EXHIBIT 12

SUPPLEMENTAL STATEMENT
REGARDING PROJECT SIZE AND COST

I. PROPOSED PROJECT SIZE

A. Industry Standard for Area Calculation Methodology for Healthcare Facilities

1. Recent Studies on Standardizing Area Analysis Procedures

Two recently published white papers presented the results of studies aimed at standardizing area analysis procedures for healthcare facilities.[1] The studies were driven by the need for industry leaders to reach consensus on benchmarking criteria. The consensus-based research resulted in "a detailed methodology document that defines and illustrates the basic definitions needed for measuring healthcare facilities." The full reports are attached as **Exhibits A** and **B**. Several key decisions concerning standardizing the scope of work typically included in benchmark area analysis are highlighted below.

Benchmark standards do not include in the Hospital BGSF / bed calculations:

- Medical Office Buildings
- Ambulatory Care Centers
- Health Science Centers
- Parking Decks
- Bridge Walkways
- Other detached structures (such as a central utility plant (CUP))

One of the publications, *Preliminary Benchmarking Results: Departmental Gross And Building Gross Data* (**Exhibit A**), notes "[i]n cases where additional areas were included, such as research buildings, central plant, covered parking, professional buildings, or other functions, these areas were also measured and reported separately, so these additional areas did not affect the net-to-gross ratios." *See* Exhibit 56 at 5. In addition, "the greatest variation [among the projects submitted for study] occurs among the mechanical and non-departmental corridors." Most significantly, "rooftop mechanical systems impact the BGSF when compared to penthouse designs." *Id*. at 10.

The other publication, *Area Calculations & Net: Gross Ratios in Hospital Design, Methodology Guide*, released in August 2011 (**Exhibit B**) includes the following descriptions in the "Definitions" section of the report:

Item 3. "Attached medical office buildings (MOB) will not be measured or included in the calculations."

Item 6. "Enclosed roof-top mechanical space (*e.g.*, Penthouses) = BGSF; mechanical areas not enclosed will be calculated as zero area"

Item 18. "Tunnels to power plant or other needed service will be measured if it is tall enough for a walking space and placed below the calculation line under

[1] The white papers were produced by Texas A&M University and the AIA-affiliated Academy of Architecture for Health Foundation, with others. Dimension's prior design and architecture firm, HOK, along with a number of other leading healthcare design firms, participated by providing project experience and technical advice for these studies.

Related Areas Not In Calculations. Buried utility lines or crawling tunnels will not be measured.

Item 19. "A Bridge or walkway to a building not included in the measurement drawings (e.g. for outbuildings to a facility) is not calculated. The exterior wall of the hospital will be treated as if the bridge or walkway does not exist but no additional exterior wall will be added."

Item 45. "Parking space enclosed within the building envelope will be assigned a DGSF and placed below the calculation line under Related Areas Not In Calculations."

Item 46. "Central Utility Plants (CUP) are assigned only a DGSF and listed below the calculation line. Two possible circumstances include:

a. The CUP is a detached piece. The exterior wall for the CUP is not counted in the Exterior Wall calculation. It is included in the CUP DGSF listed below the calculation line.

b. The CUP is attached to or enclosed within the building envelope. An exterior wall will be created at the wall boundary between the CUP and the remainder of the hospital. The CUP is excluded from the Total Floor Area and the DGSF will be included below the calculation line."

2. Treatment of Ambulatory Care Center Space

Many calculated relationships exist between the inpatient bed count and the patient volumes, procedure capacity, and physical size of treatment areas such as the emergency and surgery departments. The inpatient bed counts are also related to the need for the support areas such as pharmacy, lab, materials management, and foodservice. These relationships do not exist for outpatient spaces. Medical office buildings and ambulatory care centers provide care for both patients who are not considered inpatients and who are not housed or treated for longer than a 24-hour period. These buildings and the functions within them are designated separately from traditional inpatient hospitals by patient acuity, procedure type, length of stay, and construction and building code classification. Outpatient facilities, whether a medical office, ambulatory clinic, or specialty treatment area such as a cancer center, should not be included in the benchmark area/inpatient bed analysis.

The proposed uses in the PGRMC Ambulatory Care Center ("ACC") are all outpatient spaces. The Cancer Center on Level 1 is an outpatient function and this type of treatment function is, on many hospital campuses, located in a freestanding building. The outpatient clinic spaces on Level 2 are not for inpatient use, and as explained below, may be considered by the building codes as business, not healthcare, occupancy. Similarly, the administration functions on Level 3 are for business use. Administration areas on many modern healthcare campuses are located in freestanding buildings and not in the main hospital building.

The 2010 Guidelines for the Design and Construction of Healthcare Facilities, the 2012 NFPA 101 Life Safety Code, and the 2012 International Building Code differentiate inpatient hospital space from outpatient/ambulatory space. These differentiations support the benchmarking process of not including outpatient/ambulatory spaces in the definition of inpatient hospital space or in the calculation of benchmark area/inpatient room.

The 2010 Guidelines include several definitions for ambulatory care spaces that are applicable to the proposed project. The term "ambulatory care" is defined in the Glossary as "a

defined health care encounter of less than 24 hours in duration that requires direct professional health care support within a specific facility"

Section 3.1-1 defines outpatient facilities as follows:

> *The outpatient facilities described in Part 3 of the Guidelines are used primarily by patients who are able to travel or be transported to the facility for treatment, including those confined to wheelchairs. These facilities may be an outpatient unit in a hospital, a freestanding facility, or an outpatient facility in a multiple use building containing an ambulatory health care facility as described in the NFPA 101: Life Safety Code occupancy chapters.*

Section 3.1-7.1.1.1 further clarifies that "*Occasional facility use by patients on stretchers shall not be used as a basis for more restrictive institutional occupancy classifications."*

Part 3, Section 3.1-1.1.1 and 1.1.2, includes a number of delineated facility descriptions:

- *Primary care outpatient facilities*
- *Small primary care outpatient facilities*
- *Freestanding outpatient diagnostic and treatment facilities*
- *Freestanding urgent care facilities*
- *Cancer treatment facilities*
- *Outpatient surgical facilities*
- *Office surgical facilities*
- *Gastrointestinal endoscopy facilities*

The inclusion of cancer treatment and diagnostic and treatment clinics in Section 3.1-1.1.2 is applicable to the definition of these areas as outpatient care space in the proposed PGRMC ACC Building. The proposed ACC building, while situated adjacent to the hospital, will be structurally separated from the hospital building, and there will be a designated fire protection separation between the two buildings. The inpatient hospital space will conform to the building code classification of institutional occupancy. The ACC will be designated as a different occupancy and construction type, in conformance with Guidelines Section 3.1-7.1.1.2 *"Construction and structural elements of freestanding outpatient facilities shall comply with recognized building code requirements for offices."*

The NFPA 101 Life Safety Code includes much of the same language differentiating inpatient hospital space from outpatient/ambulatory space. In particular, the Code includes dentist offices, doctor's offices, and outpatient clinics in the business occupancy category, not in the institutional occupancy category. The clinic spaces on Level 2 of the proposed PGRMC ACC are of this type.

NFPA 101 — Chapter 3 identifies the definitions of the occupancy classifications used in the Code.

> *3.3.168 Occupancy. The purpose for which a building or other structure, or part thereof, is used or intended to be used. [ASCE 7:1.2]*
>
> *3.3.168.1* Ambulatory Health Care Occupancy. A building or portion thereof used to provide services or treatment simultaneously to four or more patients that provides, on an outpatient basis, one or more of the following: (1) treatment for patients that renders the patients incapable of taking action for self-preservation under emergency conditions without the*

assistance of others; (2) anesthesia that renders the patients incapable of taking action for self-preservation under emergency conditions without the assistance of others; (3) emergency or urgent care for patients who, due to the nature of their injury or illness, are incapable of taking action for self-preservation under emergency conditions without the assistance of others.

A.3.3.168.1 Ambulatory Health Care Occupancy. It is not the intent that occupants be considered to be incapable of self-preservation just because they are in a wheelchair or use assistive walking devices, such as a cane, a walker, or crutches. Rather it is the intent to address emergency care centers that receive patients who have been rendered incapable of self-preservation due to the emergency, such as being rendered unconscious as a result of an accident or being unable to move due to sudden illness.

3.3.168.3 Business Occupancy. An occupancy used for the transaction of business other than mercantile. [5000, 2006]*

A.3.3.168.3 Business Occupancy. Business occupancies include the following:

(1) Air traffic control towers (ATCTs)
(2) City halls
(3) College and university instructional buildings, classrooms under 50 persons, and instructional lab oratories
(4) Courthouses
(5) Dentists' offices
(6) Doctors' offices
(7) General offices
(8) Outpatient clinics (ambulatory)
(9) Town halls

Doctors' and dentists' offices are included, unless of such character as to be classified as ambulatory health care occupancies. (See 3.3.168.1.)

NFPA 101 - Chapter 20 defines specific requirements for ambulatory health care facilities, and includes definitions of these spaces.

A.20.1.2.2 Doctors' offices and treatment and diagnostic facilities that are intended solely for outpatient care and are physically separated from facilities for the treatment or care of inpatients, but are otherwise associated with the management of an institution, might be classified as business occupancies rather than health care occupancies.

20.1.1.1.4 Buildings, or sections of buildings, that primarily house patients who, in the opinion of the governing body of the facility and the governmental agency having jurisdiction, are capable of exercising judgment and appropriate physical action for self-preservation under emergency conditions shall be permitted to comply with chapters of this Code other than Chapter 20.

Finally, the International Building Code, 2012, provides similar identification of outpatient spaces differentiated from inpatient spaces:

Chapter 3: Use and Occupancy Classification

Section 304: Business Group B

SECTION 304
BUSINESS GROUP B

304.1 Business Group B. Business Group B occupancy includes, among others, the use of a building or structure, or a portion thereof, for office, professional or service-type transactions, including storage of records and accounts. Business occupancies shall include, but not be limited to, the following:

…
Clinic—outpatient
…

304.1.1 Definitions. The following words and terms shall, for the purposes of this section and as used elsewhere in this code, have the meanings shown herein.

CLINIC, OUTPATIENT. Buildings or portions thereof used to provide medical care on less than a 24-hour basis to individuals who are not rendered incapable of self-preservation by the services provided.

308.3 *Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care for persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:*

Child care facilities
Detoxification facilities
Hospitals
Mental hospitals
Nursing homes

308.3.1 *Definitions. The following words and terms shall, for the purposes of this* section *and as used elsewhere in this code, have the meanings shown herein.*

…
HOSPITALS AND MENTAL HOSPITALS. Buildings or portions thereof used on a 24-hour basis for the medical, psychiatric, obstetrical or surgical treatment of inpatients who are incapable of self-preservation.
….

The space for medical office buildings and ambulatory care centers are excluded from benchmark area-per-bed calculations for inpatient hospital facilities because the functions contained in outpatient facilities are completely independent of inpatient treatment functions, and the size and scope of these facilities are not related to the number of inpatient beds. Excluding outpatient space in a benchmark analysis is consistent with industry standards, and maintaining this consistency allows for a more accurate benchmark comparison process.

A. Size Analysis of Proposed Project

1. Adjusting PGRMC Size for the CUP and Ambulatory Care Center

The area of the proposed Prince George's County Regional Medical Center ("PGRMC") before any adjustment is 3,235 SF / bed. When the building area assigned to the PGRMC facility is adjusted to adhere to industry standard methodology for calculating hospital areas by removing the CUP and the Ambulatory Care Center, the area of PGRMC is reduced to 2,806 SF / bed.

PGRMC CON SUBMISSION	
PGRMC New Campus Total Area	747,211
PGRMC Total Beds	231
Total Campus SF/Bed	3,235

ADJUSTMENTS PER INDUSTRY STANDARDS	
ACC (Remove)	55,822
Central Utility Plant (Remove)	43,199
PGRMC BGSF Per Industry Standard	648,190
PGRMC Total Beds	231
Hospital SF/Bed	2,806

2. Additional Unique Programs and Features

The proposed PGRMC is a regional trauma teaching hospital, rather than a community hospital, and as a result it has additional programs and features that smaller scale community hospitals do not have. A straight comparison to community hospitals or hospitals with a smaller scope of services and programs would therefore lack meaningful context. Several features of the proposed PGRMC that may be lacking in smaller scale community hospitals have a significant impact on its area, as detailed in the table below.

Program/Design Feature	**Area Impact**
Ambulatory Care Center / Cancer Center	55,822 SF (adjustment made above)
Central Utility Plant (CUP) detached and sized to serve other campus buildings	43,199 SF (adjustment made above)
Trauma Center	5,165 SF
Pediatric ED	1,757 SF
Embedded Education Space	15,341 SF
Conference Center	5,256 SF
Rooftop Helipad and Enclosed Mechanical Space Response	55,377 SF

Two of these spaces, the educational space and enclosed mechanical space, are discussed in more detail below.

Education Space Strategy

When comparing the proposed PGRMC to other academic regional hospitals, there should be little difference in education and training space needs. Community hospitals, however, do not have space dedicated to such needs. While many community hospitals may have conference rooms, the student support areas (lockers, lounge, training rooms) on patient units and in diagnostic areas, and the administrative areas that are utilized solely by faculty, will not be present. Thus, community facilities will have an overall lower BGSF / bed ratio if no adjustments for scope are made.

The PGRMC design has 820 net square feet of education-related space on each patient unit, equaling approximately 945 departmental square feet. By contrast, the student/faculty support areas and the scope of the conferencing areas are not provided or are not as extensive in the designs of nearby community hospitals Clarksburg Community Hospital (planned), Holy Cross Hospital—Germantown (recently constructed), or Washington Adventist Hospital (planned).

PGRMC will have a significant medical education program, much like the current PGHC has today. PGHC currently has its own ACGME (Accreditation Council for Graduate Medical Education) accredited internal medicine residency program and a family practice residency program. PGHC also has a number of affiliation agreements with other residency programs, in which residents complete rotations at PGHC as part of their residency training program. These programs include:

- Howard University Hospital:
  - family medicine program for the OB curriculum,
  - cardiology fellowship, and
  - general surgery residency;
- University of Maryland emergency medicine residency;
- University of Maryland orthopedic residency;
- University of Maryland orthopedic trauma fellowship;
- University of Maryland acute care surgical fellowship;
- St. Elizabeth's Hospital—psychiatric residency

PGHC has affiliation agreements with Ross University School of Medicine, the University of Maryland School of Medicine, and Howard University College of Medicine for medical students to complete rotations at PGHC.

PGRMC will also be involved with non-physician medical education programs, similar to the programs at the current PGHC. The current PGHC non-physician medical education affiliations include:

- Georgetown University Nurse Midwife Program
- Shenandoah University Nurse Midwife and Physician Assistant
- Frontier School of Midwifery - Nurse Midwives
- Anne Arundel Community College Physician Assistant Program - Physician Assistant Students
- George Washington Physician Assistant program - Physician Assistants students. Plans are to expand rotations to include Nurse Practitioner students.

A list of additional medical education affiliation agreements is attached as **Exhibit C**.

In sum, the current PGHC has, and the proposed PGRMC will have, a very active medical education program and medical education activities that require space and other resources for the learning environment. The PGRMC facility, with stronger affiliation ties to the University System of Maryland, will provide additional opportunities to further expand its medical education activities. This is important for the community in that such professionals get exposed to the Prince George's County community and enhances recruitment efforts of needed medical professionals.

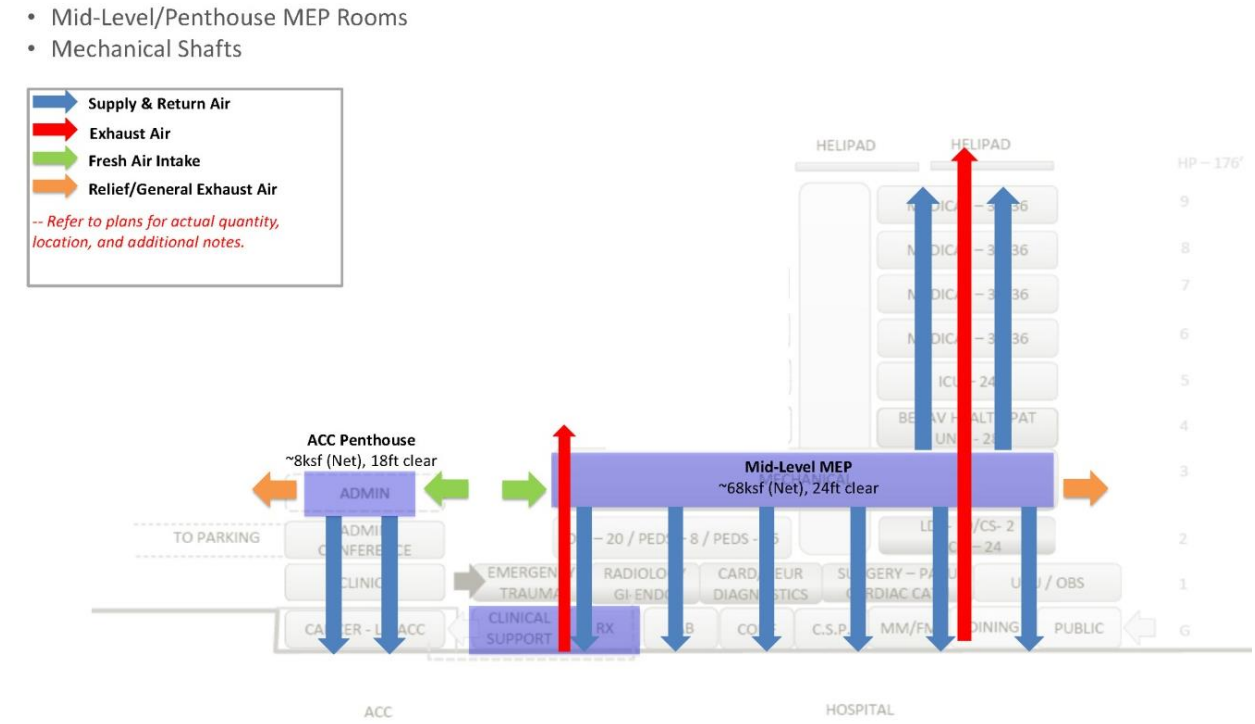
Because of the different space needs of an academic training hospital and a smaller scale community hospital, any unadjusted comparison of such hospitals will lack significant context regarding the scope of the facility and available programs if adjustments are not made for education space.

Mechanical Strategy

The design for PGRMC must conform to the Prince George's County Largo Town Center Sector Plan, which calls for high-rise buildings to create dense, urban developments. A copy of the Largo Town Center Sector Plan is attached as **Exhibit D**.

In considering the height of the PGRMC facility and the proposed height of buildings on the immediate adjacent parcels, representatives from Dimensions and the University of Maryland Medical System met with the State Police Aviation Division and Andrews Air Force Base regarding the trauma center and helicopter access to the facility. The current facility has one roof top helipad, and the proposed facility includes two roof top helipads to accommodate the projected need in trauma arrivals. After reviewing the location of the facility relative to other buildings on site and in the area, the State Police requested that the helipads be placed on the rooftop, rather than the ground. Additionally, the efficiency of patient transfers down a dedicated trauma elevator to the trauma center, rather than moving patients across the site, provides the best patient care design. These decisions led to a particular design strategy for the mechanical systems for the hospital.

As shown in the diagram below, the design team developed the conceptual blocking and stacking to locate the main electrical room on the concourse level similar to other facilities and the main mechanical rooms in the middle of the tower at Level 3, rather than having exposed roof top air handling units as is more typically designed for similar facilities.



If the air handling equipment were located on the roof level, diesel exhaust from helicopter would be easily entrained into the air system for the hospital, resulting in health and odor impacts to the occupants. Although a system of filters has been used on other projects, this design strategy is not as reliable as locating the air intake and exhaust at a distance from the source of the pollution.

This mid-level mechanical room strategy also provides more efficient equipment design and energy conservation. The overall height of the building does not support feeding the entire building from just roof top units at the top of the tower. This approach would require larger fan sizes and larger duct sizes to move air farther down the height of the building, and directly resulting in increased energy usage. Roof top units may be located on the lower roof level, but these would be at a distance from the core of the floor plate and would result in lager duct sizes on the horizontal runs, which in turn would increase the floor to floor heights. The current design makes efficient use of equipment and distribution systems by allowing distribution spread over the footprint of the diagnostic areas, which reduces floor to floor heights, and both upward and downward, which reduces fan and shaft sizes. Dimensions is not aware of any recent projects in Maryland involving rooftop helipads. Without such a constraint, other facilities would be able to design distributed rooftop equipment to serve the patient floors.

Level 3 MEP Room Layout

In addition to impact of the helipad location on the project design, the higher amount of diagnostic and treatment areas at PGRMC as compared to a facility such as the proposed Washington Adventist Hospital project, drives a higher load and equipment sizes and costs. The OR count comparison between the two facilities shows a 50% increase in OR's (8 vs. 12) while the bed count is only 15% different. This disproportionate difference, weighted toward the most intensive mechanical use areas, increases the equipment sizes and negatively affects the BGSF / bed calculations.

Lastly, to achieve higher reliability and flexibility, investment of mechanical equipment and distribution systems in PGRMC includes standby thermal equipment (boiler, chiller, cooling tower and associated distribution pumps), standby generator, 96-hour fuel storage and some extra capacity in AHU's and electrical switchgears/primary equipment. This increased first investment will realize savings in operation cost over the life of the facility, and more importantly will provide a reliable and robust infrastructure of utility services to support uninterrupted patient care.

3. Adjusting for the Unique Programs and Features

Each of elements described above impact space needs and distinguishes PGRMC from other hospital facilities. To compare PGRMC to other facilities in an "apples to apples" fashion, the distinguishing elements should be identified and isolated to create a common core of elements that are similar across all of the facilities compared. After removing these elements, the adjusted PGRMC facility area is 2,448 SF / bed.

The adjustments discussed above are summarized in the following table.

PGRMC CON SUBMISSION	
PGRMC New Campus Total Area	747,211
PGRMC Total Beds	231
Total Campus SF/Bed	3,235

ADJUSTMENTS PER INDUSTRY STANDARDS	
ACC (Remove)	55,822
Central Utility Plant (Remove)	43,199
PGRMC BGSF Per Industry Standard	648,190
PGRMC Total Beds	231
Hospital SF/Bed	2,806

ADJUSTMENTS FOR COMMON PROJECT COMPARISONS	
Trauma Center (Remove)	5,165
Pediatric ED (Remove)	1,757
Embedded Education Space (Remove)	15,341
Conference Center (Remove)	5,256
Rooftop Helipad and Enclosed Mechanical Space Response (Remove)	55,261
PGRMC BGSF Per Industry Standard	565,410
PGRMC Total Beds	231
Hospital SF/Bed	2,448

The existing Hospital Building (not including the parking garage, the CUP or the Spellman Building) is 579,057 SF / 311 beds = 1,862 SF / bed

C. Comparison to Existing Facility

HOK, Dimensions' prior architectural firm, identified in the facility analysis that the use of semi-private rooms in the existing facility is not a current standard for patient safety or satisfaction, and there are numerous other areas that are well below current industry benchmarks for area per key room. The process of "right-sizing" a facility to meet current industry standards requires an increase in area / bed calculations. As shown in the chart below, making an adjustment solely to change the patient rooms from semi private to private would have an impact of 71,000 BGSF and would increase the calculation for the existing building from 1,862 to 2,093 SF / room.

	Inpatient Beds	Facility Square Footage	Sq. Footage per Patient Room
Prince George's Hospital Center (Existing)	311	579,057	1,862
Prince George's Hospital Center (Exist/Adjust)	311	650,957	2,093

Many of the problems identified in the facility analysis report, including the unusually configured and small structural bays and floor to floor heights, would contribute to a continued inefficient use of space in the existing facility, even if the facility were upgraded in place. If the current facility were upgraded for all other areas outside of the patient units, these inefficiencies would produce a compromised design where the overall area of the building would be greater than the area of the proposed project.

D. Comparison to Other Recent Projects

1. Project Benchmark Analysis

In connection with completeness questions raised following Dimensions' original CON application, MHCC Staff asked Dimensions to discuss its project size and costs in comparison to a number of local projects. A summary table is provided below.

Maryland Facility Gross Area Comparison

PROJECT	BEDS	BGSF	BGSF/ BED	Enclosed MEP/AHU	MOB/ACC	CUP
Dimensions/PGRMC	231	565,410	2,448	Yes	Not Included	Not Included
Washington Adventist Hospital	170	427,662	2,516	No	Not Included	Not Included
Shore Health Memorial Hospital Easton	126	300,678	2,386	No	Not Included	No Information
Holy Cross Hospital Germantown	93	215,469	2,317	No Information	Not Included	Not Included
Clarksburg Community	86	186,512	2,169	No	Not Included	Not Included
Mercy Medical Center	253	700,000	2,767	No Information	No Information	No Information
Architect Survey*			2,000-2,500	No Information	No Information	No Information

*MHCC referenced an unspecified Architects Survey during a January 16, 2014 meeting

The lowest actual project area on the above chart is 2,169 SF / bed for the planned Clarksburg Community project. As this project planning was never completed, it may not be appropriate to use for benchmark analysis. The lowest comparable project is Memorial Hospital at Easton, which when an ACC / MOB is added measures at 2,849 SF / bed (as shown in the chart on the following page). This comparison shows that the PGRMC project at 2,995 SF / bed (calculated after subtracting space for mechanical/helipad premium) is only 5% larger, than a comparable project. While this example deviates from the industry standards discussed here, it is a useful comparison to illustrate the difficulty of comparing facilities with different scopes of construction. The project measurement of 2,448 SF / bed, derived by adjusting the space calculation to remove the elements that industry standard dictates should not be included in calculation (the ambulatory care center space and the CUP, as discussed in section A, above), and further adjusting to remove elements that are not common among the comparison projects (as discussed in section B, above) PGRMC , is only 5% larger than the average of all of the comparable projects on the above chart, which is 2,431 SF / bed.

Thus, a meaningful comparison of the hospital-only area indicates the following:

- PGRMC at 2,448 SF / bed = 1% increase greater than the average of other recent Maryland projects included in the chart above (2,294 SF / bed);
- PGRMC at 2,448 SF / bed is within the range of the unspecified Architect Survey (2,000-2,500 SF/bed) referenced by MHCC in a meeting on January 16, 2014;
- PGRMC at 2,448 SF / bed = 2% less than the top range of the Architect Survey (2,500/bed), an area per bed which more accurately reflects the scope of a regional medical center.

The chart below illustrates a number of built projects designed by HOK. The areas disclosed in the chart are exclusive of ACC, MOB, parking, and CUP space, in accordance with the industry standards described above.

University of Maryland Medical System

New Hospital Benchmark Cost Summary

	HOK PROJECTS						
	CSM	SJMC	UMCP	LAC+USC	WISHARD	HCA	OSU
LOCATION	Suburban, WI	Urban, IN	Urban, NJ	Urban, CA	Urban, IN	Suburban, TX	Urban,OH
YEAR COMPLETED	2011	2009	2011	2008	2013	2008	2014
SF	703,000	656,000	523,010	1,407,232	881,842	327,000	956,900
BEDS	268	253	266	598	329	147	420
SF/BED	2,623	2,593	1,966	2,353	2,680	2,224	2,278
HOSPITAL	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED	INCLUDED
ENCLOSED MEP/AHU	YES	YES + ROOFTOP	YES + ROOFTOP	YES	YES	YES	YES
MOB/ACC	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED
CUP	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED	NOT INCLUDED

Benchmark Average: **2, 388 SF/Bed**
Benchmark Range: **1,966 - 2,623 SF/Bed**

Wilmot Sanz expanded the HOK benchmark analysis for new hospital construction in the chart below. This study provides a broader sampling of projects to refine the understanding of the appropriate benchmark range for new hospital construction.

National Facility Gross Area Comparison

PROJECT	LOCATION	BEDS	BGSF	BGSF/ BED	Enclosed MEP/AHU	MOB/ACC	CUP
Community Hospitals:							
Progress West	O'Fallon, MO	72	154,425	2,145	No Information	No Information	No Information
Deaconess Gateway - Evansville	Evansville, IN	116	382,646	3,299	No Information	No Information	No Information
Methodist Stone Oak	Houston, TX	147	327,343	2,227	Yes	Not Included	Not Included
Saint Joseph Regional (Replacement)	Mishawaka, IN	253	656,122	2,593	Yes + Rooftop	Not Included	Not Included
Columbia St. Mary's Lake Drive (Replacement)	Milwaukee, WI	268	702,725	2,622	Yes	Not Included	Not Included
West Kendall	Coral Gables, FL	92	302,527	3,288	No	Not Included	Not Included
Einstein Healthcare Network Regional M.C.	East Norriton, PA	138	360,000	2,609	No Information	No Information	No Information
American Hospital Dubai	Dubai	228	513,000	2,250	No Information	No Information	No Information
Academically Affiliated:							
Princeton (UMCP)	Princeton, NJ	266	523,010	1,966	Yes + Rooftop	Not Included	Not Included
Baylor Hospital (Replacement)	Houston, TX	244	883,131	3,619	No Information	Not Included	No Information
Wishard Hospital (Replacement)	Indianapolis, IN	329	881,842	2,680	Yes	Not Included	Not Included
LAC + USC Medical Center (Replacement)	Los Angeles, CA	598	1,407,232	2,353	Yes	Not Included	Not Included
Rush University Medical Center	Chicago, IL	446	1,000,000	2,242	No Information	No Information	No Information
Ronald Reagan UCLA Medical Center	Los Angeles, CA	525	1,200,000	2,286	No Information	No Information	No Information
University of Kentucky Albert B Chandler Hosp.	Lexington, KY	512	1,244,000	2,430	No Information	No Information	No Information
OSU	Urban, OH	420	956,900	2,278	Yes	Not Included	Not Included

Benchmark Average: **2, 555 SF/Bed**
Benchmark Range: **1,966 - 3,619 SF/Bed**

Utilizing the industry standard methodology for identifying the correct area for the proposed PGRMC, the proposed design falls in line with these projects.

FACILITY	LOCATION	BEDS	DGSF	DGSF / BED	BGSF	BGSF / BED
Dimensions PGRMC	**Largo, MD**	**231**	441,830	**1,913**	565,410	**2,448**

The chart below has been modified to illustrate three projects documented above that, when the MOB or ACC scope is added, vary significantly from the original calculation. Most notable is the design for Shore Health Memorial Hospital at Easton, which when excluding the ACC/MOB is 2,386 SF / bed, but including the ACC/MOB, is 2,849 BGSF / bed. Because there is great variance among hospital designs in the types of clinic services and related space requirements, there is no benchmark ratio for the number of clinics (*e.g.*, facility size) relative to inpatient bed counts; every ACC/MOB facility is developed differently based upon the unique needs of the hospital. Thus, there can be no reliable standardized methodology for creating a direct comparison of ACC/MOB area per bed.

FACILITY	LOCATION	BEDS	DGSF	DGSF / BED	BGSF	BGSF / BED
Baylor Hospital Including ACC	**Houston, TX**	**244**	874,277	**3,583**	1,179,555	**4,834**
Wishard hospital including ACC	**Indianapolis, IN**	**329**	911,622	**2,771**	1,228,610	**3,734**
Shore Health Including ACC	**Maryland**	**126**			358,928	**2,849**

2. Analysis of Functional Space Components of the Comparison Projects

The core patient care areas of the proposed PGRMC facility will be sized consistent with other hospital facilities. Facility benchmarking is used to gauge an overall facility size in reference to a particular baseline unit. On a large scale, this comparison is created using a calculation of overall Building Area per Inpatient Room.

On a smaller scale within facilities, Diagnostic and Treatment areas may have a specific "Key Room" or "Key Rooms," depending on the specific hospital department. Examples include operating rooms and procedure rooms for a Surgery Department; radiology, CT scan, MRI, and

ultrasound stations, among others, for a Radiology Department; exam room and treatment bays for an Emergency Department; or exam rooms for a Medical Office or Ambulatory Clinic. The number of Key Rooms is determined by the patient volume and throughput calculations. The total area of a department for all of the required supporting functions can then be benchmarked to the total number of Key Rooms.

The following tables demonstrate that, in general, the Key Room benchmarks for patient care areas within the hospital for the proposed PGRMC are all in the same typical range for a hospital facility.

The behavioral health program, which includes outpatient space adjacent to the inpatient space, is larger relative to the other projects in the chart of recent/proposed Maryland projects. This increases the overall area per room.

Maryland Facility Department Area Comparison

	Dimensions - PGRMC			WAH			MHE			HCH - Germantown			Clarksburg		
	Design areas from Schematic Design			*Approximate areas from CON design*			*Approximate areas from CON design*			*Approximate areas from CON design*			*Program areas from CON design*		
DEPARTMENT/FUNCTION	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**
ACUTE PATIENT CARE															
Acute Care	133	90,840	683	124	67,271	543	104	69,820	671	90	58,600	651	60	26,123	435
Intensive Care	32	22,794	712	28	19,930	712	12	9,918	827	15	8,725	582	10	4,451	445
Post-Partum	22	17,454	793	18	16,145	897	14	6,750	482	12	7,575	631	16	7,838	490
Neonatal Intensive Care Unit	24	11,921	497	0	N/A		5	3,100	620	8	2,520	315	0	N/A	
Mt. Washington Pediatrics	15	13,149	877	0	N/A			N/A		0	N/A		0	N/A	
Inpatient Psych	28	20,488	732	0	N/A			N/A		6	5,250	875	0	N/A	
Pediatrics	1	400	400	0	N/A		6	5,700	950	0	N/A		0	N/A	
SUBTOTAL (not including NICU)	231	165,125	715	170	103,346	608	136	92,188	678	123	80,150	652	86	38,412	447

As shown below, diagnostic areas for the PGRMC design are within the range of the comparison projects.

Maryland Facility Department Area Comparison

	Dimensions - PGRMC			WAH			MHE			HCH - Germantown			Clarksburg		
	Design areas from Schematic Design			*Approximate areas from CON design*			*Approximate areas from CON design*			*Approximate areas from CON design*			*Program areas from CON design*		
DEPARTMENT/FUNCTION	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**
DIAGNOSTICS & TREATMENT															
Surgery	16	36,872	2,305	12	34,497	2,875	9	24,475	2,719	9	21,450	2,383	4	11,709	2,927
Cardiac Cath Lab	4	4,676	1,169	6	20,611	3,435	included above			included above			0	N/A	
GI - Endoscopy	2	1,903	952	included above			included above			included above			2	1,070	535
Adult/Peds ED	48	28,908	602	32	21,714	679	37	19,400	524	12	13,300	1,108	17	10,130	596
Trauma	4	5,165	1,291		N/A			N/A			N/A		0	N/A	
Clinical Decision/ Observation	20	9,904	495	included above			No Information			No Information			No Information		
Universal Care/ Pre-Post/PACU	63	19,516	310	35	included above		35	10,950	313	24	7,624	318	15	5,211	347
Imaging	13	18,135	1,395	12	11,605	967	12	17,200	1,433	9	12,800	1,422	14	12,370	884
Non-Invasive Cardiology	6	6,854	1,142	8	4,278	535	4	5,025	1,256		N/A			1,190	
Neurodiagnostics	included above				N/A			N/A			N/A		0	N/A	
Labor & Delivery	10	18,383	1,838	9	12,372	1,375	16	12,950	809	7	14,900	2,129	8	7,286	911
Dialysis	6	2,344	391	6	2,526	421	4	2,150	538		N/A		0	N/A	
PT/OT		3,461			N/A			N/A			N/A			2,985	
SUBTOTAL	192	156,121		120	107,603	897	117	92,150	788	61	70,074	1,149	60	51,951	866
Proc	22			18			9			9			4		

Support areas space for the PGRMC design also is within the range of the recent/ proposed Maryland projects.

Maryland Facility Department Area Comparison

	Dimensions - PGRMC			WAH			MHE			HCH - Germantown			Clarksburg		
	Design areas from Schematic Design			*Approximate areas from CON design*			*Approximate areas from CON design*			*Approximate areas from CON design*			*Program areas from CON design*		
DEPARTMENT/FUNCTION	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**
CLINICAL SUPPORT															
Laboratory/ Pathology	231	12,895	56	170	9,500	56	126	11,900	94	123	4,700	38	86	3,190	37
Pharmacy	231	5,220	23	170	4,570	27	126	4,000	32	123	3,725	30	86	2,050	24
Other Clinical Support	231	988	4	170	948	6		N/A			N/A		86	3,810	44
SUBTOTAL	231	19,103	83	170	15,018	88	126	15,900	126	123	8,425	68	86	9,050	105
NON CLINICAL SUPPORT															
Dietary/Dining	231	13,333	58	170	12,360	73	126	11,000	87	123	6,450	52	86	6,500	76
Materials/Bio Med/ EVS	231	16,176	70	170	13,827	81	126	9,950	79	123	7,020	57	86	2,160	25
Central Sterile	16	8,004	500	12	7,491	624	8	6,100	763	8	3,900	488	4	2,300	575
Facilities & Support Services	231	8,545	37	170	5,826	34	126	5,200	41	123	300	2	86	3,670	43
IT/Telecom	231	9,616	42	170	2,414	14	126	2,700	21	123	1,300	11	86	1,420	17
SUBTOTAL	231	55,674	241	170	41,918	247	126	34,950	277	123	18,970	154	86	16,050	187
OFFICES & EDUCATION															
Office/Administration	231	14,397	62	170	26,991	159	126	11,300	90	123	6,600	54	86	9,420	110
On Call	231	3,643	16	170	1,129	7		N/A			N/A			N/A	
Conference Center	231	5,256	23		N/A		126	5,950	47	123	4,160	34	86	2,660	31
SUBTOTAL	231	18,040	78	170	28,120	165	126	17,250	137	123	10,760	87	86	12,080	140

A further analysis of relatively recent hospital construction projects designed by Wilmot Sanz presented in the table below supports the conclusion that the PGRMC department design is within the range recent Maryland projects.

Recent Maryland Facility Department Area Comparison

	Dimensions/PGRMC			Shady Grove Adventist			Franklin Square			Howard County			Carroll County			Calvert County		
	Design areas from Schematic Design			*Recent Construction*			*Recent Construction*			*Recent Construction*			*Recent Construction*			*Recent Construction*		
DEPARTMENT/FUNCTION	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**	**KEY ROOM**	**DGSF**	**SF/KEY ROOM**
ACUTE PATIENT CARE																		
Acute Care	133	90,840	683	96	59,337	618	240	162,850	679	90	57,609	640	66	66,983	1,015		N/A	
Intensive Care	32	22,794	712		N/A		42	32,570	775	16	8,023	501		N/A		10	7,610	761
Post-Partum	22	17,454	793	48	30,511	636		N/A			N/A			N/A			N/A	
Neonatal Intensive Care Unit	24	11,921	497	31	10,639	343 ***		N/A		17	6,609	389 ***		N/A			N/A	
Pediatrics	1	400	400		N/A		9	5,294	588	6	3,875	646		N/A			N/A	
DIAGNOSTICS & TREATMENT																		
Surgery	16	36,872	2,305	17	37,107	2,183		N/A			N/A			N/A			N/A	
Cardiac Cath Lab	4	4,676	1,169		N/A			N/A			N/A			N/A		1	1,775	1,775
GI - Endoscopy	2	1,903	952	3	2405	802		N/A			N/A		1	1,350	1,350		N/A	
Adult/Peds ED	48	28,908	602		N/A		78	42,870	550 *	48	24,539	511 *		N/A		30	14,688	490 *
Universal Care/ Pre-Post/PACU	63	19,516	310	80	21,389	267 **		N/A			N/A		17	3,789	223 **			
Imaging	13	18,135	1,395		N/A			N/A		7	20,310	2,901		N/A		6	7,124	1,187
Non-Invasive Cardiology	6	6,854	1,142		N/A			N/A		3	3,967	1,322		N/A		4	6,683	1,671
Dialysis	6	2,344	391		N/A		6	3,097	516	4	1,097	274		N/A			N/A	
CLINICAL SUPPORT																		
Laboratory/ Pathology	231	12,895	56		N/A			N/A		112	4,455	40		N/A		105	5,689	54
Pharmacy	231	5,220	23		N/A			N/A		112	3,523	31		N/A		105	3,449	33
NON CLINICAL SUPPORT																		
Central Sterile	16	8,004	500	17	9,043	532		N/A						N/A			N/A	

* Emergency Department does not include ED Imaging
** 8x10 cubicles at Pre-op
*** NICU does not utilize private rooms

II. PROPOSED PROJECT COST

As noted above, following submission of the original CON application, the MHCC Staff asked Dimensions to explain the differences in project sizing and costs between the proposed PGRMC project and several other Maryland hospital projects.

The table below sets forth the costs comparison the MHCC Staff asked Dimensions to explain (the budget numbers, square footage, and number of beds have been updated to reflect the project modifications proposed by Dimensions and Washington Adventist Hospital).

Project	Sq. Ft.	# Beds	Construction Cost	Project Cost	Project Cost/Sq. Ft.	Project Cost/Bed
Dimensions/Prince George's	747,211	231	$341,334,694	$651,223,000	$872	$2,819,147
Washington Adventist	424,557	170	$159,500,000	$330,829,524	$779	$1,946,052
Memorial Hospital at Easton	358,928	126	$184,716,247	$283,240,375	$789	$2,247,939
Holy Cross Germantown	237,842	93	$112,284,568	$201,983,857	$849	$2,171,869
Holy Cross Germantown w/o Shell	215,469					
Clarksburg Community	186,512	86	$81,141,000	$177,081,000	$949	$2,059,081
Unspecified Architect Survey					$675-$825	

Because of the differences in scope, services, existing resources and equipment, and year of construction among hospital construction projects, cost comparisons between projects are difficult and do not provide the most meaningful tool for assessing the reasonableness of project costs. Instead, the MHCC has established a regulatory benchmark for determining if project costs are reasonable. COMAR 10.24.10.04B(7) states:

Standard .04B(7) – Construction Cost of Hospital Space.

(a) The cost per square foot of hospital construction projects shall be no greater than the cost of good quality Class A hospital construction given in the Marshall and Swift Valuation Quarterly, updated to the nearest quarter using the Marshall and Swift update multipliers, and adjusted as shown in the Marshall and Swift guide as necessary for terrain of the site, number of levels, geographic locality, and other listed factors.

(b) Each Certificate of Need applicant proposing costs per square foot above the limitations set forth in the Marshall and Swift Guide must demonstrate that the higher costs are reasonable.

The Marshall and Swift Guide method of assessing reasonable cost, which is prescribed by MHCC regulation, is the benchmark against which construction costs should be measured and compared. For the reasons described below, Dimensions does not believe that the project comparison analysis suggested by the MHCC Staff provides a correct assessment of project costs.

A. Total Project Costs Include Costs That Should Not Be The Basis for Comparison

Marshall & Swift's Marshall Valuation Service (MVS) is a benchmark that can be reasonably applied to all projects. It clearly delineates what is in the benchmark and what is not. The MHCC Staff's project comparison seeks to evaluate costs that are simply not comparable between projects because each project has unique characteristics. **Exhibit E** is a table that shows the project budgets for all five projects the MHCC Staff identified for comparison. Among other things, the budget chart shows that the PGRMC project includes $158,916,566 in moveable equipment costs, of which, $32,496,000 is for equipment in the Central Utility Plant. PGHC's current equipment is old and Dimensions expects to purchase all new equipment for the new facility. By comparison, Washington Adventist Hospital has budgeted only $33,800,000 (a difference of more than $125 million) for moveable equipment. Also, Dimensions has budgeted $14,500,000 in other cash requirements to resolve certain real estate development rights of the land seller and to purchase the lease rights of Gold's Gym. These costs are unique to the selected site and do not reflect the cost of constructing of the facility.

B. All But One of The Projects Were Filed in Different Years, and Their Costs Are in Different Year Dollars.

Because two of the projects that the MHCC Staff proposes to compare were proposed and budgeted in 2009, the per unit costs are lower than a project budgeted five years later in 2014. Also, one of the projects is located on the Maryland's Eastern Shore, for which the MVS Local Multiplier is lower than for other parts of Maryland. Any valid comparison of project costs would have to adjust for these differences.

The Table below shows in what month and year each project was submitted for approval. It also shows the MVS Base Cost in that month, the MVS Update Multiplier, the MVS local Multiplier in that month, and the calculation of an MVS Benchmark for each of the projects (unadjusted for building size, height, etc.). The Table then shows the ratio that would be required make the resultant MVS Benchmark comparable to the PGRMC application's benchmark by dividing the PGRMC benchmark by each of the other project's calculated benchmark.

	Filed	MVS Base/SF	Update	Local	Benchmark/SF (Unadjusted for size, building height, etc.)	Factor to Update to 9/14
Dimensions/ Prince George's	1/15	$354.99	1.04	1.05	$387.65	1.00
Washington Adventist	11/14	$354.99	1.04	1.05	$387.65	1.00
Memorial Hospital at Easton	9/12	$336.71	1.04	1	$350.18	1.11
Holy Cross Germantown	2/09	$306.33	1.12	1.02	$349.95	1.11
Clarksburg Community	4/09	$306.33	1.11	1.02	$346.83	1.12

In the following table, Dimensions has found the formal MVS benchmark and Project Costs that the MHCC or the applicant used in its formal MVS benchmark comparison in the sources that are listed for each project. Dimensions multiplied the Project Costs by the "Factor

to update to 01/15" that Dimensions calculated in the previous table. The result shows that PGRMC's project costs/square foot are similar to the other projects, except the most recently filed Washington Adventist Hospital project, which has not yet been tested for reasonableness of costs in the CON review process.[2]

		Formal Benchmark	Comparable Project Costs	Source	Factor to Update to 9/14	Comparable Costs/SF Updated to 1/15
Dimensions/ Prince George's	01/15	$405.11	$404.71	1/15 Modification	1.00	$404.71
Washington Adventist	10/14	$374.91	$371.37	10/14 Modification	1.00	$371.37
Memorial Hospital at Easton	9/12	$397.31	$373.83	Completeness	1.11	$413.83
Holy Cross Germantown	2/09	$380.33	$376.67	MHCC Decision	1.11	$417.25
Clarksburg Community	4/09	$371.56	$452.21	MHCC Decision	1.12	$505.44
Average without PGHC						$426.97

[2] Dimensions does not assume that the proposed Washington Adventist Hospital costs per square foot are correct and reasonable, nor should the MHCC Staff.

EXHIBITS

A	*Area Calculations & Net: Gross Ratios in Hospital Design, Methodology Guide*
B	*Preliminary Benchmarking Results: Departmental Gross And Building Gross Data*
C	List of Additional Medical Education Affiliation Agreements
D	Largo Town Center Sector Plan
E	Table of project budgets for comparison

EXHIBIT A

2012 PDC Summit
Phoenix, Arizona
March 7, 2012 9:50 am – 10:50am

Preliminary Benchmarking Results: Departmental Gross and Building Gross Data

D. Kirk Hamilton[1], FAIA, FACHA, EDAC; Sarel Lavy[2], PhD; Amy Kircher[3], BED, LEED AP BD+C, EDAC; and Yin Jiang[4], M.Arch

[1] Professor, Texas A&M University
[2] Associate Professor, Texas A&M University
[3] Master of Architecture Student, Texas A&M University
[4] Doctoral Student, Texas A&M University

This session will review Texas A&M research on the calculation of building gross square footage for health care facility projects, including lessons learned about the need for precision and consistency in calculation methods, preliminary data results, and early conclusions about how the research results could affect space programming for health care projects. Time will be allowed for Q&A. This session will enable you to:

- Express how precision and consistency in area calculation methods can improve an organization's internal and external measurement comparisons.
- Apply the information provided when assessing which building components to include in net area calculations and which to include in gross square footage calculations.
- Discuss how and why area allocations in recent hospital designs have changed from traditional allocations for the same spaces.
- Apply techniques discussed to revise preparation and use of hospital space programming information for a particular facility.

Introduction

Hospitals and hospital designs have been changing. Plans must now address far higher percentages of outpatient care, accommodate new equipment modalities, and provide space to account for family presence in patient rooms. There are new and exciting advances, as in the case of robotic surgery or intervention suites combining invasive and imaging capabilities. There are substantially larger commitments to wired and wireless networks for communications and data transmission. Some departments, like the pathology laboratory may be shrinking in response to new machinery that can test

more samples for more parameters with smaller and more compact devices. Architects and space programming consultants may wonder whether the projections made to plan for projects and their budgets can rely on the information gathered from projects in the past. Do today's hospital designs produce new ratios of net space to the gross area of departments, and the departmental gross to the gross space associated with the larger building? What constitutes the elements that make up the contemporary building gross square footage calculations in a new hospital?

Texas A&M University, through the College of Architecture's Evidence-Based Design Research Lab and principal investigators, Professor D. Kirk Hamilton and Associate Professor Sarel Lavy, PhD with the support of Herman Miller Healthcare, the Academy of Architecture for Health Foundation, and Alberta Infrastructure, has been conducting a study to answer these important questions.

Background

The following report summarizes the preliminary data collected for first 20 projects of the "Area Calculations and Net:Gross Ratios in Hospital Design - Phase I" study last updated on September 18, 2011. The results are preliminary, based upon a small sample and should be used with discretion as the results will certainly change as more projects are added to the database. The study builds on the basis of a preliminary study, "Analysis of departmental area in contemporary hospitals: calculation methodologies and design factors in major patient care departments," as conducted by David Allison of Clemson University and D. Kirk Hamilton of Texas A&M University. The findings of the previous study are available online at: http://www.aia.org/aiaucmp/groups/aia/documents/pdf/aias074528.pdf. The pilot study was limited to five major departments and did not investigate the final project's relationship to the program or design intent.

Research Objectives

The goal of the current study is to make planning data available to the industry in a way that allows for better predictions of square footage requirements and improved performance of healthcare buildings. Ratios used to calculate proposed departmental gross square footage constitute key information used in the process of programming, planning and design. Planners and designers use this ratio to project the total area of proposed departments within hospitals, based on the net area requirements. These ratios may also be used as space utilization benchmarks according to which future needs and costs can be projected. Similarly, the predictive calculation of total building gross area based upon the total departmental gross area is important for scope and budget determination. The purpose of this study is to establish a publicly accessible database of healthcare and hospital area calculations that can be updated and maintained over time. The searchable database will contain collected data on industry trends for the ratio between departmental net and departmental gross square footage in significant patient care, diagnostic, and treatment departments within hospitals.

Research Questions

The study attempts to address several research activities:

- Develop consensus on methods for calculating net and gross area of all departments in the buildings studied.
- Survey participating firms and their designers to discover the standards they use in healthcare design, as well as their design targets for each project.
- Measure the net to gross ratios for departments and elements of the building gross analyze the data by conducting net to gross calculations using the methods agreed upon by the research team and consensus advisory council.
- Disseminate the findings and conclusions back to the industry.
- Compare with historical ratios.

Methodology

It was easy to assume that everyone was calculating area in the same or similar ways based on the American Institute of Architects (AIA) Document D101-1995 "Method of Calculating Area and Volumes of Buildings" or the Canadian Standards Association document "Area Measurement for Health Care Facilities." This, however, has not proved to be the case. One of the more important lessons learned, is the need to reach agreement on the methods for measuring a project, as well as developing consistent definitions and methods.

AIA D101 is a simple two page document that includes basic definitions for calculating the useable net area. This document does not give detailed information and is not specific enough for conducting area take-offs for healthcare facilities.

The Canadian Standards Association Z317.11 –'02 is a lengthier document of approximately 25 pages with more detailed explanations than the AIA D101. This document uses examples of colored floor plans to illustrate each of the definitions it describes. The content of these two documents provided a basic methodology for this study, but there was still a need for multiple interpretations of undocumented conditions or ambiguous situations. The AIA and CSA methods are compatible.

The research team created a detailed methodology document that defines and illustrates the basic definitions needed for measuring healthcare facilities. This methodology document also addresses ambiguous situations and judgment call situations for various department and building gross components.

Measurement Procedures

The area take-offs for each project are conducted in AutoCAD Architecture software. A three-step process is used to create the measurement spaces: create polyline, convert to space, and name space.

To begin, draw a closed polyline around the desired space. Next, the polyline is converted to what AutoCAD calls a "space." The "spaces" are able to have specific identifying information assigned to them. Upon converting the polyline to a space, required information should be entered into the appropriate fields.

The measurement of drawings follows a five-step procedure:

1. Measure building gross square footage (BGSF) line items. BGSF line items identify several functions including Mechanical, Electrical, Communication, Non-departmental corridors, Stairs, Vertical Transport, Miscellaneous Structure, and Exterior Wall Thickness.

2. Measure BGSF total floor area. The BGSF is comprised of the total area of each floor in the project. The boundary of each floor is defined by the exterior face of the exterior wall.

3. Measure exterior wall thickness. The exterior wall thickness includes the exterior wall material, all columns along the perimeter of the wall and any furr-outs along those columns.

4. Measure each departmental gross square footage (DGSF). Departmental gross footage includes wall thickness between all its NSF spaces, departmental circulation, and building structure within the department.

5. Measure individual room net square footage (NSF). The NSF boundary should be along the interior finished face of the surrounding walls. Every room that belongs to the department must be measured. Major rooms to be included in the departmental NSF are: patient rooms and toilets, nurse stations, operation rooms, soiled and clean linen closets, and housekeeping closets.

Upon completing the area take-offs, the data which lies within AutoCAD are converted to an Excel spreadsheet using the "Data Extraction" feature. This feature allows researchers to sort the data and eventually generate a unique report for each project.

Questionnaires

In addition to the measurement and data analysis, the research team sends out questionnaires to collect extra information about the projects. Architects and programmers of each project are asked to answer a series of questions regarding project type, design features, and other information not accessible through the CAD drawings. The questionnaires are used to better understand the projects, and further categorize them for analysis.

Sensitivity Analysis

The following method is used by the research team to double check the accuracy of the entire calculation: the Department grand total plus the BGSF Line Item grand total (including the Exterior Wall Thickness square footage) should equal the BGSF Total Floor Plate Area grand total.

A rule of thumb used by the research team to ensure the measurements were conducted accurately is that the BGSF Total Floor Plate Area grand total must be within **1%** of the BGSF Total generated in the report by adding the Department grand total to the BGSF Line Item total. Accuracy must be within one in a hundred square feet, or ten in a thousand. This ensures that the accuracy of the measurements do not impact or skew the DGSF:BGSF Ratio. If these two numbers are not deemed to be accurate enough the research assistant must go back to the drawings and double check all measurements until the miscalculations are found.

Dealing with Ambiguous Situations and Judgment Calls

During the course of this study, the research team encountered various ambiguous situations related to dealing with NSF and DGSF measurements in departments or components of building gross. These ambiguous situations are defined by consensus among the advisory council. The attempt is to produce consistency with methodologies among the firms in practice and the TAMU researchers. There is a continuous struggle for consistently measuring projects, and using consistent department names. Procedures for checking accuracy have become important to develop precision in measuring each project.

Preliminary Findings

Profile of Projects Measured

As of January 2012, 17 firms responded to the call for submissions by submitting drawings and materials for 30 complete projects and 19 partial projects. Two sets of questionnaires that follow the submission of project drawings were sent to these firms immediately after receiving their materials. Twenty-five projects have been fully measured, for which detailed individual reports were produced and shared back with the firm that submitted each project. The firms were given access to the data that included a breakdown of departmental net and gross areas, and net-to-gross ratios for more than 100 possible departments in a hospital building, as well as shell space, the building gross areas for 9 different categories of space, and the building gross to departmental gross ratio. In cases where additional areas were included, such as research buildings, central plant, covered parking, professional buildings, or other functions, these areas were also measured and reported separately, so these additional areas did not affect the net-to-gross ratios. Table 1 summarizes the profile of the 25 projects measured.

Table 1: Characteristics of projects measured (based on 20 projects)

	Mean	Std. Dev.	Minimum	Maximum
Number of projects measured	25			
NSF (sf)	186,890	80,699	58,196	355,777
DGSF (sf)	254,567	110,267	77,105	497,932
BGSF (sf)	334,656	150,722	97,625	638,726
Number of floors per building	5.64	2.48	1	13
Number of beds	132.2	69.2	20	253

Findings

Figure 1 shows the minimum, maximum, and mean values for each department for which at least 10 measurements were obtained. This figure shows that in some departments, e.g., PACU and surgery, there is a much larger variability of measurements than in other departments, e.g., acute care, intensive care, obstetrics, neurodiagnostics, and pulmonary function, which showed a more consistent trend.

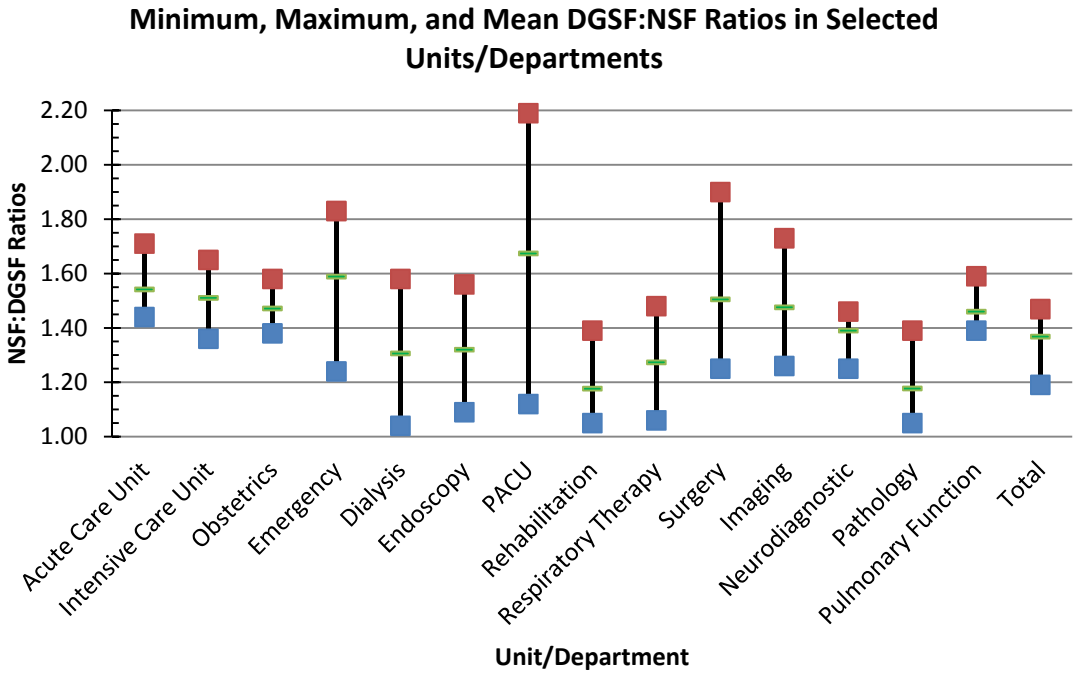


Figure 1: Minimum, maximum, and mean DGSF:NSF ratios in selected units/departments

Based on the projects measured and on the departmental ratios as presented in Figure 1, the research team conducted a preliminary statistical analysis that led to the development of expected departmental net-to-gross ratios (DGSF:NSF) in several major departments of a hospital where at least 10 measurements were obtained.

As can be seen in Table 2, these nine departments were measured in a minimum of 13 to a maximum of 25 projects. The results are, therefore, limited by this small number of measurements, and as the number of projects that are been added to the pool of measured projects increases, these values may become more consistent, having a smaller level of variability. The results are arranged by the number of Standard Variations (S.D.) from the mean value for each department, which us an indicator of the probability of future measurements. Statistically speaking, 1 S.D. means that based on the current measurements, it is expected that over 68% of the projects added to the pool will result in a ratio that falls in between the minimum and the maximum values showed in Table 2. Similarly, 2 S.D. and 3 S.D. mean that 95.5% and 99.7% of the projects, respectively, will fall within the ranges shown in Table 2.

It is expected that as the number of projects grows, the minimum and the maximum values in each department for each category will change, and may become closer to each other. It is necessary to mention that all the values presented in Table 2 assume a normal distribution of the measurements. Should this not be found to be the case, the values presented in Table 2 may change significantly. At this moment, with no more than 25 measurements per department, it is still too early to test this assumption.

Table 2: DGSF:NSF expected ratios, by statistical probability (with values based on Table 1).

Department	1 S.D. (68.3%)		2 S.D. (95.5%)		3 S.D. (99.7%)	
	Min.	Max.	Min.	Max.	Min.	Max.
Acute Care Unit	1.47	1.61	1.40	1.68	1.33	1.76
Intensive Care Unit	1.43	1.59	1.36	1.66	1.28	1.74
Obstetrics	1.42	1.52	1.37	1.57	1.32	1.63
Emergency	1.46	1.72	1.32	1.85	1.19	1.99
Dialysis	1.10	1.51	1.00	1.72	1.00	1.93
Endoscopy	1.19	1.45	1.06	1.58	1.00	1.71
PACU	1.41	1.94	1.14	2.21	1.00	2.48
Rehabilitation	1.05	1.30	1.00	1.42	1.00	1.54
Surgery	1.35	1.66	1.20	1.81	1.04	1.97
Imaging	1.34	1.61	1.21	1.74	1.08	1.87
Pathology	1.07	1.28	1.00	1.39	1.00	1.49
Total DGSF:NSF	1.29	1.44	1.22	1.52	1.14	1.59

Table 2 presents a picture similar to Figure 1; for example, the PACU department is found to have a large variability of the results, and so it is expected that 68.3% of the DGSF:NSF ratio measurements will range between 1.41 to 1.94. This is a very wide range of values, which can't provide significant assistant to programmers and/or designers of such spaces. On the other hand, when looking at acute care units, the findings show that it is expected that 68.3% of the DGSF:NSF ratio measurements will range between 1.47 to 1.61, while 95.5% of the measurements will range between 1.40 to 1.68. The overall total DGSF:NSF ratio is also found to be consistent within the 25 projects measured, and so it is expected that 68.3% and 95.5% of the measurements will range between 1.29 to 1.44, and between 1.22 to 1.52, respectively.

In order to be able to analyze the results further on, Figures 2 and 3 are presented as examples of two departments having different characteristics. In Figure 2, the intensive care unit is analyzed in terms of the actual measurements in comparison with the normal distribution assumption made. In this case, it can be seen that the actual measurements are tilted toward the lower side of the curve (with most measurements fall below the mean value,) and no measurements in both far ends of the curve exist. Any conclusions are still too early to be made at this time, given the small number of data points that are currently included in this figure.

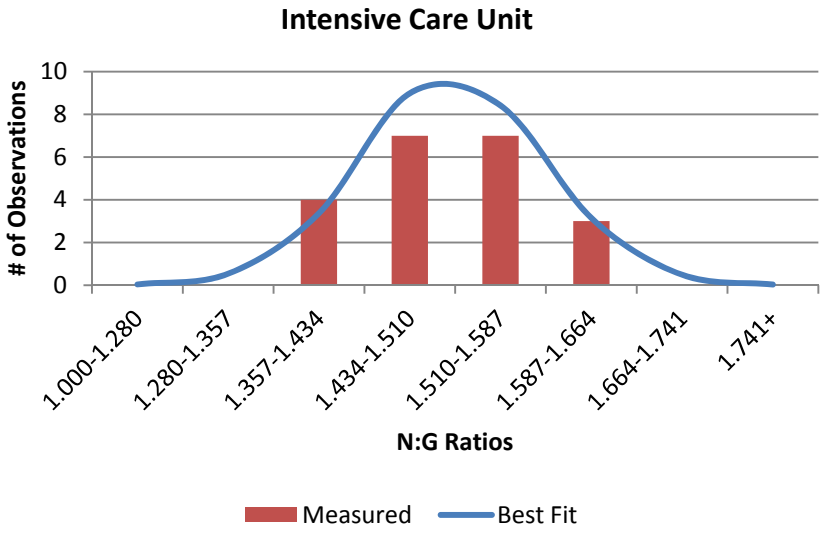


Figure 2: Distribution of DGSF:NSF ratio measurements for an intensive care unit; mean ratio: 1.51; based on 21 measurements

Figure 3 presents a similar analysis for the emergency department. Here, it can be seen that the distribution of the actual results mirrors the normal distribution curve pretty well. It can also be seen that a similar number of projects exist from both sides of the mean value, and one measurement even falls on the far right end side of the curve. As in the previous example, any conclusions are still too early to be made at this time, given the small number of data points that are currently included in this figure. What these two figures (Figure 2 and Figure 3) show us is a trend that can be either validated or invalidated in the future, with more measurements added to the study, and if validated, the range of values (as shown in the x-axis of these two figures) can also change.

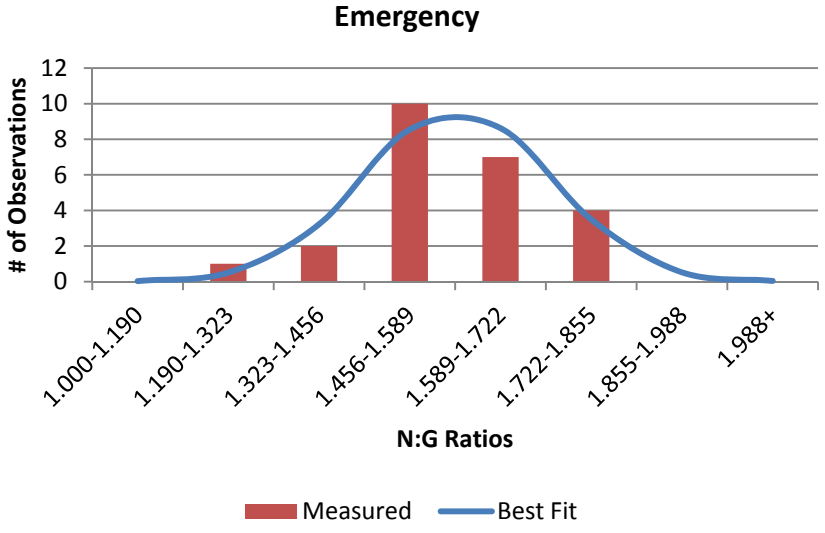


Figure 3: Distribution of DGSF:NSF ratio measurements for an emergency department; mean ratio: 1.59; based on 24 measurements

Another significant finding from conducting this project deals with the ratios of BGSF functions to DGSF areas. This aspect has not been studied before, and the findings show that BGSF:DGSF ratios are consistent within the 25 projects measured so far. The statistical analysis of the results shows that the expected values for the BGSF:DGSF ratio for 68.3% and for 95.5% of the projects is expected to range between 1.231 to 1.388 and between 1.153 to 1.466, respectively. Even within this range, the various BGSF functions have different contributions to these totals. Figure 4 shows the average percentages of various BGSF functions out of the total BGSF:DGSF ratio. It can be seen that the non-departmental corridors are the major component (40.0%), followed by the mechanical areas (23.1%). The third most influential function is the exterior wall, with a contribution of 14.5% to the ratio. These three functions contribute over 75% to the BGSF:DGSF ratio, while the remaining less than 25% are contributed by six other functions, naming (in decreasing order of their contribution): stairs (8.1%), vertical transport (6.4%), electrical (5.1%), communication distribution (2.1%), exterior covered areas (0.6%), and miscellaneous structures (0.0%). In this case too, any conclusions are still too early to be made at this time, given the small number of data points that are currently included in this figure. More significant conclusions will be available as the number of measured projects increases.

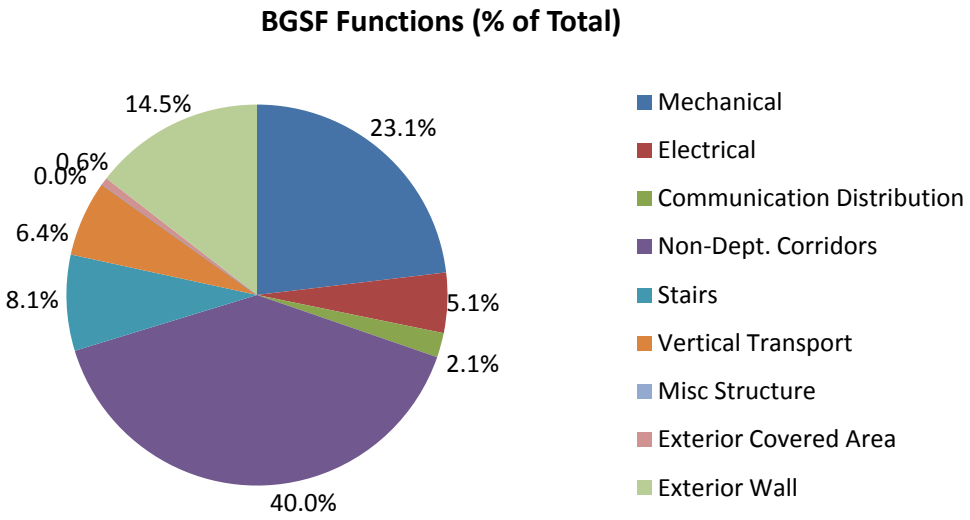


Figure 4: The contribution of various functions to the BGSF:DGSF ratio

Preliminary Conclusions

The reports and data on the 25 projects measured have shown several trends. The DGSF: NSF ratios for many departments are at or near the old rules of thumb used in practice (i.e., Acute Care). These rules of thumb have typically been based on the experience of the practitioner rather than data taken from several projects in a rigorous method. Some departments exhibit wider variation than others (i.e., Surgery, Imaging, ED, PACU). The ratios for Imaging and Surgery seem to be somewhat lower than past rules of thumb.

BGSF ratios and the breakdown of the BGSF components is potentially important new information for the profession. While the overall preliminary BGSF ratio seems to track around 1.3 and match the older rules of thumb, the greatest variation occurs among the mechanical and non-departmental corridors. As the number of projects measured increases, the different components of the BGSF can be further analyzed. One of the preliminary conclusions based on the BGSF ratios shows that rooftop mechanical systems impact the BGSF when compared with penthouse designs. Unusual design elements like large courtyard designs may also impact the percentage of exterior wall in the BGSF. The method for measuring overhangs, canopies, and partially enclosed spaces as a "half- area" measurement may not give the best explanation of what exists. This brings to attention the issue of measuring convention vs. accuracy. Many more hospitals need to be measured before the significance of these preliminary conclusions can be confirmed.

Limitations of the Study

These preliminary findings must be carefully considered and discounted as a result of the study's limitations. The sample size is quite small. Designers may be planning on the basis of the 'rules of thumb' from the past, therefore perpetuating the old ratios. There have been a limited number of firms providing projects to measure, so a bias may be present based on the planning habits of those firms. Quality of the source documents have varied by submission, so the researchers may have introduced interpretation errors. The sample contains few small critical access hospitals and no huge academic medical centers. Submissions consisting of additions or partial facilities have not yet been included at this point, as they do not offer a full view of all parts of a hospital.

What is Ahead?

There are plans for an interactive database in the future, when a sufficient number of projects have been measured. The research team would like to appeal for more submissions, in return for which participants will receive copies of reports and guidelines for consistent measurement methods.

EXHIBIT B

Evidence Based Design Research Lab
Center for Health Systems and Design
College of Architecture

TEXAS A&M UNIVERSITY

Area Calculations & Net:Gross Ratios in Hospital Design

Methodology Guide

August 20, 2011

Herman Miller Architecture
Academy of Architecture for Health Foundation
Alberta Infrastructure
Texas A&M University

Table of Contents

Introduction

Study Background

Hospitals and hospital designs have been changing. Plans must now address far higher percentages of outpatient care, accommodate new equipment modalities, and provide space to account for family presence in patient rooms. There are new and exciting advances, as in the case of robotic surgery or intervention suites combining invasive and imaging capabilities. There are substantially larger commitments to wired and wireless networks for communications and data transmission. Some departments, like the pathology laboratory may be shrinking in response to new machinery that can test more samples for more parameters with smaller and more compact devices. Architects and space programming consultants may wonder whether the projections made to plan for projects and their budgets can rely on the information gathered from projects in the past. Do today's hospital designs produce new ratios of net space to the gross area of departments, and the departmental gross to the gross space associated with the larger building? What constitutes the elements that make up the contemporary building gross square footage calculations in a new hospital?

Texas A&M University, through the College of Architecture's Evidence-Based Design Research Lab and principal investigators, Professor D. Kirk Hamilton and Associate Professor Sarel Lavy, with the support of Herman Miller Healthcare, the Academy of Architecture for Health Foundation, and Alberta Infrastructure, have been conducting a study to answer these important questions.

Procedures

-Conducting Area Take-Offs
-Generating Project Reports
-Revisions
-Checking Calculations

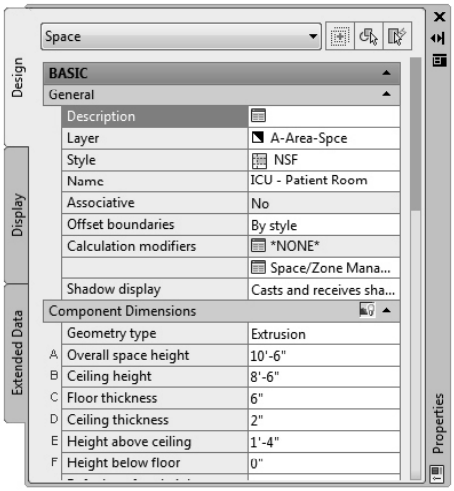
Conducting Area Take-Offs

Basic Process

1. Measure Building Gross Square Footage (BGSF) line items
    a. Identify zero area spaces (e.g. open to below, interior courtyards, etc.)
2. Measure Exterior Wall Thickness
3. Measure each Departmental Gross Square Footage (DGSF)
4. Measure individual room Net Square Footage (NSF)
5. Measure BGSF total floor area

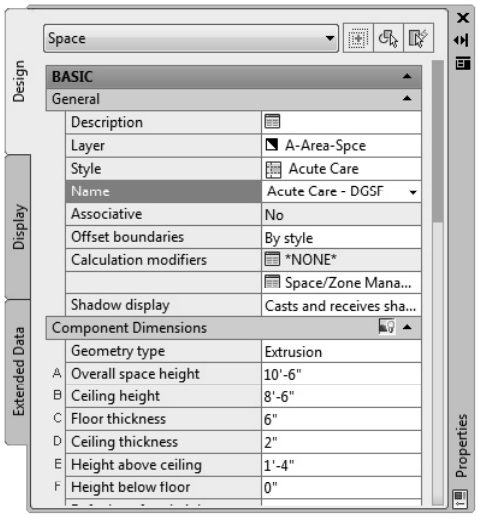
Net Square Footage (NSF)

In order to assure the correct identification of NSF in a department, consult with the colored floor plans that have been provided by the architectural firm. Sometimes, departmental boundaries will be included in the AutoCAD floor plans or department identification will be part of each room tag in the AutoCAD floor plans. Creating the measurement spaces is a three-step process: create polyline, convert to space, name space. To begin, draw a closed polyline around the desired room. This boundary should be along the interior finished face of the surrounding walls. Every room that belongs to the department must be measured. Major rooms to be included in the departmental NSF are: patient rooms and toilets, nurse stations, operating rooms, soiled and clean linen closets, and housekeeping closets. For any questions regarding the method to correctly identify the NSF space, please refer to the "Decisions and Judgment Calls" list. Next, the polyline is converted to what AutoCAD calls a "Space." These "spaces" are able to have specific identifying information assigned to them. Upon converting the polyline to a space, enter the required information into the appropriate fields.



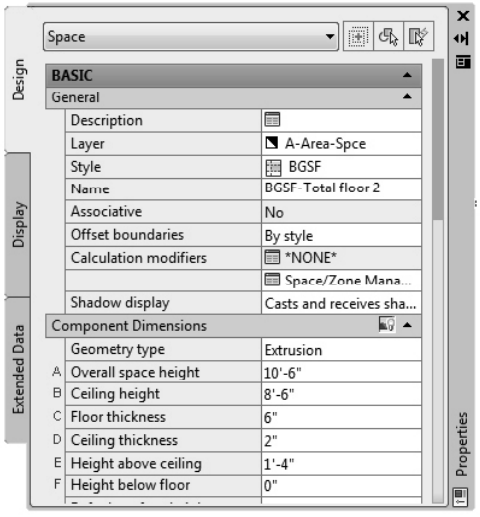
Departmental Gross Square Footage (DGSF)

After creating the “spaces” in the measurement drawing for each NSF item in a department, draw a polyline around the entire department to create the Departmental Gross Square Footage (DGSF) boundary. Included in the DGSF are wall thicknesses between all NSF spaces, departmental circulation, and building structure within the department. If a department is on an exterior wall, the DGSF boundary is drawn along the interior face of the exterior wall and does not include the columns along the perimeter of the exterior wall. When two departments share a common demising partition, the boundary line is drawn down the middle of this partition so that half of the demising partition is equally allocated to the two departments. Every department must be accounted for. For any questions regarding the method to correctly identify the DGSF space, please refer to the “Decisions and Judgment Calls” list. In a manner similar to the NSF three-step procedure, convert the polyline to a space, and enter the required information into the appropriate fields.



Building Gross Square Footage (BGSF)

The BGSF is comprised of the total area of each floor in the project. To measure the BGSF total floor area, draw a closed polyline around the exterior face of the exterior wall. In a manner similar to the DGSF procedure, convert the polyline that surrounds the building floor plate to a space and enter the required information into the appropriate fields.



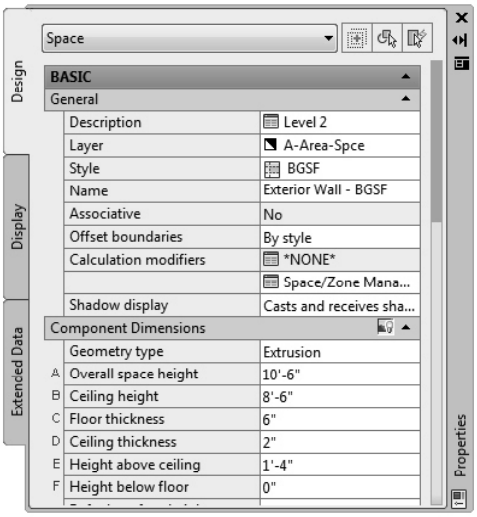
BGSF Line Items

There are several functions included in the BGSF that need to be identified. These functions are referred to as “BGSF Line Items” and include Mechanical, Electrical, Communications, Non-Departmental Corridors, Stairs, Vertical Transport, Miscellaneous Structure, and Exterior Wall Thickness. These line items will only have a “departmental” boundary; there will be no NSF, even if there are multiple rooms for a function. Follow the same rules when drawing the boundary for the BGSF Line Item that are used when drawing a DGSF boundary.

For covered areas that are not enclosed in the building envelope such as covered drop-offs, entries and exit niches, their square footage will be measured in the same three-step method and labeled Exterior Covered Areas. These spaces will be counted at ½ area to the total BGSF number and this calculation is completed in the Excel file. For any questions regarding the method to correctly identify the BGSF line items, please refer to the “Decisions and Judgment Calls” list.

To measure the BGSF line item Exterior Wall Thickness, draw a polyline following the perimeter of outside face of the exterior wall. Without closing the polyline, trace the interior face of the exterior wall in its entirety. Close the polyline and convert to a space. Enter the required information into the appropriate fields naming the space: Ext Wall Thickness-Floor #.

Note: The research team has elected to measure the departmental gross to the inside face of the exterior wall, and to allocate the entire thickness of the exterior wall to the building gross calculation. For any questions regarding the method to correctly identify the Exterior Wall Thickness, refer to the “Judgment Calls” list.

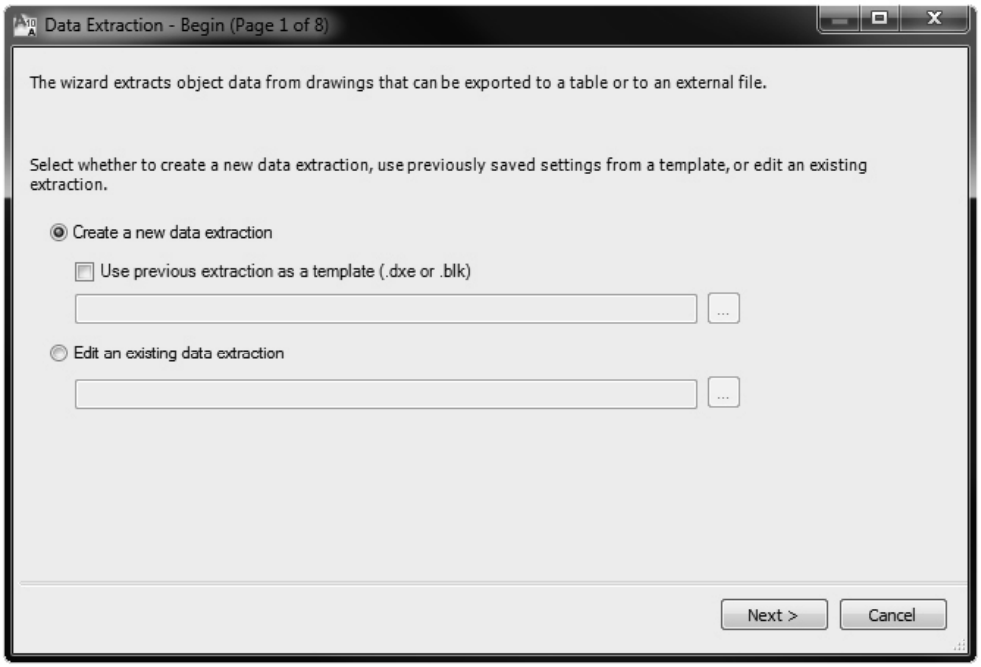


Generating Project Reports

Data Extraction and Sorting

Once the area take-offs have been completed for each area breakdown in the project, the data that lies within AutoCAD must be converted, sorted and organized to generate the necessary reports. This is possible with use of the “Data Extraction” feature in AutoCAD. This feature will extract the data and save it in a Microsoft Excel spreadsheet. Please refer to the sections AutoCAD Step by Step and Excel Step by Step for more detailed instructions.

The information should be sorted according to function – Patient Beds, Obstetrics Unit, Procedure Departments, Diagnostic Department, Centers of Excellence, Support Services, Administrative, BGSF Line Items, Related Areas Not in Calculation. After the data has been sorted appropriately, the Master Project List, Project Type Categories, and Ratings should be updated next by referencing the information from the individual project spreadsheet. The questionnaire responses are also listed on the information sheet. When the information sheet is completed, email the information sheet along with PDFs of the final department boundaries to the architecture firm that provided the project. The architecture firm’s participation in reviewing the final report is an important part in the process. Any comments the architecture firm has should be sent to the research team at Texas A&M and any necessary adjustments will be made. All of the correspondence between the research team and the architecture firm needs to be filed in both hard-copy form and electronic form.



Revisions

Revisions to Completed Projects

The research team has determined there are measurement corrections that need to be considered on all previously completed and measured projects (Projects A-X). The calculation for determining the Exterior Wall Thickness has been evaluated and found not to be accurate enough for the purpose of this study.

The original method for calculating the Exterior Wall Thickness was a subtractive method: the Department grand total and the BGSF Line Item grand total were both subtracted from the BGSF grand total. In theory, this left only the square footage for the Exterior Wall Thickness. However, the research team decided it is more accurate to use an additive method in calculating the Exterior Wall Thickness. The additive method measures the Exterior Wall Thickness in AutoCAD using the same three-step method used on all other parts of the floor plan.

The second correction to be made to each project calculation is calling out Exterior Covered Areas and Miscellaneous Structure in the BGSF line items. (Miscellaneous Structure items include shear walls, cross bracing and other structural elements not calculated in Department Gross or the Exterior Wall Thickness.) In the original calculation these items were not subtracted from the BGSF grand total when calculating the Exterior Wall Thickness. Therefore the Exterior Wall Thickness square footage was skewed in the original calculation. In the new calculation using the additive method described above, these BGSF line items will be correctly calculated for and errors similar to this will be avoided.

These corrections have implications on the progress of the study. Each completed and measured project will need to be checked and may need to be repaired. To repair each project the Exterior Wall Thickness, Exterior Covered Areas, and Misc Structure will be measured in AutoCAD. The data will then be re-extracted from the AutoCAD software and re-sorted into Excel. A new report will be created reflecting the new calculations. This report will then be sent to each architecture firm for the new findings to be reviewed and reconciled. The process of checking and repairing each project has started and the status is shown in the Progress Report.

Checking Calculations

Methods to Checking Accuracy

The research team has discovered methods in which to verify the measurements conducted by the research team:

By using the additive method for calculating the exterior wall, there is now a way to double check the accuracy of the entire calculation: the Department grand total plus the BGSF Line Item grand total (including the Exterior Wall Thickness square footage) should equal the BGSF Total Floor Plate Area grand total (which is derived by using the three-step method in AutoCAD).

A rule of thumb used by the research team to ensure the measurements were conducted accurately is that the BGSF Total Floor Plate Area grand total must be within 1% of the BGSF Total generated in the report by adding the Department grand total to the BGSF Line Item total. This ensures that the accuracy of the measurements conducted by the research team do not impact or skew the DGSF:BGSF Ratio. If these two numbers are not deemed to be accurate enough the research assistant must go back to the drawings and double check all measurements until the miscalculations are found.

One method the research team uses to further check the accuracy is to is to extract the data floor by floor. All BGSF Line Items and DGSFs are added together and compared to the BGSF Total Floor Plate Area. These two numbers should fall within the 1% rule mentioned above. If they do not, the researcher is able to determine which floor is not calculated accurately before extracting and sorting all data to generate the final project report. This method adds little additional time to each project and verifies the accuracy level of the measurements conducted by the research team.

Detailed Methodology

-Definitions
-Judgement Calls

Definitions

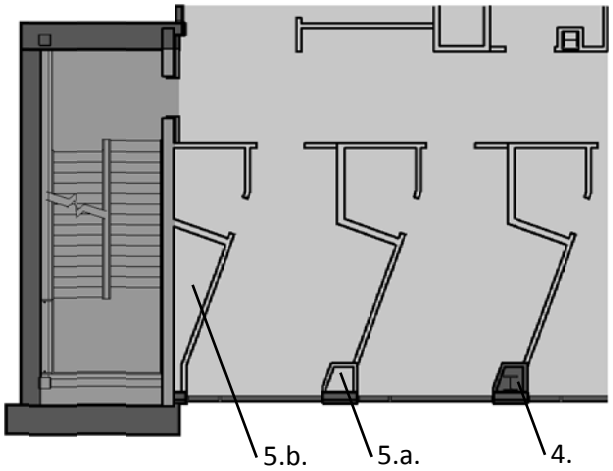
Basic Definitions

Methodology

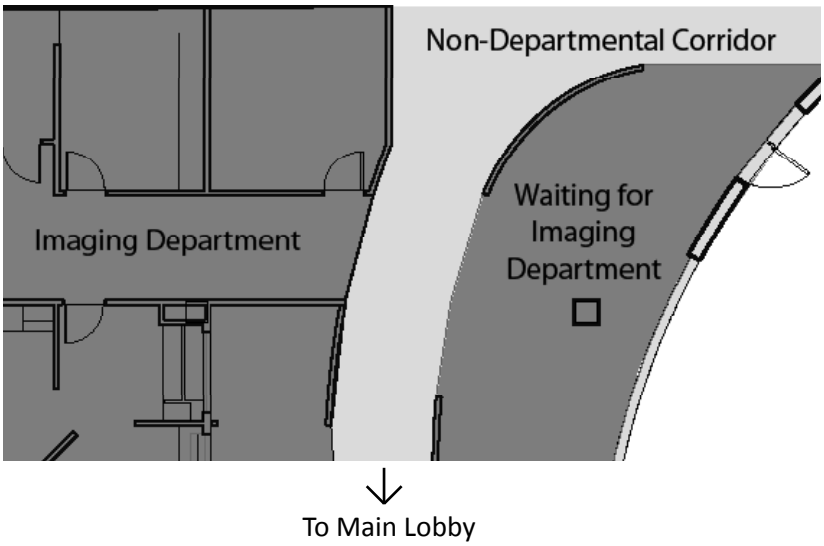
1. Net Square Footage (NSF) is measured to the inside face of the finished wall.
2. DGSF is measured to the inside face of the exterior wall and the entire thickness of the exterior wall will be allocated to the BGSF line item, Exterior Wall Thickness.
3. Attached medical office buildings (MOB) will not be measured or included in the calculations. Hospital related functions located within the medical office building will not be measured, but will be listed on the first page of the project report. The exterior wall thickness will be measured as it appears in the drawings. No additional exterior wall thickness will be assumed or added to the calculations.

BGSF Line Items

4. Exterior Wall Thickness includes the exterior wall material, all columns along the perimeter of the wall and any furr-outs along these columns.
5. Furr-outs
    a. Located along columns on the perimeter or along the exterior wall will be included in exterior wall thickness. If furr-outs are along the exterior wall but do not contain columns, the area measured belongs to the department not to the exterior wall thickness.
    b. Located in department along perimeter of stairs and elevators – area measured as part of the adjacent department, not as part of the stairs or elevators.

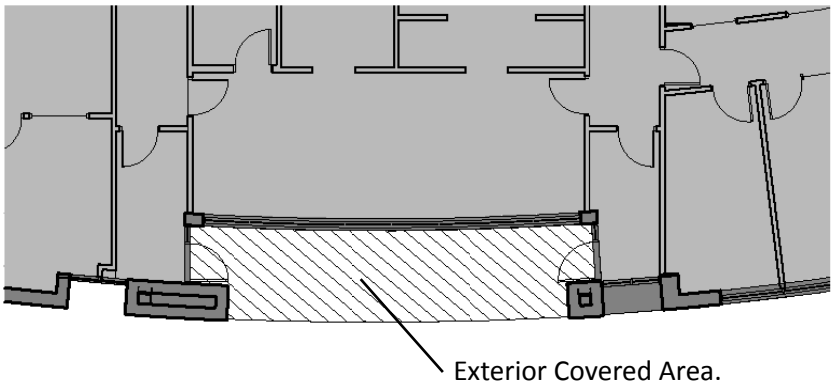


6. Enclosed roof-top mechanical space (eg. penthouses) = BGSF; mechanical areas not enclosed will be calculated as zero area.
7. The BGSF line item, Communication Distribution, is defined as rooms used for data/ communications distribution raceways and equipment. Data distribution areas may be identified in floor plans as MDF, IDF, or Communications.
8. Miscellaneous structure items include shear walls, cross bracing and other structural elements not calculated in the Department Gross or the Exterior Wall Thickness. Each item is assigned its own DGSF and labeled Misc Structure.
9. Lobbies for all elevators are included in the 'Non-Departmental Corridors'.
10. Revolving doors and vestibules will be designated as Non-Departmental Corridors.
11. Circulation:
    a. All stairs are included in BGSF and called out as 'Stairs'
    b. All elevators included in BGSF and called out as 'Vertical Transport'. This also includes dumbwaiters and cart lifts.
    c. Internal departmental corridors are included in DGSF.
12. All other corridors are not in the DGSF are called out as non-departmental corridors in a BGSF line item. The boundaries for these corridors are measured from the exterior face of the department boundary wall to the interior face of the exterior wall. Do not split the wall thickness between non-departmental corridors and departments. Public corridors may be split only when major departmental circulation overlaps with the non-departmental corridor, or when a single department is truly split by the non-departmental circulation. Special circumstances may include non-departmental circulation that splits a department into two parts. Examples may include surgery or imaging departments.



Exterior Covered Areas and Canopies

13. Canopies attached to the building are measured as half the area of the canopy and will be listed under 'Related Areas Not In Calculations'. Ambulance covers have two options: If created by the building overhang they are measured as half the area and included in the Exterior Covered Areas even if enclosed in the building envelope. If cover is an attached canopy, then it is measured as a Canopy and listed below the calculation line.
14. Exterior exit niches (recessed exterior door swing) are calculated as half the area if covered, or zero area if not and will be listed as Exterior Covered Areas.

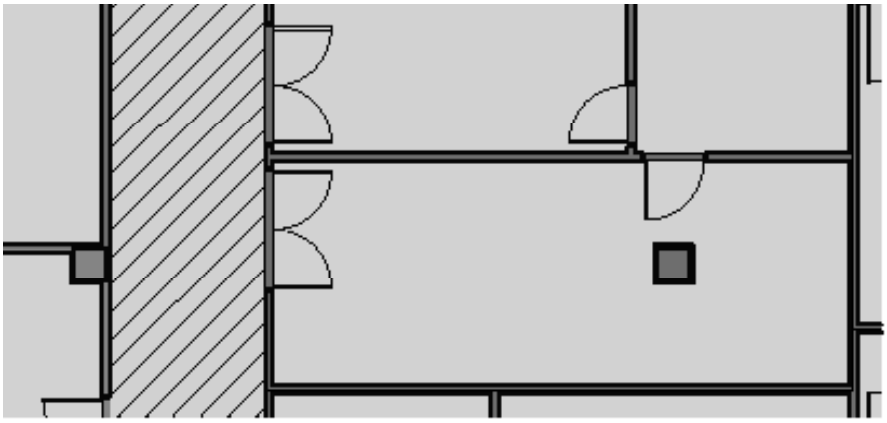


Exterior Covered Area.
Calculated as half the total area.

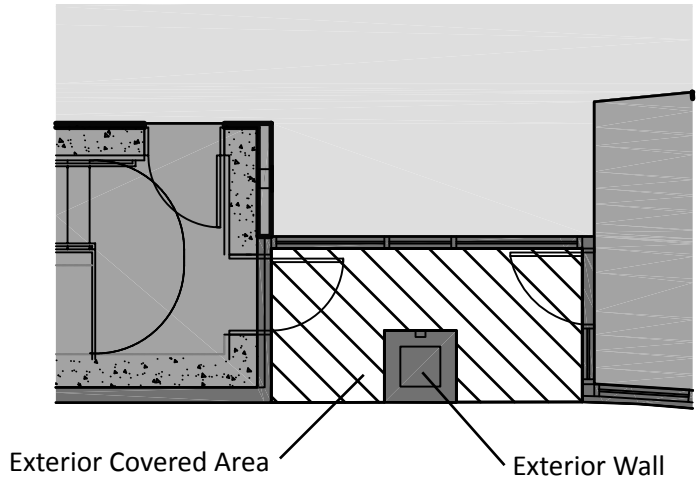
15. Exterior healing gardens, labyrinth type spaces, roof gardens, and courtyards are measured as a ½ area if covered, or zero area if not. If these spaces are enclosed and located in the building envelope, the full area is measured. Follow the rules for Canopies versus Exterior Covered Areas.

Columns

16. Columns located within a department are included in that department's gross square footage and do not receive a NSF.



17. Columns supporting Exterior Covered Areas will be included in the calculation for the Exterior Wall Thickness. The square footage of the columns will be subtracted from the overhang square footage for the Exterior Covered Area.



Connections to Other Buildings

18. Tunnels to power plant or other needed service will be measured if it is tall enough for a walking space and placed below the calculation line under Related Areas Not In Calculations. Buried utility lines or crawling tunnels will not be measured.
19. A Bridge or walkway to a building not included in the measurement drawings (eg. for outbuildings to a facility) is not calculated. The exterior wall of the hospital will be treated as if the bridge or walkway does not exist but no additional exterior wall will be added.

Light Wells and Atriums

20. Atriums or 'open to below' areas: the full area of the bottom-most level is measured once if covered, zero area if not. All other floors the atrium passes through are assigned a zero area and subtracted from that floor's total BGSF floor area. Verify all enclosing exterior walls are properly measured.
21. Skylights and light wells located in the interior of the building are treated as an atrium. The full area is measured once if covered, or zero area if not. Verify all enclosing exterior walls are properly measured.
22. Skylights and light wells located on the perimeter of the building with and open side are calculated once as ½ area if covered, or zero area if open to the sky and called out as 'Exterior Covered Areas'. Verify all exterior walls are properly measured.

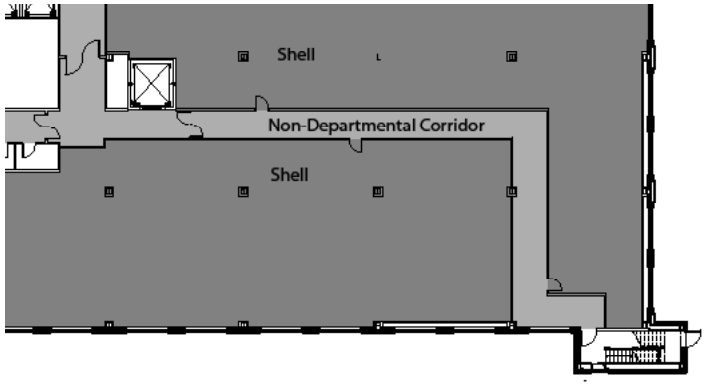
Departments

23. The thickness of the demising wall, that separates two departments from each other, is sometimes composed of varying thicknesses. For departmental boundary measurements there are two possible scenarios.
    a. The first is when two walls of differing thicknesses abut end to end. For this condition, join the centerlines each wall as shown in Figure 1.
    b. The second condition is when two walls of differing thicknesses join a third wall, which is typically at a 90-degree angle to the demising partition. The centerline of the perpendicular wall should serve as the joining point for the two centerlines.
24. When the “wet wall” of a toilet room falls along a departmental boundary, do not split the overall thickness, which would include the plumbing chase. All of the area that includes the plumbing should belong to the department to which the toilet room belongs.
25. Satellite conditions, such as labs, pharmacies, material handling spaces, etc. are to be called out separately. For example: the main pharmacy department will have its own NSF and DGSF. If there are three satellite pharmacies, the NSF and DGSF for all three will be added together and labeled Satellite Pharmacies (3). Other spaces that could have satellites are: Respiratory Therapy, Biomedical and Dietary.
26. The IT Department is defined as where people work and the main computer frame systems are located. These areas are separate from “Communication Distribution” areas and will be assigned a NSF and a DGSF and classified as Information Technology.
27. Folding partitions in rooms: the space allocated for the storage of the partition will not be included in the NSF only in the DGSF.
28. For open telephone and vending areas, calculate the 8’-0” for the adjoining corridor. Anything beyond this measurement will be assigned a NSF and included in the Lobby/ Public DGSF.
29. Trash chutes will have their own DGSF and will be included in the ‘Vertical Transport’ BGSF line item. They do not get their own NSF. If the trash chutes are part of the soil linen room within a department, only the trash chutes will be counted towards the Vertical Transport BGSF and the soiled linen room will be measured as part of the department and assigned a NSF.
30. Public toilets located throughout the building will be assigned a NSF and Lobby/Public DGSF. If the public toilet is part of the program for the department, it will be measured in the department’s DGSF.
31. Public waiting areas that are not specifically included in a single department will be classified as Lobby/Public spaces. Example: waiting area located directly off elevator but not included within the department boundary.
32. Large concourse areas will be called out as ‘Concourse’ and be assigned a NSF and DGSF. This department is different than an extra wide corridor. Correspondence with architecture firm may be necessary.

33. Undefined waiting and lobby areas on the first floor will be calculated as one large Lobby/ Public space and assigned a NSF and DGSF.
34. Cafeterias and bistros are included in the Food and Nutrition Department.
35. Flex beds between two departments will be included in the department in which the beds are used during the day. Correspondence with architecture firm may be necessary.
36. Salons and spas will be designated as Retail.
37. Central telemetry monitoring for acute and ICU beds will be given to acute care.
38. The obstetrics department may have spaces that are shared or do not belong to any single department. These spaces will be designated at Shared Spaces under Obstetrics.
39. Play areas and breast feed rooms if near a department will be included in the departmental DGSF. If rooms are located in a public or lobby area they will be designated as Public/Lobby.

Shell Space

40. Shell space will be identified as a department and assigned a NSF and DGSF. The unfinished area should be treated as a large NSF measurement, only extending to the interior finish face of any bounding walls.
41. When a shell space floor has a main building corridor passing through it, for example to egress stairs, the building corridor will be measured as Non Departmental Corridors. The corridor will not be included in the shell space area.



42. Shell within a department that is allocated as a future space (eg. future CT room in an Emergency Dept). The future CT room will be assigned a NSF and counted in the Emergency Department Gross not counted in the Shell calculation.
43. When adding the shelled space to the data sheet, it will be inserted as a separate line item Shell space that has been labeled as storage on the plans for construction document purposes will be measured as shell space. Coordination with the architecture firm is

necessary to properly differentiate between shell and storage areas.

44. after the total summation of the NSF and DGSF for the project. A net:gross factor will be calculated. A new grand total number will be produced for NSF and DGSF that includes the

	NSF Total	Sub NSF	DGSF Total	Sub DGSF	Net:Dept	Net:Dept
Total:	241,863		372,242			1.54
Shell Space:	37,103		37,601			1.01
Grand Total:	278,966		409,843			1.47

shell space. Also, a new net-gross factor will be calculated that includes the shelled space.

Parking

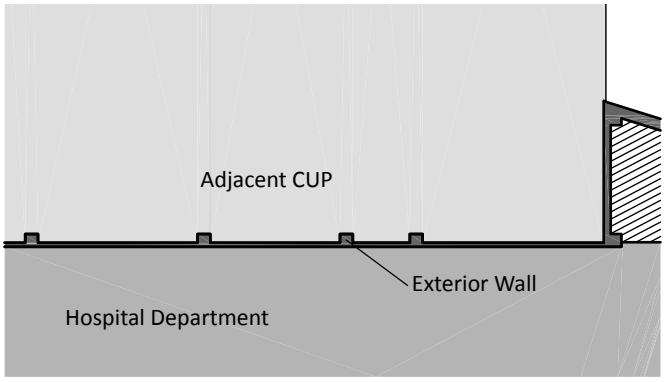
45. Parking space enclosed within the building envelope will be assigned a DGSF and placed below the calculation line under Related Areas Not In Calculations. The DGSF will be measured as all of the usable square footage for parking and vehicular circulation. When the parking space DGSF meets the open air at entrances and exits, the DGSF line is drawn so that it is in-line with the outermost edge of the exterior wall.

Central Utility Plant

46. Central Utility Plants (CUP) are assigned only a DGSF and listed below the calculation line. Two possible circumstance include:

    a. The CUP is a detached piece. The exterior wall for the CUP is not counted in the Exterior Wall calculation. It is included in the CUP DGSF listed below the calculation line.

    b. The CUP is attached to or enclosed within the building envelope. An exterior wall will be created at the wall boundary between the CUP and the remainder of the hospital. The CUP is excluded from the Total Floor Area and the DGSF will be included below the

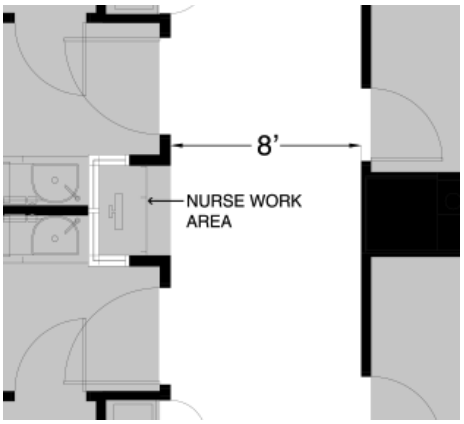


calculation line.

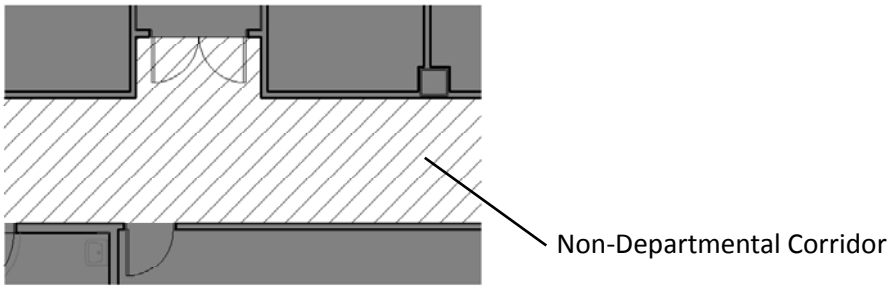
Judgement Calls

Nurse Work Areas

1. Pneumatic tube stations are included in the DGSF but do not get their own NSF.
2. Open work areas and chart areas will be assigned a NSF and be counted in the departmental gross. Respect the 8’-0” minimum requirement for corridors.

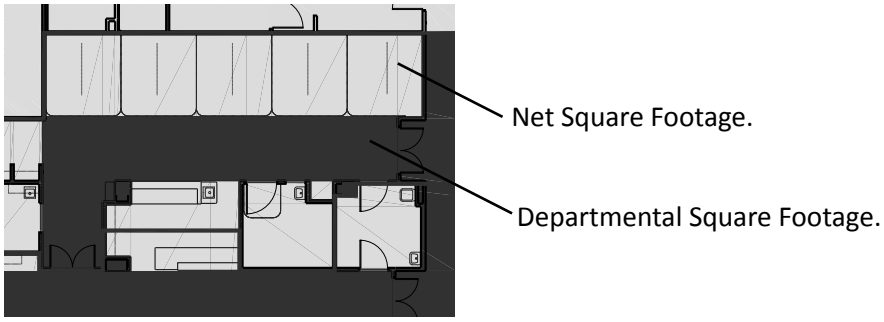


3. Recesses for door swing are part of the non-departmental corridor BGSF, unless the niche is used as an equipment alcove or crash cart storage. Then it is included in the departmental gross and the equipment area receives a NSF.

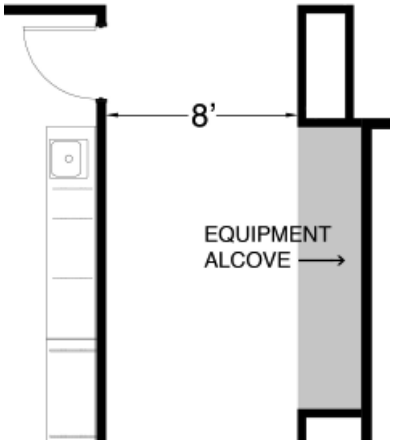


4. If the meds supply station is not adjacent to the nurse station, the circulation that is needed to get from the nurse station to the meds supply station is not included in the NSF, but is factored into the DGSF.
5. If the boundary of the nurse station is not clearly defined on the floor plans by the architect, The NSF boundary will extend to the edges of counters and exterior face of the walls that define the space. Respect the 8’-0” minimum requirement for corridors. If the nurse station is set back from the line of the corridor, the extra square footage between the edge of the nurse station and the corridor line will be given to the nurse station NSF. If the entire corridor width is larger than the 8’-0” minimum, respect the entire width of the corridor.

6. Open patient care areas, such as PACU stations, Prep/Recovery areas, and NICU, that are not clearly defined with partitions will be measured as follows. The NSF for these spaces will not extend beyond the curtain line that defines the space and the corners will be squared off. All circulation between patient beds and nurse stations will be designated as DGSF. Respect the 8’-0” requirement for corridors.



7. Scrub/hand wash sinks located in an alcove off of a corridor will be counted in the department NSF. Respect the 8’-0” requirement for corridors.
8. Equipment alcoves located off of a corridor in the department will be given an NSF. Respect the 8’-0” requirement for corridors.
9. Public entry vestibules will be measured as Non-Departmental Circulation.
10. Public entry vestibules into an emergency department will be counted in the NSF and DGSF for that department.
11. When two departments located on the same floor share a specific room or space, the dominant department will be designated the NSF for the shared space. If it is not possible to assign a dominant department or the function of the shared space is required by both departments, the shared space NSF will be split between the two departments. The measurements for splitting the space will be conducted in AutoCAD and will be kept as simple as possible. Coordination with the architecture firm may be necessary.



Entries

Shared Spaces

12. The NSF boundary for a space with punched windows or curtain wall will be the line for the edge of the window sill.
13. When there is not a window sill visible in the floor plan given by the architecture firm, the NSF boundary should follow the outline of the wall and extend no further than the interior face of the window frame visible on the plan.

Windows

14. When there is only a curtain wall span of windows, the NSF boundary should follow along the interior face of the window frame on the plan.

Appendix

-List of Department Names
-AutoCAD Step by Step
-Excel Step by Step

List of Department Names

Department Names and Alternatives Names

NTGR Departmental Categories

DEPARTMENTS:	
Patient Units	(Total Bed Count Listed in Title)
Acute Care Unit	
Cardiac	
Medical/Surgical	Note: use Medical/surgical for General Acute Care beds
Oncology	
Orthopedic	
Pediatric	
Intensive Care Unit	CCU - Critical Care Unit
Cardiac ICU	
Coronary CCU	
CV ICU	
General ICU	
Medical ICU	
Neuro ICU	
Pediatric ICU	PICU, Peds ICU
Respiratory ICU	
Surgical ICU	
Trauma ICU	
Intermediate Care Unit	IMCU, step down, progressive care, telemetry
Long Term Acute Care	LTAC
Psychiatric Care	
Skilled Nursing	
Obstetrics	
Ante Partum	
C-Section	
LDR	
LDRP	
Neonatal ICU	Newborn ICU, NICU
Newborn Nursery	Not included in Bed Count, Special Care Nursery included
Post Partum	
Shared Support	*Rooms that do not belong to any one department related to obstetrics care
SRMC	
Procedure Departments	
Emergency Department Total	
Emergency Department	
Clinical Decision	Short Stay, 23 hr stay
Observation	
Pediatric ED	
Dialysis	
Endoscopy	Bronchoscopy, Gastrointestinal
Hyperbaric Suite	
IV Therapy	
PACU	
Pheresis	
Pre-Operative Care Unit	Pre-OP
Prep/Recovery Unit	Combination Unit, Peri-operative Unit
Rehabilitation Total	
Rehabilitiation	
Hydrotherapy	
Respiratory Therapy	
Secondary Recovery	
Surgery Department Total	
Surgery	
Ambulatory Surgery	
Interventional Imaging	

Diagnostic Departments	
Cardiac Cath	
Cardiology	EKG
Imaging	
Radiology	
Nuclear Medicine	Break out dept if substantial or if called out by firm. Don't measure if buried in dept
Women's Imaging	Break out dept if substantial or if called out by firm. Don't measure if buried in dept
Neurodiagnostics	EEG, Epilespy Monitoring
Pathology	
Clinical Laboratory	
Satellite Lab	
Morgue	includes body hold room
Pre-Admission Testing	may include blood draw
Pulmonary Function	
Urodynamics	
Centers of Excellence	Depts big enough to have a large dept boundary or outside door, ambulatory like
Cancer Center Total	
Cancer Center	
Oncology/Chemotherapy	Treatment and infusion
Radiation Therapy	
Cardiac/Heart Center	
Support Services	
Bio Medical Engineering	equipment maintenance
Building Maintenance	electrician, carpenter, maintenance, etc
Central Sterile Processing	
Engineering /Facility Management	operations offices
Environmental Services	janitorial and housekeeping services not housed in a dept
Food & Nutrition	watch for elements near loading dock that are kitchen related, includes kitchen and dining
Linen	or laundry, break out dept separate from materials mgmt
Materials Management	includes waste management, biohazard room
Pharmacy Total	
Pharmacy	may include blood draw unles blood draw tied to admitting or pre admission testing
Satellite Pharmacy	could also be a decentralized blood draw
Security	
Staff Support	
Administrative & Public	
Administration/Medical Staff	
Business Offices	
Chapel	includes chaplaincy
Conference/Education	Patient and Staff education
Gift Shop	
Information Technology	
Lobby/Public	
Medical Records	HIM, Health Information Management
On Call	
Patient Admitting	may include blood draw
Public Spaces	
Lobby/Reception/Public Toilets	
Concourse/Gallery/ Main Street	also called multi-departmental waiting
Registration	
Resource Center	library or patient resource center, typical from planetree model
Retail	
Volunteer Services	
Shell Space:	
BGSF	
Mechanical	Includes major shafts
Electrical	
Communication Distribution	
Non-Departmental Corridors	
Stairs	
Vertical Transport	Elevators
Misc Structure	
Exterior Covered Areas	
Exterior Wall Thickness	
Related Areas Not In Calculations	
Faculty Offices	calculate DGSF only - similar to shell
Research Areas	calculate DGSF only - similar to shell
Clinics	calculate DGSF only - similar to shell
Central Plant	CUP, Power Plant
Canopies	1/2 area of canopy (not including supports)+ full area of canopy supports
Parking	Only parking that is determind to be located within the building envelope. Does not include garages.
Tunnels	Covered walkway only = 1/2 area; Totally Enclosed = Full Area; If no tunnel given = N/A

AutoCAD Step By Step

Preparing the Measurement Drawing File

1. Setup the file structure for the new project
    a. Rename the folder that contains the data sent by the architectural firm:
        i. "Project X" – letter will be next in the alphabet

2. Open AutoCAD and select the template file "A&M-NTGR-Temp" located in the folder "Setup Template" from our research project folder.

3. XREF the AutoCAD drawing sent from the architectural firm into a new drawing.
    a. The XREF should be on the layer named "XREF."
    b. Freeze or turn-off all layers except for the walls, doors, windows, casework, stairs, elevators, room tags, columns, and other similar/related layers

4. Save the drawing with the following nomenclature:
    a. Project Letter_FP-xx (FP: floor plan) (xx: floor number – 01, 02, 03, 04…)
    b. For basement floors, use FP-00

Process for Creating "Spaces"

For NSF:

1. Draw a closed polyline around the room
    a. Layer should be "A-Area-PL-NSF"
    b. COMMAND: "PL" or "PLINE"

2. Convert PLINE to SPACE
    a. COMMAND: "SPACE"
        i. Type "CO" for "Convert"
        ii. Window will pop up, select OK.
    b. **If columns exist within the NSF; draw a closed PLINE around them, Right-Click, choose AEC MODIFY tools, choose "SUBTRACT" and follow as prompted in the Command Line

3. Enter information for the room in the PROPERTIES TOOLBAR:
    a. Name field: DEPARTMENT-Room Name
    b. Description: Additional information about space if needed
    c. Style: NSF

4. Reapeat this process for all NSFs, DGSFs, BGSF Line Item and the Total Floor Plate Area
    a. Adjust names as necessary. Example: Name field: DEPARTMENT-DGSF.

Data Extraction

*****Once every floor has been completed, use the following instructions to complete the data extraction.*****

COMMAND: "dataextraction"
-new window opens on the screen

Page 1:
-Create new data extraction
-NEXT – "Save as" window – save in the folder "Data Extraction" within project – name file with the date of extraction in this format: "Project Letter_YYYY_MM-DD" (YYYY – 4 digit year; MM – 2 digit month; DD – 2 digit day)

Page 2:
-Add drawings button: add all of the drawings that correspond to the project that contain space objects
-Settings: uncheck boxes – "Extract from blocks" & "Extract from xrefs"
-OK and NEXT

Page 3:
-Only check "Space" from the list
-NEXT

Page 4:
-With "Category Filter" on right side, only check the boxes labeled:
1. Actual Dimensions and General
-With "Properties" on the left side, only check the boxes labeled:
1. Area, Description and Name

Page 5:
-Right click the following columns, one at a time, and select "HIDE COLUMN"
-Count and Name (with "space" as info in the cells below)
-Reorder the list by dragging the columns into this order:
1. Name
2. Description
3. Area
-Create new formula column:
-Right click on "Area" column and select "Insert Formula Column"
-Give new name: "Calc Area"
-Double-click area from column name list on the right side
-Click the "/" (divide) button and type "144" in the Formula prompt
-OK and Hide "AREA" column

Note: Uncheck all 3 options. Make sure to uncheck "Combine Identical Rows"
-NEXT

Page 6:
-Select "Output to external file"
-click the "…" button to choose file destination
-Save the extraction as an .xls file with the name: "Project Letter_YYYY_MM-DD" in the Data Extraction folder in the project file
-NEXT and FINISH

-Open the Excel spreadsheet to begin sorting the data.

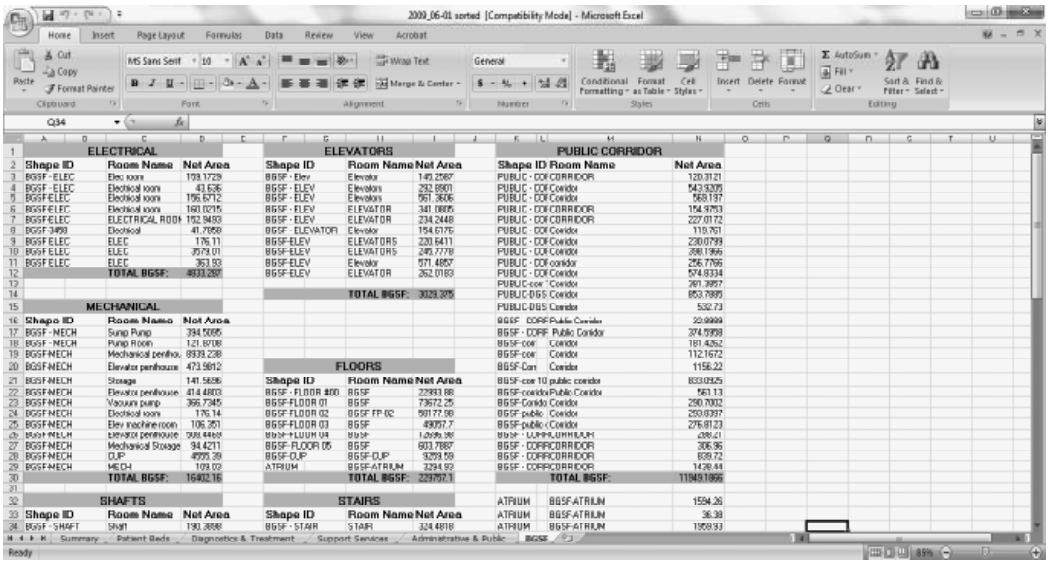
Excel
Step By Step

Data Sorting

-Open the .xls file with the extracted information
-Open “Setup spreadsheet.xls” from PROJECT DUMMY
-Copy info from extraction into the dummy spreadsheet
-Save the modified spreadsheet in the correct project data extraction folder with the name:
    -Project Letter_YYYY_MM-DD sorted.xls (YYYY – 4 digit year; MM – 2 digit month; DD – 2 digit day)

The columns in the spreadsheet should read as follows:
    A: Name
    B: Description
    C: Calc. Area
-Select all rows, excluding row one(1)
-From toolbar:
    -Data, “SORT”
    -Sort by column A, ascending
-Insert a new row between each group of departmental information

-Sort the data by departmental function; beds, then D&T, and so on…
-Copy the data from the “Summary” tab to the corresponding function and insert into the template provided
    -Note: formulas are already included in the spreadsheet.



Updating the Master List and Categories

-Open the Excel spreadsheet titled “MASTER LIST.xls” from:
  -NTGR – Documents – Excel – MASTER LIST.xls

-Have the current project spreadsheet open

-In the Master List, the NSF and DGSF numbers will be copied manually into the corresponding cells for the project from the project spreadsheet.
  -Within the appropriate cell in the Master List file, copy and click over to the project spreadsheet.
  -select the appropriate cell for the NSF, DGSF, or BGSF number
  -Special Paste Value only into the cell
  -Do this for each department and BGSF line item

-Create the data sheet report for each project
  -Copy one of the existing tabs from the bottom of the spreadsheet and change the title to correctly correspond with the most recent project.
  -Copy the NSF, DGSF, and BGSF line items into the new data sheet.
  -Do not include all of the responses to the questionnaire in the data sheet, but be selective enough to be able to paint an adequate picture of the project with responses from both the architect and programmer.

-Save the data sheet as a .pdf file in the project folder on the server
  -use the following naming: PRJ_A_ YYYY-MM-DD.pdf

-Email the completed project report and PDFs of the measurement drawings to the research team for their comments

-Make adjustments based on comments and email modified project report and drawings

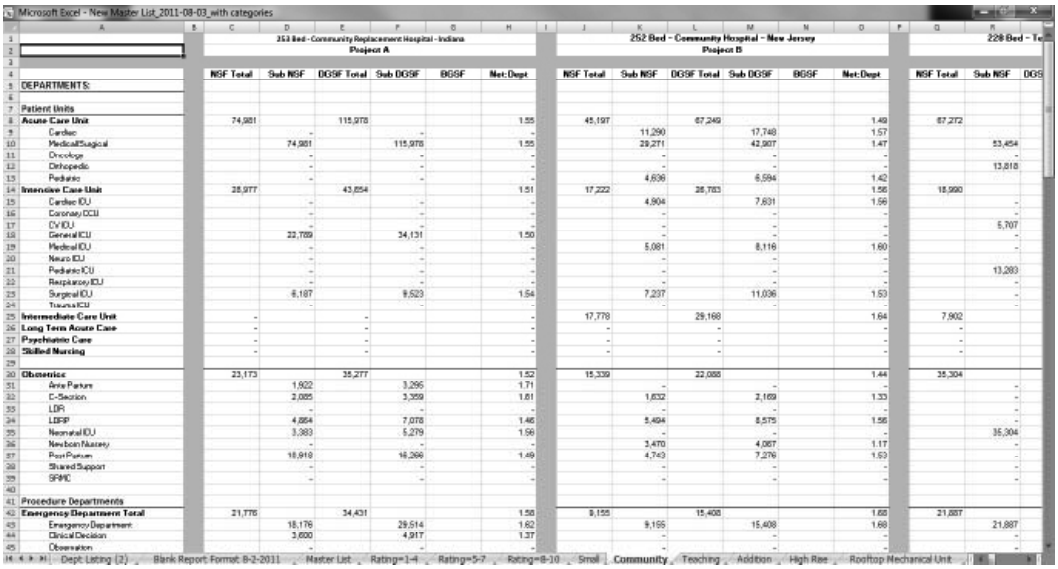


EXHIBIT C

Educational Institutions With Which
PGHC Has Additional Medical Education Affiliation Agreements

School	Department
ACE Surgical Assisting	Clinical
Albany College of Pharmacy and Health Sciences	Pharmacy
Appalachian College of Pharmacy	Pharmacy
Benedictine University	Clinical
Carroll Community College	Clinical Education Physical Therapy
Chamberlain College of Nursing	Nursing
Chatham University	Social and Health Sciences
Community College of Baltimore County	Health Information Management
Coppin University	Health Information Management
Fortis Institute	Surgical Technician
Frostburg University	Nursing
Gallaudet University	Speech Language Pathology
George Washington University	Art Therapy
Georgetown University	Nursing
HCCC	All clinical; Pharmacy Technician
Herzing University Online	Health Information Management
Howard University	Physical Medicine; Lab; Nursing; Pharmacy; Occupational Therapy
Husson University	Clinical (pharmacy)
Independence University	Clinical
Indiana State University	Clinical
Johns Hopkins University	Nursing
Kaplan University	Nursing/Clinical
Lebanon Valley College	Physical Therapy
Lecom	Pharmacy
Loyola University	Speech Language Pathology
Marymount University	Nursing
MCI/ECPI College of Technology	Nursing
Medix School West	Surgical Technology
Montgomery College	Clinical
Morgan State University	Clinical
Neumann University	Physical Medicine
Prince George's Community College	Clinical: EMT-1, EMT-P, NRSG, Resp, RAD, Nuclear Medicine; Non-Clinical: Health Information Technology/ Health Information Management
Sojourner-Douglass College	Nursing
Stevenson University	Nursing
Stratford University	Nursing
TESST College of Technology/Kaplan	Non-Clinical Administration
Texas Woman's University	College of Nursing—clinical
Trinity University	Nursing
Trinity Washington University	Clinical
University of Maryland Baltimore County	Administration
University of Maryland	Physical Medicine; Pharmacy
University of Maryland (Baltimore)	Nursing
University of Maryland (College Park)	Speech Language Pathology
University of Maryland Eastern Shore	Pharmacy
Walden University	Nursing; Public Health; Counseling
Washington Adventist University	Nursing; Health Care Administration

EXHIBIT D

Chapter 1: Introduction

Sector Plan Area Boundary

A project to update the 1990 *Largo-Lottsford Approved Master Plan and Adopted Sectional Map Amendment* was approved by the District Council as part of the Prince George's County Planning Department of The Maryland-National Capital Park and Planning Commission's (M-NCPPC) fiscal year 2012 work program. A study was conducted in April 2011 by M-NCPPC staff to identify and justify a boundary for the proposed Largo-Lottsford Master Plan update. This study included evaluation of the following seven areas: Woodmore Town Center area, Woodview Village/North Lake Arbor area, South Lake Arbor area, Largo Town Center Metro Station area, Central Avenue East/Kingdom Square area, Central Avenue West/Central industrial area, and Morgan Boulevard Metro Station area. The boundaries of the Largo Town Center Sector Plan were further refined after extensive M-NCPPC staff review and research of approved plans governing future development at the Largo Town Center Metro Station.

The boundaries of the Development District Overlay Zone (DDOZ) were established through an extensive stakeholder and community outreach planning process that included community workshops held in February, September, October, November, and December 2012.

The Largo Town Center sector plan area occupies portions of Planning Area 73 (Largo-Lottsford) in central Prince George's County. It is generally bounded by I-95/I-495 (Capital Beltway), MD 202 (Landover Road), the southwest boundary of the Woodview Village subdivision, Campus Way North, Lake Arbor Way, Landover Road (south of Lake Arbor Way), and MD 214 (Central Avenue). (See Map 1: Sector Plan Area Boundary on page 2 and Map 2: Largo Town Center DDOZ Boundaries on page 3.)

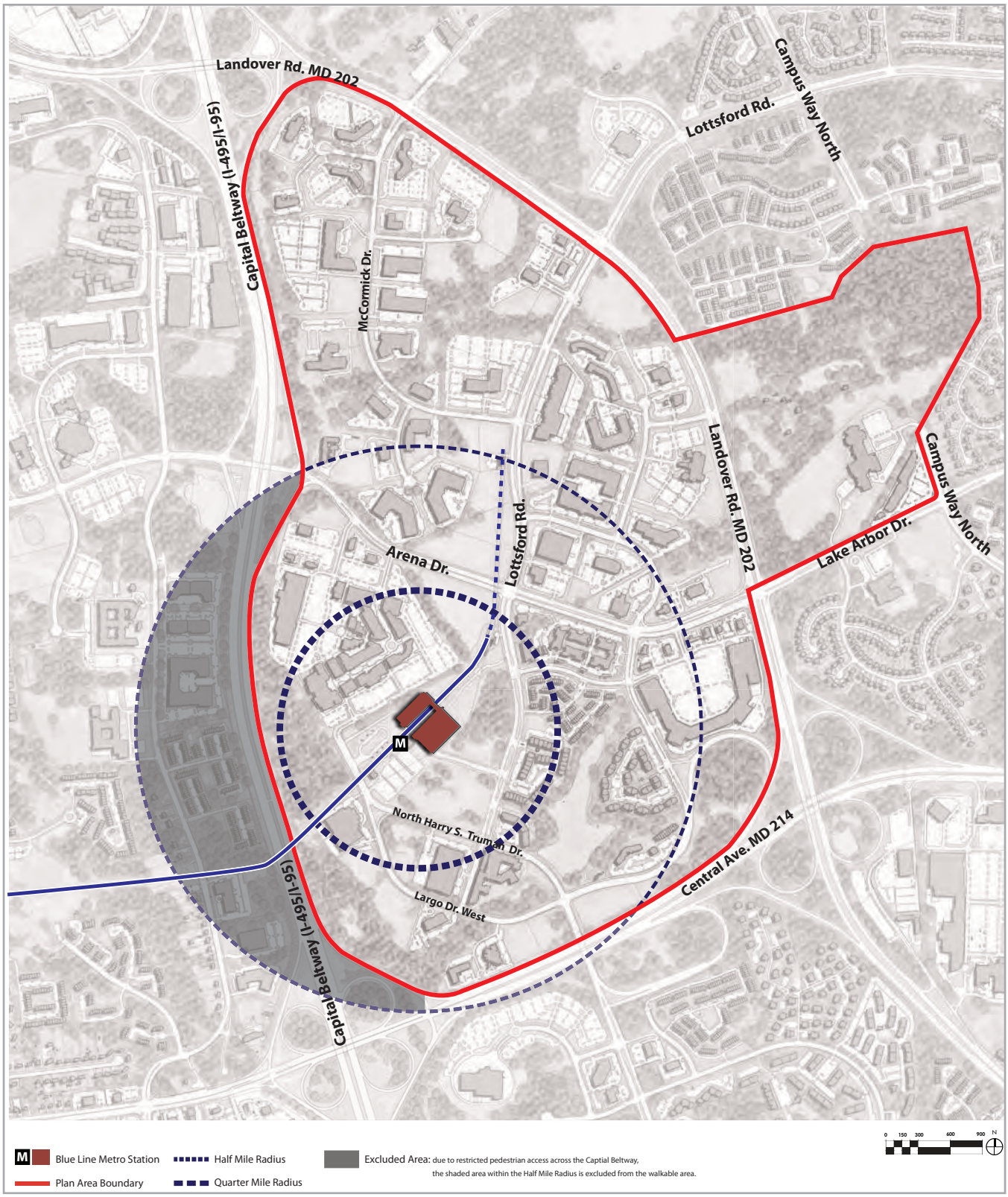
Regional Setting

The sector plan area contains approximately 800 acres of land, more than 200 acres of which are vacant or undeveloped. The area is anchored by the Largo Town Center Metro Station. The Metro station is the terminal station for the Blue Line in Prince George's County and offers direct rapid transit access to the rest of the metropolitan Washington region as well as connections to Amtrak and commuter rail (MARC and Virginia Railway Express) service. Largo is an unincorporated area; the nearest municipality is Glenarden, Maryland, with town limits that include the Woodmore Towne Centre at Glenarden immediately north of Landover Road.

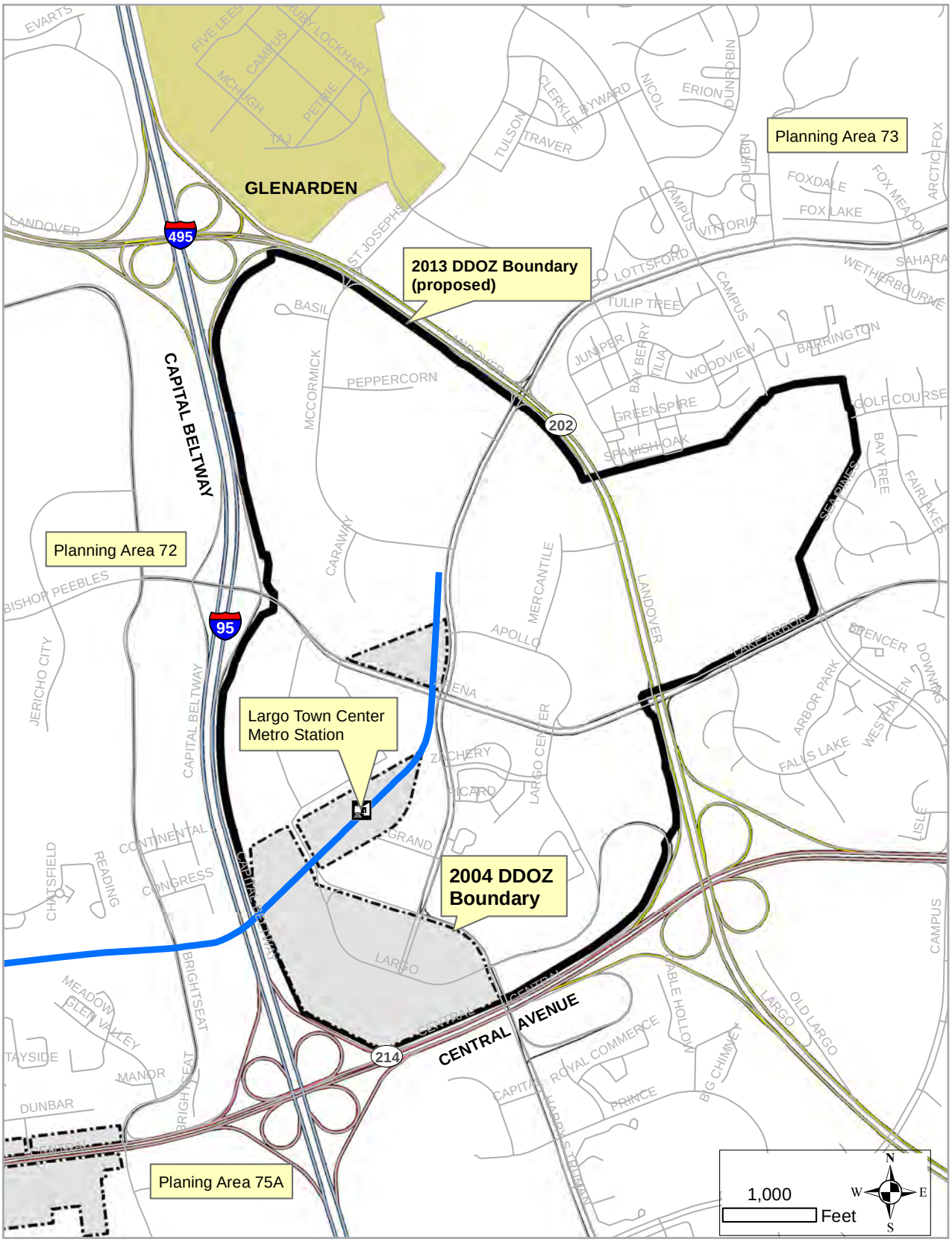
Located in Prince George's County, five miles east of Washington, D.C., Largo Town Center is highly accessible by automobile, intersecting several regionally important highways and roadways: Capital Beltway on the west (three interchanges provide the sector plan area with ample access to and from the highway), MD 202 to the north and east, and MD 214 to the south. Additionally, US 50 (John Hanson Highway) is located approximately 2 miles to the north, Baltimore-Washington Parkway is located approximately 5 miles to the northwest, and MD 301 (Crain Highway) is located approximately 10 miles to the east (See Map 3: Location of Largo Town Center DDOZ on page 4.)

The University of Maryland University College is located within the plan area, and Prince George's Community College is one-half mile to the south of the plan

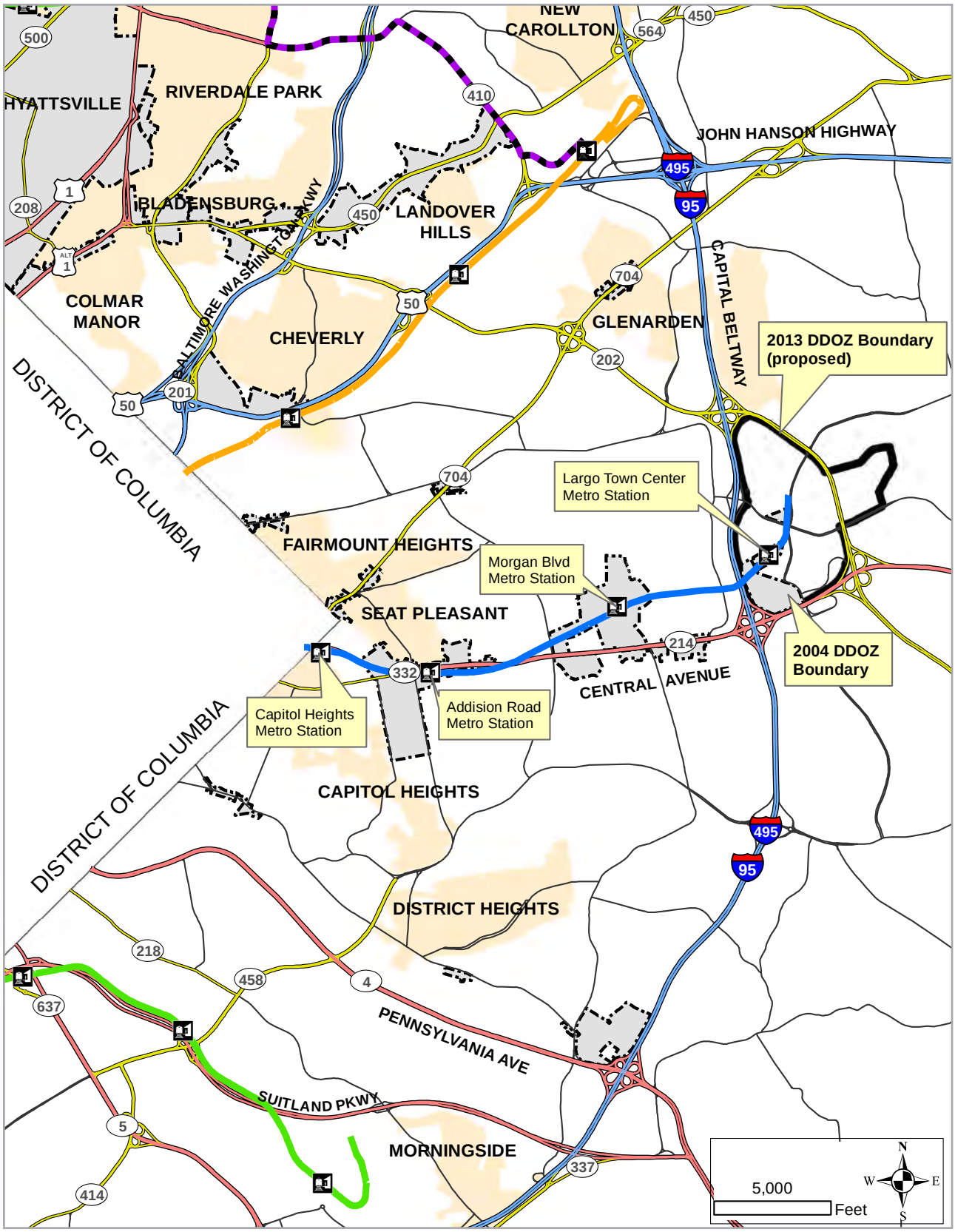
Map 1: Sector Plan Area Boundary



Map 2: Largo Town Center DDOZ Boundaries



Map 3: Location of Largo Town Center DDOZ



TOD is generally defined as development that is located within a 10-minute walk or one-half mile of a commuter rail or rail transit station (Planning and Urban Design Standards, American Planning Association Press, 2006). The 2002 General Plan further defines TOD as development that actively seeks to increase transit use and decrease automobile dependency by:

- *Locating homes, jobs, and shopping closer to transit services.*
- *Locating the mix of critical land uses (live/work/shop/recreate) in closer proximity to one another.*
- *Establishing land use/transit linkages that make it easier to use transit (rail and bus).*

area. These universities draw professionals, students, researchers, and academics to the area. Kaiser Permanente has a major medical office within the northeastern quadrant of the plan area, owning almost 15 acres of land and attracting patients from around the county.

Plan Purpose

The purpose of the *Largo Town Center Sector Plan and Sectional Map Amendment* (SMA) is to promote and facilitate transit-oriented development (TOD) around the Largo Town Center Metro Station and ensure that TOD implementation is realized. The development standards, policies, and strategies contained in this plan are intended to make certain that future development within the sector plan area maximizes transit ridership, revitalizes the area through economic development while maintaining its socioeconomic diversity, and adopts a sustainable development pattern.

The Largo Town Center SMA modifies the DDOZ established by the 2004 *Approved Sector Plan and Sectional Map Amendment for the Morgan Boulevard and Largo Town Center Metro Areas* to ensure that future development is conducive to its designation in the 2002 *Prince George's County Approved General Plan* as a metropolitan center.

This sector plan sets out a development vision for the Largo Town Center DDOZ that articulates vibrant and diverse neighborhoods, an efficient multimodal transportation system, sustainable and accessible environmental infrastructure, and pedestrian- and bicyclist-friendly urban design. This vision emphasizes:

- TOD near the Metro station and clearly defined neighborhoods with distinct characters and functions.
- Pedestrian- and bicyclist-friendly development and redevelopment in the DDOZ.
- Protected environmentally sensitive areas, minimal development impacts, and expanded recreational opportunities and trail/bikeway connections.
- Maximum housing opportunities within walking distance of the Metro station.
- Increased commercial retail and restaurant opportunities as the population expands.
- Publicly- and privately-owned open space for recreation and passive enjoyment.

The plan vision anticipates the possibility of a major institutional user within walking distance of the Metro station, such as a new regional medical center, an expanded university satellite campus, or a U.S. General Services Administration (GSA) tenant.

Additionally, this plan also moves the entire sector plan area from the Developing Tier into the Developed Tier. The Largo Town Center Metro Station is the only Metro station in Prince George's County that is not within the Developed Tier. By designating the plan area as part of the Developed Tier, the sector plan's vision is more likely to be attained. Among the goals of the Developing Tier are:

- Develop compact, higher-intensity mixed-uses in centers and corridors.
- Reinforce planned commercial centers as community focal points.
- Develop compact, planned employment areas.
- Preserve and enhance environmentally sensitive areas.
- Increase utilization of transit.
- Balance the pace of development with the ability of the private sector to provide adequate transportation and public facilities.

- Encourage contiguous expansion of development where public facilities and services can be more efficiently provided.

Relationship to Other Plans

A number of plans and initiatives at the local and state levels provide a framework in which the sector plan was prepared. The policy documents described below formed the context for the Largo Town Center Sector Plan.

2002 *Prince George's County Approved General Plan*

The 2002 General Plan sets forth goals, objectives, policies, and strategies that guide future growth and development throughout Prince George's County and is the foundation for the recommended compact, dense, transit-oriented development that emerged from the Largo Town Center planning process.

The 2002 General Plan divides the county's land into three policy tiers: the Developed Tier, the Developing Tier, and the Rural Tier. It also designates a number of centers and corridors where development is intended to be concentrated in the future. The sector plan area is located on the western edge of the county's Developing Tier. The area includes the Largo Metropolitan Center, the highest intensity center as defined by the 2002 General Plan.

The 2002 General Plan's vision for the Developed Tier is a network of sustainable, transit-supporting, mixed-use, pedestrian-oriented, medium- to high-density neighborhoods. The 2002 General Plan vision for the Developing Tier is to maintain a pattern of low- to moderate-density suburban residential communities, distinct commercial centers, and employment areas that are increasingly transit serviceable. The 2002 General Plan's vision for metropolitan centers is a high concentration of land uses and economic activities that attract employers, workers, and customers from other parts of the metropolitan Washington area.

The Largo Town Center Sector Plan amends the 2002 General Plan by expanding the Developed Tier boundary to include the Largo Town Center sector plan area. This change simultaneously removes the sector plan area from the Developing Tier (see Map 4. Largo Town Center—General Plan Tier Update on page 7).

Moving the Largo Town Center sector plan area from the Developing Tier to the Developed Tier ensures consistency between the TOD-supportive 2002 General Plan visions for both the Developed Tier and the Largo Town Center Metropolitan Center. The amendment also ensures that all 15 Prince George's County Metro stations are in areas that are eligible for county and state TOD-supportive resources and incentives.

1990 *Largo-Lottsford Approved Master Plan and Adopted Sectional Map Amendment*

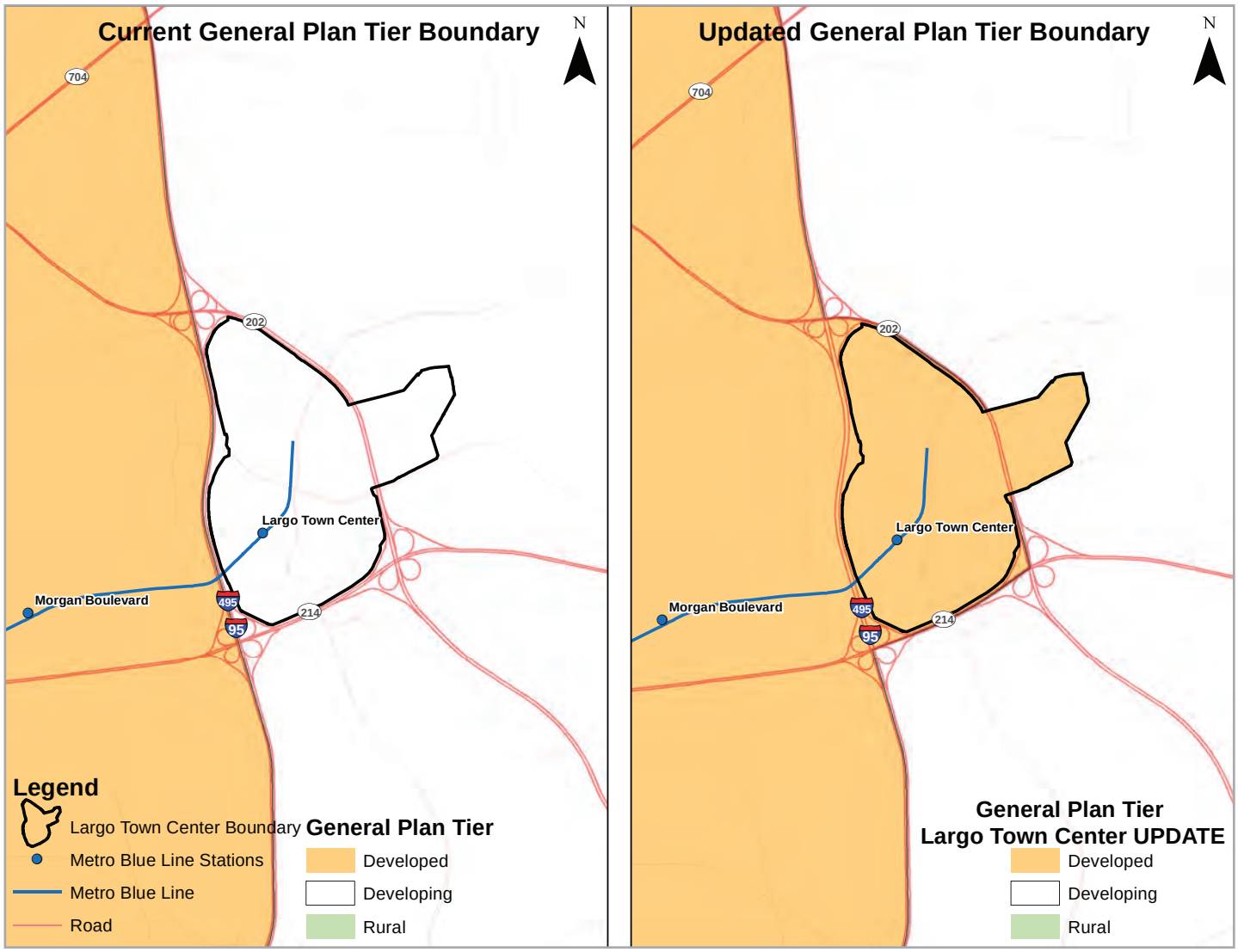
This sector plan boundary falls entirely within the boundary covered by the 1990 Largo-Lottsford Master Plan. Thus, the Largo Town Center Sector Plan amends the portion of the master plan area where both boundaries coincide. The 1990 Largo-Lottsford Master Plan's general recommendations for the area include developing unused land for employment centers, protecting existing residential areas from encroachment by incompatible land uses, and constructing adequate public facilities to meet future community needs.

The 1990 Largo-Lottsford Master Plan specifically recommends the establishment of a major employment area in the parcel between the Capital Beltway (I-495/I-95), MD 202 (Landover Road), and MD 214 (Central Avenue), which includes the majority of the sector plan area. The plan also designates the parcels adjacent to what is now the Largo Town Center Metro Station as a town center, which it classifies as a potential site of highly concentrated, mixed-use development of regional importance. The 1990 Largo-Lottsford Master Plan describes the town center as possibly the most visible aspect of the central portion of the county because of its proximity to major roads. However, the 1990 Largo-Lottsford Master Plan does not promote the town center's relationship to the future Largo Town Center Metro Station, because the master plan was approved 14 years before the Metro station opened for service.

2004 *Approved Sector Plan and Sectional Map Amendment for the Morgan Boulevard and Largo Town Center Metro Areas* (MorLar)

The MorLar Plan amends part of the area covered in the 1990 Largo-Lottsford Master Plan. The MorLar Plan

Map 4: Largo Town Center—General Plan Tier Update



intends to implement the principles of concentrated, transit-serviceable growth outlined in the 2002 General Plan and provide the land use vision required by the Washington Metropolitan Area Transit Authority (WMATA) for Metro stations nearing completion. The Largo Town Center Sector Plan amends that portion of the MorLar plan area east of the Capital Beltway.

The MorLar Plan focuses on fostering compact, mixed-use TOD around both the Morgan Boulevard and Largo Town Center Metro stations. To facilitate TOD in these areas, the MorLar Plan placed a DDOZ, a regulation that imposes a set of development standards intended to promote the urban design and land use principles expected of TOD, on several parcels in the immediate vicinity of these two Metro stations. In addition, it focuses on a swath within roughly one-third of a mile of the Largo Town Center Metro Station and designates it as a "core" area. The MorLar Plan recommends mixed-use zoning for most of this core.

2009 *Approved Countywide Master Plan of Transportation* (MPOT)

The MPOT updates the Prince George's County Master Plan of Transportation, adopted in 1982, and incorporates the transportation recommendations included in subsequent approved master and sector plans. The master plan's recommendations are intended to produce a network of transportation systems and

facilities that, as articulated in the 2002 General Plan: a) encourage quality economic development; b) make efficient use of existing and proposed county infrastructure and investment; and c) enhance the quality and character of communities and neighborhoods.

In relation to the sector plan area, the MPOT provides guidance for future changes in the county's transportation network related to the expansion of Metro's Blue Line to Largo Town Center. This includes reinforcing the 2002 General Plan's recommendation for high-intensity commercial and residential TOD in metropolitan centers, especially the Largo Town Center. The MPOT reinforces the 2002 General Plan's prioritization of public investment for the areas adjacent to the county's Metro stations.

2008 *Approved Public Safety Facilities Master Plan*

The Public Safety Facilities Master Plan contains recommendations for the Prince George's County Police Department, Fire and Emergency Medical Services Department, Department of Corrections, Office of Emergency Management, Office of the Sheriff, and the M-NCPPC Park Police Division. The plan addresses the need for new facilities, renovation of facilities, staffing levels, and crime-prevention strategies such as crime prevention through environmental design.

The master plan sets priority levels for public sector provision of capital improvements related to public safety facilities that vary depending on an area's tier status as specified by the 2002 General Plan. The Public Safety Facilities Master Plan places a high priority on public spending on such facilities in metropolitan centers in the Developing Tier and places a medium to low priority on such spending in other parts of the Developing Tier.

2005 *Approved Countywide Green Infrastructure Plan*

The Green Infrastructure Plan guides development, green space protection, and mitigation activities as well as seeks to implement a long-range vision for preserving, protecting, enhancing, and restoring a contiguous network of environmentally important areas in the county by the year 2025. The plan is not intended to reduce the overall development potential in the county nor is it intended to be a major land acquisition program. The plan emphasizes private-sector stewardship of privately-held lands, which comprise most of the county's green infrastructure network.

The plan aligns with the 2002 General Plan's guiding principles for future green infrastructure plans, which include: a) identifying a contiguous network of environmentally important areas; b) setting forth strategies to preserve, protect, enhance, and restore the network; c) supporting the desired development pattern of the 2002 General Plan; d) adopting and/or supporting effective implementation mechanisms; e) supporting the county's Livable Communities Initiative; and f) ensuring meaningful public participation.

2009 Smart, Green, and Growing Legislation

In 2009, the State of Maryland signed into law a package of three bills bundled under the title "One Maryland: Smart, Green, and Growing." The bills comprehensively outline the state's policy for smart and sustainable growth. The first law, the Smart and Sustainable Growth Act, clarifies that local jurisdictions must implement and follow the comprehensive plans they adopt. The second law, Smart Growth Measures and Markers, directs local jurisdictions and the state to collect smart-growth measures and indicators and establishes a statewide land use goal. The third law, Planning Visions, updates the state's planning process with a set of 12 plan visions that address infrastructure, economic development, public participation, and quality of life, among many other issues. Local jurisdictions are required to include these visions in their local comprehensive plans and implement them through the adoption of applicable zoning and subdivision ordinances and regulations. The 2009 Smart, Green, and Growing legislation replaced the 1992 Economic Growth, Resource Protection, and Planning Act.

Maryland's Stormwater Management Act of 2007

In 2007, the Maryland Department of the Environment passed legislation amending the state's existing site design standards for mitigating stormwater runoff. The primary goals of the state and local stormwater management programs are to maintain the predevelopment runoff characteristics (as closely as possible) after development

and to reduce stream channel erosion, pollution, siltation and sedimentation as well as local flooding by implementing environmental site design to the maximum extent practicable and using appropriate structural best management practices only when necessary. These regulations for stormwater management apply to the development or redevelopment of land for residential, commercial, industrial, or institutional use. The high-quality, mixed-use development envisioned by the sector plan and previous plans will incorporate these stormwater management principles.

1997 Smart Growth and Neighborhood Conservation Initiative

In 1997, the Maryland General Assembly enacted a package of legislation collectively referred to as the Neighborhood Conservation and Smart Growth Initiative. The Maryland Smart Growth Program had three basic goals: to save valuable remaining natural resources, to support existing communities and neighborhoods, and to save taxpayers millions of dollars in unnecessary costs for building infrastructure to support sprawl. This legislation established the state's priority funding areas to help guide future development in ways that support smart growth.

Subregion 4 (Central Avenue-Metro Blue Line Corridor) Transit-Oriented Development Implementation Project

The Central Avenue-Metro Blue Line Corridor Implementation Project will put into effect the vision and goals for the Central Avenue Corridor as presented in the 2010 *Approved Subregion 4 Master Plan and Sectional Map Amendment* and will advance the recommendations of the 2008 *Approved Capitol Heights Transit District Development Plan and Transit District Overlay Zoning Map Amendment*. These plans envision mixed-use TOD and promote housing and neighborhood conservation, public facility and infrastructure improvements, and commercial revitalization around county Metro stations. The project will concentrate on the county's Blue Line Metro stations, including Largo Town Center.

The project's objectives include: a) conducting a series of community educational and outreach programs focused on the TOD opportunities along the Central Avenue and Metro Blue Line Corridor; b) forming partnerships with economic, business, and community stakeholders to develop and initiate a strategic marketing campaign and business retention and attraction program; c) identifying and prioritizing TOD opportunities; d) undertaking a comprehensive pedestrian and bicycle access improvement plan for the Central Avenue Corridor; and e) preparing a sectional map amendment to be applied to the entire corridor.

Background

Demographic Profile

The Largo Town Center sector plan area has a population of 3,400 according to the 2010 U.S. Census Bureau and Metropolitan Washington Council of Governments Round 8.1 estimates. As of March 2013, the area had a median household income of $68,539, lower than the county's median of $72,058 but higher than the national median of $51,301. A total of 1,322 dwelling units are located in the area divided between multifamily and townhome units. Owner-occupied dwelling units in Largo Town Center were 32.4 percent of the total housing stock compared to the county rate of 62.9 percent. The Largo Town Center area is less racially/ethnically diverse than the rest of the county. In 2010, the area's population was only five percent white and 0.8 percent Hispanic compared to 23.6 percent and 14.5 percent, respectively, for the county. Black residents comprised 95 percent of the sector plan area's population compared to 66 percent of the county's population.

Residents of the sector plan are highly educated. A higher proportion of the sector plan area's adult population (47.8 percent) had completed at least two years of college compared to 34.8 percent for the county as a whole. The sector plan area's population is proportionately somewhat older than the county as a whole, with a median age of 37.4 compared to the county's median age of 36.0. The primary driver of this age difference is most likely the lack of children in the area. Many households in the area are childless. The average household size for the sector plan area is 1.9; the average household size in the county is 3.0.

Development Pattern

Land use in the sector plan area is fragmented by man-made and natural barriers. Most of the plan area is framed—and isolated—within the triangle formed by the Capital Beltway, MD 202 (Landover Road), and MD

214 (Central Avenue). All three roads are high-speed thoroughfares with limited or controlled access and no provisions for safe non-motorized use. The plan area is divided into quadrants by Arena Drive and Lottsford Road. Much of the property around the Metro station is publicly owned, including the county-owned land now occupied by The Boulevard at the Capital Centre shopping center and the WMATA-owned joint development site around the Metro station.

The development pattern within the plan area is suburban sprawl. An office park with large amounts of county-owned and county-leased office space occupies the area between Arena Drive and Landover Road. Although several office buildings are as much as six stories in height, most of these structures are three stories in height or less. South of Arena Drive, an existing residential community of low- to mid-rise apartments and townhomes is sandwiched between two suburban shopping centers—The Boulevard at the Capital Centre and the older Largo Town Center Shopping Center. Along the sector plan's southern boundary, undeveloped and privately-owned land predominates with scattered warehouse/light industrial uses and two hotels. East of Landover Road, a large undeveloped property sits immediately north of a public middle school (Ernest Everett Just), an M-NCPPC community center, and a small neighborhood shopping center. A total of more than 200 acres of undeveloped land, more than one-quarter of all of the land in the sector plan area, is scattered throughout

The street network is characterized by superblocks with little or no connectivity between the quadrants. The primary streets are very wide with discontinuous medians; their design allows for traffic speeds that are above posted limits. All development within the sector plan area faces inward and away from the streets. The result is an unattractive, and even unsafe, environment that is pedestrian-unfriendly and lacks points of visual interest in or site lines to shopping centers for pedestrians (or even motorists) to see what retail services are offered. No sense of security exists to encourage walking or biking.

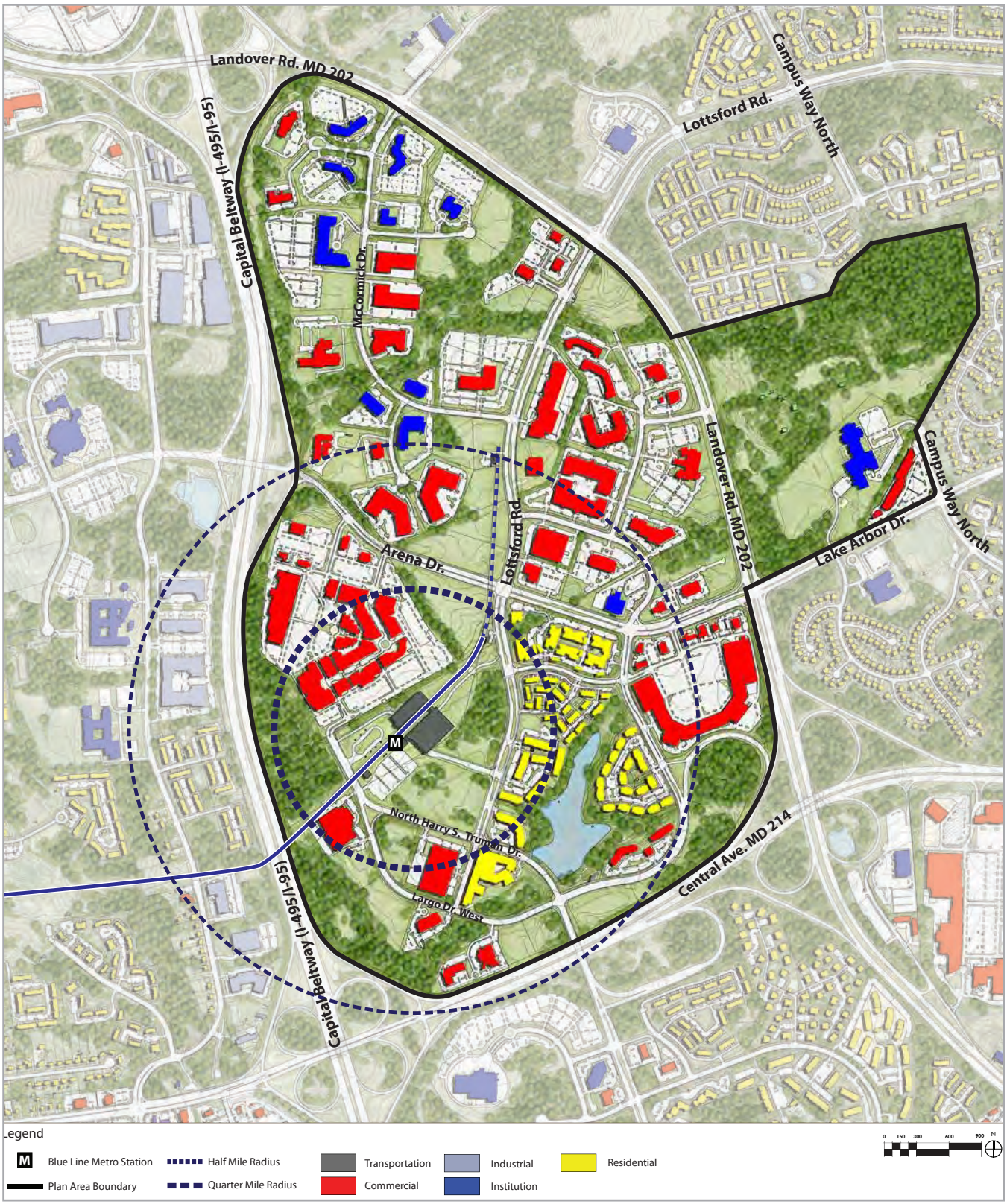
The Metro station opened for service in 2004. It was designed to facilitate convenient commuter parking instead of future air-rights development. Two large parking garages with a total of 2,200 spaces wrap the station tightly and occupy a significant portion of the WMATA joint development site. WMATA has expressed interest in joining a new public-private partnership effort to facilitate TOD around the Metro station. (See Map 5: Largo Town Center Existing Land Use on page 11.)

Development Potential

The Largo Town Center Metro Station currently serves as a commuting hub for Metro patrons traveling to other parts of the Washington metropolitan area. However, the sector plan area possesses several important assets that, leveraged wisely, could help transform the area into a regional urban destination with a vibrant mix of commercial, institutional, and cultural activities.

The most important asset is the Metro station. Not only does it serve as a gateway to the rest of the regional Metro system but also to the ongoing expansion of Metro service to Tysons Corner, Reston, and Dulles International Airport, which will bring direct Silver Line service to Largo Town Center. Second, key underdeveloped parcels around the Metro station are publicly owned. The Prince George's Revenue Authority owns 70 acres of land immediately adjacent to the Metro station at The Boulevard. Although the development at The Boulevard at the Capital Centre is privately owned and the current retail leases are long-term, an opportunity to redevelop the site through a single master planning process remains high. Third, more than 200 acres of undeveloped land are within a mile of the Metro station; nearly all of this land is in large tracks of five or more acres, most at least 10 acres. Large tracts of undeveloped land held by a few individuals increase the likelihood of developing

Map 5: Largo Town Center Existing Land Use



in a cohesive way. Finally, the plan area enjoys excellent regional highway access as well as Metrorail and bus transit access.

Recognizing these assets, the Prince George's County government has named the Largo Town Center area as one of four potential sites that are currently being screened and evaluated for the location of a new regional hospital center. The state of Maryland, through the University of Maryland's medical services system, is collaborating with the county in this major countywide health planning initiative. Such a significant institutional use—or an expanded university satellite campus or GSA tenant—would be a development game-changer for central Prince George's County. A final site for the new hospital is scheduled to be announced in summer 2013.

The county government is not the only potential developer expressing an interest in "doing something" at Largo Town Center. More than half a dozen owners of key developable parcels within the plan area have indicated interest in starting new development projects on their land. M-NCPPC staff conducted one-on-one interviews and group meetings with these key stakeholders between October 2012 and February 2013 to ascertain their development plans and share the plan vision.

In light of the intense public- and private-sector interest in the future of Largo Town Center, the Largo Town Center Sector Plan was developed as a detailed implementation plan with specific development standards and guidelines, concepts, and strategies to promote and facilitate TOD around the Metro station. By doing so, the plan will help transform the Largo Town Center into a true urban destination with enhanced employment and housing opportunities; institutional services; an effective multimodal transportation system; and attractive, walkable, and safe neighborhoods with protected environmental amenities.

Community Engagement

Direct community input shaped the ideas and recommendations found in the Largo Town Center Sector Plan. Public outreach, resident participation, and buy-in from various stakeholders, including county agencies and land owners/developers, were priorities of this planning effort. Several approaches were employed to bring attention to the sector plan area; obtain comments on community and stakeholder concerns, project priorities, and the plan vision; and build a long-term commitment to the ultimate success of the sector plan area. Since the primary focus of the plan is ensuring quality redevelopment of the area immediately surrounding the Metro station (specifically TOD), public sector coordination was necessary. Additionally, the goal was to ensure participation of those property and business owners and other stakeholders interested in and committed to the planning process for the Largo Town Center. The major components of the outreach process included:

- Community Workshops: Staff conducted community planning workshops to solicit public input in the crafting of a community vision for TOD around the Metro station. Five communitywide meetings were held. Preliminary notice of each scheduled meeting was sent to all property owners within one mile of the sector plan area. The team identified key stakeholders integral to the planning process and contacted them directly to ensure their involvement.
- Interviews and Briefings: Staff scheduled meetings with key stakeholders, including owners of potential development opportunity sites, implementing public agencies, and community organizations.

Reaching Out to the Community

Community outreach for the sector plan began with a kick-off community workshop on February 16, 2012, to explain the purpose of the plan and understand community and stakeholder priorities and concerns.

At this meeting, facilitated group discussions ensued regarding issues and opportunities in the sector plan area. This discussion and the ballot vote pointed the planning team in the direction it needed to proceed. Connectivity to Metro was deemed the most important planning issue to focus on, followed by employment, public safety, finding the appropriate intensity and density to redevelop the area, and attracting high-quality retail and restaurants. (See Figure 1: Community Meeting Ballot Results.) The primary intent of this session was to solicit input from the community and help identify issues of importance to the community for planning staff.

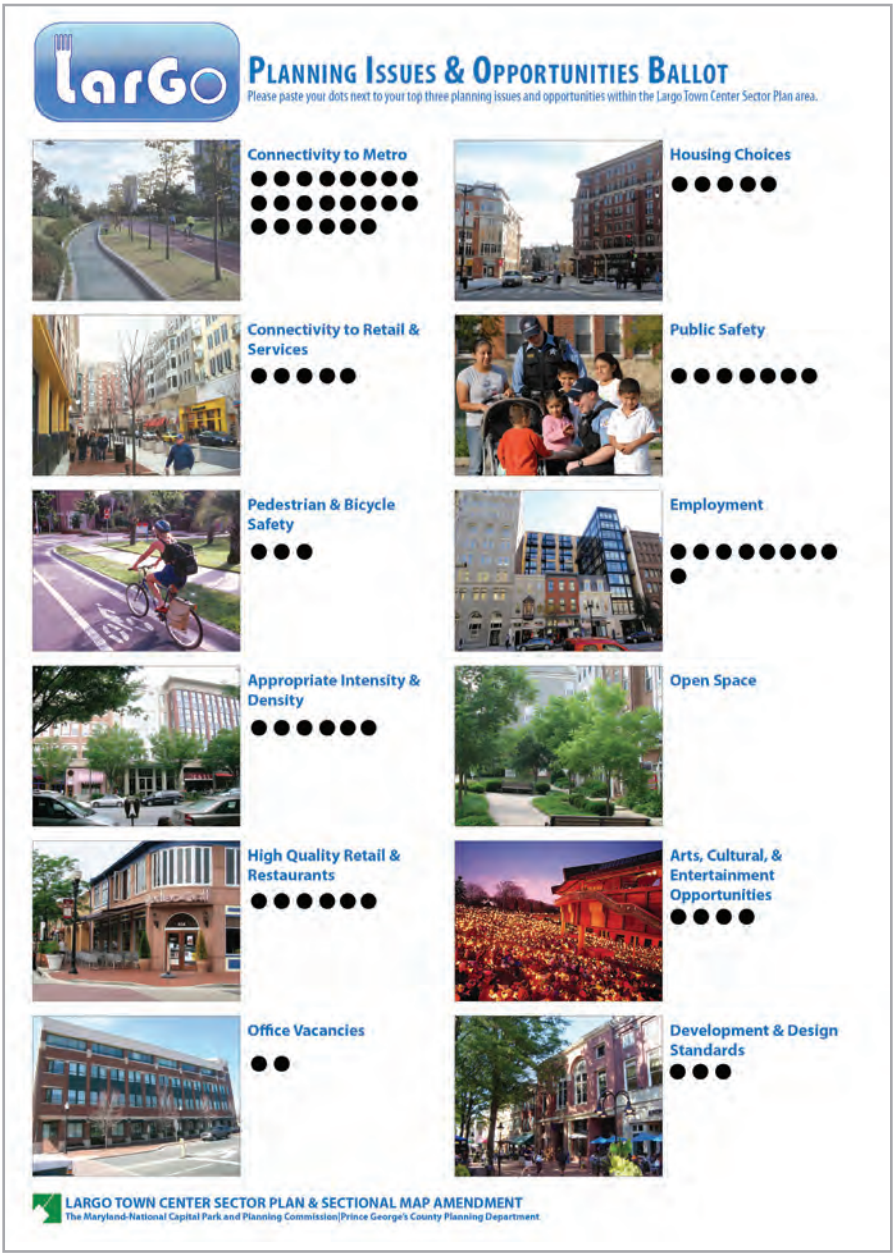


Figure 1: Community Meeting Ballot Results

After six months of data analysis (see Information Collection on page 10), outreach continued with a community meeting on October 3, 2012, describing the team's initial analysis followed by a facilitated community workshop on November 8, 2012, on the community's vision for the area and how it would fit into potential development scenarios. A preferred land use and design concept was developed, and the planning team presented their initial recommendations at this community meeting. A final presentation of the preferred development concept and plan-related recommendations took place on December 10, 2012, and participants further refined and validated the concept. The public audience, which included property owners and developers, was invited to share thoughts about the recommendations and design schematic. After the presentation, the planning team stood by illustrative boards that described architectural character, open space plans, streets and block structure, retail, and implementation while taking questions and comments from the audience.

In addition, at a meeting on February 28, 2013, the community was introduced to the possibility of a major institutional user locating within a quarter-mile radius of the Metro station. With approximately 350 people in attendance, there was overwhelming support for the concept.

A final presentation of the preferred development concept and plan-related recommendations took place on May 2, 2013. The community engagement strategy was designed to reach out to all members of the community, including those who have not actively participated in the past. More than 475 interested residents and stakeholders participated in the planning process, including property owners, neighbors, merchants, developers,

and community leaders. Responsible growth requires teamwork; the high level of civic involvement displayed during the Largo Town Center Sector Plan planning process will ultimately guide growth and ensure quality development for future generations of residents.

Interviews, Briefings, and Tours with Stakeholders

Because of the importance of creating a new mixed-use core, special efforts were made to involve landowners and business operators of undeveloped, vacant sites and sites within a half-mile radius of the Metro station. These properties and businesses would be directly affected by efforts to promote widespread mixed-use redevelopment. Planning staff contacted members of the business community and invited them to attend open houses. One-on-one interviews were held with landowners, developers, business operators, and commercial property owners throughout the process.

These meetings were set up to initiate an ongoing dialogue, regarding community concerns and desires, the plan vision, owner/developer intentions for their properties, and to ensure that the development of those parcels with the TOD core is consistent with the plan vision. The team met with business owners at The Boulevard at the Capital Centre to discuss the plan vision and business owners' concerns. Since The Boulevard at the Capital Centre site is a major part of redefining and redeveloping the area around the Metro station, the team briefed the Revenue Authority's board of directors and met regularly with Revenue Authority staff and the owners of the shopping center. Planning staff also attended a special meeting with the businesses in The Boulevard at the Capital Centre.

From January 2012 through March 2013, the planning team held a series of meetings with Prince George's County Councilmember Derrick Leon Davis and his staff, representatives of Prince George's County's state legislative delegation (Senator Joanne Benson and Senator Ulysses Currie's staff), and senior staff from the County Executive's Office. Monthly coordination meetings were held with the chief executives and directors of the county's Economic Development Corporation, Department of Public Works and Transportation, Revenue Authority, Redevelopment Authority, and Department of Housing and Community Development, as well as senior staff from the WMATA.

Meetings were also held with the Lake Arbor Civic Association. Invitations were extended to Largo Civic Association and Kettering Civic Association for M-NCPPC staff to meet with association members.

Finally, a regional TOD tour was conducted for four County Council members and their staff. With the planning team, the group visited successful, walkable mixed-use TOD communities, including Rockville Town Center in Rockville, Maryland and Clarendon, Shirlington, and Courthouse Square in Arlington County, Virginia. These sites were selected based on attractive, walkable urbanism features and the evolution of their development near transit. The team met with planners and local politicians who described the history of the area, including the market conditions and necessary legislative and implementation tools that enabled the development of each area. These first-hand, on-the-ground studies allowed the group to understand local traditions in place-making, as well as the public and private commitments.

Marketing and Outreach

A public advertisement was printed in local newspapers after the District Council formally initiated the plan in May 2012. In order to inform residents and stakeholders of community meetings, save-the-date postcards and flyers were sent to all property owners within a one-mile radius of the planning area for each of the five community meetings. Flyers were also distributed to local businesses, commuters at the Largo Town Center Metro station, and students at the Lake Arbor Elementary School and Ernest Everett Just Middle School. In addition to notices posted on the plan's web page, e-mails were sent to those who previously participated at Largo Town Center Sector Plan community meetings or signed up as stakeholders on the project web page. At the planning team's request, Councilmember Derrick Leon Davis's office also sent out meeting invitations to his e-mail list. Additionally, advertisements were posted on the Planning Department's and General Plan team's Facebook and Twitter feed. Finally, the team identified key stakeholders integral to the planning process and contacted them directly to ensure their involvement at community meetings.

Information Collection

Intensive analysis of the Largo Town Center area was undertaken during the six months between the kick-off meeting and the second community meeting. The planning team toured the sector plan area multiple times, focusing on opportunity sites, physical constraints, and the existing building layout and design. During a kick-off meeting with consultants in July 2012, the group spent an afternoon on a comprehensive bus tour, analyzing maps and discussing opportunities for growth and redevelopment.

The planning team toured the sector plan area numerous times, noting and analyzing the area's development patterns; reviewing the clustering and type of retail establishments; and documenting physical features with photographs, measurements, and sketches. From the visual analysis, in conjunction with market data and interviews with property owners (including the Revenue Authority and the owners of The Boulevard at the Capital Centre) on their debt and annualized rate of return, an economic market analysis was conducted that helped determine the viability of various land use, zoning, and design scenarios. On-site analysis through the examination of physical constraints, such as steep slopes, wetlands, and specimen trees that require preservation, also aided in identifying redevelopment and infill opportunity sites. These studies were used to better describe the Largo Town Center sector plan area and to inform the community of planning and design decisions.

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Chapter 2: The Vision for Largo Town Center Metro Station and Beyond

The Largo Town Center Sector Plan envisions the transformation of the Largo Town Center Metro Station area into one of Prince George's County's premiere mixed-use "downtowns" and 24-hour activity centers by 2035. The core area is anchored by a major new institutional use—a regional hospital, satellite university campus, or U.S. General Services Administration (GSA) tenant—and features a mixed-use retail district along an extended Harry S Truman Drive. Largo Town Center is Prince George's County's primary local government center, offering a variety of services for county residents and businesses. A range of large and small businesses serve both the needs of citizens who reside within walking distance of the Largo Town Center Metro Station and the needs of visitors from the greater Washington metropolitan region. A wide range of sit-down restaurants, performance venues, public and private open spaces, and other cultural attractions add to the regional attraction of the new Largo Town Center area.

The sector plan area's high-density, mixed-use core is bordered to the north by an expanded government services district and health-related service activities. New medium- to high-density residential development rings the sector plan area's southeast quadrant between Arena Drive and Harry S Truman Drive, east of Lottsford Road. New townhomes occupy a formerly undeveloped site east of Landover Road (MD 202).

The maximum buildout scenario for the Largo Town Center sector plan area envisions a new regional medical center, expanded university satellite campus, or GSA tenant within one-quarter mile of the Metro station entrance. Under this scenario, housing stock in the area has expanded to a total of 4,350 new and preexisting dwelling units. Approximately 5,000,000 square feet of commercial office and institutional space provide a rich mix of employment and business service opportunities. Some 400,000 square feet of reconfigured retail space line part of the extended Harry S Truman Drive and make up two smaller retail focus areas within the sector plan area.

The downtown area or Transit-Oriented Development (TOD) core contains the tallest buildings, with 8- to 14-story office and residential towers surrounding the Largo Town Center Metro Station. The TOD core transitions into outer neighborhoods with a range of high- and moderate-density civic/institutional, commercial office, and residential mixed-use development. Buildings in these areas range from 4 to 10 stories in height. East of Landover Road, a new community of three-story townhomes has been built. (See Map 6: Recommended Building Heights Plan on page 19.)

Largo Town Center serves as a major multimodal transportation hub with excellent highway and transit (bus and Metrorail) connections to support the new development. The area is buffered by a network of trails and open spaces that provide needed green and open space for residents. The roadway network is transformed into a network of pedestrian- and bicyclist-friendly complete streets.

Vision Elements

A new mixed-use TOD core that focuses on the Largo Town Center Metro Station. The TOD core is anchored by the extension of Harry S Truman Drive north to Arena Drive as a boulevard-like landscaped green street. The preferred buildout scenario for the TOD core features a major new institutional use—a new regional medical center, expanded university satellite campus, or GSA tenant—on a site south of Arena Drive and within convenient walking distance of the Metro station. Along with the new institutional use, a complementary mix

of residential and commercial uses fosters round-the-clock activity and a genuine sense of place. A compact, connected grid of streets includes many small blocks and a variety of street and building types. The TOD core functions as a place to live, work, play, and visit, with its interrelated uses and built environment forming a cohesive, vibrant whole.

The former Boulevard at the Capital Centre shopping center has been replaced by a new main street commercial retail district that lines both sides of Harry S Truman Drive Extended. The new main street includes destination and neighborhood-oriented retail uses on ground floors with offices and residences on the upper floors. A smaller cluster of retail uses links Harry S Truman Drive to a new public green at the Metro station via a new local street. (See Map 7: TOD Core Concept Plan on page 20.)

Expanded primary civic center to consolidate county services. The consolidation of a variety of county services at a single location has resulted in an expanded civic center north of the TOD core. The expanded government services center is an employment and cultural destination with a mix of government, cultural, educational, office, and hotel uses. New road connections make the TOD core accessible by transit and on foot. The modified street grid is punctuated and complemented by civic places that accommodate a variety of needs from public gatherings and cultural activities to quiet contemplation.

Healthcare center. The existing private healthcare complex at this location (Kaiser Permanente) has been joined by more specialized, mostly private health care providers in several medical services buildings. Healthcare-related retail uses are located in ground floor space in one or two of the new buildings.

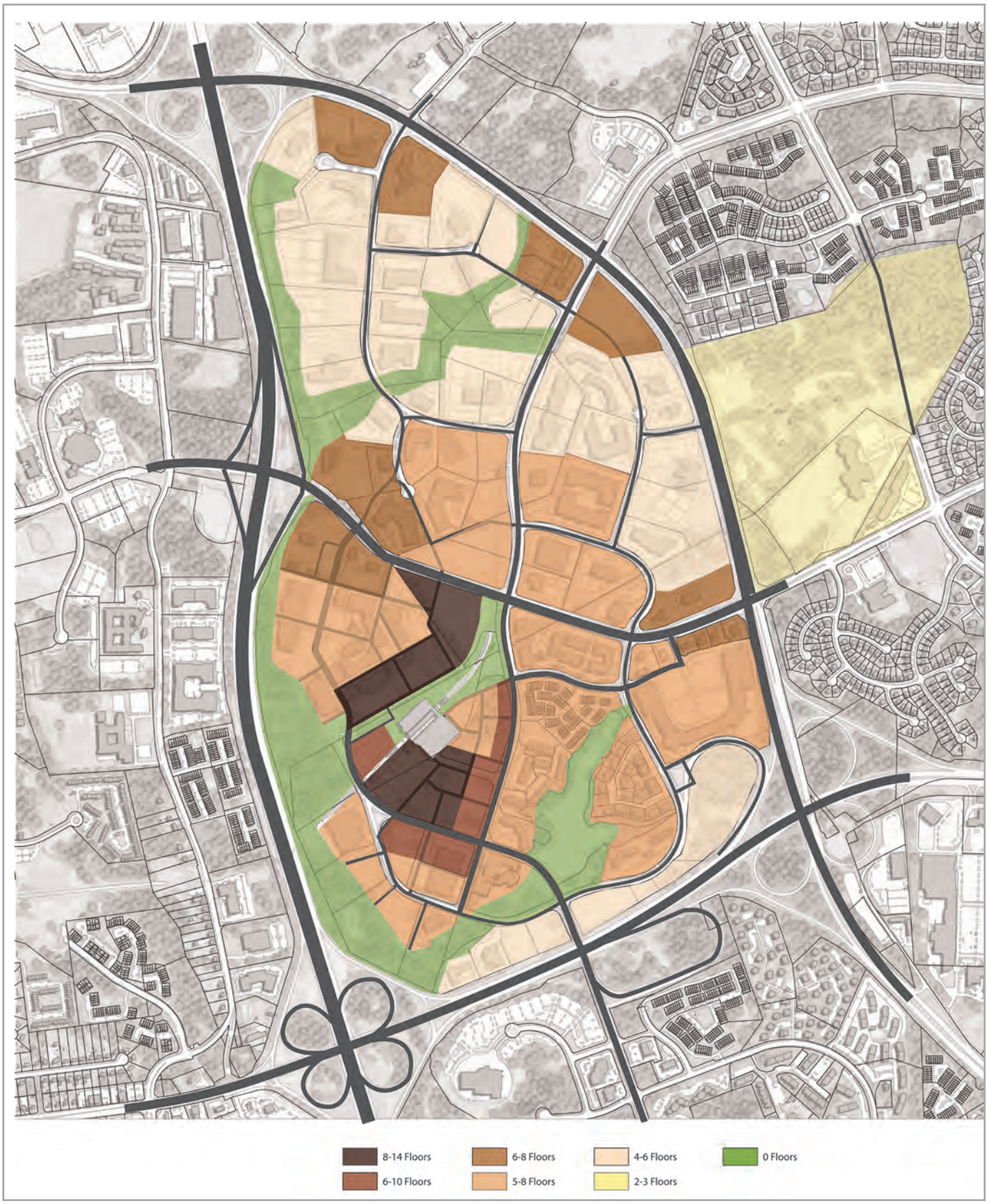
A variety of neighborhoods with a range of housing types. Largo Town Center includes a variety of neighborhoods, including housing integrated into mixed-use districts; high-density multifamily residential neighborhoods; and townhome neighborhoods. A large concentration of high-density multifamily residential units are located in the TOD core west of Lottsford Road. East and south of Largo Center Drive, moderate- to medium-density multifamily residential development buffers the sector plan area from the highway noise of Landover Road and Central Avenue (MD 214). The old Largo Town Center Shopping Center has been replaced by new medium-density multifamily residences over reconfigured retail services that continue many of the services offered by the former shopping center. This mixed-use residential complex fronts Arena Drive and is no longer set back from the street, enabling greater access and walkability. A large townhome community sits on formerly undeveloped land that is bisected by the now-completed Campus Way North.

These neighborhoods achieve a successful housing mix, offering housing opportunities across a broad spectrum of ages and incomes. The area includes mixed-income and workforce housing in a variety of housing types, which range from single-family attached townhomes to higher-density apartment buildings of various sizes. The housing mix accommodates older adults and families with children, as well as singles and couples seeking an urban lifestyle in Prince George's County. The multifamily units throughout the sector plan area are a mix of rental and condominium units, but most will be rental units in the near term due to market forces. As the market shifts, rental units can be converted to condominiums with tenants having the right of first refusal. Ultimately, rental and condo units abound the entire plan area in addition to the for-sale single-family attached townhomes. In short, county residents in the Largo Town Center sector plan area now have the option to "age in place" without fear of involuntary displacement or other loss in their quality of life.

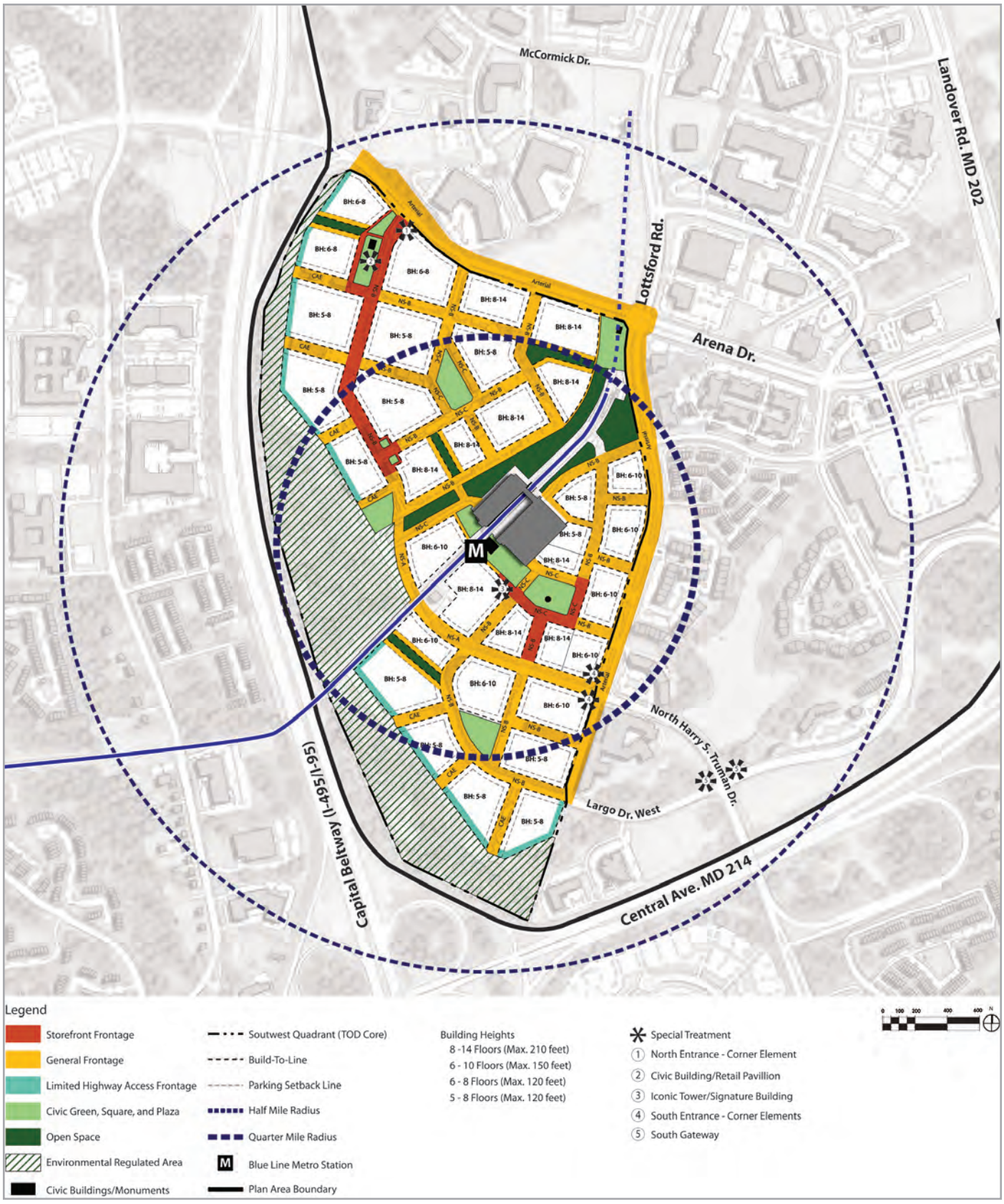
Economic development and a vital economic mix. The area offers a variety of employment opportunities and generates substantial tax-based revenue for the county, especially with the addition of a major institutional user. Largo Town Center accommodates a diverse mix of business opportunities, having attracted anchor office tenants to this regional destination with its rich mix of retail and restaurants. At the same time, needed neighborhood-oriented services are found at several select locations within the sector plan area. By combining compatible uses within walking distance of each other, the area achieves a synergy and vitality that continues well past the end of the workday. In this 18- to 24-hour-a-day regional destination, residents and visitors patronize local and national businesses; cultural uses enliven the TOD core and civic center; and major employers provide a daytime and, in the case of a regional hospital, nighttime population to support businesses.

A fully-integrated, multimodal transportation system. The vision for Largo Town Center provides a

Map 6: Recommended Building Heights Plan



Map 7: TOD Core Concept Plan



comprehensive, multimodal transportation network that fully accommodates public transit, automobiles, pedestrians, and bicyclists through the application of complete street principles. A key component of the vision for Largo Town Center is enhanced highway and Metrorail access to other key destinations in the region, including downtown Washington, D.C., Montgomery County, northern Virginia, and all three regional commercial airports (Ronald Reagan Washington National, Washington Dulles International, and Baltimore/Washington International Thurgood Marshall). An urban street grid with smaller blocks and no cul de sacs encourages travel on foot and bicycle within the area by providing a safe pedestrian/bicyclist environment.

All former one-way streets in the area south of the Metro Blue Line rail overpass have been converted to two-way streets with abundant on-street parking. Arena Drive, McCormack Drive, and Lottsford Road have been transformed into boulevard-like streets with green medians, curb bumpouts at intersections, lighted bus stop shelters with real-time transit service information, pedestrian-scaled streetlights, and pedestrian-activated crossing signals with countdown displays. The former flying right-turn entrance ramp from Largo Center Drive to westbound Central Avenue has been reconfigured into a 90-degree, three-way intersection with Largo Center Drive. East of Landover Road, a completed Campus Way North provides direct connections between residential areas northeast and southeast of the sector plan area and helps to divert local traffic away from Landover Road. (See Map 8: Proposed Street Network on page 25.)

An enhanced and expanded network of open space and civic places, Largo Town Center includes an expanded open space network that comprises publicly and privately owned greens and plazas, linear parks, promenades, natural resource-based parkland, and recreational amenities. The open space system provides focal places in the hearts of neighborhoods, settings for public gatherings and events, opportunities for quiet contemplation and appreciation of nature, attractive connections between destinations, and opportunities for passive and active recreation that are located in safe places. The open space system is tied together by expanded trail connections linking Largo Town Center with surrounding areas.

Improved pedestrian, bicycle, and trail connections. The Largo Town Center area encourages residents and visitors alike to leave their automobiles behind. All destinations are accessible by a continuous network of sidewalks, safe pedestrian crossings, bicycle routes, and new trail connections. New development emphasizes pedestrian and bicycle linkages to schools, parks/recreational areas, and commercial and employment centers for all ages. Largo Town Center's pedestrian- and bicyclist-friendly built environment encourages its residents to make much healthier personal mobility choices. (See Map 9: Illustrative Community Open Space and Bicycle Path Plan on page 26.)

An environmentally sensitive and security-conscious site design. Largo Town Center incorporates environmentally sensitive design and stormwater management practices that (1) minimize and manage stormwater at its source, thereby protecting local and regional watersheds from harmful runoff; and (2) counteract the "urban heat island effect" through a reduction in heat-retaining impervious surfaces (i.e., building roofs, paved surface parking lots, and too-wide streets). The area includes open spaces that combine stormwater management functions and publicly and privately owned amenities. New development minimizes impervious surfaces and employs other low-impact design techniques. Following a "green streets" model, Largo Town Center features many street trees and multipurpose green spaces that function as community amenities as well as areas for stormwater infiltration. In sum, the Largo Town Center sector plan area features an expanded network of green spaces and places that connect with natural resource areas.

All new public buildings and most—if not all—new privately built buildings in the sector plan area are designed to qualify for leadership in energy and environmental design (LEED) certification (LEED Gold or better for public buildings). Crime prevention through environmental design (CPTED) principles have also been incorporated into the design of buildings and public spaces throughout the sector plan area to minimize or eliminate opportunities for crime. Key CPTED features include continuously lighted public streets and open spaces, building façades that promote "eyes on the street" surveillance, and publicly accessible spaces whose design invites use and "ownership" by residents and visitors.

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EXHIBIT E

PROJECT COST COMPARISON

		PGRMC Mod. CON App.			WAH Mod. CON App.	MHE Completeness	Germantown Modification	Clarksburg Modification
		HOSPITAL/ACC	**Central Utility Plant**	**Total**				
1.	Capital Costs:							
a.	New Construction							
(1)	Building	$276,046,707	$8,697,383	$284,744,090	$132,200,000	$125,193,045	$86,809,872	$66,870,000
(2)	Fixed Equipment (not included in construction)						$3,439,500	
(3)	Land Purchase	$11,972,775	$377,225	$12,350,000	$11,000,000	$2,000,000	$7,746,016	
(4)	Site Preparation	$16,603,282	$530,668	$17,133,951	$10,400,000	$36,015,484	$7,139,623	$6,067,000
(5)	Architect/Engineering Fees	$15,676,523	$501,048	$16,177,571	$13,200,000	$17,400,000	$5,975,188	$5,892,000
(6)	Permits (Building, Utilities, Etc.)	$10,590,589	$338,493	$10,929,082		$4,107,718	$1,174,369	$2,312,000
	SUBTOTAL	$330,889,877	$10,444,816	$341,334,694	$159,500,000	$184,716,247	$112,284,568	$81,141,000
b.	Renovations							
(1)	Building							
(2)	Fixed Equipment (not included in construction							
(3)	Architect/Engineering Fees							
(4)	Permits (Building, Utilities, Etc.)							
	SUBTOTAL	$0	$0	$0	$0	$0	$0	$0
c.	Other Capital Costs							
(1)	Movable Equipment	$126,420,566	$32,496,000	$158,916,566	$33,800,000	$22,000,000	$14,636,677	$16,665,000
(2)	Minor Movable Equipment				-	$4,100,000	$23,118,707	$3,500,000
(3)	Contingencies	$28,582,481	$1,417,519	$30,000,000	$11,200,000	$7,000,000	$12,104,857	$6,572,000
(4)	Other (Specify)	$20,079,220		$20,079,220	$30,700,000	$18,200,000	$3,734,055	$11,996,000
	SUBTOTAL	$175,082,267	$33,913,519	$208,995,786	$75,700,000	$51,300,000	$53,594,296	$38,733,000
	TOTAL CURRENT CAPITAL COSTS (a - c)	$493,999,369	$43,981,110	$537,980,479	$246,200,000	$236,016,247	$165,878,864	$119,874,000

***NOTE**: These costs have not been adjusted for inflation. They are only being presented for comparison purposes.*

		PGRMC Mod. CON App.			WAH Mod. CON App.	MHE Completeness	Germantown Modification	Clarksburg Modification
		HOSPITAL/ACC	Central Utility Plant	Total				
d.	Non-Current Capital Costs							
(1)	Inflation	$23,469,012	$2,355,508	$25,824,521	$10,100,000	$4,679,795	$1,409,242	$7,887,000
(2)	Capitalized Construction Interest	$36,385,339	$3,376,661	$39,762,000	$45,156,375	$24,901,333	$3,313,105	$13,023,000
TOTAL PROPOSED CAPITAL COSTS (a-e)		$565,826,494	$50,090,506	$615,917,000	$301,456,375	$265,597,375	$170,601,211	$140,784,000
2.	Financing Cost and Other Cash Requirements:							
a.	Loan Placement Fees	$3,795,039	$335,961	$4,131,000		$600,000	$550,307	$6,687,000
b.	Bond Discount					$970,000	$533,588	
c.	Legal Fees (CON Related)	$917,814	$82,186	$1,000,000		$700,000	$200,000	
d.	Legal Fees (Other)	$826,033	$73,967	$900,000			$250,000	
e.	Printing							
f.	Consultant Fees							
	CON Application Assistance					$100,000	$500,000	$150,000
	Other (Specify)	$13,308,310	$1,191,690	$14,500,000	$4,898,149	$300,000	$4,348,751	
g.	Liquidation of Existing Debt							
h.	Debt Service Reserve Fund	$13,573,398	$1,201,602	$14,775,000	$24,475,000	$14,973,000		$6,880,000
i.	Principal Amortization							
	Reserve Fund							
j.	Other (Specify)							$2,580,000
TOTAL (a - j)		$32,420,594	$2,885,406	$35,306,000	$29,731,149	$17,643,000	$6,382,646	$16,297,000
3.	Working Capital Startup Costs			$0	$0	$0	$25,000,000	$20,000,000
TOTAL USES OF FUNDS (1 - 3)		$598,247,089	$52,975,911	$651,223,000	$330,829,524	$283,240,375	$201,983,857	$177,081,000

***NOTE**: These costs have not been adjusted for inflation. They are only being presented for comparison purposes.*