SPACE UTILIZATION MANAGEMENT WITHIN WILLIAM BEAUMONT ARMY MEDICAL CENTER

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Disclaimer

The views expressed in this study are those of the author and do not reflect the official policy or position of the Department of the Army, Department of Defense, William Beaumont Medical Center or the United States Government.

Ethical Considerations

No personal identifying information was used during this study. The author declares no conflict of interest or financial interest in any product or service mentioned in this paper.

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Abstract

The purpose of this study is to develop an effective space utilization program that can be incorporated into William Beaumont Army Medical Center (WBAMC). Due to the announcement of base realignment and closure (BRAC) 2005, WBAMC will require additional space in preparation of its beneficiary population increasing by almost 100%. The current process of space utilization management at WBAMC is inefficient and ineffective. Three policy options were analyzed: 1) business as usual, 2) existing policy from another medical facility, and 3) MEDCOM standardized plan for space utilization management. Evaluative criteria for this study are the following: 1) policy, 2) impact on basic operational measures, 3) staff satisfaction, and 4) accomplishment of mission. After analysis of projected outcomes and trade-offs, the recommendation is to remove the business as usual practice from the organization and incorporate an alternate policy consisting of elements from an existing policy from another medical facility and MEDCOM standardized plan for space utilization management.

Introduction

General Information

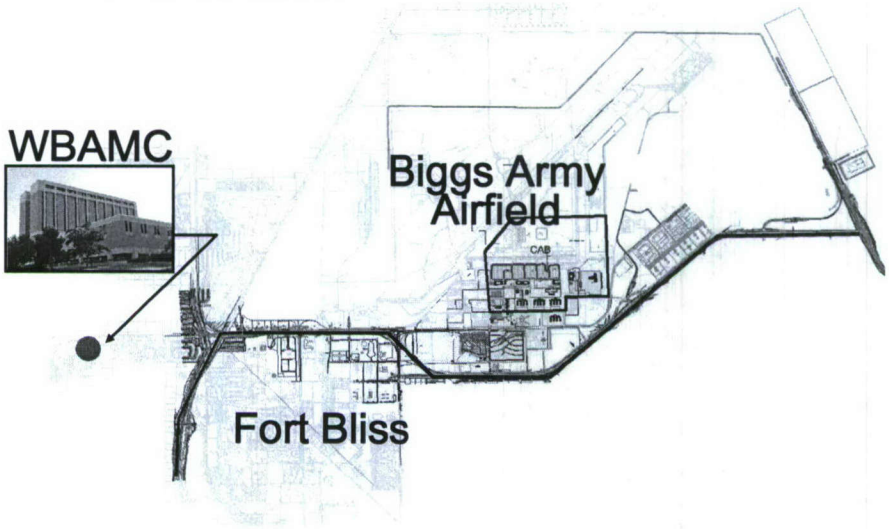
William Beaumont Army Medical Center (WBAMC) is a Department of Defense (DoD) medical facility located in El Paso, Texas. WBAMC provides comprehensive care to all beneficiaries including active duty military, family members, and retirees. The mission statement is "to ensure comprehensive, cost effective and customer driven quality healthcare for ALL our beneficiaries as we train medical providers for peace and war" (WBAMC Website, 2006). The vision of the organization is "to be the standard bearer for excellent healthcare in the Department of Defense" (WBAMC Website, 2006). Since 1921, WBAMC provided care for military personnel and eligible family members, specializing in complete medical care, hosting a medical education program, and serving as a trauma center for the surrounding community of El Paso (WBAMC Website, 2006).

El Paso, Texas lies at the intersection of three states (Texas, New Mexico and Chihuahua) and two countries (United States and Mexico). El Paso has a population of 598,590 according to the 2005 census. The racial makeup of the city was 76.6% Caucasian, 3.12% African American, 0.82% Native American, 1.12% Asian, 0.10% Pacific Islander, and 18.15% from other races. Hispanic or Latino of any race

was 76.62% of the population. El Paso is home to Fort Bliss, a major Army installation, which lies to the east and northeast of the city, extending north up to the White Sands Missile Range (El Paso, 2006).

Fort Bliss was established in 1854 and is home to the U.S. Army's Air Defense Artillery Center and the Sergeants Major Academy. Fort Bliss' catchment area consists of three primary garrison areas: Fort Bliss, Biggs Army Airfield, and William Beaumont Army Medical Center (see Figure 1).

Figure 1. Fort Bliss Area.

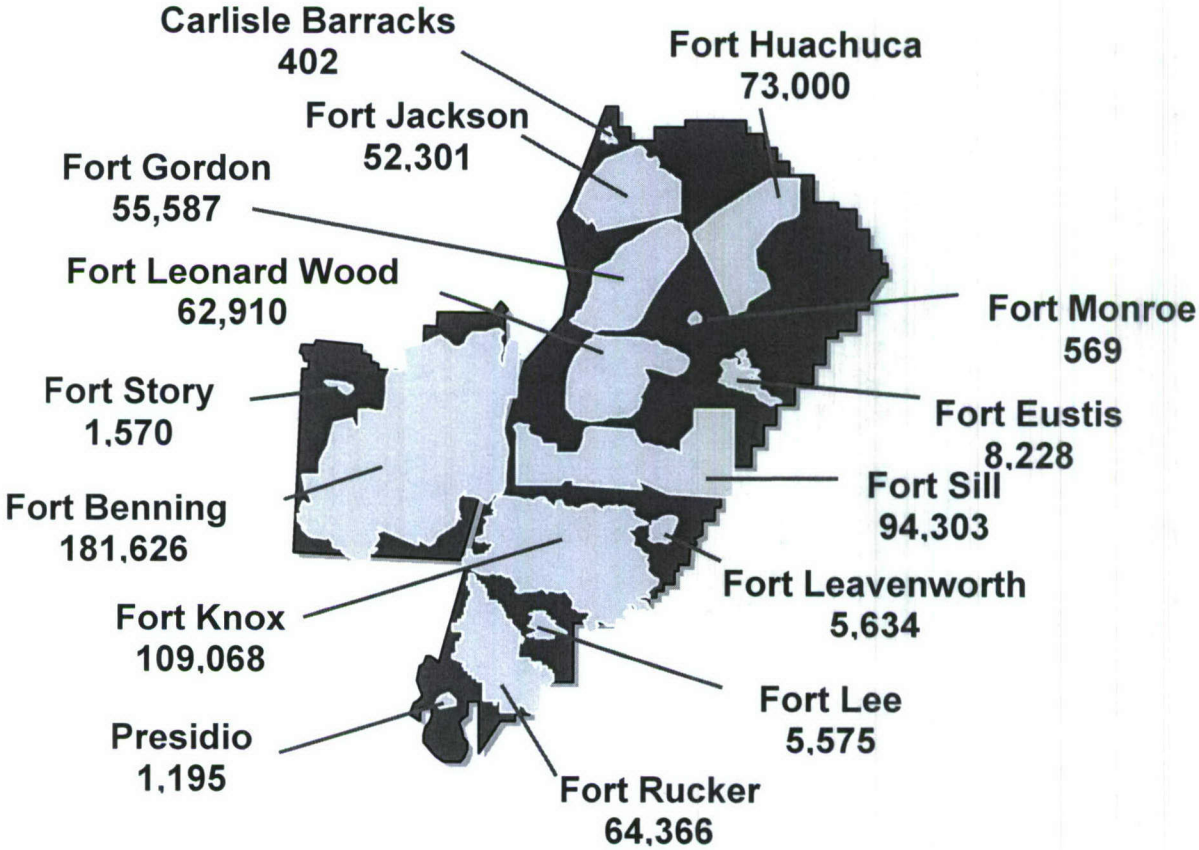


Source: Command Briefing, 2006.

Fort Bliss is the largest maneuver post in the U.S. Army covering 1.16 million acres. In relative comparison conceptually, Fort Bliss is the size of the state of Rhode Island. The following is a list of Army posts and its size that follows Fort Bliss: Fort Irwin, CA (585,000 acres),

Fort Polk, LA (198,968 acres), and Fort Hood, TX (214,570 acres). Within the confines of Fort Bliss, 15 Army posts can comfortably (see Figure 2). Fort Bliss has enough land to train three to four heavy Brigade Combat Teams (BCTs), approximately 12,000 to 16,000 soldiers, at one time. (Department of Defense, 2005)

Figure 2. Fort Bliss Comparison to other Installations



Note. Scale = acres. Source: BRAC Update Briefing, 2006.

Fort Bliss is a critical strategic platform for the U.S. Army. Fort Bliss is equipped with a robust rail system that can process 350 rail cars in a 24-hour period. In addition to being a rail platform, Fort Bliss is the

home to Biggs Airfield, the Army's longest and tenth longest runway in the continental United States. Biggs Airfield tarmac can hold 12 C-5's, 18 C-17's, and 60 C-130's on the ground. With this type of strategic mobility, Fort Bliss is a critical asset among the Army's inventory in deploying military forces anywhere around the globe. (Department of Defense, 2006)

About two miles west of Fort Bliss, along the Franklin Mountain is WBAMC. Its history began in the 1850s were doctors and medics were assigned to El Paso to provide medical support to the soldiers defending settlers and the U.S. border. Between June 1920 and July 1, 1921, Fort Bliss built a new hospital with a 403 patient capacity on 272 acres of rocky, cactus-covered land northwest of the main post. The hospital was named The William Beaumont General Hospital, in honor of Army Captain (Dr.) William Beaumont. (Metz, 1981)

Captain (Dr.) William Beaumont had joined the 6th Infantry as an assistant surgeon, and saw action during the war of 1812 at Fort Mackinac in the Michigan Territory. There he conducted research on the human digestive system which revolutionized medical understanding of how the digestive system functioned. (Metz, 1981)

Today, WBAMC provides healthcare support to over 12,000 active duty (AD) personnel, 19,000 active duty family members (ADFM), 28,000 Non Active Duty Dependents (NADD) and over 70,000 Veterans Affairs (VA) beneficiaries. The medical center has 104 fully staffed beds and the ability to expand to 152 beds within 72 hours. The total expansion capacity for the medical center is 352 beds. Services at WBACM include primary care, comprehensive medical and surgical services, mental health services, and research and clinical investigative services. WBAMC has a robust Graduate Medical Education program. The facility trains residents in orthopedics, internal medicine, general surgery, and transitional year programs. The medical center also provides phase II training for nurse anesthetists and practical nursing, as well as, training for preoperative nursing, operating room specialists, and a myriad of other healthcare specialties. The facility is staffed with over 2,300 military, Department of the Army civilian, and contract personnel committed to providing excellent medical care to all beneficiaries. William Beaumont provides support to many other military installations to include White Sands Missile Range, Fort Huachuca, Holloman Air Force Base (AFB), Cannon AFB, Davis-Monthan AFB, and Luke AFB. WBAMC is a level III trauma

center in El Paso and provides over 10% of the trauma care to the community. In addition, WBAMC is one of few military medical centers that have a contiguous Veterans Administration clinic with same day surgery. This relationship exists to provide seamless care for veterans in the El Paso and surrounding area. (WBAMC Website, 2006)

Conditions Which Prompted the Study

Fort Bliss, Texas is one of many U.S. bases around the world that is affected by the Base Realignment and Closure (BRAC) 2005. The BRAC 2005 is "the congressionally authorized process the DoD has previously used to reorganize its base structure to more efficiently and effectively support our forces, increase operational readiness and facilitate new ways of doing business" (BRAC Report, 2005). BRAC 2005 provides an opportunity to reshape the military's infrastructure to optimize military readiness. The BRAC 2005 process develops innovative ways to consolidate, realign, or find alternative uses for current facilities to ensure that the U. S. continues to field the best-prepared and best-equipped military in the world. BRAC 2005 also enables the U.S. military to better match facilities to forces, meet the threats and challenges of a new country, and make the wisest use of limited defense dollars.

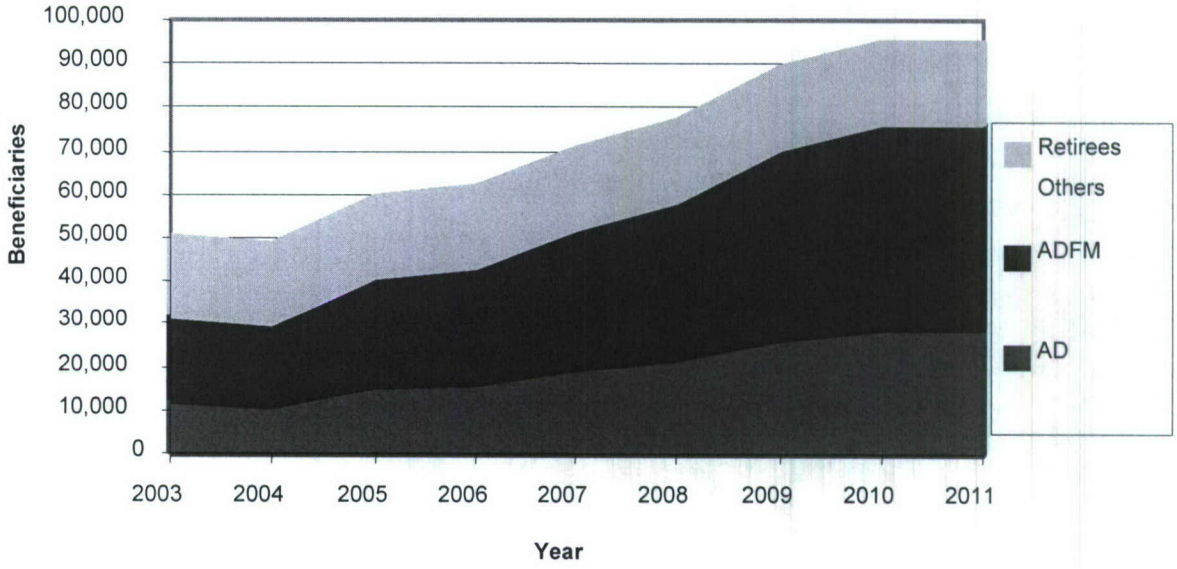
There are major elements of the BRAC 2005 process that ensure fairness. The process begins with a threat assessment of the future national security environment, followed by the development of a force structure plan and basing requirements to meet these threats. DoD then applies legally mandated selection criteria to determine which installations to recommend for realignment and closure. The Secretary of Defense publishes a report containing his realignment and closure recommendations, forwarding support documentation to the independent commission or BRAC commission. (BRAC Report, 2005)

The BRAC commission is an independent body responsible for reviewing the Secretary's recommendations for BRAC 2005. Commission members are selected through a process specified by the Base Closure and Realignment Act. Furthermore, the President is required to consult with the congressional leadership on nominations to serve on the commission. The commission has the authority to change the Secretary's recommendations if it determines that the Secretary deviated substantially from the force structure plan and/or selection criteria. The commission holds regional meetings from the force structure plan and /or selection criteria to solicit public input prior to making its recommendations. History has shown that the use of an

independent commission and public meetings make the process as open and fair as possible. (BRAC Report, 2005)

As a result of the BRAC 2005 findings, Fort Bliss will transform into a heavy maneuver installation that will serve as the new home of the 1st Armored Division, currently based at Germany (BRAC Report, 2005). This plan includes the relocation of the Air Defense Artillery Center and School and an Air Defense Artillery Brigade to Fort Sill, Oklahoma (BRAC Report, 2005). Due to the realignment of military troops and resources, Fort Bliss is expected to increase the beneficiary population from approximately 52,000 to an estimated 93,000 between fiscal years 2007 and 2010 (see Figure 3). This realignment of Fort Bliss obviously poses significant challenges to WBAMC and the El Paso community. In reaction to the realignment, WBAMC has conducted numerous space projects in preparation of the increasing beneficiaries in the years to come.

Figure 3. Fort Bliss Population 2005-2011



Source: BRAC Update Briefing, 2006.

The BRAC 2005 presents a significant change for WBAMC compared to its past history. Since late 1990's, Fort Bliss was originally slated to be one of many bases in the U.S. Army to close (WBAMC Website, 2006). This allowed for insignificant amount of expansion projects throughout Fort Bliss and an organizational culture of doing enough to sustain versus expand. However due to BRAC 2005, Fort Bliss' future has drastically changed course causing organizations within the Fort Bliss area to face issues and obstacles for the arrival of the 1st Armored Division.

Problem

Fort Bliss may have a significant amount of space to grow, but ironically WBAMC does not have enough in reaction to BRAC 2005. WBAMC, like most all military health care facilities, is experiencing problems in space utilization management. Many clinics in the facility are overcrowded with patients and have limited exam rooms and offices, making the delivery of quality health care difficult. Furthermore, there is an issue of the process of managing space within WBAMC. WBAMC conducts space projects without the use of a space committee or any other formal process to intervene with the project in order to make sure the project supports the commander's mission and vision, organization's strategy, entire internal supporting systems, and need. As a result, there are numerous space projects ranging from $400,000 to $6 million being conducted without a sense of a strategic direction. One specific example was the $4 million renovation at the laboratory. According to the laboratory manager, R. Walker (personal communication, March 15, 2007), the laboratory was renovated without taking into consideration the concept of lab flow. Furthermore, R. Walker (personal communication, March 15, 2007) stated that the lab flow was so inefficient that an addition $40,000 was spent

redesigning the laboratory and for the removal of office furniture and cubicles.

Purpose

The purpose of this study is to develop an effective space utilization program that can be incorporated into WBAMC. There is no standard process for analyzing and reallocating space at WBAMC (WBAMC REG 15-1, 2006). Space must be allocated in a manner that maximizes its utility. Without a process for conducting space utilization management, an organization may find itself in a chaotic environment were space allocation is conducted without any consideration in the improvement of patient care, reduction of operating costs, reduction of personnel requirements, improvement of productivity, alignment of the facility's Master Plan, and future requirements of upcoming functional changes.

Importance or Significance of the Study

This study intends to determine an effective space utilization management program that can be used within WBAMC. Identifying intervention points with the issue of space utilization could have impacts on policy and regulations by the Army Medical Department (AMEDD), Department of the Army, and Department of Defense. Most

importantly, this can provide better care to soldiers and families.

This study can also look into the civilian sector. Hospitals today are looking for ways to meet the challenge of boosting patient satisfaction by speeding up care delivery and expanding to handle the growing demand within current budget constraints. They are turning to new technology, process re-engineering and new space planning techniques. (Knepper, 2003)

Literature Review

According to WBAMC staff, the current "business as usual" process in space utilization management has been practiced for years. Most space projects are born of a "good idea" and communicated to the facilities manager, who in turn requests funding for the project. Once funding is obligated, the staff is individually contacted to provide support of the project. This process allows for little intervention opportunities by the leadership and decision makers to ensure the project follows the commander's mission and vision, supports the organization strategic plans, and if it is needed at all. Furthermore, this process allows little command and control and drives ineffectiveness in prioritizing one project with other projects.

Problem Causes

There is a trend within organizations for management to overlook one of our most valuable and scarce resources - space. Space is no longer a "free" resource and needs to be looked at as a critical resource for it to be managed effectively in an organization. Organizations need to ensure systems and processes of the management of space resources are treated with the same level of confidence and diligence as full-time equivalents (FTEs) and the budget. (Seely and Orosz, 2006)

One explanation of this problem is organizational culture. Thomas Atchison (2002) defines organizational or corporate culture as "the way we do things around here." The U.S. Army refers to culture as "a longer lasting, more complex set of shared expectations than climate. While climate is how people feel about their organization right now, culture consists of the shared attitudes, values, goals, and practices that characterize the larger institution. [Culture is] deeply rooted in long-held beliefs, customs and practices" (Army Leadership, 1999).

Organizational culture refers to a system of shared meaning held by members that distinguishes the organization from other organizations. This system of shared meaning is a set of key characteristics that the organization values.

Research suggests that there are seven primary characteristics that capture the essence of an organization's culture:

- Innovation and risk taking: The degree to which employees are encouraged to be innovative and take risks.
- Attention to detail: The degree to which employees are expected to exhibit precision, analysis, and attention to detail.
- Outcome orientation: The degree to which management focuses on results or outcomes rather than on the techniques and processes used to achieve those outcomes.
- People orientation: The degree to which management decisions take into consideration the effect of outcomes on people within the organization.
- Team orientation: The degree to which work activities are organized around teams rather than individuals.
- Aggressiveness: The degree to which people are aggressive and competitive rather than easygoing.
- Stability: The degree to which organizational activities emphasize maintaining the status quo in contrast to growth. (Robbins, 2003, p.525)

Each of these characteristics exists on a continuum from low to high. Appraising the organization on these seven characteristics can give a composite picture of the organization's culture. This picture becomes the basis for feelings of shared understanding that members have about the organization, how things are done in it, and the way members are supposed to behave. (Robbins, 2003)

The role of culture appears to be increasingly important in today's workplace in influencing employee behavior. According to Robbins (2003), culture can be defined by the following:

> Culture by definition is elusive, intangible, implicit, and taken for granted. But every organization develops a core set of assumptions, understandings, and implicit rules that govern day-to-day behavior in the workplace. Until newcomers learn the rules, they are not accepted as full-fledged members of the organization. Transgressions of the rules on the part of high-level executives or front-line employees result in universal disapproval and powerful penalties. Conformity to the rules becomes the primary basis for reward and upward mobility. (p. 528)

Culture can enhance organizational commitment and increases the consistency of employee behavior. However, there are potentially dysfunctional aspects of culture that can have significant effects, especially on an organization's effectiveness. One way is through barrier to change. Culture can be a problem when the shared values are not in agreement with those that will further the organization's effectiveness. This is most likely to occur when an organization's environment is dynamic. An organization's deep-rooted culture may no longer be appropriate when an environment is undergoing rapid change. Consistency of behavior maybe an asset to an organization when it faces a stable environment, but as the environment become more dynamic, it can become a burden as the organization resists change. This explains the challenges that executives at organizations like Mitsubishi, Eastman Kodak, Xerox, Boeing, and the U.S. Federal Bureau of Investigation have had in recent years in adapting to chaos in their environment. These organizations have been known to have strong cultures that worked well for them in the past. However with these turbulent times, these strong cultures have become barriers to change when "business as usual" is no longer effective (Robbins, 2003, p.529).

Another aspect that can have an affect on the problem of space management is leadership. The Army defines leadership as "influencing people - by purpose, direction, and motivation - while operating to accomplish the mission and improving the organization" (Army Leadership, 1999). Leadership from the top management can have a major impact of an organization functions. According to the Director of Logistics at Womack Army Medical Center, LTC Chapa (personal communication, September 14, 2006), "there is never enough space to do all of the things that you want to do and it ultimately comes down to who is going to make the hard call…so it is imperative that the Command Group [is involved] in establishing the priority of effort." Senior management establishes norms that filter down through the organization by setting the example whether through oral communication, written communication, actions or behavior (Robbins, 2003, p. 532).

An example of leadership impacting an organization from senior management is the story of Robert A. Keirlin. According to Robbins (2003):

> Robert A. Keirlin is chairman and CEO of Fastenal Co., the largest specialty retailer of nuts and bolts in the United States, with 6,500 employees. He is dubbed as "the cheapest CEO in America." He takes a salary

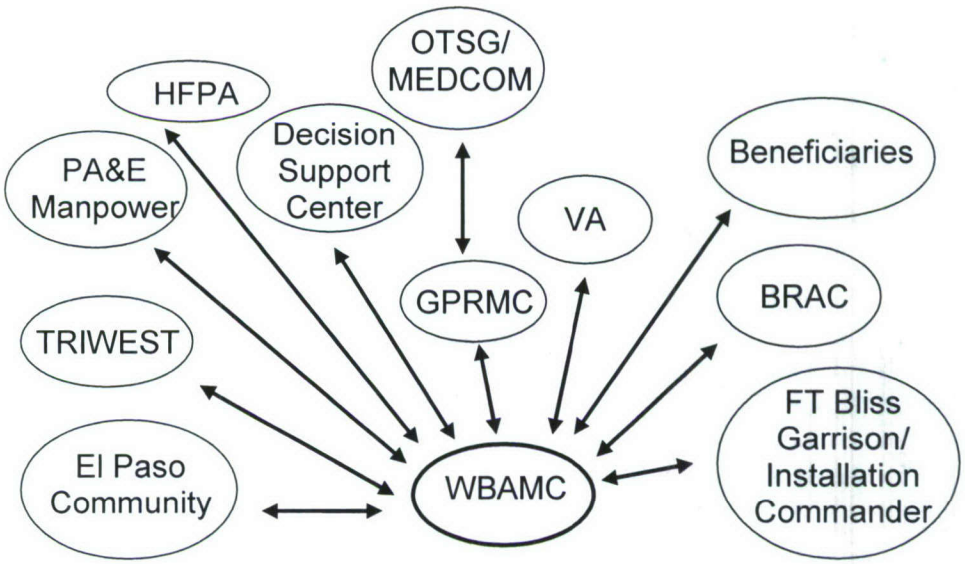
> of only $60,000 a year. He owns only three suits, each of which he bought used. He clips grocery coupons, drives a Toyota, and stays in low-priced motels when he travels on business. Keirlin does not, however, pinch pennies. The market value of his stock in Fastenal is worth about $300 million. Keirlin argues that his behavior should send a message to all his employees: We don't waste things in this company. Keirlin sees himself as a role model for frugality, and employees at Fastenal have learned to follow his example. (p. 532)

WBAMC's culture can be a challenge for senior management. WBAMC is commanded by a hospital commander averaging a term or tenure of no more than two years. In the past nine years, WBAMC has had five hospital commanders who bring his/her individual ideals, values, and leadership to the organization. This presents a challenge to establishing norms in the organizations. Once employees of the organization learn to accept the norms, it can change again with a new hospital commander.

The environment cannot be forgotten as a variable in the problem of space management. An organization's environment is composed of institutions or forces outside the organization that potentially affect the organization's

performance. These typically include suppliers, customers, competitors, government regulatory agencies, public pressure groups, and the like. Figure 4 gives an example of WBAMC's stakeholders.

Figure 4. WBAMC Stakeholders.



Source: Command Briefing, 2006.

An organization can be affected by its environmental uncertainty. Research has helped to clarify what is meant by environmental uncertainty by defining three key dimensions to an organization's environment: capacity, volatility, and complexity (Robbins, 2003, p. 443).

The capacity refers "to the degree to which it can support growth" (Robbins, 2003, p.443). Constantly growing environments produce a surplus of resources, which can assist the organization in periods of relative scarcity. For example, abundant capacity leaves room for an

organization to make mistakes, while scarce capacity does not. (Robbins, 2003)

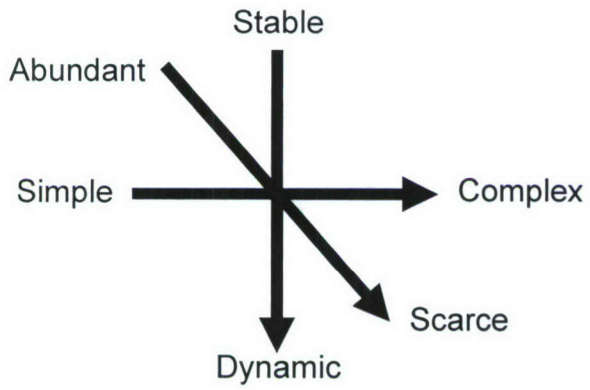
The degree of instability is found in the volatility dimension (Robbins, 2003, p. 443). When there is a high degree of unpredictability with the environment, the environment is considered dynamic. An example is the current global war on terrorism. This makes it difficult for management to predict accurately the probabilities associated with various decision alternatives. At the other extreme is considered a stable environment. (Robbins, 2003)

The last dimension the environment needs to be assessed is in terms of complexity. Complexity is "the degree of heterogeneity and concentration among environmental elements" (Robbins, 2003, p. 443). Simple environments are homogeneous and concentrated which might describe the tobacco industry, since there are relatively few players. In contrast, environments characterized by heterogeneity and dispersion are called complex. An example is the current environment for firms competing in the Internet-connection business. (Robbins, 2003)

Figure 5 summarizes the environment in relation to its three dimensions. General conclusions can be derived given the three-dimensional definition of environment. There is

evidence that relates the degrees of environmental uncertainty to different structural arrangements. Specifically, the more scarce, dynamic, and complex the environment, the more organic a structure should be. The more abundant, stable, and simple the environment, the more the mechanistic structure will be preferred. (Robbins, 2003)

Figure 5. Three-Dimensional Model of the Environment.



Source: Robbins, 2003, p. 444.

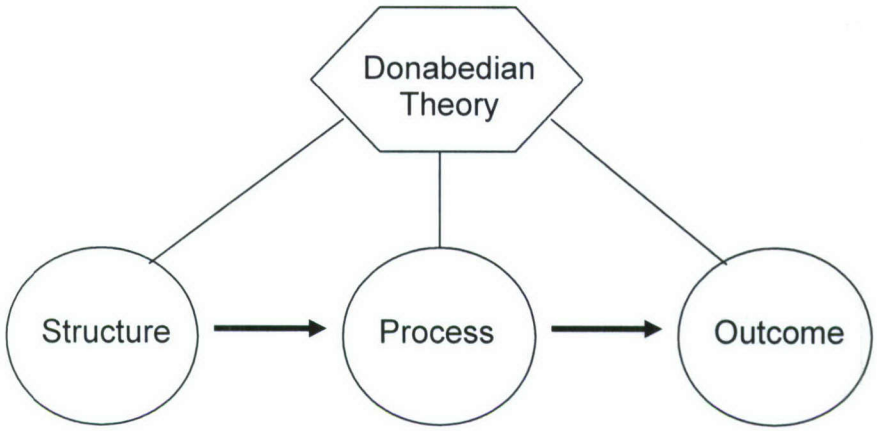
Problem Solutions

The Donabedian Theory is a theory that helps define and measure quality in health care organizations (Donabedian, 2002). Donabedian proposed three variables in which health care quality should be examined: structure, process, and outcome (see Figure 6). Structure is the foundation of the quality of health care and greatly impacts the process. Deficiencies in structure generally

have a negative effect on the processes of health care delivery. Structure and processes together influence quality outcomes. Structure primarily influences process and has only a secondary direct influence on outcome. According to Shi and Singh (2004), "the theory views quality strictly from the delivery system's perspective" (p. 520).

Structure is defined as "the relatively stable characteristics of the providers of care, of the tools and resources they have at their disposal and of the physical and organizational settings in which they work" (Shi & Singh, 2004, p. 520). The criteria used for the structure variable of the Donabedian Theory refer to the resource inputs of the healthcare organizational system. Such resource inputs include "facilities, equipment, staffing levels, staff qualifications, programs, and the administrative organization" (Shi & Singh, 2004, p. 520). Structural measures specify the extent to which healthcare organizations have the capability to provide adequate levels of care. For that reason, "structure provides an indirect measure of quality, under the assumption that a good structure enables health delivery professionals to employ good processes that would lead to good outcomes" (Shi and Singh, 2004, p. 520).

Figure 6. Donabedian Theory.



Source: Donabedian, 2002.

This study will specifically take a look at the process aspect of the model. The process variable "refers to the specific way in which care is provided" (Shi and Singh, 2004, p. 521). Such examples of process include "correct diagnostic tests, correct prescriptions, accurate drug administration, pharmaceutical care, waiting time to see a physician, and interpersonal aspects of care delivery" (Shi and Singh, 2004, p. 520). Similar to structure, process also plays a part in patient outcome. According to the Donabedian Model, structure and process are exogenous variables that affect the total outcome. (Donabedian, 2002)

Another aspect to look at for this study is the model for planning success. The model for planning success emphasizes surveillance, mission setting, and community-focused criteria. Error comes when the innovation

opportunity is missed. There are several ways to check for those few cases where innovation is the key to success:

- Radical change often occurs at different times in different places.
- Radical change often arises from individuals with different views from the rest of the group
- The hoshin concept leads to a search for the ideal way to meet customer needs. At least a few hours each year should be devoted to hoshin thinking to come up with the solution unbound by current practice and tradition.
- Imagination can be prompted by deliberately trying to think the unthinkable.

The planning activity should have established performance measures, short-term expectations, and regular reporting of achievement against these. For planning, this means that service quality, cost, customer satisfaction and human resources should be measured as quantitatively and objectively as possible and specific expectations should be set. Examples of performance measures are demand for planning services, cost measures, human resources satisfaction, outcome quality, and customer satisfaction. In addition, a log of requests and responses must be kept and the milestones must be established in advance. Goals

for measures: timelines, databases, forecast accuracy, and internal customer satisfaction are appropriate targets; cost reduction may also be important. The evaluation of planning is inevitably bound up with that of the CEO and the governing board. (Griffith and White, 2002)

Best Practices

At Duke University Hospital, space utilization management is conducted using a collaboration process with clinicians, administrators, and facility designers. This resulted with the organization successfully using their resources effectively. The voice of the clinicians established the functions to be accommodated. The architects and interior designers balanced the design needed for the function with the expense of the construction. The administrators weighed the priorities and options in making the decisions. The result adapted the space to be patient oriented environments in which care can be provided today and tomorrow. (Nevidjon, 2006)

One technique used to improve office space is photo mapping. This term was coined by marketing scholar Phillip Kotler who suggests that walking through the facility and photographing the key areas of the patient's areas can produce clues to improve in the facility. Photo mapping can be used to expose the impact that lighting, color,

textures, sounds, furnishing and physical layout/ design have on customers in retail settings. The pictures may be shared with the entire organization team to identify areas in the facility that has opportunities to improve patient satisfaction. Examples of these include:

- Practice overview - A tired, cluttered, old-fashioned office that needs a face lift.
- Interior entry door - Signage that is small and difficult to read, especially for seniors.
- Waiting room - An undersized waiting area cluttered with disorderly stacks of magazines.
- Reception window - Curling, overlapping, unattractive paper signs - some hand lettered - describing various rules and informational items are taped to the glass.
- Main corridor/ hallway - Bare walls in need of fresh paint and no wall hangings that could help relay a positive and calming atmosphere.
- Examination rooms - A mix of old (1970s) and new furniture, and cluttered-looking counters that do not telegraph the message that this office is up to date.

Picking up a digital camera and taking a tour of the facility from the patient's perspective may surprise the

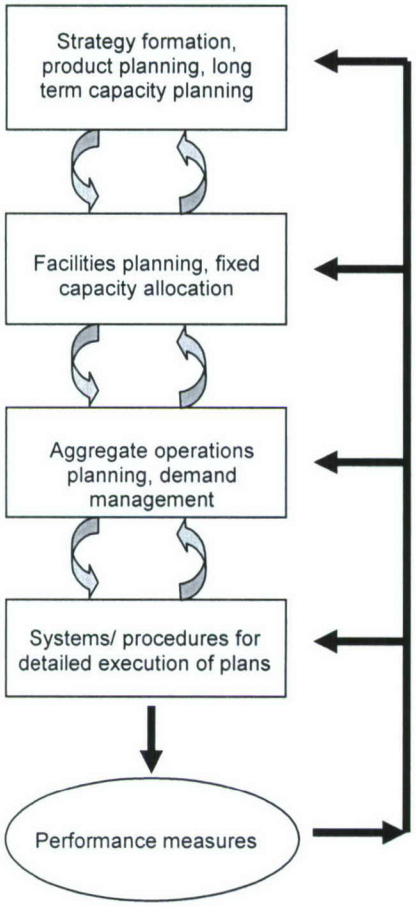
management on ways to improve space utilization. (Redling, 2005)

Richard J. Lanzarone, administrative director at The Kingston Hospital, Kingston, NY, provided helpful information on managing the facility development process. He states that "this can be a complicated process knowing that the space is presently occupied and hospital operations must continue without interruption" (Lanzarone, 2000, p. 3). The process begins by developing a clear vision of what the facility will look like and how it will function at the end of the project. Therefore, before embarking on a significant renovation or addition project, a Master Facility Plan should be developed. The Master Planning process should be an extension of the organization's Strategic Planning process; therefore, a solid Strategic Plan should be developed before embarking on a major building modernization program. Management must resist the temptation to quickly satisfy the pent up demand for more or better space until there is an understanding of the long term consequences of the decisions that will be made. Placing structures or improving and expanding departments in what has often turned out to be the wrong place has wasted countless dollars. Lanzarone (2000) further states that "it is essential that a carefully

conceived phasing plan must be developed early in the design process to ensure uninterrupted patient care, income and public access" (p. 3). Temporary facilities for dislocated departments will usually be necessary and the costs for these moves must be included in the project. Some departments may need to move several times during the project. Early, complete and continuous communication with administration and all departments is essential. The key is to communicate early so the staff can clearly understand the full benefits of the finished project and the reasons for any inconvenienced. (Lanzarone, 2000)

Figure 7 depicts a hierarchical view of hospital planning. The first step in this process involves a wide set of activities that include strategy formation (asking the question 'what business are we in?'), definition of product lines, forecasting the need for each of these, and long term fixed capacity planning. The subsequent steps in the process, as depicted in the figure, than relate increasingly to operational concerns, beginning with long term issues and progressing to the more routine ones. (Butler, Karwan & Sweigart, 1992)

Figure 7. Hierarchical view of hospital planning.



Source: Butler, Karwan & Sweigart, 1992.

Typical of most large organizations, hospitals make strategic responses to either perceived market changes (demands) or crises created by not noting these changes early enough. The first of these responses usually involves a long term capacity adjustment - either an expansion or a contraction. This change is often then accompanied by a facilities reorganization or layout change to accommodate new, expanded, and reduced service types. Since an extreme level of capital investment is typically

required for layout adjustments in hospital settings, this decision is usually also a long term one, linked to lower level ones by decisions about the allocation of fixed capacity (space) to specific services. (Butler, Karwan & Sweigart, 1992)

Once major fixed capacity decisions are made, the next important steps in the decision hierarchy involve aggregate operations planning and demand management. Aggregate planning encompasses the medium term set of decisions that determine the levels of fixed and variable capacity (usually staffing) required by time period. Demand management is a highly integrated set of activities that includes detailed forecasting (by product or service type) and the delineation of systems to link patient demand with variable capacity allocation, scheduling and operating rules. (Butler, Karwan & Sweigart, 1992)

The final set of activities in the hierarchy involves the execution of detailed plans on a regular or routine basis. In health care and other service settings, the disposition of these activities may be the primary determinant of customer (patient) service and satisfaction. The precise manner in which hospital services are delivered is thus the result of higher level plans, day-to-day rules of operation that determine how both routine and crisis

situations are dealt with, the attitudes of employees, etc. (Butler, Karwan & Sweigart, 1992)

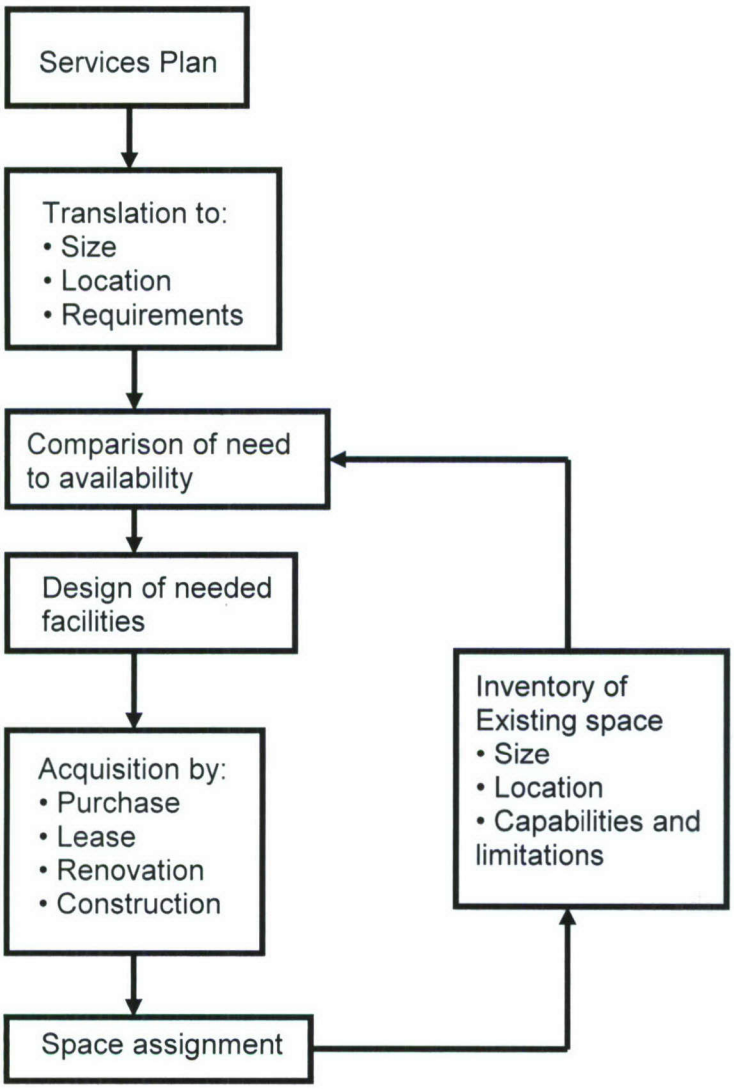
The results of the hierarchical planning process must be evaluated in terms of performance measures. Although long term survival and profitability are almost always paramount, the effectiveness of most decisions is usually assessed in relation to other strategic objectives, or derivatives of these objectives. Whatever the key objectives, the chosen performance measures as well as the decisions made at the various levels of the hierarchy must be consistent with these. (Butler, Karwan & Sweigart, 1992)

The key point about the planning and decision process is that overall system performance is the result of how well the various activities are integrated. Whether the hospital is measured in terms of profitability or customer service, the various activities must complement rather than hinder one another. For this reason, links are shown between the decision blocks in the figure going in both ways. Problem formulation, objectives, and decision must be mutually reinforcing and in line with relevant performance measures. (Bulter, Karwan and Sweigart, 1992)

Griffith and White (2002) propose a facilities planning process as depicted in Figure 8 (p. 638). First,

the space needs of each service or activity proposed in the services plan is estimated. Space needs are described by location, special requirements, and size. The need is compared to available space, and deficits are met at the lowest cost. Four major ways of meeting needs are conversion, renovation, acquisition by sale or lease, and new construction. Conversion is operationally defined as "the simple reassignment of space from one activity to another" (Griffith & White, 2002, p. 638). Although conversion is the least expensive of the four ways of meeting needs, many healthcare organizations possess needs that require specific locations and requirements that renovation, acquisition, or construction are frequently necessary. The final part of the facilities planning process shows the future location of all services and documents the renovation, acquisition, or construction necessary in terms of specific actions, timetables, and costs.

Figure 8. Facilities Planning Process.



Source: Griffith & White, 2002.

Any project to change the use of space should be carefully planned in advanced and closely managed (Griffith & White, 2002, p. 641). Griffith and White (2002, p. 641) recommend a sound program to include the following:

1. Review of space and equipment needs forecast.
2. Identification of special needs.

3. Trial of alternative layouts, designs, and equipment configurations.
4. Development of a written plan and specifications.
5. Review of code requirements and plans for compliance.
6. Approval of plan and specifications by the operating unit.
7. Development of a timetable and PERT chart identifying critical elements of the construction.
8. Contracting or formal designation of work crew and accountability.
9. Ongoing review of work against specifications and timetable.
10. Final review, acceptance, and approval of occupancy.

The management of allocating existing space is conceptually simple, but in reality can be quite difficult to apply. Space is unique and limited. For example, the third floor of WBAMC is not identical to the fourth floor (See Appendix A and B). Griffith and White (2002) state "each space should be used or disposed of in the way that optimizes achievement of the organization's mission (p. 642)." Optimizing space is the key for decision makers in the organization to be familiar with because departments or activities tend to expand in order to fill the available space. This leads to a constant complaint of shortages of

space and an agenda of possible reallocations or expansions. Vice versa, when departments or activities shrink, the space is more often difficult to recover and reuse. This leads to the reason why space allocation decisions tend to be strenuously contested. (Griffith and White, 2002)

To address space problems, many well-run organizations incorporate space use and facility needs into their long-range planning by developing a facilities plan that translates the service decisions to specific available or needed space. The facilities plan describes necessary additions or reductions in the space inventory of an organization. Any department requesting additional space or renovation "must prepare a formal request to gain approval from the space office before submitting a new program or capital proposal" (Griffith and White, 2002, p. 643). The following guidelines provided by Griffith and White (2002, p. 643) assist in space management:

- Space management is assigned to a single office that permits occupancy and controls access to space. The office participates in new program and capital review activities, where most changes originate, and designs appropriate ad hoc review for other requests.

- A key function of the space management office is the preparation of the long-range facilities plan. Planning and marketing staff assist in the preparation. The draft plan is derived from the services plan, and the final version becomes part of the planning package. The facilities plan includes:
    - Forecasts of specific commitments for existing and approved space
    - Plans for acquisition of land, buildings, and equipment as indicated
    - Renovation and refurbishing requirements for existing space
    - Plant revisions indicated by approved new services and technology, the physician recruitment plan, and the human resources plan
    - Plans for new construction
- The facilities plan is incorporated into the long-range financial plan and annual review and approval processes
- The plant department implements acquisition, construction, and renovation. Details of interior design are reviewed and approved by units that will be

using the space. Financing is managed by the finance department.

To measure the effectiveness of space management, process measures are useful. Process measures are helpful in monitoring day-to-day activity. Inspections are critical to laundry, food service, supplies, maintenance, and housekeeping. Subjective judgment is usually required, but it is reliable when inspectors are trained and follow clear standards for cleanliness, temperature, taste, appearance, and so on. The frequency of inspection is adjusted to the level of performance, and performance is improved by training and methods rather than negative feedback. Work reports, brief notes identifying specific events or issues, reveal correctable problem areas in plant maintenance and materials management. (Griffith and White, 2002)

Thomas Atchison stated, "To change the corporate culture, the critical ingredient is leadership" (Atchison, 2002, p. 4). In health care, this starts with the board's approval of mission and values. This mission-driven, values-based corporate culture is expressed through the CEO's vision. The trustees define the mission and articulate the values. The CEO's main responsibility is to

create a vision in context with the organization's mission and in context of its values. Atchison (2002) states:

> The importance of alignment between governance and executive management on the issues of mission, values, and vision cannot be overstated. Misalignment makes a strong culture impossible and greatly increases the likelihood of conflict. The behavior of the CEO determines the degree to which the staff will live the values. When the CEO and the other senior executives "walk the talk," powerful cascade effects occur. All staff will imitate leaders they respect and believe. Behavioral inconsistency at the senior level typically results in multiple subcultures, wherein each sub-group's performance is more important than the organization's performance. Turfs and intergroup conflicts occur frequently in this situation. Corporate cultures, by their nature, resist change. But change is possible. Attempts to shift the mission, values, or vision quickly create a complex of traumas that force staff to worry: "Will I have a job? What will 'they' do next? Don't they ever listen to the people who actually do the work?" (p. 4)

These questions stated by Atchison indicate that change is happening too rapid and has not been adequately staffed in an efficient way.

Some individuals in an organization may work for financial gain. But people also work for "psychic income" (Atchison, 2002, p. 4). Psychic income is "the result of those feelings that come from meaningful work and from being surrounded by people who share our values" (Atchison, 2002, p. 4). Organizations can thrive when employees focus on psychic income. If people working in an organization with a strong culture find it meaningful to them and fits with their values, then change is easy. One key aspect is for them to see the payback in terms of psychic income. Corporate culture is very important to any organization for it drives decisions about hiring and firing, policies, promotions, and strategy. Atchison (2002) states that corporate culture "is the invisible infrastructure for work and is the company's personality" (p. 4).

The U.S. Army adopted a similar concept for its culture during this changing time due the global war on terrorism of "Adapt or Die." General Peter J. Schoomaker, Chief of Staff of the Army, stated, "Culture change begins with behavior and the leaders who shape it" (Fastabend & Simpson, 2004, p. 1). Most large organizations,

particularly commercial enterprises, have found that innovation is key to institutional survival, embracing continuous adaptation to remain ahead of there competitors. According to Fastabend and Simpson (2004), John Kotter, of the Harvard Business School, stated:

> Culture is not something that you manipulate easily. Attempts to grab it and twist it into a new shape never work because you can't grab it. Culture changes only after you have successfully altered people's actions, after the new behavior produces some group benefit for a period of time. (p. 4)

Kotter further states, "culture is not amenable to direct attack" (Fastabend and Simpson, 2004, p. 7). In order to change its culture, the behavior of the organization must change. Kotter looked at the following types of behavior to changing the mindset: product behavior, experimentation behavior, joint behavior, teaming behavior, efficiency behavior, parallel thinking behavior, critical thinking behavior, and learning organization behavior. (Fastabend & Simpson, 2004).

In terms of product behavior, the prior practice in the Army was process driven. Instead of process constraining products, products drive the process - the process is essentially adaptive. The Army went through

such an undertaking with its provisional redesign of brigades and divisions to a more joint, modular configuration. (Fastabend & Simpson, 2004)

With a shift in focus from process to product, true experimentation behavior must be embraced. Concepts development and experimentation plan would seek to determine the relative merits of several alternative solutions rather than seeking to confirm or deny a hypothesis. This can be an ordeal but "it is both necessary for experimentation and a reasonable strategic hedge" (Fastabend & Simpson, 2004, p. 7).

The organization behavior must also be joint rather than retroactive. The Army traditionally thought in terms of Army solutions to land warfare problems and then applied them to joint warfare. Now the mindset must be developed to identify joint problems and their land power solutions and apply them to the Army. Joint behavior will demand a higher investment of energy and time, but the payoff will come later in concepts and solutions that are more interoperable and adaptable. (Fastabend & Simpson, 2004)

Traditionally, the Army's response to when something must be done is to build a "tiger team" of cross-functional experts. These tiger teams proved their worth in late 1999 to early 2000 in developing and fielding the Stryker

Brigade Combat Team (SBCT). If the future is to include routine innovation and adaptation, then it must include staff designs that facilitate this teaming behavior, rather than relying on tiger teams. (Fastabend & Simpson, 2004)

In terms of efficiency behavior, the Army must be vigilant to assess and eliminate programs and processes that have outlast their usefulness. Successful industries have found that routinely seeking reductions in overhead is often advantageous, not only to save resources, but to drive innovation. (Fastabend & Simpson, 2004)

According to Fastabend and Simpson (2004), "Parallel thinking behavior is the allocation of special planning or review tasks to special panels, boards or ad hoc groups" (p. 9). The observations from these groups expand the insight available to the Army and are a useful balance to internal preconceptions. Fastabend and Simpson (2004) further states, "Parallel thinking provides unconstrained thought, unbound by routine processes" (p. 9). Parallel thinking behavior is a way to introduce different cultural perspectives, ensure objective analysis, and enhance the credibility of results. (Fastabend & Simpson, 2004)

Critical thinking behavior is a learned behavior that is reinforced by education. The Army education system has been noted as the Army's effective lever of cultural

change. Research has shown that cultural shifts can be traced to the school house. To assist a change in culture a thorough review of the education system is required to assess its effectiveness at kindling critical thinking. (Fastabend & Simpson, 2004)

According to Fastabend and Simpson (2004), organizations that practice learning organization behavior are "organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning to see the whole together" (p. 9). Learning organization behaviors include: search for best practice, historical research, communities of practice, after action reviews (AARs), information push, engagement of critics, and open environment. Learning organizations overcome the barrier of centralized responsibility by encouraging a thirst for creativity and a hunger for challenge. (Fastabend & Simpson, 2004)

Other Research Similarities

Space utilization is not only an issue within the health care system. Hundreds of companies such as Alcoa, Northern Telecom Ltd., Du Pont, Hewlett-Packard, 3Com, Sun Microsystems, Chiat/ Day advertising, and the Greater Omaha

Packing Company have redesigned their buildings and workplaces with the intent of reshaping employee attitudes and behaviors (Robbins, 2003, p. 469).

As stated by Robbins (2003), size is defined "by the square feet per employee" (p. 469). Traditionally, status of an employee was the most important determinant of space allocation. The higher ranking an individual was in the organization's chain of command, the larger office space he or she had. As organizations progress to become more unorthodox in their business practices, the trends have moved toward reducing the space dedicated to specific employees, lessening or eliminating space allocations based on position, and making more space available in which groups or teams can meet. According to Robbins (2003), "it has been estimated that, over the past decade, the personal office space provided by organizations to administrative employees has shrunk 25 to 50 percent" (p. 470)." Part of this move was motivated economically because space costs money and reducing space cuts costs.

The majority of this reduction in personal office space can be traced to reengineering. Many jobs have been redesigned and traditional hierarchies have replaced individual work with teamwork that required little need for large offices. Today, the typical business practice for

allocating extra space is setting it aside where people can meet and teams can work, rather than giving it to specific individuals. Robbins (2003) calls these specific spaces "public spaces" which can be used for socializing, small group meetings or as places where team members can work through problems (p. 470).

When allocating space, it is also beneficial to take into consideration the arrangement. Robbins (2003) refers to arrangement as "the distance between people and facilities" (p. 470). The arrangement is important primarily for WBAMC because WBAMC is in the business of providing quality care to all its beneficiaries. Space arrangement influences patient flow and if patient flow is ineffective, then there may be an unfavorable outcome anywhere from customer dissatisfaction to productivity. The arrangement of workplace influences social interaction. Several researches have been conducted that supports the premise that individuals are more likely to interact with other individuals who are physically close. As Robbins (2003) states:

> An employee's work location is likely to influence the information to which one is privy and one's inclusion or exclusion from organization events. Whether you are on a certain grapevine network or not, for

instance, will be largely determined by where you are physically located in the organization. (p. 470)

Patient privacy is one area WBAMC stringently practices to ensure proper, quality health care. Robbins (2003) states, "privacy is in part a function of the amount of space per person and the arrangement of that space" (p. 470). Although the trend is evidently toward public spaces, organizations are making exceptions for employees engaged in work that requires deep concentration. Companies like Microsoft, Apple Computer, and Adobe Systems, for example, continue to rely primarily on private offices for software programmers. People who write code need to cooperate with others at times, but theirs is essentially a lonely task that requires tremendous concentration. This is best achieved in a closed workplace, cut off from others. (Robbins, 2003)

According to Robbins (2003), studies suggest that workplace, in and of itself, do not have a substantial motivational impact on people. Rather it makes certain behaviors easier or harder to perform. In this way, employee effectiveness is enhanced or reduced. More specifically, evidence indicates that work space designs that increase employee access, comfort, and flexibility are likely to influence motivation and productivity positively.

For instance, Amoco Corp in Denver reported a 25 percent decrease in product cycle time, a 75 percent decrease in formal meeting time, an 80 percent reduction in duplicated files, and a 44 percent reduction in overall space costs after offices were redesigned to facilitate teamwork. Cognitive ergonomics is matching the office to the brain work. Jobs that are complex and require high degrees of concentration are likely to be made more difficult by noise and constant interruptions. Such jobs are best done in closed offices. But most jobs do not require quiet and privacy. Jobs today increasingly require regular interaction with others to achieve maximum productivity. This is probably best achieved in an open-office setting. (Robbins, 2003)

It is important to note that this study will not take into consideration the Union process that normally follows an approved space utilization decision. However, it is imperative to recognize the rules and procedures involved with the space utilization program. Based on the agreement between WBAMC and the American Federation of Government Employees Local 2516 (hereinafter referred to as the "Union"), Article V (Rights of employer), Section 1 states WBAMC has the authority "to determine the mission, budget, organization, number of employees, and internal security

practices" (Crandall & Abeyta, 1999, p. 5). Furthermore, under Article VII (Matters appropriate for consultation), Section 7 (Mid-term bargaining), it states:

> The process is triggered hen the Union or management submits a written notification of policy change or initiative. Either party will have ten (10) workdays following the receipt of written notice within which to submit a written request to negotiate. Failure to submit written request to bargain will be considered as acceptance of the change or initiative. Such bargaining negotiations should normally begin no later than ten (10) workdays after submission of the written request. The parties will develop appropriate ground rules as necessary for the negotiations and are encouraged to use an interest-based bargaining approach in such discussion. (Crandall & Abeyta, 1999, p. 14)

Policy options

The system causal model for the problem can be depicted using Donabedian's Theory. WBAMC has the correct structure of staff and resources to run efficiently. The problem and the "intervention point" to correct it lie with the process. There is no standardized process for analyzing and reallocating space at WBAMC (WBAMC REG 15-1,

2006). The current process practiced makes it inefficient to manage space. Once a project is funded by the higher unit, Medical Command (MEDCOM), the money is obligated and expected to be executed. As a result, the staff is forced to support the project without consideration in improvement to patient care, reduction of the cost of operations, reduction of personnel requirement, improvement of productivity, alignment of the facility's Master Plan, and future requirements of upcoming functional changes. If the process of space management can be improved within WBAMC, this can lead to improved outcomes.

Policies on the process of space management at WBAMC will need to be enforced to affect an effective outcome. In order to improve the process of space management, three policy options will be examined - business as usual, existing policy from another DoD medical facility, and a MEDCOM standardized plan for space utilization management.

The first policy option will be business as usual/ status quo (see Figure 9). The current business as usual process for space management at WBAMC has been practiced for years. The process begins with a design of an idea for space and communicated to the facilities manager who in turn requests funding for the project. Once funding is

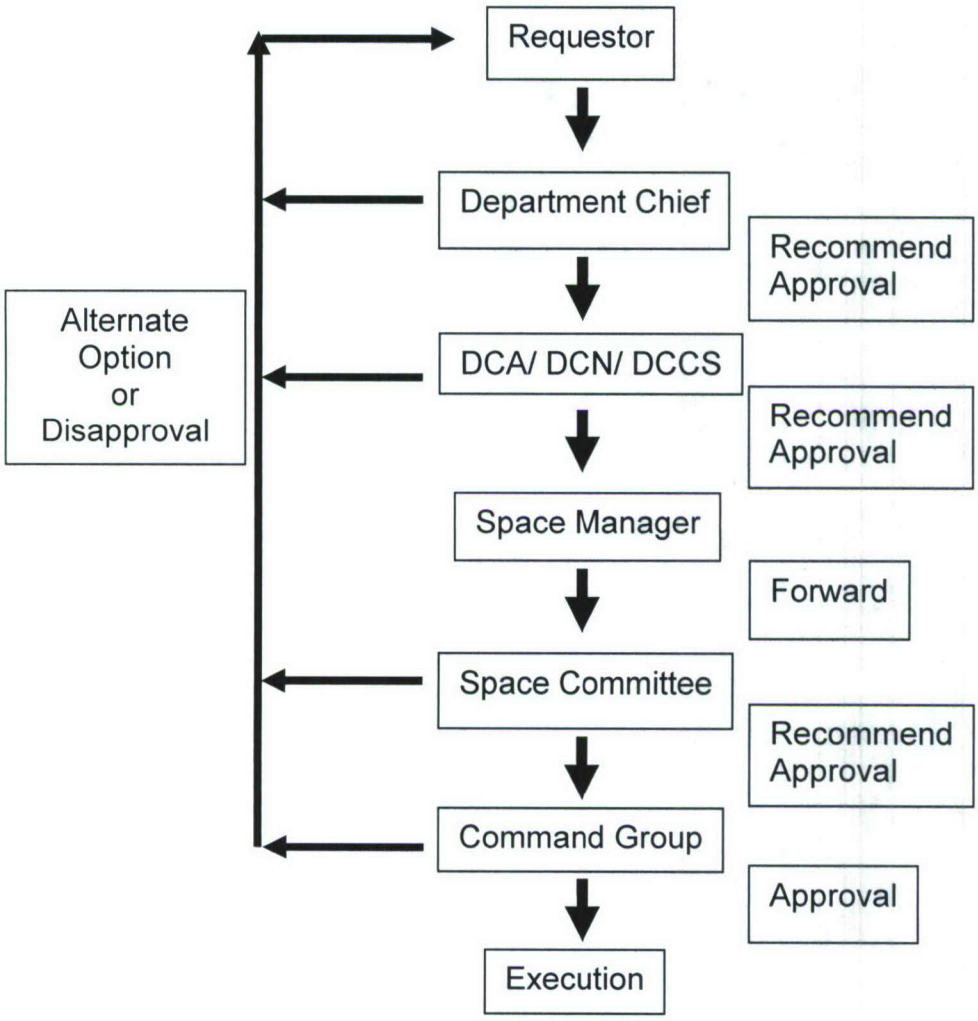
approved, the staff is individually contacted to provide support for the project and the project is executed.

Figure 9. Existing Space Management Process for WBAMC.

The second policy option is to use an existing policy from another DoD medical facility. Figure 10 shows how Dwight D. Eisenhower Army Medical Center (DDEAMC) conducts its space management process. The process begins with the requestor submitting a space request to his Department Chief. The Department Chief will have three choices: 1) accommodate the space request with existing resources within the department, 2) disapprove the request or 3) recommend approval and forward it to the Deputy Commanders. If the Department Chief approves the space request, the request is forwarded to the Deputy Commanders were it is reviewed and decided with the three options: 1) alternate option with existing resources, 2) disapproval of the request or 3) recommend approval and forwarded to the space manager. If the space request is approved by the Deputy Commanders, it is forwarded to the space manager were the request is analyzed and presented to the space committee. Once the space request is presented to the space committee,

the committee members will decide on similar choices: 1) find an alternate option with existing resources, 2) disapprove the request or 3) recommend approval and forward it to the Command Group which consist of the Hospital Commander, Command Sergeant Major (CSM), Deputy Commander of Clinical Services (DCCS), Deputy Commander of Nursing (DCN), and Deputy Commander of Administration (DCA). If the space request is forwarded to the Command Group, they decided whether to approve it or not. If the space request is approved, the project will be executed. With this model, the average length for the approval process is two to three months. This process can however increase in time with facility involvement should construction be required for implementation.

Figure 10. Space Management Process for DDEAMC



Source: E. May, 2006.

DDEAMC views space as a critical resource that a business case analysis was conducted to establish a GS-11 position for a space manager under the title facilities utilization specialist. See Appendix C for the full position description. The duty description is as follow:

1) Develops and directs space management and healthcare facilities master planning for Dwight David

Eisenhower Army Medical Center (DDEAMC) to include those at Fort Gordon, Fort Buchanan, Fort McPherson, and SOUTHCOM [Southern Command]. Duties involve restructuring of medical functional locations in all medical facilities. Manages the space and inventory module of the Defense Logistics Management Support System (DLMSS) that interfaces with the DMLSS Maintenance Management System. Manage facility related site preparation projects for the capital equipment expense program (CEEP) and the medical care support equipment (MEDCASE) program.

2) Serves as the facilities use manager at Dwight David Eisenhower Army Medical Center (DDEAMC) to include consulting for similar services within the Southeast Regional Medical Command (SERMC). Reviews requests for space or revisions to assigned space depending on mission requirements. Validates the need for revisions in space assignments based on command-endorsed standards that include both DoD and conventional commercial facility standards. Evaluates and makes proposals to properly balance existing facility utilization of outpatient and inpatient activities in order to achieve optimum mission objectives within available facilities resources.

Analyzes justification provided and discusses functional requirements with organizational representatives to clarify and resolve questions and concerns. Works closely with medical staff to determine optimum locations and size of clinical space to meet evolving health care requirements and areas of emphasis. Physically assesses and researches drawings and applicable codes to determine mission and facility impacts of proposals to include suggesting alternative solutions or locations. Formulates space assignments proposals based on valid space requests, having received input from various sources including the command group. Staffs space proposals through appropriate senior staff to the command group, which also includes resolving non-concurrences (from the senior staff) and revising the proposal as necessary. Discusses proposed space actions with the Deputy Commander of Administration (DCA), Deputy Commander for Clinical Services (DCCS), Deputy Commander for Nursing (DCN), Executive Officer (XO), and Commanding General. Obtains command group approval/ disapproval, notifies affected activities of decision(s), implements space reassignment decisions and resolves associated problems. Files and maintains

> documentation pertinent to completed space allocation actions. Convenes and chairs meetings with activities involved in space management actions often receiving upper command-level guidance and directions that require conveying direction to branch and division chiefs." E. May (personal communication, November 14, 2006)

According to DDEAMC's space manager, E. May (personal communication, November 14, 2006), "the Space Manager should be the most objective person in this process and really should not be making decisions - rather providing all the information (good and bad) to those to make the decision."

The final policy option is to review a MEDCOM standardized plan for space utilization management. The process involves two stages which may have multiple levels of determination in each stage.

The first stage is to develop specific functional area space programs based on environmental inputs. According to the Health Facility Planning Agency (2002), "functional areas of planning are driven from a set of environmental inputs, through a set of space criteria leading to a functional area program for design." Within this type of structure, the environmental inputs are defined to indicate

demand for space such as program obligations, service requirements, staffing, activity, and equipment. There are four major categories of space criteria: 1) patient care, 2) support of patient care, 3) administration, and 4) support of administration. The environmental inputs are translated through a set of space criteria to determine the program for design. (Health Facility Planning Agency, 2002)

The second stage is to perform a readiness review of the resulting first stage space programs. The Health Facility Planning Agency notes some of the questions embarked upon during a readiness review:

1) Does the program provide appropriate space for mission accomplishment and for all personnel who will be working in the facility? One of the most common mistakes in the creation of a space program for a facility is to overlook one or more functions, which will be accomplished in the proposed facility. All too often reviewers of space planning documents focus on what is stated in the document and fail to look for that which was omitted. This can result with the failure to insure that all services were included and that space was provided for all workers (military and

civilians, volunteers, contractors and borrowed labor) in the facility.

2) Are there differences in the space criteria assumptions or operating characteristics that impact the numbers and sizes of units? For example, use of quick chill food preparation allows for more even distribution of work load which can lead to almost complete elimination of food preparation areas, reduction in the cook's line space, and reduction of storage space, but increase space requirements for remote food preparation alcoves. Another example, the development and implementation of digital radiology imaging equipment will require additional space for the digital radiology equipment and computer control staff areas, while reducing film storage requirements.

3) Are environmental factors present that necessitate the support of a program not justified within the criteria? For example, obstetrical services are not justified where volumes are less than 250 deliveries per year. Remote facilities, which have an obstetrical requirement or where local community obstetrical standards are not up to US standards, may require that this service be provided.

4) Are environmental factors present that necessitate the support of a program not covered by the criteria? For example, teaching and research activities may currently warrant programming for interventional radiography. Location and access to this modality may prevent the use of local facilities.
5) Could service more appropriately be provided through alternative methods? For example, obstetrical requirement of less than 10 Average Daily Patient Load (ADPL) may be more economically met through other community providers.
6) Is this an addition/ alteration project? If so, then what allowance, if any, should be made in computing final area gross square feet?
7) Are there physical constraints on exterior walls that make the net to gross conversion factors unrealistic? For example, facilities in severe climates may be designed with thicker walls (for a larger amount of insulation) than in average climates. The additional wall thickness may be justified in order to lead to lower operating energy costs. Another example is small facilities that often have a proportionately smaller amount of space contained within the exterior walls, than larger facilities.

8) Is there potential for consolidation of staff support areas (e.g., lockers, waiting rooms, lounges or conference areas)? For example, operating practices may warrant certain groupings of activities that lead to consolidation and coordination of space. Another example is medical staff in several clinical specialties operates through a group practice. Physical design can support this leading to configuration and sizing different than the results of the first stage of the proposed space planning framework discussed above. (Health Facility Planning Agency, 2002, p. 2)

Facility programming can be a dynamic process for any organization. The two stage space planning framework presented by the Health Facility Planning Agency (2002) is "designed to assure a sound rational defense for the scope of a facility design project as it moves through the budgeting, programming, design, and approval process" (p. 4).

Evaluative criteria

In order to evaluate whether the policy will produce a sufficient outcome, an evaluation criteria needs to be established. Criteria standards used to judge the goodness of the projected outcomes in this study will consist of

four areas: 1) organization policy, 2) impact on basic operational measures, 3) staff satisfaction, and 4) accomplishment of the mission.

The first criterion is organization policy. This criterion is operationally defined as whether or not there is a current policy on space management for the organization. The main problem identified in this study is that there is no policy on space management within WBAMC. This criterion will establish the foundation of a sufficient outcome.

The second criterion is impact on the following basic operational measures: 1) Total Relative Value Unit (RVU), 2) Total Relative Weighted Product (RWP), 3) Primary care RVUs per available provider full-time equivalent per day and 4) Customer Satisfaction. Total RVU is operationally defined as the number of relative value unit weighted visits reported. Total RWP is operationally defined as the number of relative value weighted visits reported. Primary care RVUs per available provider FTE per day is operationally defined as the number of work relative value unit adjusted visits per full-time equivalent provider per 8-hour day in U.S. military primary care clinics. It is calculated by primary care RVUs/ Available provider/ 21 days. Customer satisfaction is operationally defined as

number of individuals with responses of five or higher from a customer satisfaction survey.

The basic operational measures come from the AMEDD Command Management System (CMS). The CMS provides AMEDD leadership timely, accurate insight into operational performance. The dynamic nature of this system ensures that the Command receives ongoing feedback on performance and ensures that each Commander has equal access to quality performance measurement tools regardless of organizational size or budget. (AMEDD CMS, 2006)

The third criterion is staff satisfaction. This criterion is operationally defined as the satisfaction rate of staff personnel with the available space in order to conduct their work. This criterion is specifically addressing staff satisfaction in regards to how efficient is the given space for the primary mission of providing patient care. Staff satisfaction is measured by the use of a staff satisfaction survey among staff personnel, a similar method as to the customer satisfaction survey provided within the medical facility.

The last criterion is accomplishment of the mission. This criterion is operationally defined as whether or not the allocated space allows for the accomplishment of the mission. This criterion is also measured by the use of a

staff survey among staff personnel to ensure the goodness of the space allocation.

Projected Outcomes

The first policy option, business as usual, WBAMC will not gain an effective projected outcome. The business as usual policy will expect to fail in three of the four evaluation criteria. First, business as usual will not establish a policy on space utilization management for the organization. Spontaneity will be the foundation for this policy. Second, there would not be any impact on basic operational measures with business as usual. Ceteris paribus, WBAMC will continue to experience a low scoring on basic operational measures from the AMEDD CMS. Lastly, staff personnel will continue to be dissatisfied on space and can hamper mission accomplishment due to inefficient space.

The second policy option of incorporating an existing policy for another DoD medical facility will provide a favorable outcome for WBAMC. For one, it will establish a policy on space utilization management for the organization. There would be an impact on basic operational measures with the use of this policy. Space allocation will be managed with some type of organization and legitimized through staff versus management by

spontaneity and conducted sporadically. This policy will also opt for efficient space in order for staff personnel to accomplish their mission. This efficient space will increase staff personnel satisfaction in regards to specifically space management. The only down side to this policy is the approval period. The length of an approval period is about two to three months.

The third policy option of incorporating a MEDCOM standardized plan for space utilization management will also provide a favorable outcome for WBAMC. It will establish a policy on space utilization management for the organization. There would be an impact on basic operational measures with the use of this policy. With this policy, space is managed through environment inputs and prioritized in order to maximize mission accomplishment. With this policy and its design to provide efficient space, staff personnel will have an increase in satisfaction specifically in space management. Once again, the down side to this policy is the length of the process. Depending of the initiative, expertise, and commitment of the leaders and decision makers in this process, the policy can be as quick or as slow as they want it to be.

Table 1 illustrates the projected outcomes for each course of action or policy. The "+" indicates a favorable

outcome for the organization. The "-" indicates an unfavorable outcome for the organization.

Table 1.

Projected Outcomes for Policies

Course of Action	Organization Policy	Operational Measures	Staff Satisfaction	Mission Accomplishment
Business as usual	-	-	-	+
Existing policy	+	+	+	+
MEDCOM standard	+	+	+	+

Analysis of trade-off

The first policy option of business as usual has been practiced for years at WBAMC. The main reason this practice was so popular within the organization was because it expedited the process of executing a project, thus avoiding the hassle of waiting months for an approval of a project as it goes through a committee process. Although business as usual saved time, the overall affect needs to be analyzed to determine its effectiveness. Looking at the history of WBAMC, many departments have relocated numerous times within a short period. There is also no prioritization with space projects based on the organization's mission, vision, and strategic plan. WBAMC has a vast amount of projects ranging from $400,000 to $6

million without a project officer, prioritization or alignment with the organization's strategic plan. The question is, "how much more will the DoD have to spend in the future to get it right?"

The second policy option of incorporating an existing policy from another DoD medical facility has the potential to benefit WBAMC based on trial and error. Another DoD medical facility, specifically DDEAMC, has practiced this policy and has been successful in efficiently managing space. This policy allows for intervention from several leadership levels to ensure the proposed project will be beneficial for the organization in terms of productivity, cost effectiveness, and strategically aligned. Furthermore, the policy allows for a person in charge of space allocation, the space manager, to ensure MEDCOM regulations and standards are followed and adhere to with space allocation. The only negative aspect about this policy is the two or three months it takes for the approval process of any space project.

The third policy option of incorporating a MEDCOM standardized plan for space utilization management gives a board direction in space management. This policy bases space allocation on environmental input and the conduct of a readiness review. In order for a smaller organization to

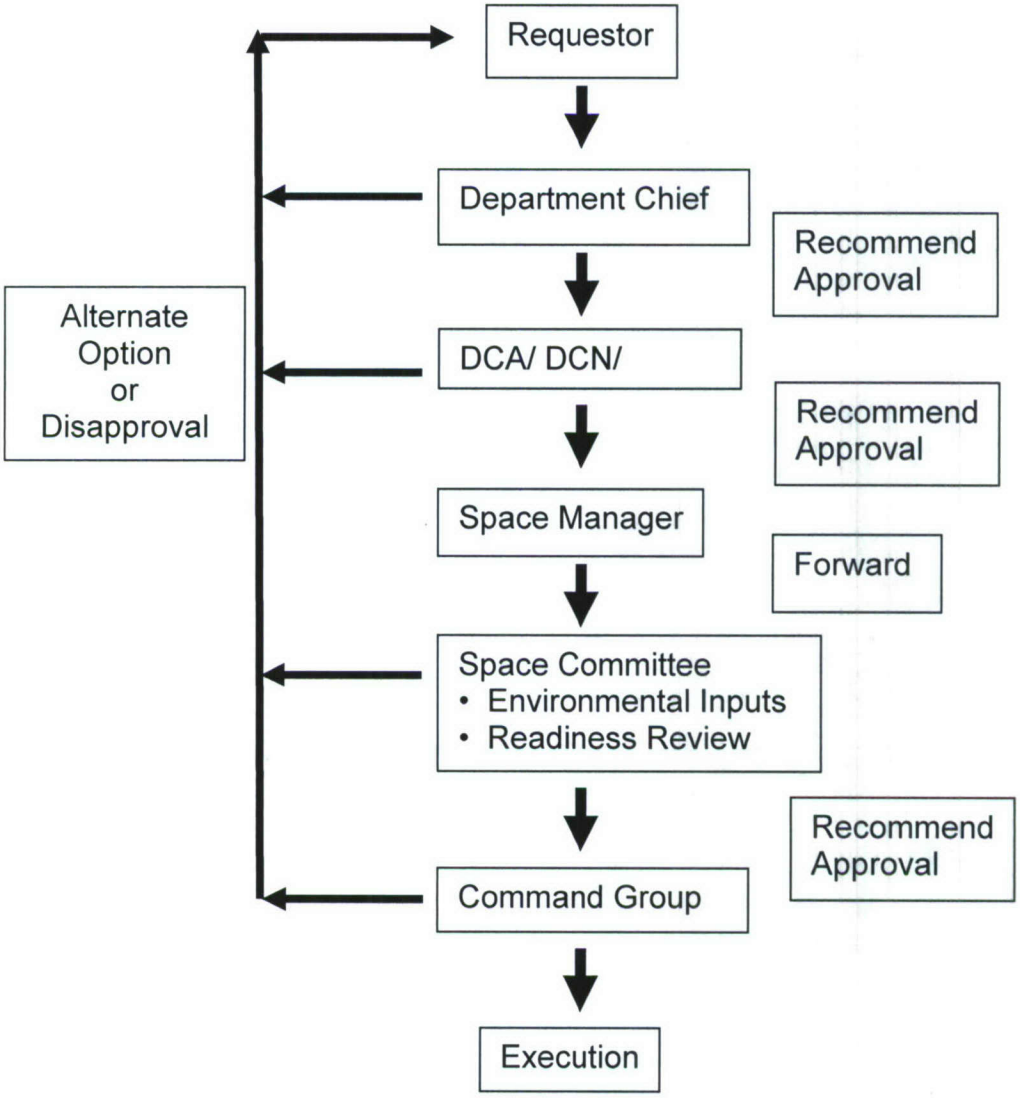
use this effectively, several implied tasks will need to be included which allows for human error. Reviewing this policy with the Donabedian model, the MEDCOM policy acts like the structure and the implied tasks the organization develops act like the process. Although, there is a legitimate structure, faults in the process can lead to an undesirable outcome.

Recommendation

Based on the previous section, the best alternative for WBAMC's policy on space utilization is to incorporate an existing policy from another DoD medical facility with a MEDCOM standardized plan for space utilization management (see Figure 11). Incorporating this best alternative policy will allow WBAMC to employ a policy on space utilization management that has worked for another DoD medical facility. In addition, this alternate policy will allow WBAMC to adhere to standard in accordance to MEDCOM. With this policy, there will be intervention points in the space approval process by leadership/ decision makers and a readiness review conducted by the space committee to ensure there is consideration in the improvement of patient care, reduction of the cost of operations, reduction of personnel requirements, improvement of productivity, alignment of the facility's Master Plan, and future requirements of future

functional changes. Furthermore, with the intervention points in the policy, this allows for the user to manage space allocation that is driven by BRAC, renovations or future demands.

Figure 11. Best alternative policy.



Source: E. May, 2006 and Health Facility Planning Agency, 2002.

There are several variables that need to be addressed that a policy cannot accurately reflect - organizational culture and leadership. In order for this policy to be effective, the entire organization needs to embrace the new policy. If the employees of the organization do not embrace this new policy, the employees will not follow it. Employees need to understand the dynamic environment WBAMC is facing and why it is important to adhere to this policy for the long run. One way to accomplish this is through leadership. As stated previously, the Army defines leadership as "influencing people - by purpose, direction, and motivation - while operating to accomplish the mission and improving the organization" (Army Leadership, 1999). With the dynamic environment and the need to change the organization's culture, this becomes a challenge for all leaders at WBAMC to face. Department leaders need to ensure all resources, to include space, are utilized to its maximum potential and effective and efficient for performance. The designated space manager needs to ensure space committee meetings are well organized with an agenda and prepared to ensure the right facts are presented to the committee for a decision on recommending approval or disapproval to the command group. Furthermore, the space manager needs to demonstrate leadership abilities by

facilitating the space committee meeting in order to minimize disruptions and allow for a well run space approval process for the organization. The command group needs to ensure the entire organization is aware of the dynamic environment and understand why it is important to embrace this policy on space utilization. In order for this new policy on space utilization to work, the entire organization needs to be a team.

Conclusion

Further areas of research can be conducted for space utilization management. One area of research in space utilization management is expediting the space approval process. The new policy can be effective, but the average length period of the approval process is two to three months. Time is something that cannot be controlled and with a dynamic environment, can be very sacred.

Another area of research in space utilization management is conducting a business case analysis (BCA) on the requirement for a space manager. With the announcement of BRAC 2005, a space manager at WBAMC can be beneficial to the organization for it allows a person to be in charge of tackling the enormous challenge of allocating space in preparation of the beneficiary population almost doubling versus another staff officer acquiring the responsibility

as an additional duty. Furthermore, it mirrors operations at Fort Bliss. In preparation of BRAC, Fort Bliss established a base transformation team consisting of about eight personnel (G. McChesney, personal communication, January 2, 2007).

Space is highly valuable and unique to an organization (Griffith & White, 2002, p. 642). WBAMC faces a dynamic environment in the near future that requires a significant change to the organization. The current practice for space utilization management allows for very little intervention to ensure a space project will improve patient care, reduce the cost of operations, reduce personnel requirements, improve productivity, and align itself with the organization's mission, vision, and strategic plan. Implementing a policy that has been used by other DoD medical facilities and adheres to MEDCOM standards will not only credit standardization, but will also allow local application. The recommended policy which allows for adherence to the standard and functionality to its specific mission and environment will benefit WBAMC by ensuring the structure and process are present for a favorable outcome. This is not only a favorable outcome to the staff, but a favorable outcome to the beneficiary population. Winston

Churchill once said, "Healthy citizens are the greatest asset any country can have" (Quotes, 2007).

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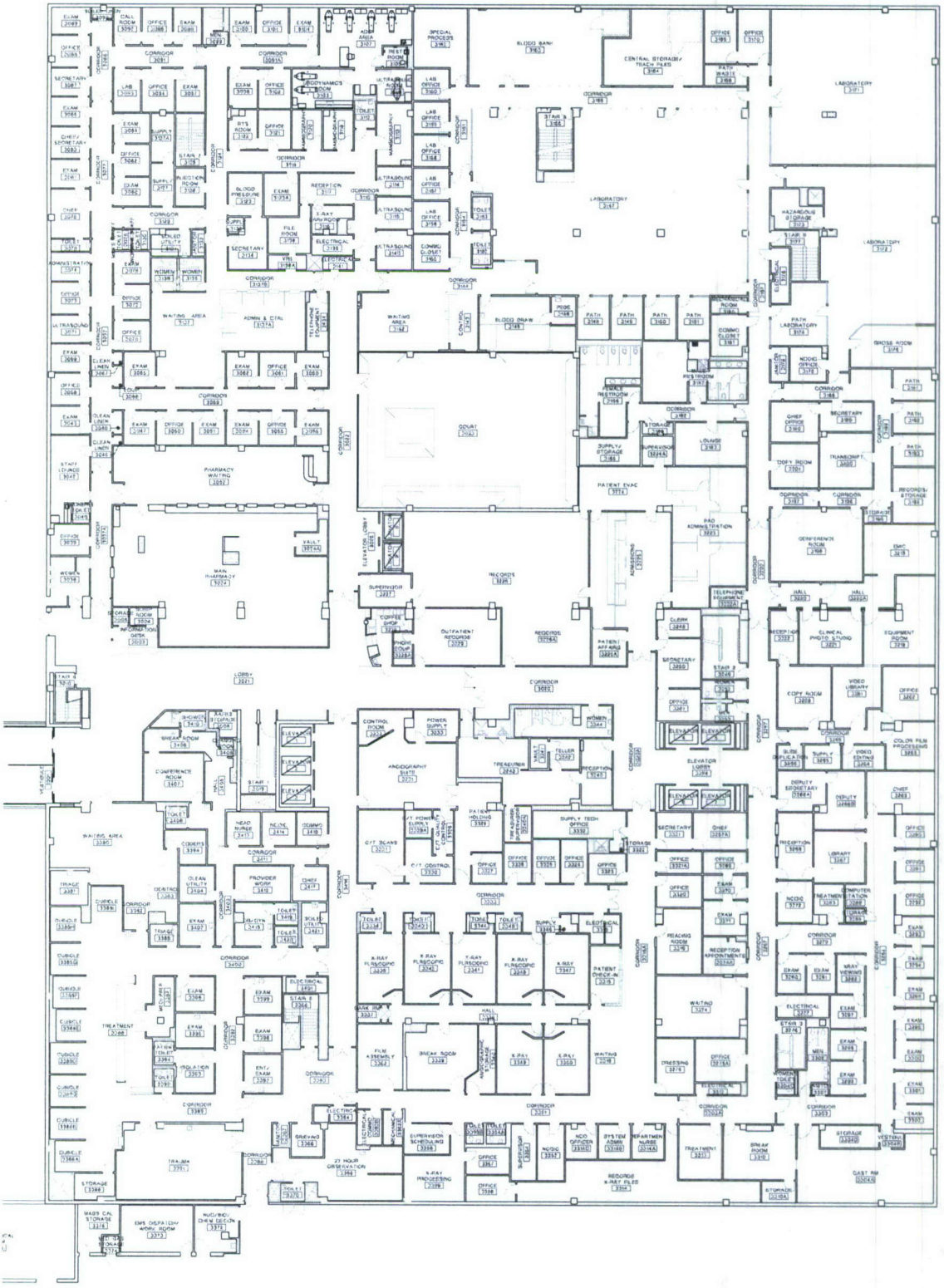
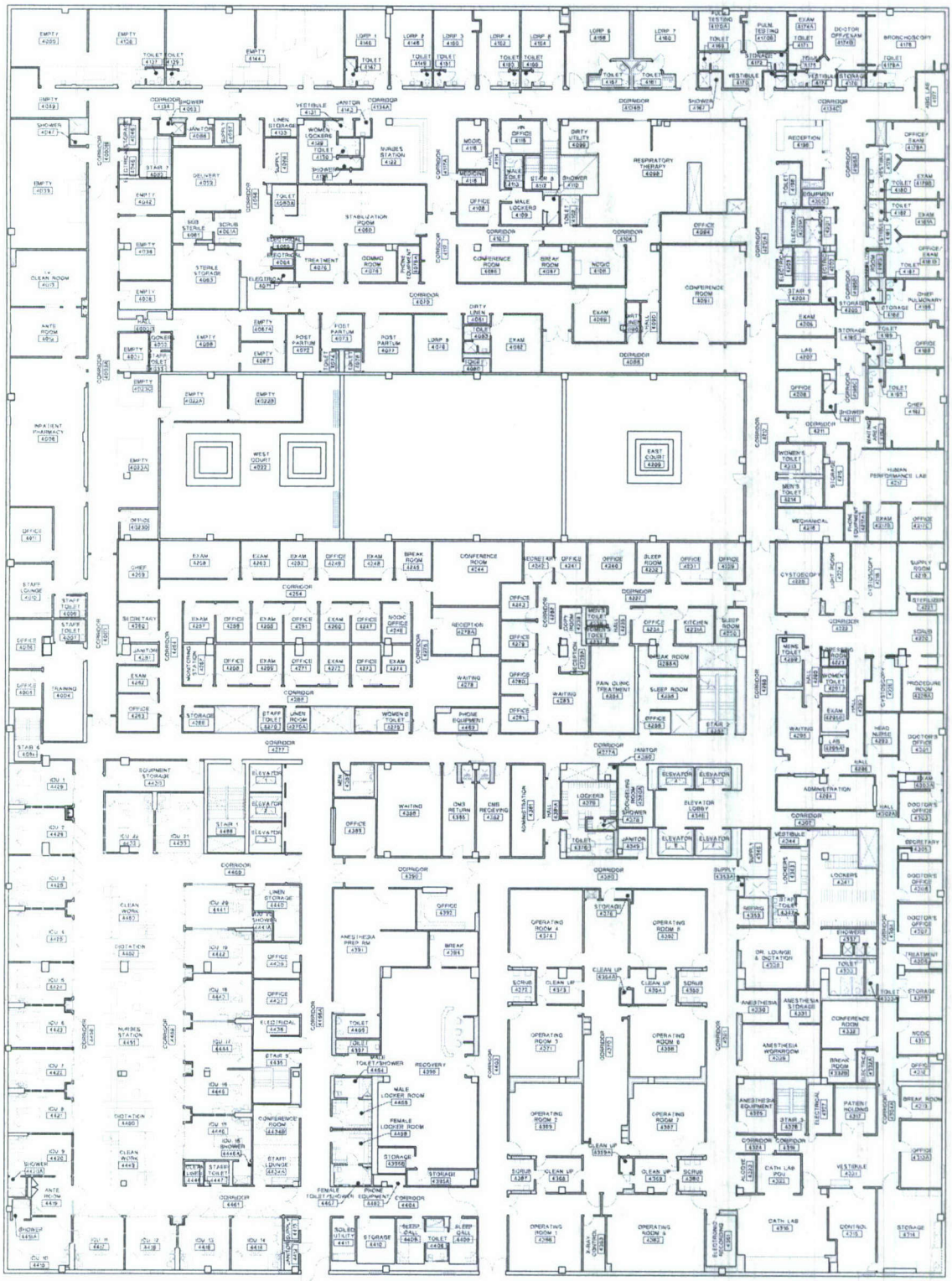
Appendix A

Floor Plans of WBAMC (3rd Floor)



Appendix B

Floor Plans of WBAMC (4th Floor)



Appendix C

The following is the position description of a facilities utilization specialist taken from the Civilian Personnel On-line:

PD#: DZ138928 **Replaces PD#:**
Sequence#: VARIES

FACILITIES UTILIZATION SPECIALIST
GS-1101-11

Servicing CPAC: FORT GORDON, GA

Agency: VARIES
MACOM: VARIES
Command Code: VARIES

Region: SOUTH CENTRAL

Citation 1: OPM, PCS, SERIES DEF, BUSINESS & INDUSTRY, GS 1101, FEB 69
Citation 2: OPM PCS FACILITY MGMT SERIES, GS-1640, JUN 73
Citation 3: OPM ADMIN ANALYSIS GEG, AUG 90
PD Library PD: NO
COREDOC PD: NO

Classified By: COL FRANCO
Classified Date: 01/24/2003

FLSA: EXEMPT
Drug Test Required: VARIES
DCIPS PD: NO
Career Program:
Financial Disclosure Required: NO
Acquisition Position: NO
Functional Code:
Requires Access to Firearms: VARIES
Interdisciplinary: NO
Competitive Area: VARIES
Position Sensitivity: VARIES
Target Grade/FPL: 11
Competitive Level: VARIES
Emergency Essential: VARIES
Career Ladder PD: NO
Bus Code: VARIES
PD Status: VERIFIED

Duties:

Comp-Area: A0
Comp-Level: 00D0

MAJOR DUTIES:

Develops and directs space management and healthcare facilities master planning for Dwight David Eisenhower Army Medical Center (DDEAMC) to include those at Fort Gordon, Fort Buchanan, Fort McPherson, and SOUTHCOM. Duties involve restructuring of medical functional locations in all medical facilities. Manages the space and inventory module of the Defense Logistics Management Support System (DLMSS) that interfaces with the DMLSS Maintenance Management System. Manage facility related site preparation projects for the capitol equipment expense program (CEEP) and the medical care support equipment (MEDCASE) program.

- Serves as the facilities use manager at Dwight David Eisenhower Army Medical Center (DDEAMC) to include consulting for similar services within the Southeast Regional Medical Command (SERMC). Reviews requests for space or revisions to assigned space depending on mission requirements. Validates the need for revisions in space assignments based on command-endorsed standards that include both DOD and conventional commercial facility standards. Evaluates and makes proposals to properly balance existing facility utilization of outpatient and inpatient activities in order to achieve optimum mission objectives within available facilities resources. Analyzes justification provided and discusses functional requirements with organizational representatives to clarify and resolve questions and concerns. Works closely with medical staff to determine optimum locations and size of clinical space to meet evolving health care requirements and areas of emphasis. Physically assesses and researches drawings and applicable codes to determine mission and facility impacts of proposals to include suggesting alternative solutions or locations. Formulates space assignment proposals based on valid space requests, having received input from various sources including the command group. Staffs space proposals through appropriate senior staff to the command group, which also includes resolving nonconcurrences (from the senior staff) and revising the proposal as necessary. Discusses proposed space actions with the Deputy Commander of Administration (DCA), Deputy Commander for Clinical Services (DCCS), Deputy Commander for Nursing (DCN), Executive Officer (XO), and Commanding General. Obtains command group approval/disapproval, notifies affected activities of decision(s), implements space reassignment decisions and resolves associated problems. Files and maintains documentation pertinent to completed space allocation actions. Convenes and chairs meetings with activities involved in space management actions often receiving upper command-level guidance and directions that require conveying direction to branch and division chiefs. 50%

Serves as the DDEAMC healthcare facilities master planner. Provides regional emergency and mobilization facility planning when mission required. Determines requirements for new construction projects from

several sources to include Headquarters Department of the Army (HQDA), Health Facilities Planning Agency (HFPA), local installation commanders and senior medical staff. Conducts annual facility assessment surveys to support HQDA's Installation Status Report program. Meets with designated future occupants to determine specific space and equipment requirements and provides the information to the local installation-planning agency for programming approvals. Reviews and makes changes to draft proposals, meeting with appropriate staff members as needed. Coordinates new construction proposals with all appropriate senior staff members and when necessary U.S. Army Medical Command (MEDCOM) and Department of Defense Health Affairs staff members. Provides changes and comments to the local installation-planning agency for preparation of a final proposal. Obtains signatures of local approving authorities and forwards the documents to MEDCOM. Prepares documentation for inclusion in the Future Years Defense Program (FYDP) and Medical Military Construction Program (MMILCON) submissions. 10%

Manages the medical equipment site preparation program for required facility modifications and engineering support. Site preparation program requires reviewing manufacturer's equipment literature and evaluating adequacy of proposed locations. Determines adequacy of existing utilities and environment as well as complying with mandated code requirements (e.g. Life Safety Code, National Electric Code, National Fire Protection Association (NFPA) Standards for Health Care Facilities (NFPA 99) and other NFPA code standards). Alternative equipment sites will be evaluated and considered when excessive site preparation cost are encountered and not supported by a reasonable return on investment analysis. Once site preparation requirements are determined and cost estimated, initiates and forwards a request for funding approval. 10%

Implements and manages all aspects of the space and asset management modules of DMLSS program for the DDEAMC, including all outlying facilities. Generates reports and presentations depicting space utilization to include square footage of individual rooms and square footage occupied by individual departments. Data will include information required by Environmental Services, frequency and type of cleaning requirements. 5%

Performs as construction project manager for renovation of existing and construction of new facilities. Projects range in scope from several thousand to several million dollars. Includes preparing programming and design documents, contract specifications, and statements of work. Reviews plans for technical adequacy and to ensure the construction process and the outcomes comply with all statutory and regulatory requirements for health care facilities. Plans and coordinates the activities of users, craftsmen, vendors, and customers. 20%

Prepares CADD drawings to reflect new construction and alterations. Updates drawings to maintain as-built conditions. 5%

Performs other duties as assigned.

1. Knowledge Required by the Position:

- Knowledge of healthcare operations obtained through either academic study or experience in healthcare management or administration.

- Knowledge of applicable DOD, MEDCOM, and DDEAMC facility management program policies, regulations, precedents and procedures, combined with knowledge of overall medical center operations, missions, program goals, and objectives, work processes and administrative operations.

- Knowledge of facility planning criteria available both within the DOD and an assortment of industry accepted healthcare facility planning and design equivalent standards such as the American Institute of Architects Guidelines for Design and Construction of Hospital and Health Care Facilities.

- Knowledge of applicable codes and standards relative to comprehensive facility use that address life safety (i.e., NFPA 101, NFPA 80, NFPA 72 & 13, etc). Standards for Health Care Facilities (NFPA 99) operational safety, (i.e. OSHA standards), local facility standards, etc.

- Knowledge of Joint Commission on Accreditation of Health Care Organizations (JCAHO) standards that addresses patient and staff functional prerequisites and space use requirements.

- Knowledge of related facility support systems that drive unique space requirements such as medical system networks, (Composite Health Care System, Clinical Information System, Medical Diagnostic Imaging Support System etc,) telephone, way-finding signage, room status or nurse call systems, medical gas and emergency power systems, installed medical equipment, and security systems.

- Skilled in the use of AUTOCADD software for creating design drawings and illustrating furniture layouts and space utilization.

- Proficient in reading and interpreting engineering drawing/blueprints and practical knowledge of construction practices.

- Analytical ability and knowledge of evaluative methods and techniques for assessing current and future facilities and space use requirements.

- Ability to make oral and written reports and presentations to relate findings, identify problems clearly, concisely and effectively.

- Ability to read and understand a wide array of facility standards and U.S. Army correspondence and regulations.

2. Supervisory Controls:

Works under the general supervision of the Chief, Facilities Management Section, who makes general assignments, establishes

overall priorities and provides general instructions as to the scope of assignments. Within a matrix management organization will often provide recommendations directly to and obtain guidance from the Command Group. Independently plans, organizes, coordinates and carries out assignments. Exercises judgment in selecting, analyzing and applying regulations and guidelines seeking guidance only for unusual issues. Advises supervisor of significant deviations and issues encountered and recommend corrective action. Performance is evaluated in terms of overall effectiveness in assessing facility management issues and meeting program objectives, judgment exercised compliance with instructions, policies, regulations and soundness of conclusions and recommendations.

3. Guidelines:

Guidelines consist of a wide variety of established local and higher headquarters references, policies, technical bulletins, procedures, manuals, regulations and precedents. General guidelines address basic areas of facilities planning from space use management to construction planning and from broad mission objectives to detailed equipment planning and associated support systems. Exercises judgment in interpreting and applying the intent of guidelines to situations that are not specifically addressed in the guidelines.

4. Complexity:

Tasking include working with clerical, technical, managerial, and professional staff members at all organizational levels throughout the medical center and higher headquarters. Prepares and uses documents associated with public law/statutes, a wide range of government regulations, guidelines, documents, and healthcare planning applicable to the health care industry. Recommendations made may establish local precedent or result in changes to existing policies, directives, and procedures.

5. Scope and Effect:

The purpose of the work is to analyze and resolve facility use, planning, and equipment installation issues that will improve overall productivity, effectiveness and efficiency throughout the Medical Center and at other Army installations within the SERMC as required.

6. Personal Contacts:

Contacts are with other engineering and DDEAMC staff at all levels to include medical department chiefs and the Command Group. Other contacts are with: resource and program management staff at other medical centers and senior members of higher headquarters such as the MEDCOM, DENTCOM, VETCOM, HFPA, Defense Medical Facilities Office, and DOD Health Affairs. Other contacts are with vendor representatives; representatives of other military services, the Veterans Administration and community based agencies, organizations, and groups.

7. Purpose of Contacts:

Contacts are to obtain, provide, exchange, and clarify information; or receive advice and guidance on facilities management matters; coordinate ongoing facility studies; resolve issues and make recommendation; justify study recommendation; influence managers and staff to accept findings and recommendations and to formulate amiable agreements. The work requires tactful approach to sensitive issues and persuasion in cases of resistance to change or adversarial impacts. This requires working with field grade medical staff in specialty medical scenarios that require diplomatic and skillful solutions.

8. Physical Demands:

The work is primarily sedentary but occasionally extensive walking and prolonged standing will be required. The work may on occasion require lifting light items such as books/reports and portable equipment, as well as climbing a ladder to inspect space above the dropped ceiling.

9. Work Environment:

Works in an office environment that is adequately lighted, heated and ventilated. Occasionally will be required to conduct outdoor site evaluations.

Evaluation:

PD#138928

1. References:

a. OPM PCS for General Business and Industry Series, GS-1101, series definition, 9/91.
b. OPM PCS for Facilities Management Specialist, GS-1640 Series.
c. OPM PCS Administrative Analysis Grade Evaluation Guide, TS-98.

2. Series/Title Determination: The work of this position involves analysis of space requirements for the hospital building and associated structures. Such work requires the incumbent to understand the unique characteristics of large and complex hospital equipment and operating systems. Although the 1640 series includes this kind of work, it does not perform the full intent of such work. The subject position is primarily involved in space management and not the provisions of building services, operations, maintenance, grounds or other facilities. Since the position is involved with facility management in the area of space utilization and facility master planning, the GS-1101 series is appropriate. It includes all classes of positions the duties of which are to administer, supervise or perform work properly classified in this group for which no other series has been provided. Appropriate title and series are Facilities Utilization Specialist, GS-1101.

3. Grade Determination: The scope and level of analysis required for the duties of this position are analogous to the description in the

standard for GS-11. Factor descriptions were written for the job and are evaluated, as follows, using the standard cited at ref 1b:

Factor 1 Knowledge Required by the Position Level 1-7 (1250 points)

Incumbent is responsible for conducting analysis of complex space issues that must take into account the unique and challenging nature of a major medical center.

Factor 2 Supervisory Controls Level 2-4 (450 pts)

Incumbent independently plans, organizes, and executes work assignments.

Factor 3 Guidelines Level 3-3 (275 pts)

Incumbent uses judgment in selecting and applying a large body of regulations, guidelines, and precedent in performing space analysis and utilization duties.

Factor 4 Complexity Level 4-4 (225 pts)

Factor 5 Scope and Effect Level 5-4 (225 pts)

The primary purpose of the work is to analyze and assess space utilization and to make recommendations that will enhance the operations of the hospital. The work directly impacts the efficiency and effectiveness of program operations.

Factors 6 and 7 Pers Contacts/Purpose of Contacts Level 3c (180 pts)

Factor 8 Physical Demands Level 8-1 (5 pts)

Factor 9 Work Environment Level 9-1 (5 pts)

TOTAL POINTS 2615
GRADE CONVERSION GS-11

Source: Civilian Personnel On-line, 2007.

Appendix D

Definition of Terms & Acronyms

AAR - After Action Review

AD - Active Duty

ADA - Air Defense Artillery - a branch in the United States Army that specializes in anti-aircraft weapons. These groups are composed of mainly air defense systems such as the PATRIOT Missile System, the M6 Bradley Linebacker and the Avenger Air Defense system.

ADFM - Active Duty Family Member

AFB - Air Force Base

AMEDD - Army Medical Department

BCA - Business Case Analysis

BCT - Brigade Combat Team

BRAC - Base Realignment and Closure

CEO - Chief Executive Officer

CMS - Command Management System

CSM - Command Sergeant Major

DCA - Deputy Commander of Administration

DCCS - Deputy Commander of Clinical Services

DCN - Deputy Commander of Nursing

DDEAMC - Dwight D. Eisenhower Army Medical Center

DLMSS - Defense Logistics Management Support System

DoD - Department of Defense

FTE - Full-time Equivalent - a way to measure a worker's productivity and/or involvement in a project

GPRMC - Great Plains Regional Medical Command - the key operational element for Army medicine in the delivery of health care in its geographic area encompassing 17 states and 10 Army installations. (GPRMC, 2007)

HFPA - Health Facility Planning Agency

MEDCOM - Medical Command

NADD - Non-active Duty Dependents

OTSG - Office of the Surgeon General

PA&E Manpower - The Office of Program Analysis and Evaluation - provides independent analytic advice to the Secretary of Defense on all aspects of the Defense program, including alternative weapon systems and force structures, the development and evaluation of defense program alternatives, and the cost-effectiveness of defense systems. The office also conducts analyses and offers advice in a number of related areas, such as military medical care, school systems for military dependents, information technology, and defense economics. (PA&E, 2007)

RVU - Relative Value Unit - a metric designed to measure physicians' outpatient workload

RWP - Relative Weighted Product - a metric designed to measure physician's inpatient workload

SERMC - Southeast Regional Medical Command

SBCT - Stryker Brigade Combat Team

SOUTHCOM - Southern Command

VA - Veterans Affairs

WBAMC - William Beaumont Army Medical Center

WSMR - White Sands Missile Range