KPMG

Business Case Study
Los Alamos National Laboratory
Technical Area-3 Revitalization

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DISCLAIMER

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Introduction

Over the last few years, the mission of the Los Alamos National Laboratory (LANL) has been changing because of strategic needs of the United States government. LANL has a long-term goal "To provide a national laboratory in which science serves society to enhance global security, preserve the earth, and improve the quality of life through innovations in science and technology, and through the management of business and operations at a world-class level." LANL has identified a critical need for revitalization of the Technical Area 3 (TA-3) because of an aging infrastructure including both facilities and utilities. The aging of these facilities is affecting the Laboratories ability to attract and retain personnel, and fulfill its overall mission.

TA-3 is the "core" area for LANL and provides key administrative, laboratory, warehousing, and support facilities necessary for the successful operations at LANL. It consists of nearly 3 million square feet of building space that is primarily office and light laboratory space. The development of this area began after the end of World War II, between the years of 1951 and 1960. This construction included nearly 2 million square feet of building space and much of the utility infrastructure (electrical, water, sewer, gas, and roadways). The remaining 1 million square feet were added between 1970 and the present; the majority of the building space is not considered as permanent facilities. That space was originally intended as temporary housing, but has been used well beyond its original design. The current population at TA-3 is approximately 7000 or nearly 75 percent of LANL total staff.

Conclusion

LANL is a key element of the US National Laboratory system and a strategic element in the future defense of the American people, yet it is an aging facility with an infrastructure that has been rated at over 50% is poor to inadequate. The revitalization of TA-3 will provide an opportunity for LANL to continue its mission and move forward with creating a premiere laboratory for the US National Laboratory system.

Using the traditional process of federal acquisition estimated construction costs are $235 per square foot for office space and $125 per square foot for warehouse building. Commercial costs are $70 - $80 per square foot for office space and $30 - $40 per square foot for warehouse construction. Federal acquisition costs are approximately 300% of commercial costs, this is primarily from the internal oversight and management fees associated with the federal system. There are other savings associated with new

construction planning. Efficiency gains from locating staff in close proximity to their internal customers and management can gain a 5% - 10% savings in the overall cost of staff time. Energy efficiency savings can be realized by utilizing new construction techniques, savings can range from 30% - 40% over those used in the 1960's and 1970's. In addition, the EPA has a program named *Energy Star* that, according to the EPA, can provide a savings of 20% to 50% by utilizing energy efficient planning in the use of lighting, heating, and efficient electrical equipment.

Using alternative funding and construction arrangements can provide tremendous savings over traditional Federal construction programs. The use of Third Party Financing can provide an effective means of providing capital for this project and allow LANL to begin construction much faster than using other traditional Federal construction methods. These types of funding arrangements have been used by the Department of Defense and are proven effective in allowing government agencies flexible cost effective means to infrastructure renovation.

It is the conclusion of this study that the Laboratory will gain dramatically from revitalization of TA-3 by providing a premiere facility for the US National Laboratory system, the Laboratory will be able to recruit and retain the best available expertise to help fulfill its mission, and plan for the future mission of LANL. The costs of TA-3 revitalization have been estimated at $200 million, however utilizing alternative construction and financing, commercial construction can dramatically reduce these costs and Third Party financing can reduce the overall estimated costs by nearly 50%. In addition, the costs of construction can be captured through savings in staff efficiency, energy efficiency, and reduced maintenance costs of the now aging infrastructure.

Master Plan

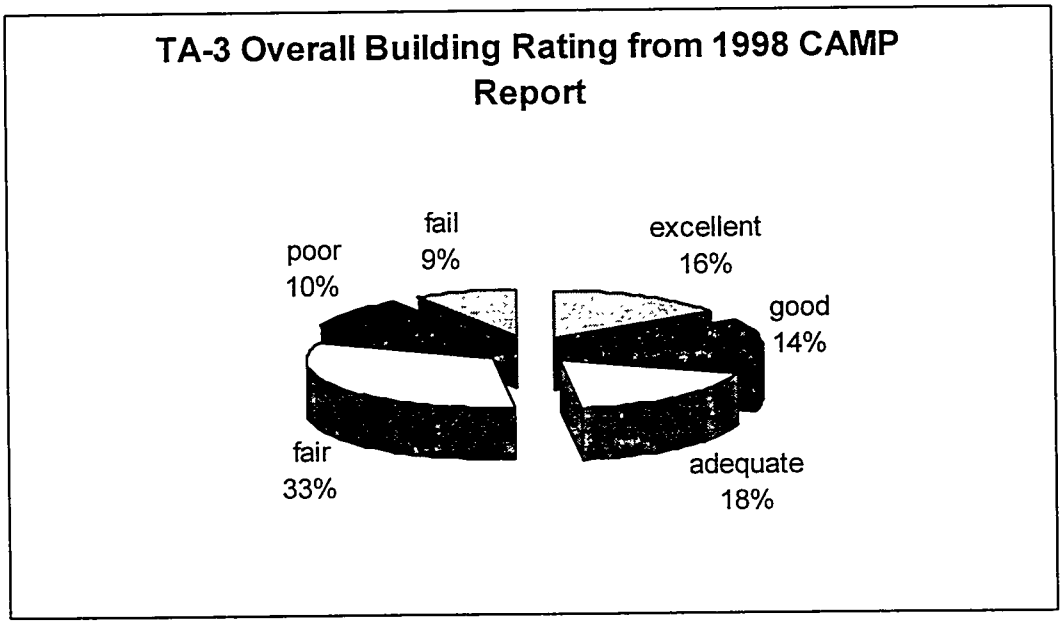
To ensure that LANL continues as a world class laboratory, a Master Plan was advanced as a mechanism for developing a revitalization of TA-3. The Master Plan strategy is to renovate or replace those facilities and infrastructure within LANL critical to its overall mission and eliminate those that are obsolete. In developing that plan, several issues were researched including land use, transportation, security and safe guards, utilities and other infrastructure, environmental needs, and the need for facility space. The goal of the Master Plan for TA-3 is to support the overall mission of LANL including a focus on scientific excellence, a world class interdisciplinary work force, and provide national laboratory leadership for the people of the United States.

Implementation of that plan will require a strategy that addresses several key elements that include:

1. Providing a quality workplace for the employees of LANL, allowing LANL to recruit and retain the best talent to support its overall mission goals.
2. Development of a work environment that will increase worker creativity, effectiveness, and efficiency while minimizing environmental impacts.
3. Ensure public and employee safety, security, and stimulate productive interactions between each.
4. Warrant actions of revitalizing or replacing facilities that are obsolete or sub-standard to ensure new facilities will provide adequate services into the future.
5. Explore the potential for partnerships between LANL and private enterprise.
6. Meet the LANL need in achieving its mission by addressing long range issues related to potential needs of the future.
7. Improve transportation systems and traffic safety.
8. Ensure that utility and other infrastructure systems meet the long-term needs of LANL.

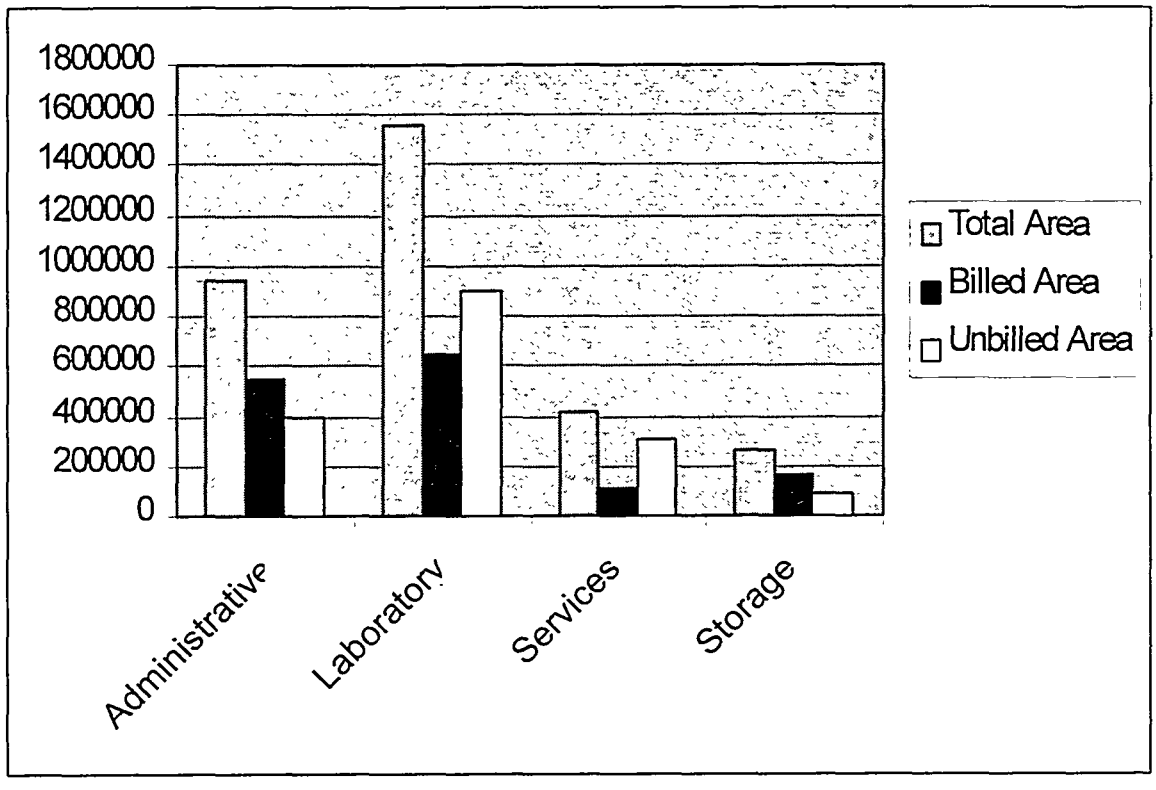
The facilities at LANL were assessed and the overall condition was rated in the FY 98 CAMP Report referred to in the TA-3 Master Plan process information. That analysis suggests that 30 percent of the facilities are good to excellent, 18 percent are adequate, and 52 percent are fair to failing (Figure 1). The condition of these facilities leads to concerns about issues relating to safety, efficiency, costly maintenance, ability of facilities to provide appropriate space for new activities assigned to LANL, and recruitment and retention of the appropriate staff necessary for LANL to meet its mission.

Figure 1.



The four basic facility types, total area, and fees associated with each are depicted in Figure 2.

Figure 2.



Facility	Total Area Sq. Ft.	Area Billed Sq. Ft.	Area Unbilled Sq. Ft.	Rate Sq. Ft.	Replace Value Sq. Ft.
Administration	948,362	548,406	399,956	$22.50	$235.00
Laboratory	1,557,820	652,952	904,868	$22.30	$390.00
Services	413,905	110,901	303,004	$32.00	$288.00
Storage	261,460	169,462	91,988	$53.22	$124.00

TA-3 has approximately 3.2 million square feet of building space that houses the LANL core functions for administration light laboratory efforts, warehousing, and general services (health center, fire stations, etc.). LANL collects approximately $44 million on fees charged to approximately 1.5 million cubic feet of building space. However, approximately 1.7 million square feet of space is unbilled, meaning no fees are collected from this space. It is unclear if that space is unoccupied or occupied and no fee is collected. Fees are not collected for common area space in most administrative buildings, that space includes hallways, restrooms, conference rooms, service areas, and other

support space. It is less clear how fees are assessed for laboratory and warehousing space, the information provided about TA-3 by LANL staff did not include a breakdown of that information. This analysis was not able to determine from the available data if fees collected on billable space were used to maintain and repair those buildings listed as unbilled, it is assumed however this is the case.

Some TA-3 buildings are charged for utilities independently from other fees; however, not all buildings reflect utility charges. From the data provided it is unclear how utility fees are assessed to each building and the programs using that space.

Estimated Revitalization Costs

The efforts to revitalize TA-3 will be significant; estimates have ranged up to nearly $200 million. These estimates are based on federal acquisition costs and estimated costs for federal estimates of replacement of buildings at the Laboratory. The primary activities included in that estimate are:

1. Replacement of the Administrative Building: This building houses approximately 1000 staff; recently it failed to meet safety standards and LANL has been directed by DOE to replace this structure. Several smaller buildings or one equal to the existing building may be used to replace this facility. The estimated cost for replacement is $60 million.
2. Replacement of the numerous trailers and transportables scattered throughout TA-3: Nearly 900 staff members are located in 115 temporary buildings; replacement is estimated at $60 - $75 million. These structures were placed at LANL from the late 1950's to 1970's. Their original purpose was to serve as temporary housing however, they have been utilized as more permanent structures. These structures have exceeded their life expectancy.
3. Removal or demolition of unusable buildings: This includes the trailers and transportables and some permanent structures. The overall cost of this action is difficult to predict but is estimated at several million dollars.
4. Rebuilding the TA-3 transportation grid: This includes rebuilding some existing roadways and building some new roadways around TA-3. This proposed change will increase safety to those working in the laboratory, ensure increased security, and provide better traffic flow throughout.
5. Upgrading utilities: This will include new sewer, gas, and waster distribution lines. In addition, it will include electrical and communications. Most of the utility infrastructure was built in the 1950's and 1960's; these services need upgrading.

Commercial Construction Costs

This study evaluated the cost of construction through commercial operations and compared those to similar Federal construction projects. The cost estimates used in this

study were averaged from several sources, specifically those that build commercial office and warehouse space analogous to the needs of TA-3. Because of the need to evaluate the potential for seismic activity at TA-3 in building construction, costs estimated were solicited from builders in the intermountain region of the United States, including Salt Lake City, Utah (a high-risk area for seismic activity). This was to ensure the proposed building costs accounted for those construction characteristics needed at the Laboratory. Cost estimates are based on construction of office space utilizing with three floor building construction with the ability to accommodating 800 to 1000 staff.

Two types of facilities were assessed and construction costs compared against commercially available building techniques. The comparison is as follows:

Facility	Commercial Cost	Laboratory Estimated Cost
Administration	$70-$80/sq ft	$235/sq ft
Warehousing	$30-$40/sq ft	$125/sq ft

An example of commercial construction for federal office needs is at the Idaho National Engineering and Environmental Laboratory (INEEL) in Idaho Falls, Idaho. This facility leased a new office building that was built within the last five years. That facility houses approximately 1140 personnel in 238,000 sq. ft. The office area totals 182,000 sq. ft. with 56,000 sq. ft of common area. The office space includes enclosed offices and cubical space; the common area includes hallways, restrooms, conference rooms, cafeteria, service areas, and other essential space that supports the staff in that building. Overall, this building provides an average of 210 sq. ft. per person. The cost of construction for this building was less than $70/sq ft and the lease rate is between $10 and $11 per sq. ft. annually. The lease is a ten-year triple net term, which means the tenant also pays utilities and applicable taxes. This facility is on private land and DOE does not plan to own the facility. However, this building meets all the needs of INEEL staff at a cost significantly less than estimated Federal building rates. The developer indicated it would capture its capital investment in building construction over the ten-year lease while paying the cost of operation and maintenance. Maintenance costs are estimated at $1 - $1.5 per sq. ft.

Replacement of LANL Administration Building is estimated at $60 million using the traditional method of Federal building acquisition. Comparing that estimate with commercial construction and specifically the administration building at the INEEL, LANL could realize a savings of nearly $40 million on construction costs. Financing fees would be in addition to construction costs and could add another $5million to $8 million resulting in an overall savings of $30 million to $35 million.

The developers contacted for this report supplied other commercial construction rates for services that would be associated with revitalization construction.

Surface Construction

Curb and Gutter	$8 per linear ft.
Sidewalks	$3 per sq. ft.
Asphalt Paving	$1.5 per sq. ft.

Underground Utility Construction

Sewer Lines	$15 per linear foot (6" pipe 6'-10' deep)
Water Lines	$20 per linear foot (2"- 4" pipe 4' deep)
Gas Lines	$11 per linear foot (1" pipe 4' deep)
Electrical	$30 per linear foot (4 conduit duct bank)
Demolition Costs	$3.5 per sq. ft (price increases if hazardous materials are present)

Savings from the Use of Energy Efficiency Initiatives

In addition to construction costs, energy efficiency savings can be realized through new construction techniques. These techniques offer overall energy efficiency savings potential of 30-40 percent over those used in the 1950's through the 1970's, the period when most of the facilities at LANL were constructed. This savings is realized by the introduction of newer building techniques, and new materials that allow greater heating and cooling efficiency. In addition, the US Environmental Protection Agency (EPA) has implemented the *Energy Star Standards*, of which DOE is a member, that focuses on lighting, heating/cooling, and other energy uses. Those standards can provide substantial savings in overall energy costs through better construction and operation planning, and use of more efficient equipment. These standards are most effective when incorporated into new construction planning and design. Although these standards cannot predict exact savings for all buildings, EPA information suggests a range of 20-50 percent savings in total energy costs.

Productivity Cost Savings

As in any new venture or reorganization, one of the key elements is optimizing overall staff productivity. At present, LANL has a large number of structures that house less than 20 staff each, and has many staff members housed off-site away from the Laboratory. Many of these staff are tasked or assigned to programs located within LANL and managed by someone not at the staff location. LANL has leased several buildings within the Los Alamos area (including vacant school buildings); these are located away from LANL and away from management and others at LANL. This requires extra means for communication, services, and management time and effort. Relocating staff into closer proximity can have a dramatic effect on the overall efficiency. These savings

could range from 5-10 percent of the overall costs of staffing the Laboratory. Total value is difficult to quantify without detailed information on the current status of LANL staff and a comprehensive plan for TA-3 revitalization. However, if one assumes 2300 staff at an average loaded rate $75 per hour, the time savings could be worth $15 million to $30 million per year over current arrangements.

Funding for TA-3 Revitalization

LANL has explored several options that could generate the capital needed to implement the revitalization of TA-3. Funding for this initiative has been addressed in the following proposals:

1. Internal Laboratory Tax: This tax is proposed at 2 percent of the LANL operating budget and would generate about $24 million per year. It is uncertain if LANL has the authority to levy this tax.
2. Third Party Financing: This concept is new to DOE but has been used by other Federal agencies including the Department of Defense (DOD). This concept could allow DOE to partner with an external group to build the facilities, then lease or finance those buildings back to DOE where it would own the structures at the end of the financial arrangement. This option would allow LANL to begin construction of a replacement for the Administration Building and possibly include other needed buildings within TA-3.
3. Line Item Funding: This is the traditional approach to large Federal projects. This approach requires lengthy planning and development efforts and usually drives the cost well above commercial construction costs.
4. 10 percent Laboratory Utility Tax: LANL has over 500 miles of utilities for distribution of gas, water, sewer, electrical, and other services. To upgrade these aging services, LANL has proposed a 10 percent tax annually that would generate nearly $4.6 million each year.

Other financing options that need further investigation for application to DOE include:

1. A DOE guaranteed loan to a financial institution that provides financing to the developer.
2. A public/private partnership between DOE and a construction management group that specializes in long-term leasing of office and warehousing space.
3. Federal land swaps where land is traded for financing and construction of the TA-3 revitalization needs.

Third Party Financing has been considered by LANL as the preferred option for providing capital for the TA-3 revitalization. This report has provided three examples of Third Party Financing as applied to government agencies. Figure 3 depicts the benefits and risk of each of these examples; however, these may change when the final plan for

implementing the TA-3 revitalization plan is complete. The summary is based on experience gained from Third Party Financing of DOD projects.

Third Party Asset Improvement Financing

This example is described in Figure 4 and models the process between the third party financier, facility developer, and government agency. This model is beneficial because of the limited capital investment by the government, land retention, control of building specifications, and rapid building development. The shortcomings are Federal budget scoring issues and inability of the government to guarantee the long-term lease. This process was used by the Department of the Army to improve Army medical centers in eight states and allowed for energy efficient upgrades at no cost to the taxpayers.

Guaranteed Loan

This example is described in Figure 5. This also describes the interaction between third party financiers, government agencies, developers, and those using the buildings. The benefits of this model include control over the building process and land retention. If the developer defaults, DOE is responsible for the entire loan, which impacts Federal scoring issues. An example of this process is the Farm Service Agency. This agency provides a guaranteed loan program made by agricultural lenders, guaranteed to 95 percent of the total loan value. The only cost to taxpayers is a minimal administrative fee.

Federal Agency Public/Private Partnership

Figure 6 depicts the relationship between Federal agencies and commercial developers. The benefits of this process are no capital investment, land retention, control over building specifications, and rapid building development. The shortcomings are the Federal scoring issues. Examples are the Department of Navy development of military housing. The Navy entered into an agreement with private developers to build housing for its sailors and marines. The Defense Authorization Act allowed the Navy to pursue this agreement and pursue direct or guaranteed loan arrangements; differential lease payments; and conveyance or lease of existing land, housing, and facilities to developers in exchange for housing construction. Financing can be obtained by transferring funds from the housing construction appropriations to the DOE Family Housing Improvement Fund.

A public/private venture was entered into between the Navy and Landmark Development Company to design, build, own, operate, and maintain 400 townhouse. The cost to the Navy was $9.5 million and $23 million contributed by the developer. The 10-year partnership has an optional 5-year extension after which the Navy will share in the proceeds of the sale of these homes.

These examples may not apply directly to the TA-3 revitalization project; each is unique to a specific situation. Third Party Financing for the TA-3 project will require planning

and efforts to identify the specific needs for that program. The result will be yet another unique application of this type of financing. Because DOE does not have the authority to implement the same types of funding strategies used by DOD, it will be necessary to establish a mechanism for DOE to use this type of alternative funding.

Figure 3

Third Party Financing Options

Financing Options	Contracting Parties	Types of Funds	Risk Level
Third Party Asset Improvement	Contractor, and Federal Agency	None – Purchase of Services	Transferred to Contractor
DOE Guarantee	DOE, Financing Parties, and Contractor	Loan	Moderate to High
Federal Energy Bank Act	Bank and Federal Agency	Loan	Moderate

Figure 4

Third Party Asset Improvement Financing Process Model

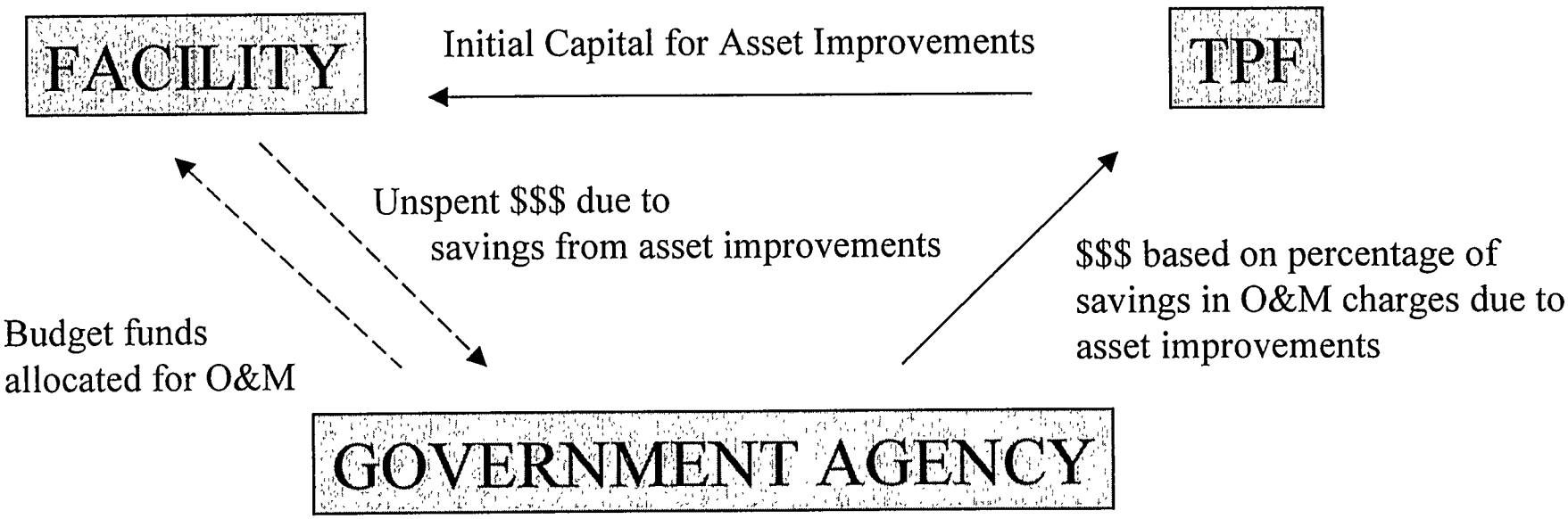


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Figure 5

DOE Guarantee of Loan Process Model

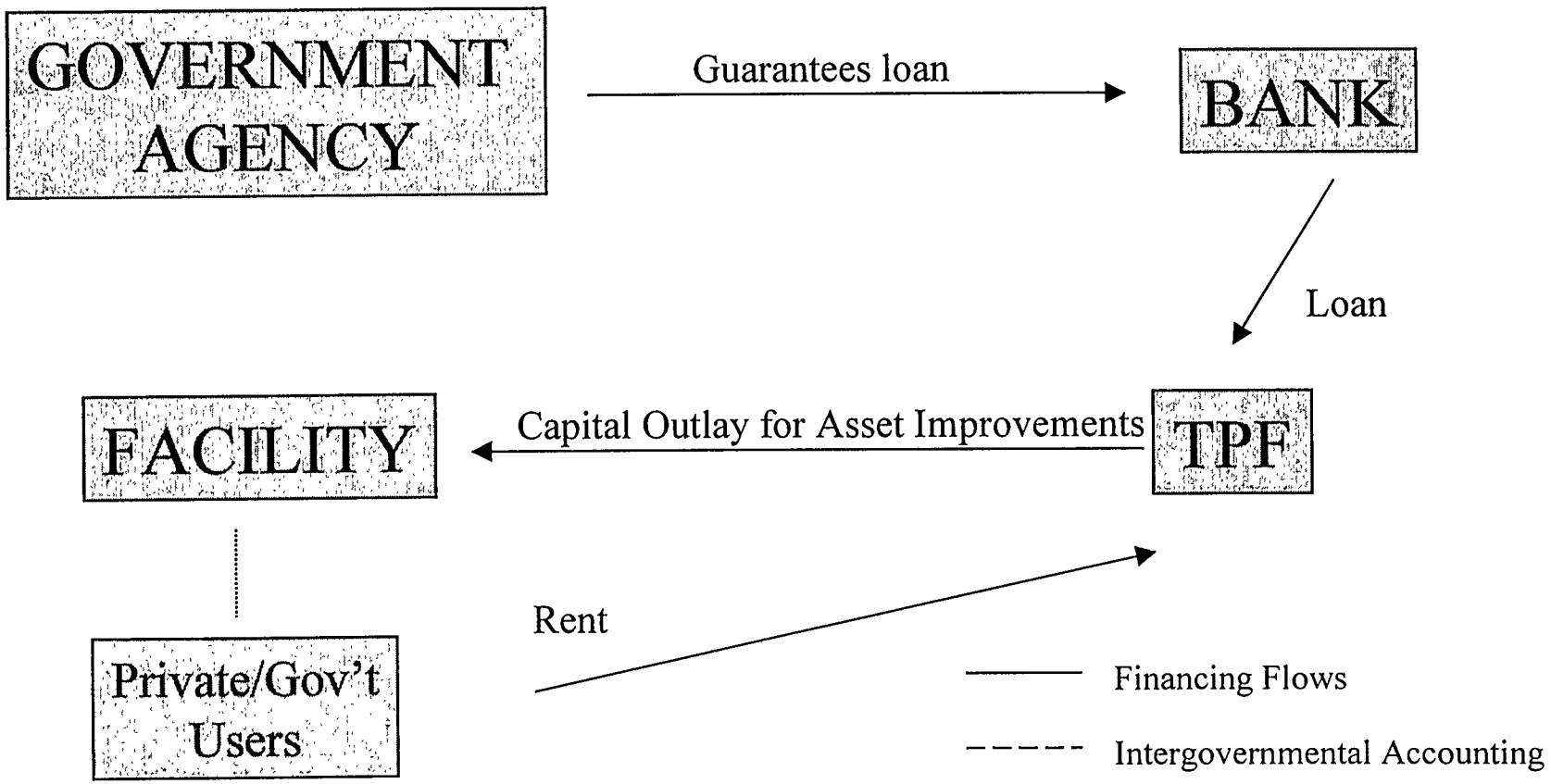

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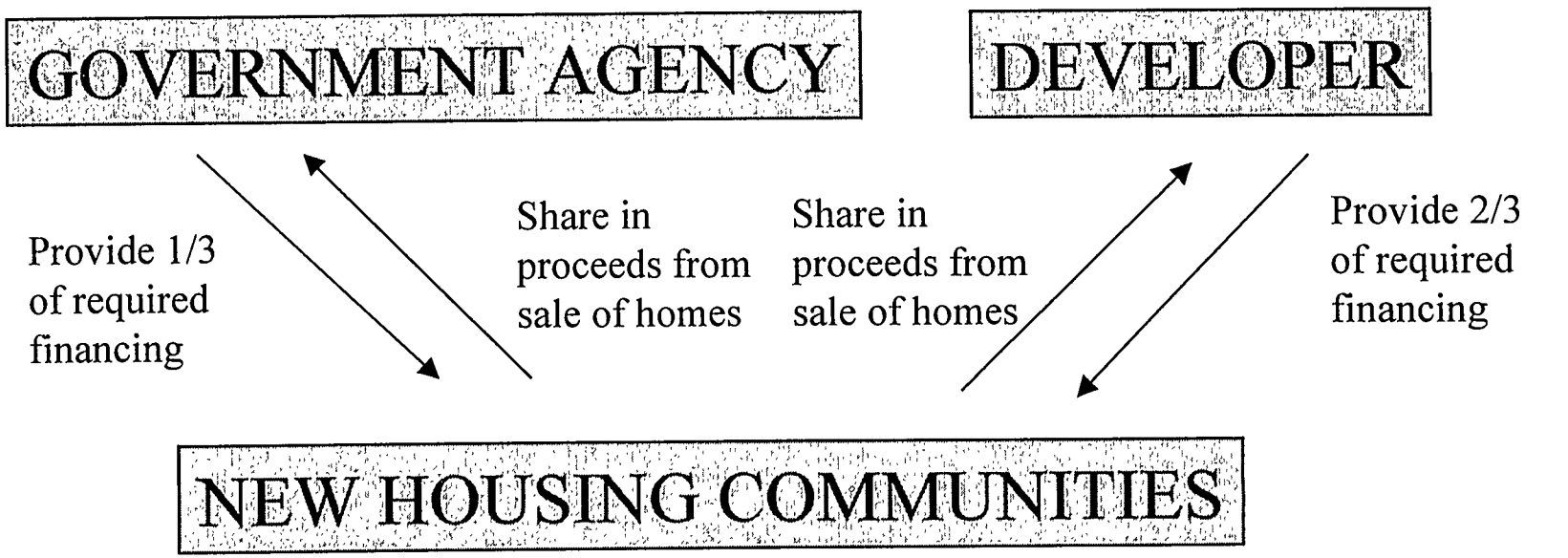
Figure 6

DOD Public/Private Partnership Process Model



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Recommendations

1. Establish a Central Project Coordinator: LANL should consider designating a team leader for the TA-3 revitalization project and a support group to assist the team leader in developing an overall plan for this effort. In addition, a plan should be developed that will focus on the success of this project; without a concise plan the revitalization of TA-3 will not succeed. The team leader must act as a champion for this project by establishing the contacts and alliance necessary to make this project a success. (Milt: Outsource contract)
2. Develop a Dialogue with Other Agencies: The TA-3 team leader should make every effort to identify and create a dialogue with other agencies that may have an interest in this project. Several agencies will have a role in the success of this effort; these include the Office of Management and Budget, DOE, Congressional interests, and state and local governments. It will be necessary to work closely with each of these agencies to ensure TA-3 revitalization is successful.
3. Commercial Construction Costs Versus Federal Sponsored Projects: Costs associated with construction of both office space and warehousing contrast dramatically between commercial and Federal estimates. Commercial costs for office space average $70-$80 per square foot while Federal costs are estimated at $200-$250 per square foot. Commercial costs are much less because the process is not subject to the tremendous amounts of overhead often associated with Federal projects. The quality of products and construction techniques are typically of high standard and provide the safety and security standards required for the TA-3 needs. INEEL utilizes commercially constructed buildings to house its primary administrative and professional staff. It is recommended that LANL explore the option of using commercial construction for TA-3 revitalization.
4. Third Party Funding: This option provides benefits to LANL in both efficiency of project implementation and timeliness of project completion. This option would allow LANL to begin construction of the revitalization of TA-3 using a commercial contractor. This would also allow LANL to negotiate favorable financing conditions to ensure the project will begin quickly. Because of the need to move this project ahead quickly and the potential for large savings in overall construction costs, the Third Party Financing option is most attractive for LANL.
5. Efficiency Savings: The efficiency savings associated with this project are two basic areas. The first is energy efficiency savings associated with modern construction techniques and with planned energy applications in accordance with guidelines proposed by the EPA. Second, LANL will realize substantial savings by locating staff in areas that will enhance their overall productivity. Currently, many of LANL personnel are located in area remote to the rest of the staff working on the same issues.

6. Space Inventory: This effort should evaluate the space available at LANL. It is unclear how LANL determines which space is billed (or charged a fee for use) and which is not. Data supplied by LANL suggests that a large portion of available space at TA-3 is used or available for use and no fees are collected for maintenance.
7. Fee Assessment at TA-3: The current fee for space use at LANL averages $22.50 per square foot. It is unclear how this fee breaks out into maintenance and other services. LANL should assess this fee to determine what is covered in this cost and also determine if this fee should be applied to the space utilized and unbilled. Those areas include warehousing, laboratory space, and the common areas in administrative buildings.