



2 Current and Future Training Requirements

Having access to high quality range resources and infrastructure is fundamental to ensuring military readiness. The U.S. military operates the largest and most diverse training enterprise in the world. Its ability to train in realistic environments directly affects its current readiness and future mission success. Military Service members must continue to receive training that covers all the skills needed to deploy safely and achieve mission success and survival. The Military Services must also clearly communicate their range requirements to the training support and range communities. While the Military Services use similar processes to develop their training requirements, those processes are not identical. Each Service provides a structure to systematically develop requirements, based on a series of strategic guidance documents and other information sources, including:

- ▶ The National Security Strategy of the United States
- ▶ The National Military Strategy of the United States
- ▶ Guidance for Development of the Force
- ▶ Guidance for Employment of the Force
- ▶ The Chairman's Joint Training Guidance
- ▶ Operational and functional profiles of the weapons and related systems that are available today and are expected to be available in the near future
- ▶ The lessons learned from military experience, training evolutions, and experimentation

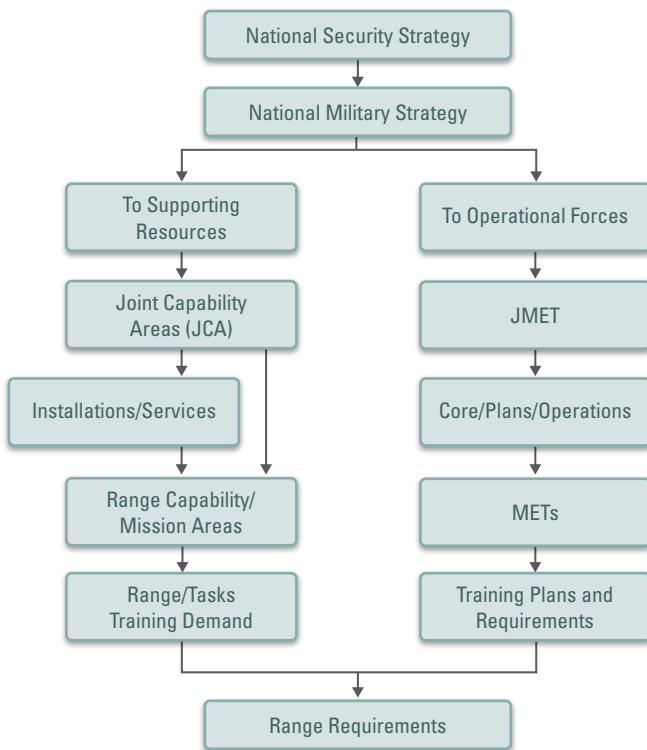
The Military Services determine how they will operate in the future by examining strategic guidance documents and exploring more specific tactics, techniques, and procedures (TTPs). Next, they identify and develop Mission Essential Tasks (METs) based on planned operations, the UJTL, and

the Joint Mission Essential Task List (JMETL). The Military Services then create training plans to ensure that their forces are proficient in executing the METs. These training plans serve as the basis for developing range resources and capabilities to support Military Services' METs execution. Figure 2-1 details this process for the development of range requirements.

2.1 Assessing Current and Future Requirements

Each Military Service generates training requirements specific to its own mission and command structure, and these requirements are used to develop, document, and execute training objectives and requirements. The set of processes used link training strategies and requirements to a standard training curriculum, based on both Military Service-specific and joint tasks identified in the UJTL and Mission Essential Task Lists (METLs). Common elements of requirements development across the Services include assessing current and future requirements, data collection, and a management system tool

Figure 2-1 Training Requirement and Range Requirement Development Process



to assist in assessing and quantifying encroachment impacts and the supporting documentation and plans that guide implementation. A variety of publications, including doctrinal reports, guidance documents, instructions, and annual messages or updates, prescribe these processes thoroughly and precisely.

Future training requirements can be grouped into two categories: near-term and long-term. Near-term training requirements can be generated with a higher degree of fidelity because the Military Services can more easily anticipate the near-term strategic environment, operating concepts and technological capabilities. The ability to anticipate these elements originates from intelligence forecasting, trend analysis, training provided in current and evolving military tactics, strategic planning, educational opportunities with regard to transformational concepts, and knowledge of existing and planned system acquisition activities.

Assessing long-term training requirements is significantly more challenging, because of greater uncertainty surrounding the strategic environment, operating concepts, and technological capabilities. Platforms, weapons, and systems are getting more

capable and more technologically advanced; aircraft and vehicles travel farther and faster; sensors detect at longer distances, platforms accurately deliver weapons at greater distances; and communications systems carry and transmit more data, all requiring changes in training and realignment of training resources. Additionally, as the strategic environment, doctrine, and tactics change in the future, the Military Services will need to change the way they train and prepare for future missions.

Changes in training will put new and, perhaps, unforeseen demands on range resources and infrastructure to address new or additional requirements to maintain readiness and support mission success. New weapon systems' performance parameters have started to force Service trainers to look at solutions like tradeoffs between the mix of live, virtual, and constructive (LVC) training.

2.1.1 Emerging Challenges

Challenges to training and the resources necessary to perform training can take many forms and are generated from external interests, as well as those within DoD. Three current challenges involve the demand for frequency spectrum, the growth in unmanned aerial systems (UAS) operations, and the need to weaponize cyber warfare. Each topic will shape the future of DoD training and ranges.

2.1.1.1 Frequency Spectrum

The growing prevalence of wireless technology and the demand for additional frequency conflicts with the DoD's requirement to train increasingly complex missions using higher performance weapons. Already, frequency competition from the growth of wireless devices has pushed DoD out of portions of commonly used bands within the radio spectrum.³ On the horizon is the National Broadband Plan, a Congressional mandate to ensure every American has "access to broadband capability." Among other initiatives, the plan calls for making "500 megahertz (MHz) of spectrum newly available for broadband within 10 years, of which 300 MHz should be available for mobile use within 5 years."⁴

In the spring of 2010, the National Telecommunications and Information Administration (NTIA) introduced sharing and reallocation proposals for 11 specific frequency bands to support the Federal Communications Commission's (FCC's) plan to free up the required 500 MHz of spectrum. Changing the allocation for some of these proposed frequency bands would directly impact military training, testing, and operations. Depending on the outcome of the deliberations, challenges posed to training would include the ability to move

³ US Government Accountability Office Report to Congressional Committees, Spectrum Management-NTIA Planning and Processes Need Strengthening to Promote the Efficient Use of Spectrum by Federal Agencies, April 2011

⁴ <http://www.broadband.gov/plan/executive-summary/>

out of the currently occupied bands within the allotted timeframe, and the associated monetary and physics challenges that are implied.

It is evident that competition for frequency spectrum will continue to increase for the foreseeable future. This portends the need for DoD to more efficiently use the spectrum allocated to it through technological innovation and scheduling. Emerging capabilities such as live sensor stimulation with synthetic threats to mitigate shortfalls in the live environment are being threatened by efforts to sell off spectrum historically used by training instrumentation. DoD's efforts to include additional participants such as Command and Control, Intelligence, Surveillance, and Reconnaissance (C2ISR) platforms and ships in live instrumented training enabling the training of entire command, control, and execution action chains will likewise be threatened.

2.1.1.2 Growth in Unmanned Aerial Systems Operations

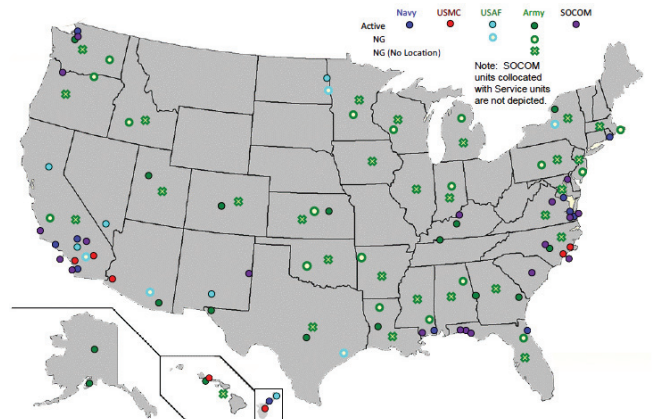
UAS are a historic leap in warfare technology that have come into their own in support of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Not only have UASs evolved into a proven weapons system, but the number and variety of these systems has grown exponentially over the last 10 years. DoD had 146 UAS units based at 63 continental United States (CONUS) locations as of 2010.⁵ By 2015, the Joint UAS Center of Excellence (JUAS COE) estimates DoD will have 197 units at 105 locations; a 35 percent increase in units and 67 percent increase in number of locations (reference Figure 2-2).⁶

The high demand for UAS in today's combat theater has led to a situation where most day-to-day continuation training is accomplished under in-theater combat conditions in real-world contingencies. The Military Services, however, will require comprehensive continuation and joint-forces training to facilitate effective use of UAS in the peacetime environment at beddown and selected joint-training locations as forces draw down in-theater and re-deploy.

UAS training brings with it several challenges:

- ▶ There is the need for frequency spectrum, which is complicated by the National Broadband Plan discussed in Section 2.1.1.1 above.
- ▶ Airspace configuration and access issues have to be resolved. For example, most airspace over Army ranges was configured for artillery safety fans, and the size and shape of existing special use airspace (SUA) at proposed beddown locations needs to be examined for adequacy to support this new or competing airspace demand.

Figure 2-2 Planned DoD 2015 UAS Locations



- ▶ Infrastructure to support a yet-to-be-determined training concept of operations (CONOP) for UAS has to be examined for adequacy, and alternative plans may have to be made or resources acquired.

Failure to prepare for the coming additional training demand that is inevitable will result in a loss of combat-gained experience with UAS.

2.1.1.3 Cyber Warfare

Although this report has traditionally dealt with the need to train for waging warfare in traditional mediums (air, land, sea), the need to train for warfare in a digital environment is today's reality. In 2010, DoD stood up the U.S. Cyber Command (USCYBERCOM). USCYBERCOM is charged with defending DoD information networks and conducting full-spectrum military cyberspace operations. Additionally, each of the Military Services has a component command specializing in cyber.

Just like traditional soldiers, sailors, marines, and airmen, this new breed of warriors needs a practice field to hone their skills. Cyber ranges, like the Defense Advanced Research Project Agency (DARPA) National Cyber Range, the Defense Information Systems Agency (DISA) Information Assurance Range, and the Joint Staff's Joint Information Operations (IO) Range, are either in the process of being developed or have achieved operational capability.

These ranges have very different characteristics and challenges than traditional air, land, or sea ranges. However, there are some challenges for cyber ranges that are common with traditional ranges. For instance, both cyber and traditional ranges are challenged by competition for frequency spectrum from cellular phone networks. Additionally, integration of

⁵ TUAS Executive Committee NAS Access Working Group, National Airspace System Access Plan for Federal Public Unmanned Aircraft Systems, October 2010

⁶ Joint Unmanned Systems Center of Excellence, National Airspace Integration, March 2010

cyber range capabilities with traditional live training and testing ranges presents a new and complex set of challenges.

2.2 DoD Training Transformation Program

SRI activities and efforts support and complement DoD’s Training Transformation Program. The program was developed to address near-term training challenges associated with an uncertain and increasingly complex strategic environment, as well as an increasing need for joint training and interoperability. The program provides dynamic, capabilities-based training for DoD personnel in support of evolving national security requirements across the full spectrum of integrated operations. Detailed information on the Training Transformation Program can be found in the *Strategic Plan for the Next Generation of Training for the Department of Defense*.⁷

2.2.1 Joint National Training Capability

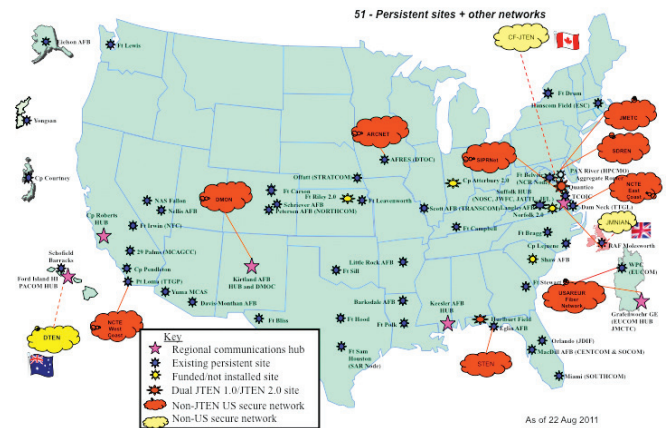
Formally established in January 2003 under Management Initiative Decision 906, the underlying concept of the Joint National Training Capability (JNTC) is to train and prepare forces to operate globally through adding joint context to Military Service training and the development of a joint training infrastructure. This infrastructure has four requirement pillars that guide training design:

- ▶ credible and adaptive opposing forces
- ▶ instrumentation that provides a common ground truth among the participants
- ▶ effective data sharing
- ▶ high quality feedback to improve the assessment of joint training events

The JNTC has made a significant addition to DoD’s training infrastructure. It has achieved its initial vision of providing a permanently installed global communications network (i.e., the Joint Training and Experimentation Network [JTEN]), which is designed to significantly reduce the amount of time required to configure and execute training in live and synthetic training environments. With the connectivity barrier removed, trainers and training organizations have leveraged this capability to provide new and innovative training to both home-station and forward deployed units. Figure 2-3 shows the current deployment of persistent communication nodes at ranges and other locations that are part of the JTEN network. The JTEN brings 24x7x365 connectivity to supporting LVC training at compatible ranges.

The JNTC is relevant to the SRR because it addresses range sustainability and modernization efforts, and recognizes LVC

Figure 2-3 Current U.S. JTEN Sites



training strategy and policy as a component of near-term and long-term future training requirements. It also highlights LVC training and the role LVC plays in addressing training requirements, readiness, and reporting systems. Reporting on LVC is responsive to the NDAA Section 366(a)(2)(B) requirement that DoD address the adequacy of current resources, including virtual and constructive training assets. An overview of LVC training and the increasingly important role it plays in providing realistic, comprehensive, and cost-effective training is detailed in the following paragraphs.

It should also be noted that the Army now has a program of record to provide LVC training solutions called LVC-Integrating Architecture (LVC-IA). The Air Force just received approval for the Integrating Architecture for Air and Space LVC Environment (IA-ASLVCE) from the Joint Requirements Oversight Council (JROC). This data provides evidence of continued use of LVC to address training requirements. These requirements and programs have linkages to the Military Services’ training ranges.

2.2.2 Live, Virtual, and Constructive Training

The following definitions clarify LVC in the training environment. The individual components of LVC training are identified and described in Table 2-1.

The DoD Training Environment allows integrated forces to conduct LVC training operations that simulate real-world operations. This tool provides a seamless environment with fully functional interaction between participants, to the limit of their respective operational system capabilities. The Defense Training Environment, as shown in the high-level operational concept (Figure 2-4), is an evolutionary family-of-systems approach, linking a network of interoperable LVC components

⁷ *Strategic Plan for the Next Generation of Training for the Department of Defense*, 23 September 2010, Office of the Under Secretary of Defense (Personnel and Readiness), Readiness and Training Policy and Programs.

Table 2-1 Live, Virtual, and Constructive Training

LVC Training Component	Description
Live	<ul style="list-style-type: none"> ▶ Live Training—Training where the training audience operates their operational systems and platforms (including their full range of mobility and capability) in the physical environment for which they were intended. ▶ Live Training Domain—The training domain where participants operate operational systems and platforms (including their full range of mobility) in the physical environment (land, sea, air) for which they were intended. The many parameters defining the live domain are fixed in physics rather than synthetic scenario generation, and constrained by the real environment (e.g., weather) that exists, to which the virtual and constructive domains must align in the integrated LVC training environment. Simulations used in the live training domain are used to maintain scenario validity during training. These models, i.e., “scoring simulations” are used to automatically in the real time, assess hard and soft weapon effects on targets, incorporating countermeasure effects and other participant actions or behaviors that affect the outcome of the event. Synthetic entities can be injected into live sensors and systems to enhance the live environment. Neither the use of scoring simulations nor presence of synthetic entities makes the live environment a synthetic environment. This domain is commonly enhanced by the extensive employment of training systems (instrumentation and simulations) embedded in the live environment.
Virtual	<ul style="list-style-type: none"> ▶ Virtual Training—Training where training audience operates simulators, emulators, or operational systems in a synthetic environment. ▶ Virtual Training Domain—The training domain where participants operate simulators, emulators, or operational systems in a synthetic environment. Fidelity may vary from “lightweight” laptop emulations, to full motion, domed simulators. Virtual components provide a very flexible capability, predominantly used for individual training in the specific platform or function being simulated, but may be linked to provide additional complexity and fidelity to the virtual training environment. Participants from the virtual domain can be injected as entities into live training operations through sensor stimulation, adding depth and breadth to the operation for those that can detect, display, and interact with the virtual entities. Virtual entities can also be injected into constructive simulations as entity participants in the synthetic mission-space. Collective applications include stand alone virtual mission training of combined forces, and integrated with live training providing individual platform augmentation to live force training.
Constructive	<ul style="list-style-type: none"> ▶ Constructive Training—Training where the training audience, typically command and staff trainees, conducts activities in an environment constituted by a constructive simulation. The trainees provide stimulus to simulated forces at different levels and act upon consequences generated by the simulation. ▶ Constructive Training Domain—The training domain where the participants, typically command and staff trainees, conduct activities in an environment constituted by a constructive simulation. The trainees provide stimulus to simulated forces at different levels and act upon consequences generated by the simulation. A constructive simulation may be “wrapped around” a live operation, adding breadth and complexity to the scenario, providing more challenge to the training audience. Constructive discrete entities may also be injected into live and virtual operations, adding depth and breadth to the operation for those that can detect, display, and interact with the constructive entities. Light constructive simulations can be used to train individuals, small units, teams, and elements of staffs with less preparation than is needed for large-scale simulations.

to provide the appropriate Joint context required for training and mission rehearsal.

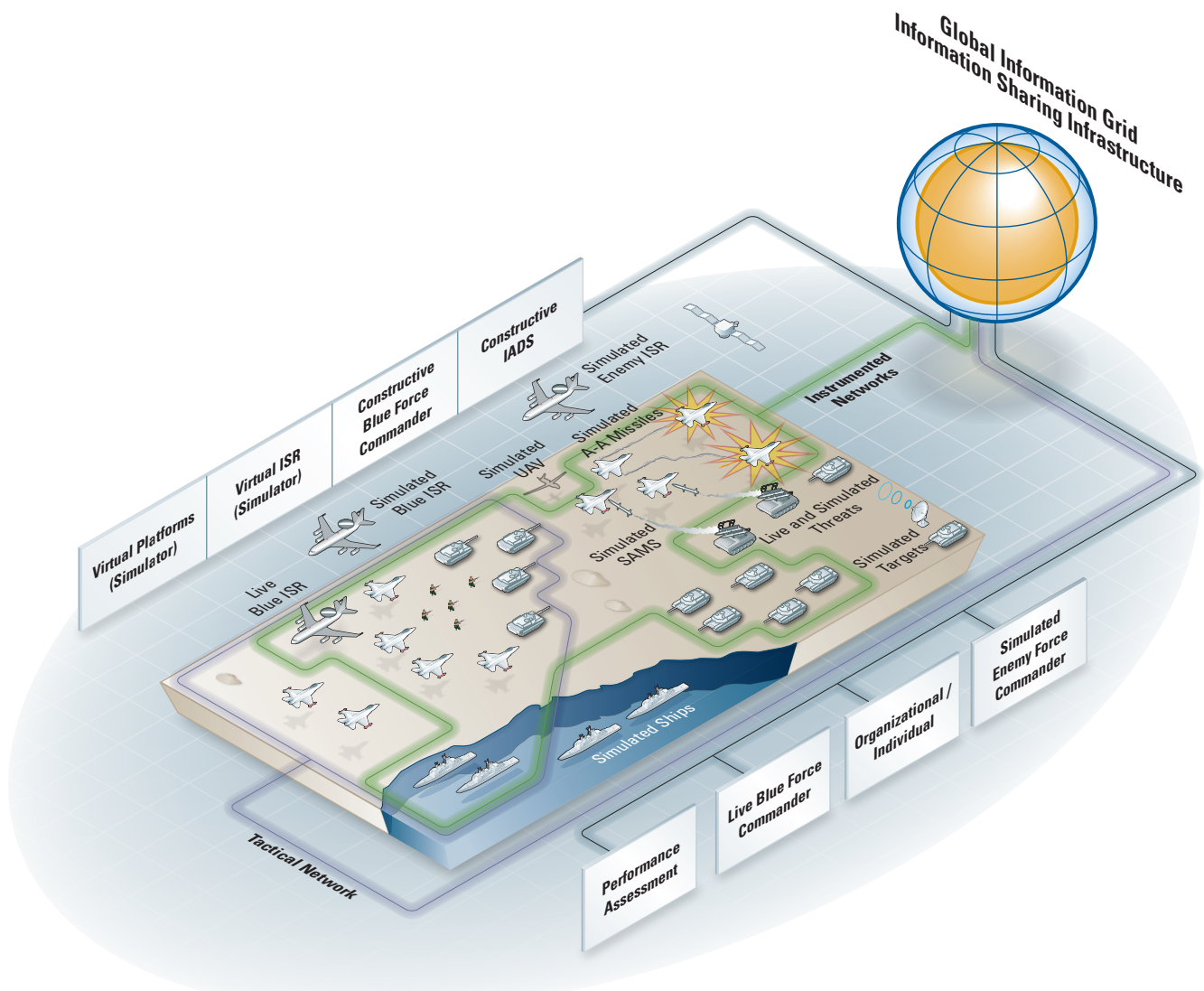
The capability will provide a comprehensive training environment that includes:

- ▶ Interoperation of live participants and their operational systems
- ▶ Realistic LVC representations of non-participant friendly warfighting capabilities across the full range of military operations (ROMO)
- ▶ Realistic LVC representations of opposing forces (OPFOR), as well as neutral and factional entities that may be required for the scenario (It is impossible to produce a level of adversary support sufficient to stress these high-technology platforms and sensors in the live domain without the integrated joint threat emitter [JTE] and its inherent capability to stimulate live sensors with synthetic entities.)
- ▶ Architecture for easy and rapid integration of those representations into scalable, realistic, and dynamic training environments

- ▶ Interfaces to warfighter equipment (e.g., operational platforms [ships, aircraft, ground vehicles], command, control, and communications [C3], intelligence, surveillance, and reconnaissance [ISR] systems) through connectivity to local and globally distributed venues
- ▶ A means to train on critical joint missions like fires, close-air support (CAS), and missile defense, so joint capable forces can be produced and provided by the Military Services and United States Special Operations Command (USSOCOM)

Virtual and constructive training are not intended to replace the value of live training; however, they can supplement, enhance, and complement live training to sustain unit proficiency, readiness, and mission effectiveness. There have been several success stories where training on DoD ranges was made possible, or more operationally realistic, by using virtual capabilities to replicate systems units would have in theater, but that were not available for training. Additionally, training on complex joint tasks has been enabled by linking operators at various sites together so that they can train like they fight from a command, control, and decision-making perspective.

Figure 2-4 The LVC Training Environment



2.3 DoD Training Range and OPAREA Requirements

As explained in Chapter 1, DoD installation and range assets serve as the foundation of the nation’s security because they are critical to maintaining Military Service readiness and mission effectiveness. These assets must be available and adequately resourced when and where needed, and have the capabilities to support current and future military requirements. Likewise, the Military Services must be able to train at ranges with the types of natural conditions and operational contexts personnel and systems may encounter during their deployments. As such, sustaining a diverse set of range resources is critical to ensuring mission readiness and military effectiveness.

Additionally, mission and training objectives for each of the respective Military Services directly influence current and future training range and operating area (OPAREA) requirements. The following paragraphs provide insight into

the Military Services’ specific assessments of current range capabilities and encroachment challenges requirements that resonate across DoD. These sections highlight current range capabilities and encroachment challenges and how these challenges impact the Military Services’ abilities to meet current and future training objectives.

2.3.1 Army Requirements

Overview

For the near-term, Army ranges continue to support OEF in accordance with the Army Force Generation Model (ARFORGEN). ARFORGEN is the Army’s model/plan to maintain balance, and meet force demands at an op- tempo that is predictable and sustainable for the all-volunteer Army.

Army range facilities are currently adequate to meet the throughput and surge requirements necessary to support training for the Range of Military Operations (ROMO).

However, funding the operation of range facilities under the expanded training schedule required to keep pace with ARFORGEN is challenging.

The Army resources its range operations on a home-station training schedule; however, Army installations are operating their ranges, particularly collective training and urban operation training facilities, on a round the clock schedule to support ARFORGEN. For example, range staff at Camp Atterbury, Indiana, and Camp Shelby, Mississippi, have doubled the number of range personnel to accommodate expanded training schedules.

Attaining funding to operate ranges under these conditions has become increasingly difficult with Commanders having to use Overseas Contingency Operations (OCO) funds to supplement range operations above peacetime levels. Further, as the Army implements a nine-month deployment cycle, periods of home-station training will be extended, which will exacerbate this problem.

For the mid-term, anticipated Army end strength, force structure, and stationing will change range demand and use dynamics. There will be fewer units; however, with OEF demand decreasing, there will be more units at home-station competing for finite range assets.

The Army is undertaking a campaign to revitalize its home-station training. This initiative will include a review of range functionality, capacity, and throughput, aligned to the evolving Army Campaign Plan. The Army has already adopted a Regional Collective Training Capability (RCTC) concept that will ensure ranges on select CONUS and Outside the Contiguous United States (OCONUS) installations are sufficient to support ARFORGEN maneuver and live fire training aim points for its active and reserve components.

Many of the Army's range facilities have not been modernized to meet new weapons systems requirements or satisfy changes in training standards and doctrinal requirements. This deficiency strains the ability of existing range facilities to support current and near-term future requirements. To address this challenge, the Army is assessing its range assets and constructing new ranges in a continuous and integrated management approach through the Sustainable Range Program (SRP) modernization planning process. This process integrates mission support, environmental stewardship, and economic feasibility at the installation, Army Command, Installation Management Command (IMCOM), and Headquarters Department of the Army (HQDA) levels to effectively support current and future range and training land requirements.

The modernization planning process begins at the installation level with an analysis that determines the range and training land requirements. These requirements are derived from the Army Stationing and Installation Plan (ASIP), Army standards, training strategies, and individual unit METs. The

process assesses ranges and training lands against current assets, utilization rates, environmental conditions and requirements, and infrastructure to determine range and training land shortages and excesses. The Army Range and Training Land Program Requirements Model (ARRM) automates this analysis, and provides the installation and HQDA with a report identifying facility shortages and excesses, as well as the number and type of ranges and the associated maneuver acres necessary to support live training for tenant units. Based on this analysis, installations submit to their commands a prioritized list of range projects needed to correct shortages and modernize existing range facilities. Range projects are incorporated into each command's annual prioritized Military Construction (MILCON) submission.

At the installation level, this planning process results in the creation of a Range Complex Master Plan (RCMP). The RCMP is a sustainable range operations tool that supports long-range planning and day-to-day integrated decision-making. Each installation's RCMP is incorporated into its Real Property Master Plan (RPMP).

The Army continues to work toward modernization goals to best match range capabilities with Army training requirements. The Army Campaign Plan provides direction for range investments to meet unit transformation and stationing. Achieving range and training land capabilities that enable modular forces to train for Unified Land Operations remains a top Army priority. The Army is continually working to modernize its ranges to more effectively support training for multiple purposes, weapons, and combined arms by incorporating new capabilities, instrumentation, and digital technologies into standard range designs.

The Army has 39 types of modernized ranges. The capabilities and standard configurations for these ranges are found in Training Circular 25-8 (TC 25-8), which is currently being updated to include changes to meet new doctrinal requirements, new weapons systems, and new training standards. The ranges described in the circular represent the inventory of standard and modernized Army facilities categorized into major subgroups as small arms ranges, urban operations training facilities, and collective training ranges.

A key component of the Army's overall modernization process is the construction of the next generation of Army ranges. These large, instrumented live fire ranges, such as Digital Multipurpose Range Complexes (DMPRCs) and Battle Area Complexes (BAXs), provide centerpiece capabilities that enable decisive action training events. Such key training assets allow soldiers and units to exercise digital command and control (C2) in a live fire training environment and afford unprecedented situational awareness, tailored scenarios, and immediate feedback required to support commanders' assessments regarding their units' abilities to conduct operations in a hybrid threat environment.

New ranges have been added to the inventory of modernized ranges as a result of new doctrinal changes, including the Convoy Live Fire Course and the Digital Air-Ground Integration Range (DAGIR). Changes in existing range designs have been made to increase range capabilities, add technology, and increase throughput capacity to match new training standards and support new weapons systems qualifications. The new family of modernized ranges will replace older types still in the Army’s inventory that cannot accommodate new training or weapons systems requirements. Next generation Army digital ranges are identified and described in Table 2-2.

The Army needs large training areas to enable Army Campaign Plan training objectives in support of Unified Land Operations doctrine, now and into the future. The Army’s operating concept, executed through decisive action, dictates a focus on the core competencies of combined arms maneuver and wide area security. Training to employ these core competencies in the operational environment requires maneuver training areas that realistically replicate the size and variety of the areas of operation in which modular brigade combat teams (BCTs) must be prepared to operate. While Army end strength and force structure changes will reduce the total number of soldiers and units competing for training areas, the transition to the operating concept of Unified Land Operations will require larger and more flexible training environments.

To prioritize training land investments in support of current and future training objectives, the Army developed the Range and Training Land Strategy (RTLTS), which was approved as a component of the Army’s Sustainable Range Program to address the Army’s long-term training land requirements. The RTLTS helps the Army prioritize its training land investment, and optimize the use of range and training land assets. The RTLTS provides a long-range plan for the Army to make available the best range and training land assets, and a framework for the Army to select the most appropriate course of action to address training land shortfalls where they exist.

The Army does not focus on high operational tempos or surge requirements when analyzing land requirements. Instead, the Army conducts its training requirements planning based on the peacetime assumption that all units are at home-station and available to conduct training. The Army is currently reviewing and updating the RTLTS. The final revision will capture Chief of Staff, Army ARFORGEN guidance on home-station training requirements and the level of maneuver training required for Active Component and Reserve Component units. This guidance and analysis could affect overall maneuver training requirements and adjust the total Army training land shortfall. The revised final RTLTS is anticipated to be complete by the end of FY2012.

Table 2-2 Next Generation Army Digital Ranges

Range Type	Description
Digital Air Ground Integration Range (DAGIR)	The DAGIR is replacing Digital Aviation Gunnery Ranges. The DAGIR is designed to train and qualify Army Aviation (helicopter) crews, teams/platoons, and companies/troops. It will support aerial operations, reconnaissance, and target engagements, such as joint tactical engagements and convoy live fire training. The DAGIR will include open and urban terrain, and targets supporting simultaneous, integrated air and ground operations. The DAGIR will be included in the updated version of TC 25-8, Training Ranges.
Battle Area Complex (BAX)	The BAX provides a collective live fire training facility for all elements in the Stryker Brigade Combat Team (SBCT). SBCT crews and dismounted soldiers train to detect, identify, engage, and defeat stationary and moving combined arms targets in both open and urban terrain environments. The BAX supports live fire operations independently of, or simultaneously with, supporting vehicles in free maneuver. All targets are fully automated, utilizing event-specific, computer-driven target scenarios and scoring.
Digital Multi-Purpose Range Complex (DMPRC)	The DMPRC complex is used to train armor, infantry, and aviation crews, sections, squads, and platoons to detect, identify, engage, and defeat stationary and moving infantry and armor targets. Combined Arms Live Fire Exercises may be conducted on this facility. The DMPRC supports dismounted infantry platoon live fire operations independently of, or simultaneously with, supporting vehicles. All targets are fully automated, utilizing event-specific, computer-driven target scenarios and scoring.
Digital Multi-Purpose Training Range (DMPTR)	The DMPTR complex is used to train crews and dismounted infantry squads to detect, identify, engage, and defeat stationary and moving infantry and armor targets. The complex is specifically designed to meet the training and crew qualification requirements for armor, infantry and aviation crews, and sections. The DMPTR supports dismounted infantry squad live fire operations independently of, or simultaneously with, supporting vehicles. All targets are fully automated, utilizing event-specific, computer-driven target scenarios and scoring.

The Army also seeks to improve training capability through targeted and prioritized training land acquisition when specific feasibility criteria are met. Feasibility criteria include large, contiguous land holdings; low population densities; minimal environmental restrictions; and low land costs. Candidate parcels must provide a significant solution to an existing installation deficit before being considered for purchase. The Army will enter the marketplace and purchase training land only when these factors exist, and the acquisition is feasible from both fiscal and community relations perspectives. This strategic approach helps the Army offset anticipated encroachment by moving training away from more densely populated areas. Training land is one of the Army’s most critical assets. The Army is dedicated to sustaining and optimizing training land use to ensure soldier readiness now and into the future.

Additional Army Information on Expansion Initiatives

The Army's strategy for acquiring training land is based on an assessment of Army Campaign Plan requirements against current land assets by installation. Based on further demographic, geographic, and environmental analysis, the Army identifies which installations have expansion potential. Installation-specific requirements and proposals are captured locally in the installation RCMP. The RCMP is reviewed, updated, and approved annually. The following bullets describe Army ongoing land expansion projects that have been approved by OSD.

- ▶ **Fort Polk**—OSD initially approved the Fort Polk expansion proposal in July 2008, and granted final approval to proceed with land purchase in April 2010. The National Environmental Policy Act (NEPA) process began in April 2009, and the final Environmental Impact Statement (EIS) and Record of Decision (ROD) were completed in the summer of 2010. The Army Corps of Engineers (the Corps) made the first offer to purchase property in February 2011. In February 2012, the Army closed on the purchase of the first acquisition parcel, adding over 4,900 acres of critical maneuver training land to Fort Polk. Actions are underway to close on additional parcels during 2012 and 2013.
- ▶ **Fort Benning**—OSD initially approved the Fort Benning expansion proposal in January 2010. The NEPA process began in August 2010. Due to pending Army force structure decisions, revisions to institutional training requirements, and the need to conduct additional analysis to address significant community and Congressional concerns related to socio-economic and environmental impacts from the land acquisition, Fort Benning has chosen to delay completion of the final EIS and ROD. Fort Benning will reassess the land acquisition following the announcement of Army force structure and stationing decisions. The Corps has completed the initial real estate planning report.
- ▶ **Texas Army National Guard (ARNG)**—OSD approved the South Texas Training Site (approximately 85 miles due south of San Antonio) expansion proposal in March 2008. The NEPA process was initiated in December 2010, and the Corps has completed the real estate planning report.
- ▶ **Montana ARNG, Limestone Hills Training Area**—OSD approved the Limestone Hills Training Area Withdrawal (18,644 acres of land located in Broadwater, MT) in early 2002. The Montana Guard (MTARNG) and other units have used the training area since 1952. A right-of-way agreement was signed in 1984 as a means to formalize a longer term authorization; in 1993, BLM requested that MTARNG submit an application for withdrawal. The required Legislative Environmental Impact Statement

(LEIS) has been completed and the Notice of Availability (NOA) for the LEIS was published in September 2011. BLM and the Army are currently coordinating to prepare proposed legislation for the withdrawal. The estimated completion date for the land withdrawal is February 2014.

- ▶ **Fort Irwin, National Training Center (NTC)**—NTC land acquisition actions are complete; however, delays continue to impact the opening of expansion areas for training. The final expansion areas were expected to be opened for training in 2013; however, due to significant ongoing delays and costs related to management and mitigation of endangered species (Desert Tortoise), Fort Irwin has decided to delay the opening of the western expansion area. Work will continue, however, to reclaim training land in the southern expansion area. The southern expansion area will be open for training in FY2013, assuming there are no additional legal challenges or delays.
- ▶ **Fort Carson, Pinon Canyon**—OSD approved the Fort Carson, Pinon Canyon expansion proposal in February 2007. The Army currently has no plans to expand Fort Carson, Pinon Canyon and has not requested any funds be programmed in the Department of Army budget (FY2013–2017) for land acquisition at Fort Carson, Pinon Canyon. In addition, the Army will consult with the Colorado Congressional delegation, Senate and House defense committees, and local communities before taking any action to request funding for land acquisition at Fort Carson, Pinon Canyon.

Current and Future Range Requirements

The Army Campaign Plan directs the planning, preparation, and execution of Army operations within the context of transformation. The Army Campaign Plan is the framework that organizes and synchronizes the many changes underway as the Army builds a campaign-capable, joint and expeditionary force. The Army Campaign Plan components that have driven changes to Army training range and OPAREA requirements include Modularity, Global Defense Posture and Realignment (GDPR), Base Realignment and Closure (BRAC), Overseas Contingency Operations (OCO), and the Grow the Army Initiative. Training requirements and operational activities associated with these components are creating readiness challenges by increasing the density of units at key installations, and the level of training being conducted in the United States. These challenges, coupled with new weapons systems capabilities and new doctrinal maneuver space requirements, continue to place pressure on existing range and training land assets.

Through Army transformation, units at all levels are doctrinally required to train for land operations across a significantly larger area of operation. The result of this

increased doctrinal requirement is that the Army is facing greater needs for training land. Technological advances, such as UAS, Stryker Infantry Combat Vehicles, and Mission Command Systems, create the capability to detect targets and conduct operations over terrain larger operational area than ever before. The Army must exploit these technological advantages by training soldiers, leaders, and units to exercise their equipment and logistics to the fullest capabilities, while operating across large areas in a unified and decisive manner.

Stationing changes directed by BRAC 2005 have concentrated Army units and service schools at key installations in the United States. Recent changes in the Army's global posture and readiness cycles have increased the pressure on Army land assets. The GDPR is moving units from overseas locations to the United States. This movement increases training land needs, because there are no new domestic Army installations being created.

In addition, ARFORGEN-based training increases the emphasis on home-station collective training. This, in turn, increases installation range and training land requirements because collective training events are inherently large in order to replicate actual operational environment. Future Army range capabilities must support operating forces training for Unified Land Operations. Unified Land Operations are executed through decisive action (offensive, defensive, stability, defense support of civil authorities) by means of the Army's two core competencies: combined arms maneuver and wide area security.

At the same time the Army is seeking to develop and resource the training support facilities necessary to enable training in support of this operational concept, it is also implementing changes to the ARFORGEN model. In the future, there will be a lower demand to support current operations; thus, the Army is transitioning to more units that may not deploy—Contingency Expeditionary Forces (CEFs)—and fewer Deployable Expeditionary Forces (DEFs). The Army's near term goal is to achieve a 1:2 (Active Component)/1:4(Reserve Component) Boots On Ground (BOG) Dwell ratio. Effective January 1, 2012, most Army units will deploy for only nine months BOG, resulting in longer dwell times at home-station. This change will significantly affect throughput on key installations, and require more home-station range capabilities than the Army has seen over the last seven years.

To support ARFORGEN-based training requirements and meet Army Campaign Plan objectives to support training for Unified Land Operations into the future, the Army is developing a plan to revitalize home-station training, and appropriately resource home-station training and 21st century leader development. The Army will accomplish this objective by creating training strategies and committing resources that ensure home-station training is as demanding, complex, challenging, relevant, and realistic as soldiers can expect to encounter during military operations. A major Army training

strategy in support of home-station training revitalization is the Regional Collective Training Capability (RCTC). RCTC installations will apply an enterprise approach to supporting collective training. That approach will focus unit collective training on select installations to ensure the Active Component, ARNG, and U.S. Army Reserves achieve ARFORGEN training aim points. RCTC will optimize regional home station Training Support Systems (TSS) capabilities, and will support the established Army rotational readiness model, ARFORGEN. RCTC will inform future TSS investments to enable ARFORGEN training aim points for the Active and Reserve Components, and provide ready contingency forces.

Selected installations have been identified as RCTC host installations, including Active Component installations, ARNG installations, and U.S. Army Reserve installations. OCONUS locations in Europe and the Pacific are also included in the RCTC construct. The Army will resource TSS (i.e., ranges, mission command training support, simulators and simulations) at RCTC installations to support unit collective training requirements based on ARFORGEN. The Army will resource non-RCTC installation TSS requirements for feeder squad level and below collective training, as well as for institutional training.

The Army expects to undergo end-strength reductions that may result in changes to operational force structure, institutional training throughput, and stationing. Range and training land capability, availability, and sustainability will be key factors in determining overall training capabilities and unit stationing during this process.

Mission Areas

Current and future range requirements are based upon the capability of ranges and training lands to support Army warfighting functions or mission areas. A mission area is a group of tasks and systems (people, organizations, information, processes) united by a common purpose, that commanders use to accomplish mission and training objectives. These mission areas are listed in Table 2-3, and defined in Appendix B.

Effective live training is the cornerstone of operational success. Individuals, crews, platoons, and companies must learn mission critical tasks to be combat ready. Ensuring that sufficient live fire ranges and maneuver areas are available, and continuing to improve these ranges and facilities remains the key to Army readiness. Live fire ranges, facilities, and training areas are expected to be even more important as the Army implements the ARFORGEN strategy. ARFORGEN will place all units continuously in a reset, train/ready, or available status, incurring greater cumulative training demand on ranges and training areas.

Table 2-3 Army Mission Areas

Mission Areas	
Movement & Maneuver	Sustainment
Fire Support	Command and Control (C2)
Intelligence	Protection

Army doctrine requires multi-echelon combined arms training, based on teamwork and synchronization among units as they prepare for the operational environment. Proficiency in the decisive action core competencies results from regular practice of combat missions and tasks in the live domain, and starts with developing individual skills that, when combined and practiced, build unit proficiency from crew through brigade task force. The modernization of Army ranges under the SRP, supported by the Range Modernization Requirements Planning Process, supports this doctrine.

2.3.2 Marine Corps Requirements

Overview

Marines, Marine units, and Marine Air-Ground Task Forces (MAGTFs) require operational ranges that meet the training demands of modern warfare, including sufficient land area, airspace, seaspace, frequency spectrum, and training range infrastructure to safely and effectively accomplish the full spectrum of mission-essential training.

The Marine Corps’ Mission Capable Ranges program, executed by the Training and Education Command (TECOM), guides Marine Corps range planning and investment. The objective of this initiative is to develop and sustain a comprehensive portfolio of modern ranges and controlled airspace that supports the entire training continuum, from individual training to large-scale exercises of the MAGTF. Live fire training events are a hallmark of, and critical to, the Marine Corps’ approach to preparing for combat, and its range modernization and transformation programs reflect this focus.

Identifying operational range requirements is a dynamic process because range requirements depend on training needs, and are determined by changing operational requirements. Marine Corps ranges must continue to support training cycles for wartime deployments. Furthermore, range capabilities must be enhanced to support both current and future training with mission-capable ranges. Marine Corps range planning is centered on six cornerstone objectives:

- ▶ Preserving and enhancing live fire combined arms training, including the capability to support large-scale exercises

- ▶ Recapturing littoral training capabilities at Camp Lejeune and Camp Pendleton
- ▶ Leveraging technology to provide feedback for better training
- ▶ Lessening encroachment
- ▶ Facilitating cross-service utilization
- ▶ Supporting the Joint National Training Capability

Continued analysis and the fielding of new systems may cause other requirements to surface in the future; however, the current gaps in training capability include:

- ▶ The inability to exercise a large scale MAGTF in a “live” training scenario, including expeditionary maneuver from the sea and distributed operations
- ▶ The lack of a capable East Coast aviation training range to accommodate the increased airspace and weapons requirements of precision guided munitions and the Joint Strike Fighter (JSF)
- ▶ Inadequate training opportunities for Marine units stationed in Hawaii and the Western Pacific

The Marine Corps is actively addressing these gaps by proposing land acquisition and airspace expansion at Marine Corps Air-Ground Combat Center (MCAGCC) Twentynine Palms, assessing the feasibility of expanding existing aviation range capabilities in the eastern United States, and investing in long-term planning for enhanced training capabilities in the Western Pacific.

A significant force relocation issue is the inter-governmental agreement between the United States and Japan to relocate some existing Marine Corps forces from Okinawa to Guam. The Marine Corps is heavily engaged in providing the necessary planning support to the Joint Guam Program Office and the Commanding General, Marine Forces Pacific.

Marine Corps installations are managed to maximize efficient use of training land and resources; however, internal and external limitations can constrain its ability to meet training requirements. Encroachment into the vicinity of Marine Corps installations, operational ranges, and training areas can result in resource (land, air, water, frequency spectrum) usages that are incompatible with current and future military training and general mission activities.

The Marine Corps is confident that it will continue to receive the support and resources necessary to provide the range capabilities required to fully train Marines, sailors, units, and MAGTFs.

Current and Future Requirements

The Mission Capable Ranges program supports the Commandant of the Marine Corps' Vision and Strategy 2025 Initiative. Vision and Strategy 2025 advances a modernization strategy, focused on range requirements of future ground and aviation weapon systems. It includes required linkages between Marine Corps installations and other Military Service ranges and the execution of training in LVC environments. Vision and Strategy 2025 also advances the Marine Corps encroachment control program, focusing on initiatives that optimize access to training ranges, airspace, and frequency spectrum required for training.

Identifying future operational range requirements is an inherently dynamic process, in that range requirements depend on training needs determined by changing operational requirements. Marine Corps ranges must support training cycles necessary to prepare individual Marines and Marine Corps units for current wartime deployments, which is an immediate concern. Furthermore, range capabilities must be continuously enhanced to support current, emerging, and future training requirements with modern ranges that are relevant to the full spectrum of conflict. Several factors affect operational range requirements, both Marine Corps-wide and at particular installations, including:

- ▶ Developing operational doctrine
- ▶ Evolution of TTPs
- ▶ Fielding new weapons and systems
- ▶ Evolving missions of the training ranges
- ▶ Training load (throughput)

As the Marine Corps reorganizes and reconstitutes to succeed in the post-OEF security environment, each of these factors will result in significant changes to range requirements. The Marine Corps is in the process of transforming policies and programs that guide training of Marines, operational units, and MAGTFs of all sizes in those skills required to execute multiple missions in increasingly complex security environments. Evolving operational doctrine, implemented through new TTPs, and employing new families of weapons, aircraft, and systems address the reality that the battlespace of the 21st century is measured in vast distances covered rapidly by highly capable forces that may range in size from small infantry units to large-scale MAGTFs. Range capabilities must evolve in concert with these changing mission requirements and associated training demands. The requirement to train scalable MAGTFs and their component units in an expanding number of essential missions means that needs for training land and airspace are increasing. The need to develop ranges that can support multiple training missions is acute. Finally, as Marine Corps forces are permanently re-deployed from contingency operations to home stations, the training load on its bases will increase.

Access to sufficient training land and airspace for ranges is an immediate concern. No training installation in the Marine Corps inventory currently includes or is projected to include surplus land. As noted in the *Report to the Committee on Armed Services of the U.S. Senate and the Armed Services Committee of the U.S. House of Representatives Pursuant to Section 2829 of the National Defense Authorization Act for Fiscal Year 2008*, deficits in available training land currently exist at every Marine Corps training installation. These deficits are described in the detailed analysis contained in Chapter 3. The Marine Corps continues to assess its land requirements, and will continue to invest aggressively in range modernization and transformation to address as many shortfalls as possible using its available resources. However, geographical and fiscal constraints will prevent the Marine Corps from addressing all shortfalls.

As noted above, a cornerstone objective of Marine Corps range planning is to facilitate cross-Military Service utilization. The Marine Corps has obtained access to other Military Services' ranges to support some types of training, and other Military Services regularly use Marine Corps ranges. The Navy's routine use of the Chocolate Mountains Aerial Gunnery Range, and ranges at Camp Pendleton and Camp Lejeune provide examples of the reciprocal nature of cross-Military Service range use. A key consideration in cross-Service utilization is the relative priority of range users. In practice, training requirements of the Military Service that owns and manages the range have priority over other Military Service users. The Marine Corps expects that, as each Military Service addresses increasing throughput demands and land and airspace requirements similar to those facing Marine Corps ranges, the ability of a given installation to accommodate training by other Military Services will be constrained. The Marine Corps will continue to rely primarily on its existing range resources and, to the extent available, use other Military Services' ranges to meet most of its training needs.

The Mission Capable Ranges program is structured to identify and address future range requirements that arise in this dynamic framework. The program's objective is to develop and sustain a comprehensive portfolio of modern ranges, including airspace that supports the entire training continuum today and well into the future, from training of the individual Marine to large-scale exercises of the MAGTF. It is both forward-looking and responsive, in that it anticipates possible emerging and future range requirements, while maintaining the flexibility to address immediate range needs to support current training of the operating forces. The Mission Capable Ranges program implements a detailed planning process for determining range requirements and investment priorities. One foundation of this program is Marine Corps Reference Publication (MCRP) 3-0C, Marine Corps Operational Training Ranges Required Capabilities. This MCRP describes training land, airspace, and required range facilities necessary to execute the training continuum. Based on the MCRP, installation-specific RCMPs are developed to guide execution of range transformation. The

Marine Corps has completed RCMPs for all of its major training bases. In addition, regional RCMPs have been initiated or are planned for Marine Corps Installations (MCI) West (in progress) and MCI East (planned FY2012).

The Marine Corps is aggressively investing in range modernization and transformation. Since 2004, the Marine Corps has invested (or is in the process of investing) over \$700 million in ranges. Lines of operation for range modernization under the Mission Capable Ranges program currently consist of:

- ▶ Range sustainment to maintain capabilities and protect range investments
- ▶ Re-capitalization to upgrade or replace existing ranges and range resources
- ▶ Investment in new ranges that leverage advanced range instrumentation, targets, and training systems
- ▶ Provision of comprehensive range support and training support services

To date, specific Mission Capable Ranges program initiatives to enhance Marine Corps range capabilities have included ongoing efforts to establish or expand training ranges at MCAGCC Twentynine Palms, Guam, and MCAS Beaufort/Townsend. A more detailed discussion of the seriousness of these present and future range requirements is included in the Chapter 3 Marine Corps Special Interest section and the Goals and Milestones section of Chapter 4.

In summary, in the near term, Marine Corps installations will be required to support training of larger numbers of Marines and Marine Corps units in an expanding array of mission-essential tasks that require ever-increasing amounts of training space and increasingly sophisticated range resources.

Mission Areas

Marine Corps forces are organized, trained, and equipped to deploy as MAGTFs. MAGTFs are scalable, task-organized force consisting of these elements: Ground Combat Element, Aviation Combat Element, Logistics Combat Element, and Command Element. The size and composition of a MAGTF depends on its mission. The Marine Expeditionary Force (MEF) is the largest MAGTF. While the Marine Expeditionary Brigade (MEB) is a large-scale MAGTF, it is smaller than an MEF. The smallest standing MAGTF is a Marine Expeditionary unit (MEU). Special purpose MAGTFs can be built as missions and requirements dictate. Additionally, the Marine Corps is exploring use of small task-organized forces, composed of enhanced infantry companies capable of operating independently for short periods of time.

Each MAGTF trains to execute six warfighting functions: Maneuver, Fires, Intelligence, C2, Logistics, and Force

Table 2-4 Marine Corps Mission Areas

Level of Training	Training Environment and Range Requirements
Individual Warfighting Skills	<ul style="list-style-type: none"> ▶ programmed instruction ▶ fixed ranges / individual movement areas / Special Use Airspace (SUA) ▶ specialized ranges such as small Military Operations in Urban Terrain (MOUT) facilities
Unit Training (smaller units)	<ul style="list-style-type: none"> ▶ scenario-based training ▶ fixed ranges / fire and movement ranges / small maneuver areas / SUA ▶ specialized ranges such as small MOUT Facilities
Unit Training (larger units/MAGTF elements)	<ul style="list-style-type: none"> ▶ dynamic decision-making in event driven training exercises ▶ fire and maneuver ranges / large maneuver areas / SUA ▶ specialized ranges such as large MOUT Facilities
MEU Training Exercises	<ul style="list-style-type: none"> ▶ fully integrated, multi-dimensional training ▶ extended fire and maneuver areas for multi-day training events ▶ extensive SUA ▶ specialized ranges such as large MOUT Facilities
Large-scale MAGTF / MEB Training	<ul style="list-style-type: none"> ▶ fully integrated, multi-dimensional training ▶ extended fire and maneuver areas for multi-day training events ▶ extensive SUA ▶ specialized ranges such as very large MOUT Facilities

Protection. MAGTF training proceeds on a continuum of individual skills training, unit training for MAGTF elements, MEU-level training, and MEB/large-scale MAGTF training. The Marine Corps organizes its range classes or range mission areas to align with the stages of the training continuum. These mission areas are identified in Table 2-4 and defined in Appendix B.

2.3.3 Navy Requirements

Overview

Today’s high performance aircraft and ships employ weapons of significant capability and complexity with unique training and delivery characteristics that require a robust training range/OPAREA infrastructure. The Navy accomplishes most of its training on ranges and OPAREAs located near concentrations of forces in the United States and its territories. These areas enable high fidelity training facilitated by exercise coordinators. For safety purposes, these areas also provide a training space with reduced or restricted civilian traffic. Additionally, Naval forces train on ranges controlled by the Army, Air Force, and Marine Corps. Shared and joint use of ranges, both in the United States and abroad, helps economize time and resources spent on travel, while simultaneously exposing Naval forces to the joint environment.

The Navy’s range complexes allow for training in support of the Composite Warfare Commander (CWC) concept. Each Carrier Strike Group and Amphibious Ready Group must master multiple mission areas, enabling the aviation, surface,

Table 2-5 Navy Fleet Response Training Plan Phases

Training Plan Phase	Description
Maintenance	Maintenance is the preferred period during the entire FRP in which major shipyard or depot level repairs, upgrades, and modernization will occur. In addition to completion of maintenance requirements, units continue to focus on individual/team training and achieving unit level readiness. To better accommodate TYCOM unit maintenance and training schedules, the basic phase may precede maintenance in part or in whole.
Basic (Unit Level Training)	The basic phase focuses on completion of TYCOM ⁵ unit level training (ULT) requirements—team training both onboard and ashore, unit level exercises both in port and at sea, unit qualifications, assessments, qualifications, and certifications. During the basic phase, a unit will maximize the use of both distance learning options for individual skills development, and in port synthetic training. Successful completion of the basic phase ensures units are proficient in all required Navy Mission Essential Task capabilities, meet TYCOM certification criteria, and are ready for more complex integrated training events. ULT follows a cyclical “assess, train, and certify” process which has been instituted by the TYCOMs.
Integrated	The goal of integrated phase training is to synthesize unit/staff actions into coordinated strike group operations in a challenging, multi-warfare operational environment. This phase provides an opportunity for strike group decision makers and watch-standers to complete staff planning and warfare commanders courses; conduct multi-unit in-port and at sea training; and to build on individual skill proficiencies attained in their respective basic phase. The integrated phase is adaptable in order to provide training for Major Combat Operations, Surge certification, Ready certification, and/or tailored training to support emergent Combatant Commander requirements.
Sustainment	The sustainment phase begins upon completion of the integrated phase, continues throughout the post deployment period, and ends with the commencement of the maintenance phase. Sustainment consists of a variety of training evolutions designed to sustain operation readiness as a group, multi-unit, or unit, until and following deployment. Sustainment phase training exercises units and staffs in multi-mission planning and execution, and to interoperate in a joint/coalition environment. In-port and at sea sustainment training allows forces to demonstrate proficiency in operating as part of a joint and coalition combined force and ensures that proficiency is maintained in all Navy METs in order to maintain Major Combat Operations Ready status. The extent of training will vary depending on the unit’s anticipated task and length of time in an MCO Ready status. During sustainment, units/groups maintain an Major Combat Operations Ready status until the commencement of the maintenance phase unless otherwise directed by Navy Fleet Commanders. Unit/group integrity during this period is vital to ensure integrated proficiency is maintained, particularly for strike groups. Deployments in support of Combatant Commander Global Force Management requirements may occur within the Sustainment Phase after numbered Fleet Commanders re-certify groups and units.

and submarine forces to work in an integrated manner. This CWC construct presents unique challenges for the Navy range complexes, which must offer realistic training across diverse and complex mission areas to meet Navy readiness and deployment requirements.

Generation and validation of requirements for Navy training ranges in the United States and its territories falls under the purview of U.S. Fleet Forces (USFF). Type Commanders (TYCOMs) and various lower echelon commands control the ranges that are tenant commands on Navy installations. For example, the ranges in the San Diego area are grouped into the Southern California (SOCAL) Range Complex. SOCAL contains several land, water, and air ranges managed by the Commander Pacific Fleet (CPF).

While CPF and subordinate elements, such as the Southern California Off Shore Range (SCORE), control the day-to-day training operations on the ranges, the Regional Environmental Coordinator on the staff of Navy Region Southwest manages environmental issues for all ranges within its region. Due to the common administrative requirements influenced by the geographic proximity of range components, the Navy manages its ranges as range complexes. For inventory and budgeting purposes, the Navy groups ranges, and sometimes sets of small complexes, to provide efficiencies.

Current and Future Requirements

Training requirements, as opposed to training range requirements, are defined by the Numbered Fleet Commanders (NFCs) and TYCOMs. Each is responsible for establishing the training requirements in Navy Warfare Areas for the various air, surface, and sub-surface forces. To prepare for the Planning, Programming, Budgeting, and Execution (PPBE) process, the TYCOMs obtain inputs from their subordinate commands to determine what training range capabilities and spaces are needed. Those requirements are forwarded to the fleet level, USFF, and Pacific Fleet (PACFLT), for validation. USFF forwards the requirements to the Chief of Naval Operations (CNO) for assessment as input to the Navy’s Program Objective Memorandum (POM) submission process.

The Navy’s highest level range requirement is to provide forces with the land, air, seaspace, and frequency spectrum necessary to support the Fleet Response Plan (FRP). To meet the requirements of the FRP, the Navy has developed a Fleet Response Training Plan (FRTTP). To meet the milestones in the FRTTP, the Navy has a geographically dispersed set of training complexes on each coast of the United States, Hawaii, and in the Western Pacific that provide the areas necessary to conduct controlled and safe training scenarios that are representative of the conditions Navy personnel will face in meeting their assigned tasks, either in peacetime operations or armed conflict. Table 2-5⁸ summarizes the four FRTTP training phases.

Table 2-6 Navy Mission Areas

Mission Areas	
Strike Warfare	Mine Warfare
Electronic Combat	Amphibious Warfare
Anti-Air Warfare	Anti-Submarine Warfare
Anti-Surface	Naval Special Warfare (NSW)

All Navy range complexes have developed individual RCMPs to ensure codification of requirements and capabilities of the various range complexes.

Navy training ranges will play a critical role in supporting training for the operational forces well into the 21st century. The Navy anticipates that, through 2025, the continuing requirement will be to support all phases of the FRP. Strategic planning for Navy range complexes will include support for future training operations, as well as improvements to infrastructure to support the JNTC. Range capabilities will be addressed in individual RCMPs. The Navy will use these plans to implement Navy and DoD sustainable ranges policies, and to assist in evaluating new requirements through the PPBE process.

Mission Areas

The Navy defines range functions as the ability to support training in mission-essential naval warfare areas. These mission areas are provided in Table 2-6 and defined in Appendix B.

2.3.4 Air Force Requirements

Overview

DoD readiness is impacted by limitations on the use of military lands, marine areas, and airspace. To address and further understand these impacts, the Air Force Air Combat Command (ACC) partnered with the RAND Corporation in 2001 to investigate a requirements-based approach for determining its range and airspace infrastructure needs. The goal of the study was to develop an analytical structure for translating ACC operational requirements into training requirements, and then into infrastructure requirements. The study sought to establish a comprehensive, objective statement of ACC range and airspace requirements linked to national interests, and a corresponding approach to compare the adequacy of existing infrastructure with those requirements. The study team created a relational database to serve as an information repository and allow for analysis of the

relationships among the different elements. This process is described in the following paragraphs.

Prior to 2001, alternative range and airspace resource determinations were based primarily on statements of apparent gaps between requirements and existing capabilities. The Air Force determined more effective decisions could be made if both the requirements and current asset capabilities were stated more explicitly, with resource decisions based on rigorously derived gap assessments. To be defensible, range infrastructure and resource requirements must be linked firmly to training requirements, which in turn must be linked directly to Air Force operational requirements in the conduct of its individual and joint national security missions. Additionally, for a requirements-based approach to succeed, an efficient means of comparing existing infrastructure capabilities with these vetted requirements would be needed. Figure 2-5 illustrates the framework at the core of the Air Force requirements translation process and Figure 2-6 illustrates how training activities are linked to Air Force range infrastructure requirements.

Current and Future Requirements

The first step in this requirements identification and translation process starts with the development of a Joint Mission Framework. This framework focuses on effects to be achieved for a joint commander, without regard to how those needs might be met. This framework was developed because existing statements of operational requirements did not readily lend themselves to a strategies-to-task linkage to training requirements. These existing statements of operational requirements were too detailed, too context-specific, and classified at a level impractical for open communication with the public. The UJTL and its derivatives, the JMETL, and Air Force Task List support the strategy-to-task approach.

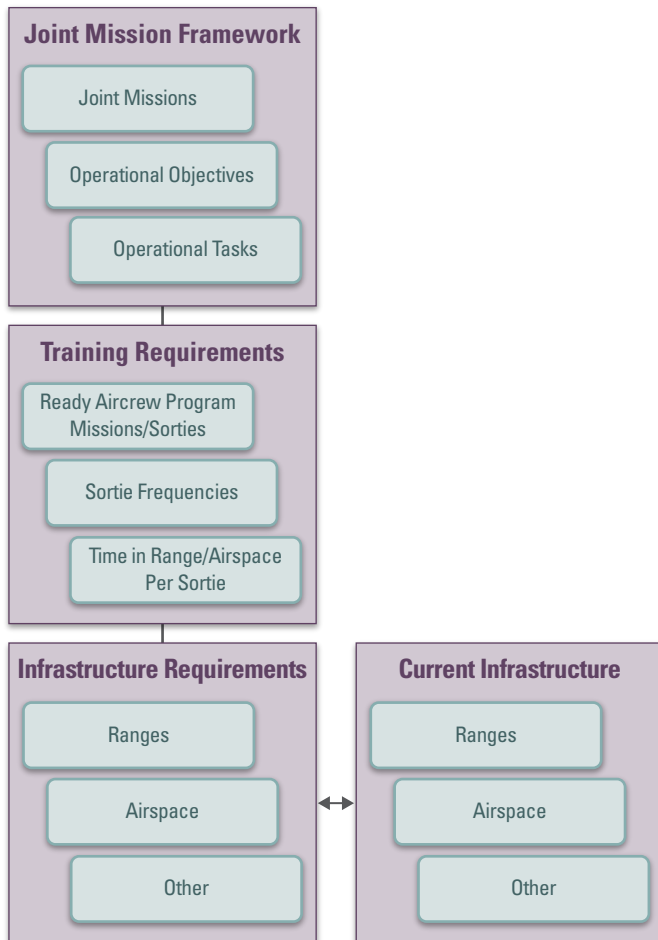
The second step in this process is to relate training activities to operational requirements as detailed in the Joint Mission Framework, and also to training resource needs, specifically range and airspace infrastructure requirements. In doing this, the Air Force focused on applied and combined sorties, as derived from the Ready Aircrew Program.

The third and final step in the Air Force range requirements development process is to evaluate operational and training requirements, and translate them into required range and airspace infrastructure. This is accomplished by grouping and dividing range and airspace infrastructure based on geographic, quantitative, and qualitative characteristics.

- ▶ From a geographic perspective, the required range infrastructure must be reasonably close to base operating

8 TYCOMs are responsible for the aircraft, ships, and submarines that make up the Navy's operational numbered fleets. Numbered fleets (e.g., 2nd Fleet, 5th Fleet, and 6th Fleet) are immediately subordinate to major fleet commands (e.g. Atlantic and Pacific Fleets). They are composed of various task forces, elements, groups, and units organized for the purpose of prosecuting specific naval operations.

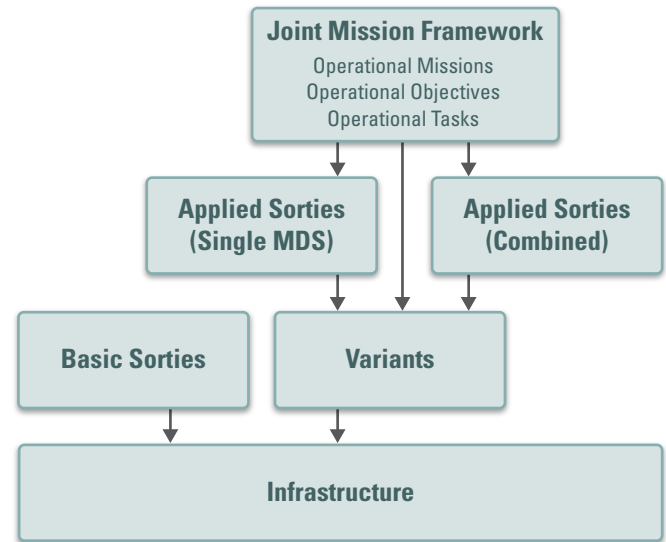
Figure 2-5 Framework for Developing Air Force Infrastructure Requirements



locations. The available training time on nearby ranges and airspace must be sufficient to support the training requirements of an operating base. For a given Mission Design Series (MDS)/sortie-type combination, the requirements are translated into capacity, or the amount of operating time required on ranges and in airspace, by multiplying the required number of sorties by the time required for an individual sortie on a range and/or in an airspace.

- ▶ Qualitative characteristics (and corresponding information on existing assets) must satisfy certain requirements, such as minimum dimensional requirements, availability of required range equipment, and authorized operation of aircraft and systems in specific ways.
- ▶ Qualitative characteristics were captured for six infrastructure types: ranges, low-level routes, maneuver areas, threats, orbits, and other.

Figure 2-6 Linking Training Activities to Air Force Range Infrastructure Requirements



Based upon the success of the RAND study, the Air Force has decided to undertake a follow-on project to provide a better foundation for ongoing and future analyses, and expand the preliminary relational database to include training other than continuation training, training for newer combat air force (CAF) MDS and weapons, and training for non-CAF MDS. The relational database will be expanded to capture and document emerging requirements and changes to the range and airspace infrastructure. The existing Air Force process for translating operational requirements into training and infrastructure requirements shall remain the Air Force standard until the follow-on study is completed.

Air Force Airspace Advisory Committee

As the Air Force activates new missions and begins to utilize new airframes, its requirements for SUA will change. To promote a common understanding of the Air Force’s future airspace needs, the Air Force is planning to establish an Airspace Advisory Committee (AAC) to serve as a venue for stakeholders within the aviation community to provide input and advice on airspace issues and actions. Through the AAC, the Air Force can solicit inputs and recommendations from industry, private pilots, the Military Services, and relevant land management agencies regarding future airspace initiatives. The committee will initially establish three subcommittees:

- ▶ Special Use Airspace Concept Subcommittee
- ▶ Flexible Use Airspace Subcommittee
- ▶ Subcommittee on the Strategic Reassessment of SUAs.

The AAC may create new subcommittees with the advice and consent of a designated federal official.

The plan is for the AAC to meet semiannually to receive updates, reports, and recommendations from each subcommittee, and to comment on various airspace actions the Air Force is conducting or considering. The ACC will also propose actions it believes the Air Force should take. Although the AAC’s recommendations are not binding, the Air Force will consider committee recommendations and provide written justification when its recommendations are not implemented. The AAC is an Air Force-specific initiative and will only consider activities sponsored by the Air Force.

Operating Space Considerations in Basing Decisions

The Air Force is continually involved in making basing decisions for the beddown of new aircraft and/or redistribution of current force structure. Air Force senior leadership recognizes the need to define and establish a framework for making decisions on where, and in what order, to locate these aircraft to best meet Air Force fleet-wide requirements. This framework requires all basing actions to be conducted at an Air Force strategic level rather than at the individual MAJCOM operational level used in the past. This repeatable, transparent, standardized process was established by the Secretary of the Air Force to ensure mission and Combatant Commander requirements are linked to installation attributes that identify those locations that are best suited to support any given mission worldwide.

Corporate Operating Space Management Construct

This initiative seeks to increase the effectiveness and efficiency of USAF Operating Space (physical or virtual space used for operations, test, or training) management and utilization by leveraging and integrating the efforts of existing bodies and processes. This effort will apply across the live, virtual, and constructive domains of air, space, cyber, IO, distributed mission operations (DMO), operational, test, and training communities to provide timely information to decision makers within the Air Force Corporate Structure (AFCS).

The objective of this construct is to increase effectiveness and efficiency by:

- ▶ Leveraging resources
- ▶ Specifying range configurations for common investment areas
- ▶ Reinvigorating the previously chartered Air Force Range Investment Council (AFRIC) and Combat Training Range (CTR), outlining organizational participation, sharing the relevant proceedings of the OSD Test Investment Coordinating Committee (OTICC), and modifying and utilizing the Airspace and Range Council (ARC) to communicate actions across the communities

Table 2-7 Air Force Mission Areas

Mission Areas	
Strategic Attack	Command and Control (C2)
Counterair	Air Drop
Counterspace	Air Refueling
Counterland	Spacelift
Countersea	Special Operations
Information Operations	Intelligence, Surveillance, and Reconnaissance
Electronic Combat Support	

- ▶ Aligning actions to the AFCS timelines to gain timely shared advocacy throughout the AFCS
- ▶ Reiterating the use of only existing PPBE practices, constructs, and procedures as they apply to the 10 common investment areas as defined by Air Force Instruction (AFI) 13-212, Range Planning and Operations.

Note: This construct does not involve transfer of funds, responsibility, manpower (leveling), or workload between or among Major Commands (MAJCOMs), beyond what is currently established by AFI, charter, or other existing guidance. Missions or mission requirements unique to a MAJCOM (e.g., space launch, special operations [SPECOPS]) are, likewise, beyond the scope of this construct.

Mission Areas

The Air Force classifies ranges based upon their ability to support 13 specific types of air warfare training. These training events, or mission areas, are listed in Table 2-7, and defined in Appendix B.

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