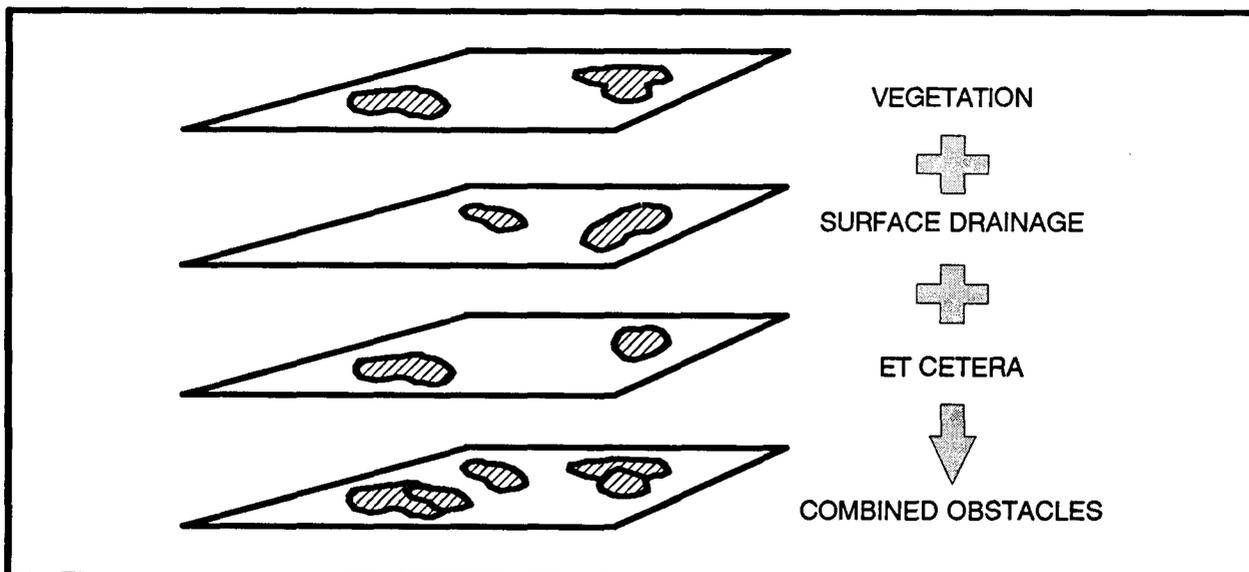
- Identify pertinent obstacles in the AI.
- Determine the effect of each obstacle on the mobility of the evaluated force.
- Combine the effects of individual obstacles into an integrated product.

If DMA products are unavailable, and time and resources permit, prepare terrain factor overlays to aid in evaluating obstacles. Some of the factors to consider are—

- Vegetation (tree spacing and trunk diameter).
- Surface drainage (stream width, depth, velocity, bank slope, and height).
- Surface materials (soil types and conditions that affect mobility).
- Surface configuration (slopes that affect mobility).
- Obstacles (natural and manmade; consider obstacles to flight as well as ground mobility).
- Transportation systems (bridge classifications and road characteristics such as curve radius, slopes, and width).
- Effects of actual or projected weather such as heavy precipitation or snow cover.

Combine the several factor overlays into a single product known as the combined obstacle overlay. The combined obstacle overlay integrates the evaluations of the various factors into a single product that depicts the battlefield's effects on mobility (see Figure 2-7).

A technique often used to display the cumulative evaluation of obstacles is a graphic product that depicts areas of terrain classified as UNRESTRICTED, RESTRICTED, and SEVERELY RESTRICTED in terms of their effects on mobility. IPB defines these three classifications as follows:



**Figure 2-7. Combine all evaluated factors to produce an integrated product.**

- **UNRESTRICTED** indicates terrain free of any restriction to movement. Nothing needs to be done to enhance mobility. **UNRESTRICTED** terrain for armored or mechanized forces is typically flat to moderately sloping terrain with scattered or widely spaced obstacles such as trees or rocks. **UNRESTRICTED** terrain allows wide maneuver by the forces under consideration and unlimited travel supported by well developed road networks.
- **RESTRICTED** terrain hinders movement to some degree. Little effort is needed to enhance mobility but units may have difficulty maintaining preferred speeds, moving in combat formations, or transitioning from one formation to another. **RESTRICTED** terrain slows movement by requiring zig-zagging or frequent detours. **RESTRICTED** terrain for armored or mechanized forces typically consists of moderate to steep slopes or moderate to densely spaced obstacles such as trees, rocks, or buildings. Swamps or rugged terrain are examples of **RESTRICTED** terrain for dismounted infantry forces. Logistical or rear area movement may be supported by poorly developed road systems. A common and useful technique is to depict **RESTRICTED** terrain on overlays and sketches by marking the areas with diagonal lines.
- **SEVERELY RESTRICTED** terrain severely hinders or slows movement in combat formations unless some effort is made to enhance mobility. This could take the form of committing engineer assets to improving mobility or of deviating from doctrinal tactics, such as moving in columns instead of line formations or at speeds much lower than those preferred. **SEVERELY RESTRICTED** terrain for armored and mechanized forces is typically characterized by steep slopes and large or densely spaced obstacles with little or no supporting roads. A common technique is to depict this type of **SEVERELY RESTRICTED** terrain on overlays and sketches by marking the areas with cross-hatched diagonal lines.

Other types of **SEVERELY RESTRICTED** terrain include, for example, minefield, unfordable rivers that exceed vehicle-launched bridge length, and road or railroad embankments. Depict these types of **SEVERELY RESTRICTED** terrain using the symbology contained in FM 101-5-1. If standard symbology does not exist, such as in the case of unfordable rivers, depict them using wide solid lines, ad hoc symbology, or

cross-hatching as appropriate. Ensure that all nonstandard symbols are explained in the graphic's legend.

Terrain mobility classifications are not absolute but reflect the relative effect of terrain on the maneuver of combat formations. They are based on the ability of a force to maneuver in combat formations, usually linear, or to transition from one type formation to another, as opposed to simply moving through a piece of terrain.

Identifying an area as SEVERELY RESTRICTED terrain, for example, does not imply that movement through that area is impossible, only that it is impractical. Units moving in column formations along roads generally have little trouble traversing SEVERELY RESTRICTED terrain.

**Additional Considerations:**

- Obstacles perpendicular to an axis of attack favor the defender by slowing the attacker, forcing him into concentrations while crossing or negotiating obstacles, and holding the attacker for longer periods under the fires of the defender.
- Obstacles parallel to an axis of advance may give the attacker flank protection but they may also interfere with his lateral movement, employment of reserve forces, and coordination between adjacent units.
- To be effective the defender must cover obstacles by observation and fire. However, even undefended obstacles may canalize an attacker into concentrations which are easier to detect and attack.
- Terrain considered SEVERELY RESTRICTED for one unit may pose no obstruction to the mobility of another unit. For example, a dismounted infantry unit could easily negotiate a hilly, forested area that a mounted infantry unit might consider SEVERELY RESTRICTED. Similarly, an attack helicopter unit may consider an area containing several tall towers and many high tension wires as SEVERELY RESTRICTED terrain while the same terrain would pose little or no obstacle to high performance aircraft operating at higher altitudes.
- When evaluating the terrain's effects on more than one type force, such as dismounted infantry and armor, you may have to prepare separate combined obstacle overlays. Each one should focus on the mobility of a particular type force. As an alternative, if the situation or available time require you to accept the clutter, you can mark dismounted infantry infiltration lanes on an overlay that depicts the terrain's effects on the mobility of mounted forces.
- Consider the cumulative effects of individual obstacles in the final evaluation. For example, by themselves a gentle slope or moderately dense woods may present little obstacle to mounted movement. Taken together, however, the combination may be restrictive.
- Ensure that you account for the weather's effects on factors which affect mobility. For example, heavy rains swell streams and decrease the load-bearing characteristics of most soil types. Some soil types, however, actually improve when wet. See FM 34-81-1 for details and Appendix B of this manual for rules of thumb.
- When considering threat COAs in relation to the terrain's effects on mobility, keep the lessons of history in mind. There are many examples of a force achieving surprise by negotiating supposedly "impassable" terrain. The classification of terrain into various

obstacle types reflects only its relative impact on force mobility. The classifications are not absolute.

**Key Terrain:**

Key terrain is any locality or area the seizure, retention, or control of which affords a marked advantage to either combatant.

An example of key terrain is a bridge over an unfordable river which gives access to the opposite shore without requiring an assault crossing. Another example is a level clearing in rough terrain which is the only accessible landing field for airmobile operations.

Key terrain is often selected for use as battle positions or objectives.

Evaluate key terrain by assessing the impact of its seizure by either force upon the results of battle. Techniques that aid this evaluation are—

- Evaluate the other four aspects of military terrain first and integrate the results into the evaluation of key terrain. For example, if you identify only one valid avenue of approach to the command's objective, then the choke points on that avenue will probably become key terrain (compared to a situation where several AAs are available).
- Time permitting, conduct "mini-wargaming" to visualize possible outcomes of battle. See Appendix A for a discussion on how to do this.

A common technique is to depict key terrain on overlays and sketches with a large "K" within a circle or curve that encloses and follows the contours of the designated terrain. On transparent overlays use a color, such as purple, that stands out.

In the offense, key terrain features are usually forward of friendly dispositions and are often assigned as objectives. Terrain features in adjacent sectors may be key terrain if their control is necessary for the continuation of the attack or the accomplishment of the mission. If the mission is to destroy threat forces, key terrain may include areas whose seizure helps ensure the required destruction. Terrain which gives the threat effective observation along an axis of friendly advance may be key terrain if the threat must be denied its possession or control.

In the defense, key terrain is usually within the AO and within or behind the selected defensive area. Some examples of such key terrain are—

- Terrain which gives good observation over AAs to and into the defensive position.
- Terrain which permits the defender to cover an obstacle by fire.
- Important road junctions or communication centers which affect the use of reserves, sustainment, or LOCs.

**Additional Considerations:**

- Key terrain varies with the level of command. For example, to an army or theater commander a large city may afford marked advantages as a communications center. To a division commander the high ground which dominates the city may be key terrain while the city itself may be an obstacle.
- Terrain which permits or denies maneuver may be key terrain. Tactical use of terrain is often directed at increasing the capability for applying combat power and at the same time forcing the threat into areas which result in reduction of his ability to apply his combat power. Terrain which permits this may also be key terrain.

- Major obstacles are rarely key terrain features. The high ground dominating a river rather than the river itself is usually the key terrain feature for the tactical commander (since holding the high ground allows full use of the river's obstacle value). An exception is an obstacle such as a built-up area which is assigned as an objective.
- Key terrain is decisive terrain if it has an extraordinary impact on the mission. Decisive terrain is rare and will not be present in every situation. To designate terrain as decisive is to recognize that the success of the mission depends on seizing or retaining it. The *commander* designates decisive terrain to communicate its importance in his concept of operation to his staff and subordinate commanders.

**Avenues of Approach:**

An AA is an air or ground route of an attacking force of a given size leading to its objective or to key terrain in its path.

The identification of AAs is important because all COAs which involve maneuver depend upon available AAs.

During offensive operations, the evaluation of AAs leads to a recommendation on the best AAs to the command's objective and identification of avenues available to the threat for withdrawal or the movement of reserves.

During the defense, identify AAs that support the threat's offensive capabilities and avenues that support the movement and commitment of friendly reserves.

To develop AAs, use the results of evaluating obstacles to—

- Identify mobility corridors.
- Categorize mobility corridors.
- Group mobility corridors to form AAs.
- Evaluate AAs.
- Prioritize AAs.

**Identify Mobility Corridors:**

Mobility corridors are areas where a force will be canalized due to terrain constrictions. The mobility corridor itself is relatively free of obstacles and allows military forces to capitalize on the principles of mass and speed.

Evaluate the combined obstacle overlay to identify mobility corridors wide enough to permit maneuver in tactical formations. If friendly and threat forces require mobility corridors of different widths, perhaps due to organizational or equipment differences, you may have to conduct two separate evaluations. Identification of mobility corridors requires some knowledge of friendly and threat organizations for combat and preferred tactics. See Appendix B for more information on threat forces.

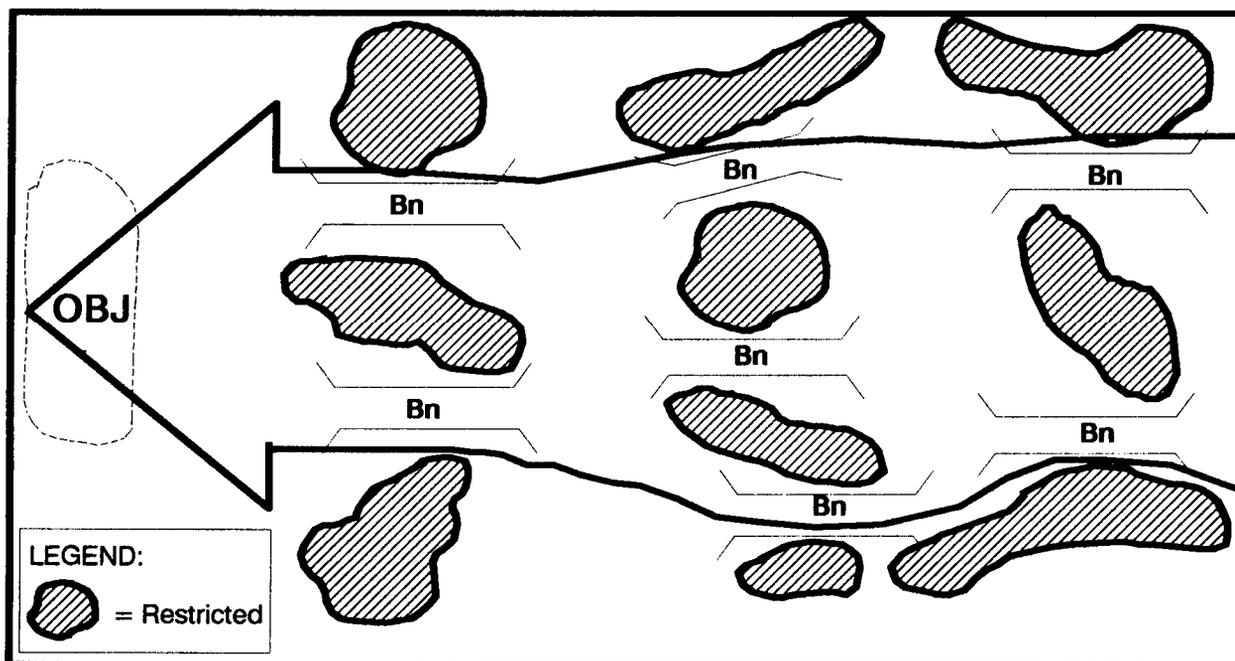
The best mobility corridors use UNRESTRICTED terrain that provides enough space for a force to move in its preferred doctrinal formations while avoiding major obstacles. Mobility corridors usually follow the direction of roads and trails.

You may have to evaluate factors other than obstacles and mobility when identifying mobility corridors. Mobility corridors, like obstacles, are a function of the type and mobility of the force being evaluated. For example, mechanized and armored units generally require large open areas in which to move. Dismounted infantry, and most insurgents and terrorists, are

less restricted by the presence of obstacles or hindering terrain and prefer areas that provide concealment and cover.

Similarly, the mobility corridor used by a jet aircraft with a minimum operating altitude of 1,000 feet is quite different from that considered by a helicopter with a maximum service ceiling of 12,000 feet.

Depict mobility corridors and zones of entry (see Figure 2-8) on overlays and sketches using simple, easily recognized symbols. See Chapter 3 for examples. If using colored graphics, use **red** when focusing on *threat* mobility or **blue** when the attention is on *friendly* force mobility. Ensure that any nonstandard symbols are explained in the graphic's legend.



**Figure 2-8. Group mobility corridors to form avenues of approach.**

#### **Categorize Mobility Corridors:**

Once you have identified mobility corridors, categorize them by the size or type of force they will accommodate. You may prioritize them in order of likely use if warranted. For example, because military units generally require logistical sustainment, a mobility corridor through UNRESTRICTED terrain supported by a road network is generally more desirable than one through RESTRICTED terrain or one unsupported by a road network.

Normally, identify mobility corridors for forces two echelons below the friendly command. This varies with each situation. Where the terrain is restrictive, allowing only relatively small mobility corridors, you may need to evaluate mobility corridors several echelons below the friendly command.

#### **Group Mobility Corridors to Form Avenues of Approach:**

Group mobility corridors together to form AAs. An AA must provide ease of movement and enough width for dispersion of a force large enough to significantly affect the outcome of an operation.

Normally, identify AAs for a force one echelon below the friendly command. Unlike mobility corridors, AAs may include areas of SEVERELY RESTRICTED terrain since they show only the general area through which a force can move.

Depict AAs using arrows that encompass the mobility corridors which constitute the avenue. Use the same considerations for color selection that apply to mobility corridors.

**Evaluate Avenues of Approach:**

An evaluation of AAs identifies those which best support maneuver capabilities. Most engineer detachments do not have the expertise on threat or friendly tactical doctrine required to conduct this step alone. It should be performed by the G2/S2 or his analysts, with assistance from the G3/S3 as required. Evaluate them for suitability in terms of—

- Access to key terrain and adjacent avenues.
- Degree of canalization and ease of movement.
- Use of concealment and cover (force protection from both fires and intelligence collection).
- Use of observation and fields of fire.
- Sustainability (LOC support).
- Directness to the objective.

The results of evaluating mobility corridors and AAs is usually depicted on the combined obstacle overlay. This may vary with the situation.

**Prioritize Avenues of Approach:**

Prioritize the AAs based on how well each supports maneuver.

As always, the final product should focus on the results of the evaluation rather than on the factors of the analysis.

**Additional Considerations:**

- Do not confuse AAs with direction of attack or axis of advance, which, to achieve surprise, may not follow AAs (see glossary).
- Mobility corridors and AAs are based on the maneuver requirements of tactical formations. They will not by themselves identify likely infiltration lanes or routes likely to be used by reconnaissance assets. You must consider other factors, such as the availability of concealment and cover, to identify likely infiltration lanes or reconnaissance unit routes.
- AAs are based solely on assigned or likely objectives, the effects of the battlefield environment, and force mobility considerations. The ability of an opposing force to interfere with the friendly use of AAs does not influence the evaluation at this point in the IPB process. Threat actions will be wargamed during step 4 of the IPB process, **Determine Threat Courses of Action**, and during staff wargaming.
- When evaluating AAs for units with amphibious, airborne, or airmobile capabilities, you must also consider suitable zones of entry, such as airfields, LZs or beachhead sites. See Appendix B for information on identifying zones of entry.
- The type unit under consideration is a major factor in identifying mobility corridors and AAs. In built-up areas, for example, a mechanized unit might prefer areas of wide

streets and parks for movement. In the same area, dismounted infantry might prefer an area of closely built structures that allows them to move under cover via holes knocked through walls between buildings. Similarly, helicopters look for areas that allow access to concealment and cover by NOE flight techniques while high performance aircraft generally avoid obstacles and use direct approaches. This is more than a function of mobility. For example, mechanized and armored units generally require open areas in which to move. This certainly enhances mobility but the improved observation of open areas also facilitates command and control (C<sup>2</sup>) over maneuvering sub-elements. Similarly, reconnaissance units generally prefer areas that allow them to conduct their mission without detection, favoring areas that offer concealment even if it requires some sacrifice of mobility.

- Air AAs permit the employment of penetrating aerial sensors, attack aircraft, and airmobile forces. Air AAs are generally as direct as possible in order to minimize risk to the aircraft and maximize the aircraft's payload. However, terrain can influence the choice of particular routes. Terrain corridors are usually desirable because they afford some defilade protection from ADA systems outside the corridor. Corridors, and other linear terrain features such as roads or rivers, also provide aids to navigation at high speeds. Concealment from ground observation or radar acquisition is also important to low-flying aircraft, particularly helicopters. All other things being equal, aircraft will generally use the most direct approach to the target area. In the target area, many attack profiles depend on low-level flight. It is here that terrain analysis is most useful in identifying aircraft AAs. In addition to the terrain factors considered above, evaluate air AAs by considering obstacles to flight. See Chapter 4 for example considerations.

## (2) EVALUATE THE TERRAIN'S EFFECTS ON MILITARY OPERATIONS.

A common fault is to discuss the military aspects of terrain in great detail without addressing *why* they are important. To avoid this common fault, you must relate the analysis to the terrain's effects on the broad COAs available to threat and friendly forces.

Evaluate the terrain's effects on offensive and defensive COAs by identifying the areas along each AA best suited for use as potential—

- Engagement areas and ambush sites: Using the results of evaluating concealment and cover, identify areas where maneuvering forces are vulnerable to fires. Consider weapon ranges, missile flight times, and the likely speed of maneuvering forces. If your command is **attacking**, these are areas where it will be vulnerable to threat fires. If your command is **defending**, these are potential engagement areas.
- Battle positions: Identify concealed and covered positions that offer observation and fields of fire into potential engagement areas. If your command is **defending**, they are potential defensive positions. If your command is **attacking**, they provide a start point for determining possible threat COAs. They might also be used by friendly attacking forces to block enemy counterattacks.
- Immediate or intermediate objectives: Identify any areas or terrain features that dominate the AAs or assigned objective areas. These will usually correspond to areas already identified as key terrain.

As time permits, or the situation requires, also identify potential—

- Assembly and dispersal areas.
- Observation posts.

- Artillery firing positions.
- Air defense system positions.
- Intelligence and target acquisition system positions.
- FAARPs.
- LZs or DZs.
- Infiltration lanes.

See Chapter 4 for additional considerations.

The terrain rarely favors one type of operation throughout the width and breadth of the battlefield. Within a given area certain sub-sectors will affect various operations to varying degrees. Based on the location and nature of potential engagement areas, battle positions, and so forth, determine which areas of the battlefield favor each broad COA, such as attack or defend.

Disseminate the results of terrain analysis in the analysis of the AO, the intelligence estimate, and in graphic products that will aid the staff in the completion of their own estimates and plans. A common and effective technique is the use of a MCOO.

To construct a MCOO, start with the combined obstacle overlay and consider adding—

- *Cross-country mobility classifications.* Mark areas of RESTRICTED and SEVERELY RESTRICTED cross-country mobility with easily distinguishable symbology.
- *AAs and mobility corridors.* Tailor these to the type force under consideration, basing them on factors other than mobility as required. Categorize them by the size force they accommodate and rank them in priority order if justified. While it is possible to put both ground and air mobility corridors and AAs on the same overlay, clarity may require separate overlays. Consider both friendly and threat avenues.
- *Counter-mobility obstacle systems.* Include only those known to exist within the AI.
- *Defensible terrain.* Evaluate terrain along each AA to identify potential battle positions or possible defensive sectors for subordinate units.
- *Engagement areas.* Combine the results of evaluating defensible terrain with the results of evaluating observation and fields of fire to identify potential engagement areas.
- *Key terrain.* Identify any areas or terrain features which dominate the AAs or objective areas. These will usually correspond to terrain already identified as potential battle positions or intermediate objectives.

Distribute terrain analysis products as widely as possible. Make the specific terrain factor overlays available to other units and staff sections for their own planning use. They will refine them to meet their own needs. For example, the CIAS will use the results of evaluating the terrain's effects on observation to aid in evaluating the threat's intelligence collection capabilities.

For more information on terrain analysis, see FM 5-33 and FM 5-170. For terrain analysis techniques and considerations in various climates and terrain types, see FMs 90-3, 90-5, 90-6, 90-10, and 90-11.

### **Weather Analysis**

USAF weather teams at division, corps, and EAC work together with engineer teams during much of the analysis process. The weather team analyzes the weather's direct effects and its effects on terrain and integrates climatic, forecast, and current weather data with terrain analysis.

Terrain and weather analyses are inseparable. You should have already included the weather's effects on terrain during terrain analysis. In this sub-step, weather analysis evaluates the weather's direct effects on operations.

If time and resources permit, you can obtain climatology-based overlays for planning purposes from the USAF Environmental Technical Applications Center. Once deployed, the supporting USAF weather team can prepare similar but less detailed overlays depending on the availability of data. Weather teams can provide detailed descriptions of the weather's effects on each system and sub-system of your unit's equipment. If you are not directly supported by a weather team, request support from your higher headquarters.

Evaluate the effects of each military aspect of weather. However, just as in terrain analysis, focus on the aspects that have the most bearing on the situation your command faces. Begin the evaluation of each aspect with the local climatology, but always free-tune the evaluation with the most current forecast available.

You use two sub-steps to accomplish weather analysis: (1) Analyze the military aspects of weather; and (2) Evaluate the weather's effects on military operations.

Each sub-step is discussed below.

#### **(1) ANALYZE THE MILITARY ASPECTS OF WEATHER.**

The military aspects of weather are—

##### **Visibility:**

Low visibility is beneficial to offensive and retrograde operations. In the offense, it conceals the concentration of maneuver forces, thus enhancing the possibility of achieving surprise.

Low visibility hinders the defense because cohesion and control become difficult to maintain, R&S are impeded, and target acquisition is less accurate.

When evaluating visibility, consider the effects of all aspects of the weather. For example, temperature conditions can have either an adverse or beneficial effect on the use of modern thermal sights. Cloud cover can negate the illumination provided by the moon. Precipitation and other obscurants can also have varying effects.

A major factor in evaluating visibility is the amount of available light. Consider the phase of the moon as well as the times associated with—

- Beginning morning nautical twilight (BMNT).
- Sunrise.
- Sunset.
- End evening nautical twilight (EENT).
- Moonrise.
- Moonset.

**Winds:**

Winds of sufficient speed can reduce the combat effectiveness of a force downwind as the result of blowing dust, smoke, sand, or precipitation. The upwind force usually has better visibility. NBC operations usually favor the upwind force.

Strong winds and wind turbulence limit airborne, air assault, and aviation operations. Evaluation of weather in support of these operations requires information on the wind at the surface as well as at varying altitudes. High winds near the ground increase turbulence and may inhibit maneuver. High winds at greater altitudes can increase or reduce fuel consumption.

Wind-generated blowing sand, dust, rain, or snow can reduce the effectiveness of radars and communication systems. Strong winds can also hamper the efficiency of directional antenna systems by inducing antenna wobble.

**Precipitation:**

Precipitation affects soil trafficability, visibility, and the functioning of many electro-optical systems. Heavy precipitation can reduce the quality of supplies in storage. Heavy snow cover can reduce the efficiency of many communication systems as well as degrade the effects of many munitions and air operations.

**Cloud Cover:**

Cloud cover affects ground operations by limiting illumination and the solar heating of targets. Heavy cloud cover can degrade many target acquisition systems, the use of infrared-guided artillery, and general aviation operations.

Heavy cloud cover often canalizes aircraft within air AAs and during the final approach to the target. Partial cloud cover can cause glare, a condition that attacking aircraft might use to conceal their approach to the target. Some types of clouds reduce the effectiveness of radars.

**Temperature and Humidity:**

Extremes of temperature and humidity reduce personnel and equipment capabilities, and may require the use of special personnel shelters or equipment. Air density decreases as temperature and humidity increase, which may require reduced aircraft payloads.

Temperature “crossovers,” when target and background temperatures are nearly equal, degrade the use of thermal target acquisition systems. The length of crossover time depends on air temperature, soil and vegetation types, amount of cloud cover, and other factors.

**(2) EVALUATE THE WEATHER'S EFFECTS ON MILITARY OPERATIONS.**

Weather has both direct and indirect effects on military operations. Examples of indirect effects are—

- Temperature inversions might cause some battle positions to be more at risk to the effects of chemical warfare than others due to their altitude.
- Local conditions of visibility, such as fog, might make some potential engagement areas more attractive than others.
- Hot, dry weather might force a unit to consider water sources as key terrain.

All of these conditions would significantly affect the selection of defensive positions even though their effects are indirect. An effective technique for evaluating and depicting the

weather's indirect effects is to modify the terrain analysis products to show the effects of weather considerations.

Remember to revise the effects of weather upon terrain analysis as the weather changes from the originally evaluated conditions.

You must also evaluate the weather's direct effects on personnel, equipment, and operations. Begin by establishing the critical values of the military aspects of weather that affect the effectiveness of—

- Personnel.
- Specific types of equipment.
- Types of military operations.

An example would be setting critical values for visibility's effects on airborne operations as—

- Visibility of 1 km or less as an unfavorable condition.
- Visibility of 1 to 5 km as a marginal condition.

A forecast of 2 km visibility can then be quickly evaluated as making the conditions for airborne operations marginal.

See Appendix B for other examples and techniques in establishing critical values. An example of critical values arranged into matrix format is shown at Figure 3-1-13.

Once you have set the critical values, use them as gauges to evaluate the effects of local weather on the operations and COAs available to both friendly and threat forces.

An example might be an S2 reporting to his commander: "Sir, weather practically rules out the use of air assault operations because temperature and humidity have reduced the lift capability of the enemy's helicopters by 70 percent."

Weather effects are harder to depict graphically and may have to be portrayed in a matrix.

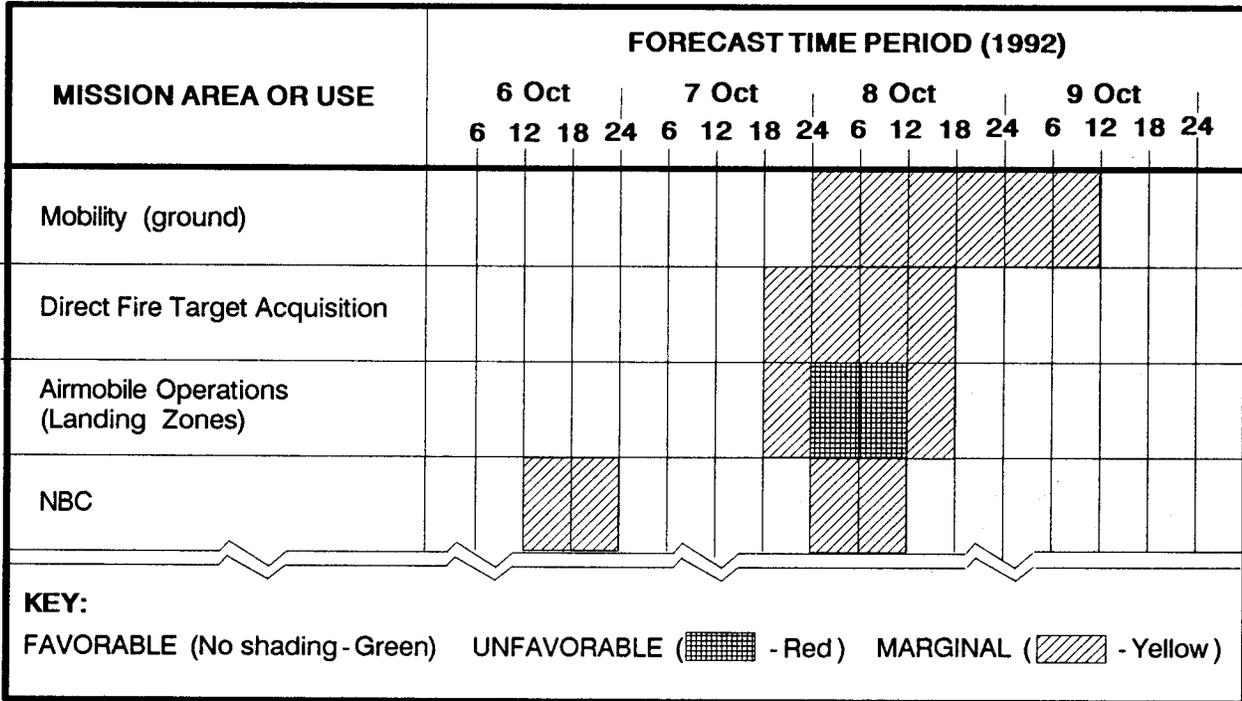
Figure 2-9 is an example of one type of matrix that shows the results of the evaluation of the weather's effects on military operations. See Chapter 3 for other examples.

Regardless of the means of presentation, ensure you focus on the *effects* of weather on military operations rather than the factors that make up the analysis.

For example, you might express the effects of visibility and precipitation on the mobility of a force in terms of movement rates or the amount of time the force will be exposed in an engagement area. These types of evaluations are more readily usable by the commander than statements such as "...3 inches of rain over the next 24 to 48 hours..."

#### **Additional Considerations:**

- To completely account for the weather's effects on your unit's equipment, you must account for its effects on each system and subsystem. For example, when considering the weather's effects on a tank, you must consider its effects on—
  - Target acquisition systems.
  - Ballistic trajectories.
  - Mobility.
  - Crew performance.



**Figure 2-9. Determine the weather’s effects on military operations.**

- You do not have the equipment or information needed to conduct detailed weather analysis. Use the supporting weather team!

For more information, refer to—

- FM 34-81-1 for “how to” information on determining the weather’s effects on military operations.
- FM 34-81/AFM 105-4 for information on support by USAF weather teams.

**Analysis of Other Characteristics of the Battlefield**

“Other Characteristics” include all aspects of the battlefield environment that affect friendly or threat COAs not already incorporated into the terrain and weather analysis.

An example might be an S2 reporting to his commander: “Sir, religious considerations will make cordon and search operations on Wednesdays extremely difficult to execute—the local population will be praying at the same time we’re trying to conduct the search.”

In another example, during riot control assistance to civil authorities the influence of gangs or other unofficial political elements becomes very important.

Use a two step process to determine the effects of other characteristics of the battlefield:

**(1) ANALYZE THE OTHER CHARACTERISTICS OF THE BATTLEFIELD.**

*Typical Characteristics:* Because these aspects vary greatly with each circumstance, a comprehensive list cannot be provided here. However, depending on the situation, these characteristics might include:

- Logistics infrastructure, such as—

- Land use patterns.
- Sources of potable water.
- Bulk fuel storage and transport systems.
- Canals and waterways, with associated control facilities such as locks.
- Communication systems.
- Transportation means and systems, including road and rail networks, transloading facilities, and airfields.
- Natural resources.
- Industries and technologies.
- Power production facilities.
- Chemical and nuclear facilities.
- Population demographics, such as—
  - Living conditions.
  - Cultural distinctions.
  - Religious beliefs.
  - Political grievances.
  - Political affiliation.
  - Education levels.
- Economics.
- Politics—local, regional, and international (government systems, treaties, agreements, and legal restrictions; includes unofficial systems such as gangs).

**(2) EVALUATE THE EFFECTS OF OTHER CHARACTERISTICS OF THE BATTLEFIELD ON MILITARY OPERATIONS.**

As with terrain and weather, the evaluation of the other characteristics of the battlefield is not complete until you express it in terms of their effects on friendly and threat COAs.

In some situations, the “other characteristics” of the battlefield are of more concern than terrain and weather. An historical example illustrates this well:

All US Army activities during and preceding Operation JUST CAUSE were bound by the Carter-Torrijos treaty. Certain provisions of this treaty categorized land within the old canal zone into five different categories. The rights and responsibilities of the United States and the Republic of Panama varied widely depending upon the legal designation of the terrain.

During the show of force operations that led to JUST CAUSE, the legal status of each piece of land influenced the COAs of US Forces and Panamanian Defense Forces far more than the tactical significance of the terrain and weather.

To further illustrate this point, the perception of “seizing the moral highground” often influenced the actions of both sides in Panama far more than the terrain and weather.

These other characteristics of the battlefield are particularly important at the operational and strategic levels, but also play a major role at the tactical level in operations other than war. Chapter 5 gives examples of “other characteristics” as they might affect operations at different levels of war.

Although you will usually be forced to discuss the effects of other characteristics of the battlefield in text products or a matrix, always attempt to use graphics. Examples of graphic depictions include an overlay showing areas most vulnerable to insurgent operations, based on demographics; or an overlay identifying HVTs in the logistics infrastructure, in either the threat or friendly rear area.

### **DESCRIBE THE BATTLEFIELD’S EFFECTS ON THREAT AND FRIENDLY CAPABILITIES AND BROAD COURSES OF ACTION**

Combine the evaluation of the effects of terrain, weather, and the other characteristics of the battlefield into one integrated product. Do not focus on the factors that lead to your conclusions. Instead, focus on the total environment’s effects on COAs available to both friendly and threat forces.

The following are some examples of techniques for accomplishing this.

- Prior to the development of friendly COAs—
  - Provide the evaluated and prioritized set of AAs to the S3 so he can develop COAs by designating an axis of advance, direction of attack, or zone of attack for each subordinate unit (offense).
  - Provide the sets of defensible terrain along threat AAs to the S3 so he can develop strongpoints, battle positions, or sectors for each subordinate unit (defense and retrograde).
  - Identify the periods when weather conditions will optimize the use of friendly sighting and target acquisition systems so the S3 can make recommendations on the timing of operations.
- After the development of friendly COAs, emphasize concluding sentences, such as “... of the COAs available, COA 2 makes second best use of the opportunities the battlefield environment offers for the following reasons...”

You must address the battlefield’s effects on threat as well as friendly COAs. A good technique for accomplishing this is to completely place yourself in the perspective of the threat’s S2 and S3 who must recommend a set of COAs to their commander.

Ensure that you evaluate the effects of battlefield environment on threat COAs considering the specific threat your command is facing. Following are some examples to consider:

- Threat vehicles may have different values than the friendly vehicles you are used to in terms of mobility, optical systems, and so forth.
- The threat may have an organic capability that undermatched or overmatches your unit. If the threat is attacking without dismounted infantry, do not waste time identifying infiltration lanes. Likewise, a threat unit with exceptional bridging capabilities will be less affected by river obstacles.
- Bear in mind that weather will affect threat equipment differently than US equipment. Examples: An AK-47 is more resistant to moisture than an M-16. Likewise, fog will affect US thermal sights less than it will affect vehicles with optical sights only.

- Remember that “other characteristics” may sometimes influence threat actions more than terrain or weather considerations. Remember, also, to account for the cultural bias the threat operates within. They will evaluate the same legal, political, economic, and demographic aspects in a completely different manner than US personnel would.

The bottom line is to evaluate the battlefield completely from the perspective of the threat. Remember to express this evaluation in terms of COAs, not detailed descriptions of the analytical factors that led to the conclusions.

Focus the commander on concluding statements such as, “Sir, the battlefield environment best supports insurgent attacks on US and host nation (HN) forces near Daleytown. The next best place for their operations is Elkinsville.” Be prepared to back these conclusions with the detailed analysis prepared in the previous steps.

Communicate the final conclusions from the description of the battlefield environment in written reports such as the analysis of the AO or the intelligence estimate. Distribute the graphic products developed during the analysis and evaluation as needed to support the remainder of the staff and other commands in their own IPB and planning efforts.

## Evaluate the Threat

### What Is It?

#### Definition:

The determination of threat force capabilities and the doctrinal principles and TTP threat forces prefer to employ.

#### An Example:

While planning a contingency show of force operation, a J2 directs the Joint Intelligence Center (JIC) to study the decisions on record of the targeted country’s dictator. As a result of this research, the intelligence center produces a model of how the dictator makes decisions, with special emphasis on his tendencies during political crises.

Meanwhile, the S2 of the brigade which will conduct the operation does his own evaluation of the threat. He evaluates his contingency area order of battle (OB) files and determines that the two threat brigades within the target area are equipped, organized, and trained well enough to be capable of offensive as well as defensive operations against the friendly brigade. He prepares threat models depicting the threat’s normal offensive and defensive operations in built-up areas (the setting for the show of force operation).

#### Desired End Effect:

Know the enemy. Develop threat models which accurately portray how threat forces normally execute operations and how they have reacted to similar situations in the past. Know what the threat is capable of, given the current situation.

The threat model should include-

- Standard graphic control measures, such as boundaries.
- A description of typical tasks for subordinate units.
- An evaluation of how well the threat force is trained on the task.
- Employment considerations.
- A discussion of typical contingencies, sequels, failure options, and wildcard variations.

- An evaluation of the threat's strengths, weaknesses, and vulnerabilities, including an evaluation of typical HVTs.

### ***So What?***

#### **Success Results In:**

Threat COAs developed in the next step of IPB reflect what the threat is and is not capable of and trained to do in similar situations.

#### **Consequences of Failure:**

The staff will lack the intelligence needed for planning.

The threat will surprise the friendly force with capabilities that the G2/S2 failed to account for.

At the other extreme, the friendly staff may waste time and effort planning against threat capabilities that do not exist.

### ***How To Do It:***

- Update or create threat models:
  - Convert threat doctrine or patterns of operation to graphics (doctrinal templates).
  - Describe in words the threat's tactics and options.
  - Identify HVTs.
- Identify threat capabilities.

Each of these steps is discussed below.

#### **Update or Create Threat Models**

Threat models depict how threat forces prefer to conduct operations under ideal conditions. They are based on the threat's normal or "doctrinal" organization, equipment, doctrine, and TTP. Threat models result from a detailed study of the threat force. Ideally, you construct threat models prior to deployment. Even after deployment, however, continue to evaluate the threat and update the threat models as required.

Threat models consist of three parts:

- Doctrinal templates.
- Description of preferred tactics and options.
- Identification of type HVTs.

An effective technique for recording threat models is to use the target spreadsheet format (see Figure 2-10).

Each part of the threat model is discussed in detail below.

#### **Doctrinal Templates:**

Doctrinal templates illustrate the deployment pattern and disposition preferred by the threat's normal tactics when not constrained by the effects of the battlefield environment. They are usually scaled graphic depictions of threat dispositions for a particular type of standard operation, such as a battalion movement to contact, an insurgent ambush, or a terrorist kidnapping. Figure 2-11 shows one such doctrinal template.

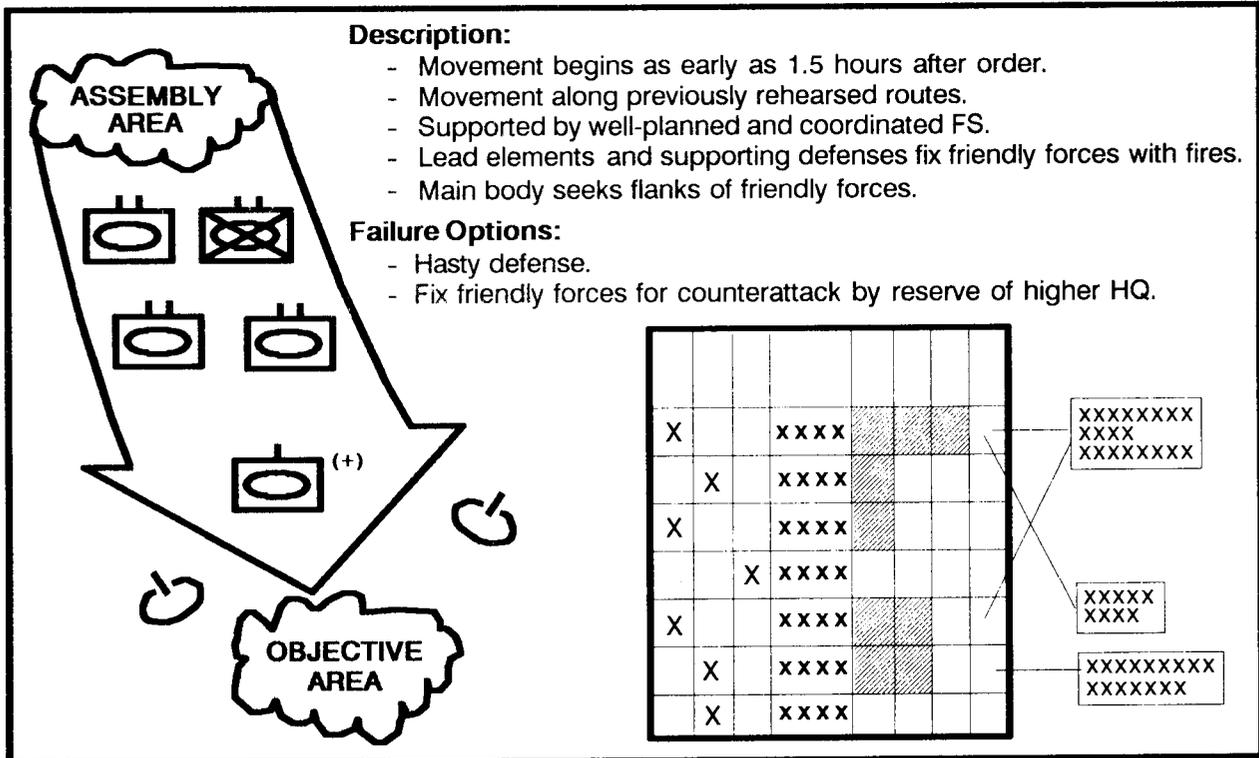


Figure 2-10. A complete threat model consists of a graphic depiction, a description and identification of HVTs.

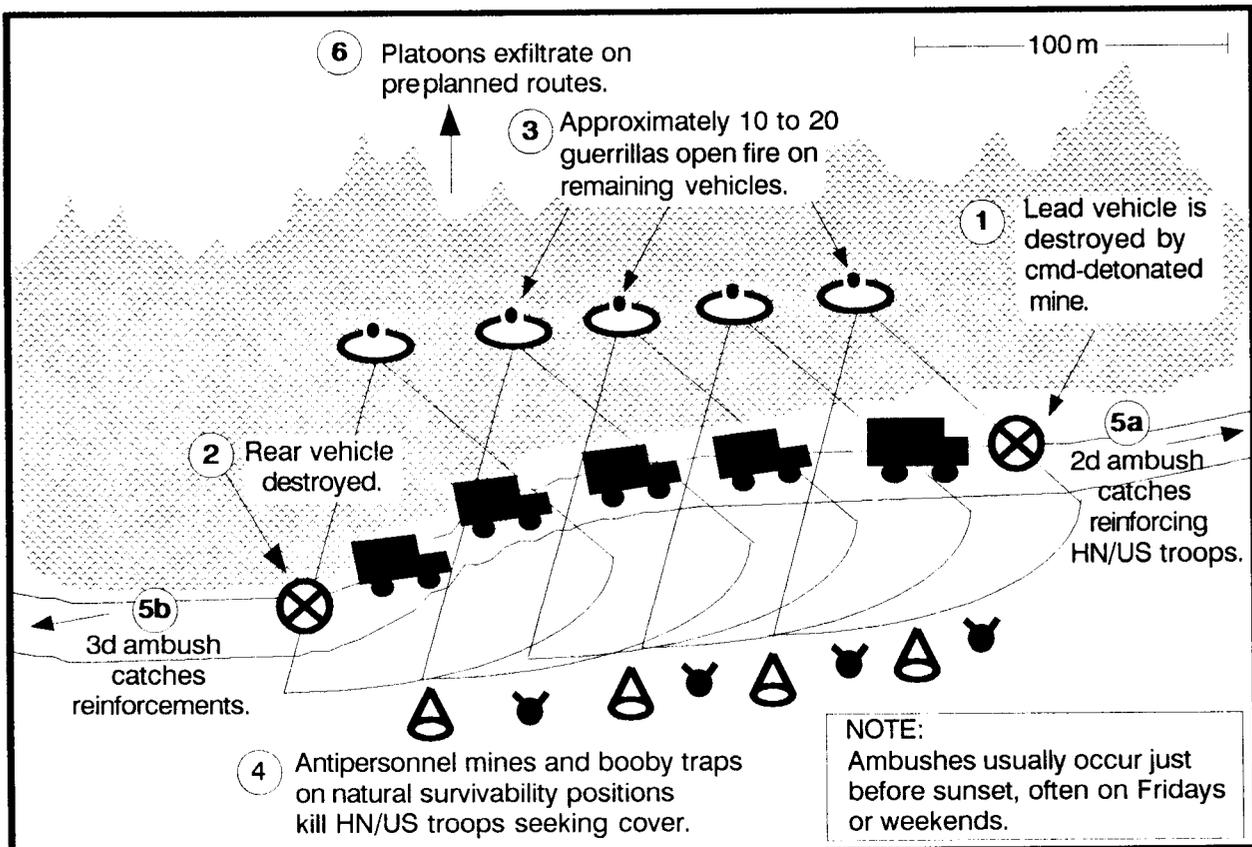


Figure 2-11. Doctrinal templates depict the enemy's normal or preferred tactics.

Construct doctrinal templates through an analysis of the intelligence data base and an evaluation of the threat's past operations. Determine how the threat normally organizes for combat and how he deploys and employs his units and the various BOS assets. Look for patterns in task organization of forces, timing, distances, relative locations, groupings, or use of the terrain or weather. Focus on major elements as well as individual HVTs.

Even unconventional operations lend themselves to graphic depiction. For example, an evaluation of the data base might indicate that when robbing banks the threat always sends four guerrillas inside with at least two remaining outside. The four who move inside the bank usually take up positions at distinct locations within the bank. This type of information can easily be converted into a graphic representation, although not necessarily to a standard map scale.

Doctrinal templates can also portray the threat's normal organization for combat, typical supporting elements available from higher commands, frontages, depths, boundaries, engagement areas, objective depths, and other control measures. Whenever possible, convert these patterns into graphic representations such as overlays or sketches.

Doctrinal templates are tailored to the needs of the unit or staff section creating them. For example, a division G2 creates a template that differs in scope from that constructed by a battalion S2; the template constructed by an EW section differs drastically from that constructed by an air defense unit. An air defense doctrinal template, for example, would include a description of normal strike package composition, altitudes, time spacing between groups of aircraft, and so forth.

Some doctrinal templates consider the threat unit or force as a whole, while others focus on a single BOS, such as intelligence or fire support.

#### **Description of Tactics and Options:**

The threat model includes a description of the threat's preferred tactics. It addresses the operations of the major units or elements portrayed on the template and the activities of the different battlefield operating systems. It also contains a listing or description of the options available to the threat should the operation fail (branches), or subsequent operations if it succeeds (sequels).

Even if the threat's preferred tactics can be depicted graphically, the threat model includes a description. This allows the template to become more than a "snapshot in time" of the operation being depicted. It aids in mentally wargaming the operation over its duration during the development of threat COAs and situation templates.

The description should address typical tin-dines and phases of the operation (maneuver and support), points where units transition from one formation to another, and how each BOS contributes to the operation's success. Describe the actions of the supporting BOS in enough detail to allow the later identification of HVTs and HPTs. Since the target's value usually varies with its role in each phase of the operation, ensure that you examine each phase separately.

Like the template itself, you develop the description of the threat's tactics and options from an evaluation of his doctrine and past or current operations. Include a description of the branches and sequels normally available to or preferred by the threat should the depicted operation succeed or fail. For example, the threat might prefer to follow successful attacks with pursuit. Should an attack begin to fail, his preferred branches might include committing reserves, reinforcement, or shifting the main effort. Should the attack fail, his preferred sequel might be a hasty defense.

If the data base reveals any decision criteria that cause the threat to prefer one option over another, include that in the description. This information will aid in wargaming threat and friendly COAs, targeting, and deception planning.

### **Techniques:**

- Start with the scheme of maneuver, then examine how each BOS “fits in” or provides support.
- Time-event charts can describe how the threat normally conducts an operation. For example, while it is difficult to depict a large scale air operation graphically, the time relationship between the various echelons and their normal composition can easily be described in a time-event chart, narrative, or matrix format.
- Marginal notations on the graphic template are an effective technique, especially when the notes are tagged to key events or positions on the template. For example, marginal notes might describe the insurgent’s normal reactions to friendly reinforcements during their conduct of an ambush (see Figure 2-11).
- A BOS synchronization matrix depicts the threat’s TTP in matrix form. See Chapter 3 for some examples.

### **Identification of Type HVTs:**

Assets that the threat commander requires for the successful completion of the mission depicted and described on the template are HVTs.

Identify HVTs from an evaluation of the data base, the doctrinal template, its supporting narrative, and the use of tactical judgment. HVTs usually (but not always) fall within the non-maneuver BOS. Develop the initial list of HVTs by mentally wargaming and thinking through the operation under consideration and how the threat will use the assets of each BOS to support it. Identify any that are critical to the operation’s success.

For example, while mentally wargaming an enemy air attack against friendly targets supported by a well prepared air defense system, it is logical to assume that the enemy will need a substantial air defense suppression package as part of the strike force. In such a case, threat aircraft commonly used in such a role become HVTs.

Identify assets which are key to executing the primary operation. Also identify any assets which are key to satisfying decision criteria or initial adoption of the branches and sequels listed in the description and option statements.

Determine how the threat might react to the loss of each identified HVT. Consider his ability to substitute other assets as well as the likelihood of adopting branches to the operation.

After identifying the set of HVTs, rank order them with regard to their relative worth to the threat’s operation and record them as part of the threat model. An HVT’s value usually varies over the course of an operation. Identify any changes in value by phase of the operation and make the necessary annotations.

As you identify key assets, group them into one of the 13 categories used to develop target sets. These 13 categories are—

- Command, control, and communications (C<sup>3</sup>).
- Fire support (includes target acquisition assets, ammunition, aircraft, fire direction control, and others).

- Maneuver.
- Air defense (includes radars, processing centers, and headquarters).
- Engineer.
- Reconnaissance, intelligence, surveillance, and target acquisition (RISTA).
- NBC (includes support elements and weapons).
- Radio electronic combat (REC) or EW assets.
- Bulk fuels (storage and refueling assets).
- Ammunition storage sites and distribution points.
- Maintenance and repair units (includes collection points and mobile repair facilities).
- Lift.
- LOCs (roads, bridges, railheads, transloading facilities, airfields, choke points, others).

In a pinch, you can annotate the identified HVTs in the margins of the doctrinal template. When fully developed, HVT evaluations take the form of target relative value matrices (see Figure 2-12).

Target value matrices give a measure of the relative worth of targets, the rationale behind an attack on each type of target, and the resulting effects on the operation. See FM 6-20-10 for a complete discussion.

As always, tailor IPB to your needs by concentrating on potential HVTs important to your command or mission area. For example, an ADA unit's evaluation of HVTs might concentrate on distinguishing between the relative HVT worth of one type of aircraft over another. A CIAS might focus on the relative HVT worth of one type of intelligence collector or discipline over another.

#### **Additional Considerations:**

- Use all available intelligence sources to update and refine threat models. The most useful are the OB files. OB files contain the details which allow you to reach conclusions about the threat's operations, capabilities, and weaknesses. The OB factors that structure the OB files are—
  - Composition.
  - Disposition.
  - Strength.
  - Tactics or modus operandi (including habitual operating areas for unconventional warfare [UW] forces, gangs, insurgences, and so forth).
  - Training status.
  - Logistics.
  - Effectiveness.
  - Electronic technical data.
  - Miscellaneous data (personalities, pseudonyms, other).

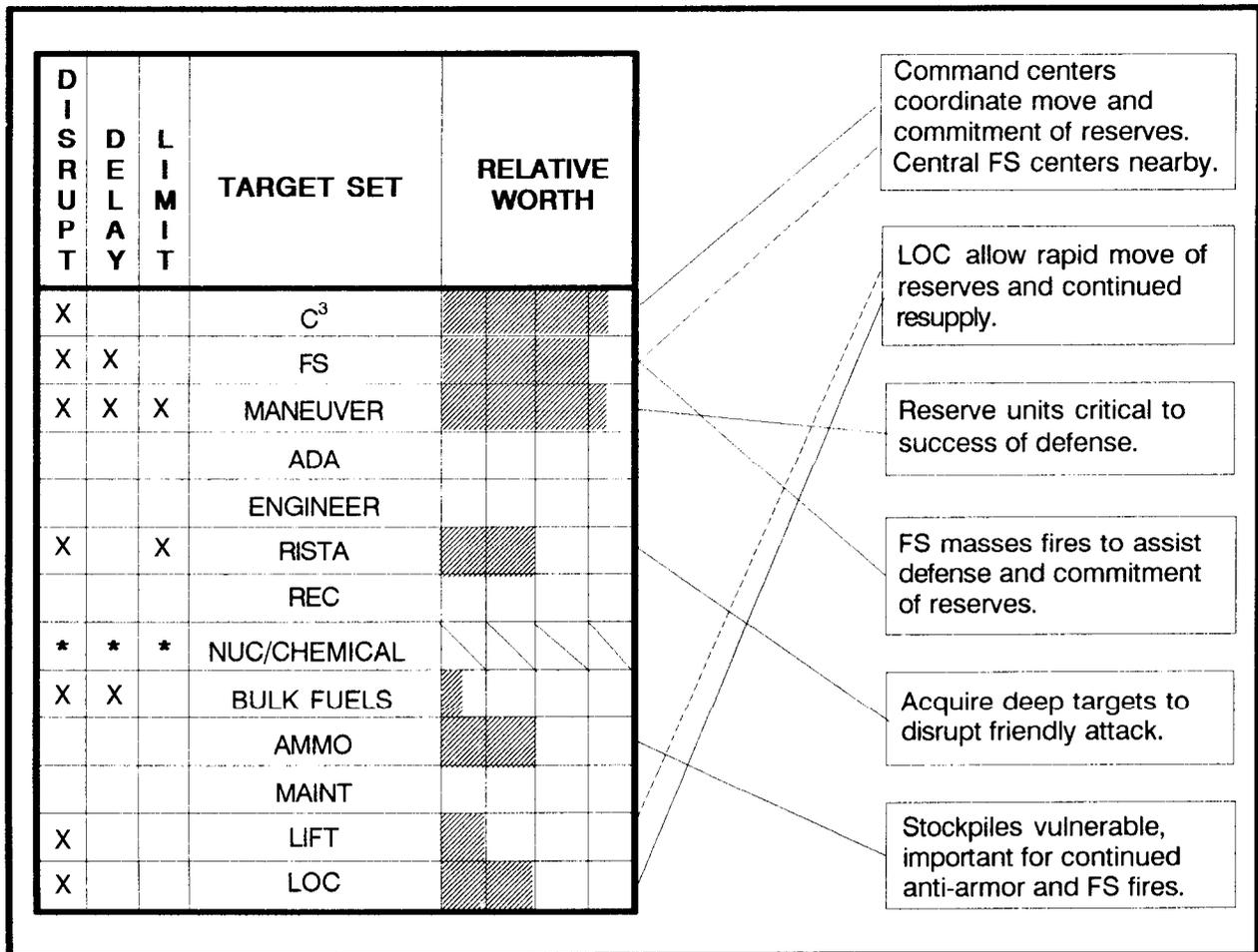


Figure 2-12. A complete threat model identifies HVTs.

- Create an OB file for each threat unit you are concerned with. Comparing the doctrinal norm with the files on each unit will indicate that most vary from the standard. Types of equipment as well as organization and training status may differ. As much as possible, the threat models should portray the specific units you are evaluating, not just the doctrinal norm.
- As time permits, continuously update the OB files as you develop intelligence during the processing phase of the intelligence cycle. Do not wait until staff planning begins to conduct the analysis. A common technique is to maintain a set of threat models under the "tactics" or "modus operandi" tab of each OB tile.
- Consider the various OB factors and their relationship when conducting the evaluation and updating the threat models. For example, how do direct fire weapon ranges and the threat's preferred size and location of engagement areas and battle positions relate?
  - If he increases his direct fire weapons system range, will he move his engagement areas farther from his battle positions, or make the engagement areas larger?
  - If he improves the range of his artillery systems will he employ them farther to his own rear, or use the extra range to engage deeper targets?

- If his air defense capability improves, will he reduce the number of ADA assets in each unit?
- The OB factors are not independent of each other; they are closely related—consider them as a whole. For example, changes in training status, command personality, strength, or any other of the OB factors may affect the tactics of a unit at a given time.
- The OB factors form a framework for evaluation of any force, not just those that are strictly military. For example, when considering composition during a counter-drug operation, you might include an analysis of extended family ties of suspected traffickers. In evaluating an insurgent force, you would include an analysis of the insurgent political structure and its relationship to the military elements.
- Tailor evaluation of the OB factors to your unit needs. For example, an aviation unit's evaluation of composition would focus more heavily on those units that contained air defense assets. Its evaluation of equipment would focus on the vulnerabilities of likely threat targets as well as the technical characteristics of the threat's air defense systems.
- Consider not only the threat's physical capability based on organization and equipment strength but also his normal modus operandi, tactical doctrine, and state of training. This requires an understanding of the art and science of war as well as current knowledge of the threat. Ensure that you update the historical data bases with current observations whenever possible. For example, in scenario 3 of Chapter 3, the S2 uses three reports of recent insurgent ambushes to create a threat model depicting an insurgent ambush (see Figure 3-3-12).
- Mentally wargame the operation through to its completion. Do not stop at initial deployment of threat forces or initial contact with friendly forces.
- Rely on staff experts for help. The staff aviation officer, for example, probably knows a great deal about threat air and air defense operations.
- A useful technique in understanding how threat forces conduct operations is to first gain an understanding of how your own force conducts them. Then compare and contrast the threat's normal approach to the same operations. The OB factors form the framework for this evaluation. Another useful framework is the BOS.
- For a full discussion of the analytical techniques used in constructing threat models, see FMs 34-3, 34-7, 34-40(S), and 34-60.

### Identify Threat Capabilities

Threat capabilities are the broad COAs and supporting operations which the threat can take to influence the accomplishment of the friendly mission. They take the form of statements, such as—

- “The enemy has the capability to attack with up to 8 divisions supported by 170 daily sorties of fixed-wing aircraft.”
- “The enemy can establish a prepared defense by 14 May.”
- “The enemy has the ability to insert up to 2 battalions of infantry in a single lift operation.”
- “The drug smugglers have the capability to detect the radars used at our observation posts.”
- “The threat can conduct up to three separate smuggling operations simultaneously.”

- “The protesters can effectively block traffic at no more than 7 different intersections.”

There are generally four tactical COAs open to military forces in conventional operations:

- Attack.
- Defend.
- Reinforce.
- Conduct a retrograde.

Each of these broad COAs can be divided into a variety of more specific COAs. For example, an attack may be an envelopment, a penetration, or other variations of an attack. A retrograde movement may be a delaying action, a withdrawal, or a retirement.

Other capabilities include support to broad COAs or specific types of operations. Examples of these types of capabilities are—

- Use of NBC weapons.
- Use of supporting air assets.
- Intelligence collection.
- EW.
- Engineering operations.
- Air assault or airborne operations.
- Amphibious assaults.
- Riverine operations.
- Psychological operations (PSYOP).
- Deception operations.

At other levels of war and during operations other than war you will consider other types of operations and broad COAs. In any case, start with the full set of threat models and consider the threat’s ability to conduct each operation based on the current situation.

Most situations will not present the threat with the ideal conditions envisioned by his doctrine and TTP. He will usually be under-strength in terms of personnel or equipment. He may be short of logistical support. He may not enjoy air superiority. His troops may be inexperienced or poorly trained. As a result, the threat’s actual capabilities usually will not mirror the ideal capabilities represented by the complete set of threat models. For example:

- The threat’s doctrine may call for penetration attacks when possible. Your evaluation of his current strength, however, may indicate that the threat lacks the force ratio he normally considers adequate for a penetration attack.
- A terrorist group’s normal tactics may call for the use of car bombs or similar devices to tie down emergency services while they conduct raids in other parts of town. Your evaluation of the threat’s current logistics status, however, might indicate a critical shortage of explosive materials.

**Additional Considerations:**

- Use all available intelligence sources in the evaluation of the threat's current situation. Focus on the *effects* each incident or fact has on threat capabilities rather than simply enumerating details.
- Use the OB files for the particular threat force you are evaluating. Most forces differ from the ideal portrayed in threat doctrine or tables of organization and equipment (TOE). They may be equipped or organized differently, train for special missions, or have a particular record of combat experiences that give them a unique set of capabilities.
- In addition to identifying actual threat capabilities, the evaluation may identify additional threat strengths or vulnerabilities caused by the current situation. Ensure you incorporate them into the threat models, the intelligence estimate, and the threat COAs you develop in the next step of the IPB process.
- Consider the threat's ability to operate in darkness or adverse weather. This is more than the technical capability of selected items of threat equipment. For example, the threat's tank fleet may be equipped with the latest in night vision devices but the supporting infantry and other arms may not be.
- Also consider training levels. A force that frequently trains in night combat may have a better capability for such operations than a better equipped force that seldom trains at night. A force that has never trained in large scale troop movements may have a limited capability to conduct large offensive maneuvers.
- Consider the time element when evaluating capabilities. For example, the threat's forces may be currently dispersed to the point where he is not capable of offensive action. Given time, however, he can mass his forces. Similarly, the threat's current logistical stockage may permit offensive operations for only a limited amount of time before his stockpiles are exhausted.
- When time or some other factor is a critical element in a threat capability, ensure that you state it explicitly. For example:
  - "The enemy has the capability to attack to seize objectives no deeper than the line SOCHATON-MESSVILLE due to insufficient fuel reserves."
  - "The enemy has the capability to attack after repositioning major elements of the IV Army. Current dispositions preclude an attack before 9 July."
  - "The insurgents will have the manpower they need to conduct offensive action once the harvest is completed."

Do not limit the threat models and evaluation of capabilities strictly to military forces of the threat. Student rioters during a noncombatant evacuation (NEO) operation, for example, are a threat to the friendly mission. Evaluate them using all the techniques described in this section.

Like all other parts of the IPB process, tailor the evaluation to your particular needs. A CIAS, for example, focuses on the threat's intelligence collection capabilities, and levels I and II threats. Signal units focus on the ability of the threat to disrupt friendly communications.

Disseminate the results of evaluating the threat as widely as possible. This allows other staff sections and units to include them in their own IPB process. For example, the doctrinal

templates produced by a division will be refined by subordinate battalions to include a greater degree of detail. Templates produced by a G2 or S2 section will be modified by other staff sections, possibly to highlight specific BOSs in more detail, such as air defense assets.

In addition to distributing threat models, disseminate the results of evaluating the threat's capabilities, strengths, and vulnerabilities. The traditional means of disseminating the evaluation is the intelligence estimate, but always use the means best suited to the situation. The graphics that make up the threat model might best be delivered by courier. You can also deliver other parts of the evaluation by voice communications or over automated systems.

For a full discussion of the analytical techniques used in evaluating the threat, refer to FMs 34-3, 34-7, 34-40(S), and 34-60.

## Determine Threat Courses of Action

### *What Is It?*

#### **Definition:**

The identification and development of likely threat COAs that will influence accomplishment of the friendly mission.

#### **An Example:**

A Boer S2 tells his commander: "Sir, the enemy platoon leader's likely objective is to retain control of the only crossing point suitable for wheeled traffic over the Silliaasvogel River. He can defend the crossing, known as Duffer's Drift, with his 50 soldiers in any one of the following ways:

- (1) "He can leave it undefended until tomorrow (being inexperienced and thinking that we will not arrive until the next day).
- (2) "He can dig his platoon into a small enclosure just on the other side of the drift. A variant of this COA would be for him to establish a trenchline astride the main road.
- (3) "He can occupy and fortify the Kraal village that overlooks the drift.
- (4) "He can occupy the riverbed itself with only a small outpost in the Kraal village. This goes against every canon in British doctrine; however, we must consider this COA because it is so dangerous to the accomplishment of our mission.

"Sir, I think the platoon leader will adopt one of these COAs, in order of probability as I gave them. We need to conduct reconnaissance of the riverbed and the Kraal in order to find out which of these COAs he has chosen."

(Note: "The Defence of Duffer's Drift," by MC Sir Ernest Swinton, is a classic vignette illustrating the proper use of tactics, IPB, and the practical application of doctrine.)

#### **Desired End Effect:**

Replicate the set of COAs that the threat commander and staff are considering.

Identify all COAs that will influence the friendly command's mission.

Identify those areas and activities that, when observed, will discern which COA the threat commander has chosen.

***So What?***

The staff uses the resulting threat COAs, along with other facts and assumptions about the battlefield environment, to drive the wargaming process and develop friendly COAs.

**Success Results in:**

The friendly commander and staff will avoid being surprised with an unanticipated threat action.

You will be able to quickly narrow the set of possible threat COAs to the one he has chosen.

**Consequences of Failure:**

You will fail to identify which of the possible COAs the threat has chosen, leading to surprise of the friendly command.

***How To Do It:***

Each of the following steps is discussed below:

- Identify the threat's likely objectives and desired end state.
- Identify the full set of COAs available to the threat.
- Evaluate and prioritize each COA.
- Develop each COA in the amount of detail time allows.
- Identify initial collection requirements.

**IDENTIFY THE THREAT'S LIKELY OBJECTIVES AND DESIRED END STATE:**

Start with the threat command at least one level above your own and identify likely objectives and the desired end state. As you identify the likely objectives at each level of command, repeat the process for the next subordinate level, working down to two levels below your own command. Ensure that each level's objective will accomplish the likely objectives and desired end state of its parent commands.

**Additional Considerations:**

- The situation may require you to start at more than one level above your command, particularly in operations other than war.
- Only in rare cases will you have the intelligence you need to state the threat's objectives and intended end state as facts. You will usually state them as assumptions. As with all assumptions, ensure that you discuss them with the commander and the remainder of the staff. Ensure that you identify assumptions as such.
- Especially during operations other than war it is important that you consider more than the conventional objectives of terrain or friendly forces. This is also true at higher levels of command where the threat's political and economic objectives have a direct influence on his COAs.
- Terrain related objectives (intermediate and final) often focus on key terrain features. Force related objectives usually focus on reserve forces.
- Even during defensive operations the threat will have objectives, such as retain control of a piece of terrain, defeat or delay a friendly force, or take prisoners. You must also identify likely counterattack objectives such as terrain features or friendly reserve forces.

- It is possible that the threat's intent and objectives may not interfere with the accomplishment of the friendly mission. This is more likely during operations other than war.

#### **IDENTIFY THE FULL SET OF COAs AVAILABLE TO THE THREAT:**

To ensure that you consider the full set of COAs available to the enemy, you must at least consider—

- The COAs the threat's doctrine believes appropriate to the current situation and the likely objectives you have identified. This requires an understanding of the threat's decision making process as well as an appreciation for how he perceives the current situation.
- The threat COAs which could significantly influence your command's mission, even if the threat's doctrine considers them infeasible or "sub-optimum" under current conditions. Consider any indirect or "wildcard" COAs that the threat is capable of executing.
- The threat COAs indicated by recent activities and events. To avoid surprise from an unanticipated COA, consider all possible explanations for the threat's activity in terms of possible COAs.

Consider each sub-set of COAs independently to avoid forming biases that restrict the analysis and evaluation. Once you have evaluated each sub-set separately, combine them to eliminate redundancy and minor variations. Compare the consolidated list to threat capabilities you identified in step 3 of the IPB process, **Evaluate the Threat**, and eliminate any COAs which the threat is incapable of executing.

Based on the evaluation of the threat's capabilities (step 3 of the IPB process), select threat models that will accomplish the threat's likely objectives. Examine how the effects of the battlefield (from step 2 of the IPB process, **Describe the Battlefield's Effects**) influence their application as COAs (see Figure 2-13). You will usually find that terrain, weather, and other characteristics of the battlefield environment "offer" a limited set of COAs, encouraging some while discouraging others.

Start with the general COAs open to the threat, such as deliberate attack, hasty attack, defend, and delay. Further define each general COA as a set of specific COAs by integrating the threat models from step 3 of the IPB process with the description of the battlefield's effects from step 2. Factors to consider include—

- The threat's intent or desired end state.
- Likely attack or counterattack objectives.
- Effects of the battlefield environment on operations and broad COAs.
- Threat vulnerabilities or shortages in equipment or personnel.
- Current dispositions.
- Location of main and supporting efforts.
- Threat perception of friendly forces.
- Threat efforts to present an ambiguous situation or achieve surprise.

Refine each broad COA statement into a set of specific COAs. For example, a general COA such as “hasty attack” might be further defined as a set of specific COAs such as “with main effort in the east . . . in the west . . . against the adjacent unit.”

**Criteria for COAs:**

Each threat COA you identify should meet five criteria: suitability, feasibility, acceptability, uniqueness, and consistency with doctrine.

**Suitability:**

A threat COA must have the potential for accomplishing the threat’s likely objective or desired end state. If the COA is successfully executed, will it accomplish the threat’s objectives?

**Feasibility:**

Consider the time and space required to execute the COA. Are they available?

Consider the resources required to execute the COA. Does the threat have the physical means required to make it a success?

Occasionally, force ratios or other factors might indicate that the threat lacks the means to accomplish his likely objectives. Before discounting the threat completely, consider all actions he might take to create the conditions needed for success. For example, he might conduct economy of force operations in some sectors in order to generate sufficient combat power for offensive operations in others. His lack of resources might force him to violate his own doctrine in order to accomplish his objective. What seemingly radical measures can he take to create the conditions for success? Avoid surprise.

**Acceptability:**

Consider the amount of risk involved. Will threat forces accept the amount of risk entailed in adopting the COA? Can they afford the expenditure of resources for an uncertain chance at success? This is obviously a subjective judgment based on knowledge of the threat and his doctrine. In some instances, the threat might undertake otherwise unfavorable COAs, particularly if they are the only means to accomplishing his objective.

**Uniqueness:**

Each threat COA must be significantly different from the others. Otherwise, consider it as a variation rather than a distinct COA. Factors to consider in determining if a COA is “significantly” different are—

- Its effect on the friendly mission.
- Use of reserves or second echelon.
- Location of main effort.
- Scheme of maneuver.
- Task organization.

This is obviously a subjective judgment based on your experience and training.

**Consistency with Doctrine:**

Each threat COA must be consistent with the threat’s doctrine. Base the evaluation of consistency on the threat’s written doctrine and observations of his past application of

doctrine, as revealed in the intelligence data base. Do not, however, overlook threat efforts to achieve surprise by deviating from known doctrine or using “wildcard” COAs.

### Additional Considerations:

- Account for the effect of friendly dispositions, or the threat’s perception of friendly dispositions, when determining the COAs the threat believes are available. A technique for accomplishing this is to conduct “reverse IPB.” In other words, replicate the process that the threat is employing to discern friendly COAs.

- Focus on those COAs that will affect accomplishment of your command’s mission. This obviously includes those threat COAs that will interfere with the command’s mission. If there are indications that the threat might adopt a COA that favors accomplishment of your command’s mission, include it as well. This prepares the commander to take advantage of opportunities that might arise. For example:

If the friendly command’s mission is to attack to destroy the threat, threat COAs that would interfere with the friendly mission are **defend** (including counterattacks), **reinforce**, and **withdraw**.

If your command’s mission is to attack to seize a terrain objective, threat COAs that could interfere with the mission are **defend**, (including counterattacks) and **reinforce**. Threat withdrawal would favor accomplishment of the friendly mission and would also be included in the set of probable COAs *if* there were indications the threat might actually withdraw.

- It is possible for the threat to have objectives and choose COAs which will not interfere with success of your command’s mission.
- Identify the *full* set of COAs available to the threat. History repeatedly demonstrates that those who predict only one COA are often surprised by the enemy.
- Do not overlook the less likely but still viable COAs. Do not risk surprise by failing to take the time to consider all feasible COAs. Identify alternative methods by which the threat can achieve his objective or desired end state. Consider the following possibilities that might lead to “wildcard” COAs.
  - Superior understanding of “other characteristics of the battlefield” (politics in particular).
  - Ignorance of the military arts and sciences.
  - Immature decision making.
  - Uncertainty as to friendly disposition or intent.
  - Unexpected objectives or desired end states.
  - Desperation.
  - Bureaucratic inefficiency.
  - Audacity.

On the other hand, avoid developing a “full” set of COAs by including bogus options.

- For a complete discussion of methods used to construct COAs (friendly or threat), refer to FM 101-5.

**EVALUATE AND PRIORITIZE EACH COURSE OF ACTION:**

The resulting set of COAs depicts the full set of options available to the threat. Remember that the threat COAs you identify are *assumptions* about the threat, *not facts*. Because of this, you cannot predict with complete accuracy which of the COAs the threat will employ.

However, the commander and his staff still need to develop a plan that is optimized to one of the COAs, while still allowing for contingency options if the threat chooses another COA. Therefore, you must evaluate each COA and prioritize it according to how likely you estimate it is that the threat will adopt that option. Establish an initial priority list to allow the staff to plan for friendly COAs. Once the commander selects a friendly COA, you may need to reorder the list of threat COAs. Consider especially any changes in the threat's perception of friendly forces.

To prioritize each COA—

- Analyze each COA to identify its strengths and weaknesses, centers of gravity, and decisive points.
- Evaluate how well each COA meets the criteria of suitability, feasibility, acceptability, and consistency with doctrine.
- Evaluate how well each COA takes advantage of the battlefield environment. How does the battlefield encourage or discourage selection of each COA?
- Compare each COA to the others and determine if the threat is more likely to prefer one over the others. Most forces will choose the COA that offers the greatest advantages while minimizing risk.
- Consider the possibility that the threat may choose the second or third “best” COA while attempting a deception operation portraying acceptance of the “best” COA.
- Analyze the threat's recent activity to determine if there are indications that one COA is already being adopted. Does his current disposition favor one COA over others?

Use judgment to rank the threat's COAs in their likely order of adoption. Modify the list as needed to account for changes in the current situation. For example, the initial priority order of threat COAs does not account for the friendly COA, since one has not yet been selected. Friendly dispositions may change as the command moves to adopt its own COA. How will that change the likelihood of each threat COA? Given time, you could develop several different versions of the prioritized list of threat COAs—a different order for each potential friendly COA. Alternatively, after the commander has selected the friendly COA, reprioritize the initial list of threat COAs to reflect changed friendly dispositions and activities.

**DEVELOP EACH COURSE OF ACTION IN THE AMOUNT OF DETAIL TIME ALLOWS:**

Once you have identified the complete set of threat COAs, develop each COA into as much detail as the situation requires and time available allows. Base the order in which you develop each COA on its probability of adoption and the commander's guidance. To ensure completeness, each COA must answer five questions:

- WHAT - the type of operation, such as attack, defend, reinforce, or conduct retrograde.
- WHEN - the time the action will begin. You usually state this in terms of the earliest time that the threat can adopt the COA under consideration.

- WHERE - the sectors, zones, axis of attack, avenues of approach, and objectives that make up the COA.
- HOW - the method by which the threat will employ his assets, such as dispositions, location of main effort, the scheme of maneuver, and how it will be supported.
- WHY - the objective or end state the threat intends to accomplish.

Consider threat forces available to at least one level of command above your own when developing each COA. For example, a battalion S2 would consider the COAs available to threat regiments and brigades. This helps to ensure that you account for possible reinforcing forces and the higher command's own objectives and intent.

Time permitting, the final product should consist of a comprehensive, detailed set of threat COAs. Work to a degree of resolution at two levels of command below your own. For example, a brigade S2 would depict the missions and actions of threat battalions and companies in the threat COAs he develops.

Each developed threat COA has three parts:

- A situation template.
- A description of the COA and options.
- A listing of HVTs.

#### **Situation Template:**

Situation templates are graphic depictions of expected threat dispositions should he adopt a particular COA. They usually depict the most critical point in the operation as agreed upon by the G2 and G3. However, you might prepare several templates representing different "snapshots in time" starting with the threat's initial array of forces. These are useful in depicting points where the threat might adopt branches or sequels to the main COA, places where the threat is especially vulnerable, or other key points in the battle such as initial contact with friendly forces. You use situation templates to support staff wargaming and develop event templates.

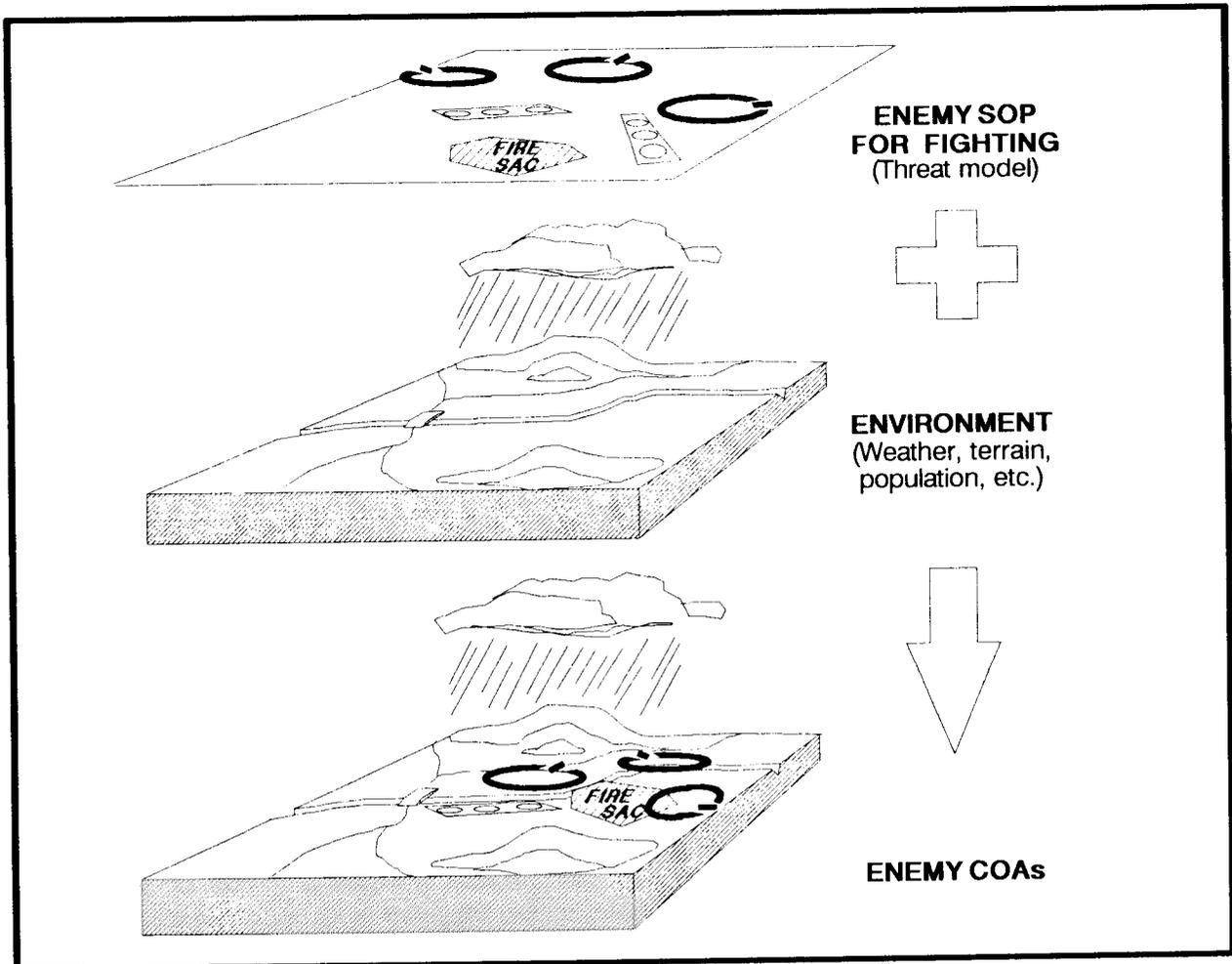
To construct a situation template, begin with the threat model representing the operation under consideration. Overlay the doctrinal template on the products that depict the battlefield environment's effects on operations. Typically, the product of choice is the MCOO, but this may vary with the situation (see Figure 2-13).

Using your judgment and knowledge of the threat's preferred tactics and doctrine as depicted in the threat model, adjust the dispositions portrayed on the doctrinal template to account for the battlefield environment's effects. Obviously, there will be many options available. Attempt to view the situation from the point of view of the threat commander when selecting from among them.

Check the situation template to ensure that you have accounted for all the threat's major assets, and that none have been inadvertently duplicated (see Figure 2-14).

Ensure that the template reflects the main effort identified for this COA. Compare the depicted dispositions to the threat's known doctrine; check for consistency. Consider the threat's desire to present an ambiguous situation and achieve surprise.

Include as much detail on the situation template as the time and situation warrant. For example, if the threat is defending, identify the likely engagement areas, reinforcing obstacle



**Figure 2-13. Consider the effects of the environment on the threat's doctrine to develop threat COAs.**

systems, and counterattack objectives that form part of his defensive COA. Ensure you depict the locations and activities of the HVTs listed in the threat model.

Next, using the description of preferred tactics that accompanies the doctrinal template as a guide, think through the COA's scheme of maneuver. Attempt to visualize how the threat will transition from his current positions to those depicted on the template.

Mentally wargame the scheme of maneuver from the positions depicted on the template through to the COA's success or failure. Identify points where forces will transition from one formation to another, potential assembly areas, and so forth. After working through the scheme of maneuver, identify how each of the BOSs "fits in" and supports the operation.

Evaluate time and space factors to develop time phase lines (TPLs) depicting threat movement. Draw TPLs on the template to depict the expected progress of attacking forces, the movement of reserves or counterattacking forces, and the movement of forces in the deep and rear battle areas.

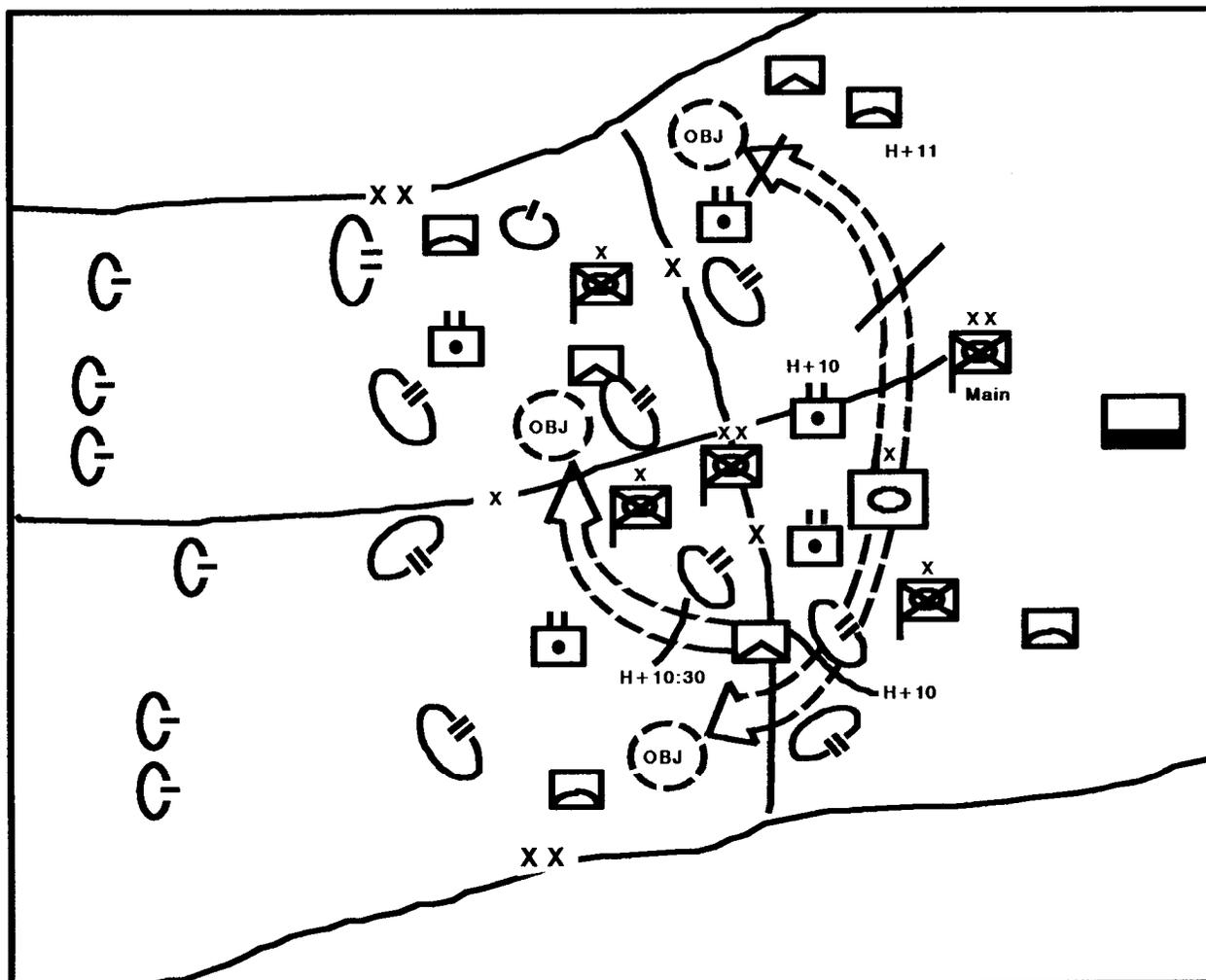


Figure 2-14. Situation templates depict threat COA.

Base TPLs on the threat's doctrinal rates of movement, with some modification. Evaluate actual movement rates, as revealed in the data base, with written doctrine. Consider the effects of the battlefield environment on mobility. If contact with friendly forces is expected, mentally wargame the effects this will have on the threat's speed as well.

When placing TPLs, consider only the time it will take to adopt movement formations, time to conduct movement to the selected location, and time for the unit to close after arrival. This assumes that time-consuming planning, issuance of orders, reconnaissance, and logistical preparations may occur during movement.

During staff wargaming of the situation templates against potential friendly COAs, update TPLs to consider when threat movement will be triggered or how they might be influenced by friendly actions.

Prepare as many graphics as necessary to depict the COA in enough detail to support staff wargaming and collection planning. For example, a COA may begin as a movement to contact, transition to a hasty attack, followed by pursuit operations that include a river crossing. Each of these phases may require a separate template.

Tailor the situation templates to your needs by focusing on the factors that are important to the commander or mission area. For example, the situation might focus only on the threat's reconnaissance assets when determining and developing threat COAs. The situation templates you produce might show only the location and movement routes of these assets, their likely employment areas, and their likely NAIs. An aviation unit, for example, might develop situation templates that depict details such as specific radar and ADA weapon locations and their range fans or areas of coverage.

At higher echelons the situation templates will usually focus on culminating points and installations or activities associated with centers of gravity rather than specific military units.

Some situation templates are better presented in a matrix format. Figure 2-15, for example, illustrates a situation template in matrix form that shows one threat COA for an air strike against friendly targets. The timeline indicates spacing between the various groups as well as the time each group is expected within each NAI.

Sometimes, situation templates are replaced by other products, such as a key facilities and targets overlay. Use whatever technique best graphically illustrates the threat's COAs.

**Description of the COA and Options:**

This is a description of the activities of the forces depicted on the situation template. It can range from a narrative description to a detailed "synchronization matrix" depicting the activities of each unit and BOS in detail. It should address the earliest time the COA can be executed, timelines and phases associated with the COA, and decisions the threat commander will make during execution of the COA and after. You use the COA description to support staff wargaming and to develop the event template and supporting indicators.

NAI 1	EW package	ADA suppression package	Strike package	Fighter intercept package			
NAI 2		EW package	ADA suppression package	Strike package			
NAI 3			EW package	ADA suppression package	Strike package		
NAI 4				EW package	ADA suppression package	Strike package	
NAI 5		Fighters attack AWACS			Fighter intercept package	Fighter intercept package	
NAI 6					EW package	ADA suppression package	
NAI 7 (target area)						EW package	
<b>NAI TIME</b>	H-20min	H-16min	H-14min	H-9min	H-7min	H-3min	

Figure 2-15. Situation templates can take the form of matrices.

Start with the description of preferred tactics that accompanies the doctrinal template. As you mentally wargame the situation template, note when and where you expect the threat to take certain actions or make certain decisions, such as transition to pre-battle formations, execute branch plans, etc. Record each event into the description of the COA. Where possible, tie each event or activity to TPLs or other specific geographical areas on the situation template. This will help you later when constructing the event template.

As the threat force approaches DPs or option points, record each decision and its timeline into the COA description. The description you develop forms the basis for the development of threat branches or sequels, should they be necessary to support friendly planning. Also record any decision criteria that are associated with each DP.

Develop the description of the COA into as much detail as time allows and the situation requires. Address each of the BOSS. Use whatever tools or techniques best satisfy your needs. For example, you might use a time event chart or a simple narrative description. Given enough time, you might develop an elaborate matrix. See Chapter 3 for examples.

Regardless of the form initially chosen, the COA statement will be refined to greater detail during the staff wargaming of potential friendly COAs.

#### **High Value Targets:**

As you prepare and mentally wargame the situation template, note how and where each of the BOSS provides critical support to the COA. This leads to identification of HVTs. Use the list of HVTs in the threat model as a guide, but do not be limited by it. Determine the effect on the COA of losing each HVT and identify likely threat responses.

The relative worth of each HVT target will vary with the specific situation under consideration and over the course of the COA's conduct. Identify the times or phases in the COA when the target is most valuable to the threat commander and make the appropriate notations on the list of HVTs.

Transfer the refined and updated list of HVTs to the situation template. You will use the list to support staff wargaming and the targeting process.

Note on the situation template any areas where HVTs must appear or be employed to make the operation successful. Focus on their locations at the times they are most valuable, or just before. These are potential TAIs and engagement areas. Cross-reference each potential TAI with the description of the COA that accompanies the template.

#### **Additional Considerations:**

- When considering an attacking threat, less detailed resolution is required. For example, depending on the situation, a friendly defending battalion might need only to work to a level of detail of threat companies. Considering the possible variations in the threat's COA based on the details of employment of the individual platoons adds a tremendous amount of effort to the process, perhaps more than the results will justify.
- When considering a defending threat, a greater level of detail might be required. For example, an attacking battalion might concern itself with individual antitank or crew-served weapons positions. A greater level of detail in resolution is generally required during operations other than war as well.
- Consider each BOS and its role in making the COA successful. Do not limit yourself to a discussion of the maneuver forces. Address the concept of operation and how it is supported, not just the disposition of forces.

- Rely on staff experts for help with the BOSS you are unfamiliar with.
- After developing each COA in detail, you may need to reprioritize the order of likely adoption. For example, as you develop a particular COA you may discover that a particular section of terrain offers only a limited number of suitable defensive positions or concealed AAs. This may cause a change in the relative priority of COAs using that section of terrain.
- The level of command and type of operation has a direct bearing on the level of detail that goes into each situation template. For example:
  - At **tactical** levels, situation templates sometimes depict individual vehicles in threat dispositions. NAIs are often “pinpoint” locations such as road junctions or small unit battle positions.
  - At **operational** levels, situation templates might focus on large reserve formations, major staging bases and LOCs. NAIs are often large dispersal areas, reserve assembly areas, or logistical support areas.
  - At **strategic** levels, situation templates might focus on the shift of large forces from one theater to another as well as political and economic developments. NAIs can sometimes encompass large regions.

#### **IDENTIFY INITIAL COLLECTION REQUIREMENTS:**

After identifying the set of potential threat COAs the initial challenge is to determine which one he will actually adopt. Initial collection requirements are designed to help you answer the challenge.

The art of identifying initial collection requirements revolves around predicting specific areas and activities, which, when observed, will reveal which COAs the threat has chosen. The areas where you expect key events to occur are called NAIs. The activities which reveal the selected COA are called indicators.

#### **The Event Template:**

The differences between the NAIs, indicators, and TPLs associated with each COA form the basis of the event template (see Figure 2-16). The event template is a guide for collection and R&S planning. It depicts where to collect the information that will indicate which COA the threat has adopted.

Evaluate each COA to identify its associated NAIs. Mentally wargame execution of the COA and note places where activity must occur if that COA is adopted. Pay particular attention to times and places where the threat’s HVTs are employed or enter areas where they can be easily acquired and engaged. These areas will evolve into NAIs in support of targeting. Also consider places you expect the threat to take certain actions or make certain decisions, such as the adoption of a branch plan or execution of a counterattack.

An NAI can be a specific point, a route, or an area. They can match obvious natural terrain features or arbitrary features, such as TPLs or engagement areas. Make them large enough to encompass the activity which serves as the indicator of the threat’s COA.

Compare and contrast the NAIs and indicators associated with each COA against the others and identify their differences. Concentrate on the differences that will provide the most reliable indications of adoption of each unique COA. Mark the selected NAIs on the event template.

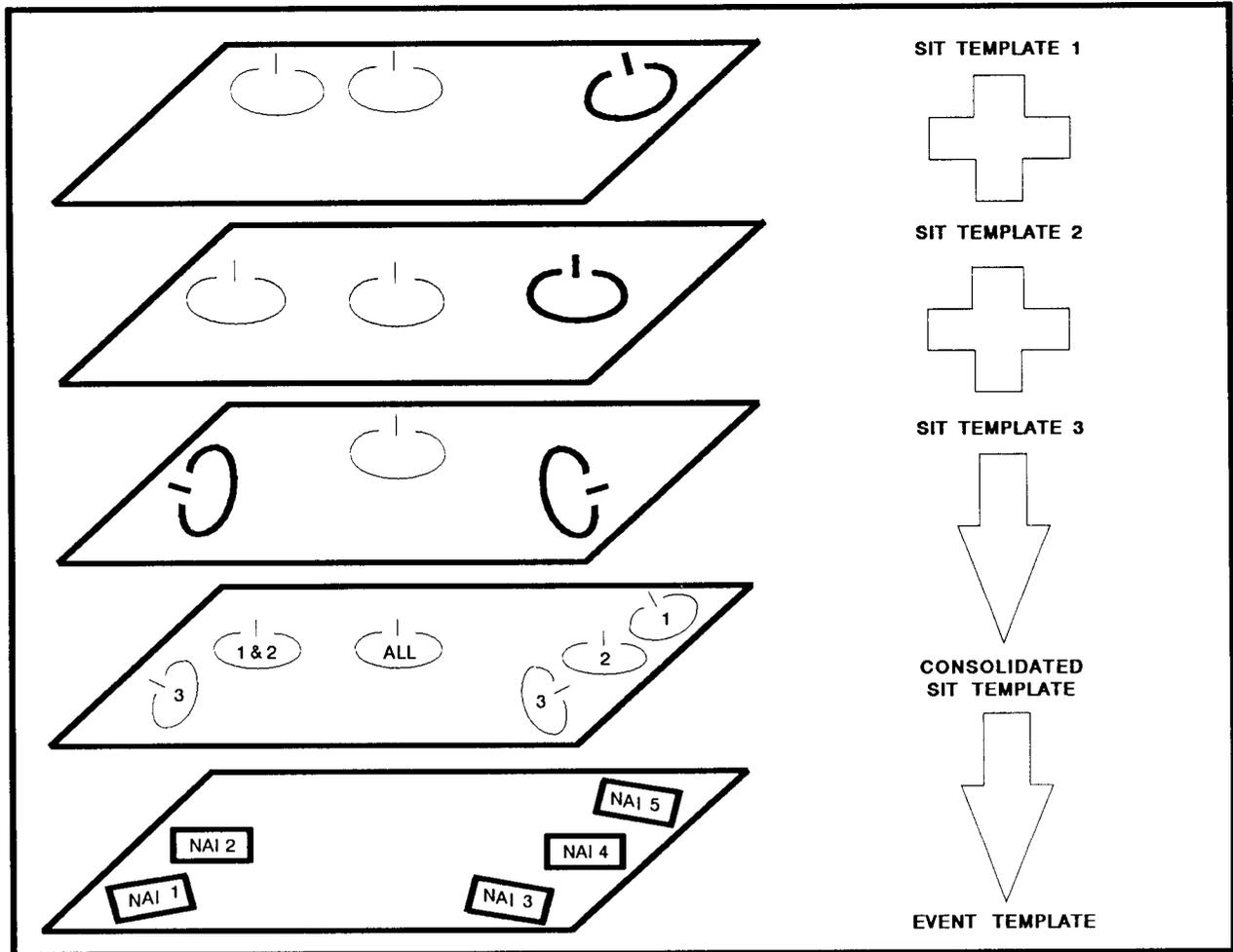


Figure 2-16. Compare enemy COAs to produce the event template.

The initial event template focuses only on identifying which of the predicted COAs the threat has adopted. Later, you will update and further refine the event template and its supporting matrix to support friendly decisions identified during staff wargaming.

**The Event Matrix:**

The event matrix supports the event template by providing details on the type of activity expected in each NAI, the times the NAI is expected to be active, and its relationship to other events on the battlefield. Its primary use is in planning intelligence collection; however, it serves as an aid to situation development as well (see Figure 2-17).

Examine the events associated with each NAI on the event template and restate them in the form of indicators. Enter the indicators into the event matrix along with the times they are likely to occur. Use the TPLs from the situation template or the description of the COA to establish the expected times in the event matrix. If there is a latest-time-information-of-value (LTIOV) timeline, based on the expected flow of events, record it into the event matrix as a guide for the collection manager.

Refine the event matrix during staff wargaming and the targeting process.

NAI No.	NO EARLIER THAN (HOURS)	NO LATER THAN	INDICATOR
NAI 1	H-7	H-2	Engineer preparation of artillery positions
NAI 1	H-2	H-30min	Artillery occupies firing positions
NAI 1	H-1	H-15min	Artillery commences preparatory fires
NAI 2	H-2	H-1.5	Combat recon patrol conducts route recon
NAI 2	H-1.5	H-30min	Rifle company ( + ) in march formation

Figure 2-17. The event matrix supports the event template.

**Additional Considerations:**

- Differences between COAs are usually reflected in different NAIs but might also consist of different TPLs or indicators associated with a particular NAI.
- Consider the effects of threat deception attempts on the reliability of each event as an indicator.
- NAIs for counter-air operations are more similar to those used in targeting. Their focus is on locations where threat aircraft are likely to appear when using particular air AAs, likely forward support bases, and FAARPs. Generally, ADA units will cover these NAIs with their own target acquisition assets.
- During staff wargaming you will help establish a DST that incorporates NAIs supporting decisions by the commander and the tracking of HPTs. The additional NAIs are developed from potential NAIs identified on the situation templates and the results of decisions made during wargaming of friendly COAs.

Threat COA models drive the wargaming of potential friendly COAs. They aid in the construction of the command’s DST and other synchronization tools the staff uses during mission execution. Disseminate the threat COA models as widely as possible. They are the most useful products in allowing other commands and staff sections to develop their own more detailed or specialized threat COA models.

The event template and matrix, once complete, form the basis for planning collection strategies, synchronizing intelligence with friendly operations, and preparing the collection plan. In some cases, you might disseminate the event template in the form of a collection graphic to support intelligence planning and collection by other units.

**The Abbreviated IPB Process**

Many of the steps involved in IPB are time intensive. This is especially true at the tactical echelons where automated support for terrain analysis and other functions is not available. Unfortunately, these echelons generally have less time available for the IPB process.

Following are some effective techniques for abbreviating the IPB process:

### **Work Ahead**

The best solution is to complete as much ahead of time as possible. Establish a series of base products, particularly those that deal with the battlefield environment's effects on operations. Keep them updated by periodic review instead of waiting until receipt of a new mission.

Keep the data bases on the threat up to (late. As you develop intelligence that indicates changes or evolution in threat doctrine, change the threat models to match.

If faced with a number of contingency missions, conduct periodic reviews to ensure that the base IPB products, such as descriptions of the battlefield environment and the threat, are updated regularly.

Become familiar with the support available to you from the ISOS. Know how to get what you need when you need it. Think through methods to get support before, during, and after deployment.

### **Focus on Essentials**

Consider the general factors of METT-T when starting the IPB effort, particularly that of time. Backward plan the IPB effort. Determine how much time you can devote to each step of the IPB process. Ensure that the timeline allows you to properly support the decision making process.

Decide which products you will develop and to what degree of detail. Focus on the products most important to your mission. Rather than fully developing one threat COA at the expense of all others, identify the full range of available COAs. Determine the degree of detail required and then develop all COAs to that level of detail.

Always work in a priority order established by the commander's intent and needs. If he is particularly pressed for time, he may specify which COAs he wants you to focus on, such as the most likely or the most dangerous. This implies that you first identify all COAs and evaluate them to determine which is the most likely or most dangerous. You abbreviate the IPB process by developing in detail only those he has specified.

### **Stay Objective Oriented**

The objective of IPB is to help the commander and his staff put together the best possible plan in the time available. This requires models of the range of viable threat COAs that will influence mission accomplishment. Supporting the finished plan with intelligence requires a good event template and matrix. Everything else is only a means to producing these essentials.

### **The Minimum Essentials**

In a pinch you can get by with just a good set of threat COA models and a good event template and matrix. To save time and materials, you can combine all threat COA model templates and the event template on a single map overlay, or use cartoons and sketches as a map substitute.

If you have not yet described the battlefield environment's effects, work directly from the map or a sketch of major terrain features. Start by identifying the set of threat COAs and briefly comparing them to determine which is most likely and which is most dangerous considering the current situation and your command's mission. Rank the remainder in order of likely adoption.

Begin by developing the most dangerous or most likely threat COA. In the absence of guidance from the commander you will have to use your own judgment on which to do first. Develop the selected COA to as much detail as the available time allows before turning to the other.

Next, construct an event template that focuses on identifying which of the two COAs the threat has adopted. Then turn to developing the remaining courses of action. Work each COA in the priority order you put them in when evaluating their likelihood of adoption.

As each COA is finished to the determined degree of detail, incorporate NAIs associated with it into the event template. The initial structuring of the collection requirements can actually wait until after staff wargaming. The most important milestone prior to wargaming is to develop the most likely and most dangerous COAs.

If the most likely COA is also the most dangerous COA, develop the second most likely or the second most dangerous COA. **NEVER** take just one COA into wargaming—this is not an acceptable way to abbreviate the IPB or staff planning processes.

The single product that results from this approach is a far cry from the fill-blown set of products described in the first scenario of Chapter 3. However, the “one-overlay product,” when developed to a quality standard, has repeatedly proven to be effective on the battlefield. This is IPB in its most elementary form, and it proves the strength of the fundamental IPB process.